PRE-FEASIBILITY REPORT (PFR)

For

Proposed Expansion in "Pesticide Technical Manufacturing Unit"

At

Khasra No 15/23, 24/1/1, 24/2, 24/3/1, 31/4/1/1, 15/24/1 (0-19), 24/2(0-19),24/3(2-1),31/4/1 (5-7), 15/23(8-0), 24/1 (2-0), 24/2 (2-0),24/3(4-0),31/4/2 (0-15)
Village Rampura, Tehsil Rampura Phul, District-Bathinda, Punjab

Type of Project	Brownfield Project
Total Plot Area	7770.88 m^2
Total Cost of Project	Rs. 15 Crores
Category as per EIA notification 2006 and its amendments:	5(b), Category- A (Pesticides industry and pesticide specific intermediates (excluding formulations) **Category A**
Production Capacity	**Existing Formulation:** 200 MTPA **After Expansion production Capacity:** 3000 MTPA (Insecticides: 1140 MTPA, Fungicides: 300 MTPA, Herbicide: 1200 MTPA, Intermediates-products: 360MTPA) **Formulations-60000 MTPA**
NABET Acc. No.:	NABET/EIA/1922/RA0196 valid till 23.11.2022

PROJECT PROPONENT

M/s SAI RAM AGRITECH PVT. LTD.
1st Floor, Lehra Bazar, Rampuraphul, Bathinda, Punjab-151103
Email: **sairamagritech@gmail.com Phone No**: - 9216626301

UID No.: EQMS/PFR/SRAPL/5(b)A/PR-684/30082022	
Report Release Date: 30.08.2022	Revision No: 00

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Phone: 011-42270087, 43062757 ; Website: www.eqmsglobal.com ; E-mail: eqms@eqmsindia.org

TABLE OF CONTENTS

1 EXECUTIVE SUMMARY

M/s Sai Ram Agritech Private Limited, a leading agrochemical company in India, deals in all kinds of insecticides, herbicides, fungicides, fertilizers, manures and plant growth regulators. It is an ISO 9001:2015 certified company.

Existing plant is located at **Village Rampura, Tehsil Rampura Phul, District-Bathinda, Punjab**. The unit is currently involved in manufacturing of **Formulation (Formulation of pesticides / weedicides and Fungicides: 200 MTPA).** As of now, this unit is manufacturing formulation products, hence **environment clearance is not applicable** for the existing unit. Existing unit has valid **consent to operate granted from Punjab Pollution Control Board vide application no 9347862** and **9343484** dated **22nd February 2019** .

Now, Sai Ram Agritech has planned to expand their existing unit. The project will involve in production of pesticides and pesticide specific intermediates. **The total production capacity of plant after expansion will be 3000 MTPA (excluding formulation). The plant also proposes to enhance their formulation capacity from 200 MT/Annum to 60000 MT/Annum**. Since environmental clearance has been exempted for formulation units as per EIA Notification, 2006 and further amendments, formulation capacity for the plant has not been added.

The chronology of events in establishment of existing formulation unit and subsequently obtaining the appropriate approvals is as under:

Year of Establishment	Total Production Capacity	Whether covered under EIA Notification or Not
2013	Formulation of pesticides / Weedicides and Fungicides @ 50 MT/Annum	• The industry was not covered under EIA Notification, 2006 and its amendments because Environment Clearance is exempted for formulation unit. • CTE and CTO was obtained from PPCB time to time for the establishment and operation of existing industry.

Year of Establishment	Total Production Capacity	Whether covered under EIA Notification or Not
2018	Formulation of pesticides / Weedicides and Fungicides @ 200 MT/Annum	• The industry was not covered under EIA Notification, 2006 and its amendments because Environment Clearance is exempted for formulation unit. • Approval for site clearance was obtained from Director of Factories, Punjab for increasing the production capacity (formulation) of Pesticides / Weedicides and Fungicides from 50 MT/year to 200 MT/year vide dated 24.09.2018.Copy of approval is enclosed along as **Annexure III**. • CTE expansion was obtained from PPCB for increasing the production capacity (formulation) of Pesticides / Weedicides and Fungicides from 50 MT/year to 200 MT/year vide Certificate No. CTE/Exp/BTI/2019/9143245 dated 06.02.2019. Copy is enclosed along as **Annexure IV.** • CTO was granted by PPCB for Formulation of pesticides / weedicides and Fungicides @200 MT/year vide Certificate No. CTOA/Varied/BTI/2019/9343484 for Air & CTOW/Varied/BTI/2019/9347862 for Water dated 22.02.2019 and valid till 30.09.2023. Copy is enclosed as **Annexure V.**

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

Details of proposed products is mentioned below in **Table 1.1.**

Table 1.1 : Details of Proposed Product Capacity

Sr.no.	Name of Products	Cas No.	Quantity (MT/Annum)
HERBICIDE GROUPS			
Group 1: UREAS/ ALS-SULFONYLUREACONT/ALS-IMIDAZOLINONE			
1	Bispyribac-Sodium	125401-92-5	180
2	Bensulfuron	83055-99-6	
3	Chlorimuron	90982-32-4	
4	Pyrazosulfuron	93697-74-6	
5	Sulfosulfuron	141776-32-1	
6	Penoxsulam	219714-96-2	
7	Imazethapyr	81335-77-5	
Group 2: AMINO ACIDS / UREAS/ ACETAMIDES/CYCLOHEXANDIONES			
8	Glyphosate	1071-83-6	300
9	Glufosinate	77182-82-2	
10	Pendimethalin	40487-42-1	
11	Pretilachlor	51218-49-6	
Group 3: PPO-DIPHENYL EHTERS/ ARYLOXYPHENOXYPROPIONATES			
12	Clodinafop	105512-06-9	120
13	Quizalofop	100646-51-3	
Group 4: TRIAZINES/PGR / OTHERS			
14	Metribuzin	21087-64-9	600
15	Atrazine	1912-24-9	
16	Ethopen	16672-87-0	
17	2,4 D Sodium Salt		
FUNGICIDE GROUPS			
Group 5: SDHIs / OTHERS – CONT			
18	Thifluzamide	130000-40-7	**120**
19	Isoprothiolane	50512-35-1	
Group 6: STROBILURINS/SBI – TRIAZOLE			
20	Azoxistrobin	131860-33-8	**180**
21	Picoxystrobin	117428-22-5	
22	Trifloxystrobin	141517-21-7	
23	Tebuconazole	107534-96-3	
24	Tricyclazole	41814-78-2	
25	Propiconazole	60207-90-1	
26	Difenoconazole	119446-68-3	
INSECTICIDE GROUPS			
Group 7: ACARICIDES COMPOUNDS/ BENZOYLUREA/OTHERS			
27	Diafenthiuron	80060-09-9	120
28	Spiromesifen	283594-90-1	

Sr.no.	Name of Products	Cas No.	Quantity (MT/Annum)
29	Pyriproxyfen	95737-68-1	
Group 8: NEONICOTINOIDS			
30	Dinotefuran	165252-70-0	**600**
31	Imidacloprid	138261-41-3	
32	Thiamethoxam	153719-23-4	
33	Pymetrozine	123312-89-0	
Group 9: SYNTHETIC PYRETHROIDS			
34	Lamda-Cyhalothrin	68085-85-8	**360**
35	Bifenthrin	82657-04-3	
36	Cypermethrin	52315-07-8	
37	Deltamethrin	52918-63-5	
Group 10: ORGANOPHOSPHORUS & OTHERS			
38	Chlorantraniliprole	500008-45-7	**60**
39	Flubendiamide	272451-65-7	
Group 11: ADVANCE SPECIFIC PESTICIDE INTERMEDIATES			
40	PEDA		**240**
41	PMIDA		
42	RHPPA		
43	LAMBDA ACID		
44	Research & Development Based Products		**120**
	Total		**3000**

***No Banned Pesticides will be manufactured.**

****As per season, the demand of products pattern changes and accordingly products will be manufactured. All the products will not be manufactured at a time. The likely production capacities of the products will depend upon demand but limited to the sanctioned capacity.**

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 proposed project site is not located in a Notified Industrial Area. **therefore, Public Hearing has been applicable for this project.**

Details of the project have been mentioned below in **Table 1.2:**

Table 1.2 : Details of Proposed Project

S. No.	Particulars		Unit	Existing	Proposed/ Additional Details	After Expansion	Remarks
1	Total Project Cost		Rs. (In Crore)	0.973	15	15.973	Increase
2	**AREA DETAILS**						
a.	Total Plot Area		m^2	7770.88	-	7770.88	No Change
b.	Green Area		m^2	-	2612.614	2612.614	Increase
3	**POPULATION**						
a.	Workers/ Staff	Permanent	No.	22	50	72	Increase
		Temporary:		25	60	85	Increase
4	**SERVICE DETAILS & ENVIRONMENTAL ASPECTS**						
a.	Total Water Requirement		KLD	2.3	58	60.3 ~ 60	Increase
b.	Wastewater Generation		KLD	Total: 1.7	Total: 42	Total: 43.7	Increase
	(Including Domestic Sewage & Industrial Effluent)			Industrial:0.2 Domestic:1.5	Industrial: 41.8 Domestic: 0.2	Industrial:42 Domestic: 1.7	
c.	Wastewater Treatment Schemes/Capacity		KLD	Solar evaporation pond; Septic tank	ETP: 30 KLD MEE: 50 KLD; SBT: 60 KLD	ETP: 30 KLD MEE: 50 KLD; SBT: 60 KLD	After expansion for waste water treatment MEE, ETP & SBT proposed
d.	Recycled Water Reuse		KLD	-	45	45	Increase
e.	Power Requirement		kVA	122.22	1000	1122.22	Increase
f.	DG Sets (Backup) Boiler		kVA Tph	1 x 62.5	1 x 250 & 1x 380	1 x 62.5, 1 x 250 & 1x 380	Increase

1.1 Plant location and area classification

The project site is located at Village- Barnala-Bathinda Road, Rampura phul, District- Bathinda, Punjab. The site belongs to M/s Sai Ram Agritech Pvt. Ltd. *(*Land Documents have been attached as **Annexure-I**). Project Location (Google Earth Pro Image) is shown in ***Figure 1.2.***

The **total plot area of the project is 7770.874 m^2.** Out of total, 2612.614 **m^2 i.e., 33.62 % of total plot area will be developed as Green Area**. Detailed land-use breakup of the plant is shown in **Table 1.3**. and **Figure 1.1**.

Table 1.3: Land-use Breakup of Project Site

Land use	Area (Sq. m)	Percentage Area (%)

Ground Coverage	3355.370	43.178%
Green Belt	2612.614	33.62%
Open area & Road Area	1802.890	23.202%
Total Plot Area	**7770.874**	**100.00%**

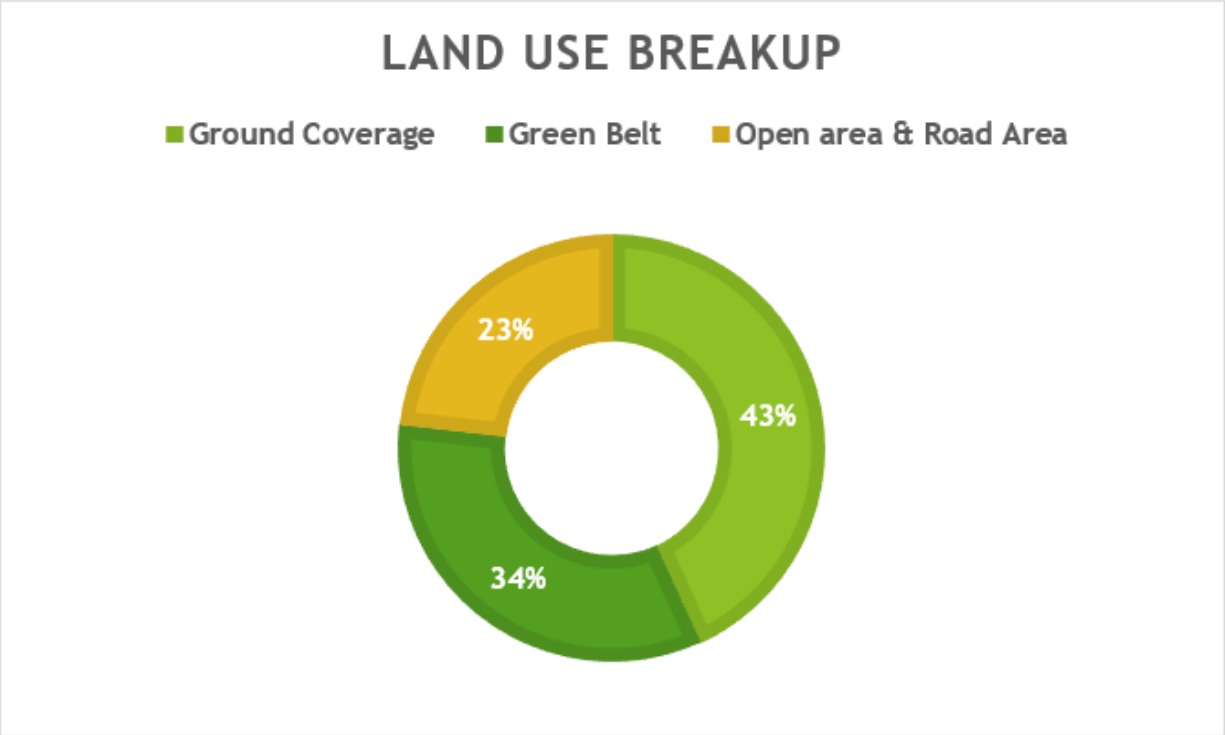


Figure 1.1 : Land-use Breakup of Proposed Project

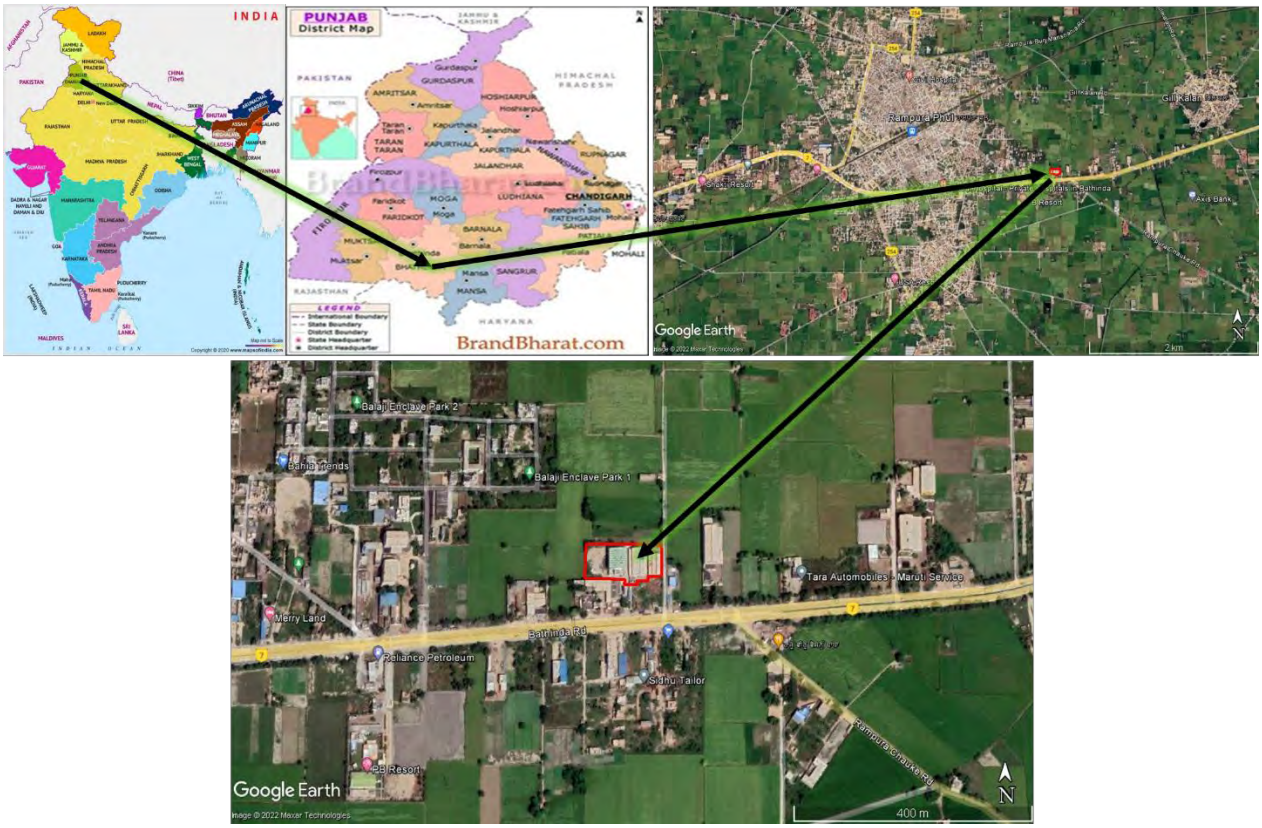


Figure 1.2: Project Location

1.2 Green belt

To mitigate and minimize the environmental impacts, arising due to project especially from air pollution, noise pollution, soil erosion etc. a dense Greenbelt shall be developed all around the proposed site. *M/s Sai Ram Agritech Pvt. Ltd.* will develop greenbelt in **2612.614 m^2 area i.e. 33.62 % of total plot area**. The industry shall put in serious effort to create the greenery.

1.3 Water Requirement

Construction Phase: The total water requirement for construction phase will be 5 KLD (Domestic- 2 KLD, Construction- 3 KLD) which will be supplied by private tankers.

Operation Phase: The existing total water requirement of the plant is 2.3 KLD. After expansion, total water requirement shall increase to **60 KLD** out of which **15 KLD** freshwater requirement shall met through Borewell after getting permission from concerned authority i.e. PWRDA and rest **45 KLD** from in-house treatment schemes i.e., ETP, MEE and SBT. Details of water requirement and wastewater management have been provided below in ***Table 3.2 & Table 3.3.*** Details have been provided in **Section 3.8.1.**

1.4 Power requirement & supply/ source

Construction Phase: Total 1 no. of DG Sets of capacity 1 x 250 kVA will be used for power supply during construction works.

Operation Phase: Existing power requirement of the plant is 122.22 KVA, being sourced through Punjab State Power Corporation Limited (PSPCL). For Power backup, DG sets of capacity 62.5 kVA is already installed in existing unit. After expansion, the power requirement of the whole plant will be 1122.22 KVA. Additional two DG sets of 1 x 250 kVA & 1x 380 kVA shall be installed after expansion. Details have been provided in **Section 3.8.2.**

1.5 Effluent Management

Construction Phase: 1.4 KLD domestic sewage will be treated in septic tanks followed by soak pits.

Operation Phase: Existing effluent generation from plant is 1.7 KLD (Domestic: 1.5 KLD + Industrial: 0.2 KLD). Domestic effluent is being treated in septic tank and Industrial effluent of 0.2 KLD laboratory wash is evaporated through solar evaporation ponds.

After expansion, the effluent generation will increase to 43.7 KLD (Domestic: 1.7 KLD + Industrial:42 KLD). The source of effluent will be Domestic use, Process, scrubbers, washing, Boiler and cooling towers. The project will be a **"Zero-liquid Discharge"** Project.

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 pollution will be dust emission from demolition and Construction activity, vehicular movement, emissions from construction machinery and activities as well from DG sets (1 x 250 kVA). DG sets will be installed as per CPCB guidelines and manufacturer's instructions to keep the emissions within limits of CPCB. Stack height will be provided as per CPCB guidelines for adequate dispersion of released pollutants and to have negligible GLCs in the surrounding area. 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 sources of emission in the plant will be combustion of fuel for operation of DG Sets, &Boiler as well process emission from process reactor vents.

Air pollution control techniques and systems will be installed in the plant to reduce the emissions. Proposed Air pollution control devices includes Cyclone, Bag Filter, Water and Caustic Multistage scrubber. The plant will be maintaining all emission norms prescribed by MoEF&CC/PPCB/CPCB. Stacks with appropriate pollution control system shall be introduced in the plants. **Details of proposed stacks are given below in Section 3.10.**

1.7 Solid & Hazardous 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 by 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 sent to solid waste site. After expansion, municipal solid waste generated in the plant area will be disposed as per existing practices.

Hazardous Waste Management

The industry shall obtain authorization under Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2020 for the waste generated and categorized under hazardous waste as per Schedule of The Hazardous & Other Waste (Management and Transboundary Movement) Amendment Rules, 2021. The generated hazardous waste will be stored in designated Hazardous waste storage room up to maximum of 90 days and shall be disposed to either TSDF or authorized recyclers. ***Details have been provided in Section 3.9.3.***

1.8 Noise Management

***Construction Phase*:**

The most common sources of noise pollution will be activities like foundation, operation of construction machinery and vehicular movement. However, magnitude of the impact will depend upon the type and nature of the machinery, time schedule of operations, construction method and management practices followed during activities.

To mitigate the impact, following steps will be taken:

- The construction activity will be carried out mostly during daytime.
- Proper maintenance of noise generating transport vehicles.
- Regular maintenance of heavy earth vehicles may be adopted to reduce noise levels.
- All the construction machinery and equipment used shall be provided with adequate noise mufflers and noise suppression equipment. Proper lubrication and maintenance of the machinery & equipment and vehicle will be carried out to minimize the noise generation due to abrasion
- Noise level from loading & unloading of material will be reduced by usage of various types of cranes & placing material on sand or sandy bag beds.
- Noise monitoring shall be carried out to ensure the effectiveness of mitigation measures and develop a mechanism to record and respond to complaints on noise.
- Adequate parking space will be provided at the project site to minimize the honking requirement due to congestion and jams and restricting the speed limits.
- Protection devices (earplugs or earmuffs) shall be provided to those workers who cannot be isolated from the source of noise and reducing the exposure time of workers to the higher noise levels by rotation.
- Construction material vehicular movement shall be planned during non-peak hours to avoid traffic congestion in the area.

Operational Phase:

The main sources of noise generation in the proposed project are various types of ID fans, Boiler, pumps & compressors, grinders, DG sets, vehicular movement etc. To reduce impact in the project site and nearby habitations, following mitigation measures will be done.

- Equipment meeting standard of noise shall be used.
- All engineering control practice shall be undertaken during installation of machinery to maintain noise level.
- Acoustical Enclosures and Mufflers will be provided at all required locations.
- Vibration pads and foundation will be provided at all heavy machinery areas.
- Noise generating units like machinery area, canteen etc. will be well insulated with enclosed doors.
- Earmuffs will be used while in high noise areas. Separate cabins will be provided.
- Acoustic treatment rooms will be provided at appropriate location.
- Well- developed road will be constructed within plant, for smooth and hassle free movement of personnel;
- Proper and timely maintenance of machineries and preventive maintenance of vehicles will be done.
- Plantation will be done all over the plant area to provide noise barrier.
- Important Instructions will be displayed all over the plant area.

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, are intentionally dispersed in the environment and are applied to food crops."

Pesticides represent the last input in an agricultural operation and are applied for preventing the spoilage of crops from pests such as insects, fungi, weeds, etc., thereby increasing the agricultural productivity. The significance of pesticides has been rising over the last few decades catalyzed by the requirement to enhance the overall agricultural production and the need to safeguard adequate food availability for the continuously growing population in the country. 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, M/s Sai Ram Agritech pvt. ltd has planned to expand their existing formulation unit and introduce manufacturing unit of technical grade pesticide withing existing plot area. 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

The M/s Sai Ram Agritech Pvt Ltd has planned to expand their existing unit located at Village Rampura, Tehsil Rampura Phul, District Bathinda, Punjab. The project will involve production of pesticides and pesticide specific intermediates. **The total production capacity after expansion will be 3000 MTPA (excluding formulation). The plant also proposes to enhance their formulation capacity from 200 MT/ Annum to 60000 MT/Annum**. Production Details is given in **Table 2.1.**

Table 2.1: Production Details (After Expansion)

Type	Quantity (MT/Annum)
Insecticides	1140
Fungicides	300
Herbicide	1200
Intermediate Product & R&D products	360
Total	**3000**
Formulation	**60000**

2.1.2 Identification of Project Proponent

M/s Sai Ram Agritech Pvt. Ltd., a leading agrochemical company in India, deals in all kinds of insecticides, herbicides, fungicides, fertilizers, manures and plant growth regulators. In just over a decade from its inception, Sai Ram Agritech has become a name to reckon with among the farmer fraternity owing completely to the quality of products, manufactured with excellence to meet international specification.

M/s Sai Ram Agritech Pvt. Ltd. an ISO 9001:2015 Certified Company, has an existing Pesticide formulation unit located at Barnala-Bathinda Road, Rampura phul, District- Bathinda, Punjab. The existing unit deals with the formulation of pesticides, weedicides and fungicides with the production capacity of 200 MT/year.

Contact detail of the project proponent is as mentioned below:

Table 2.2: Details of Authorized Signatory

Project Proponent:	**M/s Sai Ram Agritech Pvt. Ltd**
Authorized Signatory:	Mr. Deepak Bansal
Correspondence Address**:**	Village Rampura, Tehsil Rampura Phul, District-Bathinda, Punjab
Designation:	Director
Phone No:	9216626301
Email Id:	**sairamagritech@gmail.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 expansion project involves production of Pesticides and hence falls under **Activity 5(b); Category "A".** Thereby, the project requires environmental clearance from MoEF&CC, New Delhi.

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

Indian Agrochemicals Market

The Indian pesticides market was worth INR 197 billion in 2018. The market is further projected to reach a value of INR 316 billion by 2024, growing at a CAGR of 8.1% during 2019-2024.

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 fulfil the demand supply gap of pesticides and related intermediates.
- It is expected to improve the profitability of Sai Ram Agritech.
- 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 plant will reduce the elevated demand supply gap of agricultural products.

2.5 Imports Vs Indigenous Production

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

2.6 Export Possibility

M/s Sai Ram Agritech Pvt. Ltd. proposes to provide supply of pesticides and related intermediates 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

The Proposed project will generate direct and indirect employment.

Construction Phase: Total **50 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, approx. **110 nos**. (**Contractual: 60 + Permanent: 50**) of employees will be hired during operation stage of the project. 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, Sai ram agritech 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 3000 MTPA (excluding formulation).

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 project site is located at Barnala-Bathinda Road, Rampura phul, District- Bathinda, Punjab. It is a brown field project having total plot area of **7770.874 Sqm**. The coordinates of center of the site are **Latitude: 30°15'51.32"N and Longitude: 75°15'16.68"E.** The Google image showing Project boundary and 10 km area map is shown in **Figure 3.1** & **Figure 3.2,** respectively. Plant layout is shown in **Figure 3.3.**

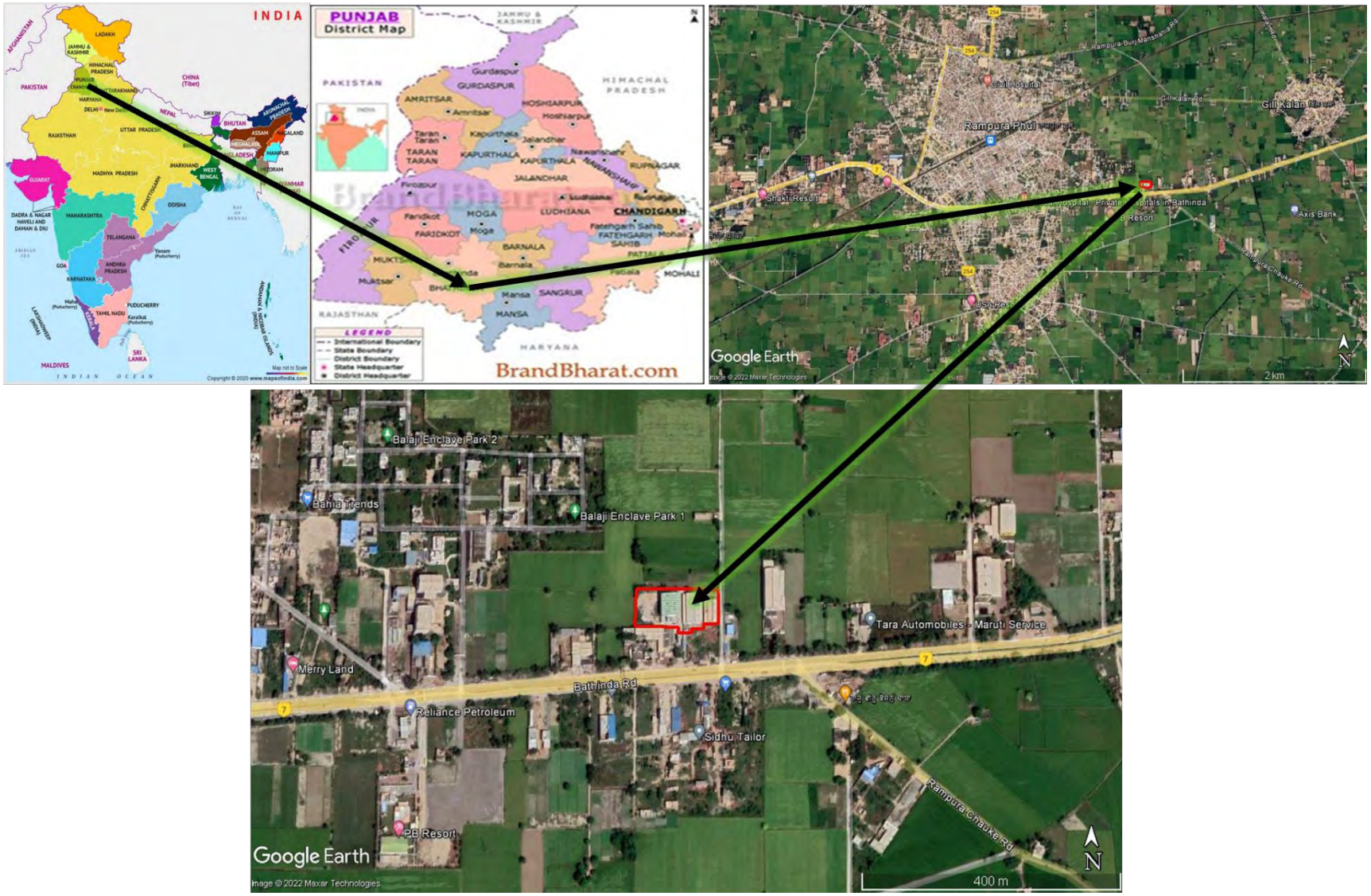


Figure 3.1 : Project Location

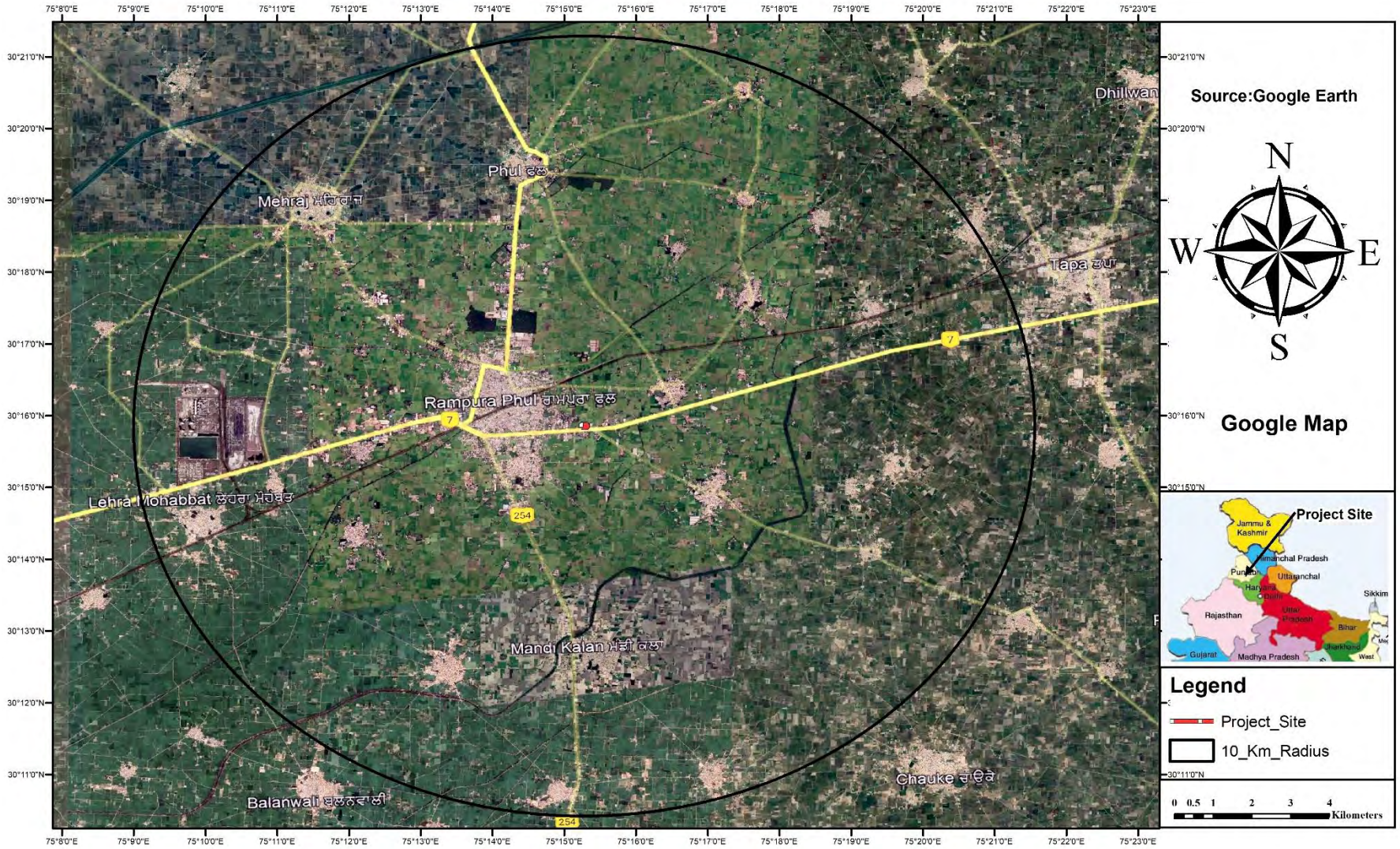


Figure 3.2: Google Image (10 km radius) of the Project Site

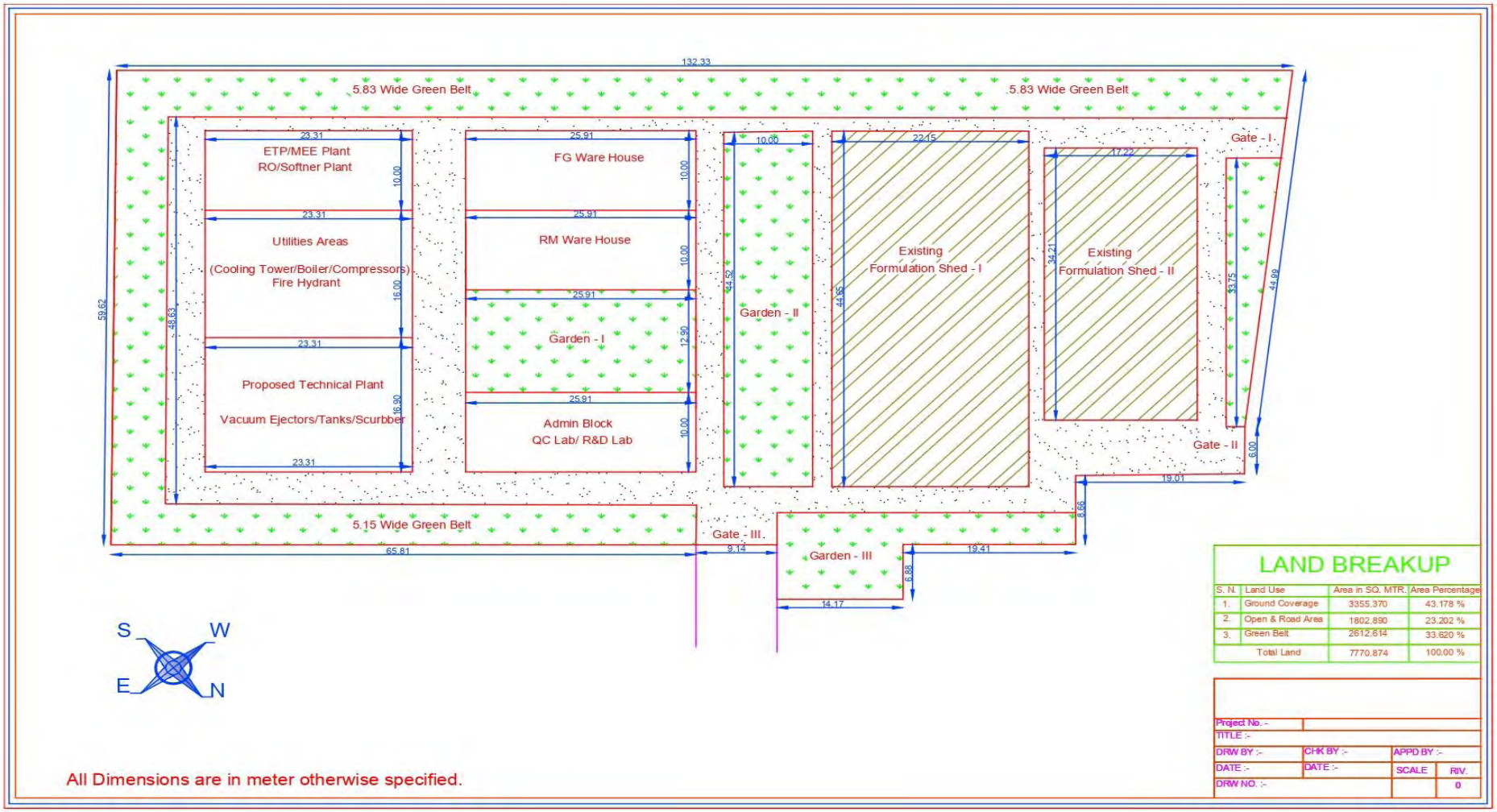


Figure 3.3: Layout of the Project Site

Existing Area	
	

Proposed Area	
	

Figure 3.4 : Plant Photograph

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

No Alternative sites have been considered as expansion is proposed in existing factory premises where all common infrastructure including water supply, electricity, wastewater disposal facilities etc. are available. Connectivity facilities like road/rail facilities are also available.

The site is located near Rampura Phul city (0.20 km W from the project site) and well connected with National Highway-7 located at 0.05 km in South direction. Nearest Railway station is Rampura Phul Railway Station which is located at 1.77 km in NW direction from the Project Site. Nearest Airport from the project site is Bathinda Airport located at 46.5 km in West direction.

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 3.1 : Environmental Sensitivity of Project

S. No.	Environmental Features	Within 500m - 2 km area around Project Site	Within 2.0-5 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	None
C	Wetland of state and national interest	None	None	None
D	Migratory route for wild animals	None	None	None
E	Critically Polluted Area	None		
2.	**Physical Environment**			
F	Road Connectivity	National Highway -7 (0.05 km, S)	National Highway-254 (2.10 km, SW)	None
G	Rail Connectivity	Rampura Phul Railway Station -1.77 km, NW	None	Jethuke Railway Station- 6.69 km, ENE Lehra Muhabbat Railway station- 8.45 km, WSW
H	Defence Installation	None	None	None
I	Densely Populated	Rampura Phul (0.20 km	None	None

S. No.	Environmental Features	Within 500m - 2 km area around Project Site	Within 2.0-5 km area around Project Site	Within 5-10 km area around Project Site
	Area	W)		
J	Other village close to Plant Site	1. Rampura Pind (1.33 km, SW) 2. Gill Kalan (1.6 km, NE) 3. Pitho (2.86 km, SE)		
K	Seismicity	Seismic Zone III (Moderate Damage Risk Zone)		
L	Rivers	None	None	None
3.	**Social Environment**			
M	Physical Setting	Agricultural, Residential, Industrial	Agricultural, Residential, Industrial	Agricultural, Residential, Industrial
N	Physical Sensitive Receptors	Hospital, School, Temple etc.	School, Hospitals, Temple etc.	School, Hospitals, Temple etc.

Source: EQMS

3.4 Size or Magnitude of Operation

List of proposed products to be manufactured within the plant have been mentioned in ***Table 1.1.***

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

Manufacturing Process

INSECTICIDES:

Lambda Cyhalothrin:

Brief Manufacturing Process: -

Meta Phenoxy Benzaldehyde is reacted with Sodium Cyanide to form Meta Phenoxy Benzaldehyde Cyanohydrin as an intermediate. This on reaction with Tri-Fluoro Propenyl Acid Chloride (TFP Acid Chloride) forms the Product Cyhalothrin. In this process n - Hexane is used as solvent along with phase transfer Catalyst.

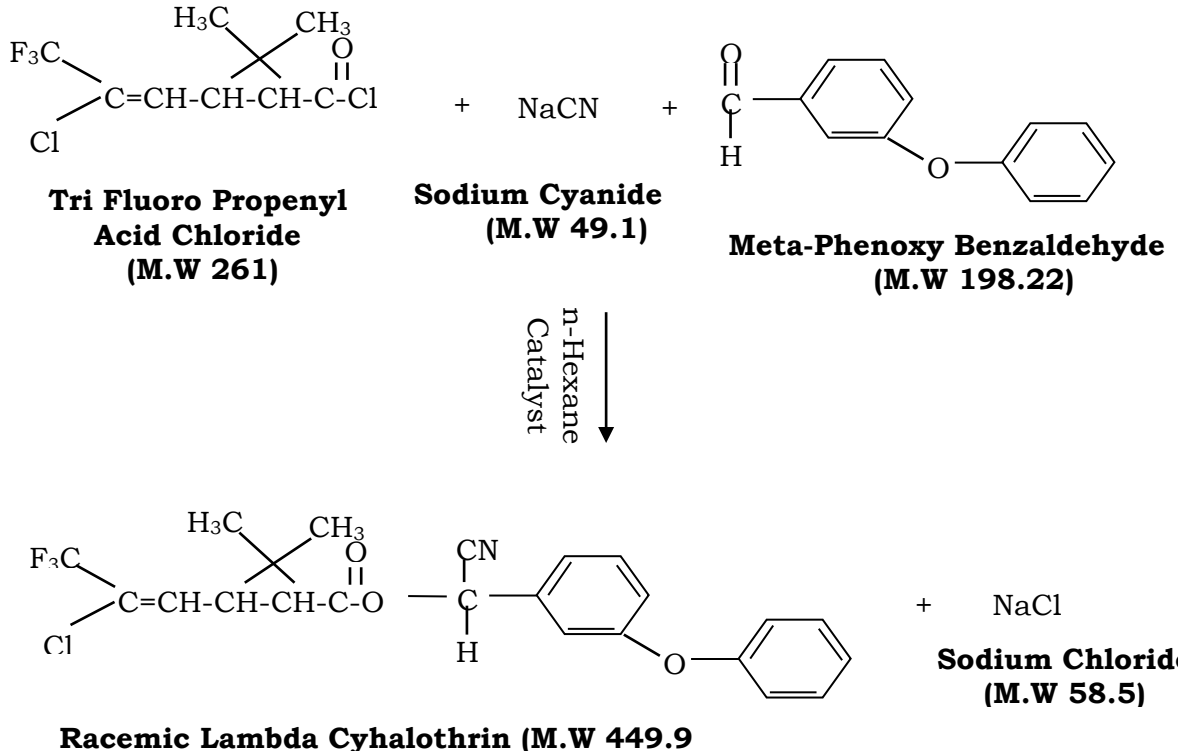
The reaction mass of Cyhalothrin is washed by Soda Ash solution as well as water. Solvent- n-Hexane is stripped off to get pure Cyhalothrin oil. Finally, Cyhalothrin oil is epimerized to give Lambda Cyhalothrin of 85 % (Min.)

An aqueous layer which contains traces of Sodium Cyanide is detoxified by the treatment of Sodium Hypochlorite Solution (8 - 10%) up to < 0.2 ppm Level. Then it is mixed up with main ETP stream for further treatment & finally drained to gutter.

Chemical Reactions: -

Step 1:

Lambda Cyhalothrin (M.W 449.9)



Tri Fluoro Propenyl Acid Chloride (M.W 261)

Sodium Cyanide (M.W 49.1)

Meta-Phenoxy Benzaldehyde (M.W 198.22)

Sodium Chloride (M.W 58.5)

Racemic Lambda Cyhalothrin (M.W 449.9

Mass Balance:

	Material / Mass Balance of LAMBDA CYHALOTHRIN (All Quantities are in kg)				
	IN – PUT			**OUT – PUT**	
Sr. No.	**Raw Materials / Items**	**Kg/Batch**		**Product / By product**	**Kg/Batch**
1	Meta Phenoxy Benzaldehyde	470		Lambda Cyhalothrin	1050
2	Lambda Acid Chloride	640		Recovered Solvent-n Hexane	2375
3	Water for Reaction	470		Solvent Loss n - Hexane	125
4	Sodium Cyanide	130		Recovered IPA + Catalyst	1154
5	Solvent –n- Hexane	2500		IPA + Catalyst Loss	56
6	5 % Soda Ash Solution	500		Detoxified Aqueous to ETP	2260

	Material / Mass Balance of LAMBDA CYHALOTHRIN (All Quantities are in kg)				
	IN – PUT			OUT – PUT	
7	Water for washing	500			
8	8-10 % Sodium Hypochlorite Solution	600			
9	Solvent- IPA for Epimerization	1100			
10	Catalyst for Epimerization	110			
	TOTAL	**7020**		**TOTAL**	**7020**

HERBICIDES

Penoxsulam

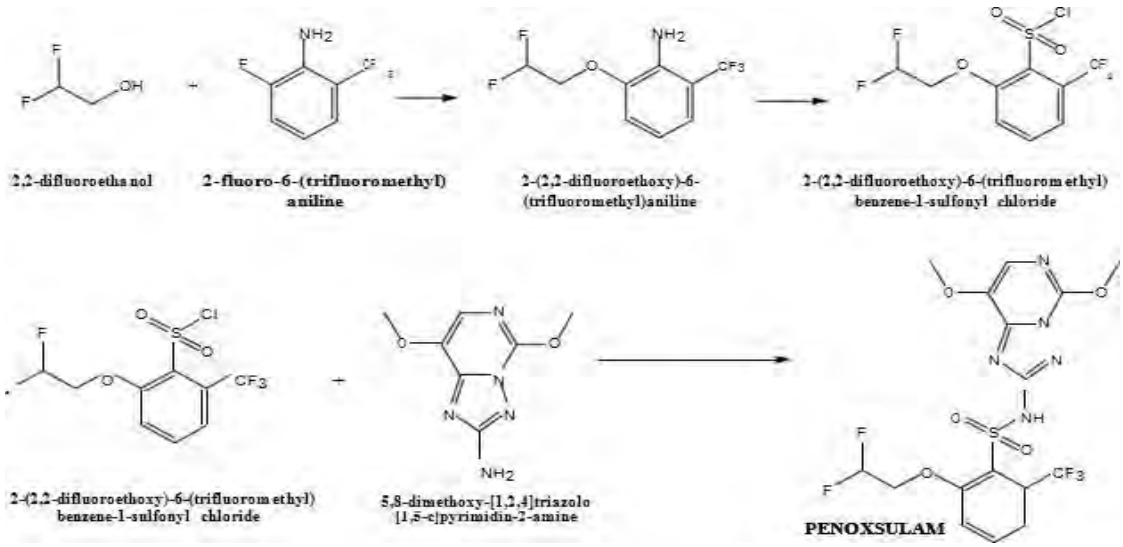
Brief Manufacturing Process: -

Charge2-fluoro-6-(trifluoro methyl) aniline(2FTFMA), catalyst sodium methoxide and solvent methanol. Rise to 50oCandadd2, 2-difluoroethanol slowlyfor4hours.Rise to reflux and reflux for 3 hours. Distil out the mass to recover methanol and obtain 2-(2, 2-difluoroethoxy)-6-(trifluoro methyl) aniline (2-DFETFMA).

Charge water, hydrochloric acid and 2-DFETFMA. Cool to 0oC and add sodium nitrite lot-wise. After 2 hours add sodium Sulphite solution at0oC for 4 hours. Rise to 30oCandmaintain for 3 hours. Add Dichloroethane and extract. Separate the aqueous phase. Distil out the organic phase to recover Dichloro ethane partially.

Add 5,8-dimethoxy-[1,2,4]-triazolo[1,5-c] pyrimidin-2-amine (5,8-DMTPA) slowly lot-wise at30oC for 3 hours. Rise to reflux and reflux for 3 hours. Cool to 30oC and add water. Separate the aqueous phase. Cool the organic phase to 0oC and filter the slurry. Dry the wet cake to obtain Penoxsulam Technical.

Chemical Reactions:



	Material / Mass Balance of Penoxulam **All Quantities are in kg)**			
	IN – PUT		**OUT – PUT**	
Sr. No.	**Raw Materials / Items**	**Kg/Batch**	**Product / By product**	**Kg/Batch**
1	Methanol	2000	Methanol	1950
2	2-FTFMA	400	Residue	50
3	Sodium methoxide	12	Aqueous effluent	1672
4	water	1000	Dichloro ethane	500
5	HCl 30%	310	Residue	17
6	Sodium nitrite	175	Aqueous effluent	525
7	Sodium sulfite	415	Dichloroethane	2440
8	Dichloro ethane	3000	OrganicResidue	43
9	5,8 DMTPA	505	Dryingloss	120
10	water	500	**Penoxulam**	1000
	TOTAL	**8317**	**TOTAL**	**8317**

FUNGICIDES

Difenoconazole

Brief Manufacturing Process: -

Step 1: - Meta-Dichloro Benzene reacted with Acetyl Chloride in presence of Aluminium Chloride and solvent Ethylene Dichloride. This process gives product 2,4-Dichloro Acetophenone.

Step 2: - 2,4-Dichloro Acetophenone further reacted with 4-Chloro Phenol in presence of Potassium Hydroxide and solvent DMF. This process gives product 2-Chloro-4-(4-Chlorohenoxy) Acetophenone.

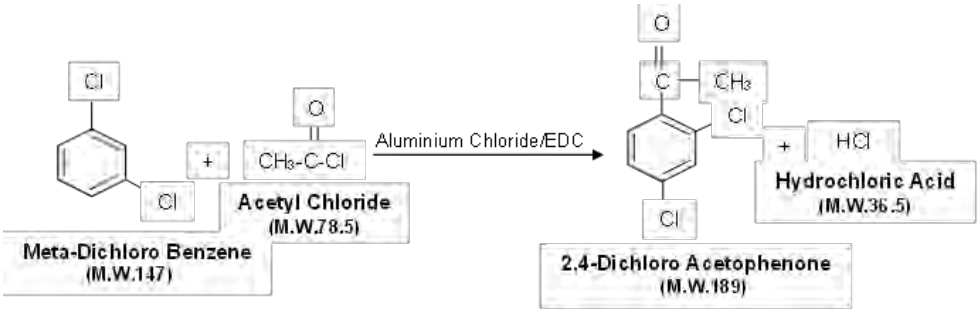
Step 3: - 2, -Chloro-4-(4-Chlorophenoxy) Acetophenone further reacted with Bromine in presence of catalyst and solvent Ethylene Dichloride. This process gives product 2, -Chloro-4-(4-Chlorophenoxy) Phenacyl Bromide.

Step 4: - 2, -Chloro-4-(4-Chlorophenoxy) Phenacyl Bromide reacted with Propylene Glycol in presence solvent Toluene to get product 3-chloro-4-(2-Bromomethyl-1,3-Dioxolane-2-yl)-4'-Chloro Diphenyl Ether.

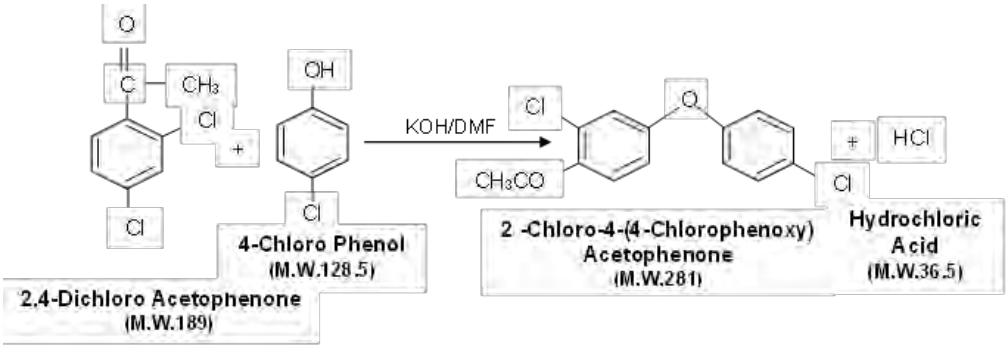
Step 5: - 3-chloro-4-(2-Bromomethyl-1,3-Dioxolane-2-yl)-4'-Chloro Diphenyl Ether further reacted with 1,2,4-Triazole in presence of Potassium Hydroxide and solvent DMF to get product final product Difenoconazole.

Chemical Reactions: -

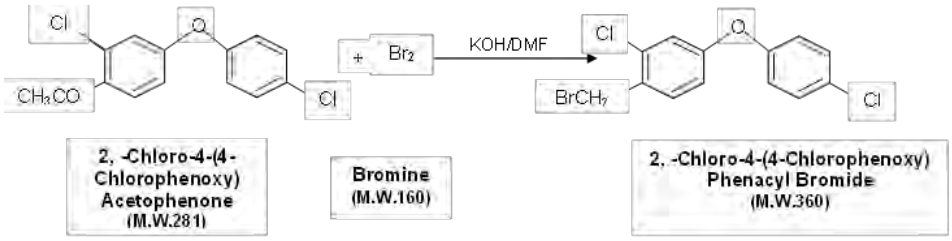
Step 1: -



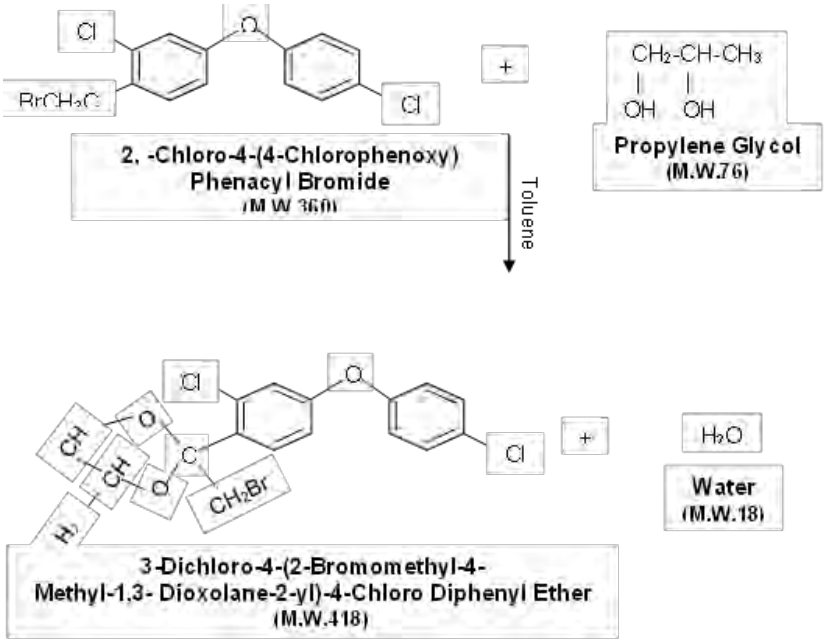
Step 2: -



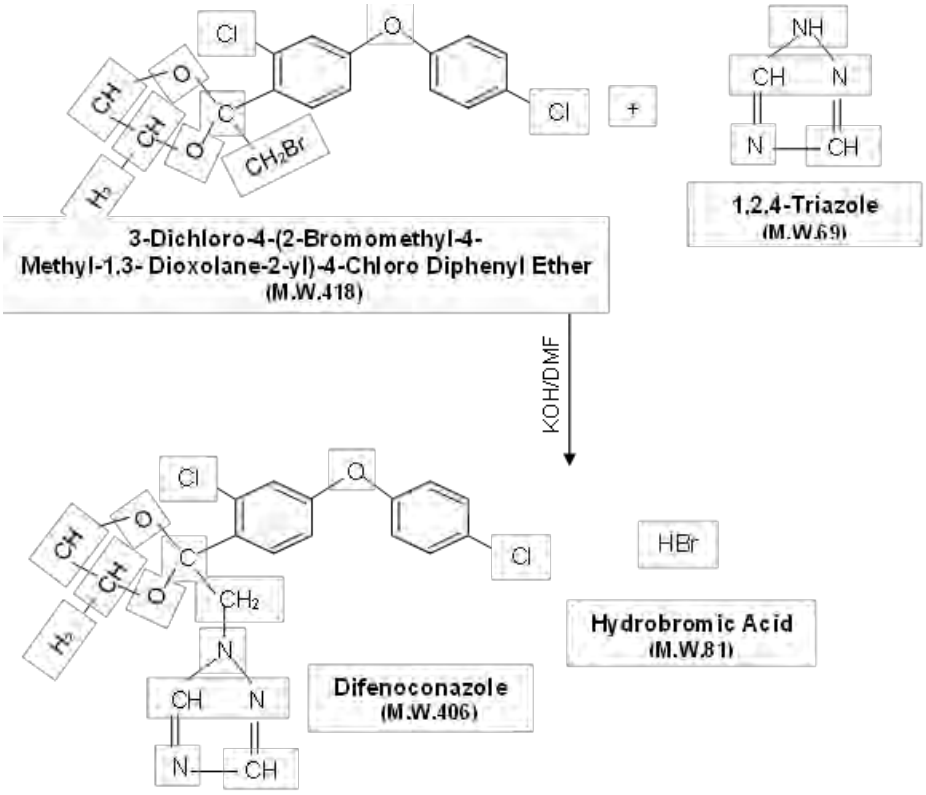
Step 3: -



Step 4: -



Step 5: -



	Material / Mass Balance of DIFENCONAZOLE All Quantities are in kg)		
	IN – PUT		**OUT – PUT**

Sr. No.	Raw Materials / Items	Kg/Batch		Product / By product	Kg/Batch
1	Meta-Dichlorobenzene	402		DIFENCOCANAZOLE	**1000**
2	Acetyl Chloride	225		Recovered EDC	2910
3	Aluminium Trichloride	520		Loss EDC	90
4	EDC	3000		20 % Aluminium Trichloride Solution	2600
5	4 Chloro Phenol	345		30% Hydrochloric Acid	312
6	Dimethyl Formamide	2100		Recovered Catalyst	10
7	Potassium Hydroxide	300		28% Hydrobromic Acid	740
8	Catalyst	12		Recovered Toluene	1170
9	Bromine	410		Loss Toluene	30
10	Proplyene Glycol	205		Recovered Dimethyl Formamide	2040
11	Toluene	1200		Loss Dimethyl Formamide	60
12	Water	3300		Potassium Bromide	315
13	1,2,4 Traizole	182		Tarry Waste	15
14				Aqueous Layer to ETP	709
15				Potassium Chloride	200
	TOTAL	**12201**		**TOTAL**	**12201**

The manufacturing process of all the proposed pesticide and related products have been annexed in ***Annexure VI***.

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

Raw materials required has been provided in ***Annexure-VI.***

Transportation

- The transportation of indigenous raw material/finished product will be done by road and import/export raw material/finished product through road complying with all safety requirements as per MSIHC rule.
- All solid / powder / granular raw materials/finished product will be transported in bags / drums through road transport. Liquid materials in road tankers (bulk) or in drums through road.

Storage

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

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

Separate storage areas will be provided for hazardous materials handled in the plant, based on their nature and degree of hazard. Storage of all chemicals shall not exceed their threshold limit, if any. All instructions as per MSIHC 1989 shall be followed as required for the chemicals falling in the list of rules. MSDS will be displayed at all the prominent sites.

Chemical Handling

- Do's and Don't instructions shall be displayed near the chemical storage.
- Regular training shall be given to the operator, safety rules and check lists will be provided.
- All the toxic chemicals will be pumped in closed loop to the reactors to avoid fugitive emission.
- All the storage / reactor vents shall be connected with scrubber.
- Local Exhaust ventilation facility shall be available at strategic locations of all plants where chemicals being handled / packing done to remove traces of chemical vapours / dust.
- PPE shall be given to the all workers handling the chemicals
- Regular workplace monitoring shall be done to check presence of toxic chemicals

Chemical Storage

- Chemicals will be kept away from the any type of flame, heat, etc.
- Chemicals will be stored in a cool place as per their properties.
- Ventilation system and de-dusting system shall be provided in the storage area.
- Storage area will be provided with all safety equipment's.
- SOP shall be developed for handling of material.

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

Sai Ram Agritech will take adequate measures for sustainability. Cleaner technologies, improved design features and innovative measures will be 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 proposed.

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 will be adopted.
- Containers of raw materials will be triple rinsed directly into formulation to prevent water contamination.

- Production will be scheduled to minimize cleanouts.
- Segregation of equipment's will be done based on individual products, solvent based versus water-based formulations and products containing similar active ingredients in different concentrations etc.
- Wastewater generated from plant will be segregated in high & low TDS and further will be treated in appropriate treatment scheme.
- Housekeeping practices like preventive maintenance on valves will be done.
- Implementation of LDAR Plan.
- Spill cleaning or leaks in outdoor bulk contaminant areas will be done to prevent contamination of wastewater.
- Equipment's that promote pollution prevention by reducing or eliminating wastewater generation like low volume/high pressure hoses, spray nozzle attachments, squeezes & mops, low volume/recirculating floor scrubbing machines, portable steam cleaners etc. will be installed.
- Dry-cleaning methods will be done in the premises.
- There will be proper segregation of solid wastes.
- Where multiple washings in a reaction are involved, each cycle wash water to be stored and used in subsequent batches.
- Solvent recovery system shall be installed for recovery of solvent.

ENERGY CONSERVATION MEASURES

- Energy efficient drives / LED lights will be 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 will be 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.
- Solar panels and other equipment's for solar energy use shall be installed in the premises.

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

3.8.1 Water Source

Construction Phase: The total water requirement during construction phase will be 5 KLD (Domestic- 2 KLD, Construction- 3 KLD) which will be supplied by private tankers.

Operation Phase: The existing total water requirement of the plant is 2.3 KLD. After expansion, total water requirement shall increase to **60 KLD** out of which **15 KLD** freshwater requirement shall met through Borewell after getting permission from concerned authority i.e. PWRDA and rest **45 KLD** from in-house treatment schemes i.e., ETP, MEE and SBT. Details of water requirement and wastewater management have been provided below in ***Table 3.2 & Table 3.3.***

Table 3.2: Breakup of Water Consumption

Sr. No.	Source	Water Consumption (KL/day)		
		Existing	Proposed	After Expansion
1	**Domestic**	1.8	0.5	2.3
2	**Green Belt**	0.3	1.7	2
3	**Industrial**			
A	Process/DM	0.2	29.8	30
B	Scrubber	0	2	2
C	Washing	0	2	2
D	Boiler Makeup	0	9	9
E	Cooling	0	13	13
Total Industrial		0.2	55.8	56
Total (1+2+3)		**2.3**	**58**	**60.3 ~ 60**

Table 3.3: Wastewater Management

Sr. No.	Source	Wastewater Generation (KL/day)		
		Existing	Proposed	Total
1	**Domestic**	1.5	**0.2**	1.7
2	**Industrial**			
A	Process	0.2	33.8	34
B	Scrubber	0	2	2
C	Washing	0	2	2
D	Boiler	0	2	2
E	Cooling	0	2	2
Total Industrial		**0.2**	**41.8**	**42**
Total (1 + 2)		**1.7**	**42**	**43.7**

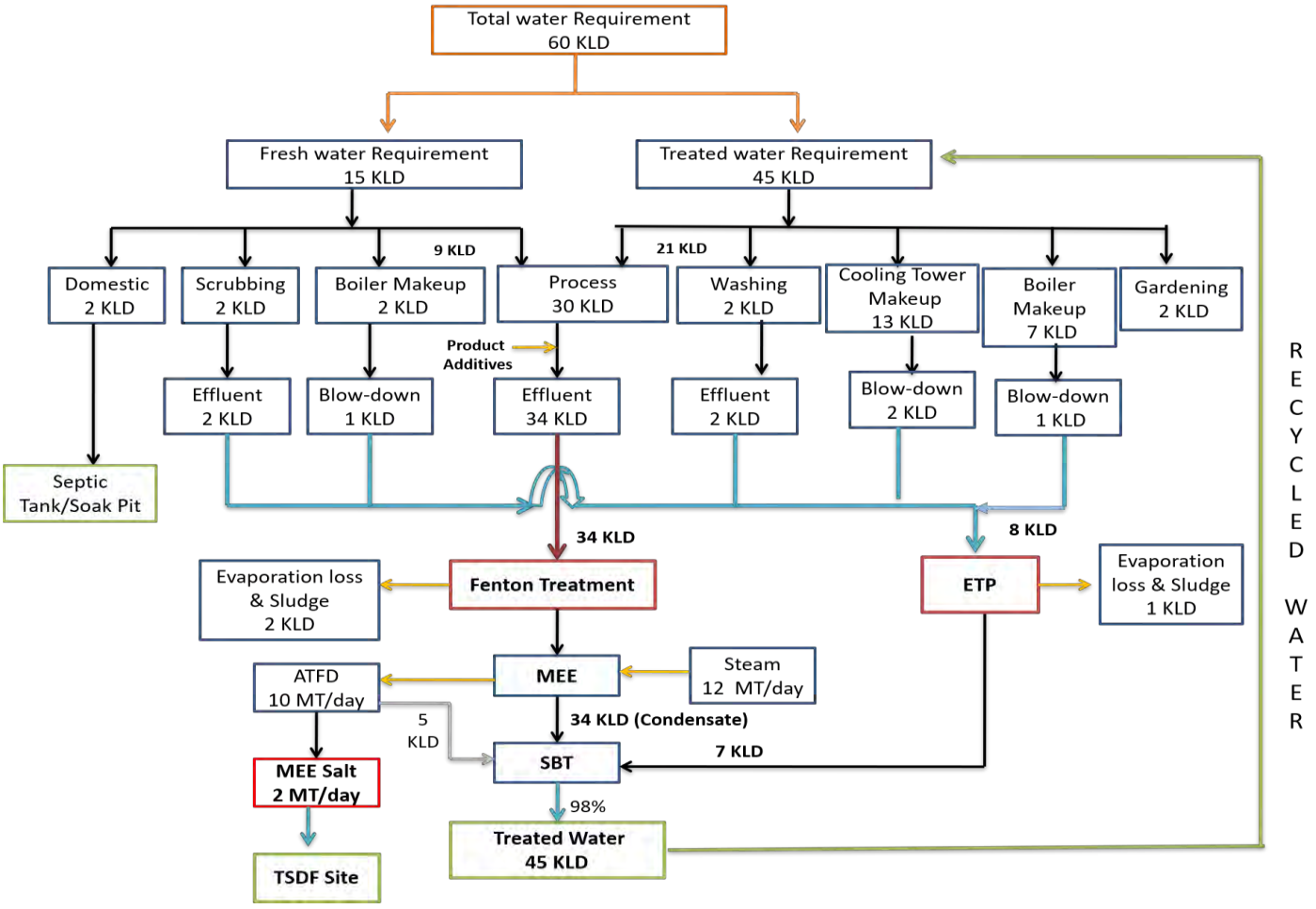


Figure 3.5: Water Balance Diagram After Expansion

3.8.2 Electricity & Fuel Requirements

Construction Phase: Total 1 no. of DG Sets of capacity 1x250 kVA will be used for power supply during construction works.

Operation Phase: Existing power requirement of the plant is 122.225 KVA, being sourced through Punjab State Power Corporation Limited (PSPCL). For Power backup, DG sets of capacity 62.5 kVA is already installed in existing unit. After expansion, the power requirement of the whole plant will be 1122.225 KVA. Additional two DG sets of 1 x 250 kVA & 1x 380 kVA shall be installed after expansion.

The details of Power requirement and fuel requirement are given in **Table 3.4.**

Table 3.1 : Power & Fuel requirement and backup

Particular	Unit	Existing	Proposed	After Expansion
Power Requirement	KVA	122.225	1000	1122.25
Power Backup-DG Set	KVA	1 x 62.5	1 x 250 & 1x 380	1x 62.5, 1 x 250 & 1x 380
FUEL REQUIREMENTS				
Imported Coal or Bio Briquette	MT/ Day	0	6 MT/ Day Coal or 8 MT/ Day Bio Briquette	6 MT/ Day Coal or 8 MT/ Day Bio Briquette
High Speed Diesel	Lit/Hr.	20	100	120

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

3.9.1 Wastewater generation & Management plan

Construction Phase: 1.4 KLD domestic sewage will be treated in septic tanks followed by soak pits.

Operation Phase: Existing effluent generation from plant is 1.7 KLD (Domestic: 1.5 KLD + Industrial: 0.2 KLD). Domestic effluent is being treated in septic tank and Industrial effluent of 0.2 KLD laboratory wash evaporated through solar evaporation ponds.

After expansion, the effluent generation will increase to 43.7 KLD (Domestic: 1.7 KLD + Industrial:42 KLD). The source of effluent will be Domestic use, Process, scrubbers, washing, Boiler and cooling towers. The project will be a **"Zero-liquid Discharge"** Project.

3.9.2 Process Description for Different Wastewater Treatment Schemes

The sources of waste water from the proposed plant will be from construction site during construction phase and process, boiler, cooling tower, washings, canteen facilities and admin building during operation phase.

The domestic waste water will be discharge to soak pit followed by septic tank.

For industrial effluent Zero Liquid Discharge (ZLD) will be proposed. Waste water streams will be segregated into two stream i.e., Concentrated stream from process waste- Stream I and Diluted stream from scrubbing, washing, boiler and cooling – stream 2. The entire operation will be in a closed system.

Stream 1 will be treated with Fenton treatment and then sent to MEE. MEE condensate will be sent to SBT for further treatment and recycled back to Industrial usage. Steam 2 will be treated in ETP (primary treatment) and then treated water further will be sent to SBT(Soil Bio Technology)for further treatment. Treated water from SBT will be recycled to Industrial purpose inside factory premises.

There will be no process effluents discharged. All the treated effluent will be recycled in process and other utilities. The ETP sludge will be temporarily stored and treated at the site and further will be disposed at the TSDF site. Hence impact on water quality from the proposed project is insignificant.

Sources of Waste Water

The wastewater generation streams are:

1. Process
2. Washing
3. Scrubbing
4. Boiler blowdown
5. Cooling tower blow downs
6. Domestic (canteen and toilets)

Table 3.5 : Equipment Used For Wastewater Treatment (ZLD)

Sr. No.	Name of unit	Capacity	No.	MOC/ Remark
Stream-I (Low COD)				
1	Equalization cum Neutralization tank	1.0 x 1.0 (1.0+0.5)	1	RCC M25+A/A Bk. Lining
2	Flash Mixer	1.0 x 1.0 (1.0+0.5)	1	RCC M25
3	Primary Clarifier	1 Dia (1.0 +0.5)	1	MSEP
4	Aeration Tank	10.0 x 3.0 (2.0+0.5)	1	RCC M25
5	Secondary Clarifier	1.5 Dia (2.0 +0.5)	1	MSEP
6	Treated Effluent Sump	2.0 x 2.0 (3.0+0.5)	1	RCC M25
7	Sludge Sump	2.0 x 1.0 (1.0+0.5)	1	RCC M25
8	Filter Press-01	20 m^3/D	1	MSEP
9	Lime Dosing Tank	2000 Lit	1	HDPE
10	Alum Dosing Tank	2000 Lit	1	HDPE
11	Poly Dosing Tank	1000 Lit	1	HDPE
12	Nutrient Dosing Tank	1000 Lit	1	HDPE
Stream-II (High COD)				
1	Collection cum Reaction tanks	4.0 x 3.0 (2.5 .0+0.5)	2	RCC M25+A/A Bk. Lining
2	Neutralization Tank	4.0 x 3.0 (2.5+0.5)	1	RCC M25
3	Filter Press-02	20m^3/D	1	MSEP
4	MEE Feed Tank	5.0 x 2.0 (3.0+0.5)	1	RCC M25
5	Multi Effect Evaporator with Solid	1 Nosx50 M^3/D	1	SSTi

Sr. No.	Name of unit	Capacity	No.	MOC/ Remark
	Dryer			
6	Condensate Storage Tank	4.0 x 3.0 (5.0+0.5)	1	RCC M25

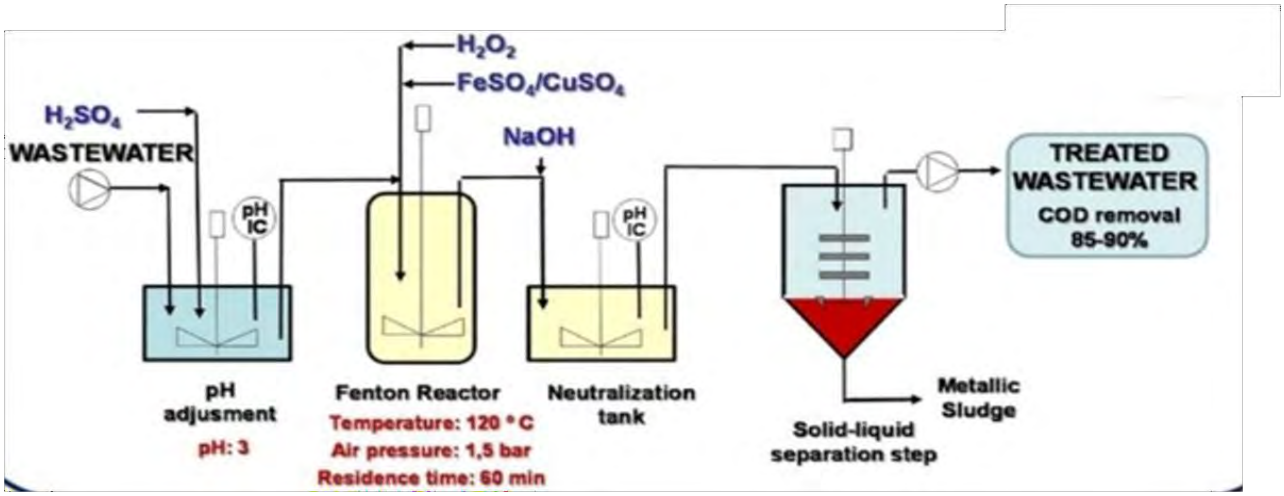
The inlet and outlet characteristics of all treatment scheme is given below in **Table 3.6**

Table 3.6 Inlet and Outlet Characteristics of Wastewater schemes

PARAMETER	Inlet to MEE	MEE Outlet	Inlet to ETP	ETP Outlet	SBT Inlet	SBT Outlet
pH	6.8-7.2	6.8-7.2	6.8-7.2	6.8-7.2	6.8-7.2	7.1-7.25
Total Suspended Solids	5 ppm	1ppm	5ppm	<50 ppm	<50 ppm	<15 ppm
TDS	100000 ppm	<100 ppm	1000 ppm	1000 ppm	100 ppm	70 ppm
Oil & Grease	1 ppm	NIL	NIL	NIL	NIL	NIL
Phenolic Compounds	50 ppm	75 ppm	NIL	NIL	75 ppm	NIL
Ammonical Nitrogen	100 ppm	175 ppm	NIL	NIL	175 ppm	<25 ppm
Phosphate	ND	ND	ND	ND	ND	ND
Nitrate	ND	ND	ND	ND	ND	ND
COD	80000 ppm	3500-5000 Ppm	1000 ppm	500-700 ppm	3500-5000 ppm	200 ppm
BOD (3 Days 27°C)	8000-10000 Ppm	500-1500 Ppm	10 ppm	5 ppm	500-1500 ppm	<30 ppm
Cyanides	10 ppm	10ppm	Nil	Nil	10ppm	Nll
Total Chromium	ND	NIL	NIL	NIL	NIL	NIL
Hexavalent Chromium	ND	NIL	NIL	NIL	NIL	NIL
Insecticides/Pesticides	0.2 ppm	NIL	NIL	NIL	NIL	NIL
Bio-Assay Test						Yes

Fenton Treatment and Neutralization

Concentrated effluent from the various stages of process shall be collected in underground collection-cum-reaction tank. Two such underground tanks shall be provided, having holding capacity of about one day effluent. Once one of the tanks is full, effluent is diverted to the other tank. Here, first effluent pH is adjusted to 4-4.5 by addition of Acid (if required). After adjustment of acidic pH effluent is subjected to Fenton treatment by addition of first FeSO4 as catalyst. Then H2O2 solution is added for destruction of phenolic compound. This reaction takes about 6-8 hrs. For thorough mixing, air is provided through twin lobe air blower. After reaction is complete treated effluent is neutralized by addition of lime powder/soda ash. Neutral effluent is then pumped to through filter press for removal for sludge. Clear filtrate from filter press shall be subjected to MEE. The dewatered sludge is collected and packed in HDPE/plastic bags and stored in a proper sludge storage area.



Multi Effect Evaporator (MEE)

Industry has proposed to install Multi Effect Evaporator for the treatment of industrial effluent having capacity of 1 Nos x 50 KL/Day.

Neutral effluent from Primary Treatment Plant is passed through 4 - Stages Evaporator System and the evaporated water shall be collected in a Collection Tank and then forwarded to SBT plant along with Primary treated dilute effluent.

Multi stage evaporator (3 - stages) is a long tube forced circulation type evaporators where in the first effect high pressure steam of 7.0 kg/cm2 is used to evaporate waste water. The evaporated water in the form of steam at 2.0 kg/cm pressure is used for evaporating the effluent in the second stage at atmospheric pressure. Evaporated water from the second stage is used for evaporating waste water in the third stage under vacuum of 650- 720 mmHg.

Finally evaporated water from the third stage is condensed in the steam condenser using cooling water on other side. Condensate from all the three stages is collected in condensate receiving tanks.

Concentrated mass is directly forwarded to ATFD system whereby the remaining water is evaporated and salt is isolated. This salt is disposed off at Common TSDF site.

Particular	Details
No. of Effects	3 (1 Falling Film + 2 Forced Circulation)
Waste Capacity	50 m^3 / day x 1
Feed Rate	3000 kg / hour (20 working hours /day)
Feed Concentration	10% TDS
Feed Temperature	35^0 C
Product Rate	750 kg / hour
Product concentration	40%
Product Temperature	55^0 C
Water Evaporation	2250 kg / hour

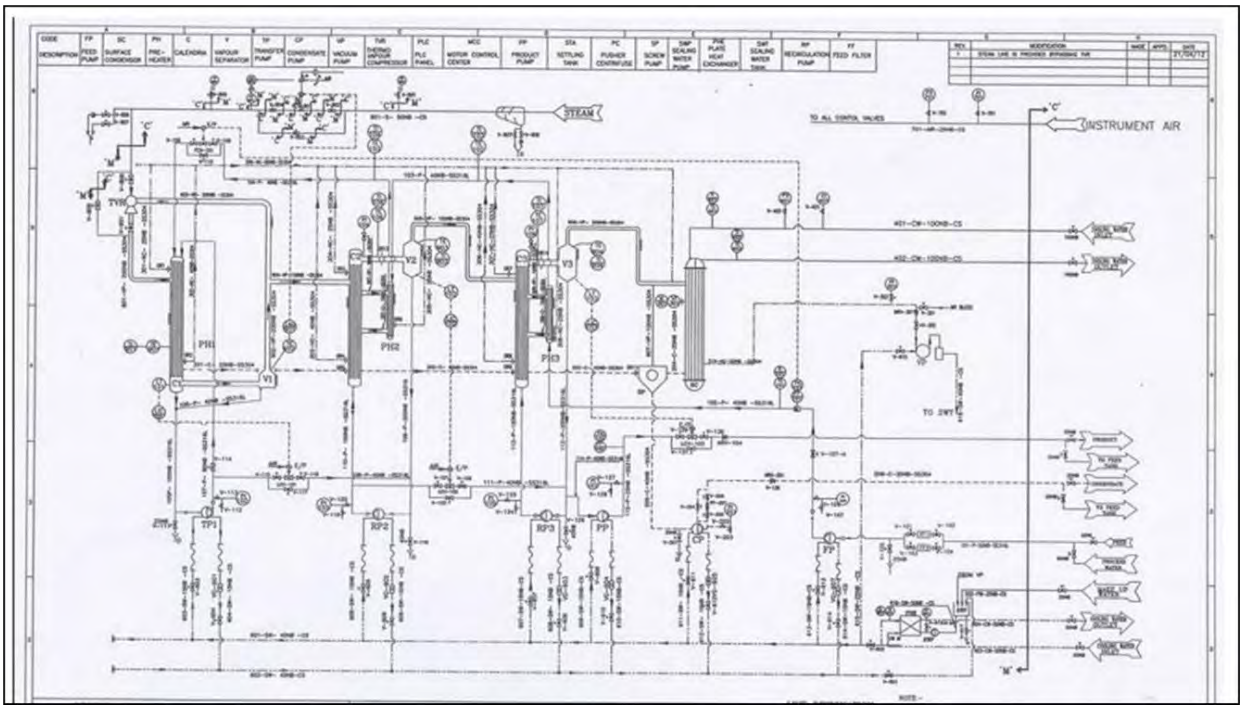


Figure 3.6: Flow Diagram of MEE

Effluent Treatment Plant (ETP)

A effluent treatment plant consisting of primary& secondary & advance treatment units. The details of ETP are as follows.

First all non-toxic and biodegradable streams (low & medium COD) of wastewater shall be collected in Equalization cum Neutralization tank-01 (ENT-01) where the continuous addition and stirring of Alkali solution is done to maintain neutral pH of wastewater from Lime Dosing Tank (LDT-01) as per

requirement by gravity. Mixer is provided at bottom of the ENT-01 to keep all suspended solids in suspension and for proper mixing.

Then after, neutralized wastewater shall be pumped to Flash Mixer (FM-01). Alum and Polyelectrolyte shall be dosed from Alum Dosing Tank (ADT-01) and Polyelectrolyte Dosing Tank (PEDT-01) respectively into FM-01 to carry out coagulation by using a Flash Mixer. Then after, coagulated wastewater shall be settled in Primary Clarifier-01 (PCL-01) where solids are settled at bottom and clear supernatant from PCL-01 shall be passed in Aeration Tank (AT-01).Here, Condensate from MEE through condensate storage tank (CST-01) mix with effluent.

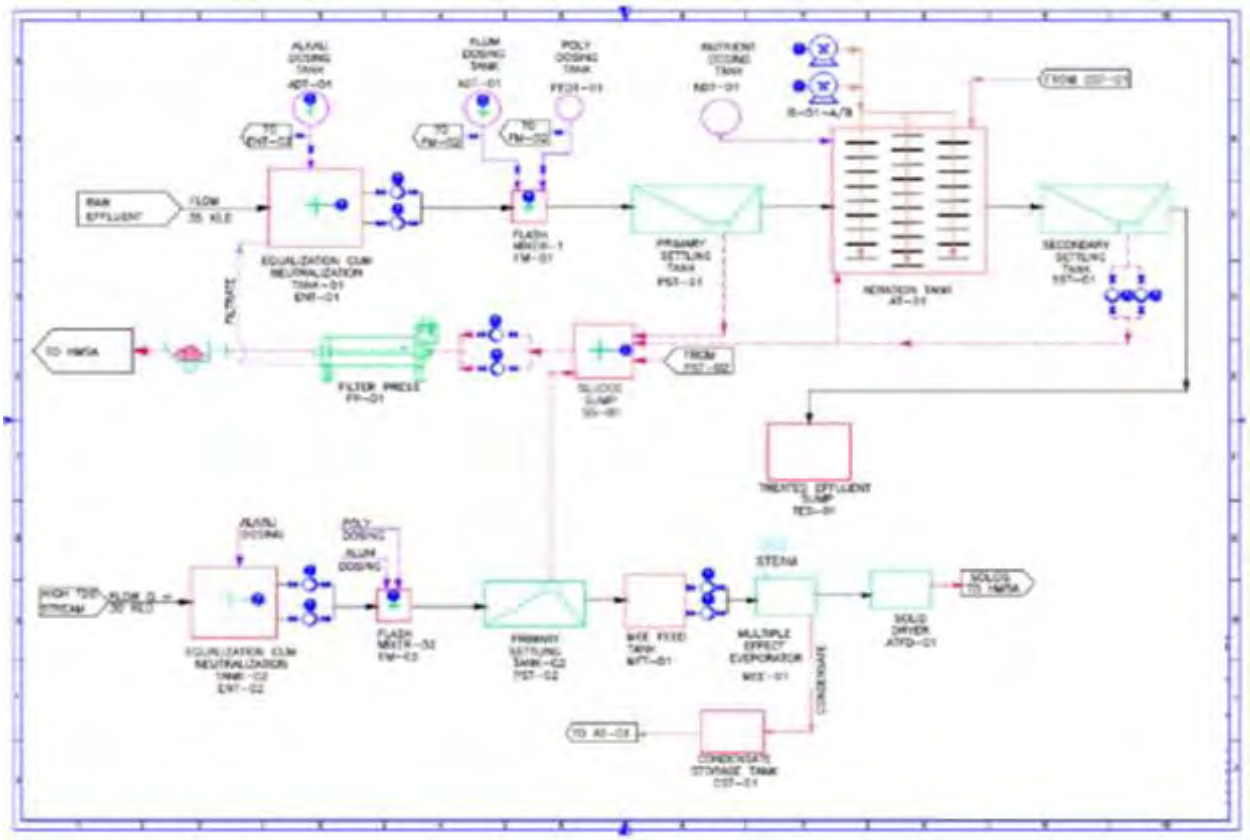
Here, biodegradation of organic matter of the wastewater shall be carried out by bacteria (suspended growth) in the AT-01 and for that oxygen shall be supplied by 2 nos. of air blowers (B-02) through diffusers. Air blowers also keep MLSS in suspension. Then after, wastewater shall go to Secondary Clarifier-1 (SCL-01). Here, the suspended solids shall be settled. Sludge shall be removed from bottom of SCL-01 and pumped to AT-1 to maintain MLSS and excess activated sludge shall be sent to Sludge Sump (SS-01).Clear effluent is the collected in Treated Effluent Sump (TES-01) .

Sludge settled in PCL-01 and excess sludge from SCL-01 shall be collected in Sludge Sump (SS-01) where mixer is provided to prevent and settling. Then sludge shall be send to Filter Press (FP-01) for dewatering. Then dry cake shall be stored in HWSA before final disposal to TSDF. Leachate from Filter Press shall be sent back to ENT-01 for further treatment. Specification of ETP is given in **Table 3.7**.

Table 3.2 Specification of Effluent Treatment Plant (ETP)

Sr. No.	Name of unit	Capacity	No.	MOC/ Remark
Stream-I (Low COD)				
1	Equalization cum Neutralization tank	1.0 x 1.0 (1.0+0.5)	1	RCC M25+A/A Bk. Lining
2	Flash Mixer	1.0 x 1.0 (1.0+0.5)	1	RCC M25
3	Primary Clarifier	1 Dia (1.0 +0.5)	1	MSEP
4	Aeration Tank	10.0 x 3.0 (2.0+0.5)	1	RCC M25
5	Secondary Clarifier	1.5 Dia (2.0 +0.5)	1	MSEP
6	Treated Effluent Sump	2.0 x 2.0 (3.0+0.5)	1	RCC M25
7	Sludge Sump	2.0 x 1.0 (1.0+0.5)	1	RCC M25
8	Filter Press-01	20 m^3/D	1	MSEP
9	Lime Dosing Tank	2000 Lit	1	HDPE
10	Alum Dosing Tank	2000 Lit	1	HDPE
11	Poly Dosing Tank	1000 Lit	1	HDPE
12	Nutrient Dosing Tank	1000 Lit	1	HDPE
Stream-II (High COD)				
1	Collection cum Reaction tanks-	4.0 x 3.0 (2.5 .0+0.5)	2	RCC M25+A/A Bk. Lining
2	Neutralization Tank	4.0 x 3.0 (2.5+0.5)	1	RCC M25

Sr. No.	Name of unit	Capacity	No.	MOC/ Remark
3	Filter Press-02	20m^3/D	1	MSEP
4	MEE Feed Tank	5.0 x 2.0 (3.0+0.5)	1	RCC M25
5	Multi Effect Evaporator with Solid Dryer	1 Nosx50 M^3/D	1	SSTi
6	Condensate Storage Tank	4.0 x 3.0 (5.0+0.5)	1	RCC M25



SBT

Incoming pH is in the range of 6.0-7.0 and has to be adjusted with lime treatment before taking to the filter. Catalytic Advance Oxygen System is given as pre-treatment. The process is a batch processes in which wastewater is pumped and applied onto the top surface of the Bioreactor as shown in Figure. The design has suitable provision for manual removal of suspended solids from the bio-filter surface. Distribution of waste water over the media is achieved via pumping, piping and distribution arrangements Separate distribution lines are provided for raw wastewater as well as recycle water. There are two modes of suspended solids handing. In one types, suspended solids can be applied on the surface directly and can be scrapped out manually may be once in a month. The top 2 inch layer can be replaced with the additive material which is easily available in the local open market. The suspended solids are filtered out which includes additives that combine with organic of waste to produce manure. In the second mode, solids can be retained in the settling tank and then can be removed mechanically. Water first percolates through the bioreactor media which in-houses cultured media in 40-60 min and gets collected into the

collection tank. It can then be pumped onto the media again(recycling) in order to achieve maximum solid liquid contact. There circulation mode is provided for further polishing of the effluent .Dissolved organic and inorganic are oxidized and the water is purified further.

This treated water will be meeting the norms of M/s. Punjab State Pollution Control Board (PPCB) & hence will be recycled back for Industrial purpose. Block Diagram of SBT system is given.

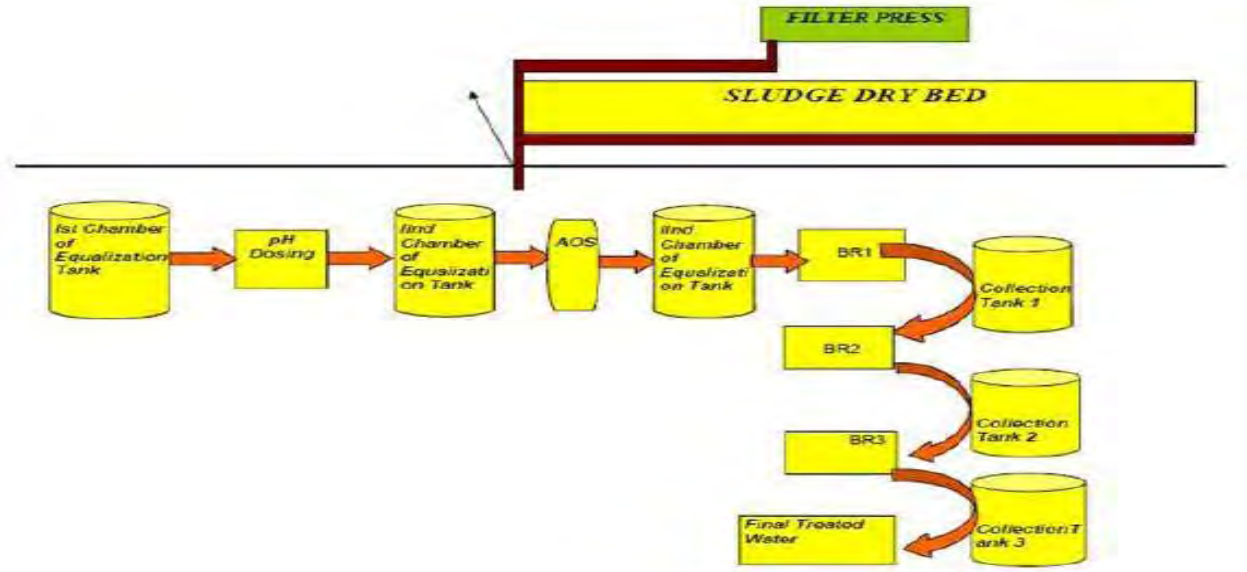


Figure 3.7: Block Diagram of Proposed SBT System

3.9.3 Solid & Hazardous waste generation & Management plan

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 sent to solid waste site. After expansion, municipal solid waste generated in the plant area will be disposed as per existing practices

Hazardous Waste Management

The industry shall obtain authorization under Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2020 for the waste generated and categorized under hazardous waste as per Schedule of The Hazardous & Other Waste (Management and Transboundary Movement)

Amendment Rules, 2021. The generated hazardous waste will be stored in designated Hazardous waste storage room up to maximum of 90 days and shall be disposed to either TSDF or authorized recyclers.

Type, source, mode of storage and treatment and disposal of hazardous waste is shown in **Table 3.8.**

Table 3.8: Management of Hazardous & Non-Hazardous Waste

Sr. No	Name of Waste	Category No. (As per Sch-I II 2016)	Quantity (MT/Annum)	Source of Generation	Mode of Treatment & Disposal Method
1	Discarded Containers/Bags/Liners	Sch-I/33.1	20	Storage & Handling of Raw Materials	Collection, Storage, Transportation, Decontamination & Disposal by selling to registered recycler.
2	Used/Spent Oil	Sch-I/5.1	20	Used/Spent Oil	Collection, Storage, Transportation, Decontamination & Disposal by selling to registered recycler.
3	ETP Sludge	Sch-I/35.3	40	In-house ETP	Collection, Storage, Transportation and disposal at common nearest TSDFsite
4	Distillation Residue	Sch-I/36.1	80	Distillation	Collection, Storage, Transportation and sent for co-processing in cement industries or nearest incineration site.
5	MEE Salt	Sch-I/35.3	700	MEE	Collection, Storage, Transportation and disposal at common nearest TSDF site

Sr. No	Name of Waste	Category No. (As per Sch-I II 2016)	Quantity (MT/Annum)	Source of Generation	Mode of Treatment & Disposal Method
6	Ash Generation	-	120	Boiler	It shall be given to cement manufacturer. In case Cement manufacturer is not available, ash will be sent to TSDF site.
Process Waste					
7	Spent Solvent	Sch-I/28.6	300	Process	Collection, Storage, management & recovery within the premises and will reuse in plant premises.
8	Spent Catalyst	Sch –I (28.1)	1	Process	Collection, Storage, Transportation Disposal at Co-processing or common incineration site.
9	Spent Sulphuric Acid	Sch-I/ 28.1	50	Process	
10	KCl (Inorganic Salt)	Sch-I/ 28.1	550	Process	Collection, Storage & reuse in plant for manufacturing of MPBAD & excess quantity will be sold to end users having Rule 9 Permission.
11	HCl % Solution	Sch-II-Class B(15)	800	Process	
12	Sodium Sulphite Solution (20%) (Na2SO3)	Sch-I/28.1	200	Process	
13	Sodium Sulphate Solution(Na2SO4)	Sch-I/28.1	958	Process	
14	Aluminium Chloride 28 -30 %	Sch-I/28.1	550	Process	
15	NaCl Salt	Sch-I/28.1	3153	Process	
16	Phosphoric	Sch-I/28.1	50	Process	

Sr. No	Name of Waste	Category No. (As per Sch-I II 2016)	Quantity (MT/Annum)	Source of Generation	Mode of Treatment & Disposal Method
	Acid(H_3PO_4)				
17	34% Calcium Chloride solution	Sch-I/28.1	80	Process	
18	Potassium Nitrate	Sch-I/28.1	270	Process	
19	Ammonium Acetate	Sch-I/28.1	58	Process	
20	Sodium Bromide	Sch-I/28.1	270	Process	
21	Hydro Bromic Acid	Sch-I/28.1	258	Process	
22	Sodium Sulfate Solution	Sch-I/28.1	959	Process	
23	Acetic Acid	Sch-I/28.1	144	Process	
24	KCl Slat % Solution	Sch-I/28.1	355	Process	
25	KHCO3 Salt	Sch-I/28.1	600	Process	
26	Ammonium Chloride	Sch-I/28.1	365	Process	
27	Sodium Bi Sulphate	Sch-I/28.1	1099	Process	
28	Potassium Bromide	Sch-I/28.1	60	Process	
29	20 % Sodium Methyl Sulphate	Sch-I/28.1	960	Process	

- The company will provide adequate separate storage area/ space for the storage of hazardous/ solid wastes generated in the plant. Hazardous wastes are sent for treatment and disposal at nearest TSDF Site.

- In proposed Boiler, Agro waste Briquettes will be used as fuel as a result fly ash generation will be minimal. Fly ash can be used for the commercial applications in cement industry, brick making industry, etc.

- Approx. 52 kg/day of municipal solid waste generated at the site and the municipal solid waste generation is being segregated in biodegradable waste and recyclable waste. Recyclable waste is being sold off to different authorized vendors. Biodegradable waste is being sent to solid waste site. After expansion, municipal solid waste generated in the plant area will be disposed as per existing practices.

3.10 Air Emission & Management

Construction Phase: The main sources of air pollution will be dust emission from demolition and Construction activity, vehicular movement, emissions from construction machinery and activities as well from DG sets (1x250 kVA). DG sets will be installed as per CPCB guidelines and manufacturer's instructions to keep the emissions within limits of CPCB. Stack height will be provided as per CPCB guidelines for adequate dispersion of released pollutants and to have negligible GLCs in the surrounding

area. 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 sources of emission in the plant will be combustion of fuel for operation of DG Sets, Boiler & process emission from process reactor vents.

Air pollution control techniques and systems will be installed in the plant to reduce the emissions. Proposed Air pollution control devices includes Cyclone, Bag Filter, Water and Caustic Multistage scrubber. The plant will be maintaining all emission norms prescribed by MoEF&CC/PPCB/CPCB. Stacks with appropriate pollution control system shall be introduced in the plants. Details of proposed stacks are given below in ***Table 3.9.***

Table 3.9. Air Emissions and Pollution Control Measures

S. No.	Source	Fuel Used	APCM	Stack (m)	Expected Pollutants	Maximum Emission (mg/Nm3)
1	Steam Boiler (1 TPH, 2TPH)	Agro waste Briquette	Cyclone Followed by Bag Filter	32	PM, SO2&NOx	PM< 800 SO2 < 600 NOx < 300
2	DG Set (1x250 kVA, 1x380 kVA)	HSD	-	25	PM, CO SO_2& NO_x	PM<0.2 g/KW-hr CO<3.5 g/ KW-hr NOx+HC<4.0 g/KW-hr
Process Stacks / Vents						
3	Process Reactor Vents	-	Two stage water scrubbers	32	HCl	HCl < 20
4	Process Reactor Vents	-	Two stage water scrubbers	32	HBr	HBr < 5
5	Process Reactor Vents	-	Two stage Alkali Scrubber (1^{st} Stage- Water & 2^{nd} Stage- Alkali)	32	HCl & SO_2	HCl < 20
6	Process Reactor Vents	-	Two stage Alkali Scrubber (1^{st} Stage- Water & 2^{nd} Stage- Alkali)	32	HCl & Cl_2	HCl < 20 Cl_2 < 5

All the emission standards given in Environment (Protection) Rules, 1986 and MoEF&CC vide notification G.S.R 446 (E) dated 13th June 2011 for pesticide industry shall be followed. Emission standards are given below in* ***Table 3.10.*

Table 3.10 Emission Standards for Pesticide Industry

S. No.	Parameter	Not to exceed (mg/Nm^3)
1	HCl	20
2	Cl_2	05
3	H_2S	05
4	P_2O_5 (as H_3PO_4)	10
5	NH_3	30
6	Particulate matter within the form of pesticide compounds	20
7	CH_3Cl	20
8	HBr	05

Measures for Pollution Prevention from Boiler Emissions:

- Bio fuel like Agro waste Briquettes will be used.
- Fuel shall be fired uniformly.
- The damper adjustment shall be done by the boiler operator through the boiler operation for achieving optimized combustion & preventing pollution.
- Cyclone separator followed by bag filter shall be installed as air pollution control system to boiler
- Fire bed and soot deposits in tubes shall be cleaned from time to time
- Good quality feed water shall be used in the boiler for better efficiency
- CO_2 shall be frequently checked to ensure the boiler operation and take corrective actions.

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. 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 will be adopted to prevent and control fugitive emissions:

- Proper selection of material of construction of scrubbing system to eliminate any leakages during the operation, graphite at most of the places for getting optimum results will be provided.
- Continuous monitoring of resulting concentrations as well as pH control during the scrubbing of gases like HCl & SO_2 will help to get saleable by-products like 30% HCl Solution and 20% Sodium Sulfite solution.
- All the reactors involved in scrubbing operations will be provided with mechanical seal which eliminates the possibility of any leakages.
- All the heat exchangers used for this operation will be 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 will be provided with mechanical seal which eliminates the possibilities of any leakages and thus reduces the waste generation.

- Airborne dust at all transfers operations/ points will be controlled either by spraying water or providing enclosures.
- Bag Filters and ID fans will be provided for collecting fugitive emissions
- Care will be taken to store construction material properly to prevent fugitive emissions, if any.
- Regular maintenance of valves, pumps and other equipment will be done to prevent leakages and thus minimizing the fugitive emissions of VOCs.
- Entire process will be carried out in the closed reactors with proper maintenance of pressure and temperature.
- Periodic monitoring of work area will be carried out to check the fugitive emission.
- Solvent tank vents will be connected to vent chillers.
- During transfer of material, steps shall be taken to reduce and prevent splashes and spills. Any liquid or dry material spilled shall be cleaned as expeditiously as possible.
- Close feeding system will be provided for centrifuges. Centrifuge and filtrate tank vents will be connected to vent chillers.
- Product filling stations will be equipped with vacuum duct hoods.
- Good Housekeeping shall be maintained in the plant.

VOC Reduction & Odour Control Measures

- Optimization of process parameters.
- Change in utility services
- Recycle / Reduction of Aqueous layer
- Increase in settling time
- Stripping of Aqueous layer
- Solvent input quantity reduction
- When any solvent/reaction mixture will be transferred from one equipment to other equipment then Vapours displace from destination vessel and fill in the space vacated in the source vessel not allowing any solvent vapours to escape
- Mechanical seal/seal less pumps will be used for solvents
- In unit operations/processes involving vacuum, vacuum will be controlled by recycle of vent gases from vacuum pump vent line
- Storage tanks and plant tanks will be connected to same venting system. So, no escape of solvent during transfer
- Appropriate design of condensers during detailed engineering phase of project. (ensuring sufficient line size and thereby flowrate)
- Annual cleaning of condensers to remove scaling (shutdown activity)
- Storage of volatile liquids at lower temperature than boiling point to avoid losses into the atmosphere. (Brine will be used for the same)
- Annual inspection and maintenance of scrubber. (Internals like distribution plate, packings, spray nozzles etc.)
- All reaction vessels will be provided with suitable sizes of primary heat exchanger with cooling water and secondary heat exchanger with chilled brine circulation to control organic vapours effectively.

- Vents of secondary heat exchangers will be connected to three stage scrubbing system consisting of a graphite tube scrubber, a venture and a packed bed scrubber.
- Further the plant will be surrounded with the thick greenbelt which will include odour control plant species.
- When monitoring results indicate VOC above permissible limit repairing should be done immediately. The repair should be conducted in such a way that there is no fugitive emission from the particular component.

3.11 Noise Pollution & Management

***Construction Phase*:**

The most common sources of noise pollution will be activities like foundation, operation of construction machinery and vehicular movement. However, magnitude of the impact will depend upon the type and nature of the machinery, time schedule of operations, construction method and management practices followed during activities.

To mitigate the impact, following steps will be taken:

- The construction activity will be carried out mostly during daytime.
- Proper maintenance of noise generating equipments.
- Regular maintenance of heavy earth vehicles may be adopted to reduce noise levels.
- All the construction machinery and equipment used shall be provided with adequate noise mufflers and noise suppression equipment. Proper lubrication and maintenance of the machinery & equipment and vehicle will be carried out to minimize the noise generation due to abrasion
- Noise level from loading & unloading of material will be reduced by usage of various types of cranes & placing material on sand or sandy bag beds.
- Noise monitoring shall be carried out to ensure the effectiveness of mitigation measures and develop a mechanism to record and respond to complaints on noise.
- Adequate parking space will be provided at the project site to minimize the honking requirement due to congestion and jams and restricting the speed limits.
- Protection devices (earplugs or earmuffs) shall be provided to those workers who cannot be isolated from the source of noise and reducing the exposure time of workers to the higher noise levels by rotation.
- Construction material vehicular movement shall be planned during non-peak hours to avoid traffic congestion in the area.

Operational Phase:

The main sources of noise generation in the proposed project are various types of ID fans, Boiler, pumps & compressors, grinders, DG sets, vehicular movement etc. To reduce impact in the project site and nearby habitations, following mitigation measures will be done.

- Equipment meeting standard of noise shall be used.
- All engineering control practice shall be undertaken during installation of machinery to maintain noise level.
- Acoustical Enclosures and Mufflers will be provided at all required locations.

- Vibration pads and foundation will be provided at all heavy machinery areas.
- Noise generating units like machinery area, canteen etc. will be well insulated with enclosed doors.
- Earmuffs will be used while in high noise areas. Separate cabins will be provided.
- Acoustic treatment rooms will be provided at appropriate location.
- Well- developed road will be constructed within plant, for smooth and hassle free movement of personnel;
- Proper and timely maintenance of machineries and preventive maintenance of vehicles will be done.
- Plantation will be done all over the plant area to provide noise barrier.
- Important Instructions will be displayed all over the plant area.

4 SITE ANALYSIS

4.1 Connectivity

- Nearest Railway station: *Rampura Phul Railway Station* (1.77 km NW)
- Nearest Highway: *National Highway-7* (0.05 km, S)
- Nearest Airport: *Bathinda Airport* (46.5 km, W).
  **All distances are Aerial Distance.*

4.2 Land Form, Land Use and Land Ownership

The proposed site is located at Village- Barnala-Bathinda Road, Rampura phul, District- Bathinda, Punjab.

***Land Use & Land Cover*:** Present Land use of site is industrial. No further change in land use is required.

Land Ownership: The site belongs to M/s Sai Ram Agritech Pvt. Ltd. (Land Documents have been attached as **Annexure-I**) and Change in Land use has been obtained from the competent authority, copy of the same is enclosed as **Annexure II.**

4.3 Topography

Topographically the area is Plain, and the elevation of the plant site is between 218-219 m above Mean Sea Level. The topographical map showing the project site has been depicted in ***Figure 4.1***

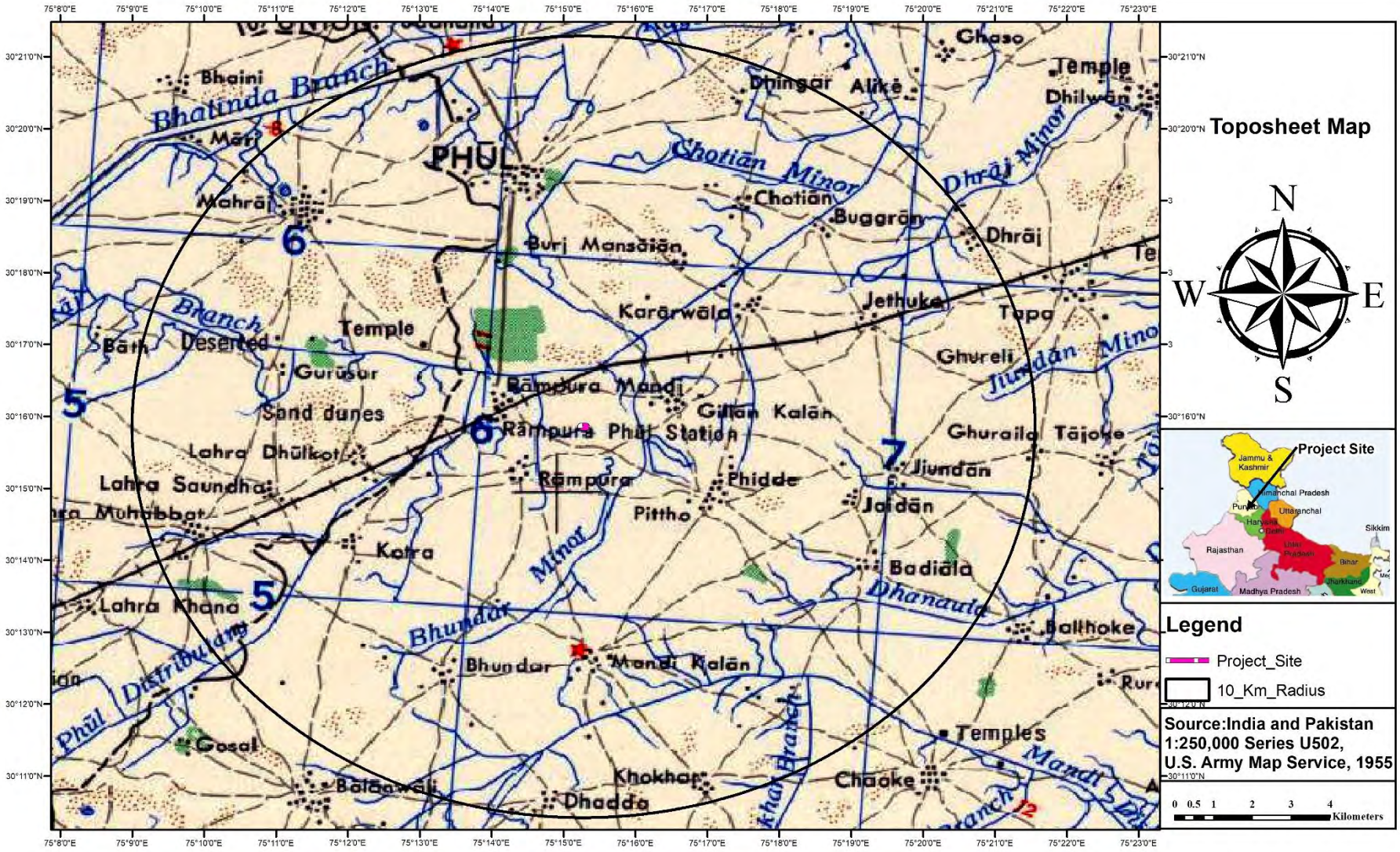


Figure 4.1: Topographical map showing the Project site

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 project site is located at Village- Barnala-Bathinda Road, Rampura phul, District- Bathinda, Punjab. Project Location (Google Earth Pro Image) is shown in **Figure 1.2**. Internal road and other infrastructure are already developed inside the plant. Apart from Plant utility and manufacturing area, R&D lab, Canteen, Admin, Dispensary, drinking water, Water treatment, etc facilities will be provided within the plant.

The site is located near Rampura Phul city (0.20 km W from the project site) and well connected with National Highway-7 (0.05 km, S direction). Nearest Railway station is Rampura Phul Railway Station which is located at 1.77 km in NW direction from the Project Site. Nearest Airport from the project site is Bathinda Airport located at 46.5 km in West direction.

4.6 Climatic data from secondary sources

The nearest IMD station is in Ludhiana (P.A.U.). The climatologically summary for station at Ludhiana (P.A.U.) is given in **Table 4.1.**

Table 4.1: Long Term Meteorological Data of Ludhiana (P.A.U.) (30 years average)

Month	Temperature (°C) Daily		Relative Humidity (%)		Rainfall (mm)	Rainy Days	Predominant Wind Direction		Calm Period		Cloud Amounts (all cloud)		Wind Speed
	Max	Min	8:30	17:30			8.30	17.30	8:30	7:30	8:30	7:30	Km/hr
January	23.4	2	93	67	28	2.3	NW, SE	NW, W	63	37	3.1	2.1	4.4
February	26.1	3.4	89	62	30.4	2.6	NW, SE	NW, W	54	23	2.6	2.3	5.2
March	31.9	7	80	52	24.2	2.3	NW, SE	NW, W	47	20	2	1.9	5.6
April	40.3	11.6	53	30	21.9	2.3	NW, SE	NW, SE	34	17	1.2	1.3	6.3
May	43.3	17.2	47	28	26.5	2.3	SE, NW	NW, SE	20	16	1.1	1	7.3
June	43.1	20.7	59	42	68.6	4.2	SE, NW	NW, SE	18	14	2	1.2	8.1
July	38.8	22.5	80	66	221.4	8.4	SE, SW	SE, NW	22	25	3.8	3.4	6.7
August	36.5	22.1	84	72	195.3	8	SE, S	SE, NW	28	28	3.9	3.6	5.2
September	36	18.7	81	63	101.6	4.3	SE, NW	NW, W	46	32	1.7	1.5	4.3
October	35	12.4	76	49	12.9	0.9	SE, NW	NW, SE	60	62	0.5	0.5	3.1
November	30.5	6.6	84	51	6.9	0.5	SE, NW	NW, SE	73	72	0.7	0.6	2.8
December	25.1	2.8	91	62	14.1	1.1	NW, SE	NW, W	74	61	1.6	1.3	3.5

Source: IMD, Ludhiana (P.A.U.)(1981-2010)

4.7 Social Infrastructure available

The Social infrastructure is available within and near the site; details are given below in ***Table 4.2.***

Table 4.2 Social Infrastructure near the site

Features	Description
Near-by Residential Area	Rampura Phul city (0.20 km NW)
Nearest Hospital	Bansal Hospital, Bathinda (1.35 km, WSW) Raj Hospital (1.95 km, W)

Features	Description
Nearest Temples	Gurudwara Shaheed Baba Jeevan Singh (1.25 km, NW)
Nearest Banks/ATM	HDFC Bank (1.76 km, W)
Nearest Post Office	Post Office, Rampura Phul (1.81 km, NW)

5 PLANNING BRIEF

5.1 Planning Concept. Town and Country Planning/Development authority classification.

The proposed project will be located at Village- Barnala-Bathinda Road, Rampura phul, District-Bathinda, Punjab. Presently, M/s Sai Ram Agritech Private Limited, is operating a pesticide formulation unit at site. Now, it is proposed to expand the existing unit and establish a pesticide manufacturing plant at the site. Change in Land use for industrial purpose has been obtained from the Department of Town and Country Planning, Punjab, copy of the same is enclosed as **Annexure II.**

5.2 Population/Employment Projection

Construction Phase: Total **50 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.

Operational Phase: Total population projection of the project will be **120 (110 nos. of workers & 10 nos. of visitors)** in its operational phase.

Table 5.1 Population/Employment Projection of Proposed Project during Operation Phase

Particulars	Details				Total
	Unit	Contractual	Permanent	visitors	
Construction Phase	No.	40	10	-	**50**
Operation Phase	No.	60	50	**10**	**120**

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

The land has allotted to M/s Sai ram agritech pvt ltd. 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 First Aid with Occupational Health Centre, Canteen, Drinking Water, Training Facilities, etc. will be provided to the workers.

The Company is more concern for the safety and health of its people, including the larger community outside of the company and the environment. All employees will be trained to work on sites in the safest possible manner and shall be made aware of the consequences of unsafe act. Company will also provide the shelter, safe drinking water, sanitation facility. The company will allocate adequate budget for safety and Occupational health management of the employees.

6 PROPOSED INFRASTRUCTURE

6.1 Industrial Area (processing area)

The total plot area of the project will be **7770.874 m^2.**

6.2 Residential Area (Non-processing area)

Not Applicable.

6.3 Green Belt

After proposed expansion, green belt area will increase to approx. 2612.614 m^2 i.e., 33.62 % of total plant area. Wide green belt will be provided all around the boundary wall of project site.

6.4 Social Infrastructure

All basic social infrastructures are available within the industrial area. Thus, no additional Social Infrastructure is proposed. Additional infrastructure development and environmental social activities shall be undertaken in the buffer zone after assessment.

6.5 Connectivity

The site is located near Rampura Phul city (0.20 km W from the project site) and well connected with National Highway-7 (0.05 km, S direction). Nearest Railway station is Rampura Phul Railway Station which is located at 1.77 km in NW direction from the Project Site. Nearest Airport from the project site is Bathinda Airport located at 46.5 km in West direction.

6.6 Drinking water management (source & supply of water)

The drinking water supply for the project is sourced from borewell.

6.7 Sewerage system

Domestic Sewage will be treated in Septic tank followed by soak pit.

6.8 Industrial waste management

There are generation of different kind of Industrial hazardous wastes from production process and other activities. Industrial hazardous waste such as used/spent oil, Empty Barrels/ containers/liners, Chemical sludge from waste water treatment or spent Carbon are sold to registered recyclers. Hazardous waste such as sludge generated from waste water is disposed off at common TSDF Site. The brief of Industrial hazardous waste is mentioned in **section 3 of PFR.**

6.9 Solid Waste Management

Approx. 52 kg/day of municipal solid waste generated at the site and the municipal solid waste generation is being segregated in biodegradable waste and recyclable waste. Recyclable waste is being sold off to different authorized vendors. Biodegradable waste is being sent to solid waste site. After expansion, municipal solid waste generated in the plant area will be disposed as per existing practices.

6.10 Power requirement & supply/ source

Construction Phase: Total 1 no. of DG Sets of capacity 1x250 kVA will be used for power supply during construction works.

Operation Phase: Existing power requirement of the plant is 122.225 KVA, being sourced through Punjab State Power Corporation Limited (PSPCL). For Power backup, DG sets of capacity 62.5 kVA is already installed in existing unit. After expansion, the power requirement of the whole plant will be 1122.225 KVA. Additional two DG sets of 1 x 250 kVA & 1x 380 kVA shall be installed after expansion.

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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 **7770.874 m^2** of land. The total area of land is in possession of Sai Ram Agritech Management. 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 expected Cost of the proposed project shall be around ***Rs 15* crore.**

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. Based on the preliminary site visit, the infrastructure demand in the villages will be assessed on the basis of need and priority.

- 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. 50 local labours for construction phase and 110 no. of skilled persons during operation 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

Annexure -I

Land Document

Government of Punjab
e-Registration Fee Receipt

Receipt No	PB1625571801246
Issue Date	25-JAN-2018 16:57
ACC Reference	SHCIL/PB-SHCIL/PB-NOD
Purchased By	ANUDEEP
Registration Fees Paid By	MS SAI RAM AGRITECH PVT LTD RAMPURA PHUL
Property Description	RAMPURA
Purpose	Leez Deed

Particulars	Amount (Rs.)
Registration Fees	₹7200
Mutation Fees	₹0
Pasting Fees	₹100
PLRS Facilitation Charges	₹500
Infrastructure Development Fees	₹0
Service Charges	₹20
Total Amount	₹7820

(Rupees Seven Thousand Eight Hundred Twenty Only)

Statutory Alert : This is a receipt of fees collected and should not be treated as receipt of Registration.
The authenticity of e-Registration Fee Receipt can be be verified at website i.e.
https://www.shcilestamp.com/Registration/ .

Government of Punjab

e-Stamp

Certificate No.	:	
Certificate Issued Date	:	
Certificate Issued By	:	
Account Reference	:	NONACC (BK)/ pbpnbbk02/ RAMPURA PHUL/ PB-BT
Unique Doc. Reference	:	~~SUBIN-PBPBPNBBK02097229334355860~~
Purchased by	:	DEEPAK BANSAL SO YASH PAL
Description of Document	:	Article 35 Lease
Property Description	:	KHEWAT NO 676 LAND (VILL RAMPURA)
Consideration Price (Rs.)	:	720,000.00 (Seven Lakh Twenty Thousand only)
First Party	:	ANUDEEP WO DEEPAK BANSAL AND OTHER
Second Party	:	SAI RAM AGRITACK PVT LTD
Stamp Duty Paid By	:	SAI RAM AGRITACK PVT LTD
Stamp Duty Amount(Rs.)	:	21,600.00 (Twenty One Thousand Six Hundred only)

Close Print this Page

3271

ਸ੍ਰੀ ਮਾਨ ਸ਼ਬ ਰਜਿਸਟਰਾਰ ਸਾਹਿਬ ਰਾਮਪੁਰਾ ਫੂਲ

ਰਜਿਸਟਰੀ ਵਸੀਕਾ ਪਟਾ ਨਾਮਾ (ਲੀਜ ਡੀਡ)	ਅਸ਼ਟਾਮ	ਸਾਹਮਣੇ ਸਬ ਰਜਿ:	ਅੱਖਰ
(20 ਸਾਲਾ) 10 ਕਨਾਲ 11 ਮਰਲੇ	21600/ਰੁ	ਕੁਝ ਨਹੀ	300
ਬਦਲੇ ਰਕਮ 3,60,000/-ਰੁਪਏ ਸਾਲਾਨਾ ਕਿਰਾਈਆ।	(ਬਲਾਕ ਨੰ 0004)		

ਅਸ਼ਟਾਮ ਦੀ ਰਕਮ ਪੀ.ਐਨ.ਬੀ.ਫੂਲ ਵਿਖੇ ਈ.ਸਟੈਪਿੰਗ ਨੰਬਰ: **IN-PB04948175953233Q** ਮਿਤੀ 25-01-2018 ਰਾਹੀ ਜਮਾ ਕਰਵਾ ਦਿੱਤੀ ਹੈ।

ਅਸੀ ਅਨੁੰਦੀਪ ਪਤਨੀ ਸ੍ਰੀ ਦੀਪਕ ਬਾਂਸਲ ਪੁੱਤਰ ਸ੍ਰੀ ਯਸ਼ਪਾਲ 1/2 ਹਿੱਸਾ ਅਧਾਰ ਕਾਰਡ ਨੰਬਰ: 7265 0818 4450 ਅਤੇ ਸ੍ਰੀਮਤੀ ਮੋਨਿਕਾ ਬਾਂਸਲ ਪਤਨੀ ਸ੍ਰੀ ਪੰਕਜ ਬਾਂਸਲ ਪੁੱਤਰ ਸ੍ਰੀ ਯਸ਼ਪਾਲ 1/2 ਹਿੱਸਾ ਅਧਾਰ ਕਾਰਡ ਨੰਬਰ: 3159 8014 2463 ਵਾਸੀਆਨ ਲਹਿਰਾ ਬਜਾਰ ਅੱਗਰਵਾਲ ਸਟਰੀਟ ਰਾਮਪੁਰਾ ਫੂਲ ਤਹਿਸੀਲ ਫੂਲ ਜਿਲ੍ਹਾ ਬਠਿੰਡਾ ਦੀਆਂ ਹਾਂ।

ਜੋ ਕਿ ਸਾਡੀ ਜਮੀਨ ਵਾਕਾ ਰਕਬਾ ਰਾਮਪੁਰਾ ਖਾਤਾ ਖਤੋਨੀ ਨੰਬਰ 676/929 ਖਸਰਾ ਨੰਬਰ 15//23(8-0) 15//24/1(2-0) 15//24/2 (2-0) 15//24/3(4-0) 31//4/2(0-15) ਕੁਲ ਜਮੀਨ 16 ਕਨਾਲ 15 ਮਰਲੇ ਦਾ 211/335 ਹਿੱਸਾ ਬਕਦਰ 10 ਕਨਾਲ 11 ਮਰਲੇ ਦੇ ਅਸੀ ਬਰੂਏ ਜਮਾਬੰਦੀ 2015-16 ਰਾਹੀ ਹਿੱਸੇਦਾਰੀ ਮਾਲਕ ਤੇ ਕਾਬਜ ਹਾਂ ਹੁਣ ਸਾਨੂੰ ਰੁਪਏ ਦੀ ਲੋੜ ਹੈ ਇਸ ਲਈ ਅਸੀ ਆਪਣੀ ਅਕਲ, ਸੁੱਧ ਬੁੱਧ ਅਤੇ ਆਜਾਦ ਮਰਜੀ ਨਾਲ ਉਕਤ ਜਮੀਨ ਨੂੰ ਬਦਲੇ ਰਕਮ 3,60,000/ਰੁ (ਅੱਖਰੀ ਤਿੰਨ ਲੱਖ ਸੱਠ ਹਜਾਰ ਰੁਪਏ) ਪ੍ਰਤੀ ਸਾਲ ਦੇ ਹਿਸਾਬ ਨਾਲ ਮਿਆਦ ਵੀਹ ਸਾਲ ਲਈ ਮਿਤੀ 01-01-2018 ਤੋ 31-12-2037 ਤੱਕ ਪਾਸ ਸ੍ਰੀ ਮੈਸਰਜ ਸਾਂਈ ਰਾਮ ਐਗਰੀਟੈਕ ਪ੍ਰਾਈਵੇਟ ਲਿਮਟਿਡ ਬਠਿੰਡਾ ਬਰਨਾਲਾ ਰੋਡ ਰਾਮਪੁਰਾ ਫੂਲ ਤਹਿਸੀਲ ਫੂਲ ਜਿਲਾ ਬਠਿੰਡਾ (92166-26301) ਨੂੰ ਠੇਕੇ ਤੇ ਦੇਣ ਦਾ ਇਕਰਾਰ ਕਰਕੇ ਲਿਖਾ ਦਿੰਦੀਆਂ ਹਾਂ ਕਿ ਉਕਤ ਜਮੀਨ ਦਾ ਕਬਜਾ ਉਕਤ ਫਰਮ ਨੂੰ ਦੇ ਦਿੱਤਾ ਹੈ ਪਟੇ ਦੀ ਰਕਮ ਹਰ ਸਾਲ 3,60,000/ਰੁਪਏ ਮਿਤੀ 01 ਜਨਵਰੀ ਨੂੰ ਲੈਕਰ ਰਸੀਦ ਦੇ ਦਿਆ ਕਰਾਂਗੀਆਂ ਅਤੇ ਬਿਨ੍ਹਾ ਰਸੀਦ ਕੋਈ ਵੀ ਰਕਮ ਮੁਜਰਾ ਨਹੀ ਹੋਵੇਗੀ ਅਤੇ ਤਿੰਨ ਸਾਲ ਬਾਅਦ ਉਕਤ ਠੇਕੇ ਦੀ ਰਕਮ ਵਿੱਚ 10 ਪ੍ਰਤੀਸ਼ਤ ਵਾਧਾ ਕੀਤਾ ਜਾਵੇਗਾ।ਜਾਨੀ ਕਿ ਵੀਹ ਸਾਲ ਤੱਕ ਉਕਤ ਜਮੀਨ ਨੂੰ ਜਿਸ ਤਰ੍ਹਾ ਮਰਜੀ ਵਰਤਣ। ਅਸੀ ਉਕਤ ਜਮੀਨ ਵਿੱਚ ਲੋੜੀਦਾ ਦਫਤਰ ਅਤੇ ਵਰਕਿੰਗ ਸੈਡ ਬਣਾ ਕੇ ਦੇਣ ਦੀਆਂ ਪਾਬੰਦ ਹੋਵਾਗੀਆਂ। ਅਤੇ ਉਕਤ ਫਰਮ ਉਕਤ ਜਮੀਨ ਦਾ ਸੀ.ਐਲ.ਯੂ ਸਰਟੀਫੀਕੇਟ ਜਾਂ ਇੰਡਸਟਰੀਜ ਚਲਾਉਣ ਲਈ ਸਰਕਾਰ ਵੱਲੋ ਲੋੜੀਦੀਆਂ ਪ੍ਰਵਾਨਗੀਆਂ ਲੈ ਸਕਦੀ ਹੈ।ਅਤੇ ਉਕਤ ਫਰਮ ਇਸ ਜਮੀਨ ਵਿਚ ਕੋਈ ਬਿਲਡਿੰਗ ਬਣਾ ਸਕਦੀ ਹੈ ਮਸ਼ਿਨਰੀ ਫਿੱਟ ਕਰਾ ਸਕਦੀ ਹੈ ਅਤੇ ਜਾਂ ਕੋਈ ਹੋਰ ਮਸ਼ਿਨਰੀ ਜਾਂ ਬਿਲਡਿੰਗ਼ ਬਣਾਉਣ ਲਈ ਉਕਤ ਫਰਮ ਕਿਸੀ ਬੈਂਕ ਤੋ ਕਰਜਾ ਹਾਸਿਲ ਕਰ ਸਕਦੇ ਹਨ ਜਦੋ ਤੱਕ ਬੈਂਕ ਦਾ ਕਰਜਾ ਉਕਤ ਫਰਮ ਵੱਲ ਰਹੇਗਾ ਉਸ ਸਮੇ ਤੱਕ ਅਸੀ ਲੀਜ ਡੀਡ ਨੂੰ ਤੁੜਵਾ ਨਹੀ ਸਕਦੀਆਂ ਹਾਂ ਉਕਤ ਫਰਮ ਇਸ ਜਮੀਨ ਵਿਚ ਕੋਈ ਵੀ ਮੋਟਰ ਟੈਲੀਫੋਨ ਬਿਜਲੀ ਜਾਂ ਕੋਈ ਹੋਰ ਕੁਨੈਕਸ਼ਨ ਲੈ ਸਕਦੀ ਹੈ। ਸਾਨੂੰ ਕੋਈ ਵੀ ਇਤਰਾਜ ਨਹੀ ਹੋਵੇਗਾ ਮਿਆਦ ਪੂਰੀ ਹੋਣ ਤੇ ਉਕਤ ਫਰਮ ਆਪਣਾ ਕੋਈ ਹੋਰ ਸਾਮਾਨ ਹੋਵੇ ਲਿਜਾ ਸਕਦੀ ਹੈ ਅਤੇ ਜਮੀਨ ਦਾ ਕਬਜਾ ਦੇ ਦੇਵੇਗੀ। ਇਕ ਸਾਲ ਦੇ ਪਟੇ ਦੀ ਰਕਮ 3,60,000/ਰੁਪਏ ਮਿਤੀ 01-01-2018 ਤੋ 31-12-2018 ਤੱਕ ਦੀ ਪੇਸ਼ਗੀ ਵਸੂਲ ਕਰ ਲਈ ਹੈ। ਲਿਹਾਜਾ ਇਹ ਚੰਦ ਕਲਮਾਂ ਪਟਾ ਨਾਮਾ (ਲੀਜ ਡੀਡ) ਜਮੀਨ ਤੇ ਲਿਖਾ ਦਿੱਤਾ ਕਿ ਸੰਨਦ ਰਹੇ।ਮਿਤੀ-25-01-2018

ਗਵਾਹ
ਨੰਬਰਦਾਰ ਗੁਰਦੇਵ ਸਿੰਘ
ਫੂਲ

ਮਿਕਰਾਨ ਪਟੇਦਾਰ
ਅਨੁੰਦੀਪ ਮੋਨਿਕਾ ਬਾਂਸਲ

ਗਵਾਹ
ਭਾਰਤੀ ਦੇਵੀ ਐਕਸ.ਐਮ.ਸੀ
ਫੂਲ।

ਪਟੇ ਤੇ ਲੈਣ ਵਾਲੀ ਫਰਮ
ਮੈਸਰਜ ਸਾਂਈ ਰਾਮ ਐਗਰੀਟੈਕ ਪ੍ਰਾਈਵੇਟ ਲਿਮਟਿਡ ਰਾਮਪੁਰਾ ਫੂਲ
ਰਾਹੀ ਡਾਇਰੈਕਰ ਦੀਪਕ ਬਾਂਸਲ।92166-26300।

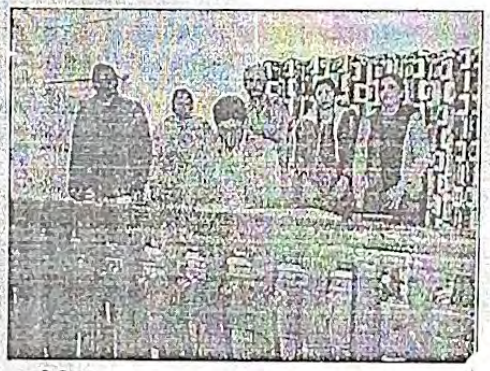
Narinder Kumar Jindal
B.A., LL.B., Advocate
Civil Courts, PHUL.

Trn. Value 30,000.00 Stamp Duty 21,000.00 Reg Fee 300.00 Pas. Fee 100.00
Mkt. Value

Type of Lanc
Area of Lanc
Village/Segmen
Rates
Seg Desc

PATTANAMA/LEASED

ਅੱਜ ਮਿਤੀ 25/1/2018 ਦਿਨ Thursday ਵਕਤ 12:40:36 PM



ਨੂੰ ਸ੍ਰੀ ਅਨੁੰਦੀਪ
ਨੇ ਵਸੀਕਾ ਇਸ ਦਫ਼ਤਰ ਵਿੱਚ ਰਜਿਸਟਰਡ ਕਰਨ ਲਈ ਪੇਸ਼ ਕੀਤਾ।

ਸਬ ਰਜਿਸਟਰਾਰ
ਰਾਮਪੁਰਾ ਫੂਲ

ਸ੍ਰੀ ਅਨੁੰਦੀਪ
ਨੂੰ ਵਸੀਕੇ ਦੀ ਲਿਖਤ ਪੜ੍ਹਕੇ ਸੁਣਾਈ ਗਈ ,ਜਿਸਨੇ ਲਿਖਤ ਨੂੰ ਸੁਣਕੇ,
ਸਮ੍ਝਕੇ ਠੀਕ ਪ੍ਰਵਾਨ ਕੀਤਾ। ਨੇ ਕੁਲ ਰਕਮ

ਅਨੁੰਦੀਪ

ਰੁ: ਮੇਰੇ ਸਾਹਮਣੇ ਨਕਦ/ ਚੈਕ ਰਾਹੀ /ਡਰਾਫਟ ਰਾਹੀਂ ਵਸੂਲ ਕੀਤੇ ।ਦੋਹਾਂ ਧਿਰਾਂ ਦੀ ਗਵਾਹ ਨੰ: 1
ਗੁਰਦੇਵ ਸਿੰਘ ਨੰ: ਅਤੇ ਗਵਾਹ ਨੰ: 2 ਭਾਰਤੀ ਦੇਵੀ
ਸਨਾਖਤ ਕਰਦੇ ਹਨ । ਮੈ ਪਹਿਲੇ ਗਵਾਹ ਨੂੰ ਜਾਣਦਾ ਹਾਂ ,ਜੋ ਕਿ ਦੁਸਰੇ ਗਵਾਹ ਨੂੰ ਜਾਣਦਾ ਹੈ
ਲਿਹਾਜਾ ਵਸੀਕਾ ਰਜਿਸਟ੍ਰਰਡ ਕੀਤਾ ਜਾਵੇ ।
ਮਿਤੀ 25/1/2018

ਸਬ ਰਜਿਸਟਰਾਰ
ਰਾਮਪੁਰਾ ਫੂਲ

ਗਵਾਹ
ਗਵਾਹ 2 ਭਾਰਤੀ ਦੇਵੀ
1.....

ਪਹਿਲੀ ਧਿਰ

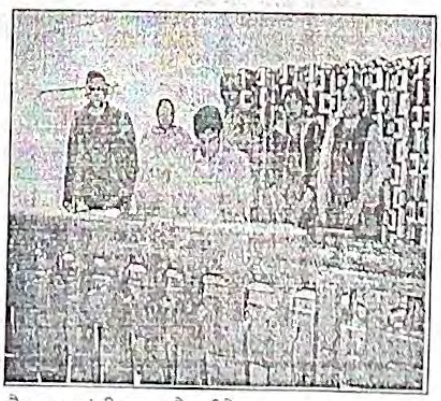
ਦੂਜੀ ਧਿਰ

ਉਕਤ ਨਿਸ਼ਾਨ ਅੰਗੂਠਾ ਅਤੇ ਦਸਤਖਤ ਮੇਰੇ ਰੁਬਰੂ ਕੀਤੇ ਗਏ।
ਮਿਤੀ 25/1/2018

ਸਬ ਰਜਿਸਟਰਾਰ
ਰਾਮਪੁਰਾ ਫੂਲ

ਵਸੀਕਾ ਨੰ: 3,271 ਜਾਇਦਾਦ ਬਹੀ 1
ਜਿਲਦ ਨੰ: 0 ਦੇ ਸਫਾ ਨੰ: 0
ਪਰ ਵਸੀਕਾ ਰਜਿਸਟਰਡ ਚਸਪਾ ਕੀਤਾ ਗਿਆ।

ਸਬ ਰਜਿਸਟਰਾਰ
ਰਾਮਪੁਰਾ ਫੂਲ



ਮੈਸਰਜ ਸਾਂਈ ਰਾਮ ਐਗਰੀਟੈਕ

Annexure-2(b)

ਜਮਾਂਬੰਦੀ- 2015 2016 ਪਿੰਡ- ਰਾਮਪੁਰਾ ਹੱਦਬਸਤ ਨੰ:- 72 ਤਹਿਸੀਲ- ਰਾਮਪੁਰਾ ਫੂਲ ਜ਼ਿਲਾ- ਬਠਿੰਡਾ

1	2	3	4	5	6	7	8
ਖੇਵਟ ਨੰ:/ ਮਾਲ/ਪੱਤੀ, ਨੰਬਰਦਾਰ	ਖਤੌਨੀ ਨੰਬਰ/ ਲਗਾਨ	ਮਾਲਕ ਦਾ ਨਾਂ ਅਤੇ ਵੇਰਵਾ	ਕਾਸ਼ਤਕਾਰ ਦਾ ਨਾਂ ਅਤੇ ਵੇਰਵਾ	ਸਿੰਚਾਈ ਦਾ ਸਾਧਨ	ਮੁਰੱਬਾ ਅਤੇ ਖਸਰਾ ਨੰਬਰ	ਰਕਬਾ ਅਤੇ ਭੋਂ ਦੀ ਕਿਸਮ	ਵਿਸ਼ੇਸ਼ ਕਥਨ
676/ 693 ਕੁਲ 3.81 ਮਾਲ 2.38 ਸਵਾਈ 1.43 (ਪੱਤੀ) ਮੌਰ ਮੌਰ (ਨੰਬਰਦਾਰ) ਸੁਰਿੰਦਰ ਸਿੰਘ, ਲਖਵੀਰ ਸਿੰਘ, ਤਰਲੋਚ ਸਿੰਘ	929	ਐਡ ਹਿੱਸਾ ਬਹਾਦਰ ਉਦਯੋਗ ਮੈਸ ਫਿਨੋ ਆਇਲ ਐਂਡ ਮਿਲਿੰਗ ਮਿਲਜ਼ ਰਾਮਪੁਰਾ ਫੂਲ 28/335 ਹਿੱਸਾ ਰੀਤਿਕਾ ਪਤਨੀ ਸਤੀਸ਼ ਪੁੱਤਰ ਮਦਨ ਲਾਲ 209/1005 ਹਿੱਸਾ ਦੀਪਕ ਪੁੱਤਰ ਜਸਪਾਲ ਪੁੱਤਰ ਬਨਾਰਸੀ ਦਾਸ 7/335 ਹਿੱਸਾ ਪੰਕਜ ਪੁੱਤਰ ਜਸਪਾਲ ਪੁੱਤਰ ਬਨਾਰਸੀ ਦਾਸ 7/335 ਹਿੱਸਾ ਪਵਨ ਕੁਮਾਰ ਪੁੱਤਰ ਪਰਸ਼ੋਤਮ ਦਾਸ ਪੁੱਤਰ ਗੋਪਾਲ 49/335 ਹਿੱਸਾ ਰਮਨ ਨਰੂਲਾ ਪੁੱਤਰ ਅਨਿਲ ਕੁਮਾਰ ਪੁੱਤਰ ਹਰਨਾਮ ਦਾਸ 43/670 ਹਿੱਸਾ ਗਗਨ ਨਰੂਲਾ ਪੁੱਤਰ ਅਨਿਲ ਕੁਮਾਰ ਪੁੱਤਰ ਹਰਨਾਮ ਦਾਸ 1/2010 ਹਿੱਸਾ ਰਾਜ ਰਾਣੀ ਪਤਨੀ ਅਨਿਲ ਕੁਮਾਰ ਪੁੱਤਰ ਮੁਕੰਦ ਲਾਲ 113/2010 ਹਿੱਸਾ ਪ੍ਰੀਤ ਪਤਨੀ ਓਮ ਪ੍ਰਕਾਸ਼ ਪੁੱਤਰ ਮੁਕੰਦ ਲਾਲ 113/2010 ਹਿੱਸਾ ਜਗਦੀਸ਼ ਗਰਗ ਉਰਫ ਜਗਦੀਸ਼ ਪੁੱਤਰ ਮੁਕੰਦ ਲਾਲ ਪੁੱਤਰ ਸਰਨਾ ਮੱਲ 33/670 ਹਿੱਸਾ ਮੁਕੰਦ ਲਾਲ ਗਰਗ ਪੁੱਤਰ ਮੁਕੰਦ ਲਾਲ ਗਰਗ ਪੁੱਤਰ ਸਰਨਾ ਮੱਲ 33/670 ਹਿੱਸਾ ਅਨੁਦੀਪ ਪੁੱਤਰ ਦੀਪਕ ਬਾਂਸਲ ਪੁੱਤਰ ਜਸਪਾਲ 41/335 ਹਿੱਸਾ ਮੋਨਿਕਾ ਬਾਂਸਲ ਪੁੱਤਰ ਪੰਕਜ ਬਾਂਸਲ ਪੁੱਤਰ ਜਸਪਾਲ 41/335	ਮਕਬੂਜ਼ਾ ਮਾਲਕਾਨ		15 // 23	8-0 (0-40-46.86) ਗੈਰਮੁਮਕਿਨ	ਇੰਤਕਾਲ ਨੰ 27807 ਤੋ 27907 ਤੋ
					15 // 24/1	2-0 (0-10-11.71) ਗੈਰਮੁਮਕਿਨ	ਰਪਟ ਨੰ 411 ਆੜ ਰਹਿਨ ਮਿਤੀ 29/3/2010
					15 // 24/2	2-0 (0-10-11.71) ਗੈਰਮੁਮਕਿਨ	ਦਾ ਮੁਕੱਮਲ ਨੋਟ ਜਮਾਬੰਦੀ ਖੇਵਟ 600/876 ਪਰ ਦਰਜ ਹੈ । ਵੱਲੋਂ ਦੀਪਕ ਪੰਕਜ
					15 // 24/3	4-0 (0-20-23.43) ਗੈਰਮੁਮਕਿਨ	ਫਰਦਬਦਰ ਨੰਬਰ 103
					31 // 4/2	0-15 (0-3-79.39) ਗੈਰਮੁਮਕਿਨ	
				ਕੁਲ	ਕਿੱਤੇ 5	16-15 (0-84-73.11)	
					16 ਕਨਾਲ 15 ਮਰਲਾ (0 ਹੈਕਟੇਅਰ 84 ਏਅਰ 73.11 ਸੈਂਟੀਅਰ) ਗੈਰਮੁਮਕਿਨ 16 ਕਨਾਲ 15 ਮਰਲਾ (0 ਹੈਕਟੇਅਰ 84 ਏਅਰ 73.11 ਸੈਂਟੀਅਰ) ਗੈਰਮੁਮਕਿਨ		

1 ਖੇਵਟ ਨੰ./ ਖਾਲ/ਪੱਤੀ, ਨੰਬਰਦਾਰ	2 ਖਤੌਨੀ ਨੰਬਰ/ ਮਕਾਨ	3 ਮਾਲਕ ਦਾ ਨਾਂ ਅਤੇ ਵੇਰਵਾ	4 ਕਾਸ਼ਤਕਾਰ ਦਾ ਨਾਂ ਅਤੇ ਵੇਰਵਾ	5 ਸਿੰਚਾਈ ਦਾ ਸਾਧਨ	6 ਮੁਰੱਬਾ ਅਤੇ ਖਸਰਾ ਨੰਬਰ	7 ਰਕਬਾ ਅਤੇ ਭੋਂ ਦੀ ਕਿਸਮ	8 ਵਿਸ਼ੇਸ਼ ਕਥਨ
675/ 692 ਕੁਲ 0.58 ਮਾਲ 0.36 ਮੁਆਫੀ 0.22 (ਪੱਤੀ) [illegible] (ਨੰਬਰਦਾਰ) [illegible] ਸਿੰਘ, [illegible] ਸਿੰਘ, [illegible] ਸਿੰਘ	928	[illegible] 2/5 ਹਿੱਸਾ [illegible] 1/6 ਹਿੱਸਾ [illegible] 1/6 ਹਿੱਸਾ	ਮਕਬੂਜ਼ਾ ਮਾਲਕ	ਕੁਲ	31 // 4/1 ਕਿੱਤਾ 1	5-7 (0-27-6.34) ਗੈਰਮੁਮਕਿਨ 5-7 (0-27-6.34) 5 ਕਨਾਲ 7 ਮਰਲਾ (0 ਹੈਕਟੇਅਰ 27 ਏਅਰ 6.34 ਮਿ.ਮੀ.) [illegible] 5 ਕਨਾਲ 7 ਮਰਲਾ (0 ਹੈਕਟੇਅਰ 27 ਏਅਰ 6.34 ਮਿ.ਮੀ.) [illegible]	ਤਬਦੀਲ ਨੰ 411 [illegible] ਮਿਤੀ 29/3/2010 [illegible] 31//4/1 (5-7) ਦਾ 1/3 ਹਿੱਸਾ [illegible] 1-15.66 [illegible] 15/23-24-24/2 24/3 [illegible] 3400000/- ਰੁਪਏ [illegible] ਹੈ।

[illegible] 30577 [illegible] 31//4/1(5-7) ਦਾ 3/107 ਹਿੱਸਾ [illegible] 0-3 [illegible] 1/107 [illegible] 1/107 [illegible]

[illegible] 30578 [illegible] 15/23(8-0) 24/1/1(0-8)24/2/1(0-8)24/2/1(0-16)31//4/1/1(0-19) [illegible] 10-11 [illegible] 1/2 [illegible] 1/7 [illegible] 25/132 [illegible] 26/132 [illegible] 41/132 [illegible] 15/24/1/2(1-12)24/2/1(1-12)24/3/2(2-16)31//4/1/2(0-10) [illegible] 0-12 [illegible] 7/99 [illegible] 26/99 [illegible] 41/132 [illegible] 31//4/1/3(3-18)4/2(0-15)15/24/3/3(0-6) [illegible] 4-19 [illegible]

[illegible] 30578 [illegible] 411 ਮਿਤੀ 29/03/2010 [illegible] 31//4/1(5-7) ਦਾ 1/3 [illegible] 1-15.66 [illegible] 15/23(8-0) 24/1(2-0) 24/2(2-0) 24/3/4-0) 31//4/2(0-15) [illegible] 16-15 ਦਾ 14/335 [illegible] 0-14 [illegible] 2-9.06 [illegible] 15//24/1/2(1-12) 24/2/1(1-12) 24/3/2(2-16) 31//4/1/2(0-10) [illegible] 0-12 [illegible] 50/132 [illegible] 2-10 [illegible]
34,00,000/- [illegible]

[illegible] 315 [illegible] ਮਿਤੀ 06/02/2020 [illegible]

[illegible] 61/ [illegible] 5-3-2020 [illegible] 448 [illegible] ਮਿਤੀ 28.1.2020 [illegible]

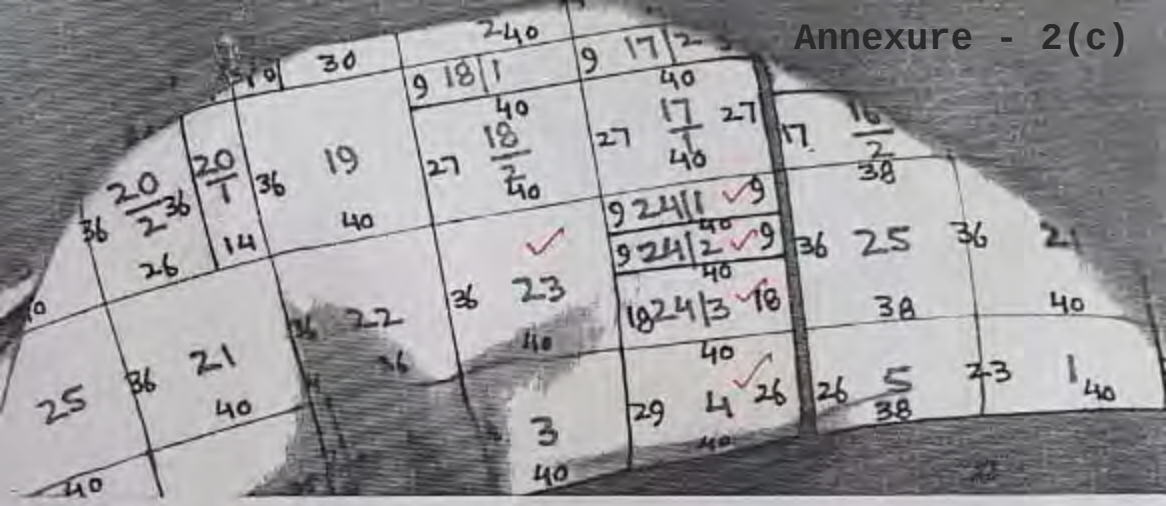
[illegible] 11630 [illegible] 65/36218 ਮਿਤੀ 3.11.1965 [illegible] 72(1) [illegible]

[illegible]

[illegible] 316 [illegible] ਮਿਤੀ 06/02/2020 [illegible] 63/Rev ਮਿਤੀ 5-5-2020 [illegible] 448 [illegible] ਮਿਤੀ 28.1.2020 [illegible] 11630 [illegible] 65/36218 ਮਿਤੀ 3.11.1965 [illegible] 72(1) [illegible]

ਟਾਈਪਿਸਟ ਨੰ 10528 [illegible] 1 [illegible] 25 [illegible]

 ਪ੍ਰਿੰਟ ਮਿਤੀ : 20-10-2020 12:00:09:307 pm [illegible] ਮਿਤੀ 19/10/2020 [illegible]



Annexure -II

CLU

DEPARTMENT OF TOWN & COUNTRY PLANNING, PUNJAB

From

Senior Town Planner,
Patiala.

To

Sh. Deepak Bansal S/o Sh. Yashpal Bansal,
Authorized Signatory,
M/s Sai Ram Agritech Pvt.Ltd,
Resident Lehra Bazar, Aggarwal Street,
Ward No. 12, Rampura Phul,
Distt. Bathinda.

Memo No: 513 -STP(P)/ SP-327
Dated: 15-02-2019

Sub: **Change of land use from agriculture to industrial** (Pesticides)- **M/s Sai Ram Agritech Pvt. Ltd. village Rampura (H.No. 72), District Bathinda.**

Ref: **Your application dated 11.02.2019.**

2. Your request for change of land use for an area measuring 1.269 acres falling in village Rampura (H.No. 72), Tehsil Rampura Phul, District Bathinda for Industrial (Pesticides) purpose has been considered in this office. The site falls in Notified Local Planning Area, Rampura Phul. Permission is hereby given as per Chief Town Planner letter no. 1219-37-CTP(PB)/SP-432 (Gen.) dated 27.02.2018 to use the said land for this unit. The detail of land as verified by Tehsildar Rampura Phul vide his letter dated 17.01.2019 is as under :-

Sr. No.	Khasra No.	Ownership as per revenue report & Jamabandi Kanal	Marla	CLU Issued
1)	15//23	08	00	1.269 acre including Road widening area
2)	24/1/1	00	06	
3)	24/2	00	06	
4)	24/3/1	00	12	
5)	31//4/1/1	00	19	
	Total	10 Or 1.269 acres	03	

3. The above permission is subject to the following terms & conditions:-

i. The change of land use shall remain in force in accordance to the provisions of revised section 83 of "The Punjab Regional and Town Planning And Development (amendment) Act, 2015" notified vide notification no.16-Leg/2015 dated 22.04-2015 by Department of Legal and Legislative Affairs, Punjab.

ii. The change of land use shall be in the hands of M/s Sai Ram Agritech Pvt. Ltd, Village Rampura (H.B.No: 72), Tehsil Rampura Phul, Distt. Bathinda for the above piece of land.

iii. The applicant shall deposit EDC / Licence / Permission Fee / SIF charges and all other charges levied or to be levied by the Housing and Urban Development Department, Punjab from time to time.

Cont. Page-2

iv. The issue of ownership of land is independent and exclusive of permission of Change of Land Use. Therefore, this permission of CLU does not in any manner grant or effect ownership right of this land which has to be determined by Competent Authority. The applicant in whose hands this change of land use lies shall be bound by the decision of such Competent Authority.

v. The applicant shall be responsible for any litigation regarding land owners in any court of law.

vi. Through revenue rasta/ khal if any passing through the site shall be kept unobstructed.

vii. The applicant shall obtain NOC from PPCB under the Water (Prevention and Control of Pollution) Act, 1974, Municipal Solid Waste Management and Handling Rules-2008 or any other relevant Act before undertaking any development at site.

viii. The applicant shall get the building plans approved from the Competent Authority before undertaking any development at site as per undertaking submitted by him.

ix. The applicant shall not make any construction under H.T/L.T. transmission electric lines if passing through the site or shall get these lines shifted by applying to the concerned authority.

x. This permission shall not provide any immunity from any other Act/Rules/Regulations applicable to the land in question. The applicant shall be liable to obtain all the statutory clearances from different agencies under any act or instructions of Govt. at his own level.

xi. The applicant shall obtain NOC from the Forest Department if required under Forest Act, 1980 before undertaking development at site.

xii. As the site falls on Bathinda-Barnala (NH-7) the applicant shall leave 25'-9" land from his site to widen the existing 148'-6" road to 200'-0" and shall leave 30 mtrs no construction zone from PWD Boundary as per undertaking submitted by him.

xiii. If the change of landuse permission is availed, then it is valid upto 31-12-2037 i.e.20 years as per registered pattanama submitted in this office by the applicant.

xiv. The applicants shall be abide by the conditions laid in letter no. 1031-33 dated 30.05.2018 issued by Executive Engineer, for Highway Administration.

xv. The applicant shall obtain permission under section 143 of the "The Punjab Regional and Town Planning and Development (Amendment) Act, 2006" to derive access from Competent Authority.

xvi. The applicant shall obtain approval/NOC from the Competent Authority to fulfill the requirement of notification dated 14.9.2006 of Ministry of Environment and Forest Deptt., Government of India before starting the development works.

xvii. The applicant shall make provision for the disposal of rain/storm water of the proposed project and shall not obstruct the flow of rain/storm water of the surrounding area.

xviii. The applicant shall make provision of rain water harvesting and plantation in the premises as per building bye-laws or instructions of Govt. issued from time to time.

xix. The applicant shall make his own suitable provision for drinking water supply and disposal of sewage & solid waste management.

xx. The Local Planning Area, Rampura Phul is Notified whose Master Plan is under preparation as and when Master Plan, Rampura Phul is prepared you will abide by the conditions of Master Plan, Rampura Phul.

xxi. As per notification issued vide Memo No.PUDA/CA/2013/1713-16, dated 27-02-2013, the applicant shall not use underground water for construction of development works in the notified area and shall use surface water sources or treated sewage from nearby Sewerage Treatment Plant.

xxii. The construction shall be done only on the site/ khasra no's verified by the concerned Tehsildar of the particular circle revenue office.

xxiii. The applicant shall leave 15 mtrs green buffer of broad leaf trees towards Balaji residential Colony as the site falls within 100mtrs. of this approved colony.

xxiv. The applicant shall obtain any other permission if required under any other act at his own level.

xxv. The applicant shall develop the site as per and PUDA Building Rules-2018.

xxvi. No change of land use charges have been charged as per notification no. 17 / 17 / 2001- 5Hg 2 / P.F./748168 dated 06.05.2016 and 17/17/2001-5hg2/4592 dated 11-08-2017.

DA/X

(Mandeep Kaur)
Senior Town Planner,
Patiala.

Cont. Page-3

Endst.No: -STP(P)/ Dated:

Copy is forwarded to the Chief Administrator, Bathinda Development Authority, Bathinda along with Bank Draft no: 236307, dated 11-02-2019 amounting to Rs. 1,05,500/- (Rs. One Lakh Five Thousand & Five Hundred only) issued by SBI Bank, Branch Rampura Phul towards total EDC for information & necessary action. These charges may be checked at your level. If any difference is found, it may be collected from the applicant at your level

DA/As above

(Mandeep Kaur)
Senior Town Planner,
Patiala.

Endst. No. STP(P)/ Dated:

Copy is forwarded to the Chief Administrator, PUDA, S.A.S. Nagar along with Bank Draft No. 236306, dated 11-02-2019 amounting to Rs. 5,300/- (Rs. Five Thousand & Three Hundred only) issued by SBI Bank, Branch Rampura Phul towards total Social Infrastructure Fund (5% of EDC) for information and necessary action.

DA/As above

(Mandeep Kaur)
Senior Town Planner,
Patiala.

Endst.No: -STP(P)/ Dated:

Copy is forwarded to: -

1) Chief Town Planner, Punjab, Chandigarh.
2) Chairman, Punjab Pollution Control Board, Patiala.
3) Director of Factories, Punjab, Chandigarh.
4) District Town Planner, Bathinda.
5) Estate Officer Regulatory, BDA Bathinda.
6) Executive Engineer, for Highway Administration.

for information and necessary action.

DA/X

(Mandeep Kaur)
Senior Town Planner,
Patiala.
(P)

PUDA Bhawan, 6TH Floor, Sector 62, SAS NAGAR.

To

M/s Sai Ram Agritech Pvt. Ltd.
Ist Floor, Lehra Bazar,
Vill. Rampura Phul,
Distt. Bathinda-151103.

Memo No. 346 CTP(Pb) SP-4326(B)
Dated: 19-01-18

Subject: **Permission for Change of land use for Industrial purpose (Pesticides Industry) under Compounding Policy of M/s Sai Ram Agritech Ltd. at Village Rampura Phul, Distt. Bathinda (Additional Area 0.47005 Acre)**

Reference: **Your request dated 12.01.2018..**

2. Your request for change of land use for an area measuring 0.47005 acre falling at Village Rampura Phul, Distt. Bathinda for industrial purpose (Pesticides Industry) has been considered at Government level under Compounding Policy. The permission for change of land use is hereby granted on the following terms and conditions. The detail of land as verified by Tehsildar Rampura Phool is as under:-

Sr.No.	Khasra No. and area as per Jamabandi (Kanal-Marla)	Area for CLU Permission.
1.	15//24/1(0-19), 24/2(0-19), 24/3(2-1), Total area 3K-19M = 0.49375 Acre	Permission granted for CLU 0.47005 acre (Total area 0.49375 acre - 0.0237 acre area under road widening).

i. The Change of Land Use shall be in the hands of **M/s Sai Ram Agritech Ltd.**

ii. Applicant shall deposit EDC/ License/ Permission Fee and all other charges levied or to be levied by Housing and Urban Development Department from time to time and shall also pay compounding charges as per policy of HUD.

iii. Applicant shall develop the site as single unit and shall not bifurcate the site.

iv. Applicant shall develop the site after getting the building plans approved from Competent Authority & shall ratify the building accordingly.

v. The issue of ownership of land is independent and exclusive of permission of Change of Land Use. Therefore, this permission of CLU does not in any manner grant or effect ownership right of this land which have to be determined by Competent Authority. The Applicant in whose hands this Change of Land Use lies shall be bound by the decision of such Competent Authority.

vi. Applicant shall be responsible for any litigation, if any, regarding land in any court of law.

vii. Thorough revenue rastas/khals and pucca road passing through the site shall be kept unobstructed.

viii. Applicant shall obtain NOC from PPCB required under the Water (Prevention and Control of Pollution) Act, 1974, Municipal Solid Waste Management and Handling Rules, 2008 or any other relevant Act before undertaking any development at the site.

ix. Applicant shall ensure the minimum distance from the nearby residential area, if any, as prescribed by PPCB, Deptt. of Environment or other Competent Authority in this regard and as per Notification dt. 25.7.2008 of the Deptt. of Science, Technology & Environment,Punjab.

x. Applicant shall not make any construction under HT/L.T. electric lines passing through the site and also shall leave green buffer strip along the site as per the provisions of PSPCL.

xi. This permission will not provide any immunity from any other Act/Rules/ Regulations applicable to the land in question.

xii. Applicant shall obtain NOC from the Forest Department, under Forest Act, 1980 before undertaking development at the site.

xiii. Applicant shall make provision for the disposalof rain/storm water of the proposed project [illegible] obstruct the flow of rain/storm water of the surrounding area.

xiv. Applicant shall make provision of rain water harvesting within the project area at its own cost.
xv. Applicant shall make its own suitable provision for drinking water supply and disposal of sewage & solid waste management.
xvi. Applicant shall obtain any other permission required under any other Act at his own level.
xvii. Applicant shall leave 5'-3" wide strip of land to widened the existing 29'.6" wide road to 40' -0" wide as per the undertaking submitted in this office.
xviii. Applicant shall abide by all the proposals of Master Plan Rampura Phul, if required.
xix. Change of land use shall to valid for 02.02.2016 to 01.02.2031 for a period of 15 years as per the pattanama submitted in this office.
xx. As per Memo No.PUDA/CA/2013/1713-16, dated 27.02.2013, restrictions in the area are imposed on construction and installation of any new structure for extraction of ground water resources without prior specific approval of the authorized officer (Deputy Commissioner) of the District and subject tot he guidelines/safeguards envisaged from time to time in this connection by Authority for ground water extraction and rain water harvesting/recharge etc.

No change of landuse charges has been charged as per notification No. 17/17/2001-5Hg2/P.F/748168/17, dated 06.05.2016.

Chief Town Planner, (Puda)
Punjab, Chandigarh.

Endst.No. CTP(Pb)/ Dated

Copy is forwarded to the Chief Administrator, Bathinda Development Authority, Bathinda with the request that EDC charges amounting to Rs. 44,100/- received by DD No. 235663 dated 12.01.2018 of State Bank of India for information and necessary action. Difference if any, shall be recovered from the applicant at your own level.

Sd/-

Chief Town Planner, (Puda)
Punjab, Chandigarh.

Endst. No. CTP(Pb)/ Dated

Copy is forwarded to the Chief Administrator, PUDA, SAS Nagar along with D.D. No. 235661 dated 12.01.2018 amounting to Rs. 2,250/- towards S.I.F charges of State Bank of India for information and necessary action. Difference if any, shall be recovered from the applicant at your own level.

Sd/-

DA/ As above.

Chief Town Planner, (Puda)
Punjab, Chandigarh.

Endst. No. CTP(Pb)/ Dated

Copy is forwarded to the following for information and necessary action:-

1) Chairman, Punjab Pollution Control Board, Patiala.
2) The Chief Conservator of Forests, Punjab, Chandigarh.
3) Senior Town Planner, Patiala
4) Distt. Town Planner, Bathinda.
5) Director of Factories, Punjab, Chandigarh.

Sd/2

Chief Town Planner, (Puda)
Punjab, Chandigarh.

DEPTT.OF TOWN & COUNTRY PLANNING PUNJAB.

From

Chief Town Planner,
Punjab, Chandigarh.

To

M/S Sai Ram Agritech,
Ist. Floor, Main Chowk,
Lehra Bazar, Rampura Phul,
Distt. Bathinda.

Memo No. 5886 /CTP(Pb)/ SP.432-B
Dated: 23/8/11

Subject: Change of land use for industrial purpose-M/s Sai Ram Agritech at Lehra Bazar, Rampura Phul, Distt. Bathinda.

Reference: Your application dated nil.

2. Your request for change of land use for an area measuring 2Kanal-10 Marla (0.3125 acre) falling at Lehra Bazar, Rampura Phul, Distt. Bathinda for industrial purpose has been considered at Government level. The permission for change of land use is hereby given with the approval of Govt. for industrial purpose on the following terms and conditions. The detail of land is given below:-

S.No	Khasra No.	Share	Area for CLU (K-M)
1.	31//4/1(5-7)	1/3	1Kanal-16 Marla
2.	15/23 (8-0), 24/1(2-0), 24/2(2-0), 24/3(4-0), 31//4/2(0-15) Total: 16 Kanal-15 Marla	14/335	0 Kanal -14Marla
Total:			2 Kanal-10 Marla (0.3125 acre)

i) Applicant should deposit EDC/License/Permission Fee and all other charges levied or to be levied by the Housing and Urban Development Department from time to time.

ii) Applicant shall develop the site after getting the building plans approved from Competent Authority.

iii) The issue of ownership of land is independent and exclusive of permission of Change of Land Use. Therefore, this permsision of CLU does not in any manner grant or effect ownership right of this land which have to be determined by Competent Authority. The Applicant in whose hand this Change of Land Use lies shall be bound by the decision of such Competent Authority.

iv) Applicant shall be responsible for any litigation, if any , regarding land in any court of law.

v) Thorough revenue rastas and pucca road passing through the site shall be kept unobstructed.

vi) Applicant shall obtain NOC from PPCB required under the Water (Prevention and Control of Pollution) Act, 1974, Municipal Solid Waste Management and Handling Rules, 2008 or any other relevant Act before undertaking any development at the site.

vii) The applicant shall ensure the minimum distance from the nearby residential area, if any, as prescribed by PPCB. Deptt. of

viii) Applicant shall not make any construction under HT/L.T. electric lines passing through the site or shall get these lines shifted by applying to the concerned authority.

ix) This permission will not provide any immunity from any other Act/Rules/Regulations applicable to the land in question.

x) Applicant shall obtain NOC from the Forest Department, if required, under Forest Act, 1980 before undertaking development at the site.

xi) Applicant shall make provision for the disposal of rain/storm water of the proposed project and shall not obstruct the flow of rain/storm water of the surrounding area.

xii) Applicant shall make provision of rain water harvesting within the project area at its own cost.

xiii) Applicant shall make its own suitable provision for drinking water supply and disposal of sewage & solid waste management.

xiv) Applicant shall obtain any other permission required under any other Act at his own level.

xv) Applicant shall leave the required strip of land to widen the road as per undertaking submitted by him.

xvi) Since the site falls in Local Planning Area, Rampura Phul hence the applicant shall be bound to shift his site to the permissible industrial zone as per provisions in "The Punjab Regional and Town Planning & Development (Amended) Act, 2006" in case the site is not designated as industrial zone in the Master Plan Rampura Phul.

No change of landuse charges has been charged as per notification vide Notification No. 17/17/01/5Hg2/638, dated 18.6.09.

Chief Town Planner,
Punjab, Chandigarh.

Endst.No. CTP(Pb)/ Dt.

Copy is forwarded to the Chief Administrator, Bathinda Development Authority, Bathinda along with DD No. 385514, dated 06.08.2011 amounting to Rs. 31,250 /- towards total EDC for information & necessary action. It is also requested to check the EDC charges at its own level. Differences, if any found, should be recovered at its own level from the applicant.

Sd/-
Chief Town Planner,
Punjab, Chandigarh.

Endst.No. CTP(Pb)/ Dt.

Copy is forwarded to the Chief Administrator, PUDA, Mohali along with DD No.808151, dated 6.08.2011 amounting to Rs. 950/- towards Social Infrastructure Fund (3% of EDC) for information and necessary action.

Sd/-
Chief Town Planner,
Punjab, Chandigarh.

Endst.No. CTP(Pb)/ Dt.

Copy is forwarded to the following for information and necessary action:-

1) Chairman, Punjab Pollution Control Board, Patiala.
2) The Chief Conservator of Forests , Punjab, Chandigarh.
3) Senior Town Planner, Patiala.

Annexure -III

Approval for site clearance by

Director of Factories,

Punjab

Government of Punjab
Department of Labour

To

M/s. Sai Ram Agritech Pvt. Ltd.,
Near PV Cold Store, Rampura Phul,
District Bathinda.

No. 8667
Dated: Chandigarh the; 24/9/18

Subject:- **Approval of Site to M/s. Sai Ram Agritech Pvt. Ltd., Near PV Cold Store, Rampura Phul, District Bathinda (Item No.102.13).**

Kindly refer to the subject noted above.

The Governor of Punjab is pleased to accord approval of site clearance to **M/s. Sai Ram Agritech Pvt. Ltd., Near PV Cold Store, Rampura Phul, District Bathinda** for increase in the production capacity (Formulation) of Pesticides, Weedisides, Fungisides from 50 Tonne/Annum to 200 Tonne/Annum by using solvent, emulsifier, technical etc. @ 200 Tonnes/Annum as raw material by acquiring 4 Kanal 10 marlas additional land (Total 7 kanal) located near PV Cold Store, Rampura Phul, Distt. Bathinda, on the recommendation of State Competent Authority-cum-Site Appraisal Committee, constituted under Section 41-A(2) of the Factories Act, 1948 subject to the following conditions:-

Conditions by PPCB

1. The industry will apply for consent to establish (NOC) of the Board through OCMMS.
2. The industry will ensure that trade effluent generated from lab section is properly handled/disposed off through solar evaporation ponds and there should not be any over flow from the solar evaporation ponds.

Conditions of DOF

3. All the reactions will be carried out in the closed reactors.
4. The industry will provide flame proof fittings on the places where flammable solvent is stored, handled or processed.
5. The industry will provide personal protective equipments to the workers and will ensure that the workers are using the same.
6. Automatic machines will be used for filling of pesticides.
7. The industry will provide proper and adequate fire fighting arrangements.
8. There should be proper washing facility for the workers working in the plant.
9. There should be restriction on drinking or eating any substance in the plant.
10. The industry will comply with the provision of Schedule XXIV of Rule 102 of Punjab Factory Rules, 1952.

11. The industry shall comply with the provisions of Factories Act, 1948 and Punjab Factory Rules, 1952.
12. The worker and the people in the vicinity shall be informed about the hazards involved and methods to be adopted to prevent the harmful effects, if any.
13. The industry will modify its On-Site Emergency Plan, Health and Safety Policy, if there is any change in the organization.
14. The industry shall submit compliance report of the condition of approval of site to the Director of Factories, Punjab before commissioning of its project.
15. The industry shall be inspected after commissioning of its proposed project to monitor the compliance of condition of approval of site.
16. The building plans of the factory shall be submitted to the Director of Factories, Punjab before starting the construction.

Conditions by DOI

17. The entrepreneur will endorse the production capacity, to be increased, in the registration certificate from the Govt. of India.

Conditions by DOA

18. The site of the industry falls in block Rampura, District Bathinda, which is declared as safe block by the Dynamic Groundwater Resources of Punjab State (as on 31st March, 2013). The industry will ensure to obtain permission for withdrawal of groundwater from the Central Ground Water Authority (CGWA).
19. The industry will artificially recharge the groundwater with the help of Roof Top Rain Water Recharge Well system.
20. The entrepreneur will adhere to the pollution control norms of water & soil fixed by Punjab Pollution Control Board.

Conditions by CTP

21. The entrepreneur will comply with the conditions mentioned in the permission of change of land use (CLU) issued vide letter No.5886 CTP (Pb)/SP-432)B) dated 23-08-2011 and CLU granted vide Memo No.346 CTP (Pb)/SP-432 (B) dated 18-01-2018 under the compounding policy, by the Chief Town Planner, Punjab.
22. The entrepreneur will leave 7 feet 6 inch land, out of his own land in front of the industry for widening the approach road from 25 feet to 40 feet and will also leave 5 feet 3 inch land out of his own land on the rear side of the industry for widening the road from 29 feet 6 inch to 40 feet, as per condition imposed in the permission for change of land use (CLU) granted by the Chief Town Planner, Punjab.
23. The entrepreneur has submitted the building plans under the Compounding Policy, which are under consideration of Town & Country Planning Department. The entrepreneur has submitted the building plans by leave the land for road widening as per the condition imposed in the CLU. As per the site land left for road widening. The entrepreneur will be bound to change the boundary wall and other constructions made in the land left by it for road widening and will be bound to pay compounding charges, as per Compounding Policy.

Conditions by DHS

24. The proposed industry should not pose any health hazard to the people residing in the surrounding areas.
25. The workers and the people in the vicinity should be informed about the hazards involved and methods to be adopted to prevent the harmful effects, if any.
26. First Aid Centers and Occupational Health Centre should be provided, as per requirements, to combat and manage health hazards from the processes.

27. No harmful bye products should be allowed to be disposed off outside the plant to keep the surrounding environment free from hazardous effects of wastage.
28. Names and connecting telephone numbers of nearby health institutions should be displayed on the board and made known to all concerned in the vicinity of the plant also.
29. SPM (Suspended Particulate Matter) should not be more than the prescribed limit at any stage to avoid exposure to the people in the vicinity.
30. Periodic inspection by the competent authority of the health department will be undertaken for the enforcement of the stipulated conditions given above. Appropriate action under rules will be taken on infringement of these conditions.

Conditions by CFO

31. The entrepreneur will make adequate fire fighting arrangements as provided in Part-IV of the National Building Code 2016, Indian Standard Code and as per the advice of the concerned Fire Officer and will obtain fire safety certificate from the concerned Fire Officer, before commissioning of the project.

General Conditions

32. This site clearance is granted under the Factories Act, 1948 and the rules framed there under as amended from time to time. The industry will obtain clearances/ approvals from other concerned departments under any other Act/rules, if need be.
33. This site clearance does not preclude the institution of any legal action nor relieve the applicant from any responsibilities or penalties to which the applicant is or may be subjected under the provisions of Factories Act or any other Act/rules.
34. This site clearance is valid for a period of five years from the date of its issuance.

24.9.18
Addl. Director of Factories,
for Director of Factories, Punjab

Endst. No. Dated:

A copy of the above is forwarded to the following for information and necessary action:-

1. Principal Secretary to Govt. of Punjab, Department of Science, Technology, Environment and Non-Conventional Energy, Punjab, Chandigarh.
2. Chairman, Punjab Pollution Control Board-cum-Member Secretary, SCA-cum-SAC, Patiala.
3. Director of Industries & Commerce, Punjab, Chandigarh.
4. Chief Town Planner, Punjab, Department of Town & Country Planning, 6th Floor, PUDA Bhawan, Phase-8, Mohali.
5. Deputy/Assistant Director of Factories, Bathinda.
6. Nodal Officer, Computerization for uploading it in the departmental Web Site.

-Sd-
Addl. Director of Factories,
for Director of Factories, Punjab

Annexure -IV

Consent To Establish

PUNJAB POLLUTION CONTROL BOARD

Zonal Office, Power House Road, Street No. 12, Bathinda

Website:- www.ppcb.gov.in

Office Dispatch No : **Registered/Speed Post** **Date:**

Industry Registration ID: *R13BTI318001* **Application No :** *9143245*

To,

DEEPAK BANSAL
1ST FLOOR, LEHRA BAZAR,
RAMPURAPHUL,BATHINDA-151103

Subject: **Grant of 'Consent to Establish'(NOC) for Expansion of an existing industrial unit u/s 25 of Water (Prevention & Control of Pollution) Act, 1974 and u/s 21 of Air (Prevention & Control of Pollution) Act, 1981.**

With reference to your application for obtaining 'Consent to Establish'(NOC) for Expansion of an existing industrial plant u/s 25 of Water (Prevention & Control of Pollution) Act, 1974 and u/s 21 of Air (Prevention & Control of Pollution) Act, 1981, you are, hereby, permitted to expand the existing industrial unit to discharge the effluent(s) & emission(s) arising out of your premises subject to the Terms and Conditions as specified in this Certificate.

1. Particulars of Consent to Establish (NOC) for Expansion granted to the Industry

Certificate No.	*CTE/Exp/BTI/2019/9143245*
Date of issue :	*06/02/2019*
Date of expiry :	*05/02/2020*
Certificate Type :	*Expansion*
Previous CTE/CTO No. & Validity :	*CTOA/Renewal/BTI/2018/7477833 From:18/06/2018 To:31/12/2018*

2. Particulars of the Industry

Name & Designation of the Applicant	*Deepak Bansal, (Director)*
Address of Industrial premises	*Sai ram agritech pvt. ltd., , Barnala bathinda road, rampura phul, distt. bathinda, Rampuraphul,Bathinda-151103*
Existing Capital investment of the industry	*73.92 lakhs*
Capital investment for Expansion Project	*24 lakhs*
Category of Industry	*Orange*
Type of Industry	*2093-Pesticides formulation*
Scale of the Industry	*Small*
Office District	*Bathinda*
Consent Fee Details	Rs. 2900/- vide R. no. 41/4825 dt. 08.01.2019
Raw Materials (Name with quantity per day)	*Technical of pesticides / weedicides / Fungicides & emulsions*

Products (Name with quantity per day)	*Existing : Formulation of pesticides / Weedicides and Fungicides @ 50 MT/year* *Proposed : Formulation of pesticides / Weedicides and Fungicides @ 150 MT/year* *Total : Formulation of pesticides / Weedicides and Fungicides @ 200 MT/year*
By-Products, if any,(Name with quantity per day)	--
Details of the machinery and processes	*Raw material, Solvent emulsifier and technicals, Mixing in vessel, product ready, Packing, Laveling and Dispatch.*
Details of the Effluent Treatment Plant	*Trade effluent is to be evaporated in 2 solar evaporation tanks*
Mode of Disposal of Effluent	*Trade effluent @ 0.2 Kl/day – to be generated from lab and floor washing and to be discharged in 2 solar evaporation tanks for evaporation.* *Domestic effluent @ 1.5 Kl/day – to be discharged onto land for plantation after treatment in septic tank.*
Standards to be achieved under Water (Prevention & Control of Pollution) Act, 1974	*As prescribed by the PPCB/CPCB/MOEF&CC.*
Sources of emissions and type of pollutants	*DG set of capacity 62.5 KVA*
Mode of disposal of emissions with stack height	*EXISTING :* *Stack of 3 meters height is to be provided with DG set of capacity 62.5 KVA.* *Stack of 5 meters height has been provided above GL with the APCD.* *PROPOSED:* *Stack of 10 meters height is to be provided above GL with the APCD .*
Quantity of fuel required in TPD	*HSD for DG set of capacity 62.5 KVA*
Type of Air Pollution Control Devices to be installed	*Hoods have been provided with wet scrubber as APCD.* *Canopy with DG set of capacity 62.5 KVA*
Standars to be achieved under Air (Prevention & Control of Pollution) Act, 1981	*As prescribed by the PPCB/CPCB/MOEF&CC.*

Assistant Environmental Engineer

For & on behalf

of

(Punjab Pollution Control Board)

Endst. No.: **Dated:**

A copy of the above is forwarded to the following for information and necessary action please:

Environmental Engineer, Punjab Pollution Control Board, Regional Office, Bathinda.

Assistant Environmental Engineer

For & on behalf

of

(Punjab Pollution Control Board)

A. GENERAL CONDITIONS

1. The industry shall apply for consent of the Board as required under the provision of Water (Prevention & Control of Pollution) Act, 1974, Air (Prevention & Control of Pollution) Act, 1981 & Authorization under Hazardous and other Wastes (Management and Transboundary Movement) Rules, 2016, two months before the commissioning of the industry.
2. The industry shall provide adequate arrangements for fighting the accidental leakages/ discharge of any air pollutant/gas/liquids from the vessels, mechanical equipments etc. which are likely to cause environmental pollution.
3. The Industry shall apply for further extension in the validity of the CTE atleast two months before the expiry of this CTE, if applicable.
4. The industry shall comply with any other conditions laid down or directions issued by the Board under the provisions of the Water (Prevention & Control of Pollution) Act, 1974 and the Air (Prevention & Control of Pollution) Act,1981 from time to time.
5. The project has been approved by the Board from pollution angle and the industry shall obtain the approval of site from other concerned departments, if need be.
6. The industry shall get its building plans approved under the provisions of section 3-A of Punjab Factory Rules, 1952.
7. The industry shall put up display board indicating the Environment data in the prescribed format at the main entrance gate.
8. The industry shall provide port-holes, platforms and/or other necessary facilities as may be required for collecting samples of emissions from any chimney, flue or duct or any other outlets.

   Specifications of the port-holes shall be as under:-

   i) The sampling ports shall be provided atleast 8 times chimney diameter downstream and 2 times upstream from the flow disturbance. For a rectangular cross section the equivalent diameter (De) shall be calculated from the following equation to determine upstream, downstream distance:-

   De = 2 LW / (L+W)

   Where L= length in mts. W= Width in mts.

   ii) The sampling port shall be 7 to 10 cm in diameter

9. The industry shall discharge all gases through a stack of minimum height as specified in the following standards laid down by the Board.

   (i) Stack height for boiler plants

S.NO.	Boiler with Steam Generating Capacity	Stack heights
1.	*Less than 2 ton/hr.*	9 meters or 2.5 times the height of neighboring building which ever is more
2.	*More than 2 ton/hr. to 5 ton/hr.*	12 meters
3.	*More than 5 ton/hr. to 10 ton/hr*	15 meters
4.	*More than 10 ton/hr. to 15 ton/hr*	18 meters
5.	*More than 15 ton/hr. to 20 ton/hr*	21 meters
6.	*More than 20 ton/hr. to 25 ton/hr.*	24 meters
7.	*More than 25 ton/hr. to 30 ton/hr.*	27 meters
8.	*More than 30 ton/hr.*	30 meters or using the formula H = 14 Qg0.3or H = 74 (Qp)0.24 Where Qg = Quantity of SO2 in Kg/hr. Qp = Quantity of particulate matter in Ton/day.

Note : Minimum Stack height in all cases shall be 9.0 mtr. or as calculated from relevant formula whichever is more.

(ii) For industrial furnaces and kilns, the criteria for selection of stack height would be based on fuel used for the corresponding steam generation.

(iii) Stack height for diesel generating sets:

Capacity of diesel generating set	Height of the Stack	
0-50 KVA	Height of the building	+ 1.5 mt
50-100 KVA	-do-	+ 2.0 mt.
100-150 KVA	-do-	+ 2.5 mt.
150-200 KVA	-do-	+ 3.0 mt.
200-250 KVA	-do-	+ 3.5 mt.
250-300 KVA	-do-	+ 3.5 mt.

For higher KVA rating stack height H (in meter) shall be worked out according to the formula:

$$H = h+0.2 (KVA)0.5$$

where h = height of the building in meters where the generator set is installed.

10. The industry shall put up canopy on its DG sets and also provide stack of adequate height as per norms prescribed by the Board and shall ensure the compliance of instructions issued by the Board vide office order no. Admin./SA-2/F.No.783/2011/448 dated 8/6/2010.

11. The industry shall put up canopy on its DG sets and also provide stack of adequate height as per norms prescribed by the Board and shall ensure the compliance of instructions issued by the Board vide office order no. Admin./SA-2/F.No.783/2011/448 dated 8/6/2010.

    (i) Once in Year for Small Scale Industries.

    (ii) Four in a Year for Large/Medium Scale Industries.

    (iii) The industry will submit monthly reading/ data of the separate energy meter installed for running of effluent treatment plant/re-circulation system to the concerned Regional Office of the Board by the 5th of the following month.

12. The industry shall provide flow meters at the source of water supply, at the outlet of effluent treatment plant and shall maintain the record of the daily reading and submit the same to the concerned Regional Office by the 5th day of the following month.

13. The industry shall make necessary arrangements for the monitoring of stack emissions and shall get its emissions analyzed from lab approved / authorized by the Board:-

    (i) Once in Year for Small Scale Industries.

    (ii) Twice/thrice/four time in a Year for Large/Medium Scale Industries.

14. The pollution control devices shall be interlocked with the manufacturing process of the industry.

15. The Board reserves the right to revoke this “consent to establish” (NOC) at any time, in case the industry is found violating any of the conditions of this “consent to establish” and/or the provisions of Water (Prevention & Control of Pollution) Act, 1974 and Air (Prevention & Control of Pollution) Act, 1981 as amended from time to time.

16. The industry shall plant minimum of three suitable varieties of trees at the density of not less than 1000 trees per acre along the boundary of the industrial premises.

17. The issuance of this consent does not convey any property right in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Central, State or Local Laws or Regulations.

18. The consent does not authorize or approve the construction of any physical structures or facilities for undertaking of any work in any natural watercourse.

19. Nothing in this NOC shall be deemed to neither preclude the institution of any legal action nor relieve the applicant from any responsibilities, liabilities or penalties to which the applicant is or may be subjected under this or any other Act.

20. The diversion or bye pass of any discharge from facilities utilized by the applicant to maintain compliance with the terms and conditions of this consent is prohibited except.

    (i) Where unavoidable to prevent loss of life or some property damage or

    (ii) Where excessive storm drainage or run off would damage facilities necessary for compliance with terms and conditions of this consent. The applicant shall immediately notify the consent issuing authority in writing of each such diversion or bye-pass.

21. The industry shall ensure that no water pollution problem is created in the area due to discharge of effluents from its industrial premises.

22. The industry shall comply with the conditions imposed if any by the SEIAA/MOEF in the Environmental Clearance granted to it as required under EIA notification dated 14/9/06, if applicable.

23. The industry shall earmark a land within their premises for disposal of boiler ash in an environmentally sound manner, and / or the industry shall make necessary arrangements for proper disposal of fuel ash in a scientific manner and shall maintain proper record for the same, if applicable.

24. The industry shall obtain and submit Insurance cover as required under the Public Liability Insurance Act, 1991.

25. The industry shall submit a site emergency plan approved by the Chief Inspector of Factories, Punjab as applicable.

26. The industry shall provide proper and adequate air pollution control arrangements for control emission from its coal/fuel handling area, if applicable.

27. The Industry shall comply with the code of practice as notified by the Government / Board for the type of Industries where the siting guidelines / code of practice have been notified

28. Solids, sludge, filter backwash or other pollutant removed from or resulting from treatment or control of waste waters shall be disposed off in such a manner so as to prevent any pollutants from such materials from entering into natural water.

29. The industry shall submit a detailed plan showing therein, the distribution system for conveying waste-waters for application on land for irrigation along with the crop pattern to be adopted throughout the year.

30. The industry shall not irrigate the vegetable crops with the treated effluents which are used/ consumed as raw.

31. The industry shall ensure that its production capacity & quantity of trade effluent do not exceed the quantity mentioned in the NOC and shall not carry out any expansion without the prior permission/NOC of the Board.

32. All amendments/revisions made by the Board in the emission/stack height standards shall be applicable to the industry from the date of such amendments/revisions.

33. The industry shall not cause any nuisance/traffic hazard in vicinity of the area.

34. The industry shall maintain the following record to the satisfaction of the Board :-

    (i) Log books for running of air pollution control devices or pumps/motors used for it.

    (ii) Register showing the result of various tests conducted by the industry for monitoring of stack emissions and ambient air.

    (iii) Register showing the stock of absorbents and other chemicals to be used for scrubbers.

35. The industry shall ensure that there will not be significant visible dust emissions beyond the property line.

36. The industry shall establish sufficient number of piezometer wells in consultation with the concerned Regional Office, of the Board to monitor the impact on the Ground Water Quantity due to the industrial operations, if applicable.

37. The industry shall provide adequate and appropriate air pollution control devices to contain emissions from handling, transportation and processing of raw material & product of the industry

Assistant Environmental Engineer

For & on behalf

of

(Punjab Pollution Control Board)

B. SPECIAL CONDITIONS

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Assistant Environmental Engineer

For & on behalf

of

(Punjab Pollution Control Board)

Annexure -V

Consent to Operate

PUNJAB POLLUTION CONTROL BOARD

Zonal Office, Power House Road, Street No. 12, Bathinda

Website:- www.ppcb.gov.in

Office Dispatch No : **Registered/Speed Post** **Date:**

Industry Registration ID: *R13BTI318001* **Application No :** *9343484*

To,

Deepak Bansal
1ST FLOOR, LEHRA BAZAR,
RAMPURAPHUL,BATHINDA-151103

Subject: Grant Varied 'Consent to Operate' u/s 21 of Air (Prevention & Control of Pollution) Act, 1981 for discharge of emissions arising out of premises.

With reference to your application for obtaining Varied 'Consent to Operate' u/s 21 of Air (Prevention & Control of Pollution) Act, 1981, you are hereby, authorized to operate an industrial unit for discharge of the emission(s) arising out of your premises subject to the Terms and Conditions as mentioned in this Certificate.

1. Particulars of Consent to Operate under Air Act, 1981 granted to the industry

Consent to Operate Certificate No.	*CTOA/Varied/BTI/2019/9343484*
Date of issue :	*22/02/2019*
Date of expiry :	*30/09/2023*
Certificate Type :	*Varied*
Previous CTO No. & Validity :	*CTE/Exp./BTI/2019/9143245* *From:06/02/2019 To:05/02/2020*

2. Particulars of the Industry

Name & Designation of the Applicant	*Deepak Bansal, (Director)*
Address of Industrial premises	*Sai ram agritech pvt. ltd., ,* *Barnala bathinda road, rampura phul, distt. bathinda, Rampuraphul,Bathinda-151103*
Capital Investment of the Industry	*97.3 lakhs*
Category of Industry	*Orange*
Type of Industry	*2093-Pesticides formulation*
Scale of the Industry	*Small*
Office District	*Bathinda*
Consent Fee Details	Rs. 29400/- vide R.No. 09/5016 dt. 07.02.2019.
Raw Materials (Name with Quantity per day)	*Technical of Pesticides / Weedicides / Fungicides and emulsifier*
Products (Name with Quantity per day)	*Formulation of pesticides / weedicides and Fungicides @ 200 MT/year*
By-products, if any, (Name with Quantity per day)	--

Details of the machinery and process	*Formulation of pesticides / weedicides and Fungicides with process -* *Raw material, Solvent emulsifier and technicals, Mixing in vessel, product ready, packing, laveling & dispatch.*
Quantity of fuel required (in TPD) and capacity of boilers/ Furnace/Thermo heater etc.	*HSD for DG set of capacity 62.5 KVA*
Type of Air Pollution Control Devices to be installed	*Canopy with DG set* *Wet scrubber on reaction vessels for liquid, graduals and powder formulation units*
Stack height provided with each boiler/thermo heater/Furnace etc.	*Stack of 3 meters height above roof level has been provided with DG set* *Common stack of 10 meters height has been provided with liquid, graduals and powder formulation units*
Sources of emissions and type of pollutants	*Process emissions from liquid formulation & granule formulation units* *DG set*
Standards to be acheived under Air(Prevention & Control of Pollution) Act, 1981	*As prescribed by the PPCB/CPCB/MOEF&CC.*

Assistant Environmental Engineer

For & on behalf

of

(Punjab Pollution Control Board)

Endst. No.: **Dated:**

A copy of the above is forwarded to the following for information and necessary action please:

Environmental Engineer, Punjab Pollution Control Board, Regional Office, Bathinda

Assistant Environmental Engineer

For & on behalf

of

(Punjab Pollution Control Board)

TERMS AND CONDITIONS

A. GENERAL CONDITIONS

1. This consent is not valid for getting power load from the Punjab State Power Corporation Ltd. or for getting loan from the financial institutions.
2. The industry shall apply for renewal /extension of consent at least two months before expiry of the consent.
3. The industry shall not violate any of the norms prescribed under the Air (Prevention & Control of Pollution) Act, 1981, failing which, the consent shall be cancelled / revoked.
4. The achievement of adequacy and efficiency of the air pollution control devices installed shall be the entire responsibility of the industry
5. The authorized fuel being used shall not be changed without the prior written permission of the Board.
6. The industry shall not discharge any fugitive emissions. All gases shall be emitted through a stack of suitable height, as per the norms fixed by the Board from time to time.
7. The industry shall provide port-holes, platforms and/or other necessary facilities as may be required for collecting samples of emissions from any chimney, flue or duct or any other outlets.

   Specifications of the port-holes shall be as under:-

   i) The sampling ports shall be provided atleast 8 times chimney diameter downstream and 2 times upstream from the flow disturbance. For a rectangular cross section the equivalent diameter (De) shall be calculated from the following equation to determine upstream, downstream distance:-

   De = 2 LW / (L+W)

   Where L= length in mts. W= Width in mts.

   ii) The sampling port shall be 7 to 10 cm in diameter
8. The industry shall put display Board indicating environmental data in the prescribed format at the main entrance gate.
9. The industry shall discharge all gases through a stack of minimum height as specified in the following standards laid down by the Board.

(i) Stack height for boiler plants

S.NO.	Boiler with Steam Generating Capacity	Stack heights
1.	*Less than 2 ton/hr.*	9 meters or 2.5 times the height of neighboring building which ever is more
2.	*More than 2 ton/hr. to 5 ton/hr.*	12 meters
3.	*More than 5 ton/hr. to 10 ton/hr*	15 meters
4.	*More than 10 ton/hr. to 15 ton/hr*	18 meters
5.	*More than 15 ton/hr. to 20 ton/hr*	21 meters
6.	*More than 20 ton/hr. to 25 ton/hr.*	24 meters
7.	*More than 25 ton/hr. to 30 ton/hr.*	27 meters
8.	*More than 30 ton/hr.*	30 meters or using the formula H = 14 Qg0.3or H = 74 (Qp)0.24 Where Qg = Quantity of SO2 in Kg/hr. Qp = Quantity of particulate matter in Ton/day.

Note : Minimum Stack height in all cases shall be 9.0 mtr. or as calculated from relevant formula whichever is more.

(ii) For industrial furnaces and kilns, the criteria for selection of stack height would be based on fuel used for the corresponding steam generation.

(iii) Stack height for diesel generating sets:

Capacity of diesel generating set	Height of the Stack	
0-50 KVA	Height of the building	+ 1.5 mt
50-100 KVA	-do-	+ 2.0 mt.
100-150 KVA	-do-	+ 2.5 mt.
150-200 KVA	-do-	+ 3.0 mt.
200-250 KVA	-do-	+ 3.5 mt.
250-300 KVA	-do-	+ 3.5 mt.

For higher KVA rating stack height H (in meter) shall be worked out according to the formula:

$$H = h+0.2 (KVA)0.5$$

where h = height of the building in meters where the generator set is installed.

10. The pollution control devices shall be interlocked with the manufacturing process of the industry to ensure its regular operation.

11. The existing pollution control equipment shall be altered or replaced in accordance with the directions of the Board, and no pollution control equipment or chimney shall be altered or as the case may be erected or re-erected except with the prior approval of the Board.

12. The industry will provide canopy and adequate stack with the D.G sets so as to comply with the provision of notification No GSR-371 E dated 17-5-2002(amended from time to time) issued by MOEF under Environment (Protection) Act, 1986.

13. The Govt. of Punjab, Department of Science, Technology & Environment vide its notification no.4/46/92-3ST/2839 dt. 29/12/1993 has put prohibition on the use of rice husk as fuel after 1.4.1995 except the following:-

"In the form of briquettes and use of rice husk in fluidized bed combustion.So the industry shall make the necessary arrangement to comply with the above notification."

14. The industry shall submit balance sheet of every financial year to the concerned Regional Office by 30th June of every year

15. That the industry shall submit a yearly certificate to the effect that no addition / up-gradation/ modification/ modernization has been carried out during the previous year otherwise the industry shall apply for the varied consent.

16. a) The industry shall ensure that at any time the emission do not exceed the prescribed emissions standards laid down by the Board from time to time for such type of industry /emissions.

    b) The industry shall ensure that the emissions from each stack shall conform to the following emission standards laid down by the Board in respect of the Industrial Boilers.

Steam Generating capacity A.	*Required particulate matter B.*	
Area upto 5 Km from Other than the periphery of I and Class-II town	*Other than 'A' class*	
Less than 2 ton/hr.	800 mg/NM3	1200 mg/NM3
2 ton to 10 ton/hr.	500 mg/NM3	1000 mg/NM3
Above 10 ton to 15 ton/hr	350 mg/NM3	500 mg/NM3
Above 15 ton/hr	150 mg/NM3	150 mg/NM3

All emissions normalized to 12% carbon dioxide.

17. The industry shall ensure that the Hazardous Wastes generated from the premises are handled as per the provisions of theHazardous Waste (Management, Handling and Transboundary Movement) Rules, 2008, without any adverse effect on the environment, in any manner.

18. The air pollution control equipments shall be kept at all time in good running condition and;

(i) All failures of control equipments.

(ii) The emissions of any air pollutant into the atmosphere in excess of the standards lay down by the Board occurring or being apprehended to occur due to accident or other unforeseen act or event. 'Shall be intimated through fax to the concerned Regional Office as well as to the Director of Factories, Punjab, Chandigarh as required under rule 10 of the Punjab State Board for the Prevention and Control of Air Pollution Rules, 1983'.

19. The industry shall plant minimum of three suitable varieties of trees at the density of not less than 1000 trees per hectare all along the boundary of the industrial premises.

20. The industry shall submit a site emergency plan approved by the Chief Inspector of Factories, Punjab as applicable.

21. The industry shall comply with the conditions imposed by the SEIAA/MOEF in the Environmental Clearance granted to it as required under EIA notification dated 14/9/06, if applicable.

22. The industry shall make necessary arrangements for the monitoring of stack emissions and shall get its emissions analyzed from lab approved / authorized by the Board:-

(i) Once in Year for Small Scale Industries.

(ii) Twice/thrice/four time in a Year for Large/Medium Scale Industries.

23. The industry shall maintain the following record to the satisfaction of the Board :-

(i) Log books for running of air pollution control devices or pumps/motors used for it.

(ii) Register showing the result of various tests conducted by the industry for monitoring of stack emissions and ambient air.

(iii) Register showing the stock of absorbents and other chemicals to be used for scrubbers.

24. The industry will install the separate energy meter for running pollution control devices and shall maintain record with respect to operation of air pollution control device so as to the satisfy the Board regarding the regular operation of air pollution control device and monthly reading / record may be sent to the Board by the fifth of the following month.

25. The industry shall provide online monitoring system as applicable, for in stack emission and shall maintain the record of the same for inspection of the Board Officers.

26. The Board reserves the right to revoke the consent granted to the industry at any time, in case the industry is found violating the provisions of Air (Prevention & Control of Pollution) Act, 1981 as amended from time to time.

27. The industry shall comply with any other conditions laid down or directions issued in due course by the Board under the provisions of the Air (Prevention & Control of Pollution) Act, 1981.

28. Nothing in this consent shall be deemed to neither preclude the institution of any legal action nor relieve the applicant from any responsibilities, liabilities or penalties to which the applicant is or may be subjected to under this or any other Act.

29. Any amendments/revisions made by the Board/CPCB/MOEF in the emission/stack height standards shall be applicable to the industry from the date of such amendments/revisions.

30. The industry shall dispose off its solid waste generated by the burning of fuel in an Environmentally Sound Manner within the premises/outside as approved by the Board, to avoid public nuisance and air pollution problem in the area.

31. The industry shall ensure that no air pollution problem or public nuisance is created in the area due to the discharge of emissions from the industry.

32. The industry shall provide adequate arrangement for fighting the accidental leakage/discharge of any air pollutant/gas/ liquids from the vessels, mechanical equipment's etc, which are likely to cause environmental pollution.

33. The industry shall not change or alter the manufacturing process(es) and fuel so as to change the quality/quantity of emissions generated without the prior permission of the Board.

34. The industry shall earmark a land within their premises for disposal of boiler ash in an environmentally sound manner, and / or the industry shall make necessary arrangements for proper disposal of fuel ash in a scientific manner and shall maintain proper record for the same, if applicable.

35. The industry shall obtain and submit Insurance cover under the Public Liability Insurance Act, 1991.

36. The industry shall provide proper and adequate air pollution control arrangements for control emission from its fuel handling area, if applicable.

37. The industry shall comply with the code of practice as notified by the Government/Board for the type of industries where the siting guidelines / Code of Practice have been notified.

38. The industry shall not cause any nuisance/traffic hazard in vicinity of the area

39. The industry shall ensure that the noise & air emission from D.G. sets do not exceed the standards prescribed for D.G. sets by the Ministry of Environment & Forests, New Delhi.

40. The industry shall ensure that there will not be significant visible dust emissions beyond the property line

41. The industry shall provide adequate and appropriate air pollution control devices to contain emissions from handling, transportation and processing of raw material & product of the industry.

42. The Industry shall ensure that its production capacity does not exceed the capacity mentioned in the consent and shall not carry out any expansion without the prior permission / NOC of the Board.

B. SPECIAL CONDITIONS

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Assistant Environmental Engineer

For & on behalf

of

(Punjab Pollution Control Board)

PUNJAB POLLUTION CONTROL BOARD

Zonal Office, Power House Road, Street No. 12, Bathinda

Website:- www.ppcb.gov.in

Office Dispatch No : **Registered/Speed Post** **Date:**

Industry Registration ID: *R13BTI318001* **Application No :** *9347862*

To,

DEEPAK BANSAL
1ST FLOOR, LEHRA BAZAR,
RAMPURAPHUL,BATHINDA-151103

Subject: **Grant Varied 'Consent to Operate'an outlet u/s 25/26 of Water (Prevention & Control of Pollution) Act, 1974 for discharge of effluent.**

With reference to your application for obtaining Varied 'Consent to Operate'an outlet for discharge of the effluent u/s 25/26 of Water (Prevention & Control of Pollution) Act, 1974, you are, hereby, authorized to operate an industrial unit fordischarge of the effluent(s) arising out of your premises subject to the Terms and Conditions as mentioned in this Certificate

1. Particulars of Consent to Operate under Water Act, 1974 granted to the industry

Consent to Operate Certificate No.	*CTOW/Varied/BTI/2019/9347862*
Date of issue :	*22/02/2019*
Date of expiry :	*30/09/2023*
Certificate Type :	*Varied*
Previous CTO No. & Validity :	*CTE/Exp./BTI/2019/9143245* *From:06/02/2019 To:05/02/2020*

2. Particulars of the Industry

Name & Designation of the Applicant	*Deepak Bansal, (Director)*
Address of Industrial premises	*Sai ram agritech pvt. ltd., ,* *Barnala bathinda road, rampura phul, distt. bathinda,* *Rampuraphul,Bathinda-151103*
Capital Investment of the Industry	*97.3 lakhs*
Category of Industry	*Orange*
Type of Industry	*2093-Pesticides formulation*
Scale of the Industry	*Small*
Office District	*Bathinda*
Consent Fee Details	Rs. 29400/- vide R.No. 08/5016 dt. 07.02.2019
Raw Materials(Name with quantity per day)	*Technical of Pesticides / Weedicides / Fungicides and emulsifier*
Products (Name with quantity per day)	*Formulation of pesticides / weedicides and Fungicides @ 200 MT/year*
By-Products, if any,(Name with quantity per day)	--

Details of the machinary and processes	*Formulation of pesticides / weedicides and Fungicides with process -* *Raw material, Solvent emulsifier and technicals, Mixing in vessel, product ready, packing, laveling & dispatch.*
Details of the Effluent Treatment Plant	*The industry has provided 2 no. solar evaporation ponds for evaporation of trade effluent generated from laboratory and septic tank for domestic effluent.*
Mode of Disposal	*Trade effluent @ 0.2 KLD (laboratory wash) - evaporation through solar evaporation ponds* *Domestic effluent @ 1.5 KLD – discharged onto land for plantation after treatment in septic tank.*
Standards to be achieved under Water(Prevention & Control of Pollution) Act, 1974	*As prescribed by the PPCB/CPCB/MOEF&CC.*

Assistant Environmental Engineer

For & on behalf

of

(Punjab Pollution Control Board)

Endst. No.: **Dated:**

A copy of the above is forwarded to the following for information and necessary action please:

Environmental Engineer, Punjab Pollution Control Board, Regional Office, Bathinda

Assistant Environmental Engineer

For & on behalf

of

(Punjab Pollution Control Board)

TERMS AND CONDITIONS

A. GENERAL CONDITIONS

1. This consent is not valid for getting power load from the Punjab State Power Corporation Limited or for getting loan from the financial institutions.
2. The industry shall apply for renewal/further extension in validity of consent atleast two months before expiry of the consent.
3. The industry shall ensure that the effluent discharging through the authorized outlet shall confirm to the prescribed standards as applicable from time to time.
4. The industry shall plant minimum of three suitable varieties of trees at the density of not less than 1000 trees per hectare all along the boundary of the industrial premises.
5. The achievement of the adequacy and efficiency of the effluent treatment plant/pollution control devices/re-circulation system installed shall be the entire responsibility of the industry.
6. The industry shall ensure that the Hazardous Wastes generated from the premises are handled as per the provisions of the Hazardous Wastes(Management, Handling and Trans boundary Movement) Rules, 2008 as amended time to time , without any adverse effect on the environment, in any manner
7. The responsibility to monitor the effluent discharged from the authorized outlet and to maintain a record of the same rests with the industry. The Board shall only test check the accuracy of these reports for which the industry shall deposit the samples collection and testing fee with the Board as and when required.
8. The industry shall submit balance sheet of every financial year to the concerned Regional Office by 30th June of every year.
9. The industry shall submit a yearly certificate to the effect that no addition/up-gradation/ modification/ modernization has been carried out during the previous year otherwise the industry shall apply for the varied consent.
10. During the period beginning from the date of issuance and the date of expiration of this consent, the applicant shall not discharge floating solids or visible foam.
11. Any amendments/revisions made by the Board in the tolerance limits for discharges shall be applicable to the industry from the date of such amendments/revisions.
12. The industry shall not change or alter the manufacturing process(es) so as to change the quality and/or quantity of the effluents generated without the written permission of the Board.
13. Any upset conditions in the plant/plants of the factory, which is likely to result in increased effluent and/or result in violation of the standards lay down by the Board shall be reported to the Environmental Engineer, Punjab Pollution Control Board of concerned Regional Office immediately failing which any stoppage and upset conditions that come to the notice of the Board/its officers, will be deemed to be intentional violation of the conditions of consent.
14. The industry shall provide terminal manhole(s) at the end of each collection system and a manhole upstream of final outlet (s) out of the premises of the industry for measurement of flow and for taking samples.
15. The industry shall for the purpose of measuring and recording the quantity of water consumed and effluent discharged, affix meters of such standards and at such places as approved by the Environmental Engineer, Punjab Pollution Control Board of the concerned Regional Office.
16. The industry shall maintain record regarding the operation of effluent treatment plant i.e. record of quantity of chemicals and energy utilized for treatment and sludge generated from treatment so as to satisfy the Board regarding regular and proper operation of pollution control equipment.
17. The industry shall provide online monitoring equipment's for the parameters as decided by concerned Regional Office with the effluent treatment plant/air pollution control devices installed, if applicable.
18. The pollution control devices shall be interlocked with the manufacturing process of the industry.
19. The authorized outlet and mode of disposal shall not be changed without the prior written permission of the Board.
20. The industry shall comply with the conditions imposed by the SEIAA / MOEF in the environmental clearance granted to it as required under EIA notification dated14/9/06, if applicable.
21. The industry shall obtain and submit Insurance cover as required under the Public Liability Insurance Act, 1991.
22. The industry shall not use any unauthorized out-let(s) for discharging effluents from its premises. All unauthorized outlets, if any, shall be connected to the authorized outlet within one month from the date of issue of this consent.

23. The industry shall make necessary arrangements for the monitoring of effluent being discharged by the industry and shall monitor its effluents:-

    (i) Once in Year for Small Scale Industries.

    (ii) Four in a Year for Large/Medium Scale Industries.

    (iii) The industry will submit monthly reading/ data of the separate energy meter installed for running of effluent treatment plant/re-circulation system to the concerned Regional Office of the Board by the 5th of the following month.

24. The industry shall provide electromagnetic flow meters at the source of water supply, at inlet/outlet of effluent treatment plant within one month and shall maintain the record of the daily reading and submit the same to the concerned Regional Office by the 5th of the following month.

25. The Board reserves the right to revoke this consent at any time in case the industry is found violating any of the conditions of this consent and/or the provisions of Water (Prevention & Control of Pollution) Act, 1974 as amended from time to time.

26. The issuance of this consent does not convey any property right in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Central, State or Local Laws or Regulations.

27. The consent does not authorize or approve the construction of any physical structures or facilities for undertaking of any work in any natural watercourse.

28. Nothing in this consent shall be deemed to neither preclude the institution of any legal action nor relieve the applicant from any responsibilities, liabilities or penalties to which the applicant is or may be subjected under this or any other Act.

29. The industry shall make necessary and adequate arrangements to hold back the effluent in case of failure of septic tank.

30. The diversion or bye pass of any discharge from facilities utilized by the applicant to maintain compliance with the terms and conditions of this consent is prohibited except.

    (i) Where unavoidable to prevent loss of life or some property damage or

    (ii) Where excessive storm drainage or run off would damage facilities necessary for compliance with terms and conditions of this consent. The applicant shall immediately notify the consent issuing authority in writing of each such diversion or bye-pass.

31. The industry shall ensure that no water pollution problem is created in the area due to discharge of effluents from its industrial premises.

32. The industry shall comply with the code of practice as notified by the Government/ Board for the type of industries where the siting guidelines/ code of practice have been notified.

33. Solids, sludge, filter backwash or other pollutant removed from or resulting from treatment or control of waste waters shall be disposed off in such a manner to prevent any pollutants from such materials from entering into natural water.

34. The industry shall re-circulate the entire cooling water and shall also re-circulate/reuse to the maximum extent the treated effluent in processes

35. The industry shall make necessary and adequate arrangements to hold back the effluent in case of failure of re-circulation system/ effluent treatment plant.

36. The industry shall make proper disposal of the effluent so as to ensure that no stagnation occurs inside and outside the industrial premises during rainy season and no demand period.

37. Where excessive storm water drainage or run off, would damage facilities necessary for compliance with terms and conditions of this consent, the applicant shall immediately notify the consent issuing authority in writing of each such diversion or bye-pass.

38. The industry shall submit a detailed plan showing therein the distribution system for conveying waste-water for application on land for irrigation along with the crop pattern for the year.

39. The industry shall ensure that the effluent discharged by it is toxicity free.

40. The industry shall not irrigate the vegetable crops with the treated effluents which are used/ consumed as raw.

41. Drains causing oil & grease contamination shall will be segregated. Oil & grease trap shall be provided to recover oil & grease from the effluent.

42. The industry shall establish sufficient number of piezometer wells in consultation with the concerned Regional Office, of the Board to monitor the impact on the Ground Water Quantity due to the industrial operations, and the monitoring shall be submitted to the Environmental Engineer of the concerned Regional Office by the 5th of every month.

43. The industry shall ensure that its production capacity & quantity of trade effluent do not exceed the quantity mentioned in the consent and shall not carry out any expansion without the prior permission/NOC of the Board.

B. SPECIAL CONDITIONS

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Assistant Environmental Engineer

For & on behalf

of

(Punjab Pollution Control Board)

Annexure -VI

Product details

Manufacturing Process, Chemical Reaction, Process Flow, Mass Balance & Raw Materials of All Products

1. **Bispyribac-Sodium**

Manufacturing Process

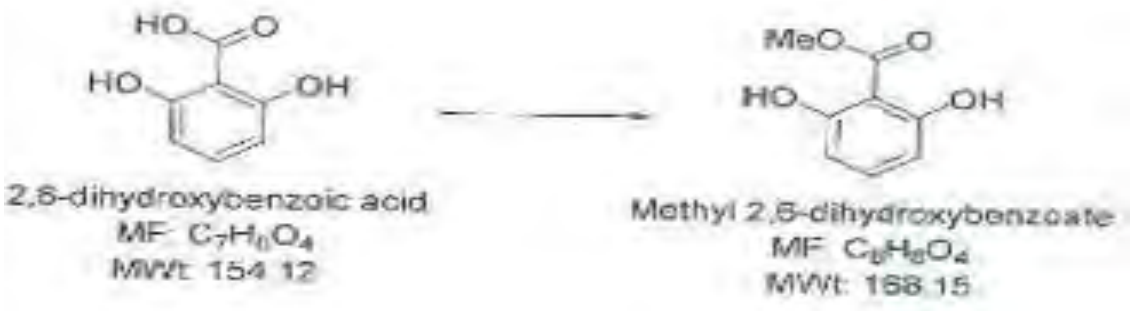
Step 1 :- 2,6 Dihydroxy Benzoic Acid converted to Benzoate by methylation by Dimethyl Sulphate (DMS) in presence of solvent-1 and base.

Step 2 :- Condensation of 2,6 Dihydroxy Benzoate & 4,6 Dimethyl -2-(Methyl sulfonyl) Pyrimidine in presence of Solvent-2 as well as Inorganic Base to get intermediates product as Bispyribac Base.

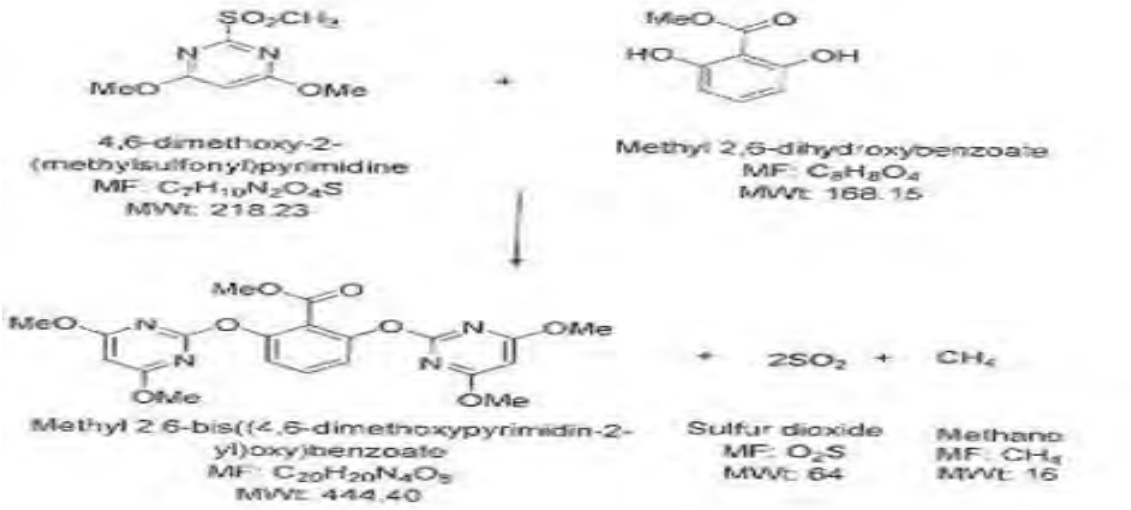
Step 3 :- Bispyribac Base is finally converted to Sodium Salt of by the reaction of Sodium Hydroxide in presence of solvent-3.

Chemical Reaction

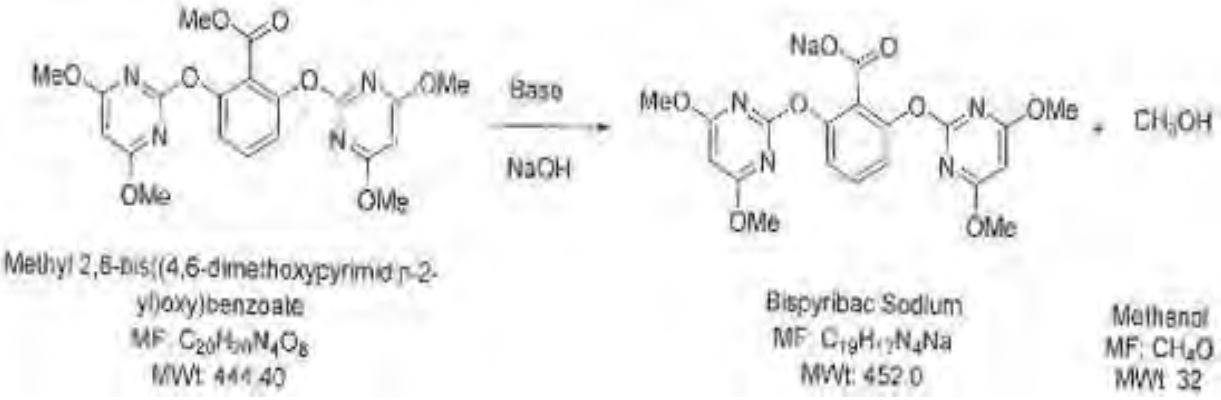
Step 1:



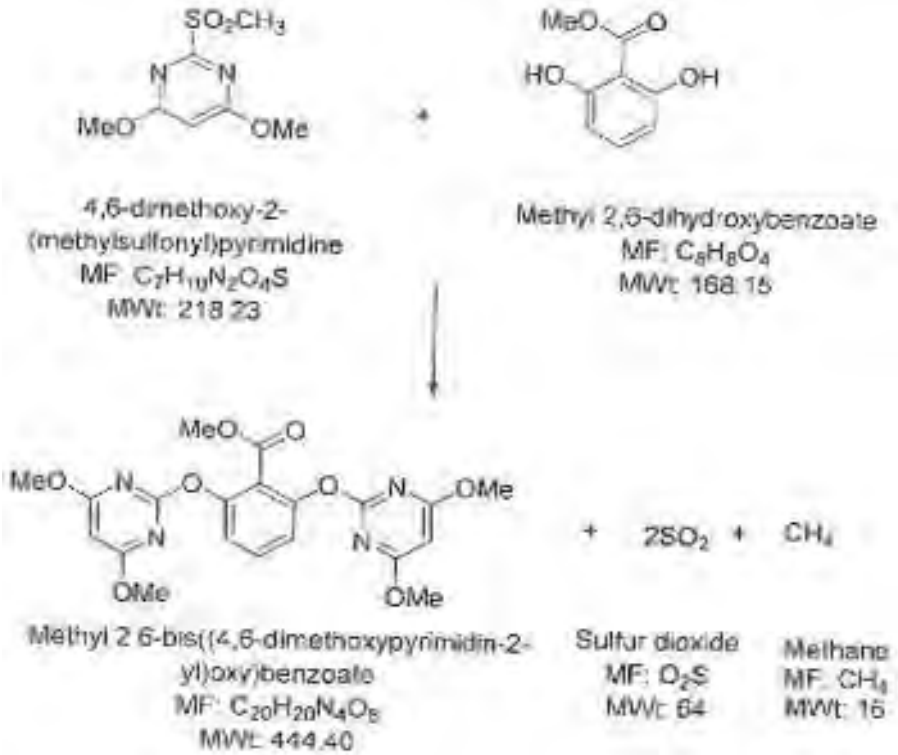
Step 2:

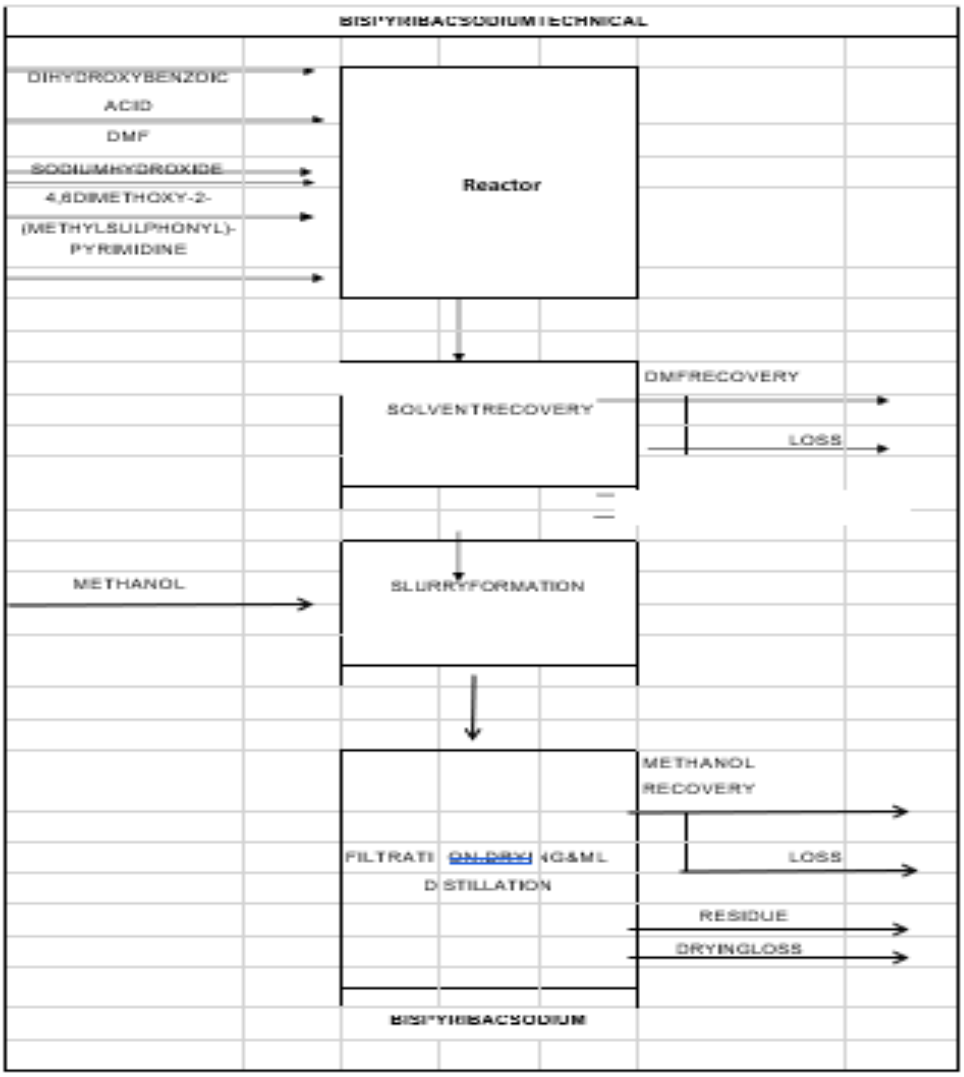


Step 3:



Process Flow





Mass Balance

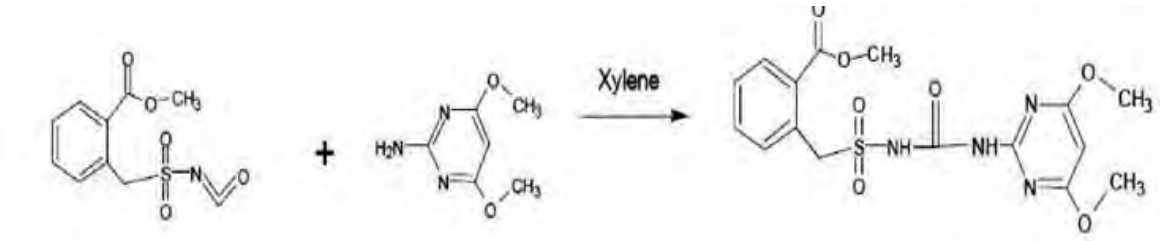
	Material / Mass Balance of BISPYRIBAC-SODIUM All Quantities are in kg)				
	IN – PUT			**OUT – PUT**	
Sr. No.	**Raw Materials / Items**	**Kg/Batch**		**Product / By product**	**Kg/Batch**
1	2,6 DihydroxyBenzoic Acid	599		Bispyribac-Sodium	**1000**
2	Acetone	25040		Recovered Acetone	24063
3	$NaHCO_3$	1557		Acetone Loss	977
4	Dimethyl Sulphate (DMS)	958		Salt	3900
5	Water	1000		Aqueous Layer to ETP	5862
6	$NaHCO_3$ 10% Solution	1500		Recovered Methanol	2800
7	Water for Washing	800		Methanol Loss	200
8	Acetone for salt Washing	1200		Distillation Residue	325
9	K_2CO_3	1868		Recovered IPA	12384
10	4,6 Dimethoxy 2-Methyl Sulfonyl Pyrimidine	1473		IPA Loss	516
11	Methanol	3000			
12	Iso Propyl Alcohol	11800			
13	NaOH Flakes	132			
14	IPA for Washing	1100			
	TOTAL	**52027**		**TOTAL**	**52027**

2. Bensulfuron

Manufacturing Process:

Methyl-2- {[Isocyanate Sulfamoyl] Methyl} Benzoate reacted with 4,6-Dimethoxypyrimidin-2-amine in presence of Solvent Xylene. This reaction gives out Bensulfuron Methyl (Methyl-2-({[4,6- Dimethoxypyrimidin-2-yl)Carbomoyl]Sulfamoyl}Methyl)Benzoate.

Chemical Reaction:



Methyl 2 {[isocynate sulfamoyl] methyl}Benzoate

4,6-dimethoxypyrimidin-2-amine

methyl 2-({[(4,6-dimethoxypyrimidin-2-yl)carbamoyl] sulfamoyl}methyl)benzoate

M.W. 229

M.W. 155

M.W. 410

Process flow:

BENSULFURON METHYL **TECHNICAL - MATERIAL BALANCE (ALL QUANTITIES ARE IN KG/TONN)**

4, 6- Dimethoxy Pyrimidine - 2-

Amine

Methyl-2- {[Isocyanate

sulfamoyl] Methyl} Benzoate

Xylene

Methanol

PREPARATION OF CRUDE BENSULFURON METHYL

CRYSTALLISATION, DRYING & SOLVENT RECOVERY

1000

BENSULFURON

Recovered Xylene

Xylene Loss

Recovered Methanol

Loss Methanol

Mass balance:

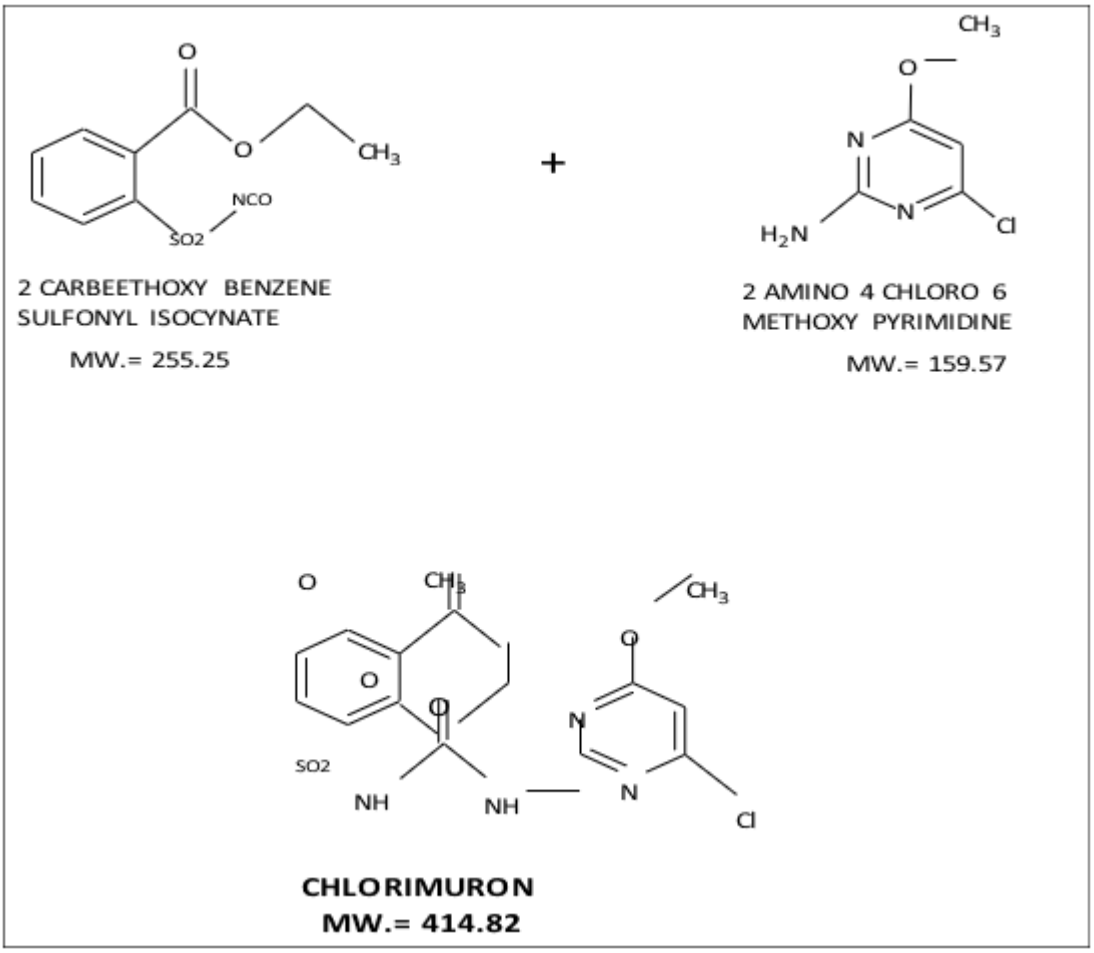
	Material / Mass Balance of BENSULFURON METHYL All Quantities are in kg)				
	IN – PUT			OUT – PUT	
Sr. No.	Raw Materials / Items	Kg/Batch		Product / By product	Kg/Batch
1	4, 6- Dimethoxy Pyrimidine - 2-Amine	418		Bensulfuron	**1000**
2	Methyl-2- {[Isocyanate sulfamoyl] Methyl} Benzoate	620		Recovered Xylene	1565
3	Xylene	1600		Xylene Loss	35
4	Methanol	2000		Recovered Methanol	1970
5				Loss Methanol	30
6				Residue	38
	TOTAL	**4638**		**TOTAL**	**4638**

1. **Chlorimuron**

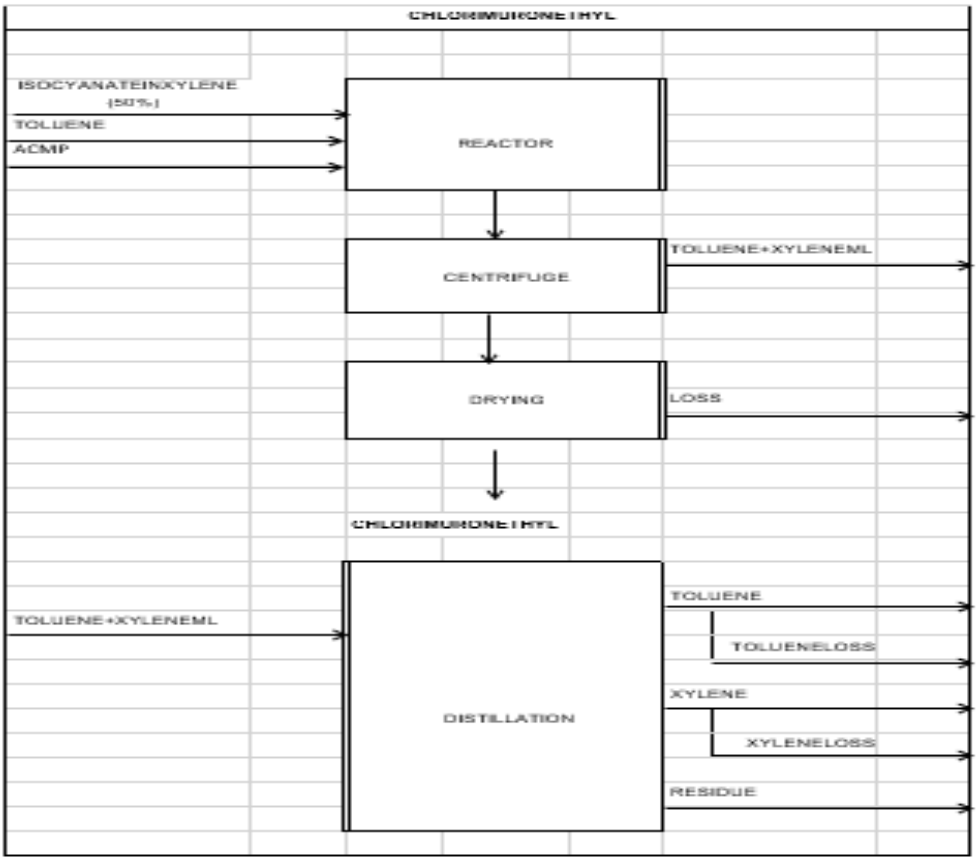
Manufacturing Process

Isocyanate and ACMP are reacted in presence of toluene solvent at controlled conditions of 65 – 70°C. Cool the mass obtained from reaction which, is then centrifuged and dried to obtain technical grade Chlorimuron.

Chemical Reaction



Process flow



Mass Balance

Material Balance for Chlorimuron Ethyl		
S. No.	**Raw Materials**	**Input/MT of Product (KG)**
1	Isocyanate in Xylene (50%)	1542
2	Toluene	770
3	ACMP	459
Total		**2771**

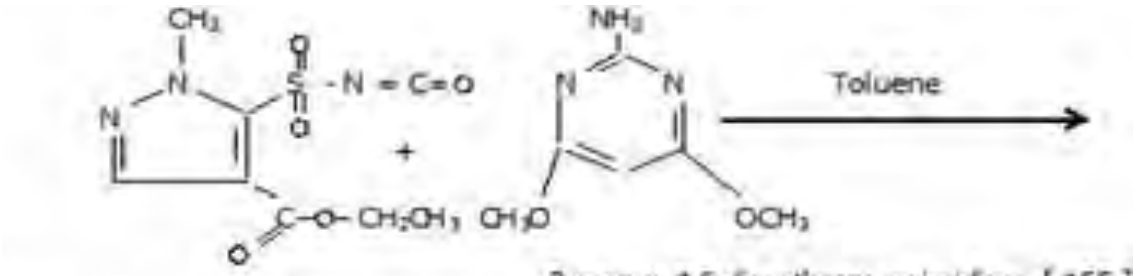
S. No.	**Output/MT of Product (KG)**					**Remarks**
	Product	**Liquid Effluent**	**Air Emission/ loss**	**Recovery**	**Solid Waste**	
1	Chlorimuron	-	-	1000	-	Product
2	Toluene	-	30	740	-	Recycle
3	Xylene		41	731	-	Recycle
4	Drying Loss	-	19	-	-	To atmosphere
5	Residue	-	-	-	210	To Incineration
Total		**-**	**90**	**2471**	**210**	
		2771				

2. **Pyrazosulfuron**

Manufacturing Process:

Ethyl-1-methyl-5-Sulfenamideisocyanate-1H-pyrazole-4-carboxylate is reacted with 2- amino- 4,6-dimethoxy pyrimidine in presence of Toluene. Crude Pyrazosulfuron is purified by methanol to get pure Pyrazosulfuron.

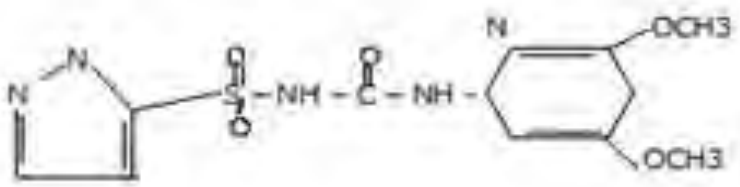
Chemical Reaction



2-amino-4,6-dimethoxy pyrimidine [155]

Ethyl-1-methyl-5-sulfenamide isocyanate-1H-pyrazole-4-carboxylate

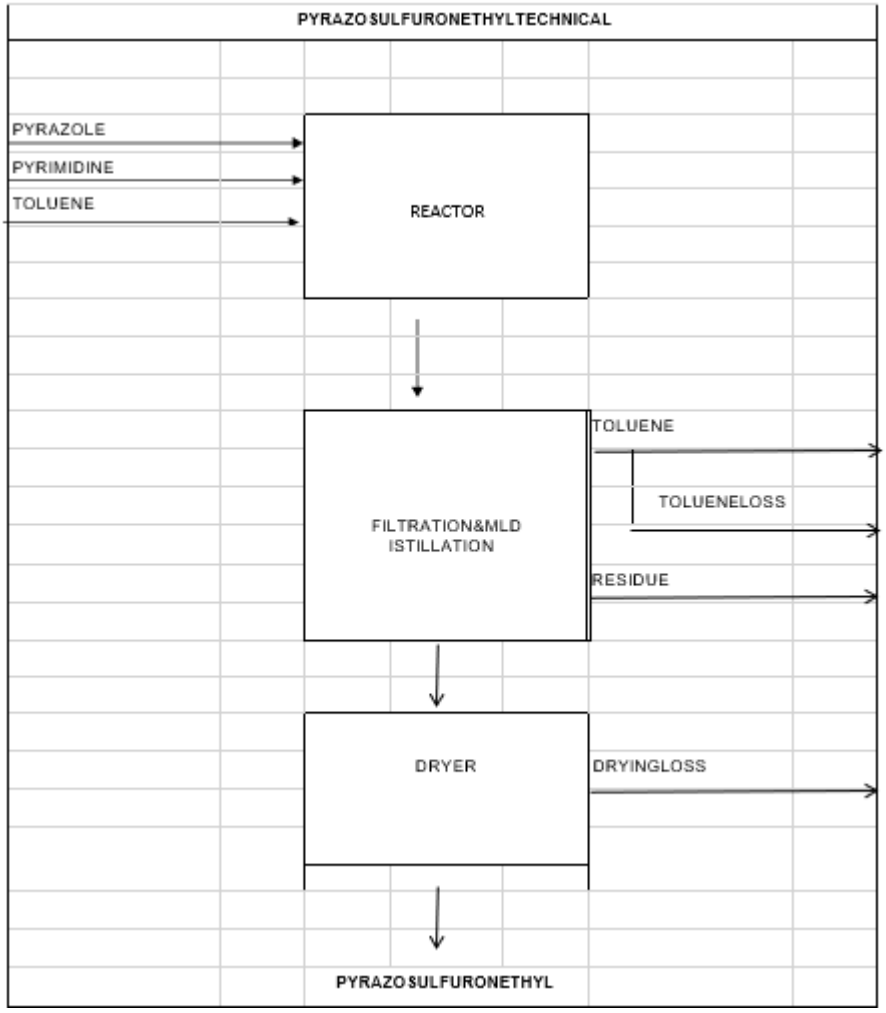
MW=259



Pyrazosulfuron

MW=414

Process Flow



Mass Balance

	Material / Mass Balance of PYRAZOSULFURON ETHYL All Quantities are in kg)				
	IN – PUT			**OUT – PUT**	
Sr. No.	**Raw Materials / Items**	**Kg/Batch**		**Product / By product**	**Kg/Batch**
1	Ethyl-1-Methyl -5-Sulphanamide Isocyanide- 1- H Pyrazole-4-Carboxylate	800		Pyrazosulfuron Ethyl	**1000**
2	2- Amino -4,6-Dimethoxy Pyrimidine	490		Toluene	2900
3	Toluene	3000		Methanol	1930
4	Methanol	2000		Uncondensed Vapor (Toluene)	100
5				Uncondensed Vapor (Methanol)	70
6				Residue	290
	TOTAL	**6290**		**TOTAL**	**6290**

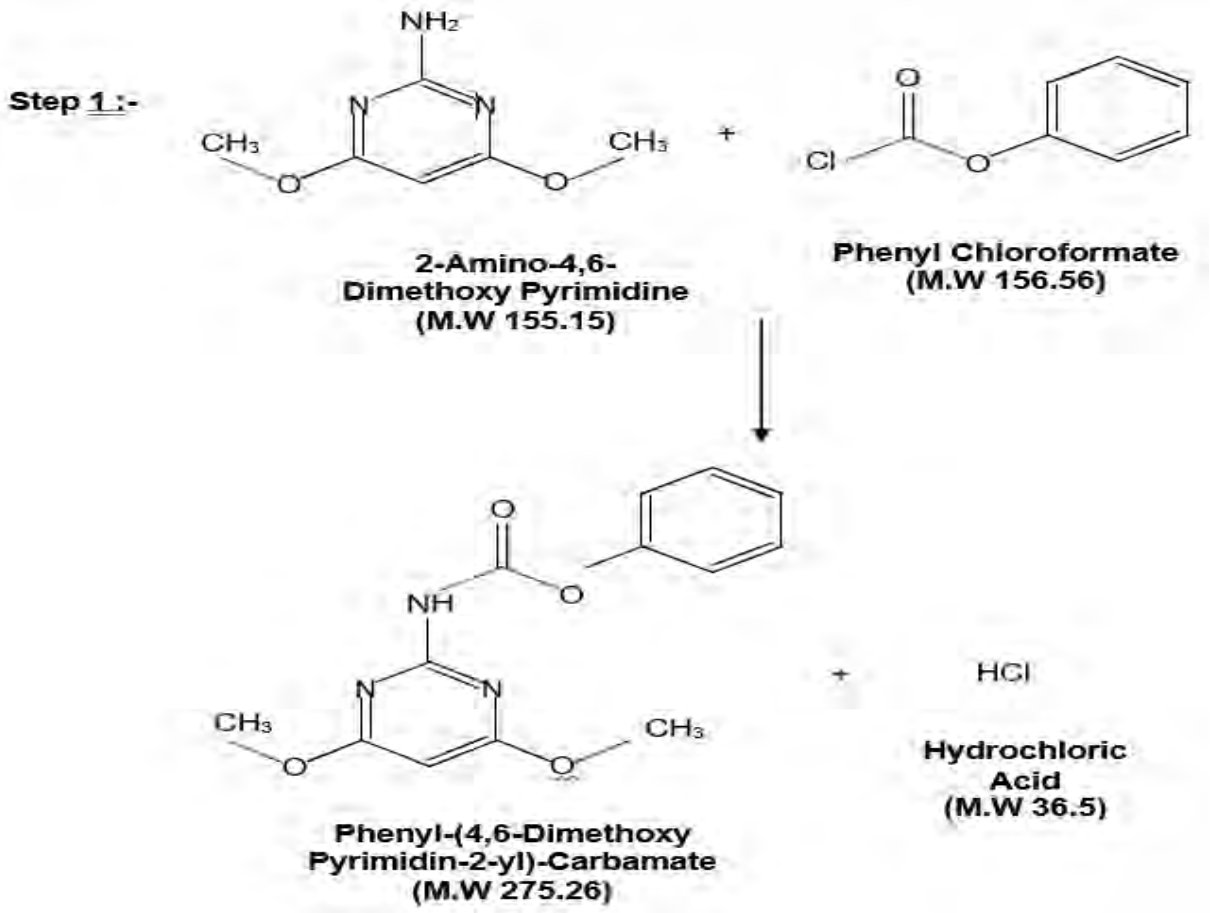
3. Sulfosulfuron

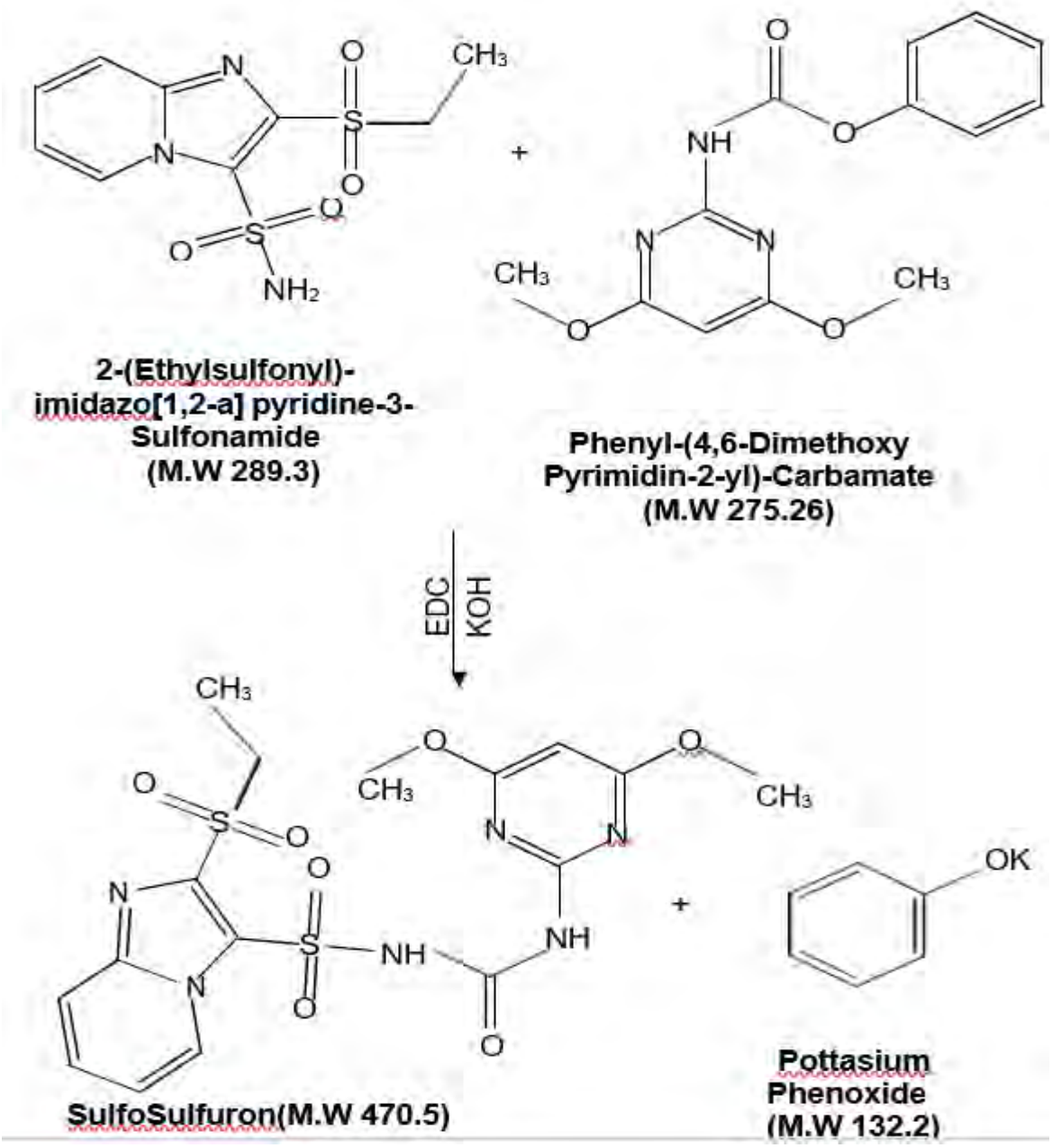
Manufacturing Process

Step 1 :- 2-amino-4,6- Dimethoxy pyrimidine is dissolved in 1,4-dioxane to which N,N-dimethylaniline is added. The temperature is cooled to 5° C and phenyl chloroformate is added to it with temperature not exceeding 20° C. The reaction mixture was stirred overnight and filtered. The precipitate is further washed with water and dried to obtain the titled product. 1,4-dioxane is separated from water by distillation. The remaining aqueous mixture is neutralized by caustic and N,N-dimethyl alinine is separated by layer separation.

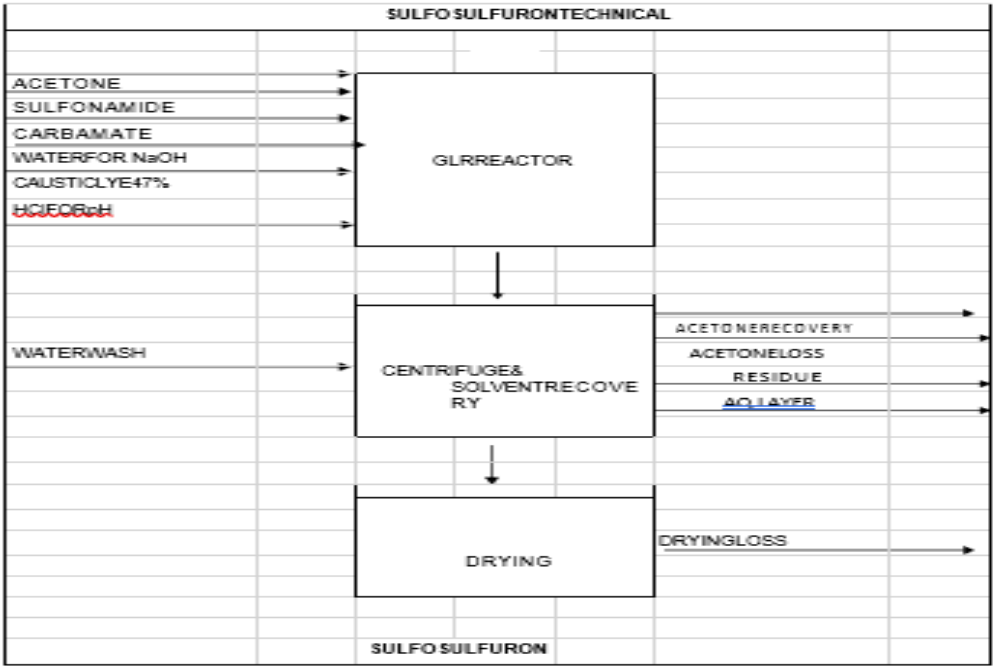
Step 2 :-Toamixtureof2-ethylsulfonylimidazo[1,2-A]pyridinesulphonamideand4,6-dimethoxy-2-((Phenoxy carbonyl) amino) pyrimidine in EDC is added potassium hydroxide flakes and heated to 60° C. After formation of the titled product, organic layer is washed with water. EDC is recovered by distillation and product is recrystallized from methanol. Phenol is formed as by-product which is recovered from aqueous layer after neutralization by extraction with EDC.

Chemical Reaction





Process Flow



Mass Balance

	Material/Mass Balance SULFOSULFURON All Quantities are in kg)				
	Input			**Output**	
Sr. No.	**Raw Materials /Items**	**Kg/Batch**		**Product/Byproduct**	**Kg/Batch**
1	2-Amino-4,6-Dimethoxy Pyrimdine	396		Sulfosulfuron	**1000**
2	PhenylChloroformate	400		HydrochloricAcid	77
3	2-Ethylsulfonylimidazo[1,2-A]PyridineSulfonamide	835		PotassiumPhenolate	270
4	PotassiumHydroxide	142		PotassiumChloride	150
5	EthyleneDichloride(EDC)	13900		MethanolRecovered	3230
6	N,N-Dimethylaniline(DMA)	309		MethanolLoss	20
7	Methanol	3400		Methanolto Wastewater	34
8	Water	2900		MethanolinResidue	115
9	Caustic	85		EDCRecovered	13622
10	HydrochloricAcid	92		EDC Loss	22
11				EDCinResidue	256
12				DMARecovered	304
13				DMALoss	1
14				DMAinResidue	4
15				2-Amino-4,6-Dimethoxy Pyrimidine	66
6				PhenylChloroformate	66
17				2-Ethylsulfonylimidazo [1,2-A]PyridineSulpho namide	139
18				Wastewater	2959
19				SodiumChloride	124
	TOTAL	**22459**		**TOTAL**	**22459**

4. Penoxsulam

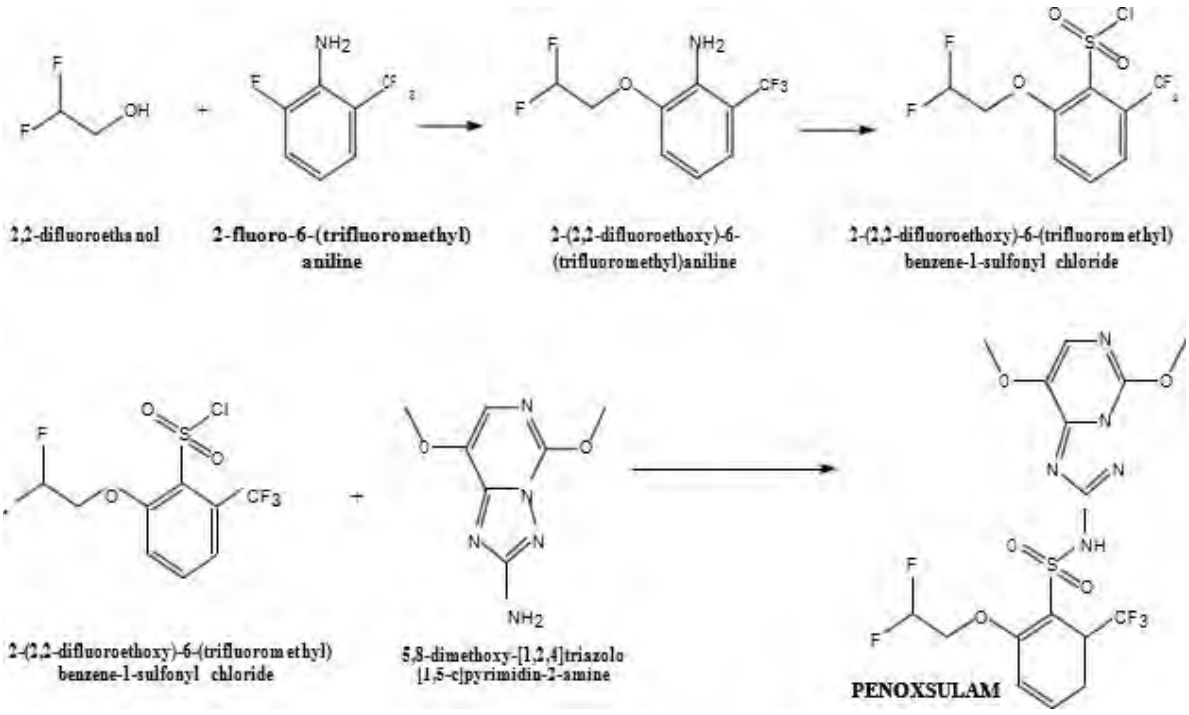
Manufacturing Process:

Charge2-fluoro-6-(trifluoromethyl) aniline(2-FTFMA), catalyst sodium methoxide and solvent methanol. Rise to 50^{o} Can dadd2, 2-difluoroethanol slowlyfor4hours.Rise to reflux and reflux for 3 hours. Distil out the mass to recover methanol and obtain 2-(2, 2-difluoroethoxy)-6-(trifluoromethyl) aniline (2-DFETFMA).

Charge water, hydrochloric acid and 2-DFETFMA. Cool to 0oC and add sodium nitrite lot-wise. After 2 hours add sodium Sulphite solution at0oC for 4 hours. Rise to 30oCandmaintain for 3 hours. Add Dichloroethane and extract. Separate the aqueous phase. Distil out the organic phase to recover Dichloroethane partially.

Add 5,8-dimethoxy-[1,2,4]-triazolo[1,5-c] pyrimidin-2-amine (5,8-DMTPA) slowly lot-wise at30oC for 3 hours. Rise to reflux and reflux for 3 hours. Cool to 30oC and add water. Separate the aqueous phase. Cool the organic phase to 0oC and filter the slurry. Dry the wet cake to obtain Penoxsulam Technical.

Chemical Reaction



Process Flow

Mass Balance

	Material / Mass Balance of Penoxulam All Quantities are in kg)			
	IN – PUT		OUT – PUT	
Sr. No.	Raw Materials / Items	Kg/Batch	Product / By product	Kg/Batch
1	Methanol	2000	Methanol	1950
2	2-FTFMA	400	Residue	50
3	Sodium methoxide	12	Aqueous effluent	1672
4	water	1000	Dichloro ethane	500
5	HCl 30%	310	Residue	17
6	Sodium nitrite	175	Aqueous effluent	525
7	Sodium sulfite	415	Dichloroethane	2440
8	Dichloro ethane	3000	OrganicResidue	43
9	5,8 DMTPA	505	Dryingloss	120
10	water	500	**Penoxulam**	1000
	TOTAL	**8317**	**TOTAL**	**8317**

5. Imazethapyr

Manufacturing Process

Stage-1

5-ethyl-3-pyridine carboxylic acid (EPCA) is reacted with 4,5 Dihydro-4 methyl 4 (1 methyl ethyl)-5-oxo-1 H-imidazoline in present of catalyst and DMF solvent. The Hydrochloric acid, which is formed during the reaction, is scavenged by putting Sodium carbonate as acids cavenger.

Stage-2

The resulting mass is diluted by water and filtered to remove the salts of Sodium Chloride(NaCl) & Sodium bicarbonate. The organic mass is then treated with water and finally solvent is removed by distillation.

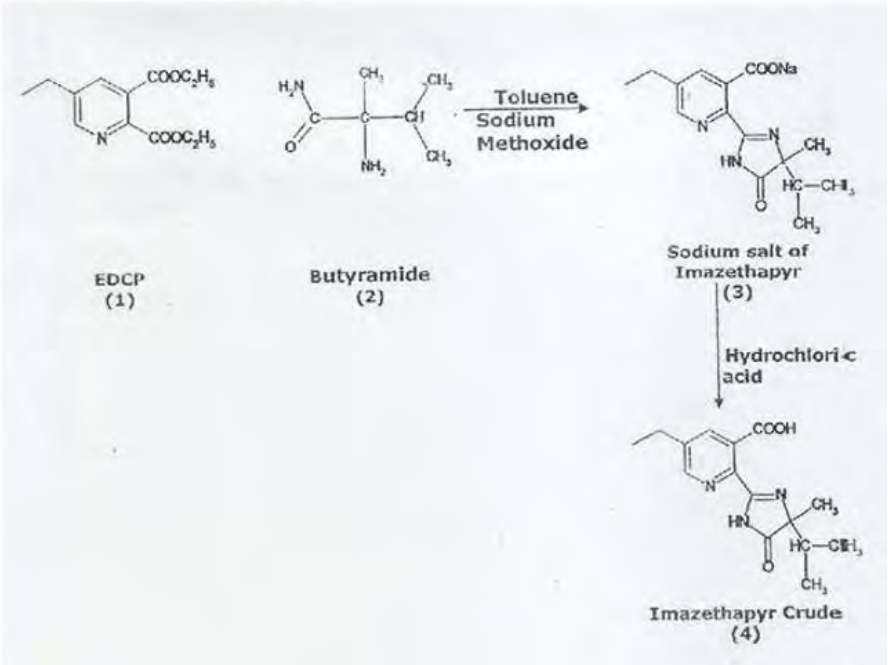
Stage-3

The concentrated mass is then crystallized to get pure product –Imazethapyr technical.

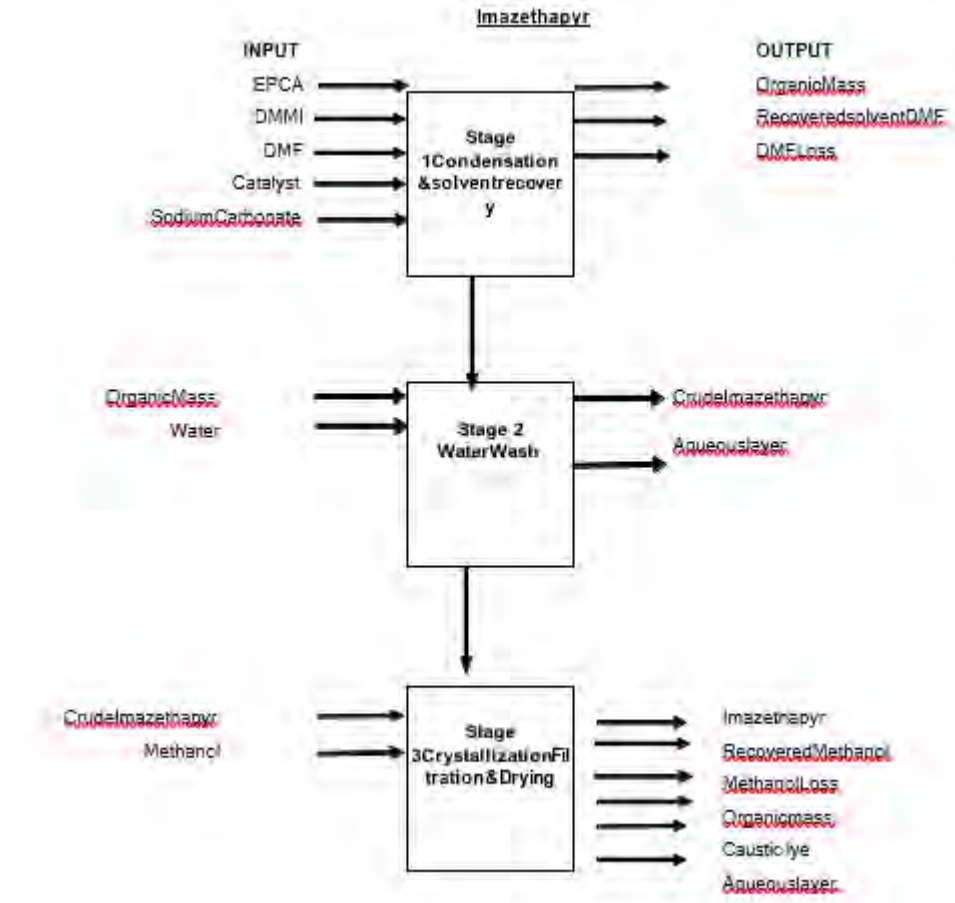
Stage-4

Finally toxic effluent, which contains traces of pesticides, is taken to hydrolysis stage for detoxification. Where aqueous mass is treated at high temperature by Alkali for the rapid hydrolys is of pesticides to simpler non-toxic compounds.

Chemical Reaction



Process Flow



Mass Balance

	Material / Mass Balance of IMAZETHAPYR All Quantities are in kg)

	IN – PUT			OUT – PUT	
Sr. No.	Raw Materials / Items	Kg/Batch		Product / By product	Kg/Batch
1	DIETHYL 5 ETHYL PYRIDINE DI CARBOXYLATE	970		Imazethypar	1000
2	2 AMINO 2,3 DIMETHYL BUTANE AMIDE	603		Methanol	800
3	SODIUM ETHOXIDE	658		Aqueous Layer to ETP	5086
4	HCl 30%	1175		TOLUENE RECOVERY	3130
5	TOLUENE	3200		TOLUENE Loss	70
6	WATER WASHING	3700		ETHANOL RECOVERY	4800
7	ETHANOL	4900		ETHANOL Loss	320
	TOTAL	15206		TOTAL	15206

6. Glyphosate

Manufacturing Process

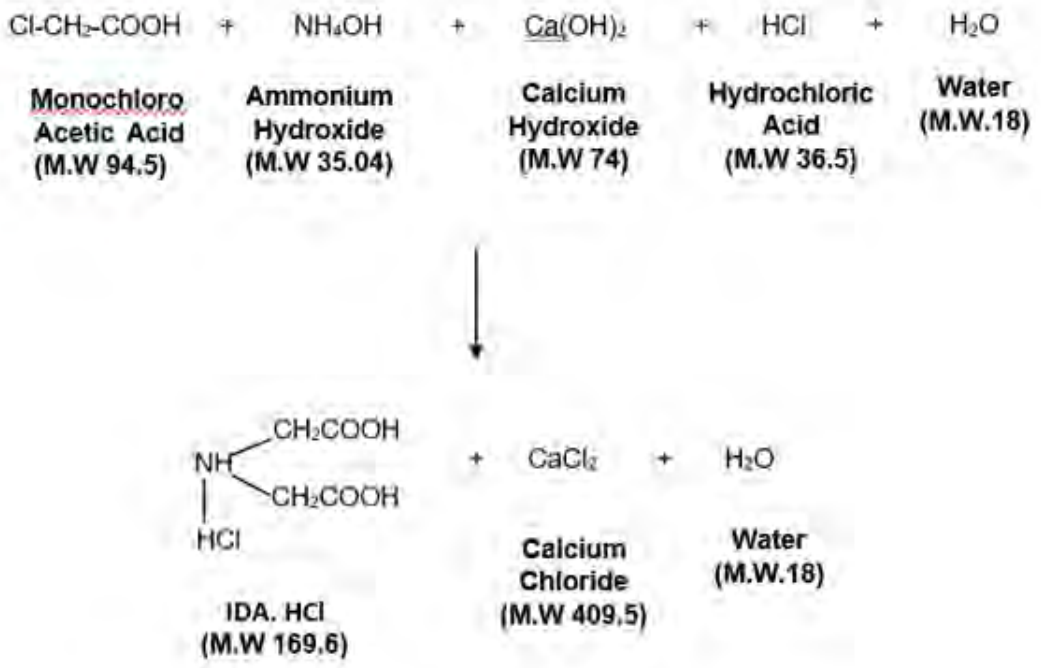
Mono Chloro Acetic Acid reacted with Ammonia in presence of Calcium Hydroxide forming Hydrochloric Acid Salt of Imino Di Acetic Acid (IDA) and carrying out the reaction at 45°C under atmospheric condition. Hydrochloric Acid (HCl) is mixed to make slurry of Imino Di Acetic Acid (IDA). Imino Diacetic Acid (IDA) if further reacted with Formaldehyde as well as Ortho Phosphorous Acid at elevated temperature to form an intermediate, Phosphono Methyl Amino Diacetic Acid(PMIDA).

Step 2 :- PMIDA is reacted with liquor Ammonia to convert it to Ammonium Salt of PMIDA, which on further undergoes oxidation reaction by molecular Oxygen in presence of Water as well as Catalyst as Activated Charcoal to give Ammonia Salt of Glyphosate.

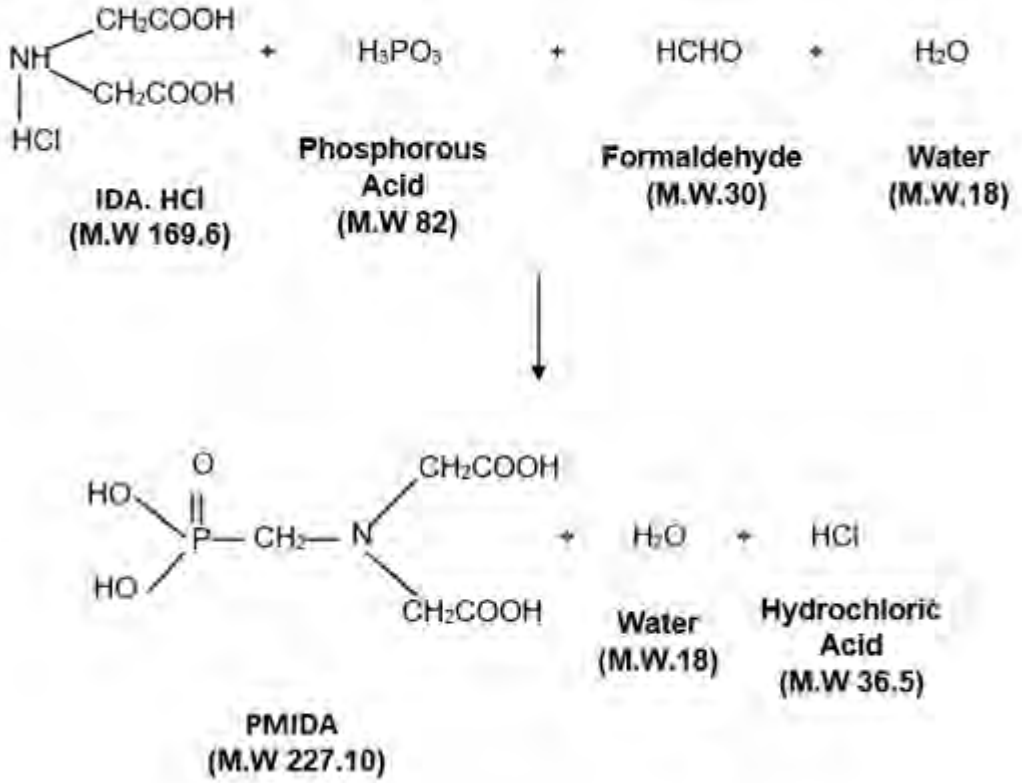
During the reaction Carbon Dioxide (CO_2) as well as Formaldehyde gases are generated which are scrubbed to Water as we as Caustic solution. The resulting Mass is acidified by Sulfuric Acid & Product is crystallized at low temperature at 5°C to get the final product Glyphosate Acid.

Chemical Reaction

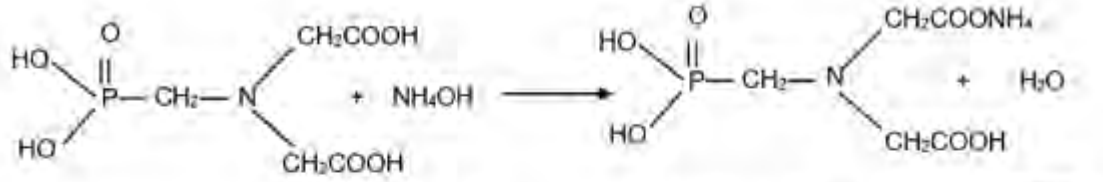
Step 1 :-



Step 1 (A) :-

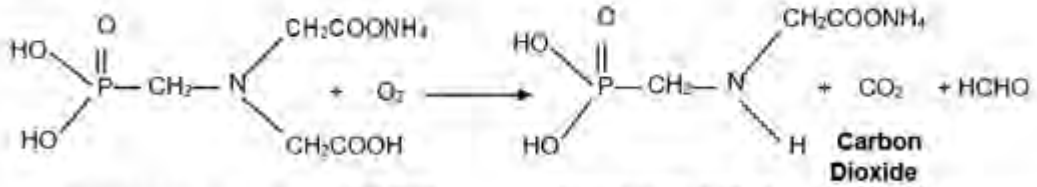


Step 2 :-



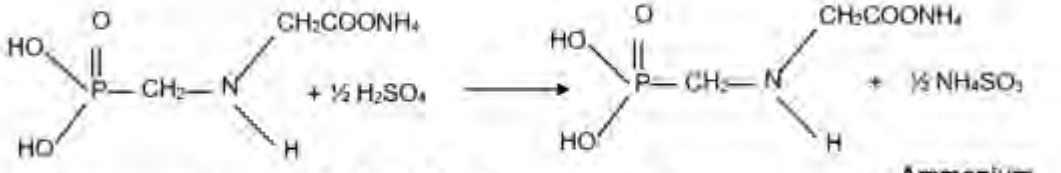
PMIDA (M.W 227.10) | Ammonium Hydroxide (M.W 35.04) | Ammonium Salt of PMIDA (M.W 244.1) | Water (M.W.18)

Step 2 (A) :-



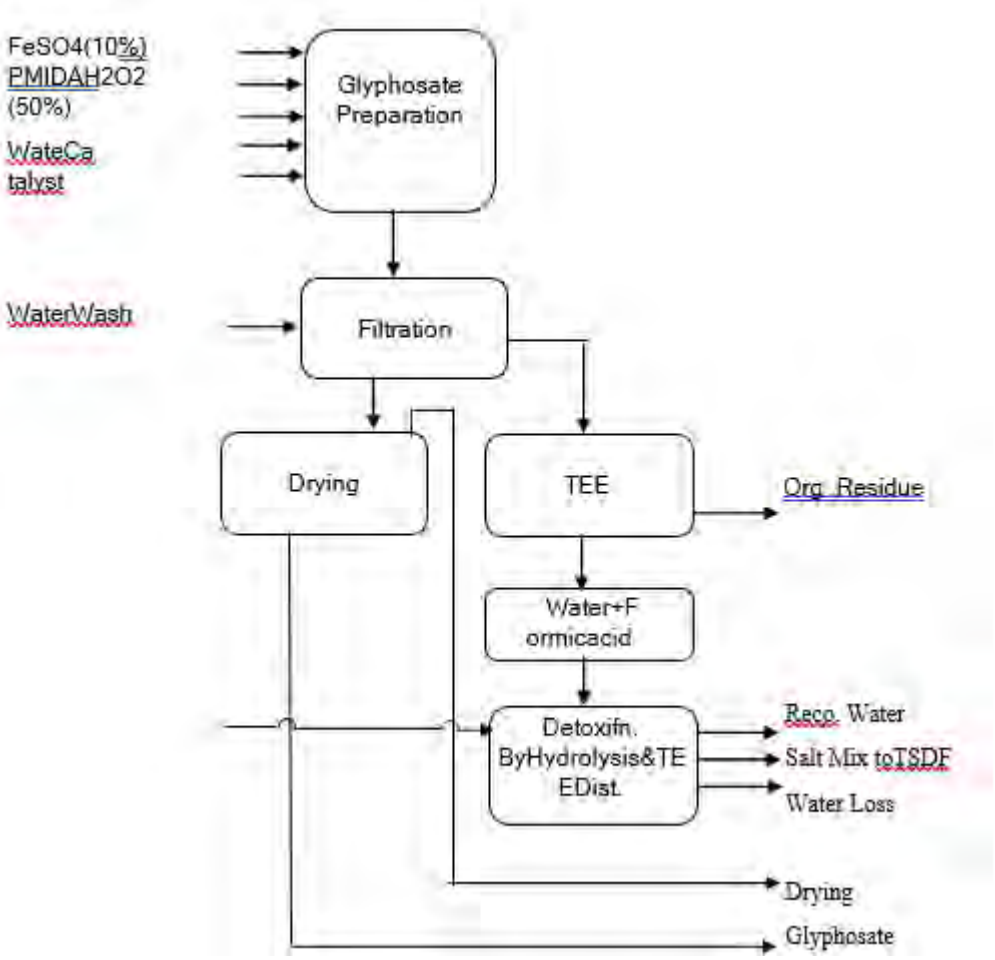
Ammonium Salt of PMIDA (M.W 244.1) | Oxygen (M.W 32) | Ammonium Salt of Glyphosate (M.W 186.1) | Carbon Dioxide (M.W.44) | Formaldehyde (M.W.30)

Step 2 (B) :-



Ammonium Salt of Glyphosate (M.W 186.1) | Sulphuric Acid (M.W.½98) | Glyphosate (M.W.186.1) | Ammonium Sulphate (M.W.½132.14)

Process Flow



Mass Balance

	Material / Mass Balance of GLYPHOSATE All Quantities are in kg)				
	IN-PUT			**OUT – PUT**	
Sr. No.	**Raw Materials / Items**	**Kg/Batch**		**Product / By product**	**Kg/Batch**
1	Mono Chloro Acetic Acid	1332		Glyphosate	**1000**
2	20 % Ammonia Solution	120		34% Calcium Chloride Solution	2338
3	Calcium Chloride	522		Evaporation Loss	18
4	Hydrochloric Acid (HCl)	257		Aqueous Layer to ETP	2128
5	Water for Process	3324		Water Evaporated & Recycled	2784
6	Water for CaCl2 Dilution	1816			
7	Ortho Phosphoric Acid	558		CO_2 Gas	310
8	37 % Formaldehyde Solution	211		HCHO	211
9	30 % HCl Solution	1410		Catalyst Recovered as wet Cake	50
10	Activated Charcoal	50		Excess Oxygen to Air	33

	Material / Mass Balance of GLYPHOSATE All Quantities are in kg)				
	IN-PUT			OUT – PUT	
Sr. No.	Raw Materials / Items	Kg/Batch		Product / By product	Kg/Batch
11	Oxygen Gas	113		Mother Liquor to ETP	1150
12	Sulphuric Acid	345		Drying Loss	36
	TOTAL	**10058**		**TOTAL**	**10058**

7. Glufosinate

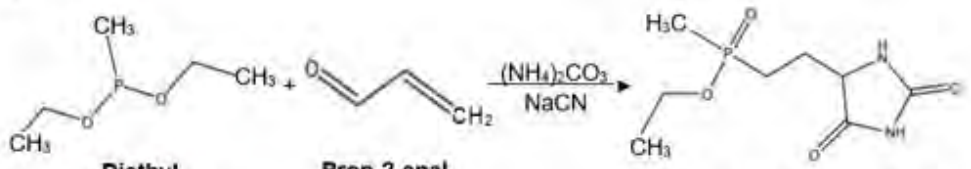
Manufacturing Process

When Acrolein & Diethyl Methyl Phosphonate are reacted in Presence of Solvent Ethanol & reaction mass is stirred at room temperature for 1 hour. Then the resulting product is further under goes cyanation by reaction of Sodium Cyanide in presence of Ammonium Carbonate. Reaction mass is then kept for Reflux for 4 hours and filter. Solvent is the distilled out to get 5-[2-ethoxy(methyl) Phosphinyl ethyl) hydantoin. Then Barium Hydroxide and Water are charged. Temperature is the raised to 60oC and stir for 1 hour. Cool to room temperature and add 30% Sulfuric Acid to neutralize. Filter and wash with water. Charge the filtrate and add Ammonium Hydroxide to pH 12. Filter the slurry to obtain Glufosinate Ammonium.

Chemical Reaction

Chemical Reactions:-

Step 1 :-

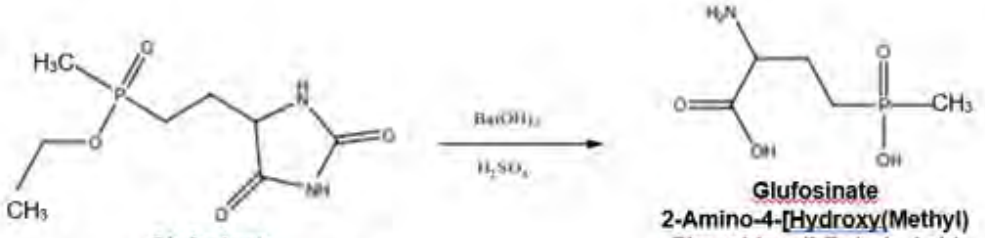


Diethyl Methylphosphonite (M.W)

Prop-2-enal (M.W)

5 - [2-Ethoxy (Methyl) Phosphinylethyl] Hydantoin (M.W)

Step 2 :-



Glufosinate 2-Amino-4-[Hydroxy(Methyl) Phosphinoyl] Butyric Acid (M.W)

Glufosinate 2-Amino-4-[Hydroxy(Methyl) Phosphinoyl] Butyric Acid (M.W)

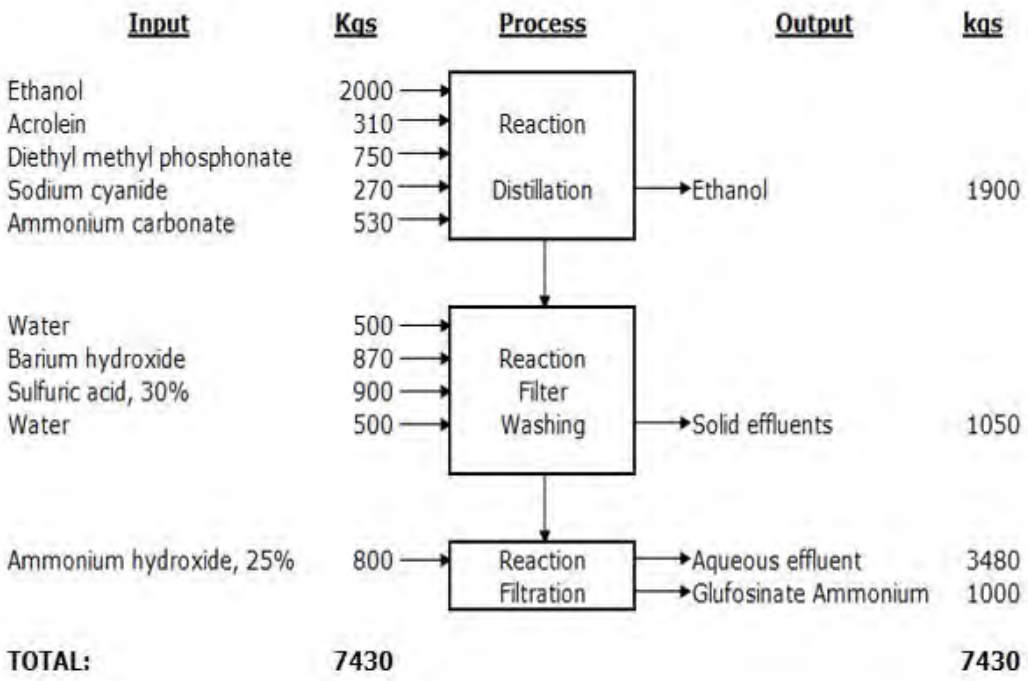
Step 3 :-

Glufosinate 2-Amino-4-[Hydroxy(Methyl) Phosphinoyl] Butyric Acid (M.W)

Glufosinate Ammonium 2-Amino-4- [Hydroxy (Methyl) Phosphinoyl Butyric Acid Mono AmmoniumSalt (M.W)

Process Flow

Mass balance of Glufosinate ammonium



Mass Balance

	Material / Mass Balance of GLUFOSINATE AMMONIUM All Quantities are in kg)			
	IN – PUT		OUT – PUT	
Sr. No.	Raw Materials / Items	Kg/Batch	Product / By product	Kg/Batch
1	Ethanol	2000	Glufosinate Ammonium	**1000**
2	Acrolein	310	Ethanol Recovered	1900
3	Diethyl Methyl Phosphonate	750	Ethanol Loss	100
4	Sodium Cyanide	270	Solid Effluents	1050
5	Ammonium Carbonate	530	Aqueous Effluent	3380
6	Water	1000		
7	Barium Hydroxide	870		
8	30% Sulfuric Acid	900		
9	Ammonium Hydroxide	800		
	TOTAL	**7430**	**TOTAL**	**7430**

8. Pendimethalin

Manufacturing Process

Step 1 :- Hydrogenation

In an autoclave reactor system 4-Nitro Ortho Xylene, diethyl ketone, pt/C (as catalyst) and naphthalene-2-sulfonic acid (as promoter) were charged. Temperature was raised to 70-72 °C. Hydrogen gas pressure (4 kgs) was applied to the autoclave reactor system. After completion of reaction, mass was filtered and subjected for separation. Recover diethyl ketone. N-alkylated Xylidine (NAX) intermediate thus obtained is used in 2nd step.

Step 2:- Nitration

First prepare mixed acid with nitric acid, sulfuric acid and water in a reactor. Prepare a mixture of NAX with EDC solvent. Add slowly this mixture in mixed acid at 40 °C. Maintain this temperature for few hours. Check sample for completion of reaction. After completion of reaction stop agitation and settle it for 6hrs. Separate spent acid from the bottom layer. Give water wash to organic mass and again separate water layer from organic layer. Aq. Ml thus obtained will be acidic in nature.

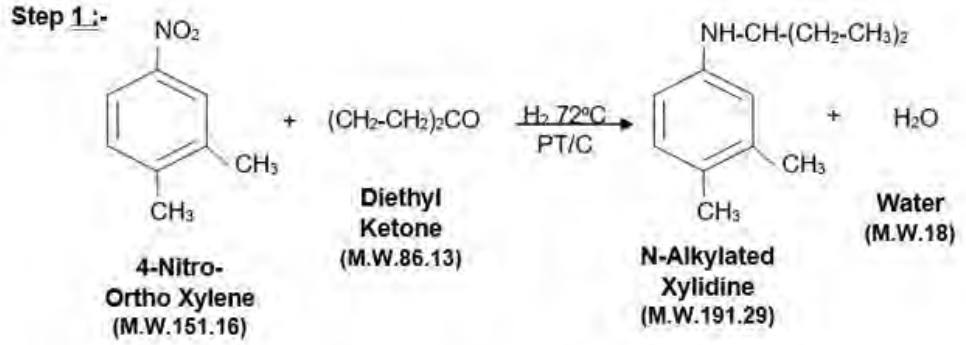
Step 3 :- Denitrosation

Charge organic mass into the glass line reactor and add acetone and 30% hydrochloric acid. Raise the temperature to 70 °C and maintain temperature about 70° C for 6 hrsza check sample for completion of reaction. After completion of reaction separate organic layer from aq. layer. Give sodium hydroxide wash to the organic layer. Distilled this organic mass to recover EDC at atmospheric and under vacuum. Final product thus obtained is Pendimethalin.

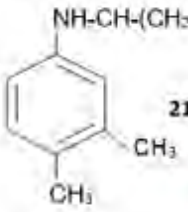
Step 4 :- Purification

Pendimethalin thus obtained from step-3 is taken into a reactor and n-hexane is charged. The reaction mass is than heated to reflux at 68 –70 °C for few hours. Hexane is recovered (distilled off) to produce pure Pendimethalin of desired specification.

Chemical Reaction



Step 2 :-

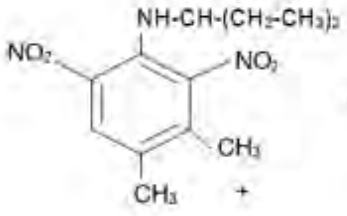


4-Nitro-Ortho Xylene (M.W.151.16)

21.0 H_2SO_4 + 2 HNO_3 **Fent** H_2O

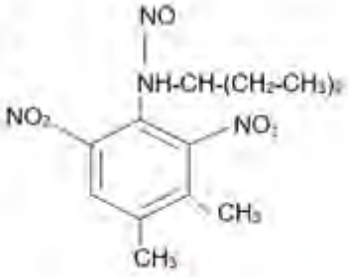
Sulphuric Acid (M.W.98) | **Nitric Acid (M.W.2×63)** | **Water (M.W.18)**

40°C, EDC



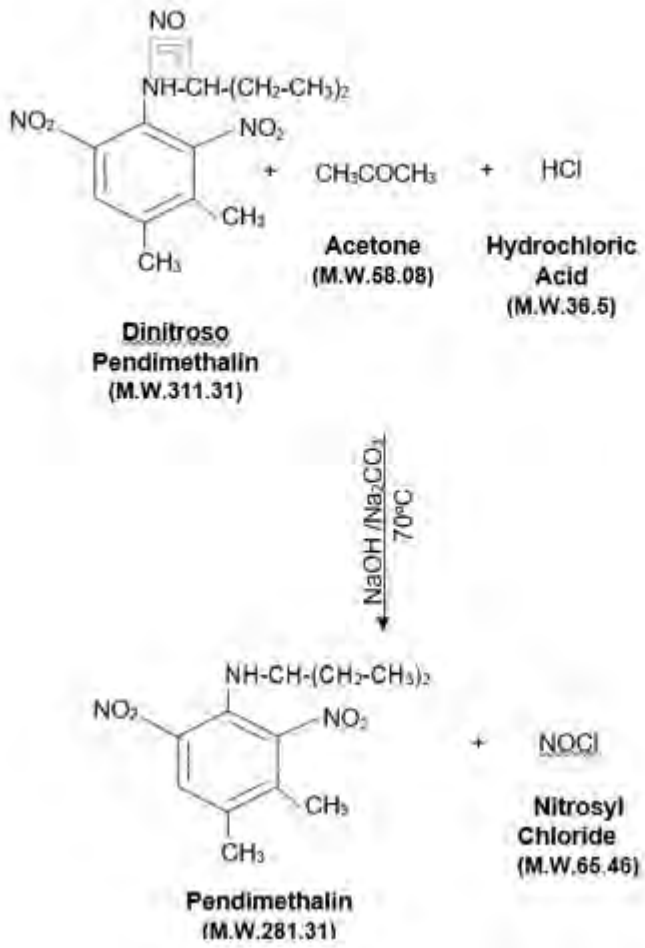
Pendimethalin (M.W.281.31)

+

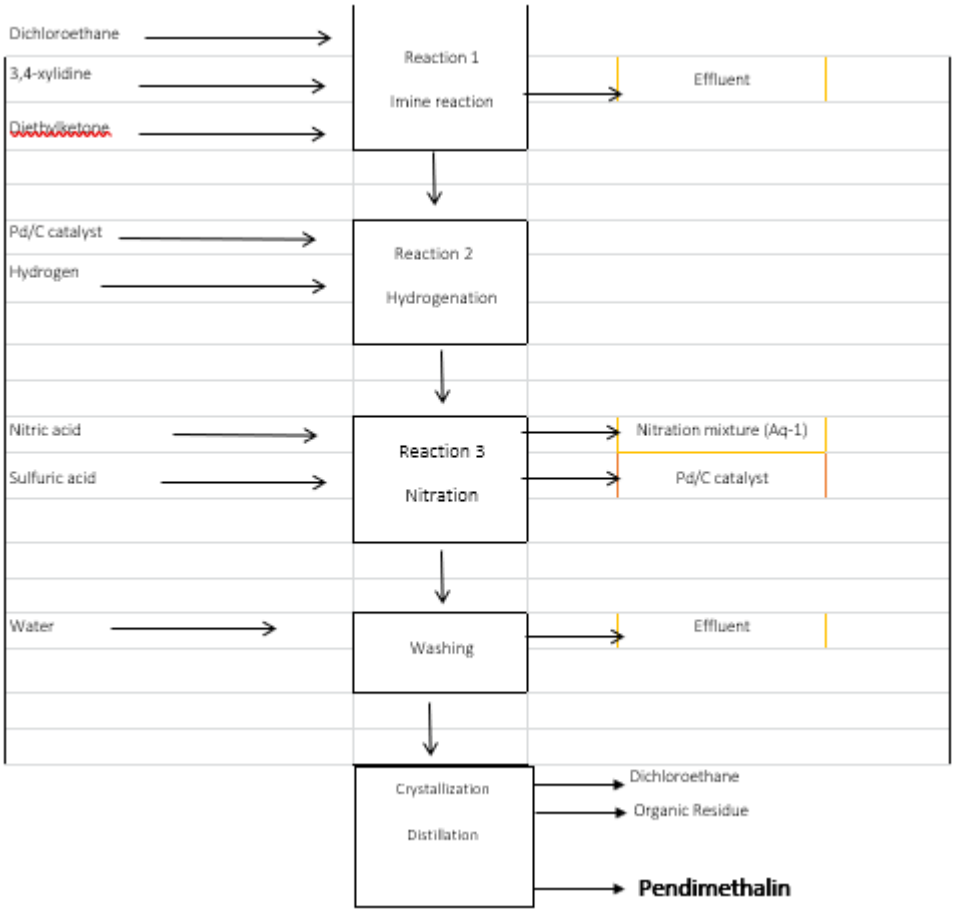


Dinitroso Pendimethalin (M.W.311.31)

Step 3 :-



Process Flow



Mass Balance

	Material / Mass Balance of PENDIMETHALIN All Quantities are in kg)				
	IN – PUT			OUT – PUT	
Sr. No.	Raw Materials / Items	Kg/Batch		Product / By product	Kg/Batch
1	4- Nitro Ortho Xylene	580		Pendimethalin	**1000**
2	Diethyl Ketone	360		Reaction water	210
3	Hydrogen gas	40		EDC Loss	100
4	Nitric Acid	1010		EDC Recovered	1900
5	Sulfuric acid	710		Spent Sulfuric acid (45%)	1500
6	Ethylene Dichloride	2000		Aqueous Effluent	1980
7	HCl	190		O-Xylene Loss	45
8	Acetone	52		O-Xylene Recovered	955
9	Caustic	20		Organic Impurities	72
10	Ortho-Xylene	1000			
11	Water	1800			
	TOTAL	**7762**		**TOTAL**	**7762**

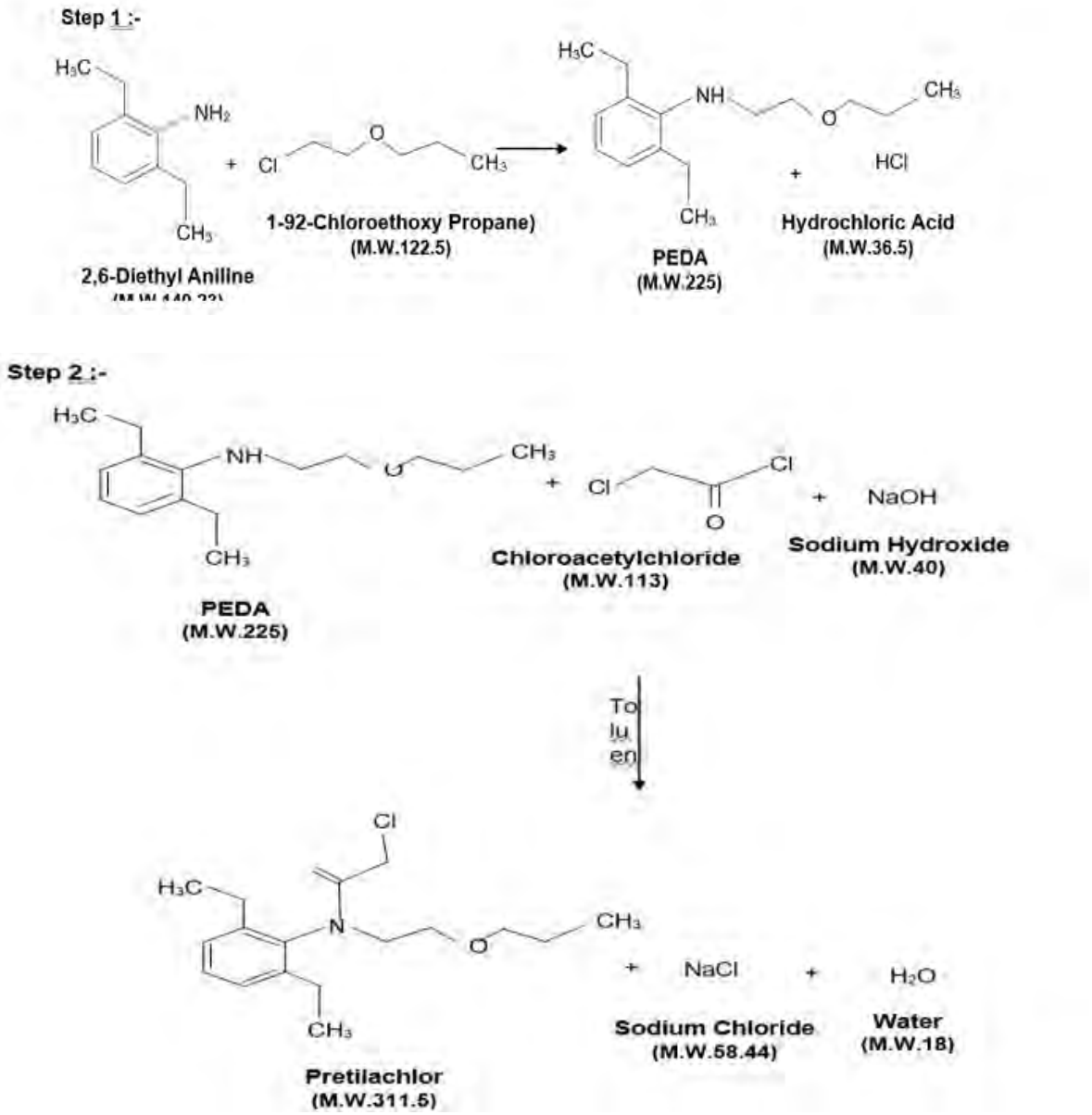
9. Pretilachlor

Manufacturing Process

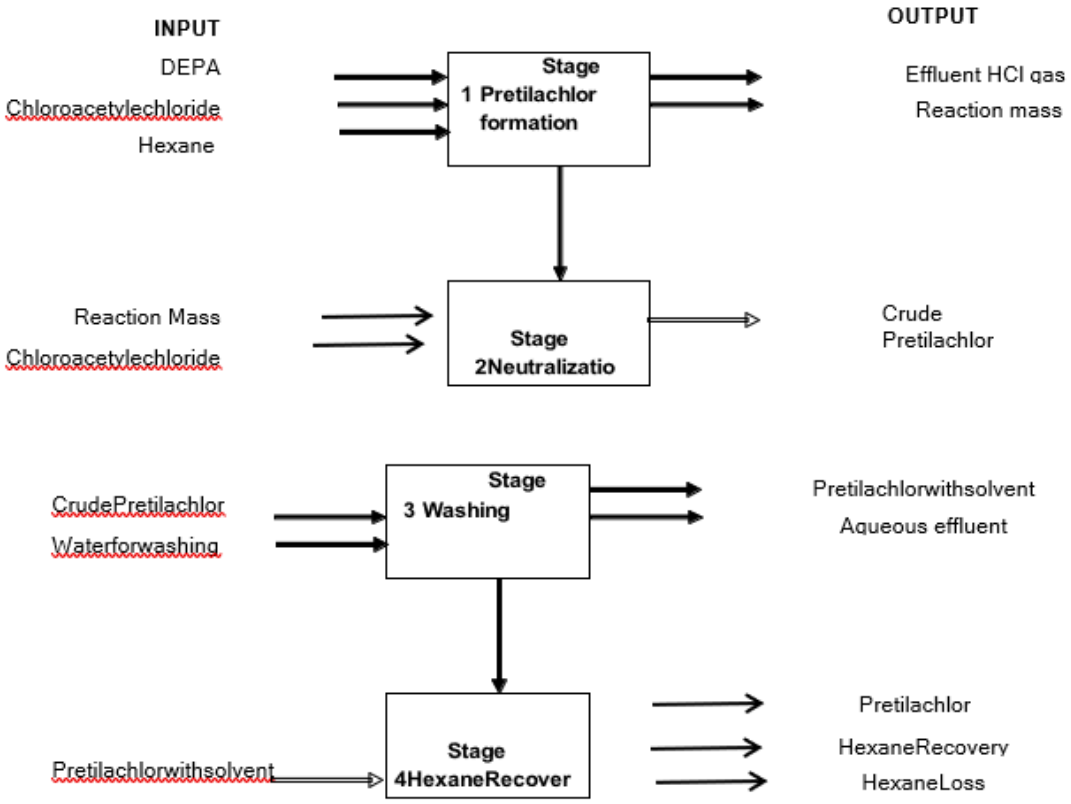
Step 1 : - 2,6 Diethyl Aniline (DEA) is reacted with Chloro Propoxy Ethane to give intermediate N Propoxy ethyl 2,6 Diethyl aniline hydrochloride at 130° C. After reaction, reaction mass is neutralized with caustic at room temperature up to pH 7.0 Aqueous layer containing NaCl is separated out and organic layer PEDA.

Step 2 :- PEDA is reacted with chloro acetyl chloride in presence of solvent Toluene at 60° C temperature. After the reaction, reaction mass is neutralized with Sodium Hydroxide. The Aqueous layer is separated and organic layer.

Chemical Reaction



Process Flow



Mass Balance

	Material / Mass Balance of PRETILACHLOR All Quantities are in kg)				
	IN – PUT			**OUT – PUT**	
Sr.No.	**Raw Materials / Items**	**Kg/Batch**		**Product / By product**	**Kg/Batch**
1	2,6 Diethyl Aniline (2,6- DEA)	575		Pretilachlor	**1000**
2	1-(2-Chloro Ethoxy) Propane	471		Hydrogen Chloride	117
3	Chloroacetyl Chloride	435		Sodium Chloride	188
4	Sodium Hydroxide	154		Water formed in reaction	58
5	Water	3600		Toluene Recovered	2572
6	Toluene	2640		Toluene Loss	8
7				Toluene to Wastewater	5
8				Toluene in Residue	55
9				2,6 Diethyl Aniline (DEA)	96
10				1-(2-Chloro Ethoxy) Propane	78
11				Chloroacetyl Chloride	73
12				Sodium Hydroxide	25
13				Water	3600
	Total	**7875**		**Total**	**7875**

10. Clodinafop

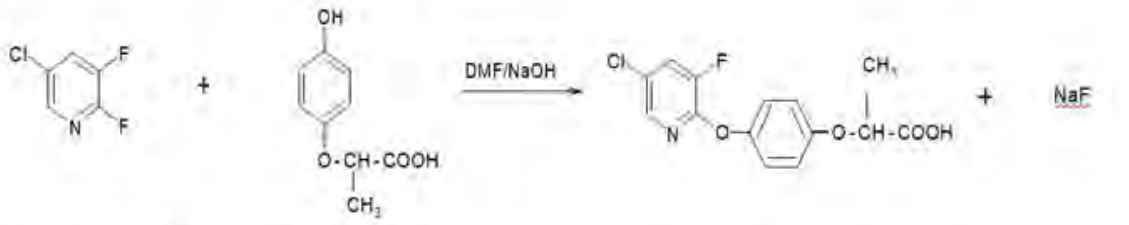
Manufacturing Process

Step 1 :- 2,3 – Di Fluoro -5 - Chloro Pyridine is reacted with 2 - (4- Hydroxy Phenoxy) Propionic Acid in presence of Sol vent - Di Methyl Formamide (DMF) and Sodium Hydroxide to form 2- [-4 – {(5 Chloro -3- Fluoro -2- Pyridinyl) Oxy} Phenoxy] Propionic Acid.

Step 2 : - 2- [-4 – {(5 Chloro -3- Fluoro -2- Pyridinyl) Oxy} Phenoxy] Propionic Acid is reacted with Propargyl chloride in Presence of Sodium Hydroxide as well as Solvent -Toluene to form final product as Clodinafop Propargyl

Chemical Reaction

Step 1 :-



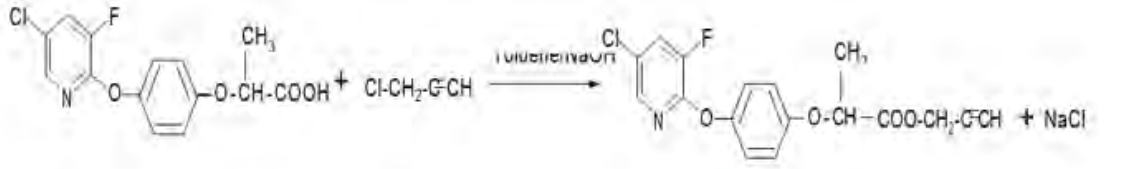
2,3-Difluoro-5-Chloro Pyridine — M.Wt=149.00

2-(4-Hydroxy Phenoxy) Propionic Acid — M.Wt=182.00

2-[4-[(5-Chloro-3-Fluoro-2-Pyridinyl) oxy] Phenoxy]Propanoic Acid — M.Wt=311.50

Sodium Fluoride — M.Wt=42.00

Step 2 :-



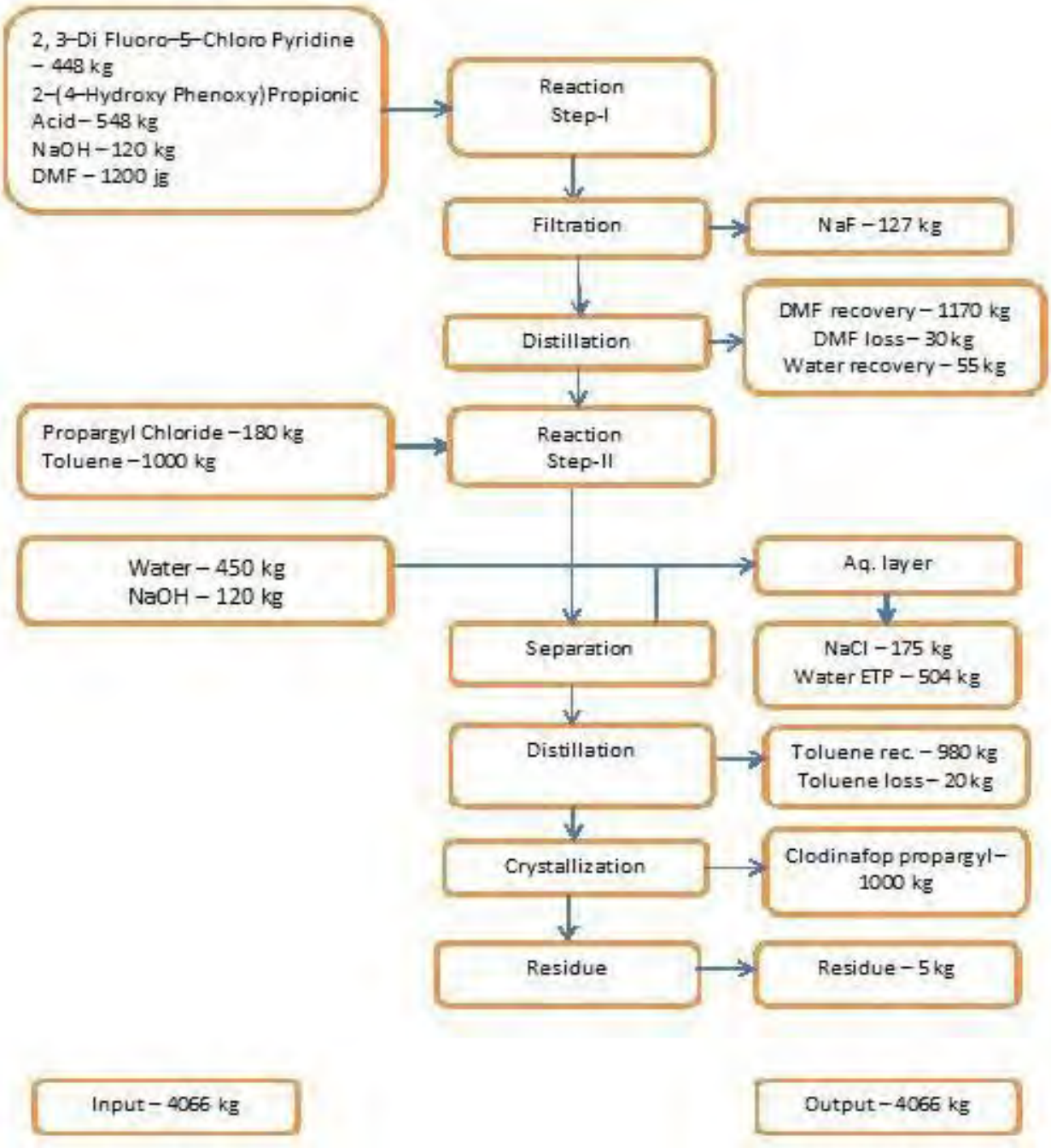
2-[4-[(5-Chloro-3-Fluoro-2-Pyridinyl)oxy] Phenoxy]Propanoic Acid — M.Wt=311.50

Propargyl Chloride — M.Wt=74.5

Clodinafop Propargyl — M.Wt=349.00

Sodium Chloride — M.Wt=58.5

Process Flow



Mass Balance

	Material / Mass Balance of Clodinafop & Clodinafop Propargyl (All Quantities are in kg)				
	IN – PUT			OUT – PUT	
Sr.No.	Raw Materials / Items	Kg/Batch		Product / By product	Kg/Batch
1	2,3-Di Fluoro -5-Chloro Pyridine	448		Clodinafop	**1000**
2	2- (4- Hydroxy Phenoxy) Propionic Acid	548		Recovered Solvent – DMF	1165
3	Sodium Hydroxide	240		Solvent Loss (DMF)	35
4	Solvent -Di Methyl Formamide (DMF)	1200		Sodium Chloride	180
5	Propargyl Chloride	180		Sodium Fluoride	128
6	Solvent – Toluene	1000		Recovered Solvent – Toluene	980
7	Water	450		Solvent loss (Toluene)	20
8				Aqueous Layer to ETP	537
9				Distillation Residue	21
	TOTAL	**4066**		**TOTAL**	**4066**

11. Quizalofop

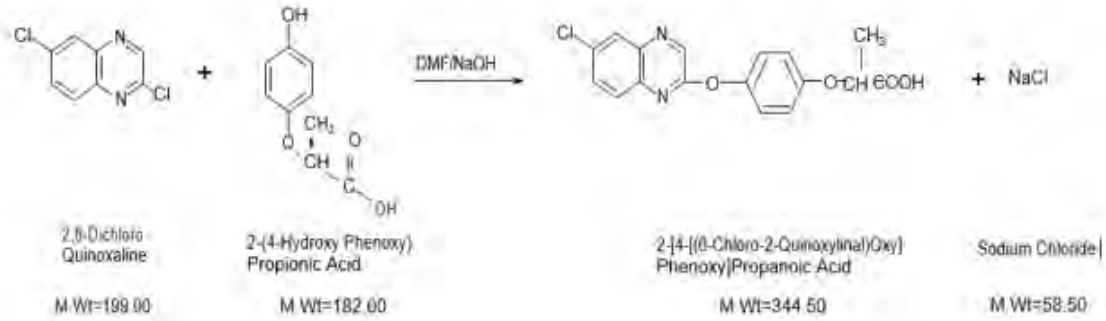
Manufacturing Process

Step 1 :- 2 ,6 - Dichloro Quinoxaline is reacted with 2- (4- Hydroxy Phenoxy) Propionic Acid in presence of Sodium Hydroxide as well as Solvent - Di Methyl Formamide (DMF) to form 2 – [4 – {(6- Chloro 2 – Quinoxalinyl) Oxy} Phenoxy] Propionic Acid.

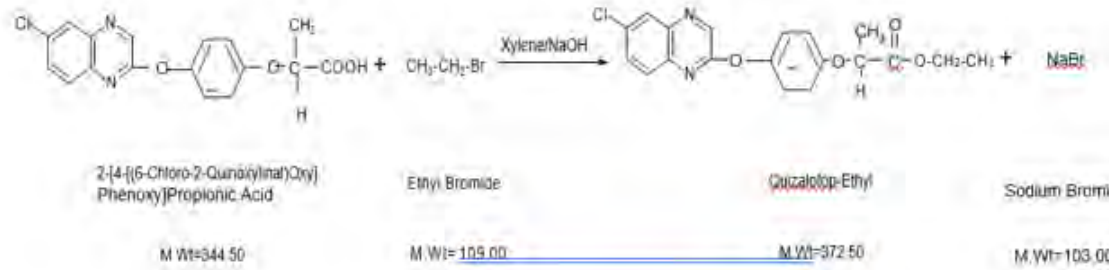
Step 2 :- 2 ,6 - Dichloro Quinoxaline is reacted with 2- (4- Hydroxy Phenoxy) Propionic Acid in presence of Sodium Hydroxide as well as Solvent - Di Methyl Formamide (DMF) to form 2 – [4 – {(6- Chloro 2 – Quinoxalinyl) Oxy} Phenoxy] Propionic Acid.

Chemical Reaction

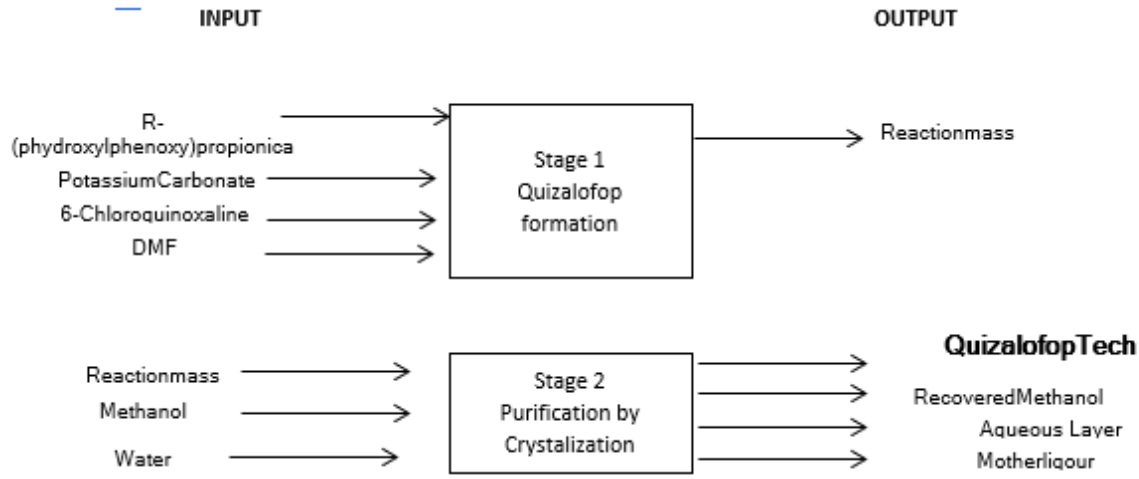
Step 1 :-



Step 2 :-



Process Flow



Mass Balance

	Material / Mass Balance of QUIZALOFOP ETHYL All Quantities are in kg)				
	IN – PUT			**OUT – PUT**	
Sr. No.	**Raw Materials / Items**	**Kg/Batch**		**Product / By product**	**Kg/Batch**
1	2,6 – Dichloro Quinoxaline	580		Quizalofop	**1000**
2	2- (4 – Hydroxy Phenoxy) Propionic Acid	525		Recovered Solvent - DMF	1070

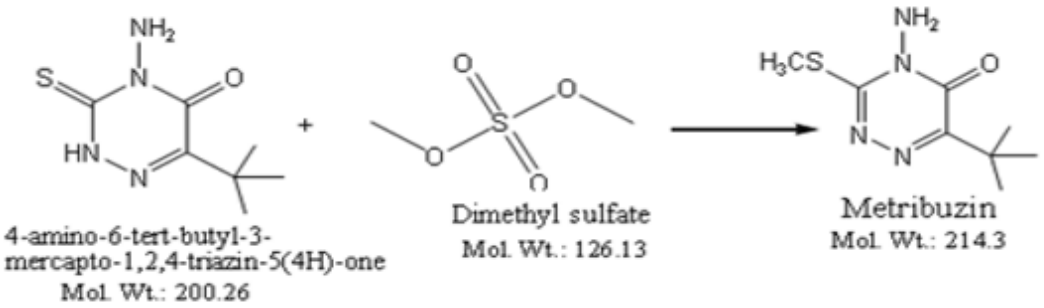
	Material / Mass Balance of QUIZALOFOP ETHYL All Quantities are in kg)				
	IN – PUT			OUT – PUT	
Sr. No.	Raw Materials / Items	Kg/Batch		Product / By product	Kg/Batch
3	Sodium Hydroxide	230		Solvent Loss - DMF	30
4	Solvent – Di Methyl Formamide	1100		Sodium Chloride	180
5	Ethyl Bromide	311		Sodium Bromide	305
6	Solvent – Xylene	1000		Recovered Solvent - Xylene	975
7	Water	624		Solvent loss - Xylene	25
8				Aqueous Layer to ETP	767
9				Distillation Residue	18
	TOTAL	**4370**		**TOTAL**	**4370**

12. Metribuzin

Manufacturing Process

Step 1 :-4-Amino-6-Tert-Butyl-3-Mercapto-1,2,4-Triazin-5(4H) -one (ATMT) reacted with Dimethyl Sulphate in presence of Sulphuric Acid to give Metribuzine.

Chemical Reaction

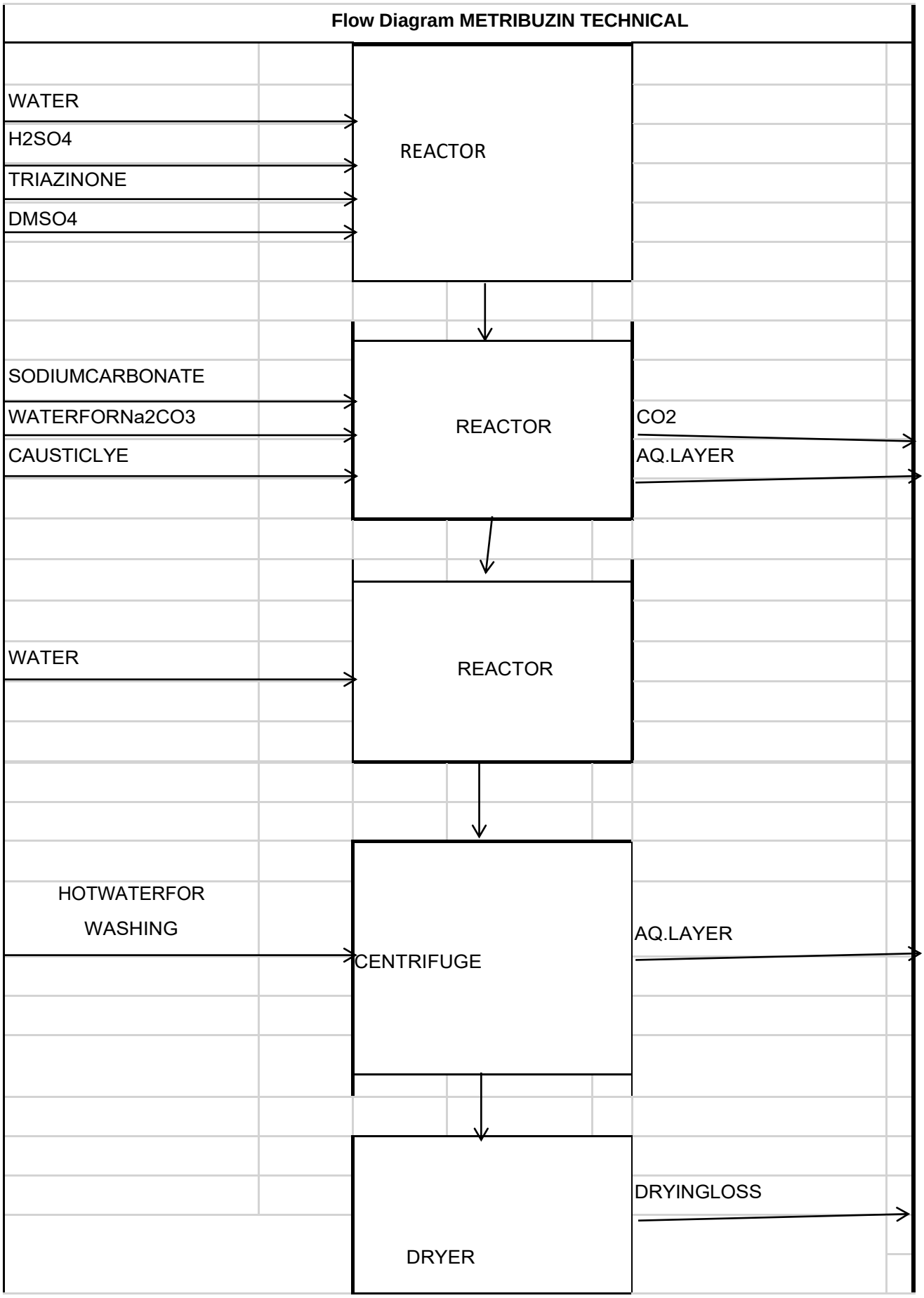


4-amino-6-tert-butyl-3-mercapto-1,2,4-triazin-5(4H)-one
Mol. Wt.: 200.26

Dimethyl sulfate
Mol. Wt.: 126.13

Metribuzin
Mol. Wt.: 214.3

Process Flow


Flow Diagram METRIBUZIN TECHNICAL
WATER
H2SO4
TRIAZINONE
DMSO4
REACTOR
SODIUMCARBONATE
WATERFORNa2CO3
CAUSTICLYE
REACTOR
CO2
AQ.LAYER
WATER
REACTOR
HOTWATERFOR
WASHING
CENTRIFUGE
AQ.LAYER
DRYINGLOSS
DRYER

		METRIBUZIN			

Mass Balance

	Material / Mass Balance of METRIBUZIN All Quantities are in kg)				
	IN – PUT			**OUT – PUT**	
Sr. No.	**Raw Materials / Items**	**Kg/Batch**		**Product / By product**	**Kg/Batch**
1	4-Amino-6-Tert-Butyl-3-Mercapto-1,2,4-Triazin-5(4H)-one (ATMT)	1000		Metribuzine	**1000**
2	Di Methyl Sulphate	652		Sodium Sulphate	2130
3	Sulphuric Acid	1274		Organic Impurities	512
4	Soda Ash	1600		Carbon Dioxide Gas	664
5	Caustic Soda Flakes	30		Aqueous Layer to ETP	4750
6	Water	4500			
	TOTAL	**9056**		**TOTAL**	**9056**

13. Atrazine

Manufacturing Process

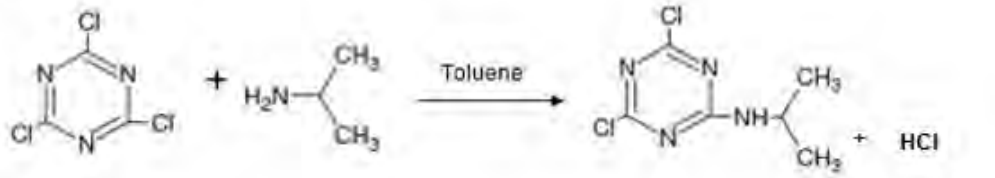
Required quantity of Toluene is taken in to reactor; Cyanuric chloride is charged and stirred so that Cyanuric chloride dissolved in the solvent completely. Isopropyl amine is charged slowly.

Sodium hydroxide is charged to neutralize Hydrochloric acid which is generated in reaction. Ethyl amine is charged slowly. Sodium hydroxide is charged to neutralize Hydrochloric acid which is generate din reaction.

Aqueous phase is separated out, fresh water is charged and Toluene is distilled out azo tropically in presence of live steam. Product is filtered off. Centrifuged, dried and pulverized and pack as per requirement.

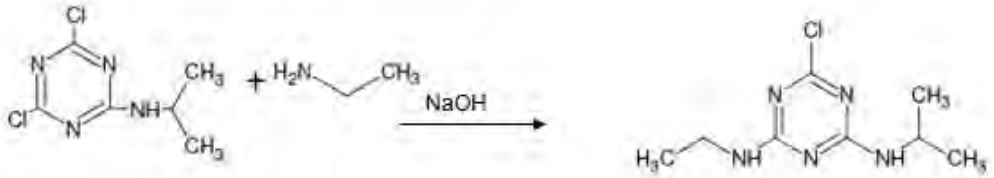
Chemical Reaction

Step 1:-



Cynuric Chloride (M.W.184.41) | Isopropyl Amine (M.W.59.11) | Intermediate 1 (M.W.207.02) | Hydrochloric Acid (M.W.36.5)

Step 2:-

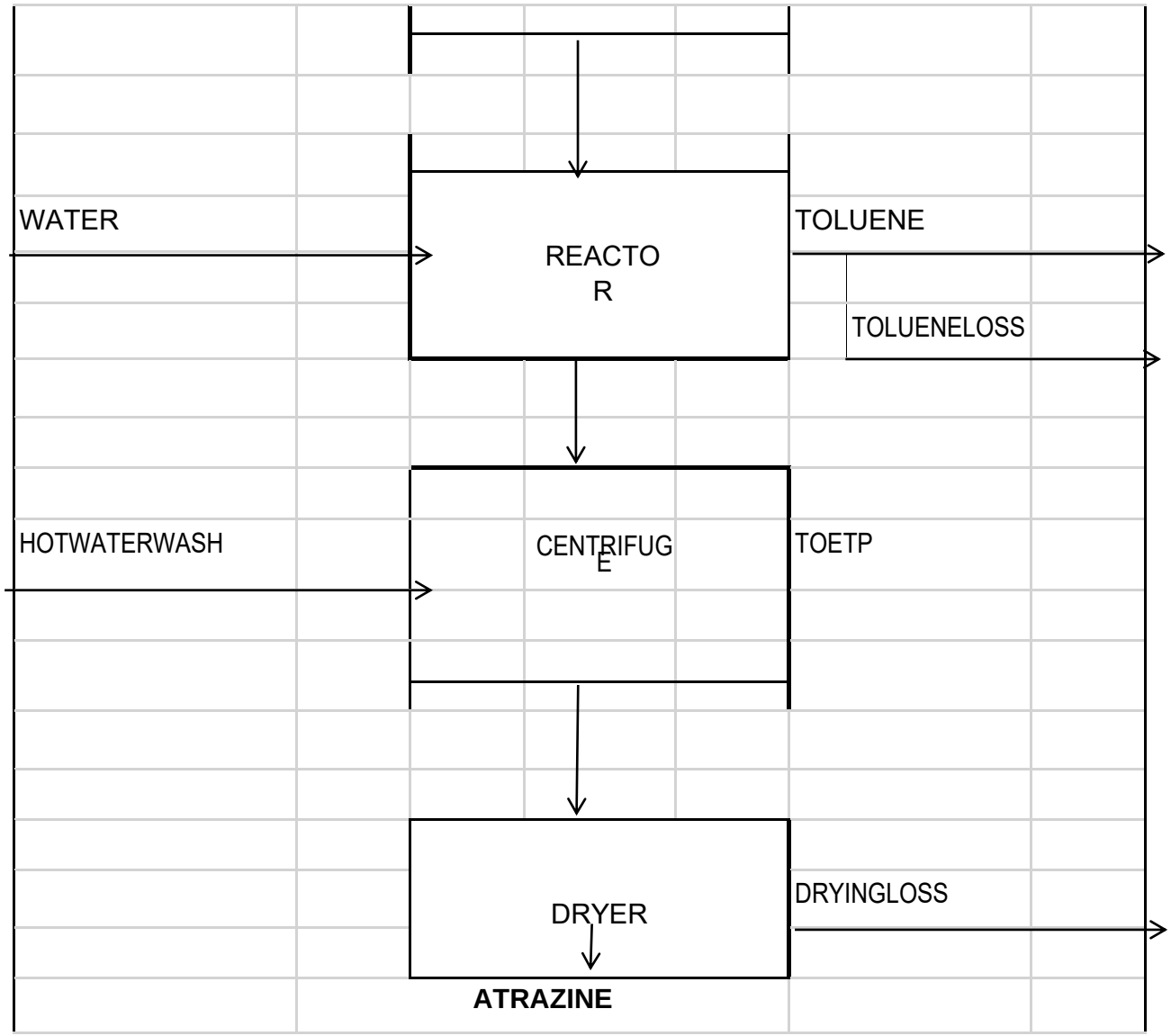


Intermediate 1 (M.W.207.02) | Ethyl Amine (M.W.45.08) | Atrazine (M.W.215.68)

Process Flow

Flow Diagram of ATRAZINE TECHNICAL

INPUT		OUTPUT
TOLUENE		
CYANURICCHLORIDE		
MIPA70%		AQUEOUSLAYER
CAUSTICSOLUTION20%	REACTOR	
WATER		
HCl10%solutionforpH		
MEA50%		
CAUSTICSOLUTION20%	REACTOR	AQUEOUSLAYER
NaClSOLUTION10%		



Mass Balance

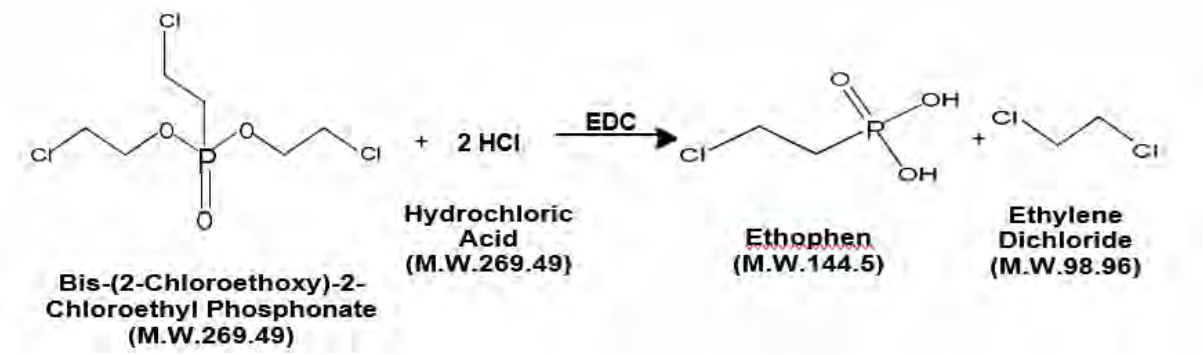
	Material/Mass Balance of ATRAZINE All Quantities are in kg)				
	IN–PUT			**OUT–PUT**	
Sr. No.	**Raw Materials /Items**	**Kg/Batch**		**Product/Byproduct**	**Kg/Batch**
1	Toluene	6950		Atrazine	**1000**
2	CyanuricChloride	900		TolueneRecovery	6900
3	IsopropylAmine	435		TolueneLoss	50
4	NaOH	410		WasteWater	4930
5	MonoEthylAmine	320		DryingLoss	85
6	Water	3950			
	TOTAL	**12965**		**TOTAL**	**12965**

14. Ethopen

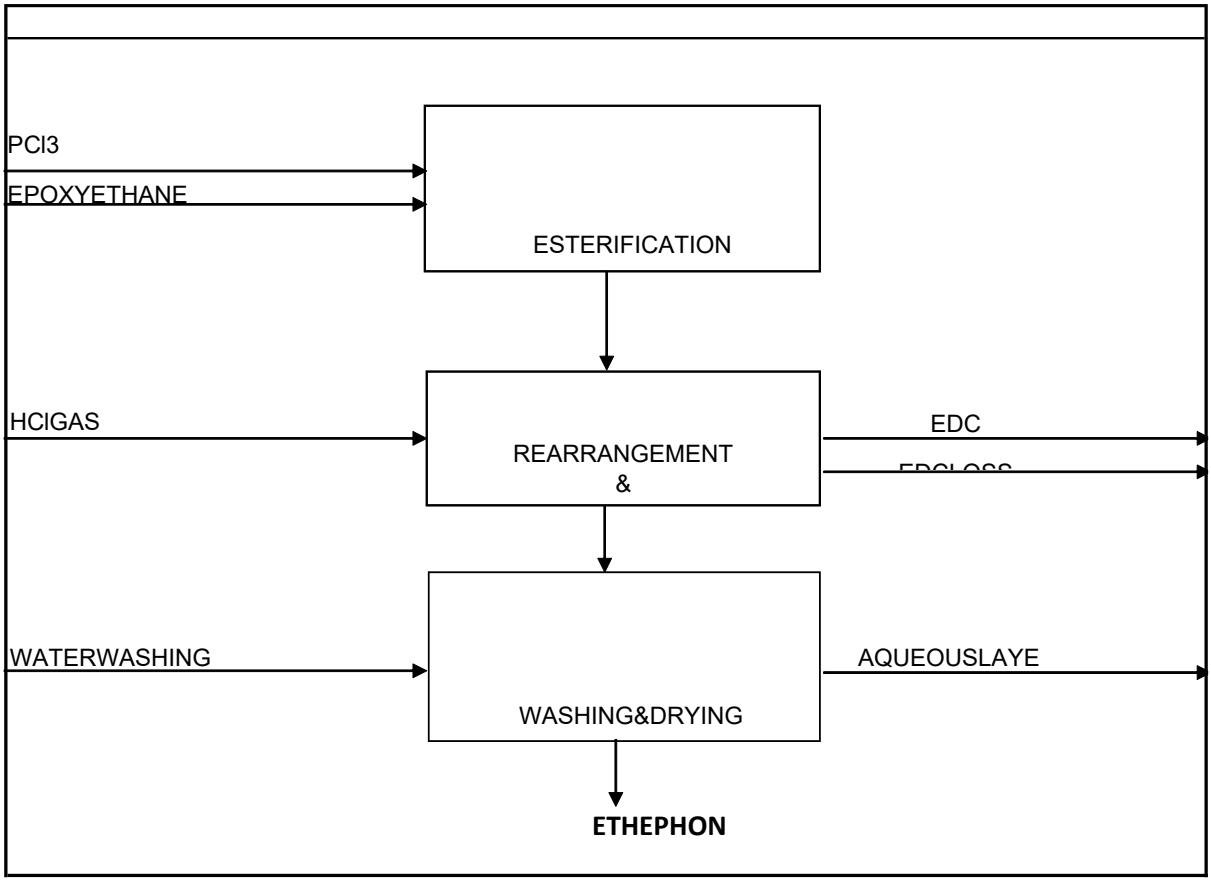
Manufacturing Process

Bis-(2-chloroethoxy) 2-chloroethyl phosphonate heated to 80 deg C, hydrogen chloride (HCl) gas is introduced through sparger at fixed rate until the reaction mixture turns pale yellow. EDC formed during the reaction is distilled off under vacuum and the residue crystallized in 1:3 mixture of toluene and methanol.

Chemical Reaction



Process Flow



Mass Balance

	Material / Mass Balance of ETHEPHON All Quantities are in kg)				
	IN – PUT			OUT – PUT	
Sr. No.	Raw Materials / Items	Kg/Batch		Product / By product	Kg/Batch
1		1942		Ethephon	**1000**
2	Hydrogen Chloride	526		Ethylene Dichloride	1369
3	Toluene	1000		Toluene Recovered	960
4	Methanol	1666		Toluene loss	5
5				Toluene in Residue	35
6				Methanol Recovered	1596
7				Methanol loss	11
8				Methanol in Residue	59
9				Bis (2-Chloroethyl) 2 Chloro Ethyl Phosphonate	78
10				Hydrogen Chloride	21
	TOTAL	**5134**		**TOTAL**	**5134**

15. 2,4 D Sodium Salt

Manufacturing Process

2,4-D Sodium Salt technical is generally manufactured to contain 80% of 2,4-Dichlorophenoxy acetic acid(2,4-D).

2,4-D Sodium Salt technical is manufactures in two stages. In the first stage, 2-4-dichloro phenol is produced by reaction between phenol and chlorine. In the second stage, 2,4-D sodium is produced by reaction between Dichloro phenol, mono-chloro acetic acid and sodium hydroxide.

(I) In the first phase reaction, phenol is charged in a lead lined reactor and chlorine is passed through it. Chlorine reacts chemically with phenol and forms dichloro phenol.

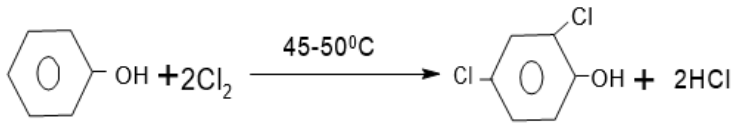
The gas stream coming out from the reactor, containing hydrochloric acid fumes and excess chlorine, is scrubbed with counter-current flow of water/dil. acid in a glass scrubber, to form bi-product hydrochloric acid (HCl).

(II) In second phase reaction, 2, 4-dichloro phenol is charged in an SS reactor. Now, MCA (Monochloro Acidic Acid) and NaOH (Caustic) are added slowly (6 hrs.) to the reactor with consist stirring. MCA and caustic react with Di chloro phenol and forms light pink coloured2, 4-D sodium salt.

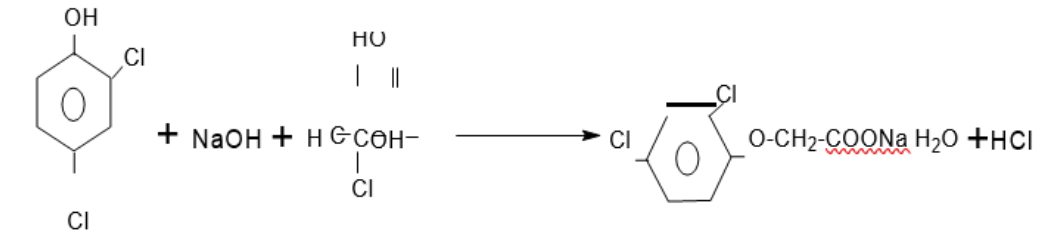
The reaction temperature is around 100^0C and pH 10 to 10.5. The product is allowed to cool down to about 65^0C, with the help of circulating cooling water, followed by transfer to cemented pits. After allowing 40 to 48 hours of stabilizing and setting, the product is separated from the mother liquor in a centrifuge and dried in a dryer. The dry product is ground in a pulverizer and packed in HDPE bags.

The mother liquor obtained from settling and centrifuge contains wastewater and different derivatives of phenol and raw materials. It is neutralized with HCl to separate the organic components, which settle down. The aqueous liquor is separated from the organic layer and sent to the ETP for treatment. The organic fraction is packed quantitatively in drums and disposed through sale to sister concern.

Chemical Reaction

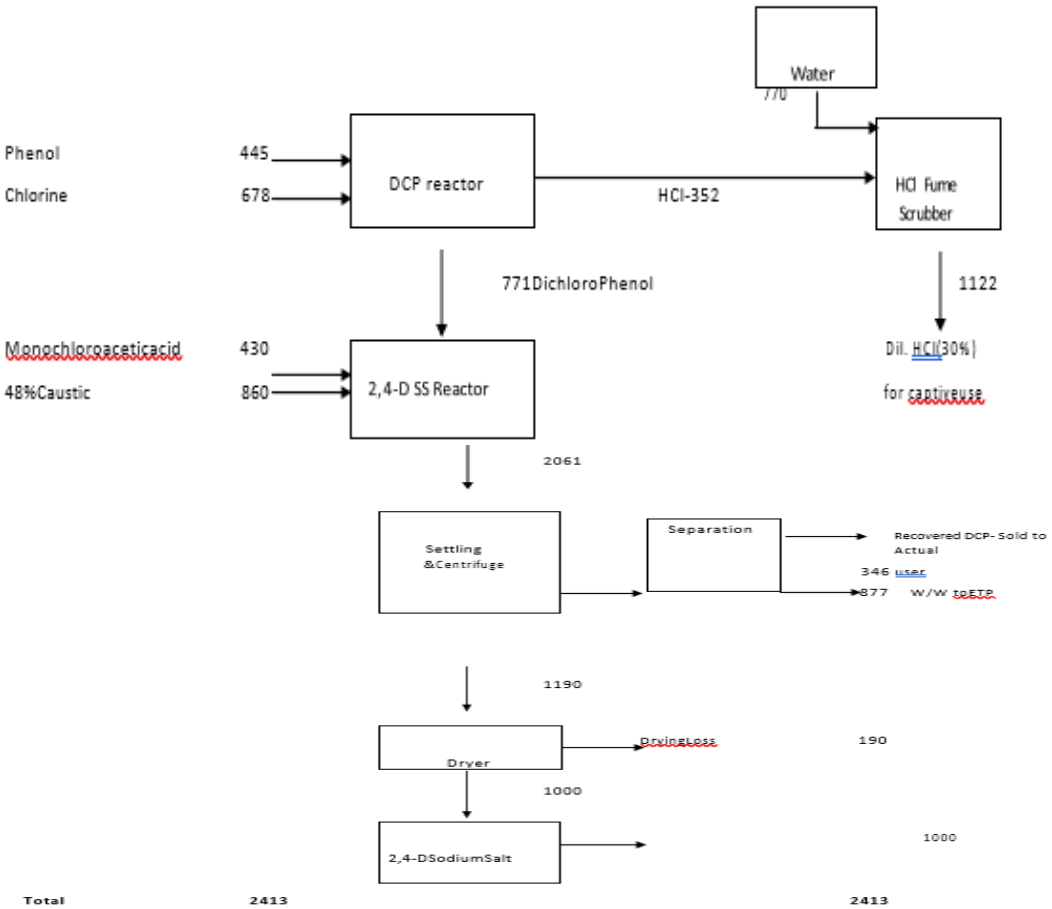


Phenol Chlorine 2,4-Dichloro Phenol Hydrochloric Acid



2,4-Dichloro Phenol Caustic MCA 2,4-DSodiumSalt Hydrochloric Acid

Process Flow



Mass Balance

	Material / Mass Balance of 2,4-D Sodium Salt All Quantities are in kg)				
	IN – PUT			OUT – PUT	
Sr. No.	Raw Materials / Items	Kg/Batch		Product / By product	Kg/Batch
1	Phenol	445		**2,4-D Sodium Salt**	**1000**
2	Chlorine	678		Recovered DCP- Sold to Actual User	346
3	Monochloroaceticacid	430		Aqueous Layer to ETP	877
4	48%Caustic	860		DryingLoss	190
	TOTAL	**2413**		**TOTAL**	**2413**

16. Thifluzamide

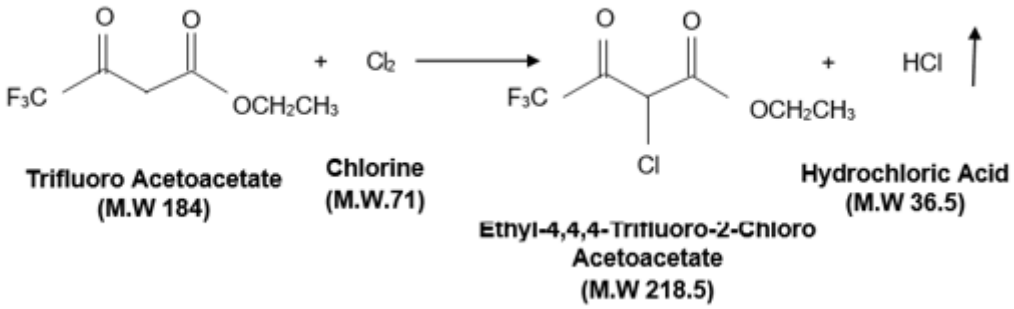
Manufacturing Process

Step 1 :- Ethyl Trifluoroacetate (ETFFA) is Chlorinated at low temperature and the chlorinated compound is thioacetamide in presence of solvent and finally reacted NaOH and acidified to get Thiazole Acid. The acid is chlorinated by Thionyl Chloride in toluene.

Step 2 :- Finally the Thiazole Acid Chloride is reacted with 2,6-Dibromo-4-Trifluoromethoxyaniline in presence of solvent. The product is isolated by filtration and washing and drying.

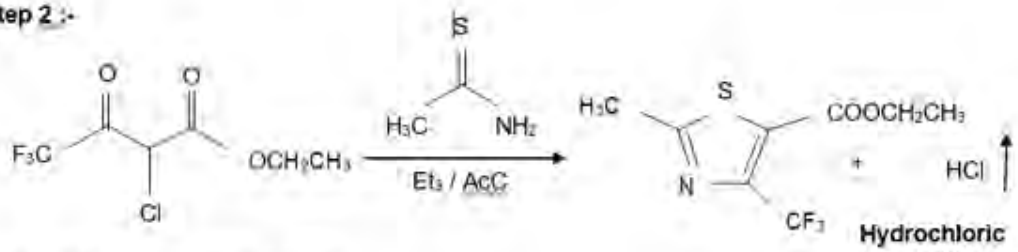
Chemical Reaction

Step 1 :-



Trifluoro Acetoacetate (M.W 184) + **Chlorine (M.W.71)** → **Ethyl-4,4,4-Trifluoro-2-Chloro Acetoacetate (M.W 218.5)** + **Hydrochloric Acid (M.W 36.5)**

Step 2 :-

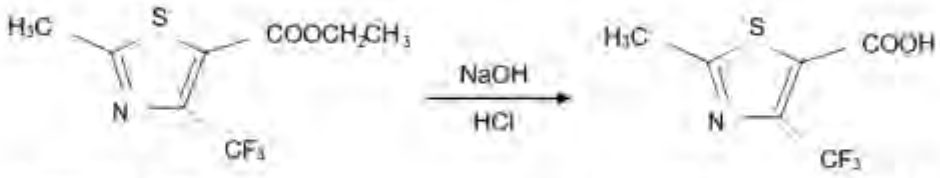


Ethyl-4,4,4-Trifluoro-2-Chloro Acetoacetate (M.W 218.5)

2-Methyl-4-Trifluoromethyl-5-Thiazole (M.W 239)

Hydrochloric Acid (M.W 36.5)

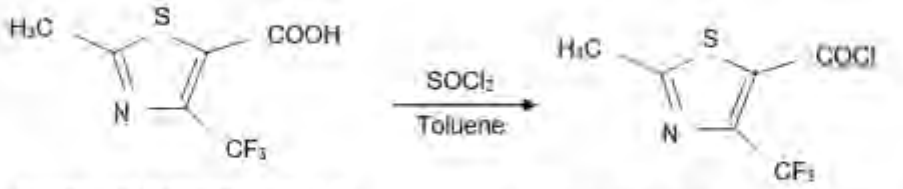
Step 3:-



2-Methyl-4-Trifluoromethyl-5-Thiazole (M.W 239)

2-Methyl-4-Trifluoromethyl-5-Thiazole Carboxylic Acid (M.W 211)

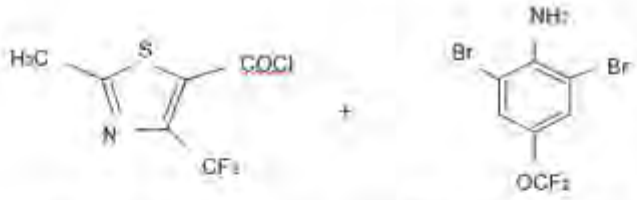
Step 4:-



2-Methyl-4-Trifluoromethyl-5-Thiazole Carboxylic Acid (M.W 211)

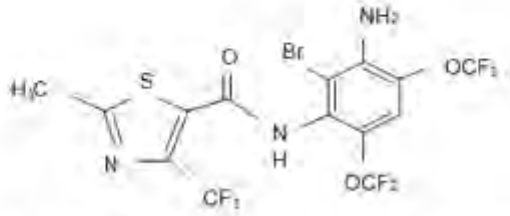
2-Methyl-4-Trifluoromethyl-5-Thiazole Carboxylic Acid Chloride (M.W 229.5)

Step 5 :-



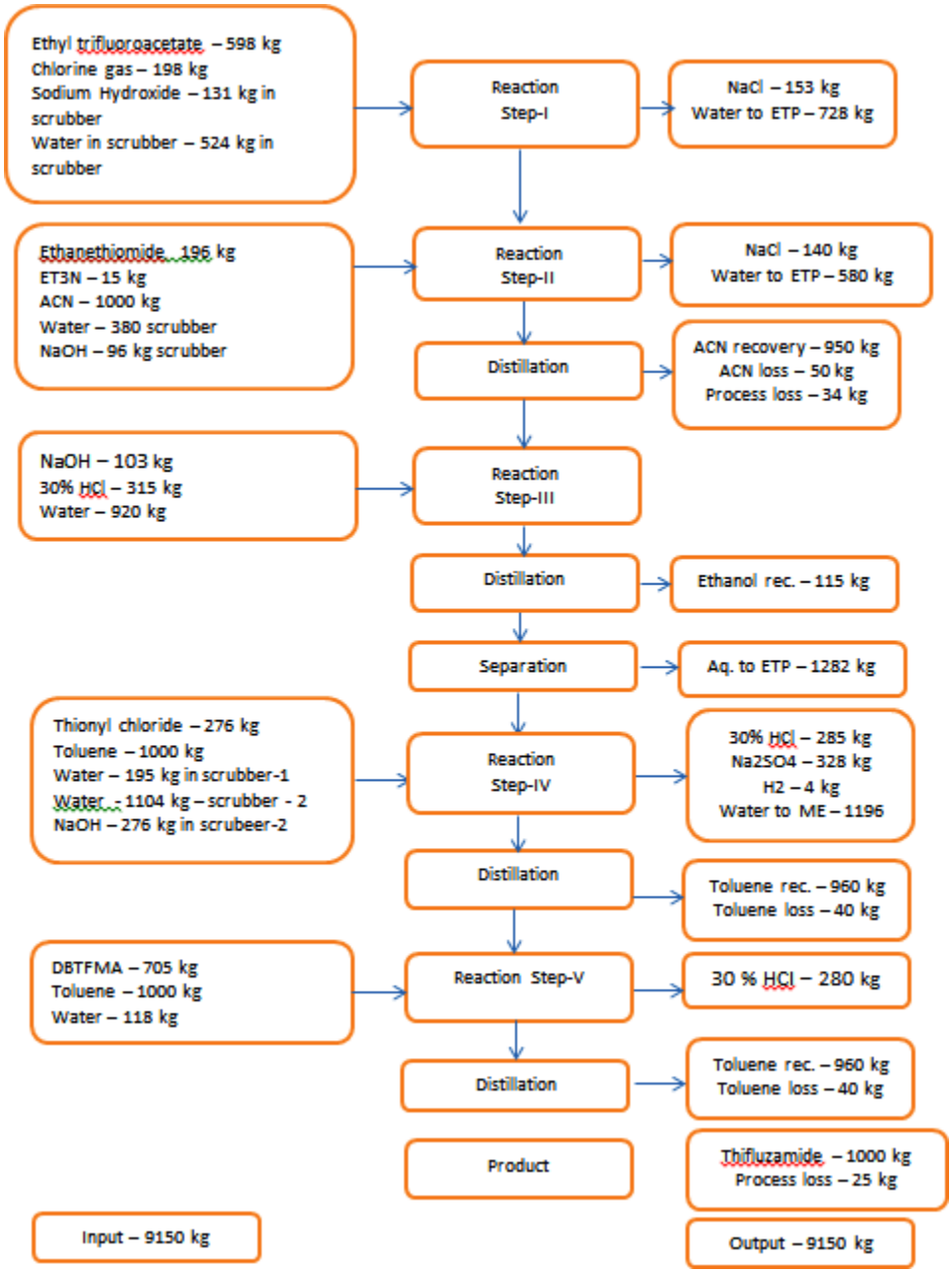
2-Methyl-4-Trifluoromethyl-5-Thiazole Carboxylic Acid Chloride

2,6-Dibromo-4-(Trimethoxy) Aniline (M.W.335)



N-(2,6-Dibromo-4-Trifluoromethoxy) Phenyl)-2-Methyl-4-Trifluoromethyl-5-Thiazolecarboxamid [Thifluzamide] (M.W.528)

Process Flow



Mass Balance

	Material / Mass Balance of THIFLUZAMIDE All Quantities are in kg)				
	IN – PUT			OUT – PUT	
Sr. No.	**Raw Materials / Items**	**Kg/Batch**		**Product / By product**	**Kg/Batch**
1	Trifluoro Acetoacetate	465		Ethyl 4,4,4 Trifluoro 2-Chloro Acetoacetate	**531**
2	Solvent - Toluene	2530		Recovered Solvent	2403
3	Catalyst	25		Solvent Loss	127
4	Chlorine	190		30% HCl Solution	309
5	Water for Washing	1265		Aqueous Layer to ETP	1320

6	Water for 30% HCl formation	215			
	TOTAL	**4690**		**TOTAL**	**4690**

	Material / Mass Balance of THIFLUZAMIDE All Quantities are in kg)				
	IN – PUT			**OUT – PUT**	
Sr. No.	**Raw Materials / Items**	**Kg/Batch**		**Product / By product**	**Kg/Batch**
1	Ethyl 4,4,4 Trifluoro 2-Chloro Acetoacetate	531		2-Methyl 4-Trifluoro Methyl 5-Thiazole Carboxylic Acid Ethyl Ester	**493**
2	Thio Acetamide	192		Recovered TEA	227
3	Triethylamine	245		TEA Loss	17
4	Solvent	2783		Aqueous Layer to ETP	1855
5	Acetic Acid	245		Recovered Solvent	1070
6	Water for Reaction	379		Solvent Loss	713
	TOTAL	**4375**		**TOTAL**	**4375**

	Material / Mass Balance of THIFLUZAMIDE All Quantities are in kg)				
	IN – PUT			**OUT – PUT**	
Sr. No.	**Raw Materials / Items**	**Kg/Batch**		**Product / By product**	**Kg/Batch**
1	2-Methyl 4-Trifluoro Methyl 5-Thiazole Carboxylic Acid Ethyl Ester + Solvent	3276		2-Methyl 4-Trifluoro Methyl 5-Thiazole Carboxylic Acid + Solvent	**3195**
2	48% Caustic Soda Lye	475		Aqueous Layer to ETP	809
3	30% HCl Solution	253			
	TOTAL	**4004**		**TOTAL**	**4004**

	Material / Mass Balance of THIFLUZAMIDE All Quantities are in kg)				
	IN – PUT			**OUT – PUT**	
Sr.No.	**Raw Materials / Items**	**Kg/Batch**		**Product / By product**	**Kg/Batch**
1	Organic Mass of 2-Methyl 4-Trifluoro Methyl 5-Thiazole Carboxylic Acid	3195		Acid Chloride	**455**
2	Thionyl Chloride	255		Recovered Toluene	2700
3	DMF Catalyst	24		Toluene Loss	83
4	Caustic Lye 15% for 20% Na_2SO_3	1194		20% Na_2SO_3 Solution	1332
5	Water for 30% HCl Solution	182		30% HCl Solution	280
	TOTAL	**4850**		**TOTAL**	**4850**

	Material / Mass Balance of THIFLUZAMIDE All Quantities are in kg)				
	IN – PUT			OUT – PUT	
Sr. No.	Raw Materials / Items	Kg/Batch		Product / By product	Kg/Batch
1	Acid Chloride	455		**THIFLUZAMIDE**	**1000**
2	Solvent Acetonitrile	2250		Recovered Solvent	2200
3	PTC catalyst	20		Solvent Loss	50
4	2,6 Dibromo 4-(Trifluoromethyl) Aniline	663		Aqueous Layer to ETP	1120
5	Water for Washing	1000		Distillation Residue	18
	TOTAL	**4388**		**TOTAL**	**4388**

17. Isoprothiolane

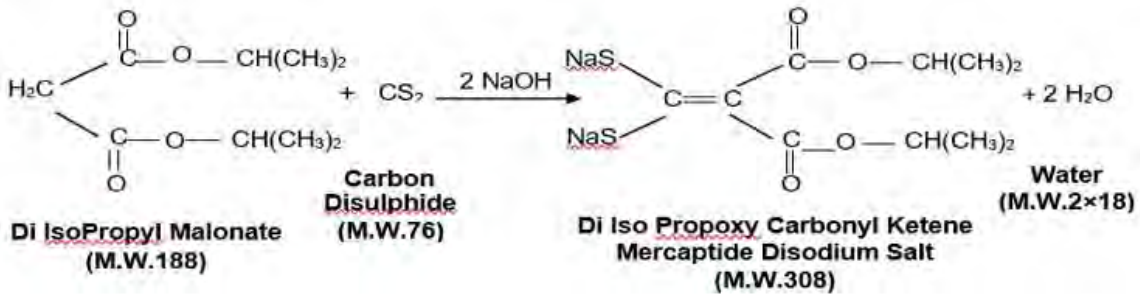
Manufacturing Process

Step 1 :- Di Isopropyl Malonate is reacted with Carbon Disulphide in alkaline medium, it gives an intermediate Di Iso Propoxy Carbonyl Ketene Mercaptide Disodium Salt.

Step 2 :- Above intermediate reacted with Ethylene Dichloride to get crude product as Isoprothiolane. This crude Isoprothiolane is purified by crystallization with Solvent n-Heptane to get Isoprothiolane (Technical).

Chemical Reaction

Step 1 :-



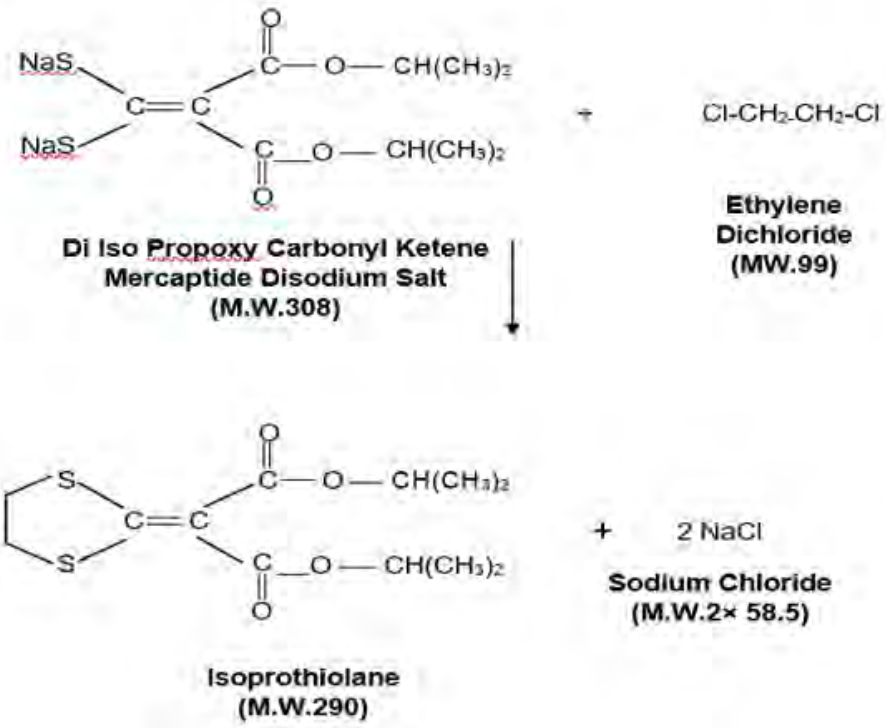
Di IsoPropyl Malonate (M.W.188)

Carbon Disulphide (M.W.76)

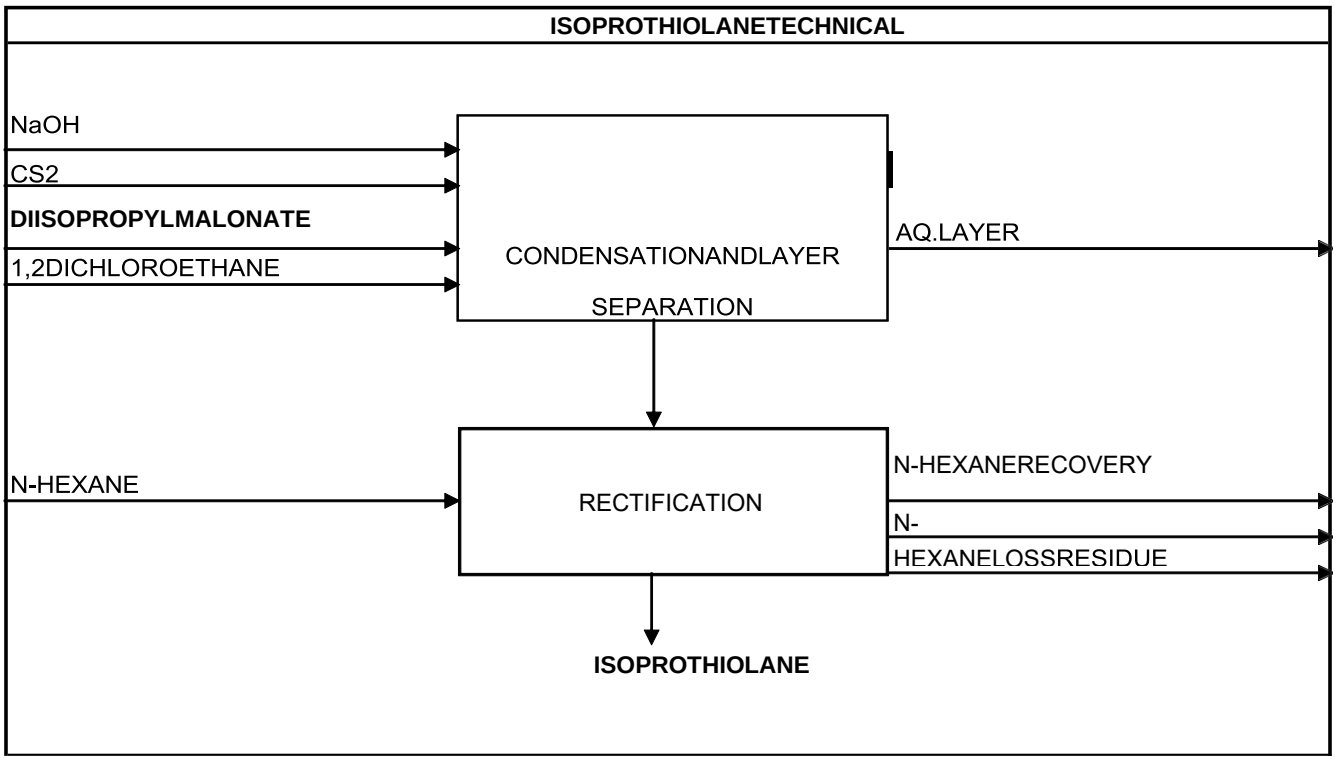
Di Iso Propoxy Carbonyl Ketene Mercaptide Disodium Salt (M.W.308)

Water (M.W.2×18)

Step 2 :-



Process Flow



Mass Balance

	Material / Mass Balance of ISOPROTHIOLANE All Quantities are in kg)

	IN – PUT			OUT – PUT	
Sr. No.	**Raw Materials / Items**	**Kg/Batch**		**Product / By product**	**Kg/Batch**
1	Di Isopropyl Malonate	715		Isoprothiolane	**1000**
2	Carbon Disulphide	290		Aqueous Effluent to ETP	2438
3	Caustic Soda Solution (47%)	710		Recovered EDC	1080
4	Water for reaction	2000		Loss EDC	360
5	Ethylene Dichloride	1440		Recovered Heptane	2375
6	Solvent – n-Heptane	2500		Heptane Loss	125
7				Sodium Chloride Salt Wet Cake	252
8				Distillation Residue	25
	TOTAL	**7655**		**TOTAL**	**7655**

18. Azoxistrobin

Manufacturing Process

Step 1 :- Phthalide is reacted with methyl format in presence of Di methyl Carbonate and Sodium Hydride as well as Solvent -Toluene to form 3- Methoxy Methylene -1- Benzo furan -2-(3-H) – One

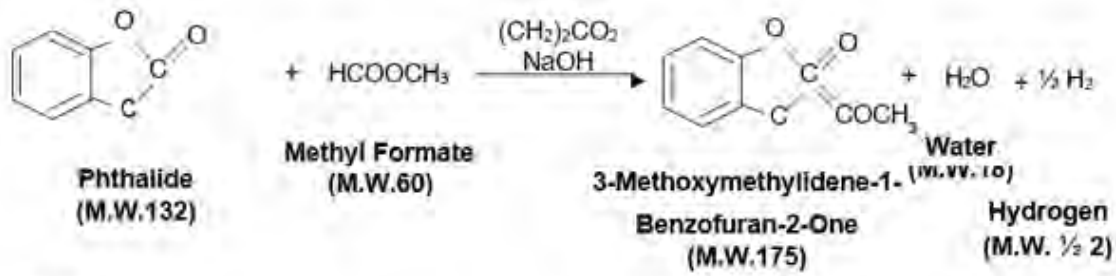
Step 2 :- 3- Methoxy Methylene -1- Benzofuran -2-(3-H) – One reacted with Sodium Methoxide in presence of Solvent – EDC to form Sodium -2- [1,3 Dimethoxy -3- Oxoprop -1- en -2- yl] Phenolate.

Step 3 :- Sodium -2- [1,3 Dimethoxy -3- Oxoprop -1- en -2- yl] Phenolate is reacted with 4,6 – Dichloro Pyrimidine in presence of Solvent – Toluene to give Methyl -2- [2- {(6- Chloro Pyrimidine - 4 –yl)} Oxy Phenyl] -3- methoxyprop -2- Ethanoate.

Step 4 :- Methyl -2- [2- { (6- Chloro Pyrimidine -4 –yl)} Oxy Phenyl] -3- methoxyprop -2- Ethanoate O-Cyano Phenol in presence of Potassium Hydroxide and Solvent – Di Methyl Formamide to give the Final product as Azoxystrobin.

Chemical Reaction

Step 1 :-



Phthalide (M.W.132)

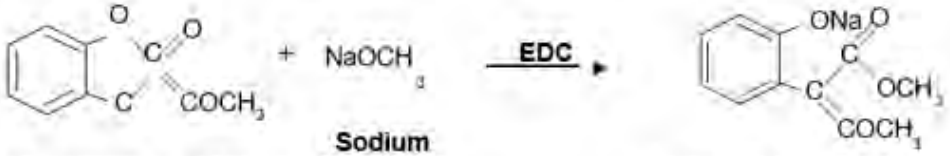
Methyl Formate (M.W.60)

3-Methoxymethylidene-1-Benzofuran-2-One (M.W.175)

Water (M.W. 18)

Hydrogen (M.W. ½ 2)

Step 2 :-

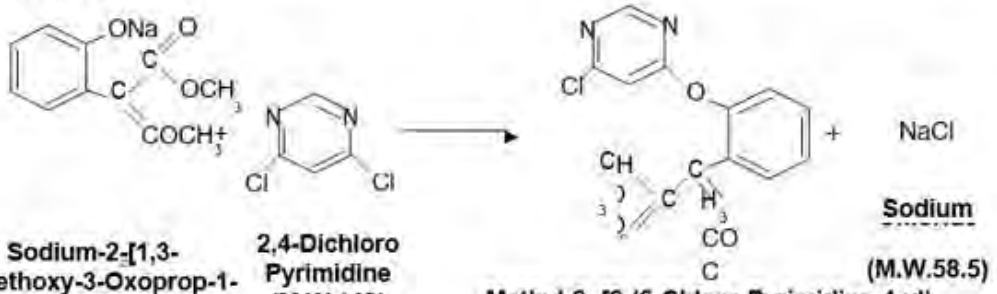


3-Methoxymethylidene-1-Benzofuran-2-One (M.W.175)

Sodium Methoxide (M.W.54)

Sodium-2-[1,3-Dimethoxy-3-Oxoprop-1-en-2-yl]-Phenolate (M.W.229)

Step 3 :-



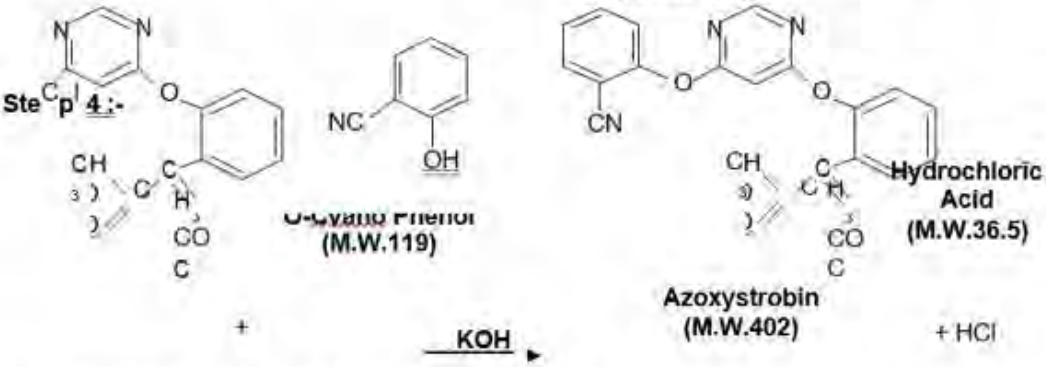
Sodium-2-[1,3-Dimethoxy-3-Oxoprop-1-en-2-yl]-Phenolate (M.W.229)

2,4-Dichloro Pyrimidine (M.W.149)

Sodium Chloride (M.W.58.5)

Methyl-2- [2-(6-Chloro Pyrimidine-4-yl) Oxyphenyl-3-Methoxyprop-2-Enoate (M.W.319.5)

Step 4 :-



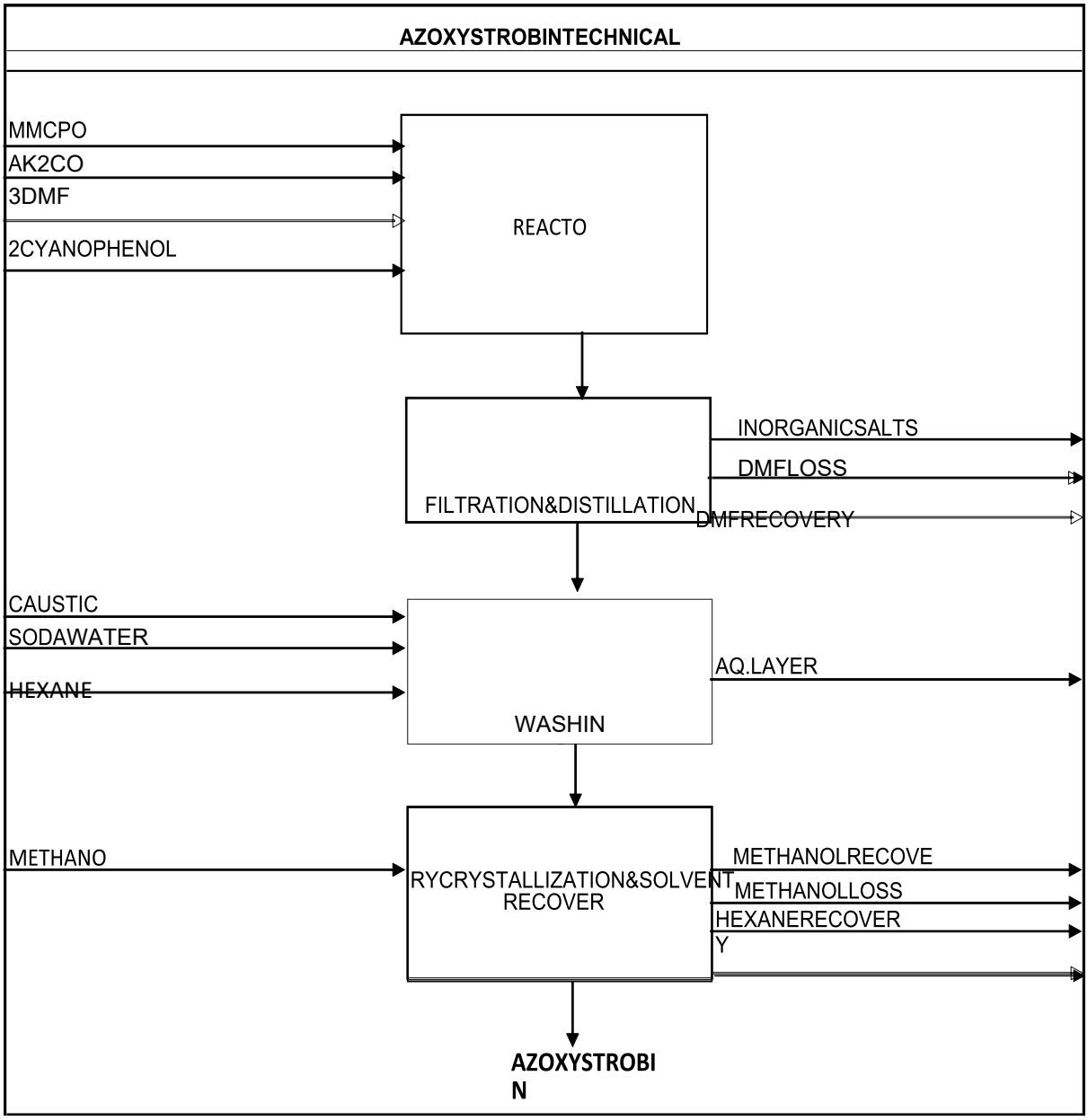
O-Cyano Phenol (M.W.119)

Azoxystrobin (M.W.402)

Hydrochloric Acid (M.W.36.5)

Methyl-2- [2-(6-Chloro Pyrimidine-4-yl) Oxyphenyl-3-Methoxyprop-2-Enoate (M.W.319.5)

Process Flow



Mass Balance

Sr. No.	IN – PUT			OUT – PUT	
	Raw Materials / Items	**Kg/Batch**		**Product / By Product**	**Kg/Batch**
1	Phthalate	320		Azoxy Strobin	1000
2	Methyl Formate	142		Recovered Solvent – Toluene	1370
3	Di Methyl Carbonate	216		Solvent Loss (Toluene)	30
4	Sodium Hydride	58		Sodium Chloride	140
5	Solvent – Toluene	1400		Sodium Carbonate	258

Sr. No.	IN – PUT			OUT – PUT	
	Raw Materials / Items	Kg/Batch		Product / By Product	Kg/Batch
6	Sodium Methoxide	128		Recovered Solvent – EDC	1160
7	Solvent – EDC	1200		Solvent Loss (EDC)	40
8	4,6 - Di Chloro Pyrimidine	352		Potassium Chloride	180
9	Ortho Cyano Phenol	283		Solvent Recovered – DMF	1160
10	Potassium Hydroxide	133		Solvent Loss (DMF)	40
11	Solvent – DMF	1200		Aqueous Layer to ETP	915
12	Water	880		Distillation Residue	19
	TOTAL	**6312**		**TOTAL**	**6312**

19. Picoxystrobin

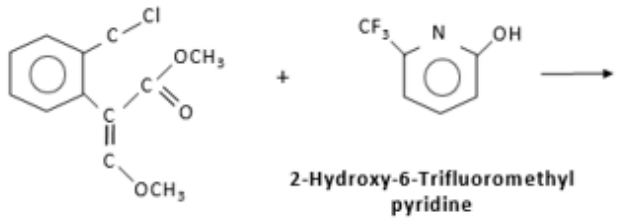
Manufacturing Process

Step 1 :- 3-Isochromanone is reacted with Methyl Formate in presence of Di methyl Carbonate and sodium hydride to give 4-(α-Methyl Methylene)-3-Isochromanone.

Step 2 : - 4-(α-methyl Methylene)-3-Isochromanone further reacted with Hydrochloric acid in presence of Solvent – EDC to give Methyl-2-(Chloromethyl)-α-methoxy Methylene-Benzene acetate.

Step 3 :- Methyl-2-(Chloromethyl)-α-Methoxy Methylene-Benzene acetate reacted with 2- Hydroxy-6-Trifluoromethyl pyridine to give final product Picoxystrobin

Chemical Reaction



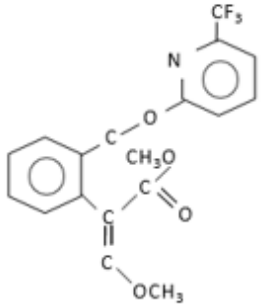
Methyl-2-Chloromethyl)-α-Methoxy Methylene-Benzene Acetate

237.5

+

2-Hydroxy-6-Trifluoromethyl pyridine

163



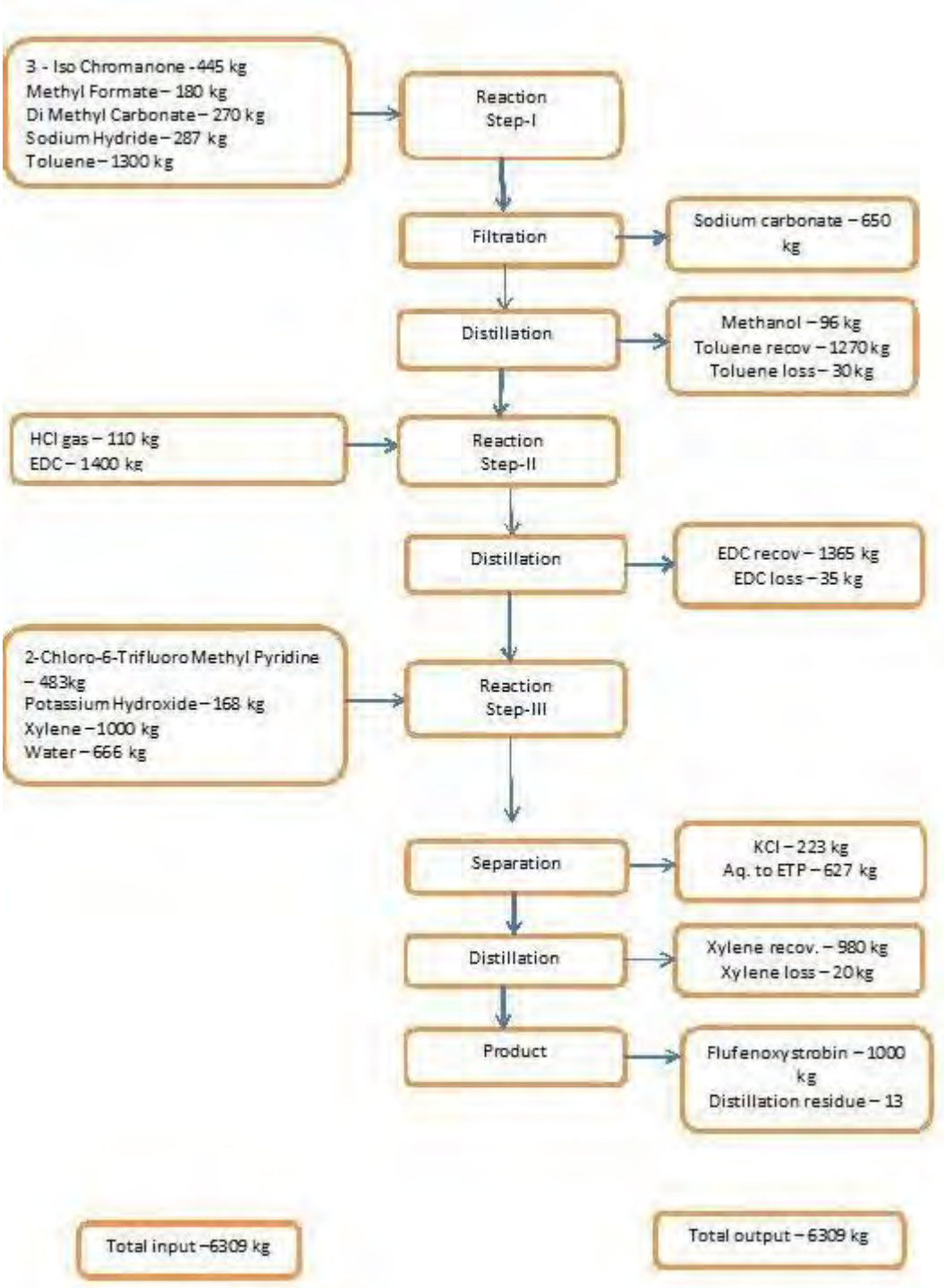
+ HCl

36.5

PICOXYSTORBIN

364

Process Flow



Mass Balance

	Material / Mass Balance of PICOXYSTROBIN All Quantities are in kg)				
	IN – PUT			OUT – PUT	
Sr. No.	Raw Materials / Items	Kg/Batch		Product / By product	Kg/Batch
1	3 – Iso Chromanone	445		Picoxystrobin	1000

	Material / Mass Balance of PICOXYSTROBIN All Quantities are in kg)				
	IN – PUT			OUT – PUT	
Sr. No.	Raw Materials / Items	Kg/Batch		Product / By product	Kg/Batch
2	Methyl Formate	180		Recovered Solvent – Toluene	1260
3	Di Methyl Carbonate	270		Solvent loss (Toluene)	40
4	Sodium Hydride	287		Sodium Carbonate	650
5	Solvent - Toluene	1300		Methanol	96
6	HCl Gas	110		Potassium Chloride	223
7	Solvent – EDC	1400		Recovered Solvent - EDC	1360
8	2- Chloro -6-trifluoro Methyl Pyridine	483		Solvent Loss EDC	40
9	Potassium Hydroxide	168		Solvent Recovered – Xylene	970
10	Solvent - Xylene	1000		Solvent Loss – Xylene	30
11	Water	666		Aqueous Layer to ETP	628
12				Distillation Residue	12
	TOTAL	**6309**		**TOTAL**	**6309**

20. Trifloxystrobin

Manufacturing Process

Step 1 :- 2-Methyl Aniline is reacted with Sodium Nitrite and Hydrochloric acid to give 2-Methyl benzene Diazonium salt by diazotization.

Step 2 :- 2-Methyl Benzene Diazonium salt further reacted with Glyoxylic Acid methyl ester Oxime to give 2-Methyl phenyl glyoxalin acid methyl ester Oxime.

Step 3 :- 2-Methyl Phenyl Glyoxylic Acid methyl ester Oxime reacted with Dimethyl sulfate in presence of Sodium Hydroxide to give 2-Methyl Phenyl Glyoxylate-o-methyl Oxime.

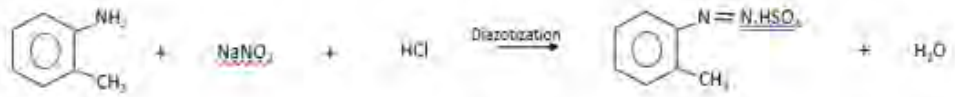
Step 4 :- 2-Methyl Phenyl Glyoxylate-o-methyl Oxime further on chlorination with chlorine gas in presence of Solvent – EDC gives 2-Methyl phenyl Glyoxylate-o-methyl Oxime.

Step 5 :- 2-Methyl Phenyl Glyoxylate-o-methyl Oxime reacted with Sodium [-1- [3- (Trifluoromethyl) Phenyl] Ethylene] Amine] Oxidanide in presence of Solvent – DMF to give final product Trifloxystrobin

Chemical Reaction

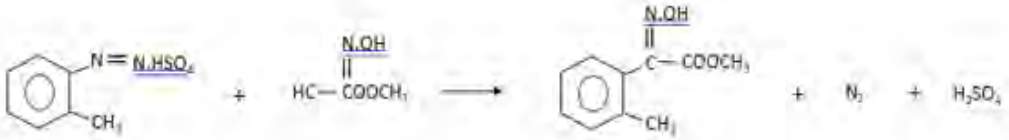
Chemical Reactions: -

STEP:1



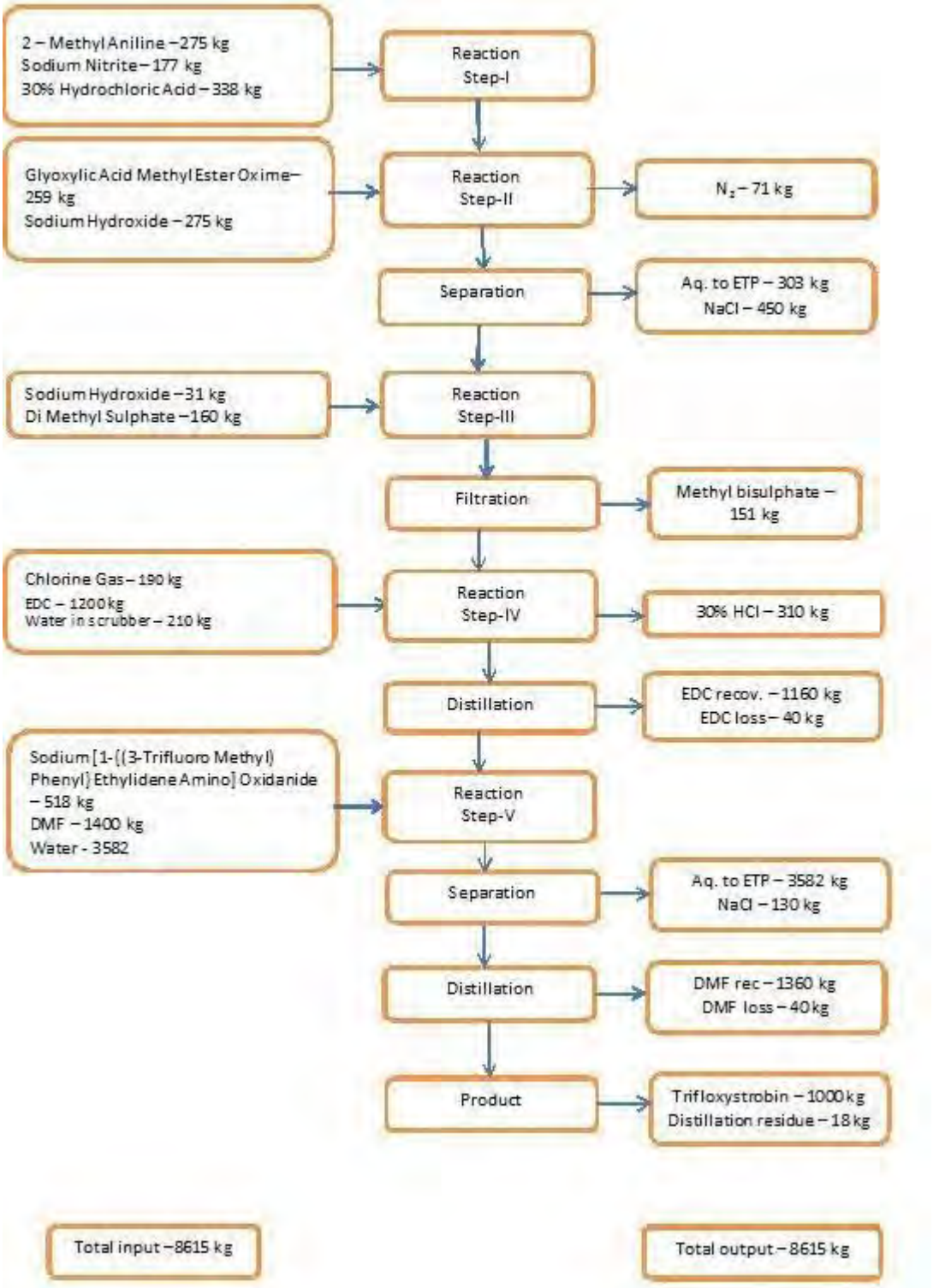
2-Methyl Aniline	Sodium Nitrite	Hydrochloric acid	2-Methyl Benzene Diazonium salt	
107	69	36.5	216	18

STEP:2



		Glyoxylic Acid Methyl Ester Oxime	2-Methyl Phenyl Glyoxylic Acid Methyl Ester Oxime		
216		103	193	28	98

Process Flow



Mass Balance

	Material / Mass Balance of TRIFLOXYSTROBIN All Quantities are in kg)				
	IN – PUT			OUT – PUT	
Sr. No.	**Raw Materials / Items**	**Kg/Batch**		**Product / By product**	**Kg/Batch**
1	2- Methyl Aniline	275		Trifloxystrobin	1000

	Material / Mass Balance of TRIFLOXYSTROBIN All Quantities are in kg)				
	IN – PUT			OUT – PUT	
Sr. No.	Raw Materials / Items	Kg/Batch		Product / By product	Kg/Batch
2	Sodium Nitrite	177		Sodium Chloride	450
3	30 % Hydrochloric Acid	338		Nitrogen Gas	71
4	Glyoxylic Acid Methyl Ester Oxime	259		Sodium Sulphate	366
5	Sodium Hydroxide	306		Recovered Solvent - EDC	1160
6	Di Methyl Sulphate	160		Solvent Loss EDC	40
7	Chlorine Gas	190		30 % Hydrochloride Solution	310
8	Solvent - EDC	1200		Solvent Recovered – DMF	1360
9	Sodium [1- {(3- Trifluoro Methyl) Phenyl} Ethylidene Amino] Oxidanide	518		Solvent Loss – DMF	40
10	Solvent - DMF	1400		Aqueous Layer to ETP	3700
11	Water	3692		Distillation Residue	18
	TOTAL	**8515**		**TOTAL**	**8515**

21. Tebuconazole

Manufacturing Process:

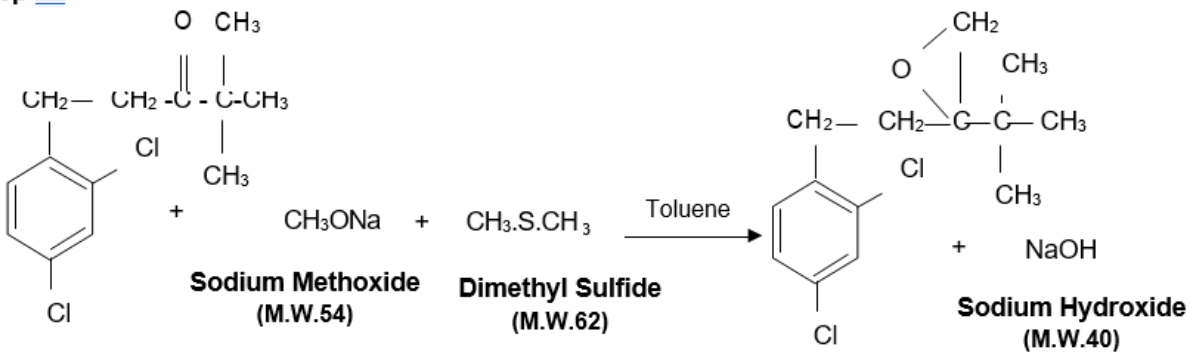
Step 1:- 1-(4-Chlorophenyl)-4,4-Dimethyl-3-Pentenone reacted with Sodium Methoxide & Dimethyl Sulfide in presence of Sodium solvent Toluene to get product 2-[2-(4-Chlorophenyl)ethyl]-2-(1,1- DiMethyl ethyl) Oxinane.

Step 2:- 2-[2-(4-Chlorophenyl) ethyl]-2-(1,1-DiMethyl ethyl) Oxinane reacted with 1,2,4-Triazole in presence of DMF to get final product Tebuconazole.

Chemical Reaction:

Chemical Reactions:-

Step 1 :-



Sodium Methoxide
(M.W.54)

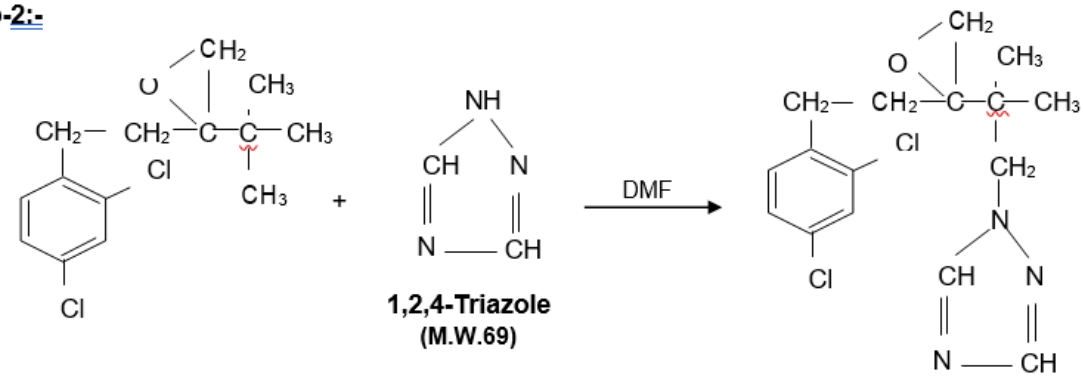
Dimethyl Sulfide
(M.W.62)

Sodium Hydroxide
(M.W.40)

1-(4-Chlorophenyl)-4,4-Dimethyl-3-Pentenone
(M.W.224.5)

2-[2-(4-Chlorophenyl) Ethyl]-2-(1,1-DiMethyl Ethyl) Oxinane

Step-2:-

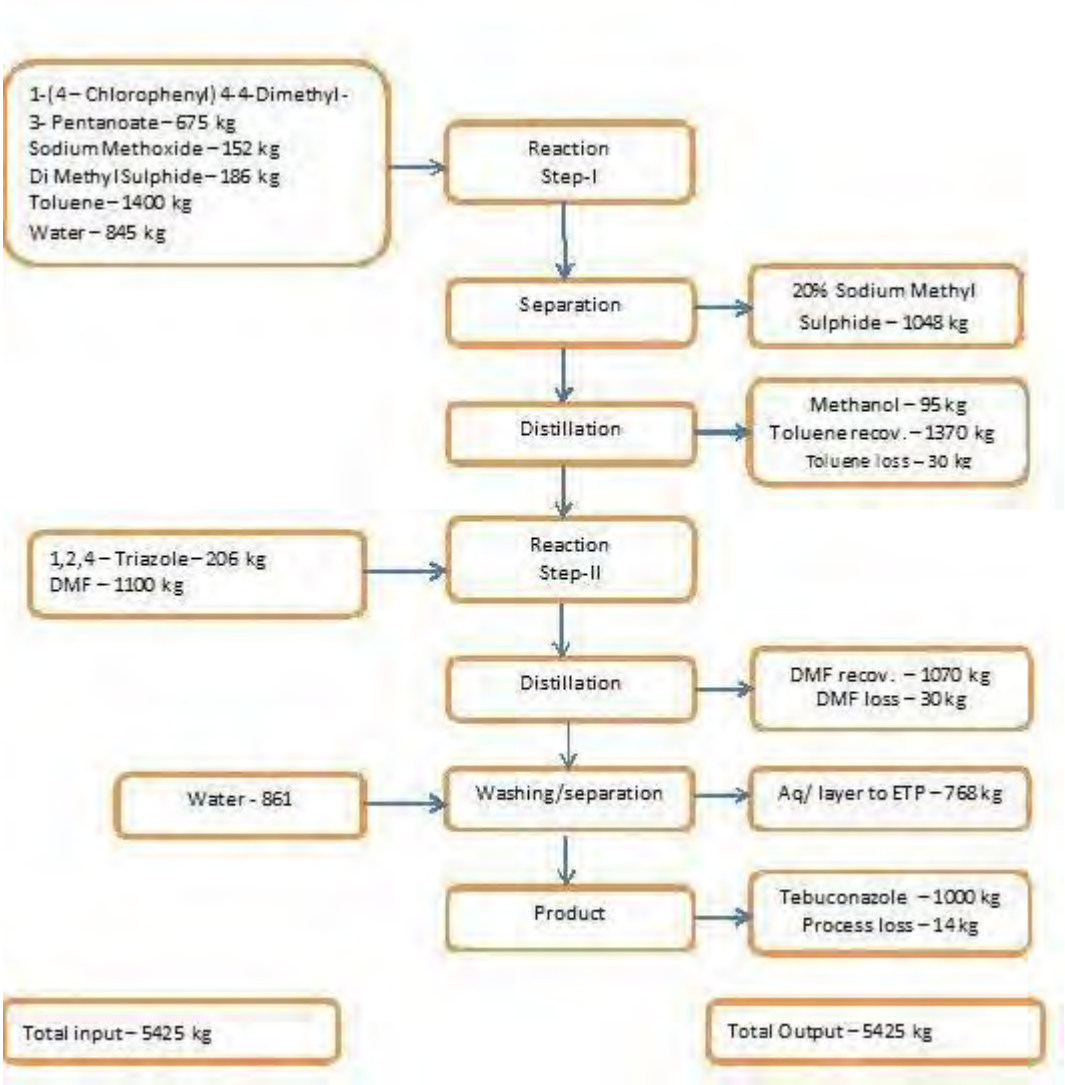


1,2,4-Triazole
(M.W.69)

2-[2-(4-Chlorophenyl) ethyl]-2-(1,1-DiMethyl ethyl) Oxinane
(M.W.238.5)

Tebuconazole
(M.W.307.5)

Process Flow:



Mass Balance:

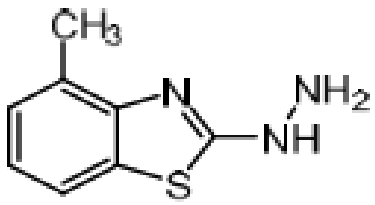
	Material / Mass Balance of TEBUCONAZOLE All Quantities are in kg)				
	IN – PUT			OUT – PUT	
Sr. No.	**Raw Materials / Items**	**Kg/Batch**		**Product / By product**	**Kg/Batch**
1	1-(4-Chlorophenyl)4-4 Dimethyl 3- Pentanoate	695		TEBUCONAZOLE	**1000**
2	Sodium Methoxide	180		Recovered Toluene	1746
3	Dimethyl Sulphide	195		Toluene Loss	54
4	Toluene	1800		20 % Sodium Methyl Sulphide	1100
5	1,2,4 Triazole	220		Recovered DMF	1455
6	Water	1800		DMF loss	38
7	DMF	1500		Effluent to ETP	967
8				Tarry Waste	30
	TOTAL	**6390**		**TOTAL**	**6390**

22. Tricyclazole

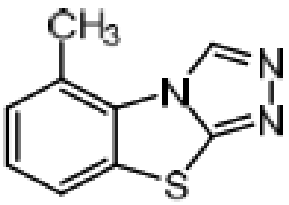
Manufacturing Process:

2-Hydroxy -4- Methyl Benzothiazole (HMBT) when reacted with Formic Acid in presence of solvent Ortho Xylene cyclization reaction takes place. Resulted reaction mass is drowned to chilled water. Subsequently it is filtered in a Nutsche. The mass is centrifuged and dried to get in a tray drier for Tricyclazole.

Chemical Reaction:



Formicacid



2-hydrazinyl-4-methylbenzo[d]thiazole

M.F.: $C_8H_9N_3S$

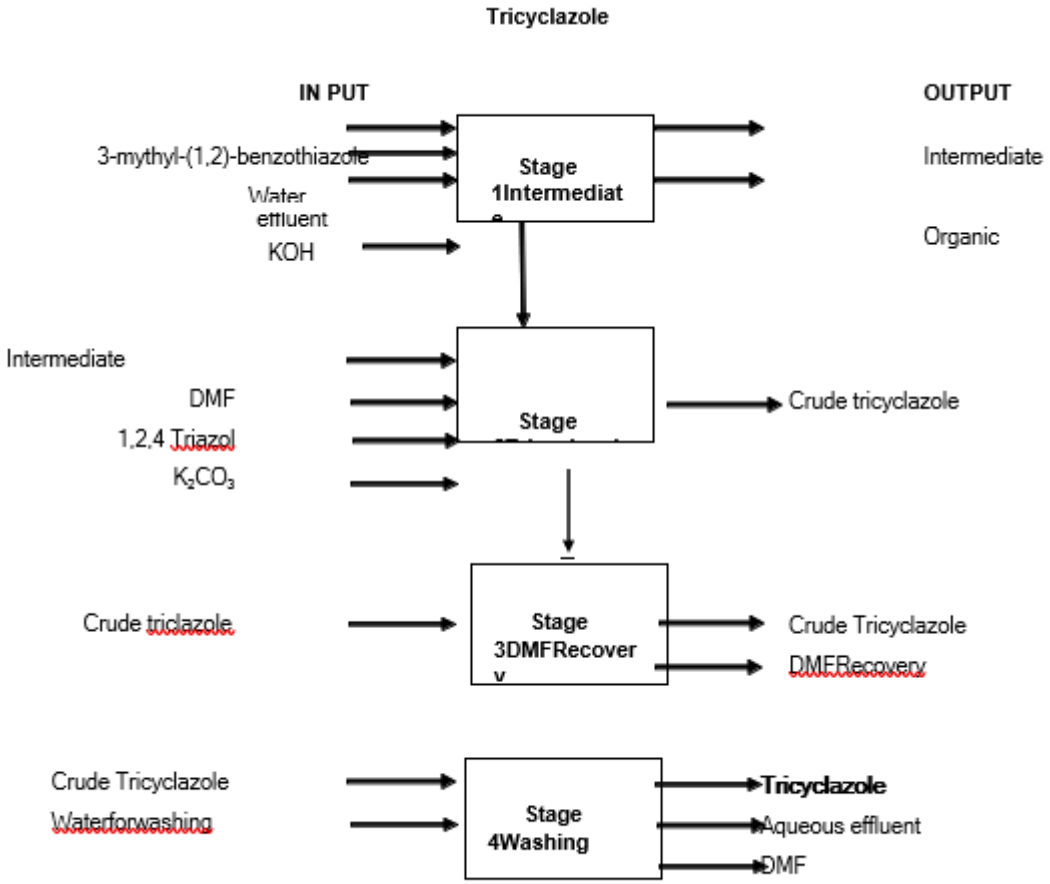
M.W.: 179.24

TRICYCLAZOLE

M.F.: $C_9H_7N_3S$

M.W.: 189.24

Process Flow:



Mass Balance:

	Material / Mass Balance of TRICYCLAZOLE All Quantities are in kg)				
	IN – PUT			OUT – PUT	
Sr. No.	Raw Materials / Items	Kg/Batch		Product / By product	Kg/Batch
1	2- Hydroxy -4- Methyl Benzothiazole(HMBT)	1000		Tricyclazole	**1000**
2	Formic Acid	2000		Recovered Ortho Xylene	4800
3	Solvent-1 Ortho Xylene	5000		Ortho Xylene Loss	200
4	Solvent-2 Toluene	2000		Recovered Toluene	1900
5	Water for Washing	1500		Toluene Loss	100
6				Recovered Formic Acid	2700
7				Drying Loss	800
	TOTAL	**11500**		**TOTAL**	**11500**

23. Propiconazole

Manufacturing Process:

Step 1 :- Meta-Dichloro Benzene reacted with Acetyl Chloride in presence of Aluminium Chloride and solvent Ethylene Dichloride. This process gives product 2,4-Dichloro Acetophenone.

Step 2 : - 2,4-Dichloro Acetophenone reacted with Bromine in presence of solvent Ethylene Dichloride to get 2,4-Dichloro Phenacyl Bromide.

Step 3 :- 2,4-Dichloro Phenacyl Bromide reacted with 1,2-Pentanediol in presence of Toluene to get 4-(2-Bromomethyl-4-Propyl-1,3-Dioxolane-2yl)-1,3-Dichlorobenzene.

Step 4 :- 4-(2-Bromomethyl-4-Propyl-1,3-Dioxolane-2yl)-1,3-Dichlorobenzene reacted with 1,2,4-Triazole in presence solvent Toluene to give final product Penconazole.

Chemical Reaction:

Step 1 :-

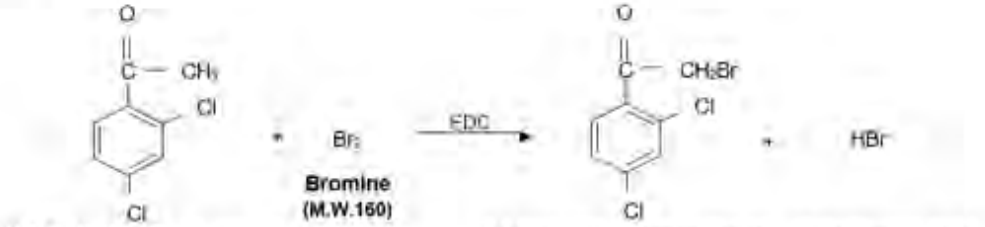
Meta-Dichloro Benzene
(M.W.147)

Acetyl Chloride
(M.W.78.5)

2,4-Dichloro Acetophenone
(M.W.189)

Hydrochloric Acid
(M.W.36.5)

Step 2 :-



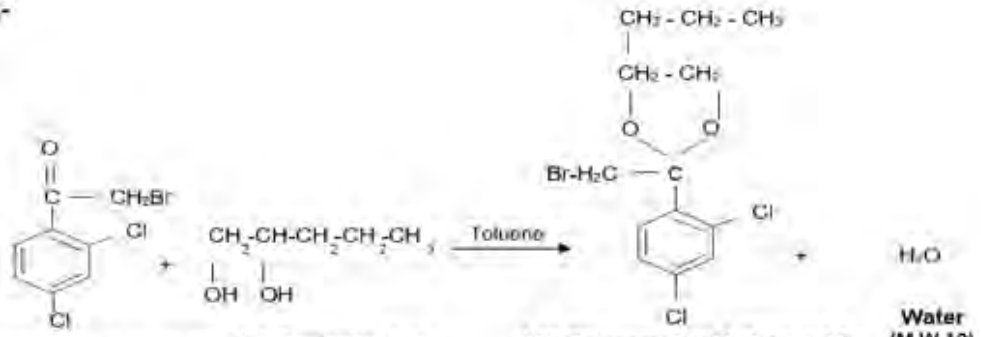
2,4-Dichloro Acetophenone
(M.W.207)

Bromine
(M.W.160)

2,4-Dichloro Phenocyl Bromi
(M.W.268)

HydroBromic Acid
(M.W.81)

Step 3 :-



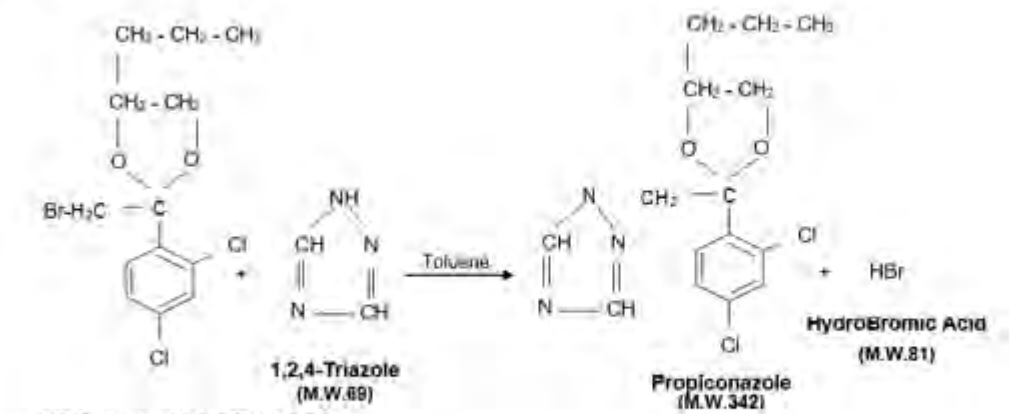
2,4-Dichloro Phenocyl Bromide
(M.W.268)

1,2-Pentanendiol
(M.W.104)

4-(2-Bromomethyl-4-Propyl-1,3-Dioxolane-2yl)-1,3-Dichlorobenzene
(M.W.354)

Water
(M.W.18)

Step 4 ;-

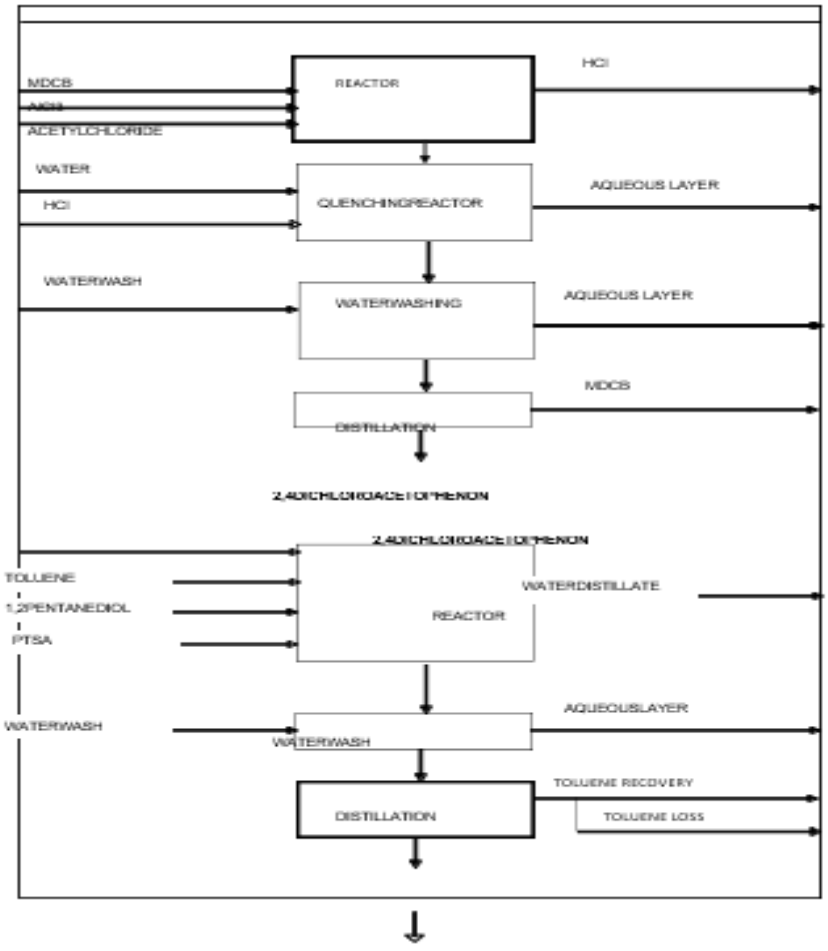


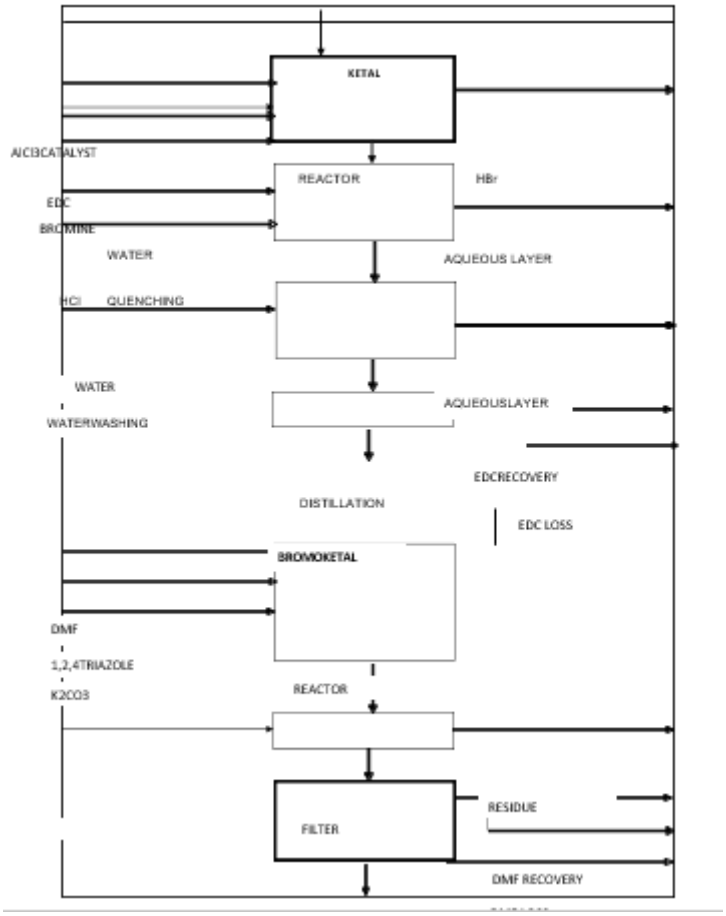
4-(2-Bromomethyl-4-Propyl-1,3-Dioxolane-2yl)-1,3-Dichlorobenzene
(M.W.354)

1,2,4-Triazole
(M.W.69)

Propiconazole
(M.W.342)

Process Flow:





Mass Balance:

	Material / Mass Balance of PROPICONAZOLE All Quantities are in kg)				
	IN – PUT			OUT – PUT	
Sr. No.	**Raw Materials / Items**	**Kg/Batch**		**Product / By product**	**Kg/Batch**
1	Meta Dichloro Benzene	460		PROPICONAZOLE	**1000**
2	Acetyl Chloride	245		20 % Aluminium Trichloride Solution	2800
3	Aluminium Trichloride	560		Recovered EDC	3880
4	Ethylene Dichloride	4000		EDC LOSS	120
5	Br_2	555		30% Hydrochloric Acid	380
6	1,2 Pentane Diol	330		27% HBr Solution	900
7	Catalyst	15		Recovered Catalyst	15
8	Water	3920		Recovered DMF	1455
9	Toluene	1200		Water to ETP	955
10	1,2,4 Triazole	215		DMF Loss	45
11	KOH	170		KBr	400
12	DMF	1500		Recovered Toluene	1170
13				Toluene Loss	30
14				Tarry Waste	20
	TOTAL	**13170**		**TOTAL**	**13170**

24. Difenoconazole

Manufacturing Process:

Step 1 :- Meta-Dichloro Benzene reacted with Acetyl Chloride in presence of Aluminum Chloride and solvent Ethylene Dichloride. This process gives product 2,4-Dichloro Acetophenone.

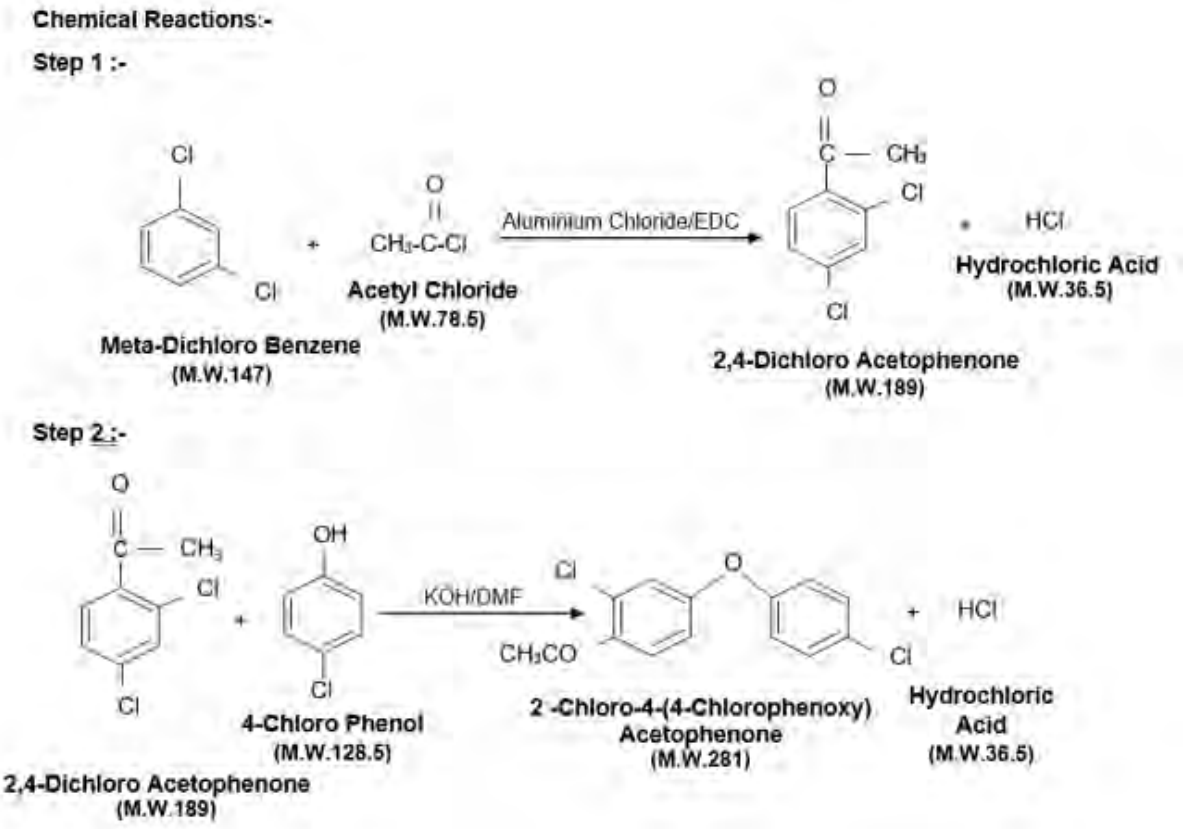
Step 2 :- 2,4-Dichloro Acetophenone further reacted with 4-Chloro Phenol in presence of Potassium Hydroxide and solvent DMF. This process gives product 2-Chloro-4-(4-Chlorohenoxy) Acetophenone.

Step 3 :- 2,-Chloro-4-(4-Chlorophenoxy) Acetophenone further reacted with Bromine in presence of catalyst and solvent Ethylene Dichloride . This process gives product 2,-Chloro-4-(4- Chlorophenoxy) Phenacyl Bromide.

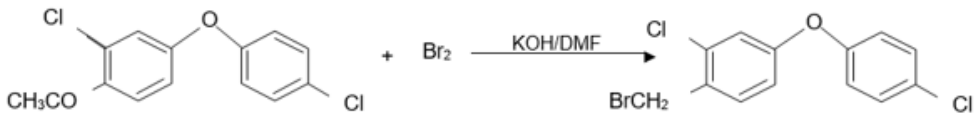
Step 4 :- 2,-Chloro-4-(4-Chlorophenoxy) Phenacyl Bromide reacted with Propylene Glycol in presence solvent Toluene to get product 3-chloro-4-(2-Bromomethyl-1,3-Dioxolane-2-yl)-4'-Chloro Diphenyl Ether.

Step 5 :- 3-chloro-4-(2-Bromomethyl-1,3-Dioxolane-2-yl)-4'-Chloro Diphenyl Ether further reacted with 1,2,4-Triazole in presence of Potassium Hydroxide and solvent DMF to get product final product Difenoconazole.

Chemical Reaction:



Step 3:-

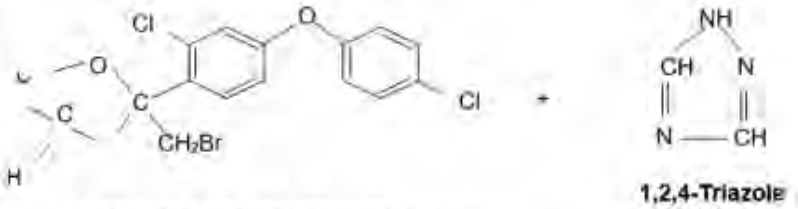


2, -Chloro-4-(4-Chlorophenoxy) Acetophenone (M.W.281)

Bromine (M.W.160)

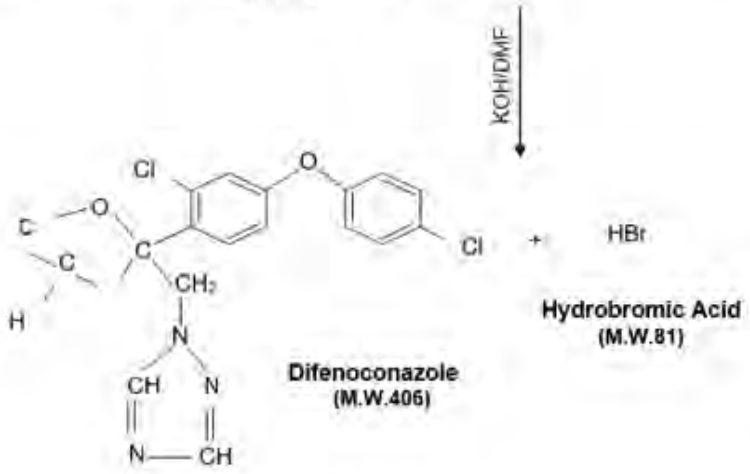
2, -Chloro-4-(4-Chlorophenoxy) Phenacyl Bromide (M.W.360)

Step 5 :-



3- **Dichloro-4-(2-Bromomethyl-4-Methyl-1,3- Dioxolane-2-yl)-4-Chloro Diphenyl Ether (M.W.418)**

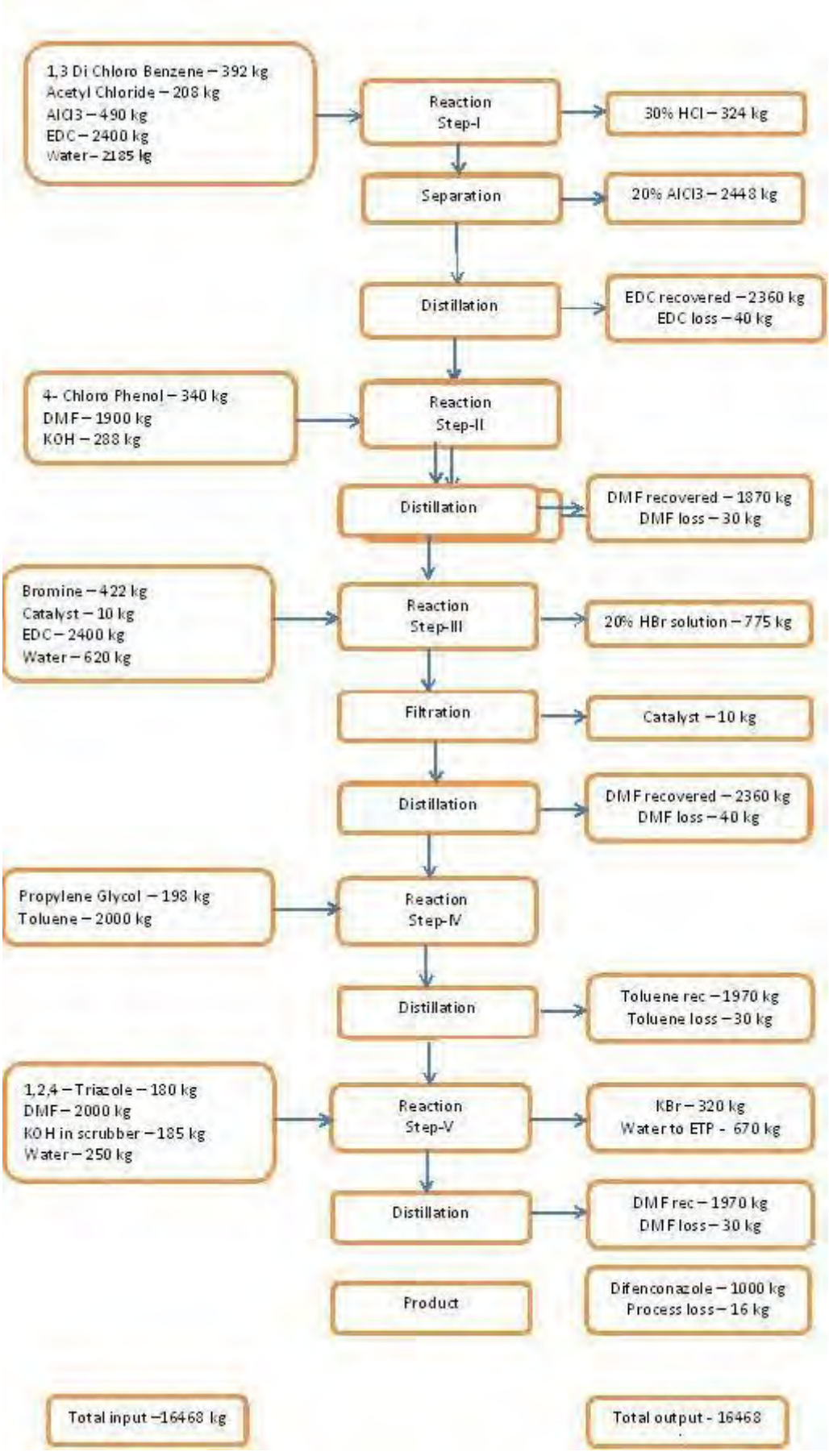
1,2,4-Triazole (M.W.69)



Difenoconazole (M.W.406)

Hydrobromic Acid (M.W.81)

Process Flow:



Mass Balance:

	Material / Mass Balance of DIFENCONAZOLE All Quantities are in kg)				
	IN – PUT			OUT – PUT	
Sr. No.	Raw Materials / Items	Kg/Batch		Product / By product	Kg/Batch
1	Meta-Dichlorobenzene	402		DIFENCOCANAZOLE	**1000**
2	Acetyl Chloride	225		Recovered EDC	2910
3	Aluminium Trichloride	520		Loss EDC	90
4	EDC	3000		20 % Aluminium Trichloride Solution	2600
5	4 Chloro Phenol	345		30% Hydrochloric Acid	312
6	Dimethyl Formamide	2100		Recovered Catalyst	10
7	Potassium Hydroxide	300		28% Hydrobromic Acid	740
8	Catalyst	12		Recovered Toluene	1170
9	Bromine	410		Loss Toluene	30
10	Proplyene Glycol	205		Recovered Dimethyl Formamide	2040
11	Toluene	1200		Loss Dimethyl Formamide	60
12	Water	3300		Potassium Bromide	315
13	1,2,4 Traizole	182		Tarry Waste	15
14				Aqueous Layer to ETP	709
15				Potassium Chloride	200
	TOTAL	**12201**		**TOTAL**	**12201**

25. Diafenthiuron

Manufacturing Process:

Step 1:- 2,6-Diisopropyl Aniline is undergoes Nitration reaction by concentrated Nitric Acid in Presence of Concentrated Sulphuric Acid and Solvent Toluene. This reaction gives out 2,6- Diisopropyl-4-Nitro Aniline as an Intermediate Product.

Step 2 :- 2,6-Diisopropyl-4-Nitro Aniline is further reacted with Phenol in presence of Potassium Hydroxide (30% KOH). This reaction gives out 2,6-Diisopropyl-4-Phenoxyaniline. Water gets separated after completion of reaction. Toluene Solvent is recovered under vacuum and 2,6- Diisopropyl-4-Phenoxyaniline is recrystallized from Methanol.

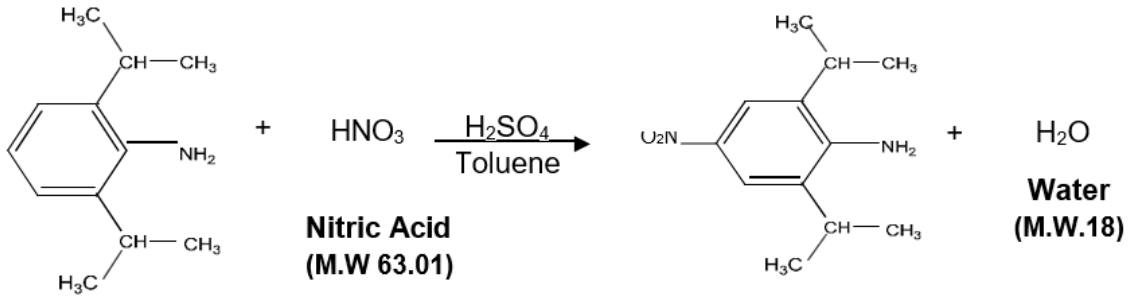
Step 3 :- 2,6-Diisopropyl-4-phenoxyaniline is further reacted with Thiophosgene in presence of Solvent- Ethylene Dichloride(EDC) and Calcium Carbonate. This reaction gives out 1,3-diisopropyl- 2-Isothiocyanato-5-Phenoxybenzene. After Completion of reaction Ethylene Dichloride (EDC) is recovered by distillation.

Step 4 :- Finally 1,3-Diisopropyl-2-Isothiocyanato-5-Phenoxybenzene is reacted with Tertiary Butyl Amine in presence of Solvent Toluene. This reaction gives out Diafenthiuron as a final product. After completion of reaction Toluene is distilled out from the reaction mass. Diafenthiuron is recrystallized from Methanol.

Chemical Reaction:

Chemical Reactions:-

Step 1 :-



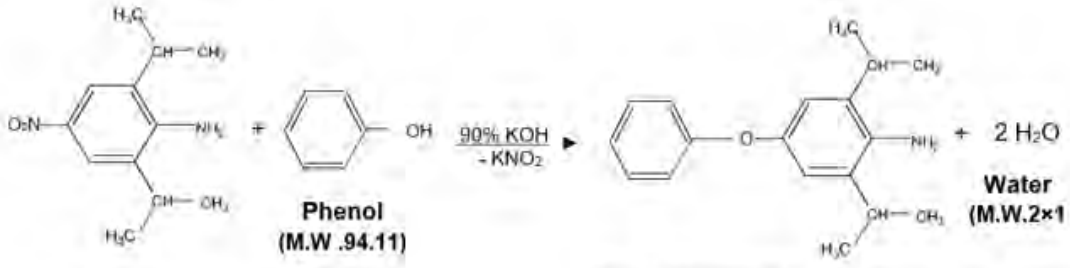
Nitric Acid
(M.W 63.01)

Water
(M.W.18)

2,6-Diisopropyl Aniline
(M.W 177.29)

2,6-Diisopropyl-4-Nitro Aniline
(M.W 222.20)

Step 2 :-



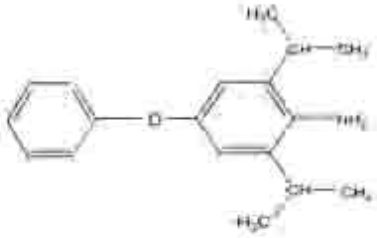
Phenol
(M.W .94.11)

Water
(M.W.2×1

2,6-Diisopropyl-4-Nitroaniline
(M W 222 20)

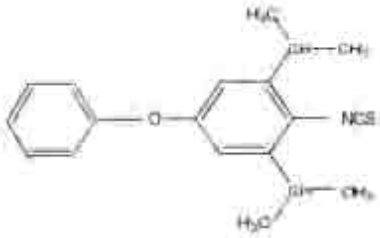
2,6-Diisopropyl-4-Phenoxy Aniline

Step 3 :-



2,6-Diisopropyl-4-Phenoxy Aniline
(M.W 269.90)

Thiophosgene
(M.W 114.98)



1,3-Diisopropyl-2-Isothiocyanato-5-Phenoxy Benzene
(M.W 311.44)

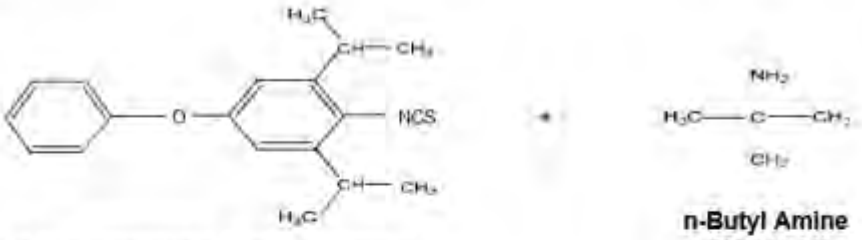
+ $CaCl_2$

Calcium Chloride
(M.W 110.98)

+ CO_2

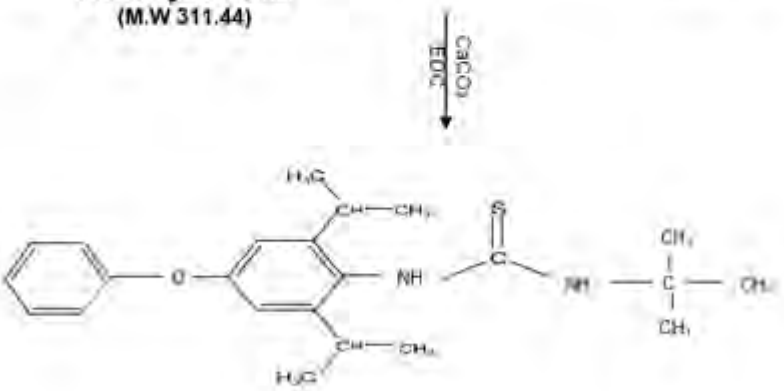
Carbon Dioxide
(M.W.44)

Step 4 :-



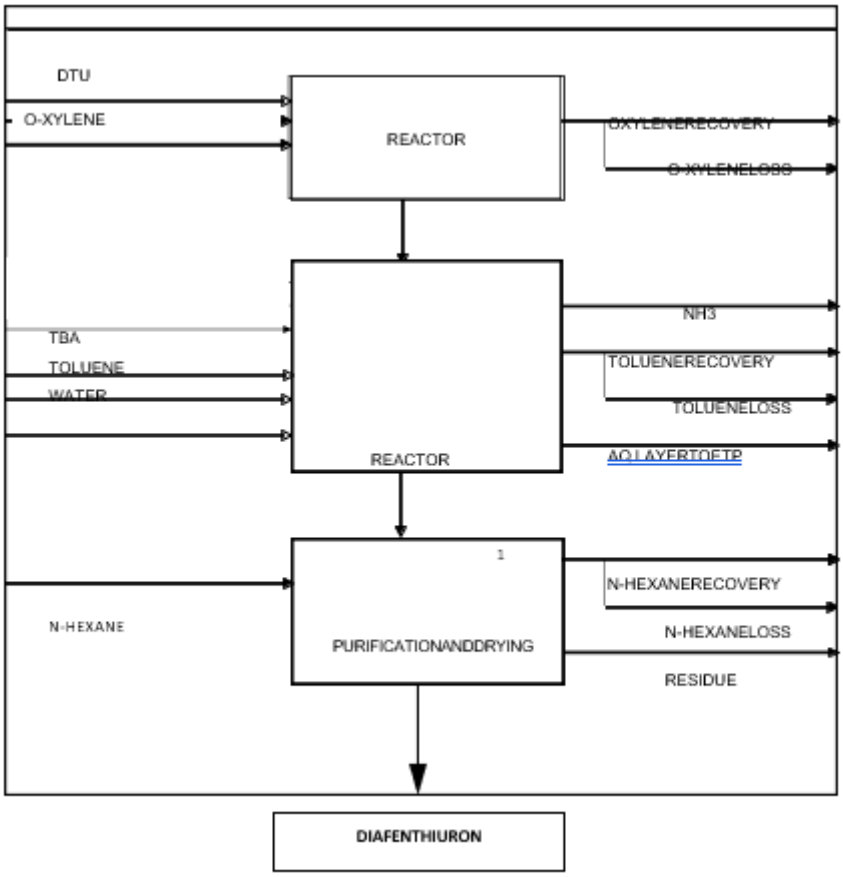
1,3-Diisopropyl-2-Isothiocyanato-5-Phenoxy Benzene
(M.W 311.44)

n-Butyl Amine
(M.W.73.14)



Diafenthiuron
(M.W.384.6)

Process Flow:



Mass Balance:

	Material / Mass Balance of DIAFENTHIURON All Quantities are in kg)				
	IN – PUT			**OUT – PUT**	
Sr. No.	**Raw Materials / Items**	**Kg/Batch**		**Product / By product**	**Kg/Batch**
1	2,6-Diisopropyl Aniline	490		Diafenthiuron	**1000**
2	Nitric Acid	174		Water	140
3	Potassium Hydroxide (30%)	686		Calcium Chloride	382
4	Phenol	260		Carbon Dioxide	70
5	Thiophosgene	317		Potassium Nitrite	221
6	Calcium Carbonate	278		Toluene Recovered	6838
7	Tert-Butyl Amine	202		Toluene Loss	21
8	Ethylene Dichloride (EDC)	3900		Toluene in Residue	189
9	Toluene	7050		Methanol Recovered	3810
10	Methanol	4000		Methanol Loss	13

	Material / Mass Balance of DIAFENTHIURON All Quantities are in kg)				
	IN – PUT			OUT – PUT	
Sr. No.	Raw Materials / Items	Kg/Batch		Product / By product	Kg/Batch
11	Water	1302		Methanol to Waste Water	40
12	Sulfuric Acid	31		Methanol in Residue	136
13				EDC Recovered	3822
14				EDC Loss	8
15				EDC in Residue	70
16				2,6-Diisopropyl Aniline	29
17				Thiophosgene	18
18				Phenol	15
19				Tert-Butyl Amine	14
20				Nitric Acid	12
21				Potassium Hydroxide	12
22				Calcium Carbonate	16
23				Sulphuric Acid	31
24				Waste Water	1783
	TOTAL	**18690**		**TOTAL**	**18690**

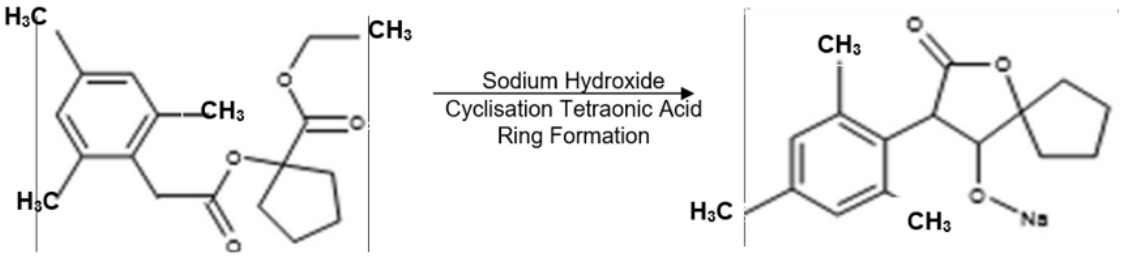
26. Spiromesifen

Manufacturing Process:

In the manufacturing process, 3,3-Dimethylpentanoyl chloride (DMPC) is reacted with 3- Mesityl-2-oxo-1-oxaspiro [4,4] non-3-ene (MOONE) in presence of solvent toluene, caustic and water. The aqueous later is separated out and the toluene solvent is distilled partially and crystallized, filtered and dried to get the product.

Chemical Reaction:

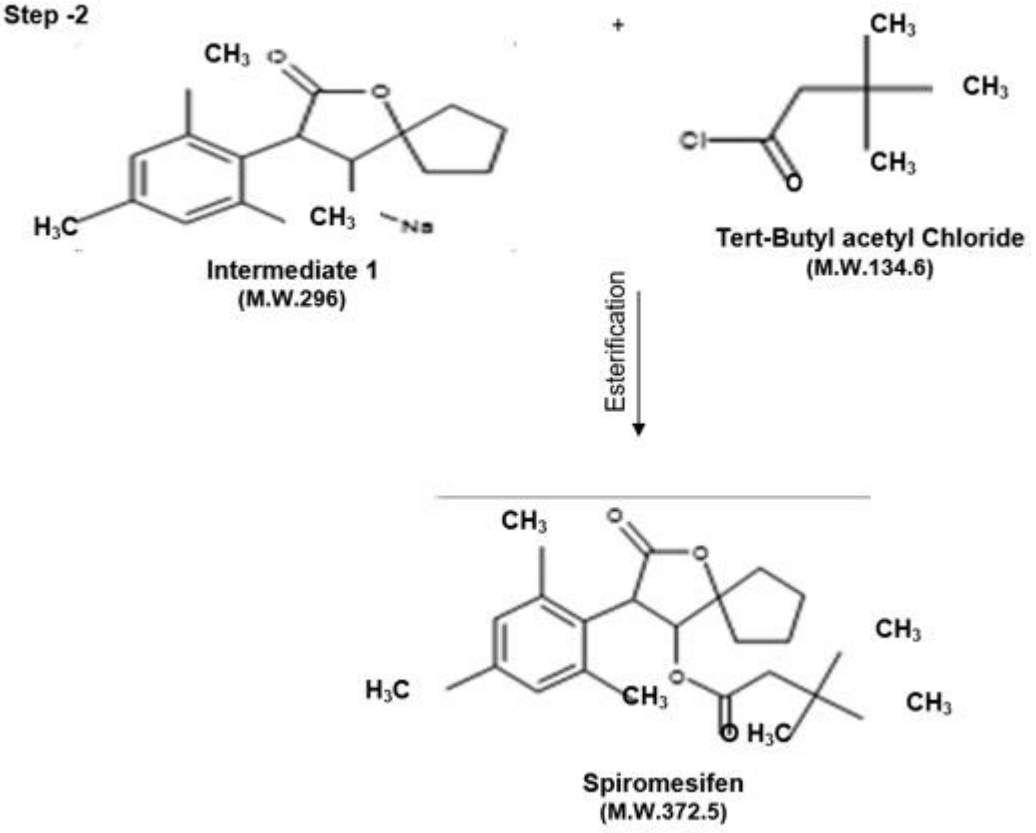
Step 1 :-



1-[2-(2,4,6-Trimethyl-Phenyl)-Acetoxy]-Cyclopentane Carboxylic Acid Ethyl Ester
(M.W.318.42)

Intermediate 1
(M.W.296)

Step -2

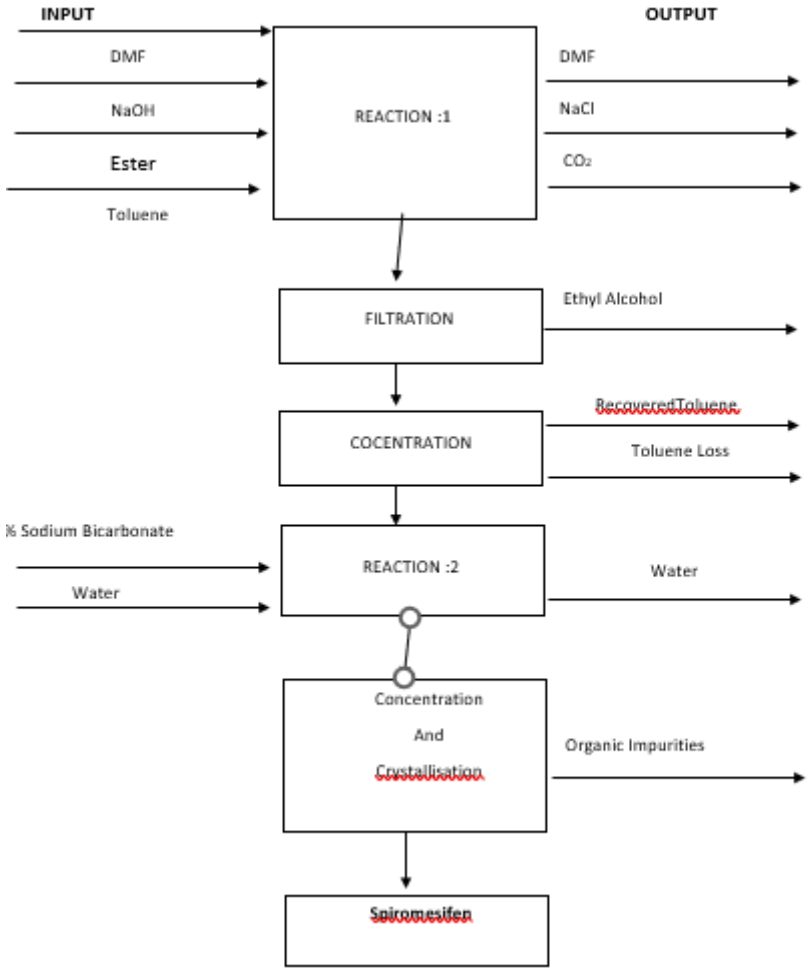


Intermediate 1
(M.W.296)

Tert-Butyl acetyl Chloride
(M.W.134.6)

Spiromesifen
(M.W.372.5)

Process Flow:



Mass Balance:

	Material / Mass Balance of SPIROMESIFEN All Quantities are in kg)				
	IN –PUT			**OUT – PUT**	
Sr. No.	**Raw Materials / Items**	**Kg/Batch**		**Product / By product**	**Kg/Batch**
1	DMF	1947		**Spiromesifen**	**1000**
2	NaOH	124		DMF	1947
3	Ester	941		Water	53
4	Toluene	1480		Ethyl Alcohol	135
5	TBAC	438		Water	2123
6	3% Sodium Bicarbonate	1480		NaCl	224
7	Water	592		CO_2	25
8	Water wash	500		Toluene Recovered	1465
9				Organic Impurities	125
10				Aq. wash	390

11				Toluene loss	15
	TOTAL	**7502**		**TOTAL**	**7502**

27. Pyriproxyfen

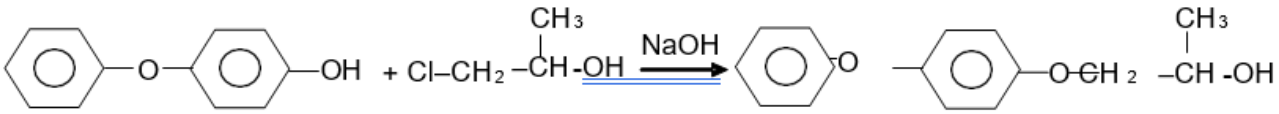
Manufacturing Process:

Step 1 :- 4-Phenoxy Phenol is reacted with 1- Chloro -2- Propanol in presence of Sodium Hydroxide to get 1- Methyl -2- (4- Phenoxy Phenoxy) Ethanol. This Intermediate is extracted by using the solvent – Toluene and then mass is filtered to isolate the Sodium Chloride salt & organic mass is taken for further stage.

Step 2 :- 1-Methyl -2- (4-Phenoxy Phenoxy) Ethanol reacts with 2- Chloro Pyridine in presence of Sodium Hydroxide to form Pyriproxyfen. This product is finally extracted by using Methanol – Solvent to isolate Sodium Chloride salt from the reaction mass. Filtrate ML is than taken for crystallization to get the pure product.

Chemical Reaction:

STEP – 1



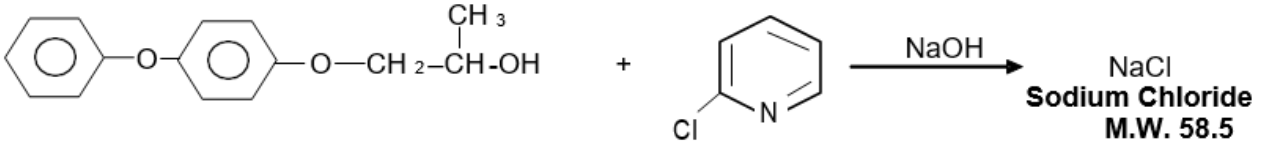
4- Phenoxy Phenol
M.W. – 186.0

1- Chloro 2 - Propanol
M.W. – 94.5

1- Methyl - 2- (Phenoxy Phenoxy)
Ethanol M.W. – 244.5

STEP – 2

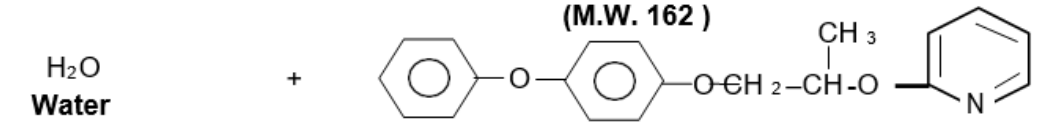
+ NaCl
Sodium Chloride
M.W. 5 8.5



Sodium Chloride
M.W. 58.5

1- Methyl - 2- (Phenoxy Phenoxy)
Ethanol M. W. – 244.5

2- Chloro Pyridine
M.W – 113.5
(M.W. 162)

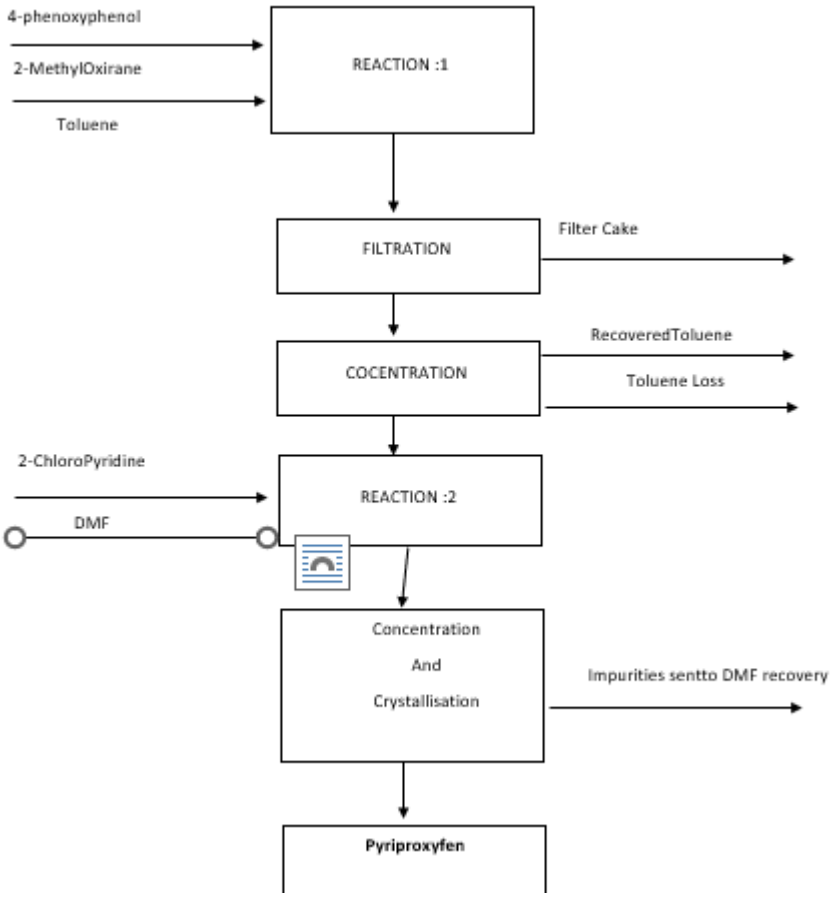


Water
M.W. 18.0

Pyriproxyfen
Pyripr

M.W. – 321.0

Process Flow:



Mass Balance:

	Material / Mass Balance of PYRIPROXYFEN All Quantities are in kg)				
	IN – PUT			OUT – PUT	
Sr. No.					
	Raw Materials / Items	Kg/Batch		Product / By product	Kg/Batch
1	4-Phenoxy Phenol	595		Pyriproxyfen	**1000**
2	1-Chloro -2-Propanol	305		Recovered Toluene	1640
3	Sodium Hydroxide	255		Toluene Loss	60
4	2-Chloro Pyridine	362		Sodium Chloride	378
5	Solvent -Toluene	1700		Water Distillate	130
6	Solvent - Methanol	1800		Recovered Methanol	1740
7	Water	660		Methanol Loss	60
8				Aqueous Layer to ETP	645
9				Distillation Residue	24
	TOTAL	**5677**		**TOTAL**	**5677**

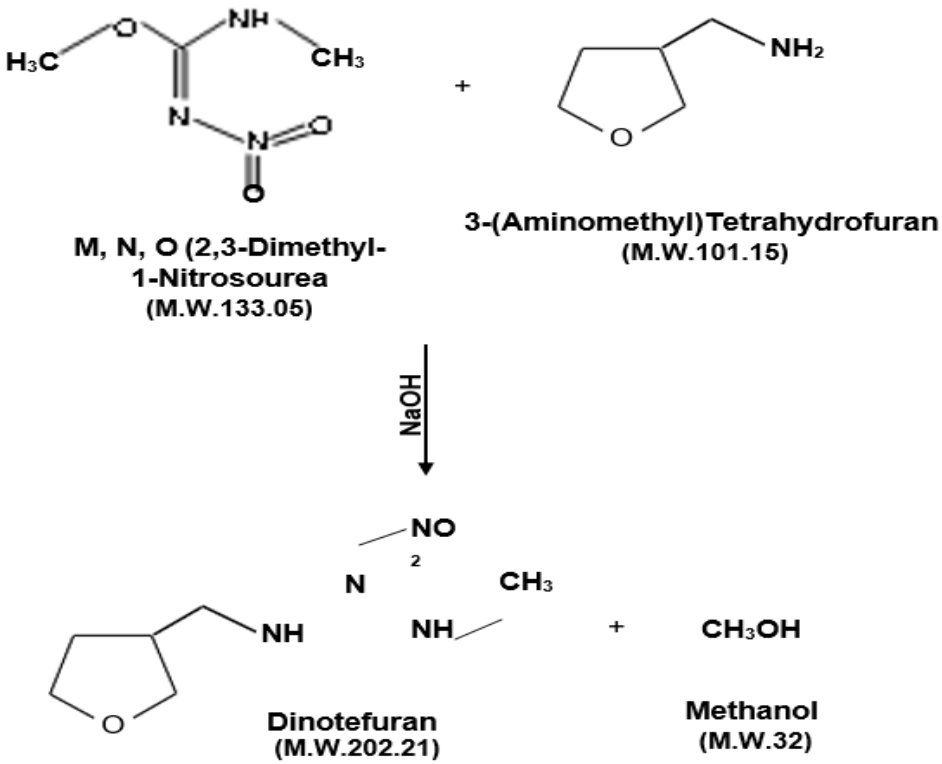
28. Dinotefuran

Manufacturing Process:

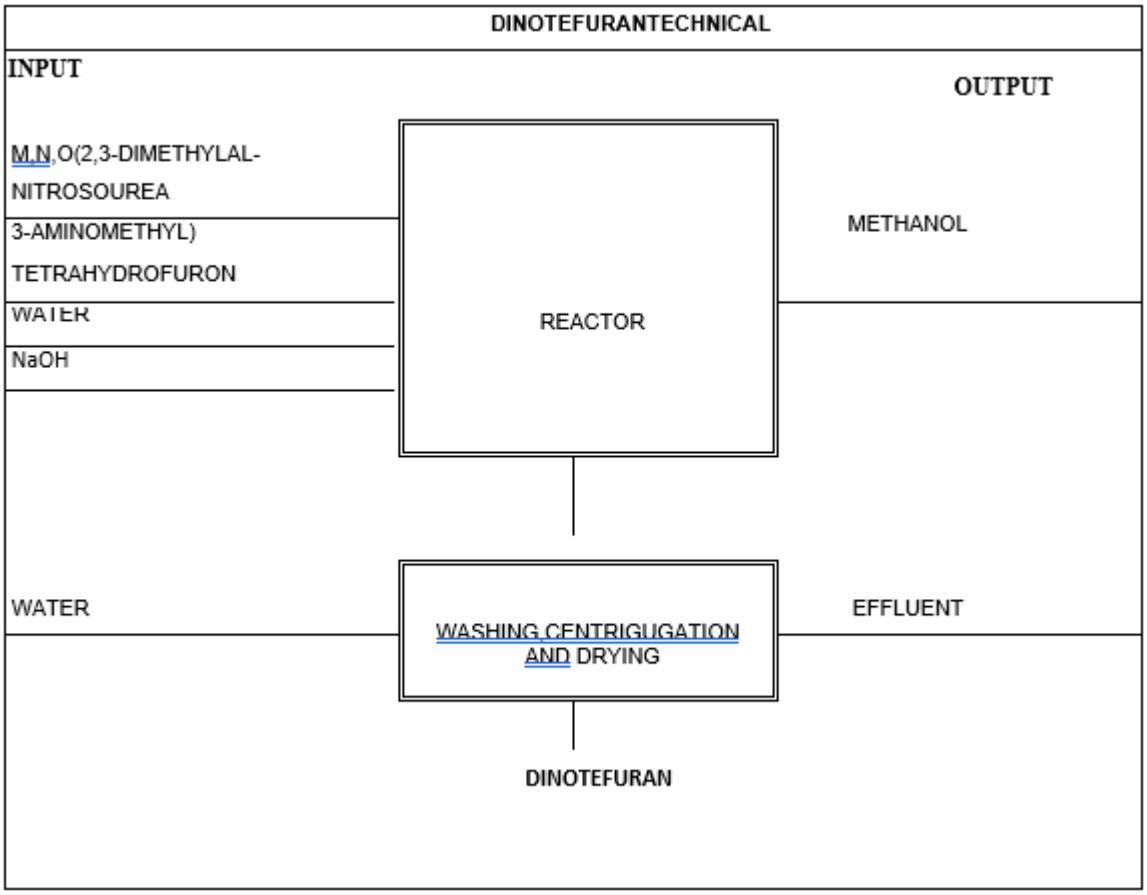
M,N,O (2,3-Dimethyl-1-Nitrosourea reacted with 3-(Amino methyl) Tetrahydrofuran in presence of Sodium Hydroxide. This Reaction gives out Dinetofuran as a Final Product. Methanol gets separated out from the reaction mass as a By-product.

Chemical Reaction:

Chemical Reactions:-



Process Flow:



Mass Balance:

	Material / Mass Balance of DINOTEFURAN All Quantities are in kg)				
	IN – PUT			**OUT – PUT**	
Sr. No.	**Raw Materials / Items**	**Kg/Batch**		**Product / By product**	**Kg/Batch**
1	M, N, O (2,3-Dimethylal-Nitrosourea	700		Dinotefuran	**1000**
2	3- Aminomethyl) Tetrahydrofuran	534		Methanol	160
3	Water	2400		Aqueous Layer	2494
4	NaOH	20			
	TOTAL	**3654**		**TOTAL**	**3654**

29. Imidacloprid

Manufacturing Process:

2 - Chloro, 5 - Chloromethyl Pyridine (CCMP) is reacted with N-– Nitro Imino Imidazolidine (N-NII) in present of Catalyst and Solvent to give the crude Product Imidacloprid.

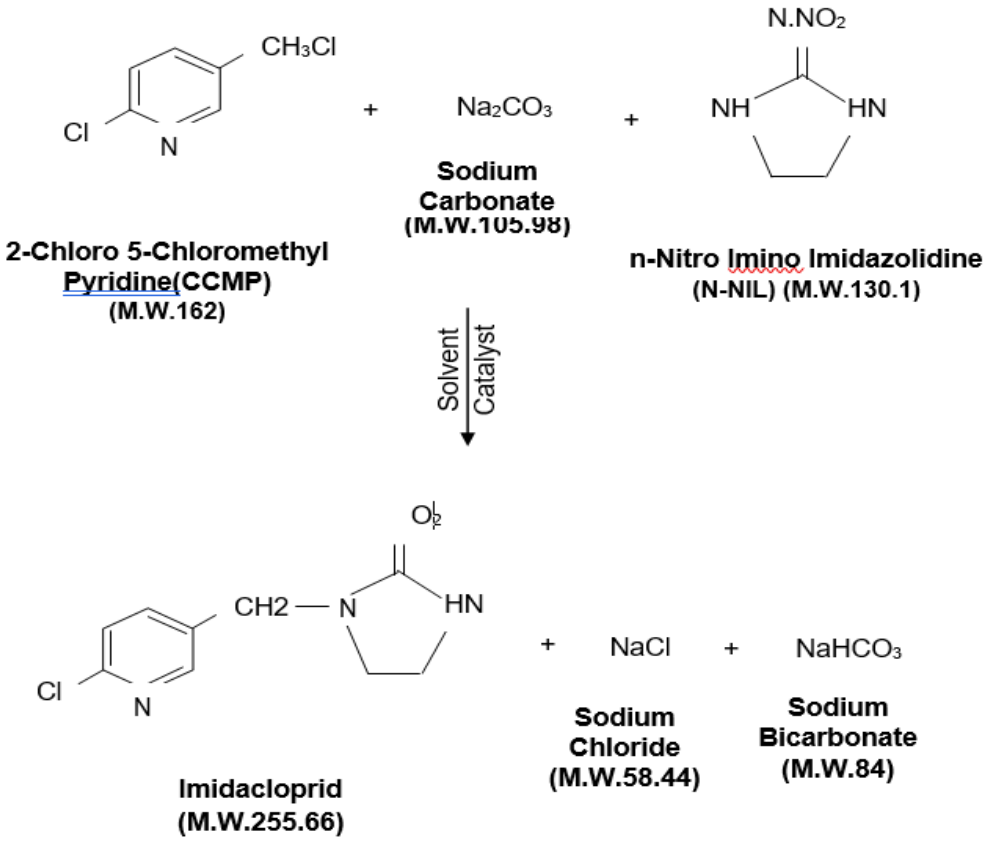
The Hydrochloric acid, which is formed during the reaction, is scavenged by putting Sodium Carbonate as acid scavenger. The resulting mass is diluted by water & filtered to remove the salts of Sodium Chloride (NaCl) &SodiumBicarbonate.

The organic mass is then treated with water and finally solvent is removed by distillation. The concentrated mass is then crystallized to get pure product – Imidacloprid (Tech).

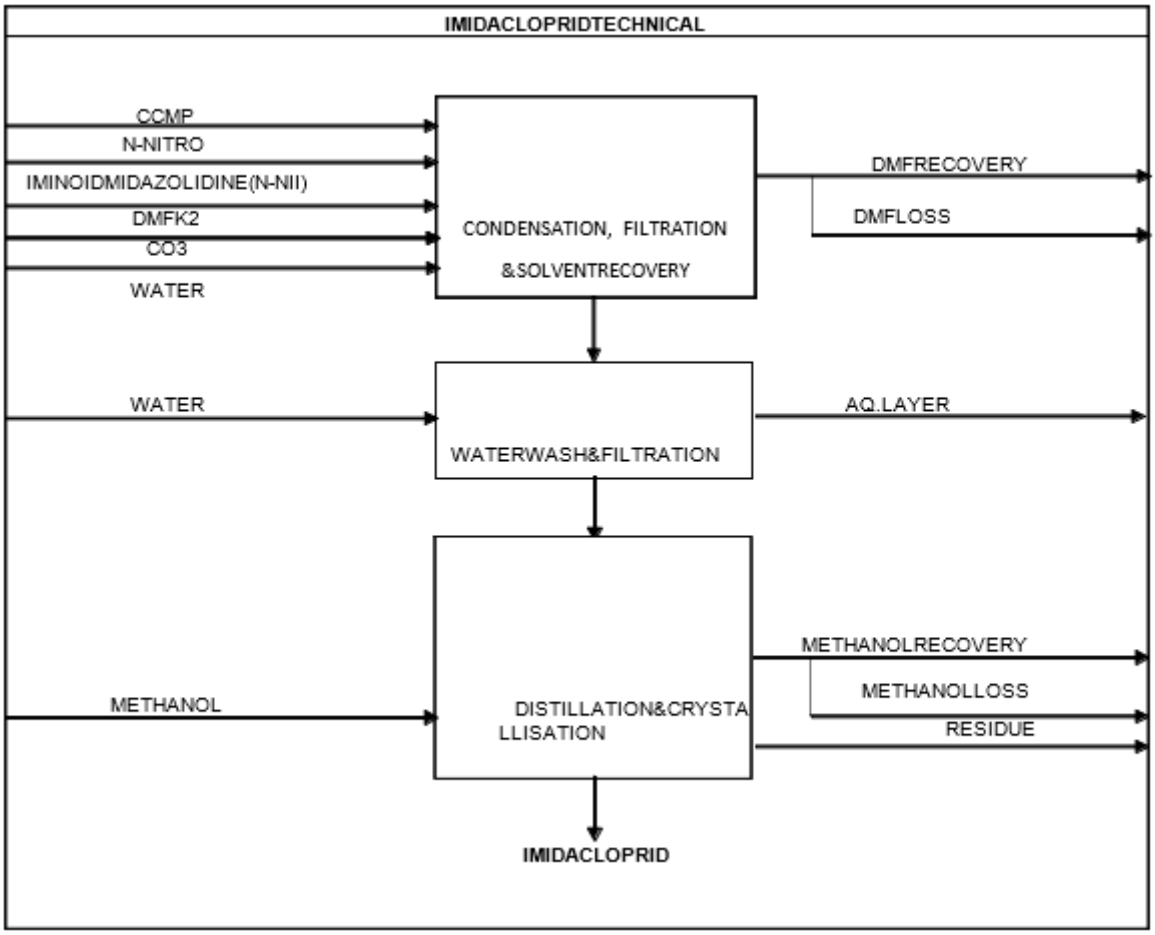
Finally, Toxic Effluent which contains traces of Pesticides is taken to Hydrolysis stage for detoxification, where aqueous mass is treated at high temperature by Alkali for the rapid hydrolysis of pesticides to simpler non-toxic compounds.

Chemical Reaction:

Chemical Reactions:-



Process Flow:



Mass Balance:

	Material / Mass Balance of IMIDOCLOPRID All Quantities are in kg)				
	IN – PUT			**OUT – PUT**	
Sr. No.	**Raw Materials / Items**	**Kg/Batch**		**Product / By product**	**Kg/Batch**
1	2- Chloro -5- Chloromethyl Pyridine	850		Imidacloprid	**1000**
2	N- Nitro N- Methyl Imidazolidine	750		Recovered Solvent DMF	2140
3	Sodium Carbonate	680		Solvent Loss DMF	60
4	Catalyst -1	10		Recovered Solvent Methanol	370
5	Solvent - DMF	2200		Solvent Loss Methanol	30
6	Water for Washings	1000		Aqueous Layer to ETP	2317
7	Caustic Lye 47 %	50		Distillation Residue	23

	Material / Mass Balance of IMIDOCLOPRID All Quantities are in kg)				
	IN – PUT			OUT – PUT	
Sr. No.	Raw Materials / Items	Kg/Batch		Product / By product	Kg/Batch
8	Solvent - Methanol	400			
	TOTAL	5940		TOTAL	5940

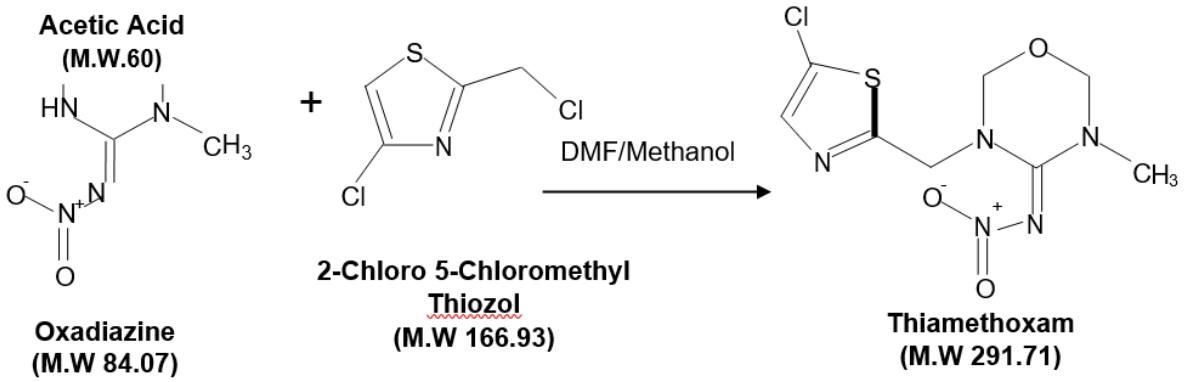
30. Thiamethoxam

Manufacturing Process:

3-Methyl 4-Nitro Imino Per hydro 1,3,5 Oxidiazineiscondensed with 2-Chloro 5-Chloromethyl Thiazole (CCMT) in presence of Solvent to form the final product Thiamethoxam. Organic mass contain solvent is taken for distillation. After it is diluted with water, neutralized with Hydrochloric Acid, cool it to form Crystal & filtered it to get product. Again re- slurry it in Spent Solvent.

Chemical Reaction:

Chemical Reactions:-

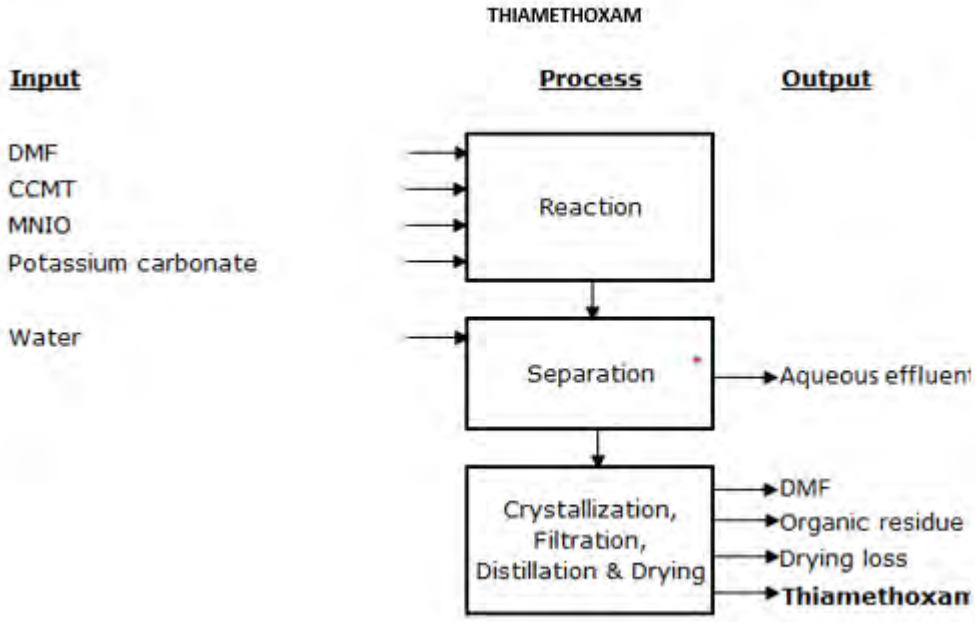


Oxadiazine (M.W 84.07)

2-Chloro 5-Chloromethyl Thiozol (M.W 166.93)

Thiamethoxam (M.W 291.71)

Process Flow:



Mass Balance:

	Material / Mass Balance of THIAMETHOXAM All Quantities are in kg)				
	IN PUT			OUT – PUT	
Sr.No.	Raw Materials / Items	Kg/Batch		Product / By product	Kg/Batch
1	2-Chloro 5-Chloromethyl Thiazole	883		Thiamethoxam	**1000**
2	3-Methyl 4-Nitroimino 1,3,5 Oxidiazine (MNIO)	962		Recovered DMF	3800
3	DMF	4000		DMF Loss	200
4	Methanol	2000		Recovered Methanol	1925
5	Caustic Soda Flakes	240		Methanol Loss	75
6	HCl (30%)	28		Aqueous Layer to ETP	2060
7	Water	1000		Distillation Residue	53
	TOTAL	**9113**		**TOTAL**	**9113**

31. Pymetrozine

Manufacturing Process:

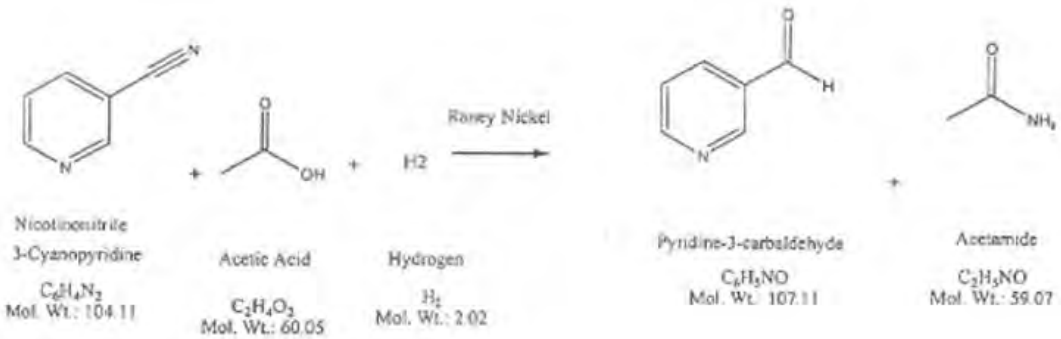
Step 1 :- 3- Cyano Pyridine undergoes hydrogenation reaction in presence of water, Acetic Acid & Catalyst (Moist Raney Nickel) under Pressure to give an intermediate as 3-Pyridine Carbaldehyde. After completion of reaction, resulted Product is isolated by filtration &Catalyst is recovered & recycled.

Step 2 :- Acetyl Amine Triazinone when reacted with Conc. Hydrochloric Acid (HCl) in presence of Solvent as water it gives second intermediate as 4-Amino-6-Methyl-3-Oxo-2,3,4,5-Tetrahydro-1,2,4- Triazin-3-(2H)-one . After completion of reaction, the reaction is treated by Caustic Lye & pH adjusted to slightly alkaline & this resulting Mass is then forwarded to next step for condensation as such.

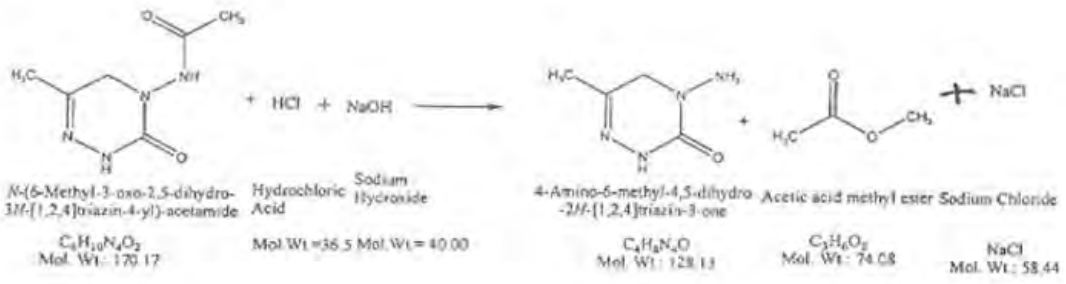
Step 3 :- 4-Amino-6-Methyl-3-Oxo-2,3,4,5-Tetrahydro-1,2,4-Triazin-3-(2H)-on undergoes condensation with 3-Pyridinaaldehyde in presence of Solvent- Methanol and maintain reaction for8.0 to 9.0 hours at 65 to 68°C. Finally, reaction mass cooled and filtered to give pure product as Pymetrozine Technical.

Chemical Reaction:

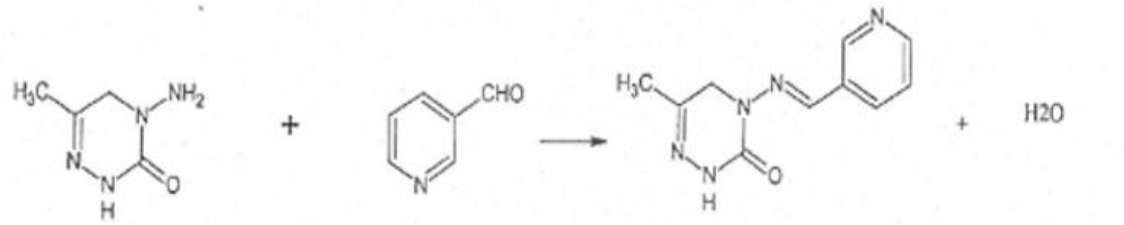
Step 1:-



Step 2:-



Step 3:-



Process Flow:

Mass Balance:

	Material / Mass Balance of PYMETROZINE All Quantities are in kg)				
	IN – PUT			OUT – PUT	
Sr. No.	**Raw Materials / Items**	**Kg/Batch**		**Product / By product**	**Kg/Batch**
1	3- Cyano Pyridine	532		Pymetrozine	**1000**
2	Water	4000		Recovered Solvent-Methanol	930
3	Catalyst- Raney Nickel	15		Methanol Loss	1070
4	Hydrogen Gas	51		Aqueous Layer to ETP	5880
5	Acetic Acid	368		Recovered Catalyst-Raney Nickel	14
6	Acetyl Amine Triazinone	870		Loss Catalyst- Raney Nickel	1
7	Concentrated HCl	623			
8	Caustic Soda Lye	436			
9	Solvent-Methanol	2000			
	TOTAL	**8895**		**TOTAL**	**8895**

32. Lamda-Cyhalothrin

Manufacturing Process:

Meta Phenoxy Benzaldehyde is reacted with Sodium Cyanide to form Meta Phenoxy Benzaldehyde Cyanohydrin as an intermediate. This on reaction with Tri Fluoro Propenyl Acid Chloride (TFP Acid Chloride) forms the Product

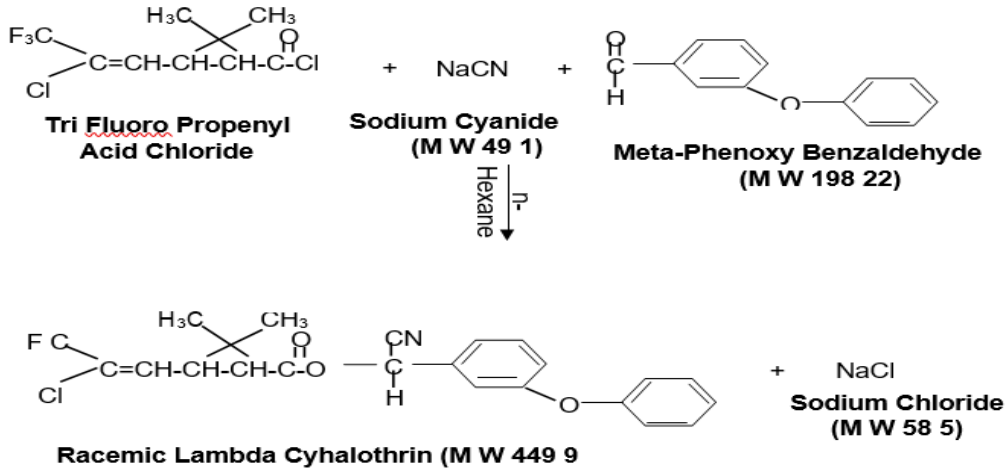
Cyhalothrin. In this process n - Hexane is used as solvent along with phase transfer Catalyst.The reaction mass of Cyhalothrin is washed by Soda Ash solution as well as water. Solvent- n- Hexane is stripped off to get pure Cyhalothrin oil. Finally, Cyhalothrin oil is epimerized to give Lambda Cyhalothrin of 85 % (Min.)

An aqueous layer which contains traces of Sodium Cyanide is detoxified by the treatment of Sodium Hypochlorite Solution (8 - 10%) up to < 0.2 ppm Level. Then it is mixed up with main ETP stream for further treatment & finally drained togutter.

Chemical Reaction:

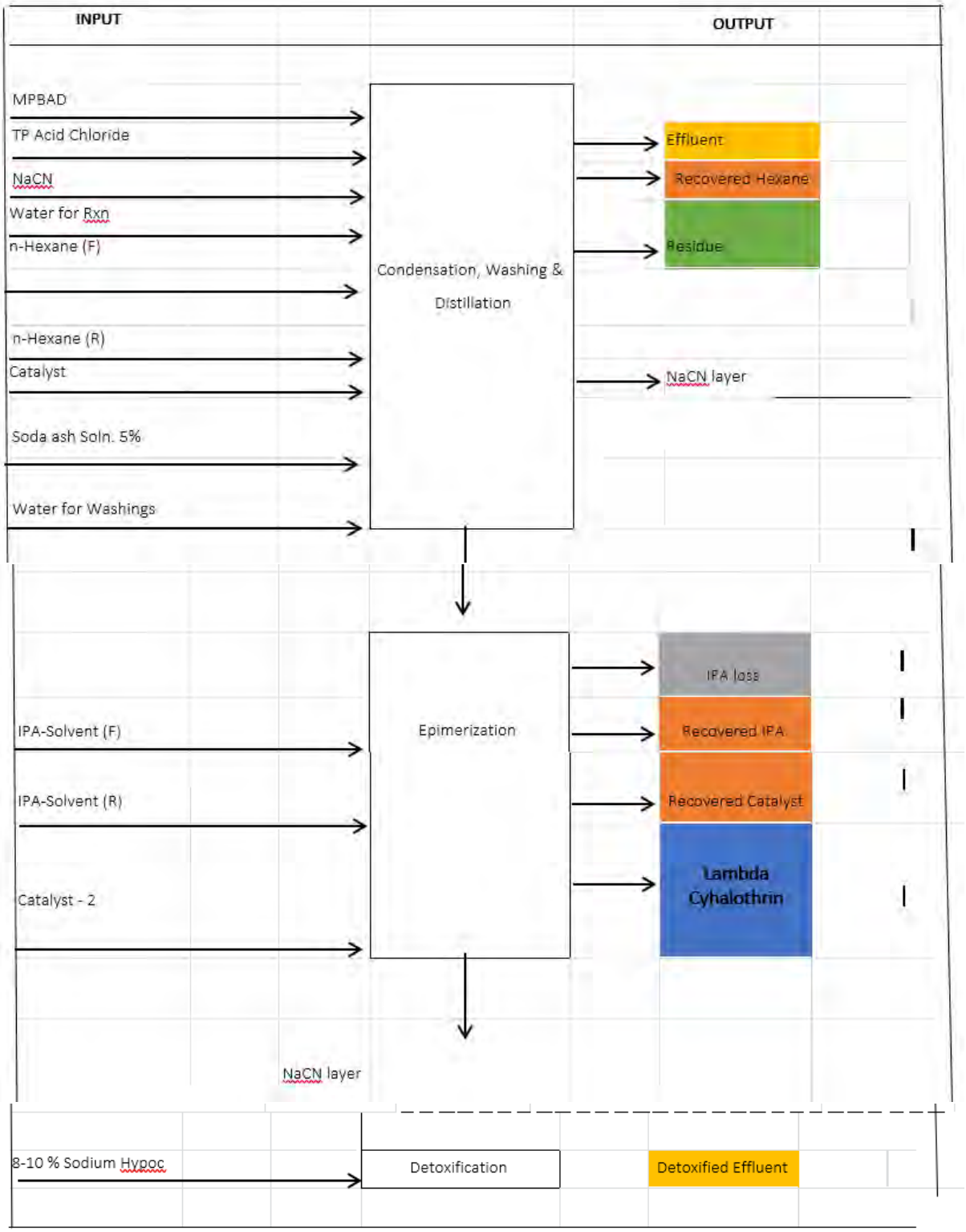
Chemical Reactions:-

Step 1 :-



Lambda Cyhalothrin (M W 449 9

Process Flow:



Mass Balance:

	Material / Mass Balance of LAMBDA CYHALOTHRIN All Quantities are in kg)				
	IN – PUT			OUT – PUT	
Sr. No.	Raw Materials / Items	Kg/Batc h		Product / By product	Kg/Batch

1	Meta Phenoxy Benzaldehyde	470		Lambda Cyhalothrin	1050
2	Lambda Acid Chloride	640		Recovered Solvent-n Hexane	2375
3	Water for Reaction	470		Solvent Loss n – Hexane	125
4	Sodium Cyanide	130		Recovered IPA + Catalyst	1154
5	Solvent –n- Hexane	2500		IPA + Catalyst Loss	56
6	5 % Soda Ash Solution	500		Detoxified Aqueous to ETP	2260
7	Water for washing	500			
8	8-10 % Sodium Hypochlorite Solution	600			
9	Solvent- IPA for Epimerization	1100			
10	Catalyst for Epimerization	110			
	TOTAL	**7020**		**TOTAL**	**7020**

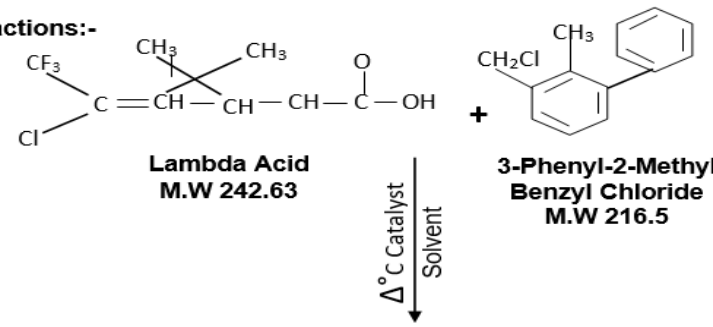
33. Bifenthrin

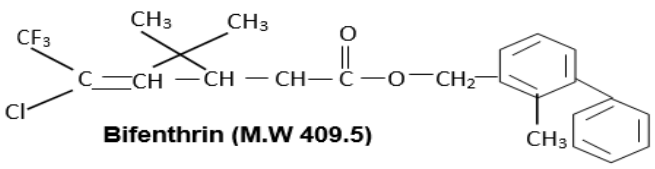
Manufacturing Process:

TFP Acid (Lambda Acid) is reacted with 3-Phenyl 2-Methyl Benzyl Chloride (PMBC) in presence of Solvent & catalyst to give the product Bifenthrin.

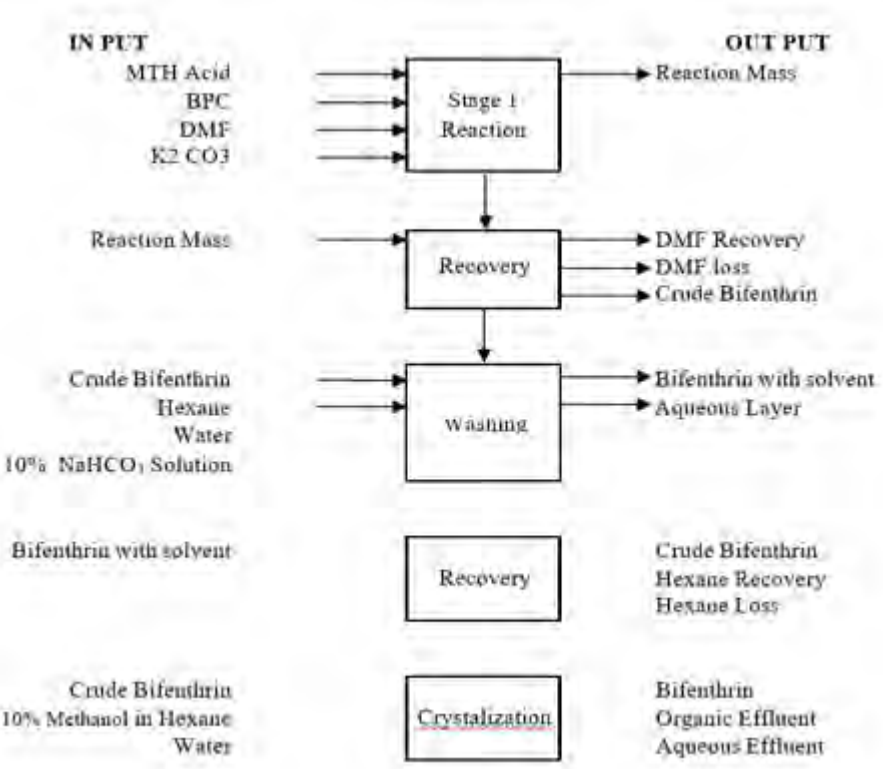
Chemical Reaction:

Chemical Reactions:-





Process Flow:



Mass Balance:

	Material / Mass Balance of BIFENTHRIN All Quantities are in kg)				
	IN – PUT			**OUT – PUT**	
Sr. No.	**Raw Materials / Items**	**Kg/Batch**		**Product / By product**	**Kg/Batch**
1	Lambda Acid	585		Bifenthrin	**1030**
2	3-Phenyl -2-Methyl Benzyl Chloride	558		Recovered Solvent - n Hexane	560
3	Catalyst	25		Solvent Loss n – Hexane	40
4	Solvent- Hexane	600		30 % HCl Solution	315
5	Water for HCl Solution	220		Distillation Residue	20
6	Water for Washing	500		Aqueous to ETP	523
	TOTAL	**2488**		**TOTAL**	**2488**

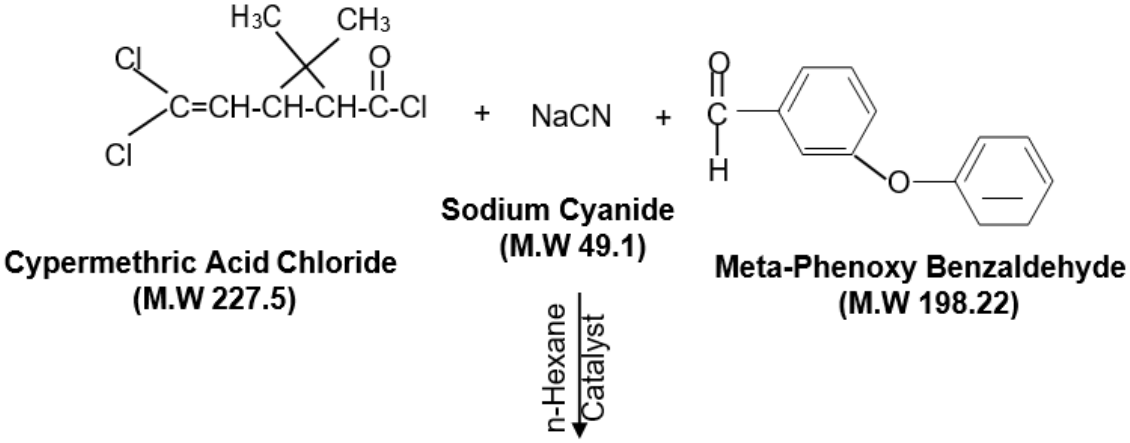
34. Cypermethrin

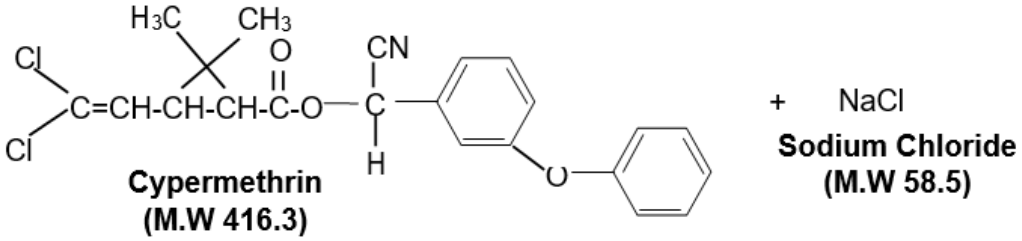
Manufacturing Process:

Meta Phenoxy Benzaldehyde is reacted with Sodium Cyanide to form Meta Phenoxy Benzaldehyde Cyanohydrin as an intermediate. This on reaction with Cypermethric Acid Chloride forms the final Product Cypermethrin. In this process n- Hexane is used as solvent along with phase transfer Catalyst. The reaction mass of Cypermethrin is washed by Soda Ash solution & Water. Finally, n-Hexane is stripped off to get pure Cypermethrin.

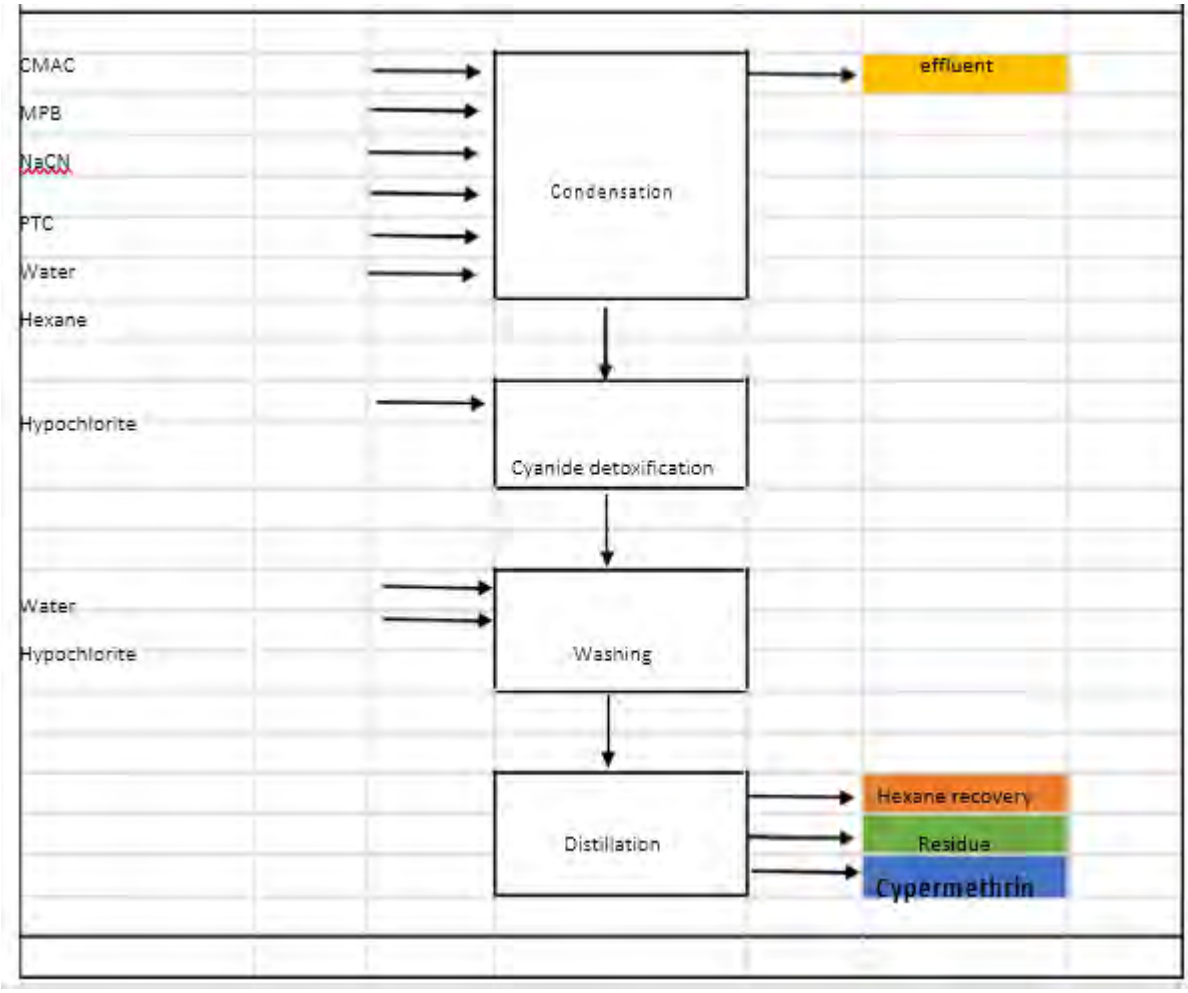
Aqueous layers which content traces of Sodium Cyanide is detoxified by the treatment of Sodium Hypochlorite 8 - 10% Solution to < 0.2 ppm Level.

Chemical Reaction:





Process Flow:



Mass Balance:

	Material / Mass Balance of CYPERMETHRIN All Quantities are in kg)				
	IN – PUT			**OUT – PUT**	
Sr. No.	**Raw Materials / Items**	**Kg/Batch**		**Product / By product**	**Kg/Batch**
1	Meta Phenoxy Benzaldehyde	500		Cypermethrin Tech	**1060**
2	Cypermethric Acid Chloride	585		Recovered Solvent n-Hexane	2900
3	Solvent n- Hexane	3000		Solvent Loss	100
4	Water for Reaction	500		Detoxified Aqueous Layer toETP	2520
5	Sodium Cyanide	135			
6	Catalyst	10			
7	4 % Soda Ash Solution	500			
8	2% Acetic Acid solution	500			

	Material / Mass Balance of CYPERMETHRIN All Quantities are in kg)				
	IN – PUT			OUT – PUT	
Sr. No.	Raw Materials / Items	Kg/Batch		Product / By product	Kg/Batch
9	10 % Sodium Hypochlorite Soln	850			
	TOTAL	**6580**		**TOTAL**	**6580**

35. Deltamethrin

Manufacturing Process:

Meta Phenoxy Benzaldehyde is reacted with Sodium Cyanide to form Meta Phenoxy Benzaldehyde Cyanohydrin as intermediate. This on reaction with Di Bromo vinyl Dimethyl Cyclopropane Carboxylic Acid Chloride – Deltamethric acid chloride (DMAC) of high cis > 96% form the product Deltamethrin oil as Racemic mixture. In this process n-Hexane is used as solvent along with phase transfer catalyst.

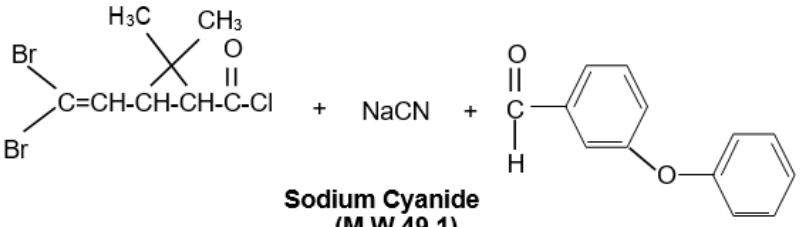
The solvent n-Hexane is then stripped off to get Deltamethrin oil in Racemic form which is then epimerized by catalyst in presence of IPA-solvent to form the final product Deltamethrin of >95% Purity

Aqueous layers of reaction stage as well as washings which contains traces of sodium cyanide is treated by sodium hypochlorite 8% solution to kill cyanide up to 0.2 ppm level, which is then mixed up with main effluent treatment plant (ETP) streams and after further treatment in effluent treatment plant drained to gutter.

Chemical Reaction:

Chemical Reactions:-

Step 1 :-

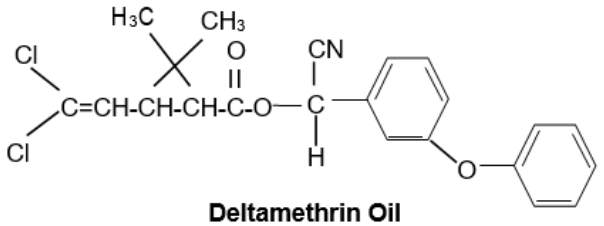


Deltamethrin Acid Chloride (M.W 316.6)

Sodium Cyanide (M.W 49.1)

Meta-Phenoxy Benzaldehyde (M.W 198.22)

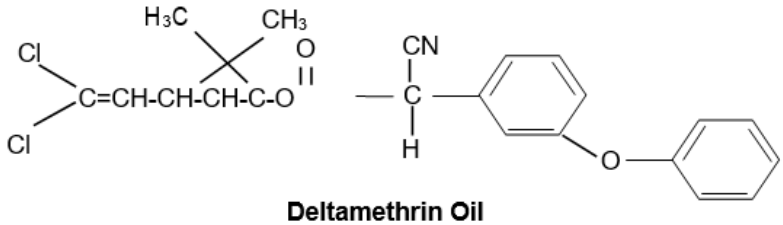
n-Hexane
Catalyst



+ NaCl

Deltamethrin Oil (M.W 505.2)

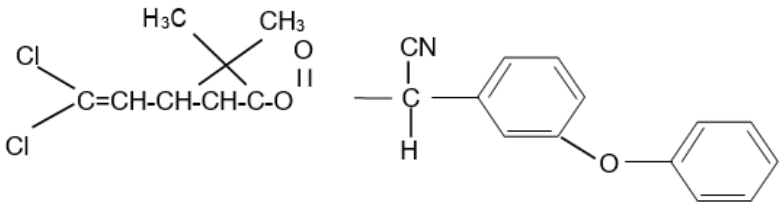
Sodium Chloride (M.W 58.5)



Deltamethrin Oil (M.W 505.2)

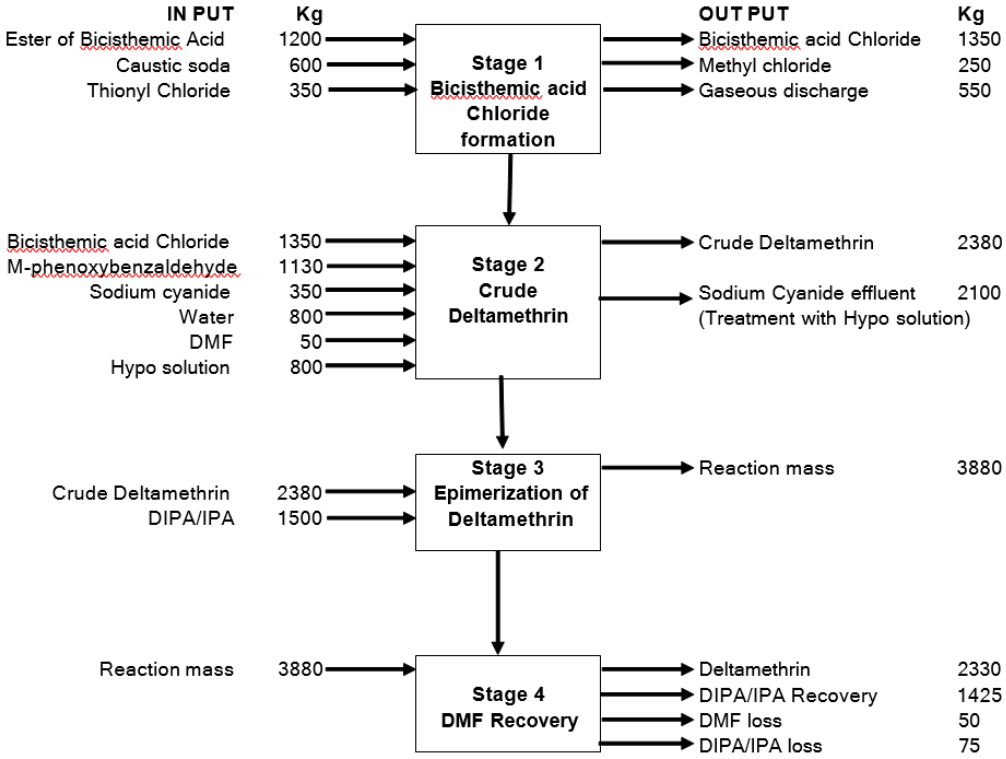
Step 2 :-

Epimerisation
IPA, Catalyst



Deltamethrin (M.W 505.2)

Process Flow:



Mass Balance:

	Material / Mass Balance of DELTAMETHRIN All Quantities are in kg)				
	IN – PUT			OUT – PUT	
Sr. No.	Raw Materials / Items	Kg/Batch		Product / By product	Kg/Batch
1	Meta Phenoxy Benzaldehyde	545		Deltamethrin	**1010**
2	DMAC - Deltamethric Acid Chloride	890		Recovered Solvent-n.Hexane	4295
3	Water for Reaction	745		Solvent Loss n - Hexane	205
4	Sodium Cyanide	150		Detoxified Aqueous to ETP	3717
5	Solvent –n- Hexane	4500		Recovered IPA + Catalyst	2465
6	Catalyst	12		Loss IPA + Catalyst	125
7	5 % Soda Ash Solution	500			
8	5 % Acetic Acid Solution	500			
9	Water for washing	500			

10	8-10 % Sodium Hypochlorite Soln	800			
11	IPA -Iso Propyl Alcohol	1450			
12	Catalyst for Epimerization	85			
13	IPA for crystallization & Washing	1140			
	TOTAL	**11817**		**TOTAL**	**11817**

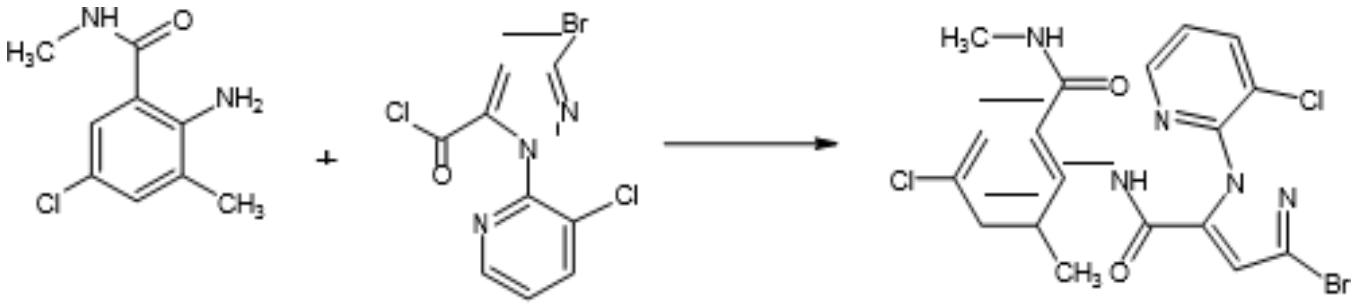
36. Chlorantraniliprole

Manufacturing Process:

The desired quantities of 2-Amino-5-Chloro-N,3-Dimethylbenzamide, Toluene, 3-Bromo-1-(3- Chloropyridin-2-yl)-1H-Pyrazole-5-Carbonyl Chloride and Triethyl Amine are charged in to the reactor and stirred at desired temperature until reaction is over.

Once the reaction is completed, water is added in to the reaction mass, Heat the mass up to desired temperature then layers are separated, Organic layer is cooled and the product is isolated by filtration and Solvent is recovered from ML for recycle.

Chemical Reaction:



2-amino-5-chloro-*N*,3-dimethylbenzamide

MF= $C_9H_{11}ClN_2O$
FW= 198.64944

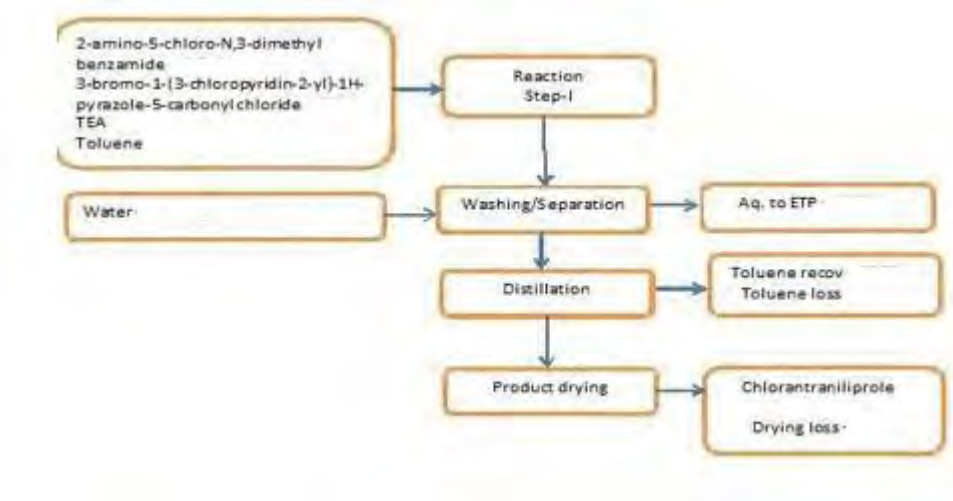
3-bromo-1-(3-chloropyridin-2-yl)-1 *H*-pyrazole-5-carbonyl chloride

MF= $C_9H_4BrCl_2N_3O$
FW= 320.95756

Chlorantraniliprole

MF= $C_{18}H_{14}BrCl_2N_5O_2$
FW= 483.14606

Process Flow:



Mass Balance:

	Material / Mass Balance of CHLORANTRANILIPROLE All Quantities are in kg)				
	IN – PUT			**OUT – PUT**	
Sr. No.	**Raw Materials / Items**	**Kg/Batch**		**Product / By product**	**Kg/Batch**
1	2-Amino-5-Chloro-N,3-Dimethylbenzamide	440		Chlorantraniliprole	**1000**
2	3-Bromo-1-(3-Chloropyridin-2-yl)- 1H-Pyrazole-5-Carbonyl Chloride	706		Toluene	2992
3	Triethyl Amine	225		Residue	146
4	Toluene	3150		Aq. Layer	2525
5	Water	2300		Drying Loss	158
	TOTAL	**6821**		**TOTAL**	**6821**

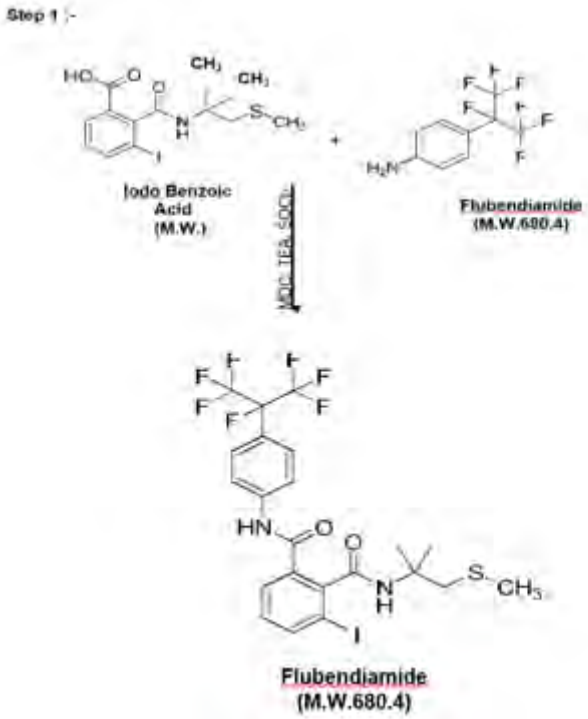
37. Flubendiamide

Manufacturing Process:

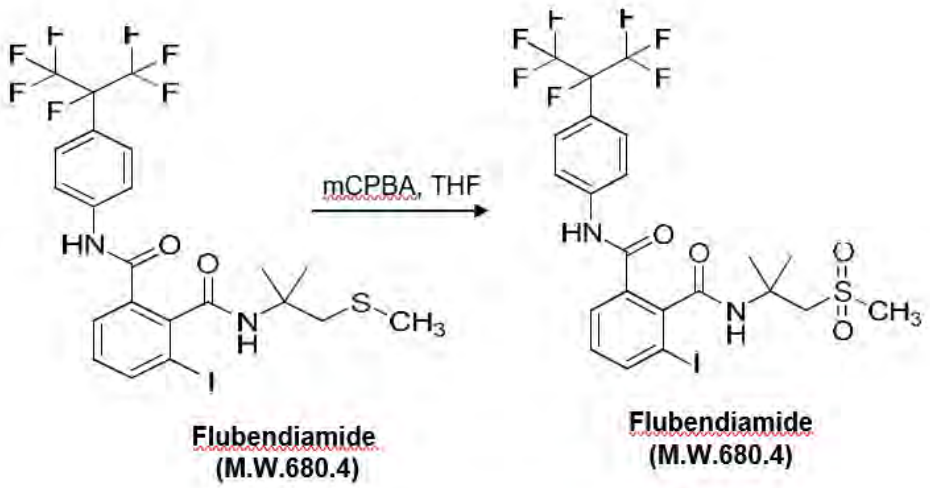
Iodo Benzoic Acid and TEA was dissolved in MDC. Into this Thionyl Chloride was added and stirred the mixture for few hours. After completion of reaction MDC and Thionyl Chloride was distilled completely. Crude mixture was again dissolved in MDC and Flubendiamide was added and stirred for 4h. After completion of reaction MDC was distilled out. Crude mixture was dissolved in THF and *m*CPBA was added portion wise and stirred for 2h. After completion of reaction THF is distilled out. Crude reaction mixture was dissolved in 10% $NaHCO_3$ solution white ppt was filtered off. Residue was washed with water and dried completely to get desired product as white powder.

Chemical Reaction:

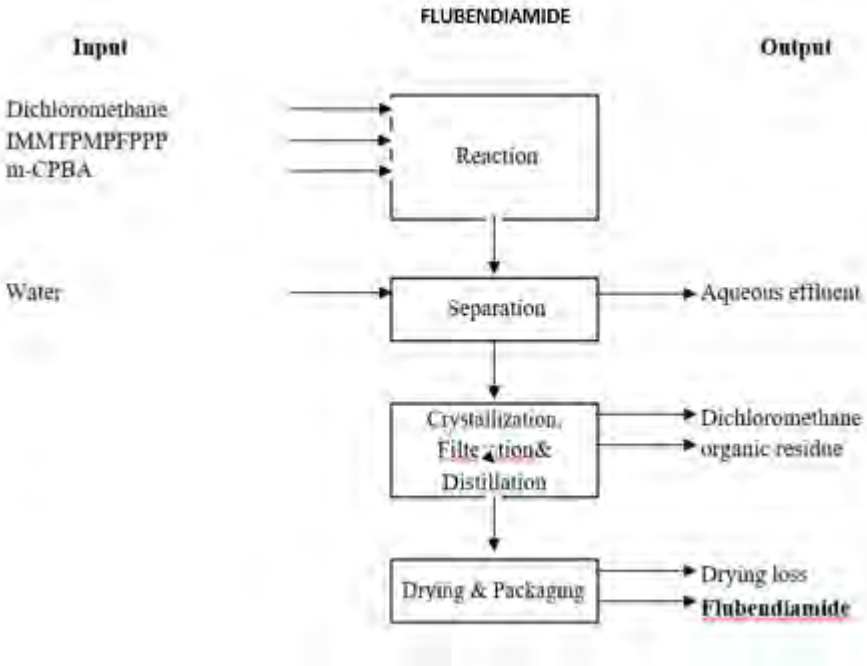
Step 1 :-



Step 2 :-



Process Flow:



Mass Balance:

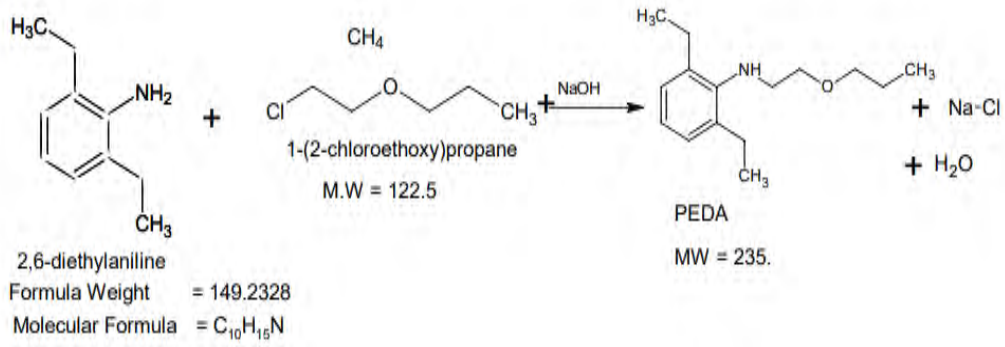
	Material / Mass Balance of FLUBENDIAMIDE All Quantities are in kg)				
	IN – PUT			OUT – PUT	
Sr. No.	Raw Materials / Items	Kg/Batch		Product / By product	Kg/Batch
1	Iodo benzoic Acid	618		Flubendiamide	**1000**
2	Amine	410		Recovered THF	3175
3	Thionyl chloride	187		Loss THF	165
4	TEA	159		Recovered MDC	2350
5	MDC	2472		Loss MDC	122
6	mCPBA	568		Waste Water	2800
7	THF	3340		Drying Loss	142
8	10% $NaHCO_3$	2000			
	TOTAL	**9754**		**TOTAL**	**9754**

38. PEDA

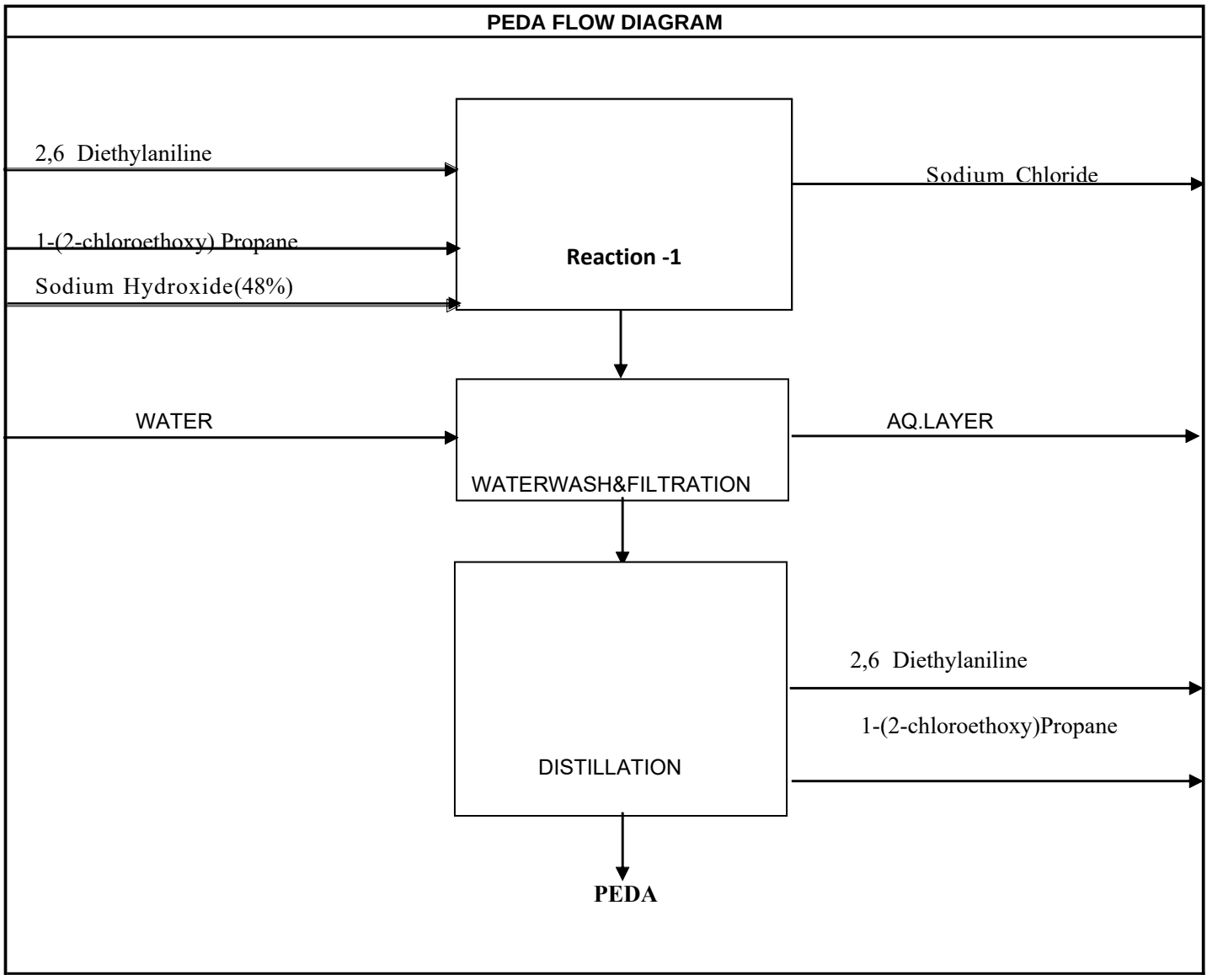
Manufacturing Process: 2,6 Diethyl aniline (DEA) is reacted with Chlo ro Propoxy ethane to give intermediate NPropoxy ethyl 2,6 Diethyl aniline hydrochloride ab ove 150 deg C. After reaction, the mass is

neutralized to pH 7 using caustic at room temperature. Aq. layer containing NaCl is separated out.

Chemical Reaction:



Process Flow:



Mass Balance:

Input	**Quantity (Kg/Batch)**	**Output**	**Quantity (Kg/Batch)**
2,6 Diethylaniline	528	PEDA	792
1-(2-chloroethoxy) Propane	434	Sodium Chloride	1197
Sodium Hydroxide (48%)	281	Water formed	1672
Water	2465	2,6 Diethylaniline	25
		1-(2-chloroethoxy) Propane	22
Total Input	**3708**	**Total Output**	**3708**

39. PMIDA

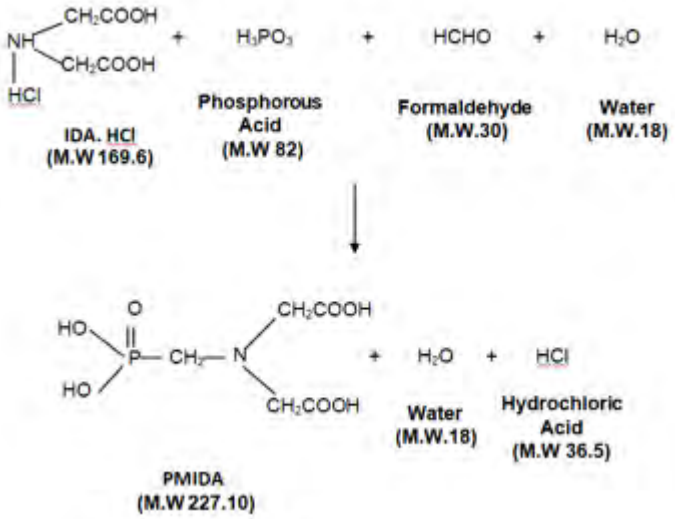
Manufacturing Process:

STEP-I: Charge DM water, IDA-HCl, Phosphorus acid and HCl in the reaction vessel. Stir the reaction mass for 1 hour. ChargeFormaldehyde solution slowly in the reaction mass in 4 hrs and stir the reaction mass at 1000 °C until reaction is complete.

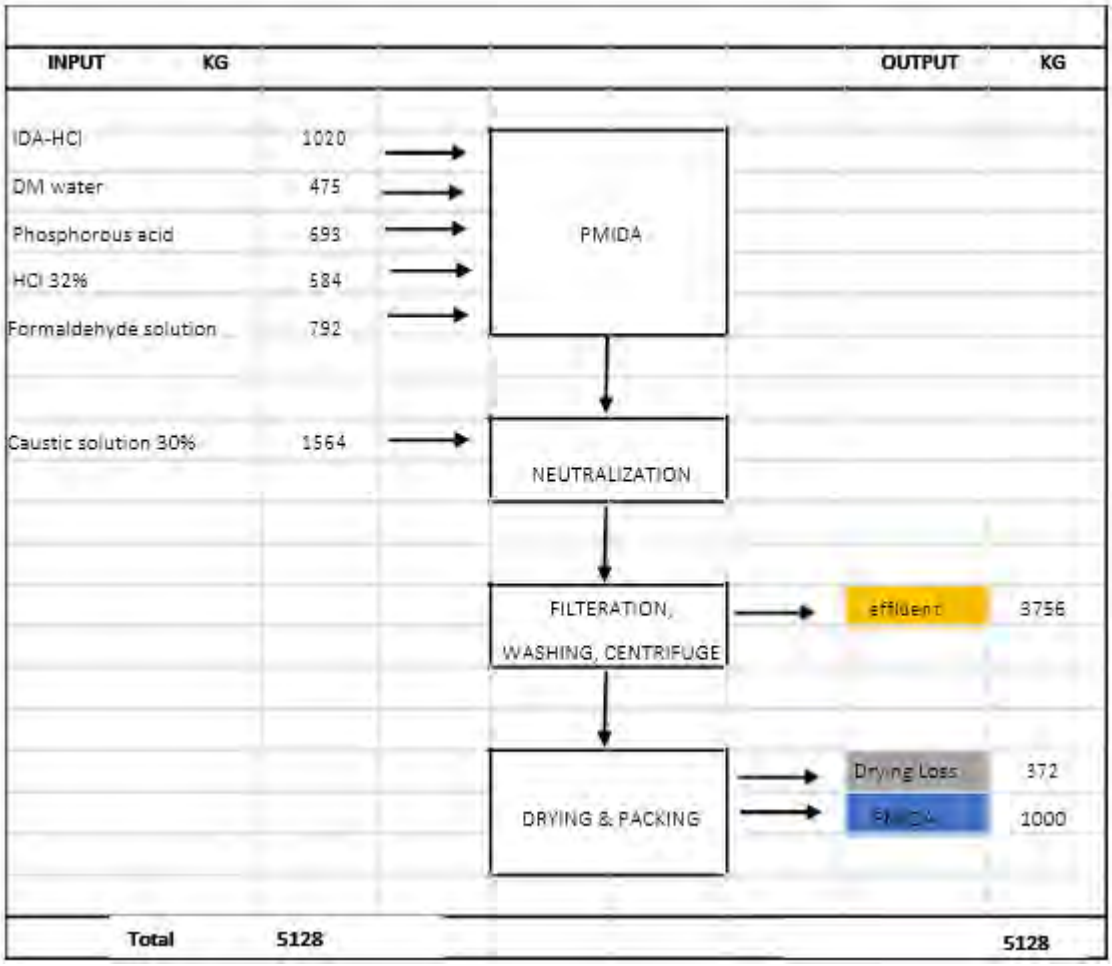
STEP-II: After complete the reaction material, cool it at 300 °C and neutralize with 30% caustic solution.

STEP-III: After neutralization cool it the material at 100 °C and filter and wash with water. Dry the wet PMIDA at 1000 °C.

Chemical Reaction:



Process Flow & Mass Balance:

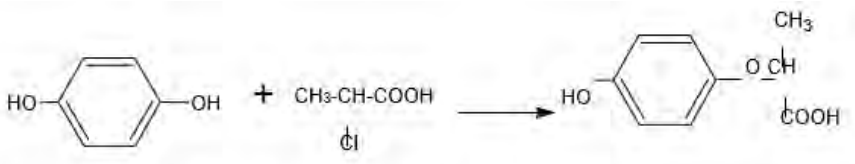


40. RHPPA

Manufacturing Process:

Preparation of (R)-2-(4-Hydroxyphenoxy)propanoic acid Hydroquinone reacts with 2-chloropropionic acid in presence of NaOH as base andsolvent Methanol to give (R)-2-(4-Hydroxyphenoxy)propanoic acid

Chemical Reaction:

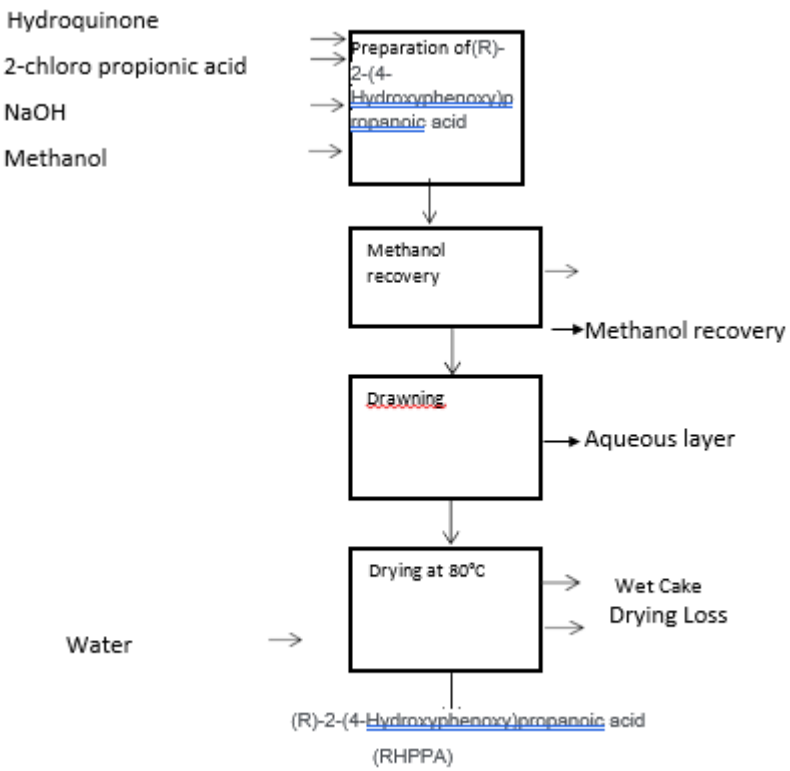


Hydroquinone M.wt. = 110

2-Chloro propionic acid M.wt. = 108.5

(R)-2-(4-Hydroxyphenoxy)propanoic acid M.wt. = 182

Process Flow:



Mass Balance:

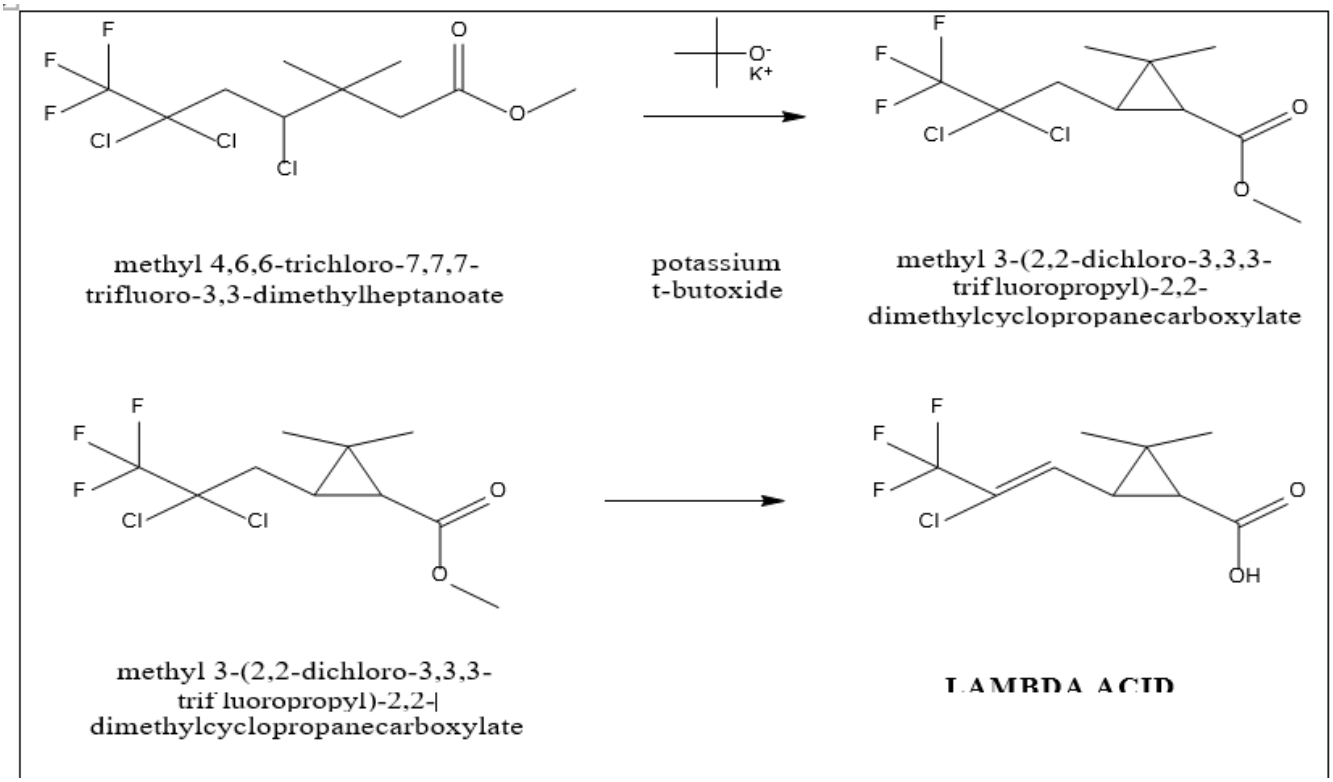
	Material/Mass Balance of RHPPA All Quantities are in kg)				
	IN–PUT			OUT–PUT	
Sr. No.	**RawMaterials/Items**	**Kg/Batch**		**Product/Byproduct**	**Kg/Batch**
1	Hydroquinone	755		RHPPA	**1000**
2	2-chloro propionic acid	856		Methanol Recovery	2215
3	NaOH	275		Water Loss	1979
4	Methanol	2307		Aqueous layer	355
5	Water	1990		Evaporation Loss	634
	TOTAL	**6183**		**TOTAL**	**6183**

41. LAMBDA ACID

Manufacturing Process:

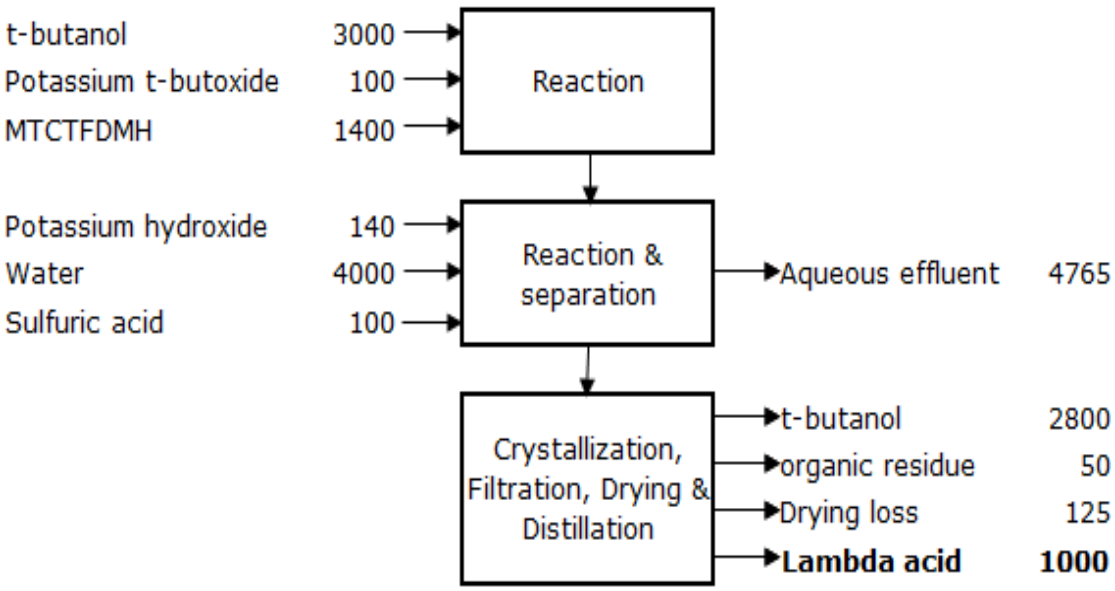
Charge t-butanol, potassium t-butoxide and cool to -15°C. Add methyl 4,6,6-trichloro-7,7,7-trifluoro-3,3- dimethylheptanoate (MTCTFDMH) and maintain for 8 hours. Charge potassium hydroxide and reflux for 6 hours. Cool to 20°C and add water. Add 50% sulfuric acid to pH 2 and separate the aqueous phase. Cool the organic phase to 0°C and filter the slurry. Dry the wet cake to obtain Lambda acid.

Chemical Reaction:



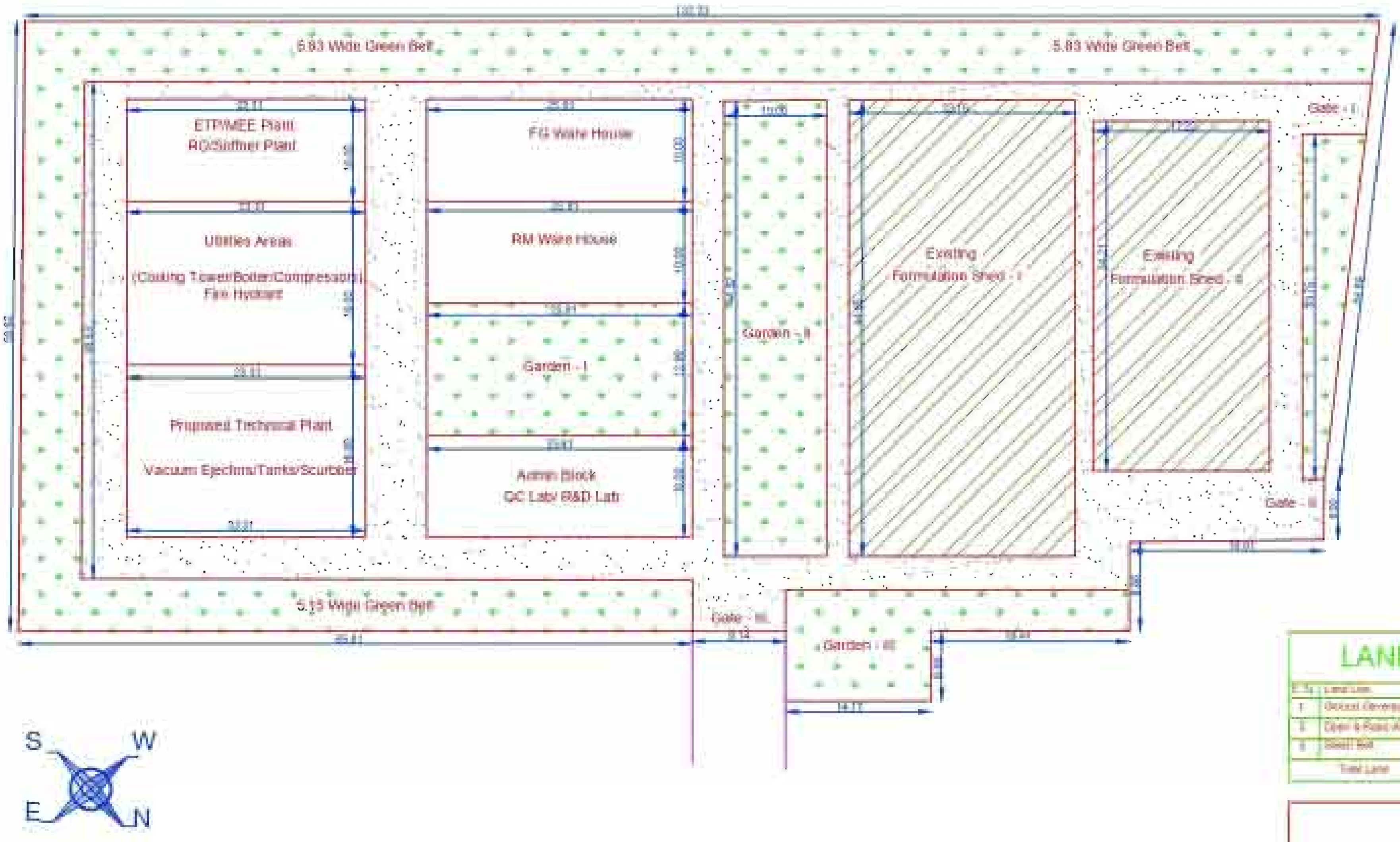
Process Flow & Mass Balance:

Input	Kgs	Process	Output	Kgs
t-butanol	3000	Reaction		
Potassium t-butoxide	100			
MTCTFDMH	1400			
Potassium hydroxide	140	Reaction & separation	Aqueous effluent	4765
Water	4000			
Sulfuric acid	100			
		Crystallization, Filtration, Drying & Distillation	t-butanol	2800
			organic residue	50
			Drying loss	125
			Lambda acid	**1000**
TOTAL	**8740**			**8740**



Annexure -VII

Layout Plan



LAND BREAKUP

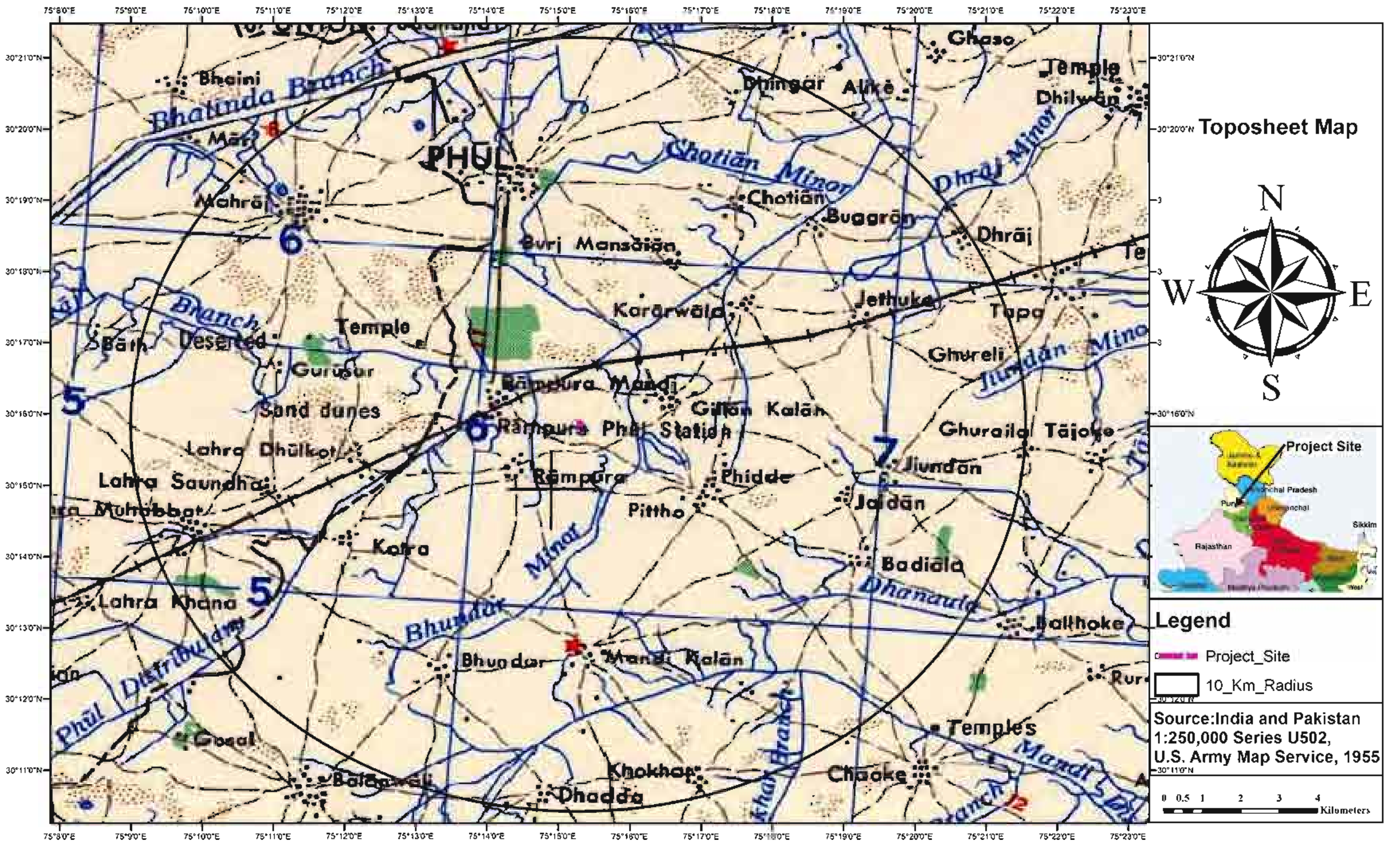
S. No.	Land Use	Area in SQ. MTR.	Area Percentage
1	Ground Coverage	[illegible]	[illegible]
2	Open & Road Area	[illegible]	[illegible]
3	Green Belt	[illegible]	[illegible]
	Total Land	[illegible]	[illegible]

All Dimensions are in meter otherwise specified.

Project No :-		
TITLE :-		
DRW BY :-	CHK BY :-	APPD BY :-
DATE :-	DATE :-	SCALE / REV.
DRW NO :-		0

Annexure -VIII

Topographical Map



Toposheet Map
N
S
E
W
Project Site
Rajasthan
Sikkim
Legend
Project_Site
10_Km_Radius
Source:India and Pakistan
1:250,000 Series U502,
U.S. Army Map Service, 1955
0 0.5 1 2 3 4
Kilometers
Ghaso
Temple
Dhilwan
Bhaini
Bhatinda Branch
Dhingar
Alike
Mari
PHUL
Chotian Minor
Dhraj Minor
Mahraj
Chotian
Buggran
Dhraj
Burj Mansaian
Branch
Jethuke
Tapa
Kararwala
Temple
Bath
Deserted
Gurusar
Ghureli
Jiundan Minor
Rampura Mandi
Gillan Kalan
Sand dunes
Rampura Phul Station
Ghuraila
Tajoke
Lahra Dhulkot
Jiundan
Rampura
Lahra Saundha
Phidde
Pittho
Jaidan
Muhabbat
Kotra
Minor
Badiala
Lahra Khana
Dhanaula
Ballhoke
Bhundar
Bhundar
Mandi Kalan
Phul Distributary
Goal
Temples
Khokhar
Chaoke
Balianwali
Dhadda
Mandi
Branch

Annexure -IX

Authorization of Consultant

Sai Ram Agritech Pvt. Ltd.
AN ISO 9001-2015 CERTIFIED COMPANY
Bathinda Barnala Road, Near P.B. Cold Store, Rampura Phul (Bathinda)-151103
Ph. No. 92166-26300-301 Office 97800-26310
E-mail: sairamagritech@gmail.com www.sairamagritech.in
S.C.O. 80-82, 4th Floor, Sector 34-A, Chandigarh

TO WHOMSOEVER IT MAY CONCERN

M/s Sai Ram Agritech Pvt. Ltd. having registered office at 1st Floor, Lehra Bazar, Rampura phul, Bathinda, Punjab-151103 for Project "**Proposed Expansion in "Pesticide Technical Manufacturing Unit" located at Village Rampura, Tehsil Rampura Phul, District-Bathinda, Punjab**"" has appointed M/s EQMS India Pvt. Ltd., having registered office at 304-305, 3rd Floor, Rishabh Tower, Plot No. 16, Community Centre, Karkardooma, Delhi-110092 (India) as environment consultant for the project. M/s EQMS India Pvt. Ltd. will carry out Environment Impact Assessment Study for the project and will present the project to MoEF&CC for obtaining the environmental clearance for the said project.

For, M/s Sai Ram Agritech Pvt. Ltd.

(Authorized Signatory)

Sai Ram Agritech Pvt. Ltd.
AN ISO 9001-2015 CERTIFIED COMPANY
Bathinda Barnala Road, Near P.B. Cold Store, Rampura Phul (Bathinda)-151103
Ph. No. 92166-26300-301 Office 97800-26310
E-mail: sairamagritech@gmail.com www.sairamagritech.in
S.C.O. 80-82, 4th Floor, Sector 34-A, Chandigarh

"AUTHORIZATION FOR "PROPOSED EXPANSION IN "PESTICIDE TECHNICAL MANUFACTURING UNIT" LOCATED AT VILLAGE RAMPURA, TEHSIL RAMPURA PHUL, DISTRICT-BATHINDA, PUNJAB BY M/S SAI RAM AGRITECH PVT. LTD"

We hereby authorize to **Mr. Deepak Bansal** to sign, submit and execute letter of intent with the various consultants and to make application, sign, submit, execute and deliver necessary papers, documents and deeds to various government or private authorities in order to get necessary approvals with respect to the project titled as mentioned above.

All acts, deeds and things done by **Mr. Deepak Bansal** for the purpose of this authorization shall be binding of the company.

For, **M/s SAI RAM AGRITECH PVT. LTD**

1. Director -1: (Deepak Bansal)

Sign.

2. Director -2: (Nirmla Devi)

Nirmla Devi
Sign.

Annexure -VII

NABET Accreditation Certificate

Quality Council of India

National Accreditation Board for Education & Training

CERTIFICATE OF ACCREDITATION

EQMS India Pvt Ltd.

305, 3rd Floor, Plot No. 16, Rishabh Towers, Community Centre, Karkardooma, Delhi – 110 092

The organization is accredited as Category-A under the QCI-NABET Scheme for Accreditation of EIA Consultant Organization, Version 3: for preparing EIA-EMP reports in the following Sectors –

Sl. No.	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1.	Mining of minerals- opencast only	1	1 (a) (i)	A
2.	Offshore and onshore oil and gas exploration, development & production	2	1 (b)	A
3.	River valley projects	3	1 (c)	A
4.	Thermal power plants	4	1 (d)	A
5.	Cement plants	9	3 (b)	B
6.	Chemical fertilizers	16	5 (a)	A
7.	Pesticides industry and pesticide specific intermediates	17	5 (b)	A
8.	Synthetic organic chemicals industry	21	5 (f)	A
9.	Pulp & paper industry excluding manufacturing of paper from wastepaper and manufacture of paper from ready pulp without bleaching	24	5 (i)	A
10.	Isolated storage & handling of Hazardous chemicals	28	-	B
11.	Airports	29	7 (a)	A
12.	Industrial estates/ parks/ complexes/areas, export processing Zones (EPZs), Special Economic Zones (SEZs), Biotech Parks, Leather Complexes	31	7 (c)	A
13.	Bio-medical waste treatment facilities	32A	7 (d a)	A
14.	Ports, harbours, break waters and dredging	33	7 (e)	A
15.	Highways	34	7 (f)	A
16.	Common Municipal Solid Waste Management Facility	37	7 (i)	B
17.	Building and construction projects	38	8 (a)	B
18.	Townships and Area development projects	39	8 (b)	B

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in RAAC minutes dated Jan 22, 2021 posted on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no. QCI/NABET/ENV/ACO/21/1661 dated March 15, 2021. The accreditation needs to be renewed before the expiry EQMS India Pvt Ltd, New Delhi following due process of assessment.

Sr. Director, NABET
Dated: March 15, 2021

Certificate No.
NABET/EIA/1922/RA 0197

Valid till
Nov 23, 2022

For the updated List of Accredited EIA Consultant Organizations with approved Sectors please refer to QCI-NABET website.