FORM-I

for

PROPOSED EXPANSION OF PESTICIDE & PESTICIDE INTERMEDIATES MANUFACTURING PLANT

of

M/s. COROMANDEL INTERNATIONAL LIMITED.
PLOT NO. Z/103/G, SEZ-2, DAHEJ, DIST: BHARUCH, GUJARAT, INDIA

AQUA AIR ENVIRONMENTAL ENGINEERS PVT. LTD.
(NABET/QCI Accredited EIA Consultant)
NABET/EIA/2023/IA0062 (Rev.03) Valid Up to Oct. 07, 2023
(MoEF Accredited Testing Laboratory): 15018/24/2019-CPW
(NABL Accredited Testing Laboratory): TC - 7328
(GPCB Recognized Schedule-II Environmental Auditor)
ISO 9001: 2015 Certified Company
OHSAS 18001: 2007 Certified Company

APPENDIX I
(See paragraph - 6)
FORM 1

Sr. No.	Item	Details
1.	Name of the project/s	Proposed Expansion of Pesticide & Pesticide Intermediates Manufacturing Plant Of **M/s. Coromandel International Limited.,** Plot No. Z/103/G, SEZ-2, Dahej, Dist: Bharuch, Gujarat, India.
2.	S. No. in the schedule	5(b)
3.	Proposed capacity/area/length/tonnage to be handled/command area/lease area/number of wells to be drilled	Total Proposed Production Capacity: 79316.0 MT/Annum Proposed Expansion will be carried out within existing plant premises, there is no require additional land for proposed expansion.
4.	New/Expansion/Modernization	Expansion
5.	Existing Capacity/Area etc.	Existing Production Capacity as Per EC: 49300.0 MT/Annum As Per CCA Formulation Production Capacity: 208380 MT/Annum As Per CCA Organic Production Capacity: 28300 MT/Annum Total Plot Area = 51,653.7 m^2
6.	Category of Project i.e. 'A' or 'B'	A
7.	Does it attract the general condition? If yes, please specify.	General Condition does not attract for this project.
8.	Does it attract the specific condition? If yes, please specify.	Specific Condition does not attract for this project.
9.	Location	
	Plot/Survey/Khasra No.	Plot No. Z/103/G,
	Village	SEZ-2, Dahej, Po-Lakhigam
	Tehsil	Vagra
	District	Bharuch
	State	Gujarat
10.	Nearest railway station/airport along with distance in kms.	Nearest Railway Station: Bharuch: 40 km Nearest Airport: Vadodara: 95 km

11.	Nearest Town, city, District Headquarters along with distance in kms.	Nearest Town: Bharuch: 45 km, Nearest District Head Quarter: Bharuch : 45 km
-12.	Village Panchayats, Zilla Parishad, Municipal Corporation, local body (complete postal address with telephone nos. to be given)	Notified Area Authority,Dahej. SEZ-2, Tal: Vagra, Dist: Bharuch, Gujarat.
13.	Name of the applicant	M/s. Coromandel International Limited.,
14.	Registered Address	Plot No. Z/103/G, SEZ-2, Dahej, Dist: Bharuch, Gujarat, India.
15.	**Address for correspondence:**	**Plot No. Z/103/G, SEZ-2, Dahej, Dist: Bharuch, Gujarat, India.**
	Name	**Mr. Anirban Majumder/ Mr. Shambhuraje Pawar**
	Designation (Owner/Partner/CEO)	**Unit Head/ Assistant EHS Officer**
	Address	**M/s. Coromandel International Limited., Plot No. Z/103/G, SEZ-2, Dahej, Dist: Bharuch, Gujarat, India.**
	Pin Code	**392 130**
	E-mail	**anirbanmajumder@coromandel.murugappa.com** **shambhuraje@coromandel.murugappa.com**
	Telephone No.	**N/A**
	Mobile No.	**+91 7045413613 / +91 84601 65636**
	Fax No.	**N/A**
16.	Details of Alternative Sites examined, if any location of these sites should be shown on a topo sheet.	Unit has not examined any Alternative sites, because Proposed expansion project will be carried out within the existing premises located at GIDC Dahej, SEZ-II. Scale of Toposheet of this location is 1:50000 and Toposheet is prepared based RS-GIS Mapping by our emplaned Expert (Mr. Pritesh Patel - Akshar Enviromatics, Vadodara). Toposheet No. F43M2 of Dist. Bharuch.
17.	Interlinked Projects	No. Unit has no Interlinked Projects.
18.	Whether separate application of interlinked project has been submitted?	No, Unit has not submitted any separate application of interlinked project.
19.	If yes, date of submission	Not applicable
20.	If no, reason	Unit has no Interlinked Projects.

21.	Whether the proposal involves approval/clearance under: if yes, details of the same and their status to be given. (a) The Forest (Conservation) Act, 1980? (b) The Wildlife (Protection) Act, 1972? (c) The C.R.Z. Notification, 1991?	Proposal does not involve approval/clearance under (a) The Forest (Conservation) Act, 1980, (b) The Wildlife (Protection) Act, 1972, (c) The C.R.Z. Notification, 1991. Not applicable, as the project is located in GIDC Dahej, SEZ-II.
22.	Whether there is any Government Order/Policy relevant/relating to the site?	No, there is no Government Order/Policy relevant/relating to the site.
23.	Forest land involved (hectares)	Not Applicable, no forest land is involved.
24.	Whether there is any litigation pending against the project and/or land in which the project is propose to be set up? (a) Name of the Court (b) Case No. (c) Orders/directions of the Court, if any and its relevance with the proposed project.	No litigation is pending against the project.

- *Capacity corresponding to sectoral activity (such as production capacity for manufacturing, mining lease area and production capacity for mineral production, area for mineral exploration, length for linear transport infrastructure, generation capacity for power generation etc.,)*

(II) Activity

1. Construction, operation or decommissioning of the Project involving actions, which will cause physical changes in the locality (topography, land use, changes in water bodies, etc.)

Sr. No.	Information/Checklist confirmation	Yes /No	Details thereof with approximate quantities frates, wherever possible) with source of information data
1.1	Permanent or temporary change in land use, land cover or topography including	No	Land use pattern will change permanently at project site after implementation of plant.

	increase intensity of land use (with respect to local land use plan)		Proposed expansion Project site is located within GIDC Industrial Estate-Dahej, SEZ-2. Total Plot Area = 51,653.7 m^2 Green Belt = 17045 m2 (i.e. approx. 33 %) in Plant Area developed as green belt.
1.2	Clearance of existing land, vegetation and Buildings?	No	No, Minor site clearance activities shall be carried out to clear shrubs and weed.
1.3	Creation of new land uses?	No	The project site is located on level ground, which does not require any major land filling for area grading work. Proposed Expansion Project site is within GIDC Industrial Estate- Dahej, SEZ-2.
1.4	Pre-construction investigations e.g. bore Houses, soil testing?	Yes	Proposed Expansion project is located in GIDC, Dahej, SEZ-2. For New Construction Soil testing will be carried out before construction activities.
1.5	Construction works?	Yes	Construction Activities will be carried out after getting EC & NOC.
1.6	Demolition works?	No	There will not be any demolition work at the site, Proposed Expansion in Existing Unit.
1.7	Temporary sites used for construction works or housing of construction workers?	No	Construction workers will be from local area so temporary sites won't be required.
1.8	Above ground buildings, structures or earthworks including linear structures, cut and fill or excavations	Yes	For Expansion, New buildings for production, Storage area, Utility building will be constructed as per approve plan from concern authority's department.
1.9	Underground works mining or tunneling?	No	No underground works, mining or tunneling will be carried out.
1.10	Reclamation works?	No	There will be no reclamation work.
1.11	Dredging?	No	Dredging will not be required.
1.12	Offshore structures?	No	Offshore structure is not needed.
1.13	Production and manufacturing processes?	Yes	After Proposed Expansion, production capacity will be 76316 MT/Annum and detail manufacturing process, chemical reaction and Mass Balance of Pesticide and Pesticide Intermediates

			are covered in proposed TOR File.
1.14	Facilities for storage of goods or materials?	Yes	Specified storage area shall be provided for storage of solvents, Raw materials & Finished products.
1.15	Facilities for treatment or disposal of solid waste or liquid effluents?	Yes	Effluent Treatment Plant will be installed to treat effluent so as to achieve the GPCB norms. Hazardous Waste from different operation will be collected, stored and disposed as per Hazardous and other waste management and trans boundary movement Rule, 2016.
1.16	Facilities for long term housing of operational workers?	No	The operational staff will be recruited locally and working in shift, hence no housing for the operational workers.
1.17	New road, rail or sea traffic during Construction or operation?	No	The project is situated in GIDC's Notified Industrial Area. It is having well connectivity with road as well as railways.
1.18	New road, rail, air waterborne or other transport infrastructure including new or altered routes and stations, ports, airports etc?	No	Not required as site is connected with the existing road of GIDC. Existing infrastructure i.e. road, rail, and air waterborne will meet the requirements and the same will be used.
1.19	Closure or diversion of existing transport routes or infrastructure leading to changes in Traffic movements?	No	There is no closure or diversion of existing transport routes or infrastructure leading to changes in Traffic movements. Not required as Industrial Estate.
1.20	New or diverted transmission lines or Pipelines?	No	There is no new or diverted transmission lines or Pipelines.
1.21	Impoundment, damming, culverting, realignment or other changes to the hydrology of watercourses or aquifers?	No	There will no changes to the hydrology of watercourses.
1.22	Stream crossings?	No	There are no stream crossings.
1.23	Abstraction or transfers of water form ground or surface waters?	No	No ground water shall be used. The requirement of raw water shall be met through GIDC Water Supply.
1.24	Changes in water bodies or the land surface Affecting	No	Site is located in G.I.D.C. Dahej, SEZ-II, Dist: Bharuch. There is no water

	drainage or run-off?		body within the project Site.
1.25	Transport of personnel or materials for construction, operation or decommissioning?	Yes	Transportation of personnel, raw materials and products will be primarily by road only.
1.26	Long-term dismantling or decommissioning or restoration works?	No	No long-term dismantling or decommissioning or restoration work will be undertaken.
1.27	Ongoing activity during decommissioning which could have an impact on the environment?	No	There is no Impact on the Environment due to ongoing activity.
1.28	Influx of people to an area either temporarily or permanently?	No	This is a well-developed Industrial Area and due to project.
1.29	Introduction of alien species?	No	There is no any alien species. Project site is located in Dahej SEZ-II Industrial Estate
1.30	Loss of native species or genetic diversity?	No	There will no loss of native species or genetic diversity. Project site is located in Dahej SEZ-II Industrial Estate
1.31	Any other actions?	No	There is no any action or work.

2. Use of Natural resources for construction or operation of the Project (such as land, water, materials or energy, especially any resources which are non-renewable or in short supply):

Sr. No.	Information/checklist confirmation	Yes/No	Details there of (with approximate quantities frates, wherever possible) with source of information data
2.1	Land especially undeveloped or agricultural land (ha)	No	This land is purchased from Gujarat Industrial Development Corporation (GIDC)-Dahej, SEZ-II, so land is developed by GIDC.
2.2	Water (expected source & competing users) unit: KLD	Yes	Total raw water requirement is Water: 2079.29 KL/Day which will be met through GIDC water supply.
2.3	Minerals (MT)	No	Not Applicable as No minerals will be used in proposed expansion project.
2.4	Construction material –	Yes	Construction materials, like steel,

<table>
<tr><td></td><td>stone, aggregates, and / soil (expected source – MT)</td><td></td><td>cement, crushed stones, sand, rubble, etc. required for the project shall be procured from the local market of the region.</td></tr>
<tr><td>2.5</td><td>Forests and timber (source – MT)</td><td>No</td><td>There are no any forests and timber. No wood shall be used as construction material or as a fuel.</td></tr>
<tr><td>2.6</td><td>Energy including electricity and fuels (source, competing users) Unit: fuel (MT), energy (MW)</td><td>Yes</td><td>Estimated power requirement is 5000 KVA. Power will be taken from DGVCL. Stand by DG sets will be used as emergency power back up.
As Per Existing EC Power Requirement: 4000 KVA
As Per EC Expansion Power Requirement: 5000 KVA

As Per EC Fuel Details:
<table>
<tr><th>Sr. No.</th><th>Fuel</th><th>Quantity</th></tr>
<tr><td>1</td><td>Natural Gas/FO/LDO (Boiler)</td><td>20160 m3/Day</td></tr>
<tr><td>2</td><td>Natural Gas (TFH)</td><td>500 m3/Day</td></tr>
<tr><td>3</td><td>HSD (DG Set)</td><td>8000 Lit/Day</td></tr>
<tr><td>4</td><td>Natural Gas (Incinerator)</td><td>800 m3/Hr</td></tr>
</table>
As Per Valid CCA Fuel Details:
<table>
<tr><th>Sr. No.</th><th>Fuel</th><th>Quantity</th></tr>
<tr><td></td><td>Natural Gas</td><td>20160 m3/Day</td></tr>
<tr><td></td><td>HSD</td><td>8000 Lit/Day</td></tr>
</table>
As Per EC Expansion Fuel Details:
<table>
<tr><th>Sr. No.</th><th>Fuel</th><th>Quantity</th></tr>
<tr><td></td><td>Natural Gas/LDO (Boiler/HAG)</td><td>40360 m3/Day</td></tr>
<tr><td></td><td>Natural Gas/LDO (TFH)</td><td>500 m3/Day</td></tr>
</table></td></tr>
</table>

				HSD (DG Set)	9000 Lit/Day
				Natural Gas/LDO (Incinerator)	800 m3/Hr
				Bio Briquettes	75MT/Day
2.7	Any other natural resources (use appropriate standard units)	No	No any other natural resources being used.		

3. Use, storage, transport, handling or production of substances or materials, which could be harmful to human health or the environment or raise concerns about actual or perceived risks to human health.

Sr. No.	Information/Checklist confirmation	Yes/ No	Details there of (with approximate quantities/rates, wherever possible) with source of information data
3.1	Use of substances or materials, which are hazardous (as per MSIHC rules) to human health or the environment (flora, fauna, and water supplies)	Yes	Company will store of hazardous chemicals as per MSIHC Rules and will take safety precaution to avoid accident and impact on human health or the environment. Necessary permissions will be taken for new hazardous chemicals in line with MSIHC Rules.
3.2	Changes in occurrence of disease or affect disease vectors (e.g., insect or water borne diseases)	No	No Changes in occurrence of disease or affect disease vectors. Not applicable as site is located in Dahej Industrial Area.
3.3	Affect the welfare of people e.g., by changing living conditions?	No	Company will do CSR & CER activities to improve the living condition of affected people. The project will benefit the people living in the neighboring area by providing them with additional direct and indirect employment opportunities. Project site is located in SEZ-II Dahej Industrial Area.
3.4	Vulnerable groups of people who could be affected by the project e.g., hospital	No	Not applicable as site is located in SEZ-II Dahej Industrial Area. Company will do CSR & CER

	patients, children, the elderly etc.		activities to improve the living condition of affected people.
3.5	Any other causes	No	No Other Causes.

4. Production of solid wastes during construction or operation or decommissioning (MT/month)

Sr. No.	Information/Checklist confirmation	Yes/No	Details there of (with approximate quantities/rates, wherever possible) with source of information data
4.1	Spoil, overburden or mine wastes	No	This is not mining project; this is Core Chemical Industry.
4.2	Municipal waste (domestic and or commercial wastes)	No	Office waste and canteen waste will be generated like paper, wood, plastic etc. in a very small quantity.
4.3	Hazardous wastes (as per Hazardous Waste Management Rules)	Yes	Hazardous Waste from different operation will be collected, stored, and sold/disposed as per Hazardous and other waste management and trans boundary movement Rule, 2016.
4.4	Other industrial process wastes	No	Hazardous Waste from different operation will be collected, stored, and sold/disposed as per Hazardous and other waste management and trans boundary movement Rule, 2016.
4.5	Surplus product	No	There will be no any surplus product.
4.6	Sewage sludge or other sludge from effluent treatment	Yes	ETP & MEE sludge will generate from ETP & MEE and will be disposed to TSDF & rule 9 end users.
4.7	Construction or demolition wastes	No	Construction waste shall be utilized for leveling, land filling in the premises.
4.8	Redundant machinery or equipment	No	There will not any redundant machinery or equipment.
4.9	Contaminated soils or other materials	No	There are no any contaminated soils.

4.10	Agricultural wastes	No	There are no generating agricultural wastes.
4.11	Other solid wastes	Yes	Fly Ash will generate and sell to brick manufacturer.

5. Release of pollutants or any hazardous, toxic or noxious substances to air (Kglhr)

Sr. No.	Information/Checklist confirmation	Yes/No	Details there of (with approximate quantities/rates, wherever possible) with source of information data
5.1	Emissions from combustion of fossil fuels from stationary or mobile sources	Yes	Company use Natural Gas/LDO/Bio-briquettes in Boiler & Thermic Fluid Heater, hot air generators as a fuel. Adequate Stack Height provided for the proper dispersion of emissions and control the flue gas emission.
5.2	Emissions from production processes	Yes	There will be 52 nos. of process vents of HCl, SO2, NH3, PM Etc. Adequate Two Stage Scrubber System & Bag Filter provided to control the process gas emission.
5.3	Emissions from materials handling storage or transport	Yes	All liquid raw materials shall be procured in bulk tankers and shall be transferred through a closed-circuit pipeline by pumps. Solid raw material shall be handled in closed charging rooms with proper ventilation and charged through close pipeline into reactors.
5.4	Emissions from construction activities including plant and equipment	Yes	Utmost care will be taken during construction activity and water sprinklers shall be utilized whenever necessary.
5.5	Dust or odors from handling of materials including construction materials, sewage, and waste	No	For dust emissions, Airborne dust at all transfers operations/ points will be controlled either by spraying water or providing enclosures. For Odor control, Close feeding system will be provided for centrifuges. Centrifuge and filtrate

			tank vents will be connected to vent chillers Regular maintenance of valves, pumps, flanges, joints and other equipment will be done to prevent leakages and thus minimizing the fugitive emissions.
5.6	Emissions from incineration of waste	No	Company may install incinerator or send incineration waste to pollution control board approved Common Incineration facility.
5.7	Emissions from burning of waste in open air e.g., slash materials, construction debris)	No	There is no emissions from Burning Waste in open Air from proposed expansion project.
5.8	Emissions from any other sources	No	There will not be any emissions from other sources.

6. Generation of Noise and Vibration, and Emissions of Light and Heat:

Sr. No.	Information/Checklist confirmation	Yes/No	Details there of (with approximate quantities/rates, wherever possible) with source of information data with source of information data
6.1	From operation of equipment e.g., engines, ventilation plant, crushers	Yes	There are few activities due to which noise would be generated. The equipment's resulting in noise generation are machinery of plant and Diesel generator. Adequate noise control measures will be provided whenever required. Proper and timely oiling, lubrication and preventive maintenance will be carried out for the machineries & equipment's to reduce noise generation. Use of PPE like ear plugs and earmuffs will be made compulsory near the high noise generating machines. Noise monitoring shall be done regularly in plant area.

			The D.G. Set will be installed in a closed room and provided with acoustic enclosure.
6.2	From industrial or similar processes	Yes	All machinery / equipment shall be well maintained, shall be proper foundation with anti-vibrating pads wherever applicable and noise levels within permissible limits. Manufacturers/ suppliers of major noise generating equipment/ machines like compressors, turbines, generators should be asked to take required measures for minimizing the noise levels generated by machines by using noise absorbing material for various enclosures or using appropriate design/ technology for fabricating/ assembling the machines. Audiometric tests should be conducted periodically for the employees working close to the high noise sources. Preventive maintenance schedule will be followed for all instruments and machineries to maintain good working condition. Enclosures and barriers will be provided to pumps and machineries producing high noise levels, required for proposed project. Acoustic barriers / shelter shall be developed in noisy workplaces.
6.3	From construction or demolition	Yes	Noise and vibration will generate during construction phase, but which is only temporary. Noise effect on the near habitation during construction activities will be negligible as the nearest habitat is more than 1.0 km from the plant. However, construction

			labor would be provided with noise protection devises like earmuffs and occupational safety ware, as per requirement. And noise generating equipment shall be stopped during night hours.
6.4	From blasting or piling	No	There shall not be any blasting or Piling activities.
6.5	From construction or operational traffic	No	There will be increase vehicular movement during construction and operation stage. All the vehicles will be maintained properly to reduce noise and vibration from the vehicles. Management will ensure effective set up of traffic management system in order to minimize the usage of horns and other such equipment which may add to noise generation. Noise generation due to movement/operation of vehicles and equipment/ machineries shall be well managed by restricting the movement/operation during night hours.
6.6	From lighting or cooling systems	Yes	Lighting will be used for night activities and operational requirements within the Site. Acoustic laggings, enclosures and silencers shall be provided wherever necessary for high noise generating equipment. Preventive maintenance schedule will be followed for all instruments and machineries to maintain good working condition.
6.7	From any other sources	No	There will be no other sources of noise.

7. Risks of contamination of land or water from releases of pollutants into the ground or into sewers, surface waters, groundwater, coastal waters, or the sea:

Sr. No.	Information/Checklist confirmation	Yes/No	Details there of (with approximate quantities/rates, wherever possible) with source of information data
7.1	From handling, storage, use or spillage of hazardous materials	Yes	All the raw material shall be stored separately in designated storage area and safely. Bund walls shall be provided around raw materials storage tanks for containing any liquid spillage. Other materials shall be stored in bags /drums on pallets with concrete flooring and no spillage is likely to occur.
7.2	From discharge of sewage or other effluents to water or the land (expected mode and place of discharge)	Yes	Sewage effluent will be treated in STP
7.3	By deposition of pollutants emitted to air into the and or into water	No	The Project site is located in Dahej SEZ-II Industrial Area, Dist: Bharuch. The emissions shall conform to the GPCB / CPCB norms of discharge. Adequate APCM shall be installed to keep the emissions within prescribed norms.
7.4	From any other sources	No	There are no other sources with risk of contamination to environment.
7.5	Is there a risk of long-term buildup of pollutants in the environment from these sources?	No	Full - fledged Environmental Management System (EMS) will be installed. i.e. ETP, Air Pollution Control systems, Hazardous Waste Handling and Management as per norms, etc. which will eliminate the possibility of building up of pollution.

8. Risk of accidents during construction or operation of the Project, which could affect human health or the environment

Sr. No.	Information/Checklist confirmation	Yes/No	Details there of (with approximate quantities/rates, wherever possible) with source

			of information data
8.1	From explosions, spillages, fires, etc. from storage, handling, use or production of hazardous substances	Yes	The risk assessment will be carried out and all mitigative measures shall be taken to avoid accidents.
8.2	From any other causes	No	Not applicable, No any other Causes.
8.3	Could the project be affected by natural disasters causing environmental damage (e.g. floods, earthquakes, landslides, cloudburst etc.)?	No	There is no history of flood in Dahej Industrial Estate, Bharuch. The buildings are designed considering seismic zone III. The land is plain terrain – no scope of landslide. This area is having moderate rainfall and there is no history of cloudburst.

9. Factors which should be considered (such as consequential development) which could lead to environmental effects or the potential for cumulative impacts with other existing or planned activities in the locality

Sr. No.	Information/Checklist confirmation	Yes/No	Details there of (with approximate quantities/rates, wherever possible) with source of information data
9.1	Lead to development of supporting. utilities, ancillary development or development stimulated by the project which could have impact on the environment e.g. • Supporting infrastructure (roads, power supply, waste or waste water treatment, etc.) • housing development • extractive industry • supply industry • other	No	Site is located in SEZ-II Dahej, having the entire required infrastructure. This industrial zone is having existing road infrastructure; power supply is to be utilized. Local people will be employed and no housing is required.
9.2	Lead to after-use of the site, which could have an impact on the environment	No	There will be no impact on environment due to after-use of the site.
9.3	Set a precedent for later	No	Not applicable

	developments		
9.4	Have cumulative effects due to proximity to other existing or planned projects with similar effects	No	The ETP & MEE of the company shall be designed such that the treated effluent conforms to the statutory requirement.

10. Environmental Sensitivity

Sr. No.	Areas	Name/ Identity	Aerial distance (within 5 km.) Proposed project location boundary
1	Areas protected under international conventions, national or local legislation for their ecological, landscape, cultural or other related value	No	No such protected areas within 10 Km radius. Proposed expansion project is located in Dahej Industrial Estate SEZ-II (GIDC, Gujarat).
2	Areas which important for are or sensitive Ecological reasons – Wetlands, watercourses or other water bodies, coastal zone, biospheres, mountains, forests	No	No such protected areas within 10 Km radius. Proposed expansion project is located in Dahej SEZ-II Industrial Estate (GIDC, Gujarat).
3	Area used by protected, important or sensitive Species of flora or fauna for breeding, nesting, foraging, resting, over wintering, migration	No	No such protected areas within 10 Km radius. Proposed expansion project is located in Dahej Industrial Estate (GIDC, Gujarat).
4	Inland, coastal, marine or underground waters	No	No inland, costal or marine within 5 km from the proposed project.
5	State, National boundaries	No	There is no interstate or national boundaries in study área.
6	Routes or facilities used by the public for access to recreation or other tourist, pilgrim areas	No	There are no pilgrim places or places of tourist importance in vicinity of site.
7	Defense installations	No	There are no Defense installations in the vicinity of project site.
8	Densely populated or built-up area	Yes	Bharuch city: 4.0 Lakh population
9	Area occupied by sensitive man-made land uses	No	There are no Areas occupied by sensitive man-made land uses

	Hospitals, schools, places of worship, community facilities)		(hospitals, schools, places of worship, community facilities).
10	Areas containing important, high quality or scarce resources (ground water resources, surface resources, forestry, agriculture, fisheries, tourism, minerals)	No	There is no available any important and high quality or scarce resources in this area.
11	Areas already subjected to pollution environmental damage. (those where existing legal environmental standards are exceeded) or	No	There will not any environmental damage due to proposed project. Proposed expansion project is located in Dahej SEZ-II
12	Areas susceptible to natural hazard which could cause the project to present environmental problems (earthquakes, subsidence, landslides, flooding erosion, or extreme or adverse climatic conditions)	No	No earthquakes, heavy floods or any other major natural disasters that can affect project site are reported in area. Proposed expansion project is located in Dahej SEZ-II

IV). Proposed Terms of Reference for EIA studies: For detail please refer **Annexure – XI**

I hereby given undertaking that, the data and information given in the application and enclosures are true to the best of my knowledge and belief and I am aware that if any part of the data and information submitted is found to be false or misleading at any stage the project will be rejected and clearance given, if any to the project will be revoked at our risk and cost.

For **Coromandel International Limited.**

AUTHORIZED SIGNATORY

Date: 21/07/2022
Place: Dahej SEZ-II

NOTE:

1. The projects involving clearance under Coastal Regulation Zone Notification, 1991 shall be submitted with the application a C.R.Z. map duly demarcated by one of the authorized agencies, showing the project activities, w.r.t. C.R.Z. (at the stage of TOR) and the recommendations of the State Coastal Zone Management Authority (at the stage of EC). Simultaneous action shall also be taken to obtain the requisite clearance under the provisions of the C.R.Z. Notification, 1991 for the activities to be located in the CRZ.
2. The projects to be located within 60 km of the National Parks, Sanctuaries, Biosphere Reserves, Migratory Corridors of Wild Animals, the project proponent shall submit the map duly authenticated by Chief Wildlife Warden showing these features vis-à-vis the project location and the recommendations or comments of the Chief Wildlife Warden thereon (at the stage of EC).
3. All correspondence with the Ministry of Environment & Forests including submission of application for TOR/Environmental Clearance, subsequent clarifications, as may be required from time to time, participation in the EAC Meeting on behalf of the project proponent shall be made by the authorized signatory only. The authorized signatory should also submit a document in support of his claim of being an authorized signatory for the specific project.

LIST OF ANNEXURES

SR. NO.	NAME OF ANNEXURE
I	List of Products with their Production Capacity
II	Layout Map of the Plant
III	Brief Manufacturing Process Description
IV	Details of Water & Waste Water Details
V	Description of Effluent Treatment Plant with flow diagram
VI	Details of Stacks and Vents
VII	Details Fuel & Energy Requirements
VIII	Details of Hazardous Waste
IX	Details of Hazardous Chemicals Storage & Handling
X	Socio-economic Impacts
XI	Proposed Terms of Reference for EIA studies
XII	GIDC Letter for Water Supply
XIII	TSDF & CHWIF Membership Certificate
XIV	GIDC Plot Transfer Letter
XV	CETP Membership Certificate
XVI	Copy of Existing EC & its Compliance
XVII	Copy of valid CCA & its Compliance
XVIII	Permission letter to develop Greenbelt
XIX	Undertaking of Banned Pesticides Product.

ANNEXURE-I

LIST OF PRODUCTS ALONG WITH PRODUCTION CAPACITY

Sr. No.	Products	CAS Nos.	LD50 (mg/kg)	Quantity (MT/Annum)				
				As Per EC Granted	As Per CCA	Additional	Total	Remarks (As Per EC Granted + Additional = Total)
	Agrochemical Formulation							
1	Mancozeb 80% WP	8018-01-7	>5000mg/kg	0.0	26400	0.0	26400	
2	Mancozeb 75% WP	8018-01-7	>5000 mg/kg	0.0	12000	0.0	12000	
3	Mancozeb 75% WDG	8018--01-7	>5000 mg/kg	0.0	12000	0.0	12000	
4	Mancozeb SC (420-600 gm/Ltr)	8018-01-7	>2000 mg/kg	0.0	3300	0.0	3300	
5	Mancozeb SE (420-500 gm/Lit)	8018-01-7	>2000 mg/kg	0.0	3300	0.0	3300	
6	Mancozeb OS 600 gm/lit	8018-01-7	>2000 mg/kg	0.0	3300	0.0	3300	
7	Mancozeb (63%) + Carbendazim (12%)	8018-01-7 10605-21-7	>5000 mg/kg	0.0	1680	0.0	1680	
8	Mancozeb (64%) + Metalyxyl (8%)	8018-01-7 57837-19-1	>5000mg/kg.	0.0	1680	0.0	1680	
9	Mancozeb (64%) + cymoxanil (8%)	8018-01-7 57966-95-7	>2000 mg/kg	0.0	1680	0.0	1680	

10	Propineb 70% WP	9016-72-2	3708 mg/kg	0.0	9240	0.0	9240	
11	Glyphosphate 71% ammonium salt (prills)	40465-66-5 7783-20-2	>3000 mg/kg	0.0	4620	0.0	4620	
12	Chlorpyriphos 20% EC	2912-88-2	500 mg/kg	0.0	11040	0.0	11040	
13	Monocrotophos 36% SL	6923-22-4	20 mg/kg	0.0	7920	0.0	7920	
14	Monocrotophos 40% SL (W/V)	6923-22-4	0.76 mg/kg	0.0	2640	0.0	2640	
15	Diclorovos 76% EC	62-73-7	80 mg/kg	0.0	1980	0.0	1980	
16	Acephate 40% SL	30560-19-1	350 mg/Kg	0.0	1680	0.0	1680	
17	Acephate 75% SL	30560-19-1	350 mg/Kg	0.0	8520	0.0	8520	
18	Acephate 75% Prills	30560-19-1	1030 mg/kg	0.0	660	0.0	660	
19	Acephate 95% Prills	30560-19-1	1030 mg/kg	0.0	1800	0.0	1800	
20	Acephate 97% Prills	30560-19-1	1030 mg/kg	0.0	1800	0.0	1800	
21	Chloropyriphos 38.7% EC	2921-88-2	292 mg/kg.	0.0	1680	0.0	1680	
22	Chloropyriphos 480 gm/lit EC	2921-88-2	240 mg/kg	0.0	1680	0.0	1680	
23	Chloropyriphos 50% EC	2912-88-2	500 mg/kg	0.0	1680	0.0	1680	
24	Chloropyriphos 50% + Cypermethrine 5% EC	2921-88-2 52315-07-8	800 mg/kg	0.0	1680	0.0	1680	
25	Cypermethrine 10% EC	52315-07-8	2400 mg/kg	0.0	4980	0.0	4980	
26	Cypermethrine 25% EC	52315078	321.64 mg/kg	0.0	1980	0.0	1980	
27	Methamidophos 600 gm/lit SL	10265-92-6	51 mg/kg	0.0	5280	0.0	5280	
28	Imidaclopyrid 17.8% SL	138261-41-3	480 mg/kg	0.0	4980	0.0	4980	
29	Alphamethrin 5% EC	67375-30-8	>300-2000 mg/kg	0.0	1200	0.0	1200	

30	Alphamethrin 10% EC	67375-30-8	>300-2000 mg/kg	0.0	1200	0.0	1200	
31	Alphamethrin 2.5% EC	67375-30-8	>300-2000 mg/kg	0.0	2388	0.0	2388	
32	Permethrin 25% EC	52645-53-1	> 5,000 mg/kg	0.0	1200	0.0	1200	
33	Permethrin 40% EC	52645-53-1	> 5,000 mg/kg	0.0	780	0.0	780	
34	Deltamethrin 2.8% EC	52918-63-5	>300-2000 mg/kg	0.0	6420	0.0	6420	
35	Cypermethrin 5% EC	52315-07-8	355 mg/kg	0.0	9900	0.0	9900	
36	Cypermethrin 20% EC	52315-07-8	355 mg/kg	0.0	2472	0.0	2472	
37	Lambdamethrin 5% EC	91465-08-6	668 mg/kg	0.0	6000	0.0	6000	
38	Lambdamethrin 10% EC	91465-08-6	668 mg/kg	0.0	3000	0.0	3000	
39	Bifenthrin 10% EC	82657-04-3	54 mg/kg	0.0	2400	0.0	2400	
40	Bifenthrin 2.5% EC	82657-04-3	74.90mg/kg	0.0	1200	0.0	1200	
41	Tricyclazol 75% WP	41814-78-2	314 mg/kg	0.0	720	0.0	720	
42	Thiamethoxam 25% WG	153719-23-4	> 5000 mg/kg	0.0	1320	0.0	1320	
43	Sulphur 80% WG	7704-34-9	>5000 mg/kg	0.0	9000	0.0	9000	
44	Sulphur 55.15% SC (800 gm/lit)	7704-34-9	>5000 mg/kg	0.0	9000	0.0	9000	
45	Sulphur 40% SC	7704-34-9	>5000 mg/kg	0.0	9000	0.0	9000	
Total Formulation Production Capacity As Per Valid CCA				**0.0**	**208380**	**0.0**	**208380**	
	GROUP A							
1	m-Phenoxy Benzaldehyde	39515-51-0	1222 mg/kg	2000	0.0	0.0	2000	

2	Cypermethric Acid Chloride	52314-67-7		2000	0.0	0.0	2000	
3	Lamda Cyhalothric Acid Chloride	72748-35-7	92.9 mg/kg	150	0.0	0.0	150	
4	Delta Methric Acid Chloride	55710-82-2		240	0.0	0.0	240	
5	Cypermethrin (T) & Beta, Zeta, Theta etc Isomers	52315-07-8	57500 ug/kg	6000	0.0	0.0	6000	
6	Alphamethrin (T)	67375-30-8	200 mg/kg	180	0.0	0.0	180	
7	Deltamethrin (T)	52918-63-5	5.0 mg/kg	180	0.0	0.0	180	
8	Permethrin (T)	52645-53-1	5.0 mg/kg	600	0.0	0.0	600	
9	Lamda Cyhalothrin (T)	91465-08-6	668 mg/kg	400	0.0	0.0	400	
10	Bifenthrin (T)	82657-04-3	2000 mg/kg	300	0.0	0.0	300	
	MAX. PRODUCTION OF GROUP A			**6000**	**0.0**	**0.0**	**6000**	
	GROUP B							
1	MMP	10265-92-6	08 mg/kg	1200	0.0	0.0	1200	
2	Profenofos	41198-08-7	500 mg/kg	10000	0.0	0.0	10000	
3	DETC (Diethyl Thiophosphoryl Chloride)	2524-04-1	953mg/kg	2000	0.0	0.0	2000	
4	DMTC (Dimethyl Thiophosphory Chloride)	2524-03-1	0.77 ml/kg	2000	0.0	0.0	2000	
5	DMTC Amide (Dimethyl Thiophosphory Chloride Amide)	2524-03-0	540 mg/kg	15000	0.0	0.0	15000	
6	TCAC (Trichloro Acetyl Chloride)	76-02-8	600 mg/kg	5000	0.0	0.0	5000	
7	Chlorpyriphos	2921-88-2	200 mg/kg	3000	0.0	0.0	3000	

	MAX. PRODUCTION OF GROUP B			**15000**	**0.0**	**0.0**	**15000**	
	GROUP C							
1	PMIDA	5994-61-6	2000 mg/kg	2000	0.0	0.0	2000	
2	Glyphosate (T)	1071-83-6	5600 mg/kg	4000	0.0	0.0	4000	
3	Triclopyr Butotyl Ester	64700-56-7	1100 mg/kg	1000	1000	0.0	1000	
4	Bispyribac Sodium	125401-92-5	2635mg/kg	500	0.0	0.0	500	
5	Pichloram	2545-60-0	5000 mg/kg	1000	0.0	0.0	1000	
6	Fluroxypyr	69377-81-7	2405 mg/kg	1500	1500	0.0	1500	
7	Imazethapyr	81335-77-5	5000 mg/kg	1500	0.0	0.0	1500	
8	Glufosinate Ammonia	77182-82-2	1620 mg/kg	1000	0.0	0.0	1000	
9	Ethoxysulfuron	126801-58-9	3270 mg/kg	5000	5000	0.0	5000	
	MAX. PRODUCTION OF GROUP C			**5000**	**5000**	**0.0**	**5000**	
	GROUP D							
1	Mancozeb Tech.	8818-01-7	5000 mg/kg	15000	15000	20016	35016	
2	Propineb	12071-83-9	8500 mg/kg	2000	2000	1000	3000	
3	Azoxystrobin	131860-33-8	5000 mg/kg	2000	2000	0.0	2000	
4	Tebuconazol	107534-96-3	3352 mg/kg	5000	5000	0.0	5000	
5	Wettable Sulphur	0007704-34-9	NA	5000	5000	0.0	5000	
6	Chlorothalonil	1897-45-6	10 gm/kg	1000	1000	0.0	1000	
7	Kresoxim-methyl	143390-89-0	5000 mg/kg	2000	2000	0.0	2000	
8	Picoxystrobin	117428-22-5	2000 mg/kg	2000	2000	0.0	2000	
9	Trifloxystrobin	141517-21-7	5050 mg/kg	2000	0.0	0.0	2000	
	MAX. PRODUCTION OF GROUP D			**15000**	**15000**	**20016**	**35016**	
	GROUP E							
1	Imidacloprid	138261-41-3	410 mg/kg	1000	0.0	0.0	1000	
2	Acetamiprid	135410-20-7	146 mg/kg	1000	1000	0.0	1000	

3	2-Chloro-5- Chloro Methyl Pyridine	70258-18-3	50% Lethal dose	8300	8300	0.0	8300	
4	Nitro Imino Imidazolidine	5465-96-3	50% Lethal dose	600	600	0.0	600	
5	Ethyl-N-Cynoethanimideate	1558-82-3	5000 mg/kg	1000	1000	0.0	1000	
6	Cartap	15263-53-3	650 mg/kg	1000	1000	0.0	1000	
7	Thiamethoxam	153719-23-4	1563 mg/kg	1500	0.0	0.0	1500	
8	Clothianidin	210880-92-5	3044 mg/kg	2000	2000	0.0	2000	
9	Emamectin Benzoate	155569-91-8	1516 mg/kg	2000	3000	0.0	2000	
10	Indoxacarb	173584-44-6	1909 mg/kg	3000	8300	0.0	3000	
	MAX. PRODUCTION OF GROUP E			**8300**	**8300**	**0.0**	**8300**	
	GROUP F							
1	Metiram	9006-42-2	> 500 mg/kg	0.0	0.0	7000	7000	
	MAX. PRODUCTION OF GROUP F			**0.0**	**0.0**	**7000**	**7000**	
	GROUP G							
2	Cyproconazole	94361-06-5	>2000 mg/kg	0.0	0.0	3000	3000	
	MAX. PRODUCTION OF GROUP G			**0.0**	**0.0**	**3000**	**3000**	
	TOTAL PRODUCTION OF ALL GROUPS AS PER EC			**49300**	**28300**	**30016**	**79316**	

Sr. No.	By product	Production capacity, MT/Annum				Remarks
		As Per EC Granted	As Per CCA Existing	Additional	Total	
1	HCl Soln. (30%)	38520	0.0	0.0	38520	
2	HBr Soln. (30%)	10428	0.0	0.0	10428	
3	Na_2SO_3 soln. (20%)	41580	0.0	0.0	41580	
4	Na_2SO_4 99%	6252	12290	20000	**26252**	
5	$AlCl_3$ soln.	8196	0.0	0.0	8196	
6	Sodium chloride salt	72	0.0	0.0	72	
7	KBr soln W.C	1968	0.0	0.0	1968	
8	CuCl2 soln.	996	0.0	0.0	996	
9	NH4Cl	6096	0.0	0.0	6096	
10	Bromobenzene	156	0.0	0.0	156	
11	NaBr soln.	13092	0.0	0.0	13092	

***EC is not fully Converted into CCA.**

As Per Actual Production Sodium Sulphate quantity Increased.

LIST OF RAW MATERIAL

Sr. No.	Product Name	Raw Material	CAS NO.	Quantity (MT/Annum)			Source	Mode Of Transport	Distance Of Source From Project Site In Kilometers	Linkage
				Existing	Proposed	Total				
	GROUP-A									
1	**m-Phenoxy Benzaldehyde**	Bromine	7726-95-6	1626	0.0	1626	Domestic	By Road	**520**	Open Market
		Chlorine	7782-50-5	730	0.0	730	Domestic	By Road	**50**	Open Market
		Ethylene dichloride	107-06-2	14908	0.0	14908	Domestic / Import	By Road	**350**	Open Market
		Anhydrous AlCl3	7446-70-0	1024	0.0	1024	Domestic	By Road	**80**	Open Market
		Benzaldehyde	100-52-7	2110	0.0	2110	Domestic	By Road	**80**	Open Market
		5% Sodium Thio sulphate	10102-17-7	1500	0.0	1500	Domestic	By Road	**80**	Open Market
		Ethylene glycol	107-21-1	1074	0.0	1074	Domestic	By Road	**350**	Open Market
		Toluene	108-88-3	7738	0.0	7738	Domestic	By Road	**350**	Open Market

		Catalyst		70	0.0	70	Domestic	By Road	**250**	Open Market
		Phenol	108-95-2	1518	0.0	1518	Domestic / Import	By Road	**250**	Open Market
		KOH flakes	1310-58-3	936	0.0	936	Domestic	By Road	**140**	Open Market
		CuCl	7758-89-6	66	0.0	66	Domestic	By Road	**80**	Open Market
		10% NaOH solution	1310-73-2	1000	0.0	1000	Domestic	By Road	**80**	Open Market
		20% H_2SO_4 solution	7664-93-9	3100	0.0	3100	Domestic	By Road	**25**	Open Market
2	**Cypermethric Acid Chloride**	Acrylonitrile	107-13-1	898	0.0	898	Domestic	By Road	**350**	Open Market
		Carbon tetrachloride	99 56-23-5.	3396	0.0	3396	Domestic	By Road	**250**	Open Market
		Acetonitrile	75-05-8	300	0.0	300	Domestic	By Road	**350**	Open Market
		$CuCl_2$ $2H_2O$	10125-13-0	26	0.0	26	Domestic	By Road	**100**	Open Market
		Diethyl amine hydrochloride	660-68-4	26	0.0	26	Domestic	By Road	**100**	Open Market
		98% H_2SO_4	7664-93-9	2078	0.0	2078	Domestic	By Road	**25**	Open Market
		$SOCl_2$	7719-09-7	3786	0.0	3786	Domestic	By Road	**258**	Open Market

		DMF	68-12-2.	28	0.0	28	Domestic	By Road	**257**	Open Market
		Hexane	110-54-3	28200	0.0	28200	Domestic	By Road	**254**	Open Market
		Isobutylene	115-11-7	3814	0.0	3814	Domestic	By Road	**159**	Open Market
		TEA	121-44-8	1708	0.0	1708	Domestic	By Road	**550**	Open Market
		NaOH Flakes	1310-73-2	1224	0.0	1224	Domestic	By Road	**140**	Open Market
		HCl (35%)	7647-01-0	600	0.0	600	Domestic	By Road	**25**	Open Market
		Hyflow	68855-54-9	40	0.0	40	Domestic	By Road	**100**	Open Market
3	**lambda Cyhalothric acid chloride**	Methyl Pentanoate	624-24-8	159.57	0.0	159.57	Imported	By Road	**250**	Open Market
		Trichloro trifluoro ethane	76-13-1	195.84	0.0	195.84	Imported	By Road	**250**	Open Market
		Tertiary Butanol	75-65-0	1810.15	0.0	1810.15	Domestic	By Road	**250**	Open Market
		Sodium metal	7440-23-5	30.46	0.0	30.46	Domestic	By Road	**100**	Open Market
		Hexane	110-54-3	1175.05	0.0	1175.05	Domestic	By Road	**254**	Open Market
		DMF	68-12-2.	320.74	0.0	320.74	Domestic	By Road	**250**	Open Market

		H2SO4	7664-93-9	6.38	0.0	6.38	Domestic	By Road	**25**	Open Market
		Caustic flakes	1310-73-2	220.36	0.0	220.36	Domestic	By Road	**140**	Open Market
		Methanol	67-56-1	696.32	0.0	696.32	Domestic	By Road	**250**	Open Market
		HCl (30%)	7647-01-0	515.28	0.0	515.28	Domestic	By Road	**25**	Open Market
		Thionyl chloride	7719-09-7	82.69	0.0	82.69	Domestic	By Road	**100**	Open Market
4	**Delta Methric Acid Chloride**	Cis SS-RR CMA	38609-97-1	932.04	0.0	932.04	Imported	By Road	**250**	Open Market
		C.S.Lye (48%)	1310-73-2	688.31	0.0	688.31	Domestic	By Road	**140**	Open Market
		MDC	75-09-2	2204.27	0.0	2204.27	Domestic	By Road	**250**	Open Market
		30% HCl	7647-01-0	480.00	0.0	480.00	Domestic	By Road	**25**	Open Market
		AlCl3	7446-70-0	180.58	0.0	180.58	Domestic	By Road	**100**	Open Market
		Benzene	71-43-2	850.49	0.0	850.49	Domestic	By Road	**100**	Open Market
		Bromine	7726-95-6	998.68	0.0	998.68	Domestic	By Road	**520**	Open Market

		Sodium thiosulphate	7772-98-7	15.15	0.0	15.15	Domestic	By Road	**100**	Open Market
		n-Hexane	110-54-3	1165.05	0.0	1165.05	Domestic	By Road	**254**	Open Market
		Sulphuric acid	7664-93-9	93.20	0.0	93.20	Domestic	By Road	**25**	Open Market
		Methanol	67-56-1	1025.24	0.0	1025.24	Domestic	By Road	**25**	Open Market
		Soda ash	497-19-8	110.68	0.0	110.68	Domestic	By Road	**100**	Open Market
		Toluene	108-88-3	326.21	0.0	326.21	Domestic	By Road	**350**	Open Market
		DMF	68-12-2.	3.73	0.0	3.73	Domestic	By Road	**25**	Open Market
		Thionyl chloride	7719-09-7	98.80	0.0	98.80	Domestic	By Road	**25**	Open Market
5	**Cypermethrin (T) & Beta, Zeta, Theta etc Isomers**	Cypermethric acid chloride	52314-67-7	3510.00	0.0	3510.00	Domestic / Import	By Road	**250**	Open Market
		m-Phenoxy benzaldehyde	39515-51-0	3000.00	0.0	3000.00	Domestic	By Road	**250**	Open Market
		NaCN	143-33-9	816.00	0.0	816.00	Domestic	By Road	**250**	Open Market
		n-Hexane	110-54-3	18000.00	0.0	18000.00	Domestic	By Road	**254**	Open Market
		4% Soda ash solution	497-19-8	3000.00	0.0	3000.00	Domestic	By Road	**100**	Open Market

		Sodium hypo solution	7681-52-9	2394.0	0.0	2394.0	Domestic	By Road	**100**	Open Market
6	**Alphamethrin (T)**	m-Phenoxy benzaldehyde	39515-51-0	123.58	0.0	123.58	Domestic	By Road	**250**	Open Market
		Cypermethric acid chloride	52314-67-7	144.52	0.0	144.52	Domestic	By Road	**250**	Open Market
		NaCN	143-33-9	33.75	0.0	33.75	Domestic	By Road	**250**	Open Market
		5% Soda ash solution	497-19-8	121.15	0.0	121.15	Domestic	By Road	**90**	Open Market
		IPA	67-63-0	392.71	0.0	392.71	Domestic	By Road	**250**	Open Market
		8% NaOCl solution	7681-52-9	98.65	0.0	98.65	Domestic	By Road	**100**	Open Market
		n-Hexane	110-54-3	744.23	0.0	744.23	Domestic	By Road	**254**	Open Market
7	**Deltamethrin (T)**	Deltamethrin acid chloride	52918-63-5	158.50	0.0	158.50	Domestic	By Road	**100**	Open Market
		m-Phenoxy benzaldehyde	39515-51-0	96.66	0.0	96.66	Domestic	By Road	**250**	Open Market
		n-Hexane	110-54-3	799.61	0.0	799.61	Domestic	By Road	**254**	Open Market
		NaCN	143-33-9	26.30	0.0	26.30	Domestic	By Road	**250**	Open Market
		5% Soda ash solution	497-19-8	133.27	0.0	133.27	Domestic	By Road	**90**	Open Market

		IPA	67-63-0	417.57	0.0	417.57	Domestic	By Road	**250**	Open Market
		8% NaOCl solution	7681-52-9	74.99	0.0	74.99	Domestic	By Road	**100**	Open Market
8	**Permethrin (T)**	Cypermethric acid chloride	52314-67-7	385.2	0.0	385.2	Domestic	By Road	**250**	Open Market
		MPBAL	100-52-7	330	0.0	330	Domestic	By Road	**257**	Open Market
		10% soda ash solution	497-19-8	600	0.0	600	Domestic	By Road	**90**	Open Market
		c.s.lye	1310-73-2	30	0.0	30	Domestic	By Road	**140**	Open Market
		n-hexane	110-54-3	1800	0.0	1800	Domestic	By Road	**254**	Open Market
9	**Lamda Cyhalothrin (T)**	TFP acid chloride	2719-27-9	256	0.0	256	Domestic	By Road	**250**	Open Market
		m-Phenoxy benzaldehyde	39515-51-0	188	0.0	188	Domestic	By Road	**250**	Open Market
		NaCN	143-33-9	51.2	0.0	51.2	Domestic	By Road	**250**	Open Market
		5% Soda ash solution	497-19-8	200	0.0	200	Domestic	By Road	**90**	Open Market
		IPA	67-63-0	420	0.0	420	Domestic	By Road	**250**	Open Market
		8% NaOCl	7681-52-9	592.8	0.0	592.8	Domestic	By Road	**100**	Open Market

		n-Hexane	110-54-3	1021.6	0.0	1021.6	Domestic	By Road	**254**	Open Market
10	**Bifenthrin (T)**	TFPA Acid	359-48-8	177.00	0.0	177.00	Domestic	By Road	**250**	Open Market
		PMBC	824-94-2	168.00	0.0	168.00	Domestic	By Road	**250**	Open Market
		solvent	64742-47-8	180.0	0.0	180.0	Domestic	By Road		Open Market
	GROUP-B									
1	**MMP**	DMPAT	17321-47-0	1233.6	0.0	1233.6	Imported	By Road	**250**	Open Market
		Toluene	108-88-3	1605.6	0.0	1605.6	Domestic	By Road	**350**	Open Market
		Dimethyl Sulphate	77-78-1	57.6	0.0	57.6	Domestic	By Road	**100**	Open Market
2	**Profenofos**	2-Chloro Phenol	99 95-57-8	3820	0.0	3820	Imported	By Road	**250**	Open Market
		Bromine	7726-95-6	4640	0.0	4640	Domestic	By Road	**520**	Open Market
		DETC	2524-04-1	5750	0.0	5750	Domestic	By Road	**450**	Open Market
		Caustic Lye(26%)	1310-73-2	5250	0.0	5250	Domestic	By Road	**140**	Open Market
		Ethanol (99%)	64-17-5	15990	0.0	15990	Domestic	By Road	**100**	Open Market

		NaSH(27%)	16721-80-5	6090	0.0	6090	Domestic	By Road	**100**	Open Market
		n-Propyl Bromide	106-94-5	13150	0.0	13150	Domestic	By Road	**100**	Open Market
3	**DETC**	PSCl3	3982-91-0	2800	0.0	2800	Domestic	By Road	**100**	Open Market
		Ethanol	64-17-5	13140	0.0	13140	Domestic	By Road	**100**	Open Market
		Caustic flakes	1310-73-2	920	0.0	920	Domestic	By Road	**90**	Open Market
		Caustic lye 47%	1310-73-2	1160	0.0	1160	Domestic	By Road	**140**	Open Market
		Benzene	71-43-2	160	0.0	160	Domestic	By Road	**100**	Open Market
4	**DMTC**	PSCl3	3982-91-0	2440	0.0	2440	Domestic	By Road	**250**	Open Market
		Methanol	67-56-1	3492	0.0	3492	Domestic	By Road	**250**	Open Market
		Caustic lye 47%	1310-73-2	2484	0.0	2484	Domestic	By Road	**140**	Open Market
5	**DMTC Amide**	DMTC	753-73-1	18300	0.0	18300	Domestic	By Road	**480**	Open Market
		MDC	75-09-2	18300	0.0	18300	Domestic	By Road	**250**	Open Market

		Ammonia	7664-41-7	4125	0.0	4125	Domestic	By Road	**100**	Open Market
6	**Trichloro Acetyl Chloride**	Acetic acid	64-19-7	2490	0.0	2490	Domestic	By Road	**250**	Open Market
		Cl2	782-50-5	5520	0.0	5520	Domestic	By Road	**140**	Open Market
		S2CL2	10025-67-9	995	0.0	995	Domestic	By Road	**250**	Open Market
7	**Chlorpyriphos**	Trichloro acetyl chloride (TCAC)	76-02-8	4308.00	0.0	4308.00	Domestic	By Road	**200**	Open Market
		Acrylonitrile	107-13-1	1563.00	0.0	1563.00	Domestic	By Road	**250**	Open Market
		Solvent	64742-47-8	6600	0.0	6600	Domestic	By Road	**50**	Open Market
		Caustic lye	1310-73-2	45	0.0	45	Domestic	By Road	**140**	Open Market
		Ethylene dichloride	107-06-2	12054.00	0.0	12054.00	Domestic	By Road	**250**	Open Market
		Salt	7647-14-5	75.00	0.0	75.00	Domestic	By Road	**25**	Open Market
		DETC	2524-04-1	1929.00		1929.00	Domestic	By Road	**480**	Open Market
	GROUP-C									
1	**PMIDA**	Catalyst slurry	7440-02-0	832.00	0.0	832.00	Domestic	By Road	**50**	Open Market
		Diethanol amine (DEA)	111-42-2	1088.00	0.0	1088.00	Imported	By Road	**250**	Open Market

		NaOH (47%)	1310-73-2	2960.00	0.0	2960.00	Domestic	By Road	**80**	Open Market
		HCl(30%)	7647-01-0	4992.00	0.0	4992.00	Domestic	By Road	**25**	Open Market
		H3PO3(70%)	10294-56-1	1340.00	0.0	1340.00	Domestic	By Road	**100**	Open Market
		Formaldehyde (37%)	50-00-0	1010.00	0.0	1010.00	Domestic	By Road	**100**	Open Market
2	**Glyphosate (T)**	PMIDA	5994-61-6.	5424	0.0	5424	Imported	By Road	**250**	Open Market
		Activated carbon	7440-44-0	158.4	0.0	158.4	Domestic	By Road	**200**	Open Market
		Oxygen	*7782-44-7*	704	0.0	704	Domestic	By Road	**100**	Open Market
3	**Triclopyr Butotyl Ester**	Na-HTCP	37439-34-2	920	0.0	920	Imported	By Road	**250**	Open Market
		Methyl chloro acetate	96-34-4	589	0.0	589	Domestic	By Road	**250**	Open Market
		Na2CO3	497-19-8	25	0.0	25	Domestic	By Road	**100**	Open Market
		NaHCO3	144-55-8	20	0.0	20	Domestic	By Road	**100**	Open Market
		TBAB	1643-19-2	30	0.0	30	Domestic	By Road	**100**	Open Market
		Toluene	108-88-3	3760	0.0	3760	Domestic	By Road	**350**	Open Market

		Carbon	7440-44-0	42	0.0	42	Domestic	By Road	**100**	Open Market
		Na2S	1313-82-2	9.66	0.0	9.66	Domestic	By Road	**100**	Open Market
		NaOH	1310-73-2	2260	0.0	2260	Domestic	By Road	**80**	Open Market
		50% H2SO4	7664-93-9	330	0.0	330	Domestic	By Road	**25**	Open Market
		Butyl cellosolve	111-76-2	395	0.0	395	Domestic	By Road	**250**	Open Market
		PTSA	6152-52-5	8	0.0	8	Domestic	By Road	**100**	Open Market
		0.5% N2CO3 solution	497-19-8	300	0.0	300	Domestic	By Road	**70**	Open Market
4	**Bispyribac Sodium**	2,6-dihydroxy benzoic acid	98 303-07-1	416	0.0	416	Domestic	By Road	**250**	Open Market
		Na2CO3	497-19-8	572.5	0.0	572.5	Domestic	By Road	**100**	Open Market
		DMSO4	77-78-1	665.5	0.0	665.5	Domestic	By Road	**100**	Open Market
		Acetone	67-64-1	4200	0.0	4200	Domestic	By Road	**250**	Open Market
		9% HCl	1240670-87-4	5000	0.0	5000	Domestic	By Road	**25**	Open Market
		4,6-dimethoxy-2-methyl sulfonyl pyrimidine	113583-35-0	414	0.0	414	Imported	By Road	**250**	Open Market

		K2CO3	584-08-7	540.5	0.0	540.5	Domestic	By Road	**140**	Open Market
		Isopropyl alcohol	67-63-0	5100	0.0	5100	Domestic	By Road	**250**	Open Market
		NaOH 9% solution	1310-73-2	677.5	0.0	677.5	Domestic	By Road	**80**	Open Market
5	**Pichloram**	3,4,5,6-tetra chloro picolinonitrile	17824-83-8	1680	0.0	1680	Imported	By Road	**250**	Open Market
		28% aqueous NH4OH	1336-21-6	8400	0.0	8400	Domestic	By Road	**100**	Open Market
		35% HCl	7647-01-0	1380	0.0	1380	Domestic	By Road	**25**	Open Market
6	**Fluroxypyr**	Pentachloropyridine Trimethyl Ammonium		1875	0.0	1875	Imported	By Road	**250**	Open Market
		Hydrochloride	7647-01-0	21	0.0	21	Domestic	By Road	**50**	Open Market
		Potassium Fluoride	7789-23-3	1650	0.0	1650	Domestic	By Road	**140**	Open Market
		Dimethyl Aceto Acetamide	2044-64-6	2775	0.0	2775	Domestic	By Road	**480**	Open Market
		Toluene	108-88-3	3900	0.0	3900	Domestic	By Road	**350**	Open Market
7	**Imazethapyr**	2-carboxylic acid ethyl ester-3-methyl-6-ethyl pyridine		1002	0.0	1002	Imported	By Road	**250**	Open Market

		Chlorine	7782-50-5	1105.5	0.0	1105.5	Domestic	By Road	**50**	Open Market
		2-Amino -2, 3-Dimethyl bufyramide	40963-14-2	675	0.0	675	Imported	By Road	**250**	Open Market
8	**Glufosinate Ammonia**	Acrolein	107-02-8	289	0.0	289	Imported	By Road	**250**	Open Market
		Acetic Anhydride	108-24-7	526	0.0	526	Domestic	By Road	**550**	Open Market
		Diethyl Methane Phosphonate	683-08-9	722	0.0	722	Domestic	By Road	**200**	Open Market
		NaCl	7647-14-5	253	0.0	253	Domestic	By Road	**80**	Open Market
		HCl	7647-01-0	5370	0.0	5370	Domestic	By Road	**25**	Open Market
		Ammonia solution (25%)	1336-21-6	2320	0.0	2320	Domestic	By Road	**100**	Open Market
9	**Ethoxysulfuron**	O-sulfo Iso Cyanate Ethyl Benzoate	93-89-0	3146.39	0.0	3146.39	Domestic	By Road	**50**	Open Market
		2-Amino 4-Methoxy 6-Methyl 1,3,5 Triazine	1668-54-8	1863.12	0.0	1863.12	Imported	By Road	**250**	Open Market
		Toluene	108-88-3	4277.57	0.0	4277.57	Domestic	By Road	**350**	Open Market
	GROUP-D									
1	**Mancozeb Tech.**	Ethylene diamine	107-15-3	3750	5250	9000	Imported/ Domestic	By Road	**250**	Open Market

		Carbon disulfide	75-15-0	9375	13125	22500	Domestic	By Road	**25**	Open Market
		Sodium hydroxide (47%)	1310-73-2	9750	13650	23400	Domestic	By Road	**25**	Open Market
		Manganese Sulphate (27%)	7439-65-5	34740	48636	83376	Domestic	By Road	**25**	Open Market
		Zinc Sulphate (32%)	7733-02-0	2895	4053	6948	Domestic	By Road	**100**	Open Market
		SLS	151-21-3	900	1260	2160	Domestic	By Road	**250**	Open Market
		HMTA	100-97-0	465	651	1116	Imported Domestic	By Road	**250**	Open Market
2	**Propineb**	1,2 –PDA	78-90-0	504	252	756	Imported	By Road	**250**	Open Market
		Carbon disulfide	75-15-0	1200	600	1800	Domestic	By Road	**25**	Open Market
		Ammonia solution (15%)	1336-21-6	1458	729	2187	Domestic	By Road	**100**	Open Market
		Zinc Sulphate solution (21%)	7733-02-0	4792	2396	7188	Domestic	By Road	**100**	Open Market
		SLS	151-21-3	70	35	105	Domestic	By Road	**50**	Open Market
		HMTA	100-97-0	17.2	8.6	25.8	Domestic	By Road	**50**	Open Market
3	**Azoxystrobin**	Trimethyle Ortho Formate	149-73-5	2310	0.0	2310	Imported	By Road	**250**	Open Market

		Acetic Anhydride	108-24-7	5780	0.0	5780	Domestic	By Road	**550**	Open Market
		2(3)Benzofuranon	271-89-6	1790	0.0	1790	Imported	By Road	**250**	Open Market
		Mdc	75-09-2	2918	0.0	2918	Domestic	By Road	**250**	Open Market
		Methanol	67-56-1	3940	0.0	3940	Domestic	By Road	**250**	Open Market
		Toluene	108-88-3	4800	0.0	4800	Domestic	By Road	**350**	Open Market
		Potassium Carbonate	584-08-7	4020	0.0	4020	Domestic	By Road	**100**	Open Market
		Sodium Methoxide	124-41-4	398	0.0	398	Domestic	By Road	**200**	Open Market
		4,6 Dichloro Pyrimidin	1193-21-1	1048	0.0	1048	Imported	By Road	**250**	Open Market
		Teda	280-57-9	160	0.0	160	Domestic	By Road	**250**	Open Market
		Koh	1310-58-3	16554	0.0	16554	Domestic	By Road	**140**	Open Market
		Methyle Sulfonic Acid	75-75-2	116	0.0	116	Domestic	By Road	**250**	Open Market
		Di-Methoxy	109-87-5	2546	0.0	2546	Domestic Imported	By Road	**250**	Open Market
		Acetonitrile	75-05-8	7038	0.0	7038	Domestic	By Road	**350**	Open Market

		2-Cyno Phenol	611-20-1	1042	0.0	1042	Imported	By Road	**250**	Open Market
4	**Tebuconazol**	Ketone	96-22-0	4875	0.0	4875	Imported	By Road	**250**	Open Market
		DMS	77-78-1	8665	0.0	8665	Domestic	By Road	**100**	Open Market
		DMSO4	77-78-1	4405	0.0	4405	Domestic	By Road	**100**	Open Market
		KOH	1310-58-3	3870	0.0	3870	Domestic	By Road	**140**	Open Market
		1,2,4-Triazole	288-88-0	1365	0.0	1365	Imported	By Road	**250**	Open Market
		n- Butanol	71-36-3	2000	0.0	2000	Domestic	By Road	**250**	Open Market
5	**Wettable Sulphur**	Micronized Sulfur	7704-34-9	4105	0.0	4105	Domestic	By Road	**250**	Open Market
		Propol DSN	2078-54-8	300	0.0	300	Domestic	By Road	**300**	Open Market
		Propol BX 80	2078-54-8	100	0.0	100	Domestic	By Road	**300**	Open Market
		China Clay	1332-58-7	495	0.0	495	Domestic	By Road	**100**	Open Market
6	**Chlorothalonil**	Tetrachloro isophthalic acid	632-58-6	745	0.0	745	Imported	By Road	**250**	Open Market
		Ammonia	7664-41-7	83	0.0	83	Imported	By Road	**250**	Open Market

		P2O5	1314-56-3	348	0.0	348	Domestic	By Road	**100**	Open Market
7	**Kresoxim-methyl**	2-(α-tolyloxymethyl)phenyl oxo methyl acetate (TMPOMA)	79-20-9	1806.39	0.0	1806.39	Domestic	By Road	**50**	Open Market
		Methoxy amine	67-62-9	308.27	0.0	308.27	Imported	By Road	**250**	Open Market
		Solvent	64742-47-8	9398.50	0.0	9398.50	Imported	By Road	**250**	Open Market
7	**Picoxystrobin**	(E) – 2- (2-Chloromethyl) Phenyl – 3 – methoxy acrylate	117428-51-0	1394	0.0	1394	Domestic	By Road	**50**	Open Market
		2 – Hydroxyl – 6 – trifloro Pyridine	34486-06-1	1108	0.0	1108	Domestic	By Road	**250**	Open Market
		MDC	75-09-2	4762	0.0	4762	Imported	By Road	**250**	Open Market
		TEBA	80904-15-0	6.8	0.0	6.8	Domestic	By Road	**250**	Open Market
8	**Trifloxystrobin**	3-Triflouromethyl acetophenone oxime	99705-50-7	1132	0.0	1132	Imported	By Road	**250**	Open Market
		(E)- 2- (2-Bromomethyl phenyl) -2-methoxy iminoacetate	13737-37-6	1594	0.0	1594	Imported	By Road	**250**	Open Market
		DMF	68-12-2	8356	0.0	8356	Domestic	By Road	**250**	Open Market

		NaH	7646-69-7	128	0.0	128	Domestic	By Road	**157**	Open Market
		Ethyl acetate	141-78-6	16712	0.0	16712	Domestic	By Road	**250**	Open Market
	GROUP-E				0.0					
1	**Imidacloprid**	Nitro Imino Imidazolidine	5465-96-3	822	0.0	822	Imported	By Road	**250**	Open Market
		2-Chloro-5-Chloro methyl pyridine	70258-18-3	831	0.0	831	Imported	By Road	**250**	Open Market
		NaOH flakes	1310-73-2	246	0.0	246	Domestic	By Road	**140**	Open Market
		DMF	68-12-2	5700	0.0	5700	Domestic	By Road	**250**	Open Market
		HCl (30%)	7647-01-0	100	0.0	100	Domestic	By Road	**25**	Open Market
2	**Acetamiprid**	MMA+ methanol	74-89-5	7750	0.0	7750	Domestic	By Road	**50**	Open Market
		2-Chloro-5-Chloro methyl pyridine	70258-18-3	993	0.0	993	Imported	By Road	**250**	Open Market
		Methanol	67-56-1	525	0.0	525	Domestic	By Road	**250**	Open Market
		Cyano methyl Imidoate	137-05-3	605	0.0	605	Imported	By Road	**250**	Open Market
		NaOH flakes	1310-73-2	240	0.0	240	Domestic	By Road	**140**	Open Market
		HCl (30%)	7647-01-0	100	0.0	100	Domestic	By Road	**25**	Open Market

3	**2-Chloro-5- Chloro Methyl Pyridine**	2- chloro 5- chloro methyl pyridine	70258-18-3	8366.4	0.0	8366.4	Imported	By Road	**250**	Open Market
		Ethylene dichloride	107-06-2	53950	0.0	53950	Domestic	By Road	**250**	Open Market
		Triethyl amine	121-44-8	74.7	0.0	74.7	Domestic	By Road	**250**	Open Market
4	**Nitro Imino Imidazolidine**	Sulphuric acid	7664-93-9	1158	0.0	1158	Domestic	By Road	**25**	Open Market
		Guanidine nitrate	506-93-4	703.8	0.0	703.8	Imported	By Road	**250**	Open Market
		EDA	107-15-3	424.8	0.0	424.8	Domestic	By Road	**250**	Open Market
		NaOH (30%)	1310-73-2	1854	0.0	1854	Domestic	By Road	**80**	Open Market
		Defomer	68 554-65-4	213.6	0.0	213.6	Domestic	By Road	**80**	Open Market
5	**Ethyl-N-Cynoethanimideate**	Acetonitrile	75-05-8	456	0.0	456	Domestic	By Road	**350**	Open Market
		Dry HCl	7647-01-0	533	0.0	533	Domestic	By Road	**140**	Open Market
		Methanol	67-56-1	378	0.0	378	Domestic	By Road	**250**	Open Market
		MDC	75-09-2	7220	0.0	7220	Domestic	By Road	**250**	Open Market
		Cyanamide (25%)	420-04-2	2333	0.0	2333	Domestic	By Road	**250**	Open Market

		NaOH (47%)	1310-73-2	1033	0.0	1033	Domestic	By Road	**80**	Open Market
6	**Cartap**	2-Dimethylamino-1,3-Dichloropropane HCl	45 84-49-0	796	0.0	796	Imported	By Road	**250**	Open Market
		Sodium thiosulphate	7772-98-7	1403	0.0	1403	Domestic	By Road	**250**	Open Market
		Sodium cyanide	143-33-9	812	0.0	812	Domestic	By Road	**250**	Open Market
		NaOH	1310-73-2	459	0.0	459	Domestic	By Road	**80**	Open Market
		Dry HCl	7647-01-0	1000	0.0	1000	Domestic	By Road	**140**	Open Market
		Methanol	67-56-1	6000	0.0	6000	Domestic	By Road	**250**	Open Market
7	**Thiamethoxam**	2-chloro-5-chloromethyl thiazole	105827-91-6	1156.5	0.0	1156.5	Imported	By Road	**250**	Open Market
		3-methyl-4-nitro imino per hydro 1,3,5-oxadiazine	153719-38-1	1215	0.0	1215	Imported	By Road	**250**	Open Market
		DMC	75-09-2	1800	0.0	1800	Domestic	By Road	**100**	Open Market
		Tmac	75-57-0	55.05	0.0	55.05	Domestic	By Road	**250**	Open Market
		K2CO3	584-08-7	1425	0.0	1425	Domestic	By Road	**100**	Open Market

		HCl (30%)	7647-01-0	1665	0.0	1665	Domestic	By Road	**25**	Open Market
		NaOH	1310-73-2	110.1	0.0	110.1	Domestic	By Road	**80**	Open Market
8	**Clothianidin**	2-chloro-5-amino methyl thiazole	105827-91-6	1404	0.0	1404	Imported	By Road	**250**	Open Market
		ACN	75-05-8	2844	0.0	2844	Imported	By Road	**250**	Open Market
		o- methyl –N-nitro urea	684-93-5	1128	0.0	1128	Imported	By Road	**250**	Open Market
		Methyl amine	74-89-5	738	0.0	738	Domestic	By Road	**290**	Open Market
9	**Emamectin Benzoate**	Methyl amine	74-89-5	80	0.0	80	Domestic	By Road	**290**	Open Market
		Avermectin	70288-86-7	2148	0.0	2148	Imported	By Road	**250**	Open Market
		Methanol	67-56-1	2600	0.0	2600	Domestic	By Road	**250**	Open Market
		Acetic acid	64-19-7	108	0.0	108	Domestic	By Road	**250**	Open Market
		Tert butyl dimethyl silyl chloride	18162-48-6	88	0.0	88	Domestic	By Road	**250**	Open Market
		Sodium carbonate	497-19-8	720	0.0	720	Domestic	By Road	**70**	Open Market
		EDC	25952-53-8	2500	0.0	2500	Domestic /	By Road	**350**	Open Market

							Import			
		Ethyl acetate	141-78-6	1520	0.0	1520	Domestic	By Road	**250**	Open Market
		Benzoic acid	65-85-0	266	0.0	266	Domestic	By Road	**250**	Open Market
10	**Indoxacarb**	Dimethoxy Ethane	110-71-4	8400	0.0	8400	Domestic	By Road	**250**	Open Market
		Dimethoxy Carbonate	616-38-6	1035	0.0	1035	Domestic	By Road	**250**	Open Market
		5 Chloro Indenone	42348-86-7	1650	0.0	1650	Imported	By Road	**250**	Open Market
		Sodium hydride	7646-69-7	960	0.0	960	Domestic	By Road	**100**	Open Market
		HCl 3%solution	7647-01-0	2400	0.0	2400	Domestic	By Road	**25**	Open Market
		Mix Xylene	1330-20-7	13200	0.0	13200	Domestic	By Road	**250**	Open Market
		Cinchonine	118-10-5	300	0.0	300	Imported	By Road	**250**	Open Market
		Butyl Hydro peroxide	75-91-2	960	0.0	960	Domestic	By Road	**250**	Open Market
		Methanol	67-56-1	750	0.0	750	Domestic	By Road	**250**	Open Market
		EDC	25952-53-8	300	0.0	300	Domestic / Import	By Road	**350**	Open Market

		NaHCO3	144-55-8	180	0.0	180	Domestic	By Road	**100**	Open Market
		IPA	67-63-0	1275	0.0	1275	Domestic	By Road	**250**	Open Market
		Phosgene	75-44-5	1680	0.0	1680	Domestic	By Road	**50**	Open Market
		Hexane	110-54-3	2250	0.0	2250	Domestic	By Road	**254**	Open Market
		MDC	75-09-2	2400	0.0	2400	Domestic	By Road	**250**	Open Market
	GROUP-F									
1	Metiram	Carbon Disulphide	107-15-3	0.0	2604.0	2604.0	Domestic	By Road	**50**	Open Market
		Ethylenediamine	75-15-0	0.0	4074.00	4074.00	Domestic	By Road	**250**	Open Market
		Ammonia solution	1336-21-6	0.0	15512.00	15512.00	Domestic	By Road	**80**	Open Market
		Zinc Sulphate	7664-93-9	0.0	4060.00	4060.00	Domestic	By Road	**80**	Open Market
		Sulphuric acid	7446-19-7	0.0	147.00	147.00	Domestic	By Road	**70**	Open Market
		Sodium Ligno sulphonate	8061-51-6	0.0	231.00	231.00	Domestic	By Road	**250**	Open Market
		Hexamethylene tetramine	100-97-0	0.0	140.00	140.00	Domestic	By Road	**250**	Open Market
	GROUP-G									

2	Cyproconazole	DMS	77-78-1	0.0	1224	1224	Domestic	By Road	**250**	Open Market
		DMSO	67-68-5	0.0	516	516	Domestic	By Road	**250**	Open Market
		DMSO4	77-78-1	0.0	2472	2472	Domestic	By Road	**250**	Open Market
		Toluene	108-88-3	0.0	4920	4920	Domestic	By Road	**90**	Open Market
*		Cp-ketone	78-93-3	0.0	3000	3000	Domestic	By Road	**250**	Open Market
		KOH flakes (85%)	1310-58-3	0.0	1800	1800	Domestic	By Road	**90**	Open Market
		1% HCl Soln	7647-01-0	0.0	1320	1320	Domestic	By Road	**80**	Open Market
		1,2,4 Triazole	288-88-0	0.0	1212	1212	Domestic	By Road	**250**	Open Market
		NMP Solvent	872-50-4	0.0	15000	15000	Domestic	By Road	**70**	Open Market
		EDC Solvent	25952-53-8	0.0	11250	11250	Domestic	By Road	**90**	Open Market
		35% HCl Solution	7647-01-0	0.0	3285	3285	Domestic	By Road	**70**	Open Market
		21% Soda Solution	1310-73-2	0.0	3720	3720	Domestic	By Road	**60**	Open Market

ANNEXURE-II
LAYOUT MAP OF THE PLANT

LANDBREAK UP OF PLANT

Sr. No.	Land Use	Area Sq. Mtr.
1	Admin, OHC & Canteen Building	855.36
2	Nr. Admin Open Space	1001.47
3	Gas Skid Area	1090
4	Parking Area	641.25
5	Formulation Plant	1574.32
6	Formulation Ware House, Office	339.33
7	Utility area (Boiler, Cooling)	1364.6
8	Transformer Area	74.5
9	Plant-2 Area	1468.31
10	Plant-1 A Area	1162.53
11	Plant-1 B Area	664.05
12	Spray Dryer Area	311
13	Tank Farm Area	853.28
14	Tank Farm and Filter Press	528.72
15	ETP Area	2106.25
16	MEE Plant	1346
17	Hazardous Waste Storage area	351.68
18	Contractor Shed	390.55
19	Petroleum Tank Farm	205.34
20	RW/FW Tank & Pump House	200
21	Nr. ETP Tank Farm Area	76.49
22	Food Composting Area	50.16
23	Toilet Block (Gents & Ladies)	85.12
24	Driver Rest Room	25.8
25	Sodium Sulphate Shed	675.46
26	Scrap Yard	66.98
27	Nr. Scrap Yard Open Space	665.72
28	Ware House	2962.65
29	Green Belt Area	17045
30	Road & Other Area	13471.78
	TOTAL	**51653.7**

ANNEXURE-III

PROCESS DESCRIPTION
MANUFACTURING ACTIVITIES

Manufacturing activities proposed in the project include various processes as a part of manufacturing Pesticides & Pesticide Intermediates. The activities shall also include operation of various utilities. The manufacturing process is described in details in following sections. The list of products and their capacity is given in Table

GROUP A
A1. m-Phenoxy Benzaldehyde
Process Description:
Stage-1

Bromination of benzaldehyde is done with Bromo chloro method to form m-Bromo benzaldehyde with the help of AlCl3 in presence of solvent EDC.

Stage-2

m-Bromo benzaldehyde formed is converted into m-Bromo benzyl acetyl in presence of Monoethylene glycol

Stage-3

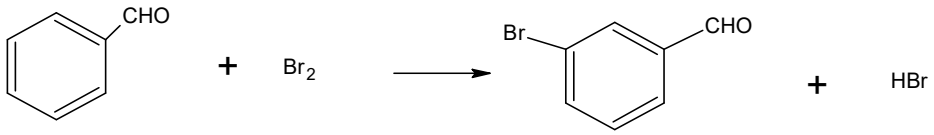
potassium Phonate is formed by the reaction of phenol and KOH. K-Phonate in turns reacts with m-Bromo benzyl acetyl to form m-Phenoxy benzyl acetate.

Stage-4

m-Phenoxy benzyl acetate is converted into m-Phenoxy benzaldehyde by hydrolysis with H2SO4. aqueous MEG liberated is distilled and recycle in MBBA stage.

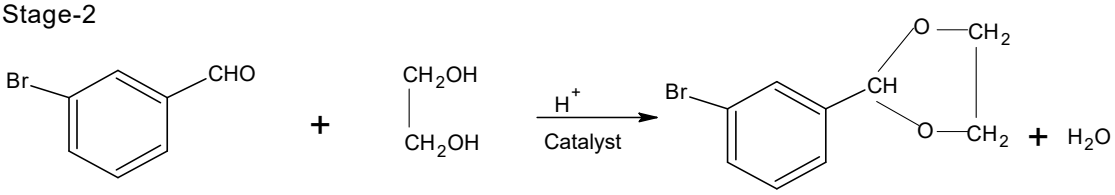
Chemical Reaction:

Stage-1

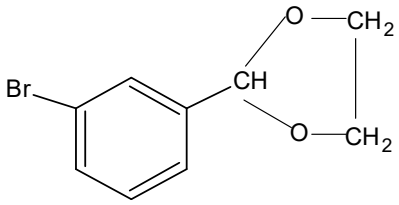


Benzaldehyde	Bromine	m-Bromo Benzaldehyde	HBr
M.F.=C7H6O	M.F.=Br2	M.F.=C7H5OBr	M.F.=HBr
M.wt.=106	M.wt.=160	M.wt.=185	M.wt.=81

Stage-2



m-Bromo Benzaldehyde	Ethylene Glycol	Acetal m-Bromo Benzaldehyde
M.F.=C7H5OBr	M.F.=C2H6O2	M.F.=C9H9O2Br
M.wt.=185	M.wt.=62	M.wt.=229



Acetal m-Bromo Benzaldehyde

M.F.=C9H9O2Br

M.wt.=229

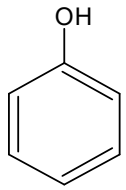
+ KOH

Potassium hydroxide

M.F.=KOH

M.wt.=56

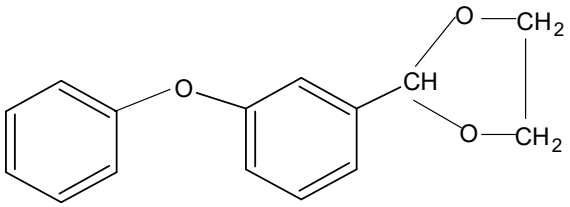
+



Phenol

M.F.=C6H6O

m.wt.=94



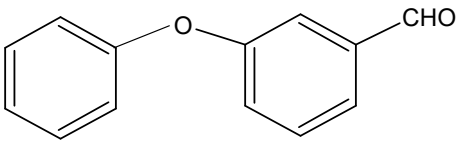
+ KBr + H_2O

Acetal m-phenoxy Benzaldehyde

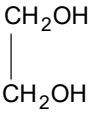
M.F.=C15H14O3

M.wt.=242

Hydrolysis



+



m-phenoxy Benzaldehyde

M.F.=C13H10O2

M.wt.=198

MEG

M.F.=C2H6O2

M.WT.=62

MASS BALANCE

INPUT	MT	OUTPUT	MT
Bromine	0.813	m-Phenoxy benzaldehyde	1
Chlorine	0.365	HCl	0.365
Ethylene dichloride	7.454	Br2+Cl2	0.123
Anhydrous AlCl3	0.512	Water	2.391
Benzaldehyde	1.055	EDC	7.149
Water	1.9	Loss	1.81
5% Sodium Thio sulphate	0.75	Salt	0.4
Ethylene glycol	0.537	Cut-1	0.197
Toluene	3.869	Toluene	5.411
Catalyst	0.035	Catalyst	0.035
Phenol	0.759	KBR wet cake	0.986
KOH flakes	0.468	MEG	0.501
CuCl	0.033	Cut-1	0.192
10% NaOH solution	0.5	Residue	0.04
20% H2SO4 solution	1.55		
TOTAL	**20.600**	**TOTAL**	**20.600**

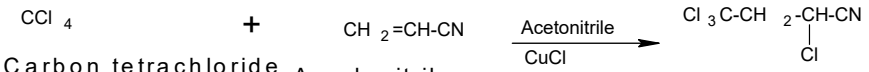
A2. Cypermethric acid chloride

Manufacturing Process:

Carbon tetra chloride is react with Acrylonitrile in presence of CuCl & acetonitrile to give tetrachloro butylonitrile which is further hydrolysis with h2SO4 to give TBA. TBA is further react with Thionyl chloride to obtain tetrachloro butyric acid chloride which is further react with isobutylene to give 2-CB. 2-CB is isomerizes in presence of catalyst to give 4-CB which is further hydrolysis with NaOH to give CM acid . CM acid is further react with thinly chloride to give CM acid chloride.

Chemical Reaction:

stage-1



Carbon tetrachloride
M.F.=CCl4
M.wt.=154

Acrylonitrile
M.F.=C3H3N
M.wt.=53

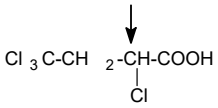
Tetrachloro butylonitrile
M.F.=C4H3Cl4N
M.wt.=207

stage-2

Tetrachloro butylonitrile
M.F.=C4H3Cl4N
M.wt.=207

sulphuric acid
M.F.=H2SO4
M.wt.=98

TB- amide
M.F.=C4H5Cl4NO
M.wt.=225



TBA
M.F.=C4H4Cl4O2
M.wt.=226

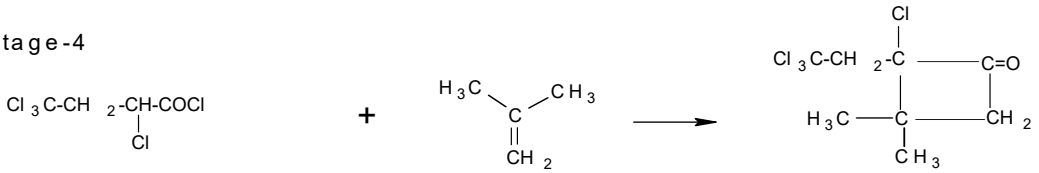
stage-3

TBA
M.F.=C4H4Cl4O2
M.wt.=226

Thionyl chloride
M.F.=SOCl2
M.wt.=119

tetrachloro butyric acid chloride
M.F.=C4H3Cl5O
M.wt.=244.5

stage-4

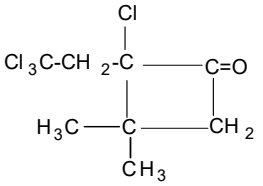


tetrachloro butyric acid chloride
M.F.=C4H3Cl5O
M.wt.=244.5

Isobutylene
M.F.=C4H8
M.wt.=56

2-CB
M.F.=C8H10Cl4O
M.wt.=264

stage-5

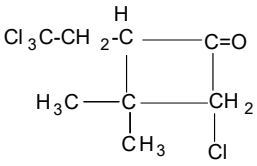


2-CB

M.F.=C8H10Cl4O

M.wt.=264

TEA

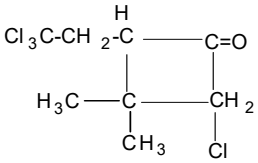


4-CB

M.F.=C8H10Cl4O

M.wt.=264

stage-6

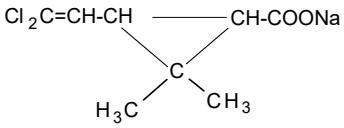


4-CB

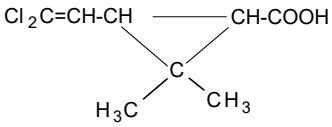
M.F.=C8H10Cl4O

M.wt.=264

+ NaOH



CM-Acid -Na-Salt

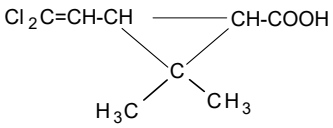


CM-Acid

M.F.=C8H10Cl2O2

M.wt.=209

Stage-7



CM-Acid

M.F.=C8H10Cl2O2

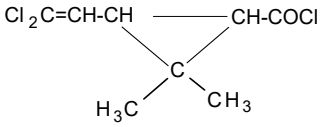
M.wt.=209

+ $SOCl_2$

Thionyl chloride

M.F.=SOCl2

M.wt.=119



CM-Acid chloride

M.F.=C8H9Cl3O

M.wt.=227.5

MASS BALANCE FOR CYPERMETHRIC ACID CHLORIDE

INPUT	MT	OUTPUT	MT
Acrylonitrile	0.449	Cyper Methric acid chloride	1
Carbon tetrachloride	1.698	Cut-1	0.51
Acetonitrile	0.15	Cut-2	0.083
CuCl2 2H2O	0.013	Cut-3	0.15
Diethyl amine hydrochloride	0.013	Water recycle	4.541
98% H2SO4	1.039	Aqueous mass	0.92
Water	4.095	Loss	2.053
SOCl2	1.893	Salt	0.8
DMF	0.014	SOCl2	1.1
Hexane	14.1	Isobutylene	1.104
Isobutylene	1.907	TEA	0.716
TEA	0.854	Hexane	13.923
NaOH Flakes	0.612	Hyflow wet cake	0.04
HCl (35%)	0.3	SO2	0.29
Hyflow	0.02	HCl	0.166
Water fresh	0.239		
TOTAL	**27.396**	**TOTAL**	**27.396**

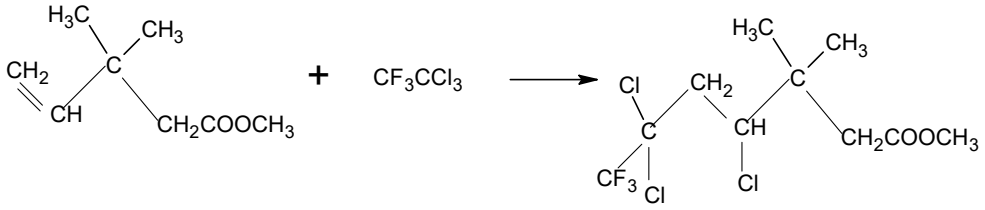
A3. lambda Cyhalothric acid chloride

Manufacturing Process:

3,3-Dimethyl-4-pentenoic acid methyl ester is react with Trifluoro Trichloro ethane to obtain Adduct (1) which is isomerizes to give unsaturated ester which is further hydrolysis to give Cyhalothric acid. Cyhalothric acid is react with Thionyl chloride to give lambda Cyhalothric acid chloride.

Chemical Reaction:

stage-1



3,3-dimethyl-4-pentenoic caid methyl ester

M.F.=C8H14O2

M.wt.=142

trifluoro trichloro ethane

M.F.=C2F3Cl3

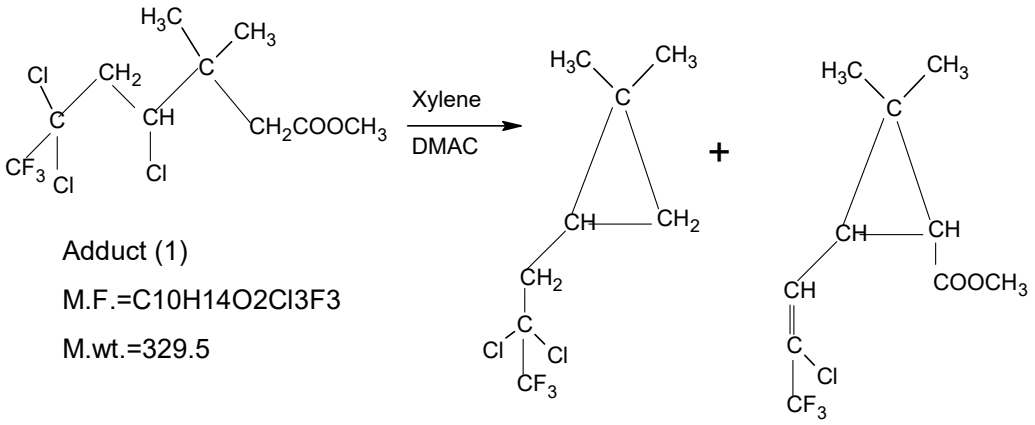
M.wt.=187.5

Adduct (1)

M.F.=C10H14O2Cl3F3

M.wt.=329.5

stage-2



Adduct (1)

M.F.=C10H14O2Cl3F3

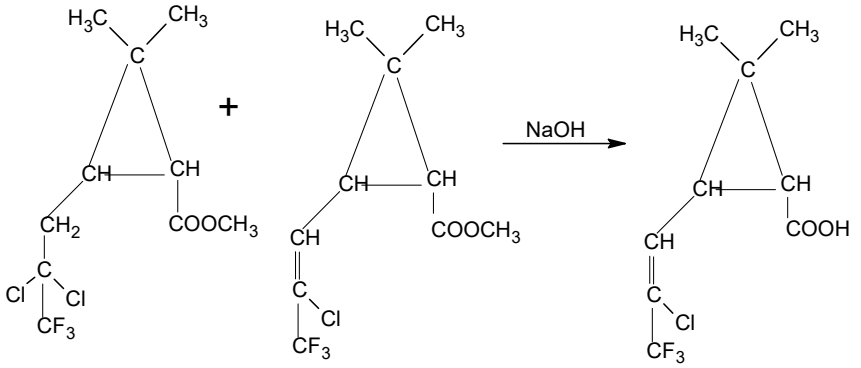
M.wt.=329.5

saturated ester

Unsaturated ester 2(B)

M.f.=C10H12F3O2Cl

M.wt.=256.5



Unsaturated ester 2(B)

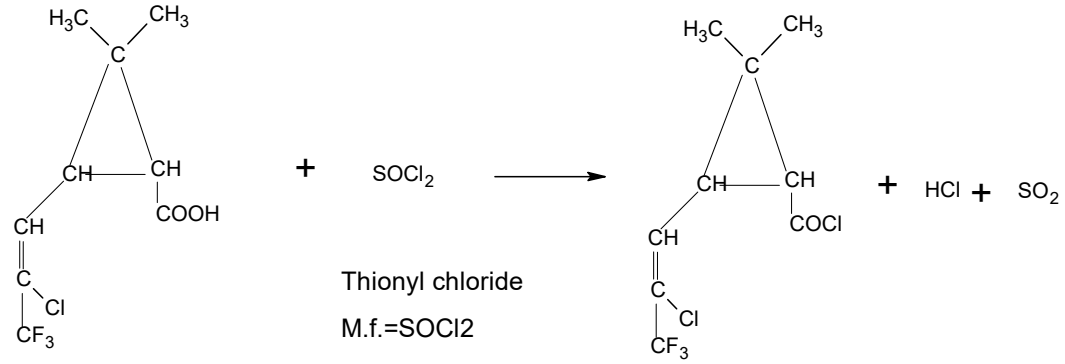
M.f.=C10H12F3O2Cl

M.wt.=256.5

cyhalothric acid

M.f.=C9H10F3O2Cl

M.wt.=242.5



cyhalothric acid

M.f.=C9H10F3O2Cl

M.wt.=242.5

Thionyl chloride

M.f.=SOCl2

M.wt.= 119

cyhalothric acid chloride

M.f.=C9H9F3OCl2

M.wt.=261

Mass Balance:

INPUT	MT	OUTPUT	MT
Methyl Pentanoate	1.1	Lambda Cyhalothric acid chloride	1.034
Trichloro trifluoro ethane	1.35	TBA	10.723
Tertiary Butanol	12.478	Water	11.545
Water	11.705	Hexane	7.39
Sodium metal	0.21	DMF	1.98
Hexane	8.1		
DMF	2.211	Loss	6.895
H2SO4	0.044	Salt	0.5
Caustic flakes	1.519	Methanol	3.79
Methanol	4.8	HCl (30%)	0.572
HCl (30%)	3.552	20% Na2SO4	3.21
Thionyl chloride	0.57		
TOTAL	**47.639**	**TOTAL**	**47.639**

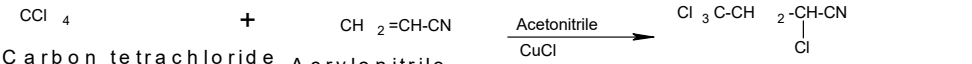
A4: Deltamethric acid chloride

Manufacturing Process

Carbon tetra chloride is react with Acrylonitrile in presence of CuCl & acetonitrile to give tetrachloro butylonitrile which is further hydrolysis with h2SO4 to give TBA. TBA is further react with Thionyl chloride to obtain tetrachloro butyric acid chloride which is further react with isobutylene to give 2-CB. 2-CB is isomerised in presence of catalyst to give 4-CB which is further hydrolysis with NaOH to give CM acid . which is further react with bromine to give Deltamethric acid which is further react with Thionyl chloride to give Deltamethric acid chloride.

Chemical Reaction:

stage-1

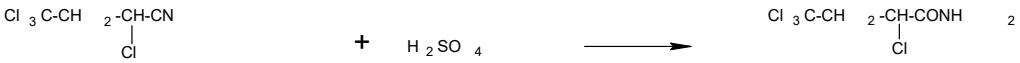


Carbon tetrachloride
M.F.=CCl4
M.wt.=154

Acrylonitrile
M.F.=C3H3N
M.wt.=53

Tetrachloro butylonitrile
M.F.=C4H3Cl4N
M.wt.=207

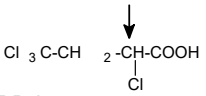
stage-2



Tetrachloro butylonitrile
M.F.=C4H3Cl4N
M.wt.=207

sulphuric acid
M.F.=H2SO4
M.wt.=98

TB- amide
M.F.=C4H5Cl4NO
M.wt.=225



TBA
M.F.=C4H4Cl4O2
M.wt.=226

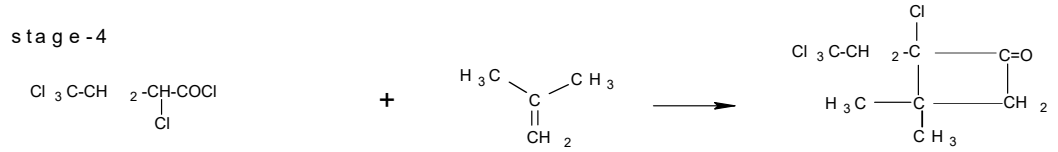
stage-3

TBA
M.F.=C4H4Cl4O2
M.wt.=226

Thionyl chloride
M.F.=SOCl2
M.wt.=119

tetrachloro butryic acid chloride
M.F.=C4H3Cl5O
M.wt.=244.5

stage-4

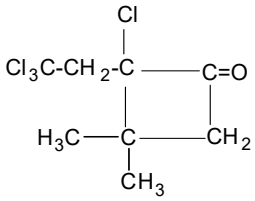


tetrachloro butryic acid chloride
M.F.=C4H3Cl5O
M.wt.=244.5

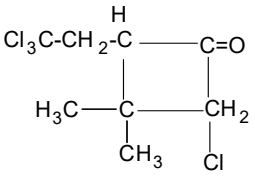
Isobutylene
M.F.=C4H8
M.wt.=56

2-CB
M.F.=C8H10Cl4O
M.wt.=264

stage-5



TEA



2-CB

M.F.=C8H10Cl4O

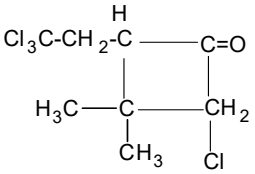
M.wt.=264

4-CB

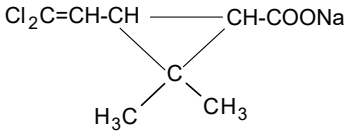
M.F.=C8H10Cl4O

M.wt.=264

stage-6



\+ NaOH

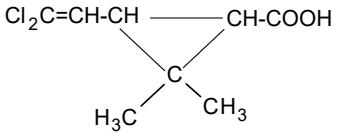


4-CB

M.F.=C8H10Cl4O

M.wt.=264

CM-Acid -Na-Salt

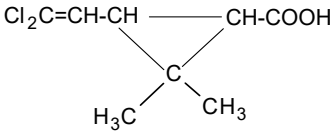


CM-Acid

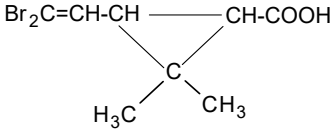
M.F.=C8H10Cl2O2

M.wt.=209

Stage-7



\+ Br_2



CM-Acid

M.F.=C8H10Cl2O2

M.wt.=209

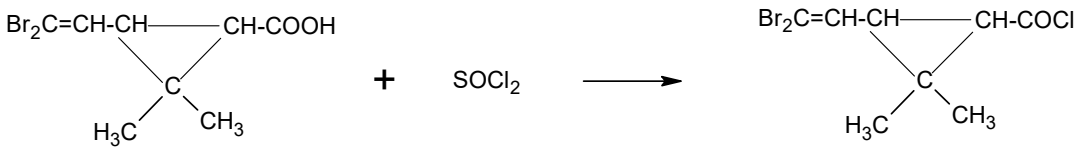
Bromine

M.F.=Br2

M.wt=160

Deltamethric acid

Stage-8



Deltamethric-Acid

M.F.=C8H10Br2O2

M.wt.=298

Thionyl chloride

M.F.=SOCl2

M.wt.=119

Deltamethric-Acid chloride

M.F.=C8H9Br2ClO

M.wt.=316.5

Mass Balance:

INPUT	**MT**	**OUTPUT**	**MT**
Cis SS-RR CMA	4	Deltamethric acid chloride	1.03
Water	3.82	Water	24.263
C.S.Lye (48%)	2.954	Effluent	6.992
Catalyst -1	1.15	Loss	8.818
Water	20.606	MDC	8.514
MDC	9.46	Bromo benzene	0.66
30% HCl	2.06	Benzene	3.033
AlCl3	0.775	Salt	0.14
Benzene	3.65	n-hexane	4.1
Bromine	4.286	Methanol	3.792
Sodium thiosulphate	0.065	Toluene	1.12
Catalyst -2	0.045	30% HCl	0.408
n-Hexane	5	20% Na2SO3	2.116
Sulphuric acid	0.4		
Methanol	4.4		
Soda ash	0.475		
Toluene	1.4		
DMF	0.016		
Thionyl chloride	0.424		

TOTAL	**64.986**	**TOTAL**	**64.986**

A5: CYPERMETHRIN

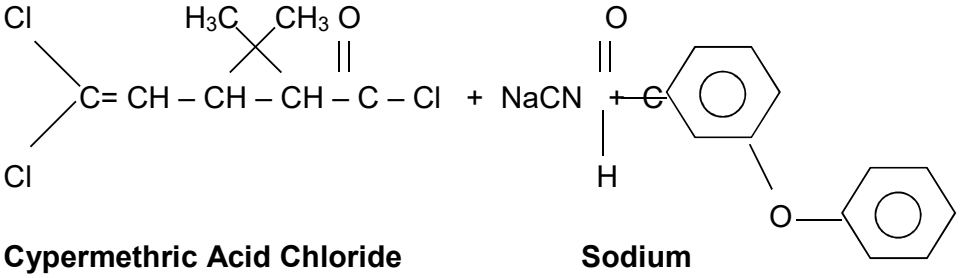
BRIEF MANUFACTURING PROCESS :-

Meta Phenoxy Benzaldehyde is reacted with Sodium Cyanide to form Meta Phenoxy Benzaldehyde Cyanohydrin as an intermediate. This on reaction with Cypermethric Acid Chloride form 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.

CHEMICAL REACTIONS :-

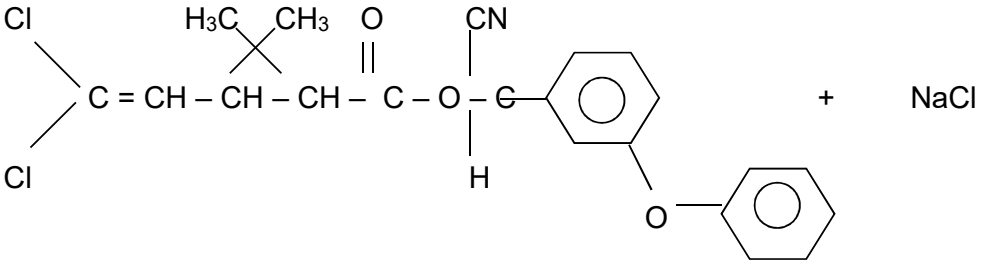


Cypermethric Acid Chloride (MW 227.5)

Sodium Cyanide (MW 49.1)

Meta Phenoxy Benzaldehyde (MW 198)

N. Hexane
Catalyst



Cypermethrin (MW 416.3)

Sodium Chloride M.W. 58.5)

MASS BALANCE:

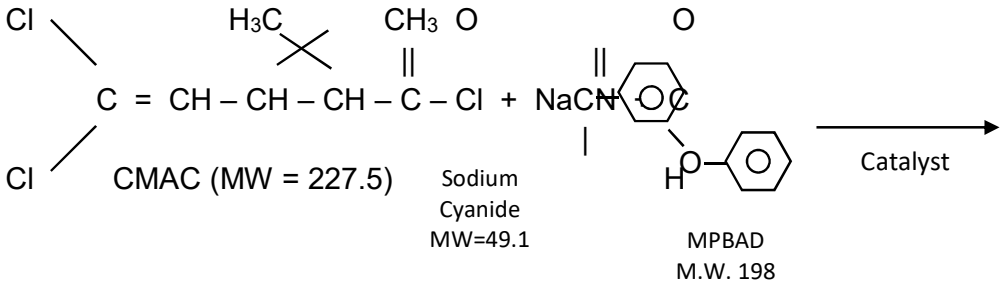
INPUT	MT	OUTPUT	MT
Cypermethric acid chloride	0.585	Cypermethrin tech.	1
m-Phenoxy benzaldehyde	0.5	Aqueous mass	2.062
NaCN	0.136	n-Hexane	2.85
n-Hexane	3	Loss	0.198
Water	0.98		
4% Soda ash solution	0.5		
Catalyst	0.01		
Sodium hypo solution	0.399		
TOTAL	**6.110**	**TOTAL**	**6.110**

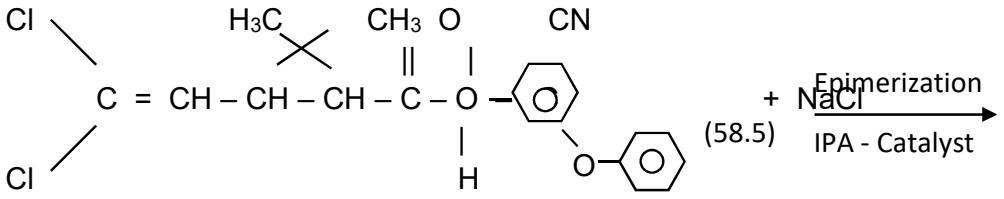
A6: ALPHAMETHRIN

BRIEF MANUFACTURING PROCESS:

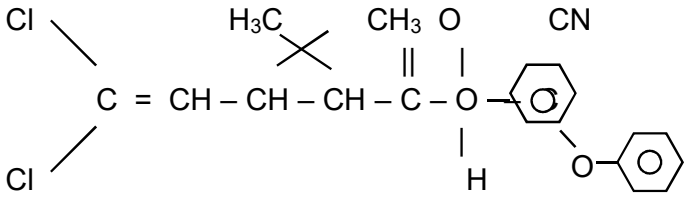
Metaphenoxy Benzaldehyde is reacted with sodium cyanide to form Metaphenoxy Benzaldehyde Cyanohydrin as intermediate. This on reaction with Cypermethric acid chloride (CMAC) of high cis > 96% from the product Alpha-Cypermethrin oil. In this process n-Hexane is used as solvent along with phase transfer catalyst. The reaction is washed by Soda-ash solution and plane water.
The n-Hexane is then stripped off to get pure Alpha-Cypermethrin oil in Racemic form which is epimerized by catalyst in presence of IPA-solvent to form the final product Alpha Cypermethrin of >95% Purity

CHEMICAL REACTIONS:





(Alpha-Cypermethrin Oil M.W. 416.3)



(Alpha - Cypermethrin M.W. 416.3)

MASS BALANCE .

INPUT	MT	OUTPUT	MT
m-Phenoxy benzaldehyde	0.714	Alphamethrin	1.04
Cypermethric acid chloride	0.835	Aqueous mass	3.627
Water	2.049	n-hexane	3.999
Catalyst	0.014	Loss	0.532
NaCN	0.195	IPA	2.484
5% Soda ash solution	0.7	Catalyst	0.05
IPA	2.269		
Catalyst	0.086		
8% NaOCl solution	0.57		
n-Hexane	4.3		
TOTAL	**11.732**	**TOTAL**	**11.732**

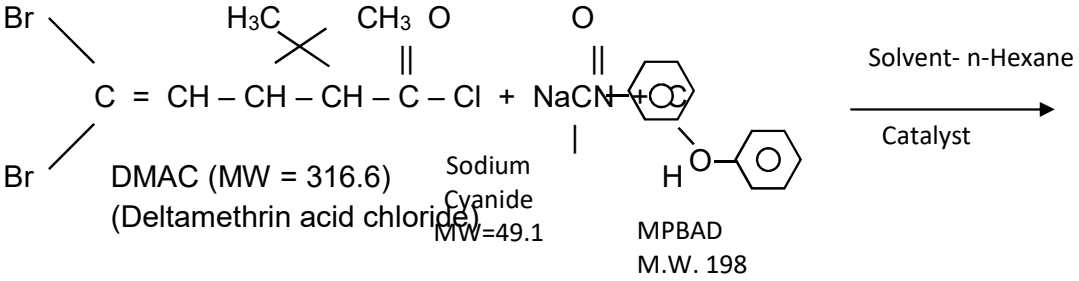
A7: DELTAMETHRIN

BRIEF MANUFACTURING PROCESS:

Metaphenoxy Benzaldehyde is reacted with Sodium Cyanide to form Metaphenoxy Benzaldehyde Cyanohydrin as intermediate. This on reaction with Dibromovinyl Dimethyl Cyclo propane Carboxyllic Acid Chloride – Deltamethric acid chloride (DMAC) of high cis > 96% from 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

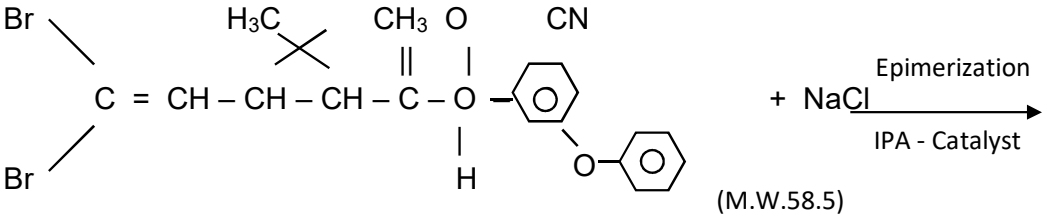
CHEMICAL REACTIONS:



DMAC (MW = 316.6)
(Deltamethrin acid chloride)

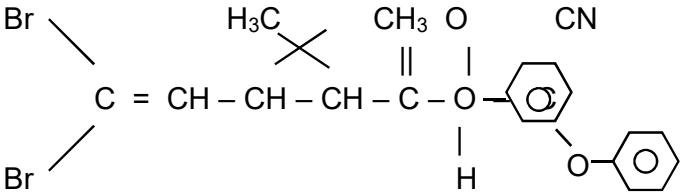
Sodium Cyanide MW=49.1

MPBAD M.W. 198



(M.W.58.5)

(Deltamethrin Oil)



(Deltamethrin M.W. 505.2)

MASS BALANCE FOR DELTAMETHRIN

INPUT	MT	OUTPUT	MT
Deltamethrin acid chloride	0.892	Deltamethrin tech.	1.013
m-Phenoxy benzaldehyde	0.544	Aqueous mass	2.97
n-Hexane	4.5	n-Hexane	4.05
NaCN	0.148	Loss	0.69
Water	1.494	Catalyst	0.075
Catalyst	0.01	IPA	1.1
5% Soda ash solution	0.75	Deltamethrin mass	0.23
IPA	2.35	Filtrate	1.107
Catalyst	0.125		
8% NaOCl solution	0.422		
TOTAL	**11.235**	**TOTAL**	**11.235**

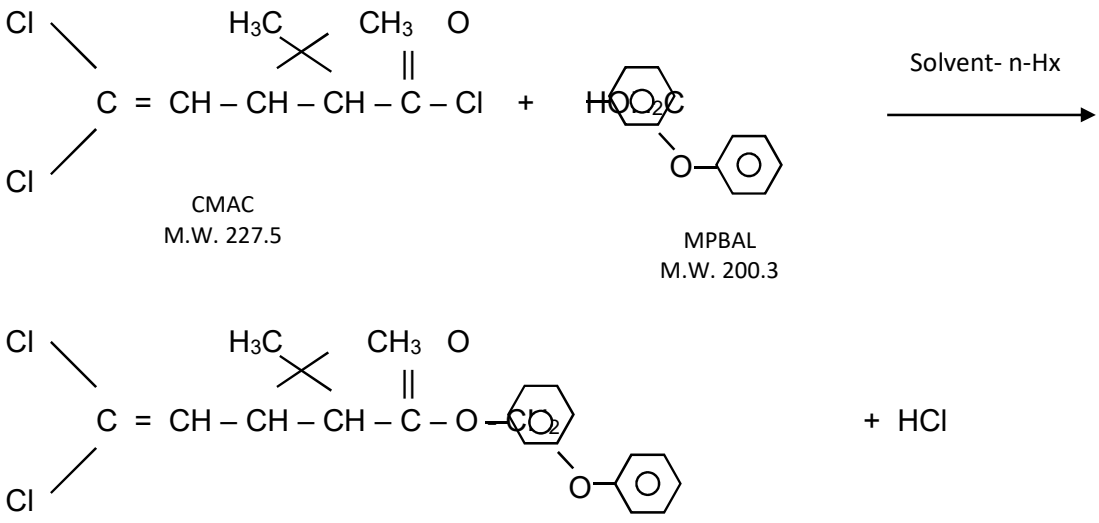
A8: **PERMETHRIN (TECH)**

MANUFACTURING PROCESS:

Meta Phenoxy Benzyl Alcohol is reacted with Cypermethric Acid Chloride (CMAC) in presence of solvent n-Hexane to give the Permethrin mass. Hydrochloric acid gas is generated during the reaction which is scrubbed in water to get 30% solution of hydrochloric acid.

The resulting mass is then washed by soda ash solutions as well as water. finally solvent is stripped off to recover it & to get the pure Permethrin Tech.

CHEMICAL REACTIONS:



MASS BALANCE FOR PERMETHRIN TECH.

INPUT	**MT**	**OUTPUT**	**MT**
Cypermethric acid chloride	0.642	Permethrin tech.	1
MPBAL	0.55	n-Hexane recover	2.85
10% soda ash solution	1	Aqueous mass	1.577
Water	0.735	Loss	0.215
c.s.lye	0.05	30% HCl	0.335
n-hexane	3		
TOTAL	**5.977**	**TOTAL**	**5.977**

A9 : LAMBDA CYHALOTHRIN (TECH)

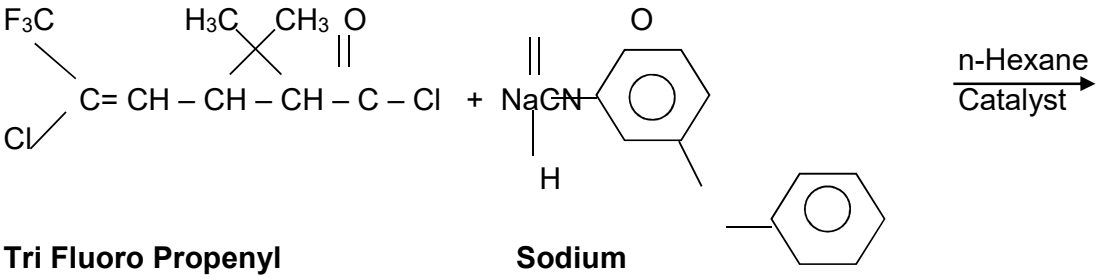
BRIEF MANUFACTURING PROCESS :

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

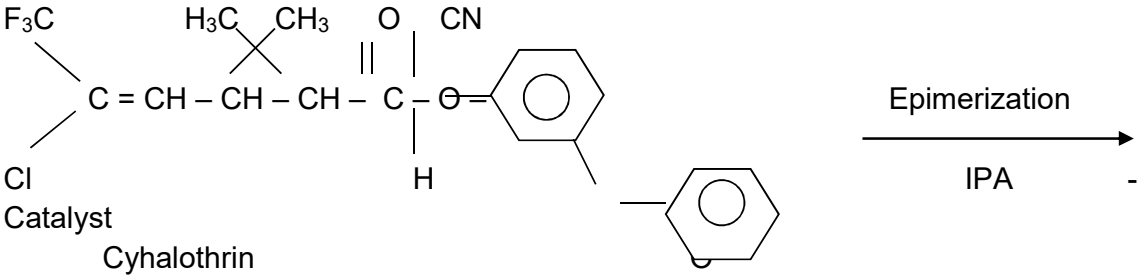
CHEMICAL REACTIONS :



Tri Fluoro Propenyl Acid Chloride (MW 261)

Sodium Cyanide (MW 49.1)

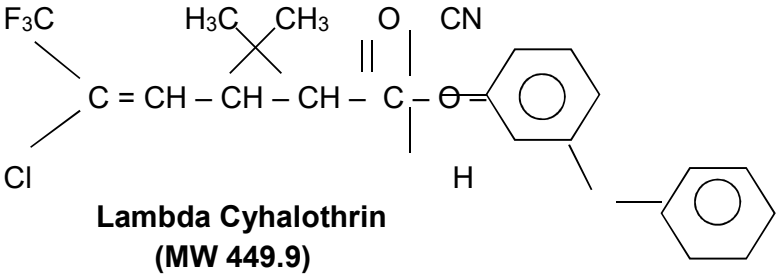
Meta Phenoxy Benzaldehyde (MW 198)



Catalyst

Cyhalothrin **(M.W. 449.9)**

+ NaCl Sodium Chloride (M.W. 58.5)



Lambda Cyhalothrin (MW 449.9)

MASS BALANCE FOR LAMBDA CYHALOTHRIN TECH.

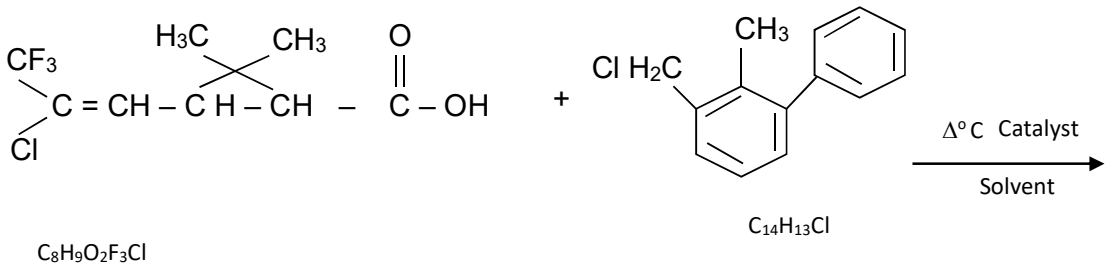
INPUT	MT	OUTPUT	MT
TFP acid chloride	0.64	Lambda cyhalothrin	1
m-Phenoxy benzaldehyde	0.47	n-Hexane	2.375
NaCN	0.128	Aq. Masss	3.146
Catalyst	0.01	Loss	0.205
Water	0.97	IPA	0.97
5% Soda ash solution	0.5	Catalyst	0.134
Catalyst	0.026		
IPA	1.05		
8% NaOCl	1.482		
n-Hexane	2.554		
TOTAL	**7.830**	**TOTAL**	**7.830**

A10: BIFENTHRIN (TECH)

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 REACTIONS :-

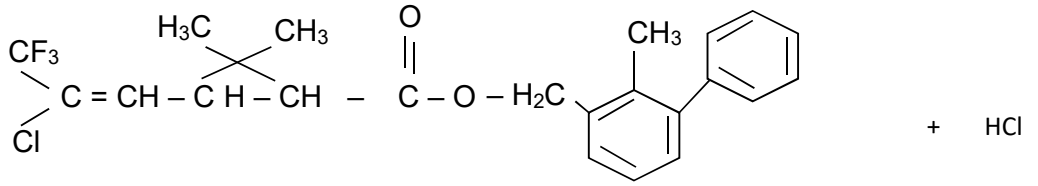


$C_8H_9O_2F_3Cl$

M.W. 229.5

$C_{14}H_{13}Cl$

M.W. 216.5



$C_{22}H_{21}ClF_3O_2$

Bifenthrin

MASS BALANCE FOR BIFENTHRIN

INPUT	**MT**	**OUTPUT**	**MT**
TFP Acid	0.59	**BIFENTHRIN (TECH)**	1.036
PMBC	0.56	HCL	0.137
Solvent	0.5	Loss	0.02
Catalyst	0.025	Residue	0.002
Solvent	0.1	Rec. Solvent	0.56
TOTAL	**1.775**	**TOTAL**	**1.755**

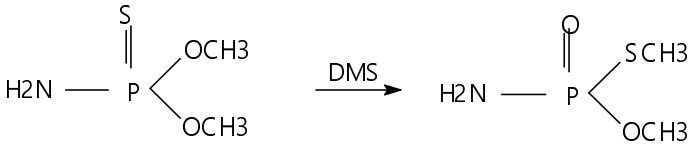
GROUP: B

B1: METHAMIDOPHOS

Manufacturing Process:

DMPAT is reacting with Dimethyl sulphate at elevated temperature in presence of Toluene as solvent. After completion of reaction recover the solvent to obtain Methamidophos.

Chemical Reaction



DMPAT Methamidophos

MASS BALANCE FOR METHAMIDOPHOS

INPUT	**MT**	**OUTPUT**	**MT**
DMPAT	1.028	Methamidophos	1
Toluene	1.338	Toluene	1.3
Dimethyl Sulphate	0.048	Loss	0.053
		Residue	0.061
TOTAL	**2.414**	**TOTAL**	**2.414**

B2: PROFENOFOS

Manufacturing Process:

Step 1

Synthesis of 4-Bromo-2-Chloro Phenol

2-Chloro Phenol is reacted with bromine to give the above intermediate product i.e. 4-bromo-2 Chloro Phenol whereby HBr is generated and scrubbed in water resulting in the formation of HBr Solution

Step 2

Preparation of 4-Bromo-2-Chloro Phenyl, O,O-Diethyl phosphorothioate(BCP Triester) 4-Bromo-2-Chloro Phenol is reacted with DETC in presence of acid scavenger like NaOH which results in the above desired intermediate. The reaction mass is then subjected to layer separation followed by water washing of the organic layer

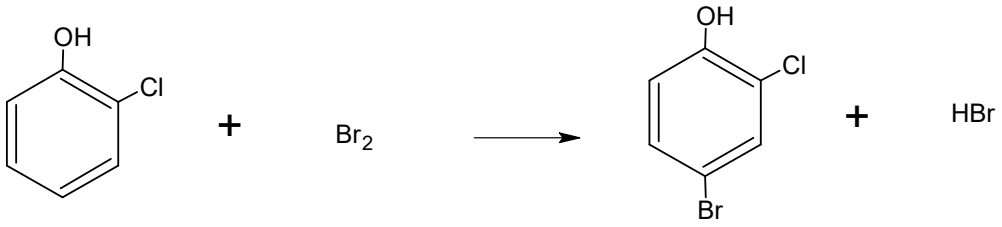
Step3

Preparation of Profenofos

The BCP Triester is then reacted with Sodium hydrosulphide solution in presence of alcohol as the solvent. After the completion of reaction the solvent is removed from The reaction mass. The residual mass is then reacted with n-Propyl Bromide at an elevated temperature. After the reaction completion they reaction mass is subjected to separation. The organic mass thus obtained is washed with water and excess of n-Propyl Bromide and is removed under reduced pressure to get the Profenofos

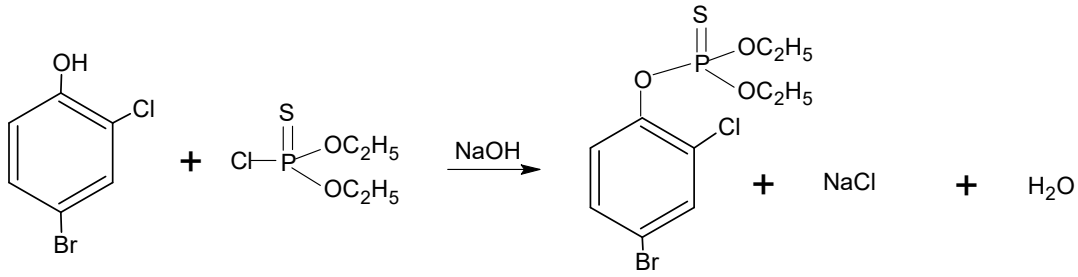
Chemical Reaction:

Step:-I 4-Bromo-2-Chloro Phenol



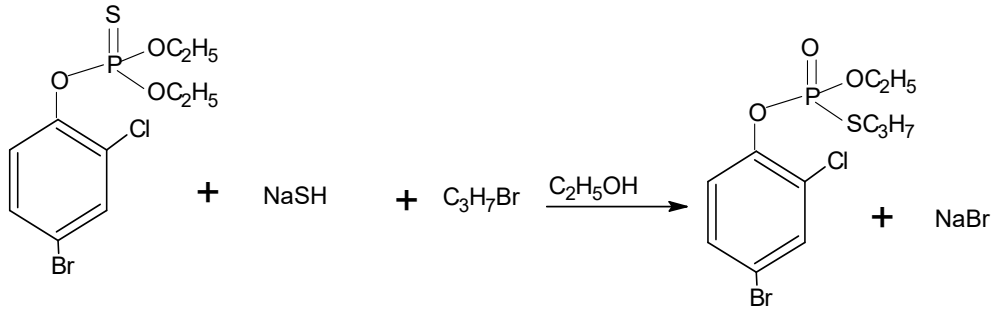
O-chloro phenol	Bromine	4-Bromo-2-Chloro phenol	Hydrobromic acid
M.wt. : 128.5	M.wt. : 160	M.wt. : 207.5	M.wt. : 81

Step-II O-4-Bromo-2-Chloro Phenyl,O,O-Diethyl Phosphoro thioate



4-Bromo-2-Chloro phenol	DETC	BCP -Triester	Sodium chloride	water
M.wt. : 207.5	M.wt. : 188.5	M.wt. : 359.5	M.wt. : 58.5	M.wt.:- 18

Step-III Profenofos



BCP -Triester	Sodiumhydrosulfide	n-Propyl bromide	Profenophos	Sodium Bromide
M.wt. : 359.5	M.wt. : 56	M.wt. : 123	M.wt. : 373.6	M.wt. : 103

+ C_2H_5SH

Ethyl mercaptan

M.wt.:- 62

MASS BALANCE FOR PROFENOFOS

INPUT	MT	OUTPUT	MT
2-Chloro Phenol	0.382	Profenofos	1
Bromine	0.464	HBr Solution	0.74
Catalyst	0.012491	Aqueous Layer	1.354
DETC	0.575	Ethyl Mercaptan	0.214
Water	2.038	Ethanol	1.26
Caustic Lye(26%)	0.525	NaBr Solution	1.309
Ethanol (99%)	1.599	n-propyl bromide	0.93
NaSH(27%)	0.609	Loss	0.712
n-Propyl Bromide	1.315		
TOTAL	**7.519**	**TOTAL**	**7.519**

B3: DIETHYL THIOPHOSPHORYL CHLORIDE (DETC)

Reaction chemistry

$PSCL_3$ + C_2H_5OH ⟶ $(C_2H_5O)\,PSCl_2$ + HCL

Phosphorus Sulpho chloride — Ethanol — Mono ethyl Thio-phosphoryl Dichloride (Mono-Ester) — Hydro chloric acid

$HCL + NaOH \longrightarrow NaCL + H_2O$

$(C_2H_5O)\,PSCl_2 + C_2H_5OH + NaOH \longrightarrow (C_2H_5O)_2PSCl + NaCL + H_2O$

Mono ethyl Thio-Phosphoryl Chloride — Ethanol — Diethyl Thio- Phosphoryl Dichloride **(Di-Ester)**

Process Description:

The manufacturing process of DETC involves following four steps:

$PSCl_3$ on low temperature reacts with absolute alcohol gives monoester.
The monoester thus formed reacts with absolute alcohol and sodium hydroxide and crude ester is separated out.
The crude ester thus separated is subjected to fractional distillation to achieve desired purity.

Mono Ester is prepared by continuous feeding of $PSCl_3$. Ethanol in reactor at lower temperature followed by washing of Mono Ester Water to remove the Acidity. The aqueous layer separated is sent to recovery column after neuterialisation while the mono ester is sent to next stage called Di-Ester.

The Di-Ester is manufactured by reaction of Mono Ester with Ethanol and Sodium Hydroxide at lower temperature. The sodium chloride formed are washed with water and sent to alcohol recovery column while crude Di-Ester is sent for the further purification by vacuum distillation.

The crude Di-Ester contains the mainly Mono Ester and Tri-Ester which is purified by distillation at 10 mm. vacuum and max. 100^{o}c. The distilled product is stored in storage tank.

MASS BALANCE FOR DIETHYL THIOPHOSPHORYL CHLORIDE (DETC)

INPUT	MT	OUTPUT	MT
PSCl3	1.4	DETC	1
Ethanol	6.57	Ethanol recover	5.57
Caustic flakes	0.46	NaCl	0.515
Caustic lye 47%	0.58	Effluent	8.615
Benzene	0.08		
Water	6.61		
TOTAL	**15.700**	**TOTAL**	**15.700**

B4: DIMETHYL THIOPHOSPHORY CHLORIDE (DMTC)

Process Description:
The manufacturing process of DMTC involves following four steps:

$PSCl_3$ on low temperature reacts with methanol gives monoester.
The monoester thus formed reacts with methanol and sodium hydroxide and crude ester is separated out. The crude ester thus separated is subjected to fractional distillation to achieve desired purity.

Mono Ester is prepared by continuous feeding of $PSCl_3$. Methanol in reactor at lower temperature followed by washing of Mono Ester with water to remove the Acidity. The aqueous layer separated is sent to recovery column while the mono ester is sent to next stage called Di-Ester.

The Di-Ester is manufactured by reaction of Mono Ester with Methanol and Sodium Hydroxide at lower temperature. The sodium chloride formed are washed with water and sent to recovery column while crude Di-Ester is sent for the next Stage.

Chemical Reaction:

$PSCl_3 + 2CH_3OH + 2NaOH \rightarrow (CH_3O)_2 PSCl + 2NaCl + 2H_2O$

Phosphorus Sulpho Chloride — Methanol — Di Methyl Thio-Phosphoryl Chloride

MASS BALANCE FOR DIMETHYL THIOPHOSPHORYL CHLORIDE (DMTC)

INPUT	MT	OUTPUT	MT
PSCl3	1.22	DMTC	1
Methanol	1.746	Methanol recover	1.156
Caustic lye 47%	1.242	NaCl	0.184
Water	7.432	Effluent	9.3
TOTAL	**11.640**	**TOTAL**	**11.640**

B5: DMTC AMIDE
DIMETHYL THIOPHOSPHORY CHLORIDE AMIDE (DMTC)

Process Description:
The manufacturing process of DMTC-amide
DMTC is react with ammonia gas at a low temperature in presence of Methylene dichloride as solvent. after completion of reaction to give product DMTC amide and byproduct is ammonium chloride

Chemical Reaction:

$(CH_3O)_2$ PSCl + 2NH3 ⟶ $(CH_3O)_2$ PSNH2 + NH4Cl

Di Methyl Thio-Phosphoryl Chloride — Ammonia — Di Methyl Thio-Phosphoryl Amide — Ammonium Chloride

MASS BALANCE FOR DIMETHYL THIOPHOSPHORYL CHLORIDE AMIDE (DMTC- Amide)

INPUT	**MT**	**OUTPUT**	**MT**
DMTC	1.22	DMTC- Amide	1
MDC	1.22	MDC recover	1.2
Ammonia	0.275	Losses	0.109
		Salt	0.406
TOTAL	**2.715**	**TOTAL**	**2.715**

B6: TRICHLORO ACETYL CHLORIDE

Manufacturing Process:

Charge MCMl, Sulphur and Ferric Chloride in a reactor. Raise the Temperature to 50^0C

And pass chlorine in 60 hours at 50 to 55^0C. Distill the DCAC and after the completion of the distillation add Pyridine in 1 hour at 35^0C.and purge Chlorine gas allow the mass to separate the Bottom Layer and Distill the TCAC by maintaining the Temperature Below 135^0C.

Chemical Reaction:

STAGE – I :-

$ClH_2CCOOH + 2\ Cl_2 + ½\ S + NaOH$

Mono chloro Acetic Acid	Chlorine	Sulfur	Sodium Hydroxide
(M.Wt : 94.5)	(71)	(32)	(40)

↓

$Cl_2HCCOCl + 2\ HCl + ½\ Na_2S0_3 + ½\ H_2O$

Dichloro Acetyl Chloride	Hydrochloric Acid	Sodium Sulfite	Water
(M. Wt : 147.5)	(36.5)	(126)	(18)

STAGE – II :-

$Cl_2HCCOCl + Cl_2 \longrightarrow Cl_3CCOCl + HCl$

Dichloro Acetyl Chloride	Chlorine	Trichloro Acetyl Chloride	Hydrochloric Acid
(M. Wt : 147.5)	(71)	(182)	(36.5)

MASS BALANCE FOR TRICHLORO ACETYL CHLORIDE:

INPUT	MT	OUTPUT	MT
Catalyst	0.00	Trichloro Acetyl Chloride	1.00
Acetic acid	0.50	HCl	0.41
CL2	1.10	So2	0.12
S2Cl2	0.20	L.B.	0.25
		Loss	0.01
TOTAL	**1.80**	**TOTAL**	**1.80**

B7: CHLORPYRIPHOS

MANUFACTURING PROCESS:

Stage-I HTCP :

Charge the specified amount of raw material in order of solvent, TCAC, Acrylonitrile and last Catalyst and mass is heated up to 140 □C under reflex condition. During reaction HCl will be generated and same is absorbed in water scrubber.

Solvent recovered under vacuums at 730 mm Hg & temperature is maintained at about 110 □C. recovered solvent is recycled in the process and part quantity transferred to Incinerator. Cool the mass temperature to 105 □C and slowly release the vacuum.

Stage-II Sodium HTCP :

Maintain the temperature of the 15 % Sodium Hydroxide solution between 10 – 15 □C and slowly add the hot reaction mass of 'Stage I' in it. The reaction mass temperature would increase, however it should not go above 65 □C. Again cool it down to 15 □C and digest for 1.0 hours. Filter the entire mass and collect the ML and transfer to Incinerator. Remove the wet cake.

Stage III: Slurry Preparation :

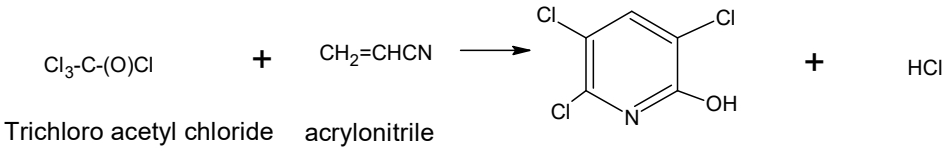
Take water and charge wet cakes and makes slurry. Also charge calculated amount of caustic lye solution. Heat the mass. Once the temperature is around 60 - 65 □C, shut the autoclave and increase the reaction mass temperature up to 130 □C.

Stage IV: Toxification reaction:

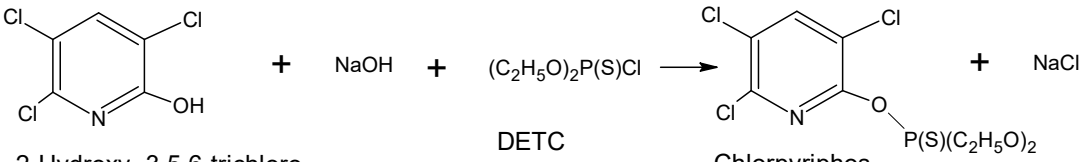
Based on calculation of active content of HTCP in the slurry add catalyst. Also add EDC as a solvent and maintain the reaction temperature around 50 □C. Add DETC over a period of 3 – 4 hours maintaining the reaction temperature around 50 □ 2 □C. Once the reaction is completed settle the mass for 1.0 hour. Filter the mass through filter. Separate out the organic and aqueous layer. Aqueous transfer to Incinerator and organic mass is transfer to EDC recovery section

Slowly raise the temperature and vacuum and recover EDC at 755 mm of Hg and temperature at 70 □C. Recover EDC is recycled in the stage IV. After recovery of EDC, CPP technical is drum out for final packing.

Chemical Reaction:



Trichloro acetyl chloride acrylonitrile 2-Hydroxy -3,5,6-trichloro pyridine



2-Hydroxy -3,5,6-trichloro pyridine DETC Chlorpyriphos

MASS BALANCE FOR CHLORPYRIFOS

INPUT	**MT**	**OUTPUT**	**MT**
Trichloro acetyl chloride (TCAC)	1.436	Chlorpyriphos	1
Acrylonitrile	0.521	Acrylonitrile	0.021
Catalyst	0.015	HCl	0.125
Solvent	2.2	Solvent	2.2
Caustic lye	1.915	Organic residue	0.182
Ethylene dichloride	4.018	Distillation loss	0.12
Salt	0.025	Aqueous layer	6.993
Recycle residue	0.036	Loss	0.398
DETC	0.643	Residue	0.036
Water	4.27	EDC	3.818
		TCAC	0.186
TOTAL	**15.079**	**TOTAL**	**15.079**

GROUP:C

C1: Phosphanomethyl iminodiacetic acid (PMIDA)

Manufacturing Process:

Stage I

Manufacturing of Di Sodium salt of Imino Di Acetic Acid

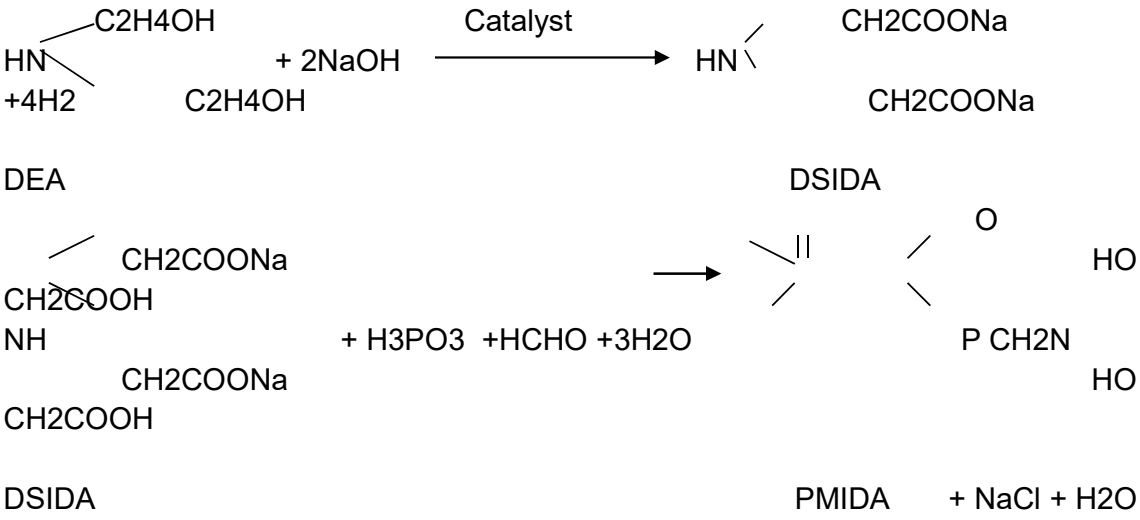
Di Ethanol Amine is reacted with Sodium Hydroxide in presence of Catalyst under pressure of nitrogen at an elevated temperature. This results into formation of Di Sodium Salt of Imino Di Acetic Acid along with liberation of hydrogen. The product is isolated and Catalyst is Recycled back in the next batch. The recycling of Catalyst is done ten times.

Stage II

Manufacturing of Phosphono Methyl Imino Di Acetic Acid

Di Sodium salt of Imino Di Acetic Acid is reacted with Formaldehyde and Phosphorus acid at elevated temperature resulting into Phosphono Methyl Imino Di Acetic Acid. The product is isolated by filtration wet cake of PMIDA used for next stage

Chemical Reaction:



MASS BALANCE FOR PHOSPHANOMETHYL IMINODIACETIC ACID (PMIDA)

INPUT	MT	OUTPUT	MT
Catalyst slurry	0.416	PMIDA	1
Diethanol amine (DEA)	0.544	Hydrogen	0.041
NaOH (47%)	1.48	Catalyst	0.416
HCl(30%)	2.496	NaCl	0.316
H3PO3(70%)	0.67	Effluent	5.481
Formaldehyde (37%)	0.505		
Water	1.143		
TOTAL	**7.254**	**TOTAL**	**7.254**

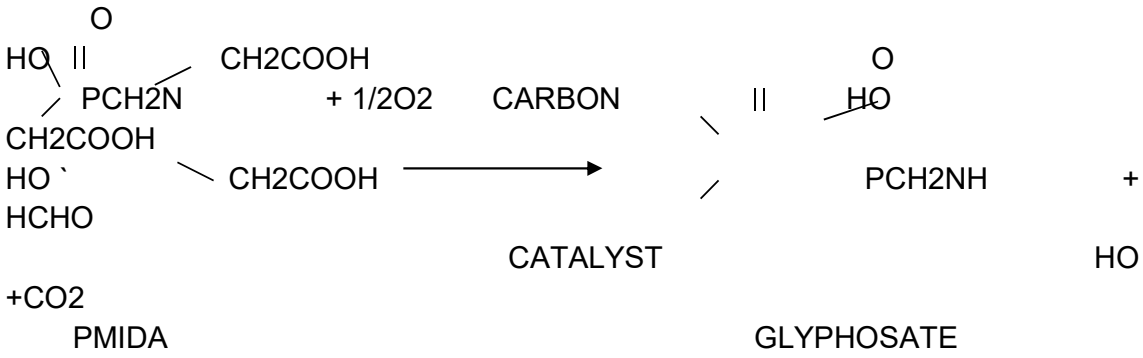
C2: GLYPHOSATE

Manufacturing Process

Manufacturing of Phosphono Methyl Glycine (Glyphosate)

Phosphono Methyl Imino diacetic Acid slurry is prepared by addition of water and activated carbon & is further oxidized by molecular oxygen to give N-Phosphanomethyl Glycine followed by water distillation & followed by filtration and further drying.

Chemical Reaction:



MASS BALANCE FOR GLYPHOSATE

INPUT	MT	OUTPUT	MT
PMIDA	1.3560	Glyphosate	1.0000
Activated carbon	0.0396	Carbon dioxide	0.2550
Oxygen	0.1760	Formaldehyde	0.1760
Water	16.2620	Activated carbon recycle	0.0880
		Water	15.5636
		Losses	0.6680
		Excess oxygen	0.0830
TOTAL	**17.8336**	**TOTAL**	**17.8336**

C3: TRICLOPYR BUTOTYL ESTER

Manufacturing Process

The Manufacturing process of Triclopyr butotyl ester involve in three step

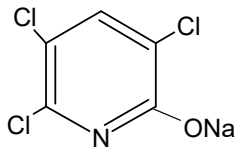
Sodium salt of 2-Hydroxy 3,4,5-trichloro pyridine is reacted with methyl Chloro acetate in presence of toluene as a solvent and PTC as a catalyst to give Triclopyr methyl ester and Solvent is remove under vacuum.

Triclopyr methyl ester is hydrolyzed with sodium hydroxide to give Triclopyr acid.

Triclopyr acid is reacted with Butyl cellosolve at elevated temperature in presence of solvent toluene to form Triclopyr butotyl ester.

Reaction Chemistry :

Stage-1



+ CH_4 $Cl\ CH_2COOCH_3$

soduim salt of 2-hydroxy 3,5,6-tricloro pyridine

M.F.:-C_5HCl_3NONa

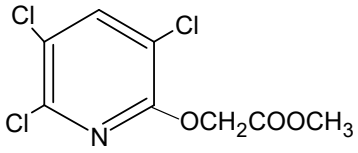
M.wt.: 220.5

Methyl chloro acetate

M.F. :-$C_3H_5O_2Cl$

M.wt.: 108.5

Toluene
PTC



+ NaCl

Triclopyr methyl ester

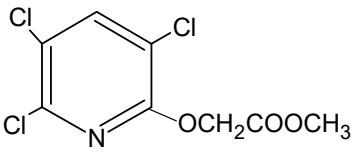
M.F.:-$C_8H_6NCl_3O_3$

M.wt.:-270.5

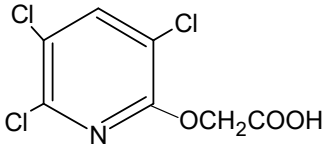
soduim chloride

M.wt.:- 58.5

Stage-2



+ NaOH $\xrightarrow{H_2SO_4}$



Triclopyr methyl ester

M.F.:-$C_8H_6NCl_3O_3$

M.wt.:-270.5

Sodium Hydroxide

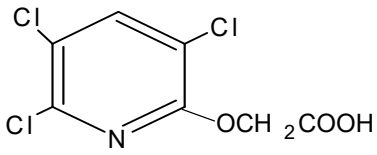
M.wt.:-40

Triclopyr acid

M.F.:-$C_7H_4NCl_3O_3$

M.wt.:-256.5

Stage- 3



+ HOCH 2CH 2-O-C 4H 9

Triclopyr acid

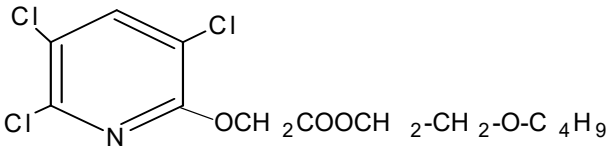
M.F.:-$C_7H_4NCl_3O_3$

M.wt.:-256.5

Butyl cellosolve

M.F.= $C_6H_{14}O_2$

M.wt.=118



+ H_2O

Triclopyr Butotyl ester

M.F.:-$C_{13}H_{16}NCl_3O_4$

M.wt.:-356.5

MASS BALANCE FOR TRICLOPYR BUTOTYL ESTER

INPUT	MT	OUTPUT	MT
Na-HTCP	0.92	Triclopyr Butotyl ester	1.00
Methyl chloro acetate	0.59	Na2SO4	0.47
Na2CO3	0.03	Toluene	3.37
NaHCO3	0.02	Aqueous mass	5.99
TBAB	0.03	Water	3.31
Toluene	3.76	Losses	0.39
Water	6.35	Effluent	0.18
Carbon	0.04	Evaporation loss	0.25
Na2S	0.01	Carbon wet cake	0.08
NaOH	2.26		
50% H2SO4	0.33		
Butyl cello solve	0.40		
PTSA	0.01		
0.5% N2CO3 solution	0.30		
TOTAL	**15.04**	**TOTAL**	**15.04**

C4: BISPYRIBAC SODIUM

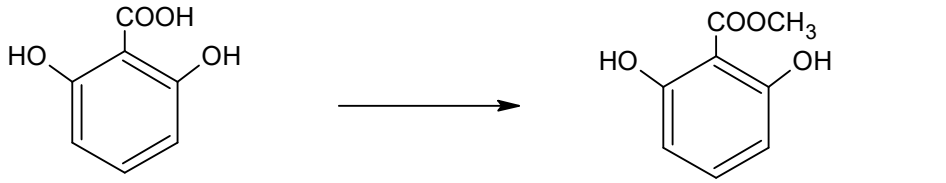
Manufacturing Process

Brief Process

Reaction of 2,6-dihydroxybenzoic acid in presence of sodium carbonate and dimethyl sulfate and solvent acetone leads to the formation of Methyl 2, 6 – dihydroxy benzoate which is the first intermediate which further is reacted with 4,6-Dimethoxy-2-methyl sulfonyl pyrimidine and a base potassium carbonate to give the product of intermediate II known as Methyl 2,6 – bis [(4,6-dimethoxy pyrimidine-2-yl) oxy] benzoate.
Methyl 2,6 – bis [(4,6-dimethoxy pyrimidine-2-yl) oxy] benzoate is hydrolyzed with caustic with IPA as the solvent to give Bispyribac sodium salt.

Chemical Reaction:

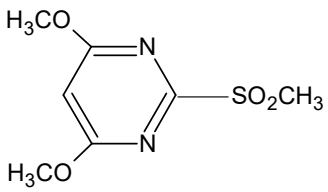
Step I : Preparation of methyl 2, 6-dihydroxy benzoate.



2, 6- dihydroxy benzoicacid
M. F. $C_7H_6O_4$
M. Wt. 154

Methyl 2, 6-dihydroxy benzoate
M. F. $C_8H_8O_4$
M. Wt. 168

Step II : Preparation of Methyl- 2, 6- bis[(4, 6 - dimethoxypyrimidine- 2-yl)oxy] benzoate

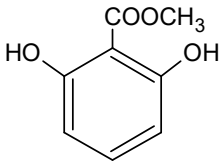


4, 6 -dimethoxy-2-methylsulfonyl pyrimidine

M. F. $C_7H_{10}O_4N_2S$

M. Wt. 218

+

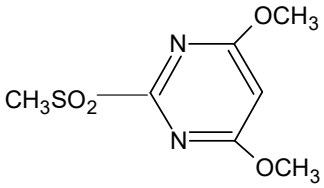


Methyl 2, 6-dihydroxy benzoate

M. F. $C_8H_8O_4$

M. Wt. 168

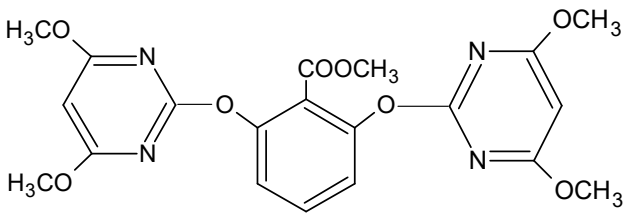
+



4, 6 -dimethoxy-2-methylsulfonyl pyrimidine

M. F. $C_7H_{10}O_4N_2S$

M. Wt. 218



Methyl 2, 6 -bis[(4, 6-dimethoxypyrimidin- 2-yl)oxy]benzoate

M. F. $C_{20}H_{20}O_8N_4$

M. Wt. 444

+ $2\ SO_2\uparrow$

Sulfur dioxide

M. F. O_2S

M. Wt. 64 x 2

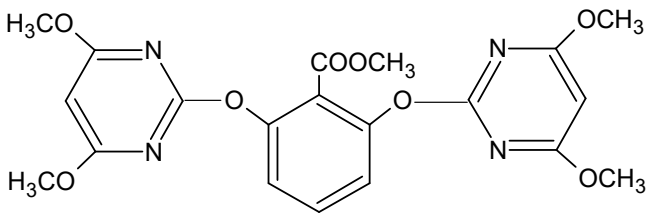
+ $2\ CH_4\uparrow$

Methane

M. F. CH_4

M. Wt. 16 x 2

Step III : Preparation of bispyribac sodium

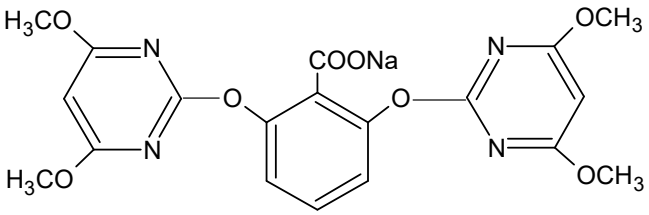


Methyl 2, 6 -bis[(4, 6-dimethoxypyrimidin-2-yl)oxy]benzoate

M. F. $C_{20}H_{20}O_8N_4$

M. Wt. 444

Base ↓ NaOH



Bispyribac sodium

M. F. $C_{19}H_{17}O_8N_4Na$

M. Wt. 452

+ CH_3OH

Methanol

M. F. CH_4O

M. Wt. 32

MASS BALANCE FOR BISPYRIBAC SODIUM

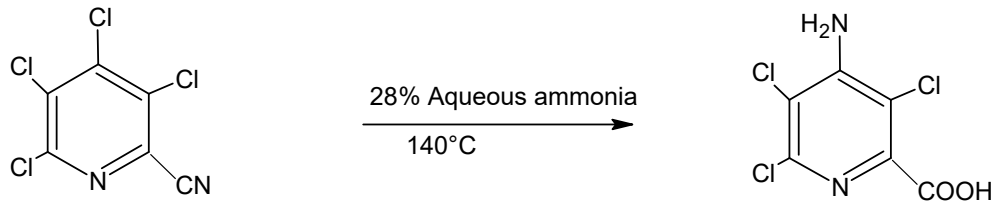
INPUT	MT	OUTPUT	MT
2,6-dihydroxy benzoic acid	0.832	Bispyribac sodium	1
Na2CO3	1.145	Aqueous mass	15.05
DMSO4	1.331	Salt wet cake	1.583
Acetone	8.4	Acetone	7
9% HCl	10	Isopropyl alcohol	11.396
Water	2	Loss	1.143
4,6-dimethoxy-2-methyl sulfonyl pyrimidine	0.828		
K2CO3	1.081		
Isopropyl alcohol	10.2		
NaOH 9% solution	1.355		
TOTAL	**37.172**	**TOTAL**	**37.172**

C5: PICLORAM

Manufacturing Process:

3,4,5,6 tetra Chloro picolinonitrile is reacted with 28% ammonium hydroxide under pressure at an elevated temperature. This results into formation of Pichloram. The product is isolated by adding Hydrochloric acid.

Chemical Reaction:



3,4,5,6-Tetra chloro picolinonitrile

M.F.= $C_6N_2Cl_4$

M.wt.=242

Picloram

M.F.=$C_6H_3N_2Cl_3O_2$

M.wt. = 241.5

MASS BALANCE FOR PICLORAM.

INPUT	MT	OUTPUT	MT
3,4,5,6-tetra chloro picolinonitrile	1.68	Pichloram	1
28% aqueous NH4OH	8.4	Aqueous mass	9.6
35% HCl	1.38	Losses	0.56
		HCl	0.215
		Insoluble	0.085
TOTAL	**11.460**	**TOTAL**	**11.460**

C6: FLUROXYPYR

Manufacturing Process:

Toluene is the solvent to which pentachloropyridine is added and is condensed with Trimethyl ammonium hydrochloride and potassium fluoride in presence of dimethyl acetoacetamide to form the Fluroxypyr.

MASS BALANCE FOR FLUROXYPYR

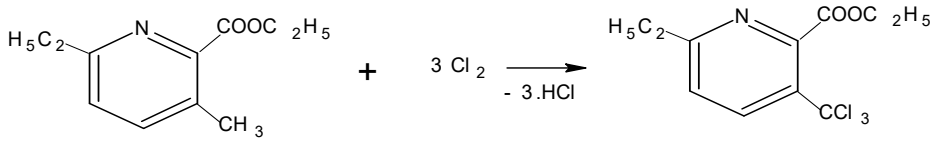
INPUT	MT	OUTPUT	MT
Pentachloropyridine	1.25	FLUROXYPYR	1
Trimethyl Ammonium Hydrochloride	0.014	Rec. Toluene	1.3
Potassium Fluoride	1.1	Toluene + DMAA	4.514
Dimethyl Aceto Acetamide	1.85		0
Toluene	2.6		0
	0		0
TOTAL	**6.814**	**TOTAL**	**6.814**

C7: IMAZETHAPYR

Manufacturing Process:

2-Carboxylicacid ethyl ester,3-methyl –6- ethyl pyridine is subjected to chlorination to form the intermediate and is reacted with 2-amino-2,3-dimethyl butyramide which undergoes cyclisation to give Imazethapyr.

Chemical Reaction

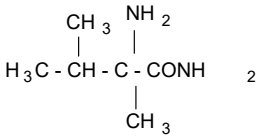


2-Carboxylic acid ethyl ester,
3-methyl-6-ethyl pyridine
M. Wt. = 193

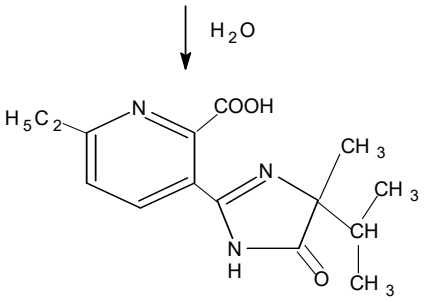
Chlorine
M. Wt. = 71

2-Carboxylic acid ethyl ester
3-trichloromethyl-6-ethyl pyridine
M. Wt. = 296.5

+



2-amino-2,3-dimethyl butyramide
M. Wt. = 130



Imazethapyr
M. Wt. = 289.3

MASS BALANCE FOR IMAZETHAPYR

INPUT	MT	OUTPUT	MT
2-carboxylic acid ethyl ester-3-methyl-6-ethyl pyridine	0.668	Imazethapyr	1
Chlorine	0.737	HCL	0.758
2-Amino -2, 3-Dimethyl bufyramide	0.45	Ethanol	0.159
Water	0.062		
TOTAL	**1.917**	**TOTAL**	**1.917**

C8: GLUFOSINATE AMMONIUM SALT

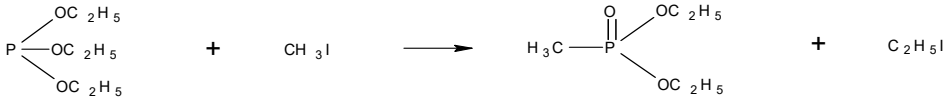
Manufacturing Process:

Step 1: The Trimethyl Phosphite is reacting with Methyl Iodide converted into Diethyl Methane Phosphonate and Ethyl Iodide.

Step 2: The Acroline is reacted with Acetic anhydride and Diethyl Methane Phosphonate and further it is reacted with Sodium Cyanide and Ammonium Chloride followed by hydrolyze with HCl to foam Glufosinate. This further reacts with Ammonium and forms Glufosinate Ammonium Salt.

Chemical Reaction:

Step-I Preparation of Diethyl Methane Phosphonate



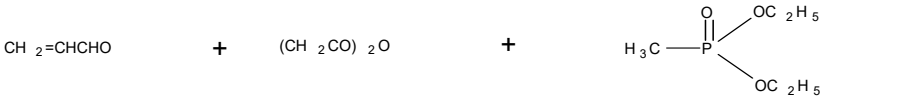
Triethyl Phosphite
M. Wt. = 166.1

Methyl iodide
M.Wt. = 141.9

Diethyl Methane Phosphonate
M. Wt. = 152

Ethyl Iodide
M.Wt.=155.9

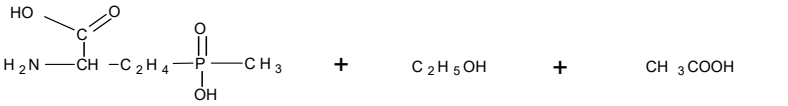
Step-II Preparation of Glufosinate ammonuim salt



Acrolein
M.Wt.=56.1

Acetic anhydride
M.Wt.=102

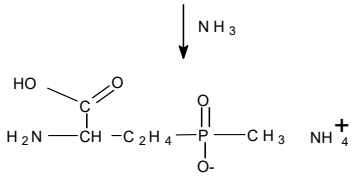
Diethyl Methane Phosphonate
M. Wt. = 152



Glufosinate
M. Wt. = 181.1

Ethanol
M.Wt. =46

Acetic acid
M.Wt.=60



Glufosinate Ammonium Salt
M. Wt. = 198.2

MASS BALANCE FOR GLUFOSINATE AMMONIUM SALT

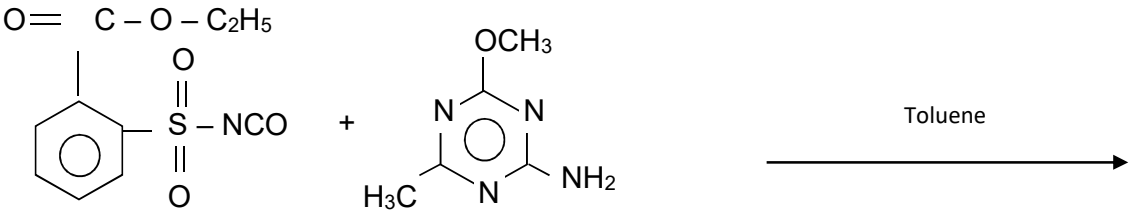
INPUT	MT	OUTPUT	MT
Acrolein	0.289	Glufosinate Ammoniumsalt	1
Acetic Anhydrie	0.526	Ethanol Rec.	0.237
Diethyl Methane Phosphonate	0.722	Aqueous mass	1.308
NaCl	0.253	Acetic Acid	0.309
HCl	5.37	Aq.	6.233
Ammonia solution (25%)	2.32	Loss	0.393
TOTAL	**9.480**	**TOTAL**	**9.480**

C9: ETHOXYSULFURON (Metsulfuron Ethyl)

MANUFACTURING PROCESS: -

O-Sulfo isocyante Ethyl Benzoate reacts with 2-Amino 4-Methoxy 6-Methyl 1,3,5 Triazine in presence of Solvent-Toluene. Since this reaction is addition reaction, no Bi-Product or Effluent is generated. On cooling crystal form which is filtered out and solvent distilled out and recycled.

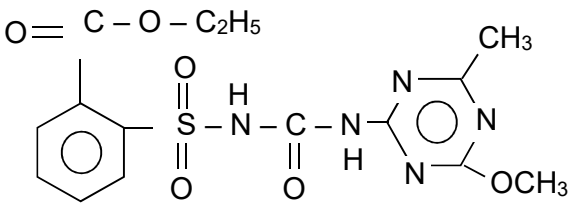
CHEMICAL REACTIONS: -



O-sulfo Iso Cyanate Ethyl Benzoate

$C_9H_7NO_4S$

2-Amino 4-Methoxy 6-Methyl 1,3,5 Triazine



Metsulfuron Ethyl

MASS BALANCE FOR ETHOXYSULFURON

INPUT	**MT**	**OUTPUT**	**MT**
O-sulfo Iso Cyanate Ethyl Benzoate	0.662	ETHOXYSULFURON	1.052
2-Amino 4-Methoxy 6-Methyl 1,3,5 Triazine	0.392	Toluene Rec.	0.8
Toluene	0.9	Residue	0.002
		Loss	0.1
TOTAL	**1.954**	**TOTAL**	**1.954**

GROUP: D

D1: MANCOZEB

Manufacturing Process:

Stage 1

Carbon Disulphide and Ethylene Diamine and Sodium Hydroxide are reacted in the presence of water to form the Di Sodium salt of Ethylene Bis Dithio Carbamate Hexahydrate (DBH).

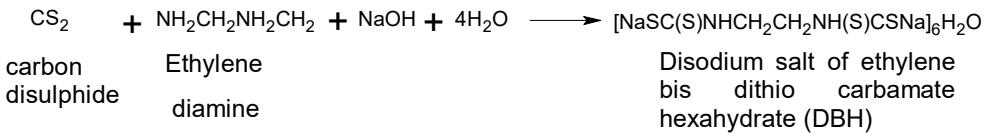
Stage 2

Di Sodium salt of Ethylene Bis Dithio Carbamate Hexahydrate is reacted with manganese sulphate to form manganese salt of Bis Dithio Carbamate.

Stage 3

The manganese salt further reacts with Zinc Sulphate to convert into Mancozeb. Slurry is initially spray dried and subsequently vacuum dried for Mancozeb powder formulation.

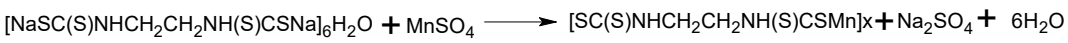
Chemical reaction:



carbon disulphide

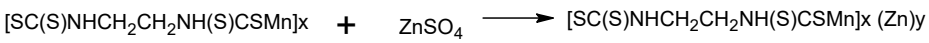
Ethylene diamine

Disodium salt of ethylene bis dithio carbamate hexahydrate (DBH)



Disodium salt of ethylene bis dithio carbamate hexahydrate (DBH)

Manganese salt of ethylene bis dithio carbamate



Manganese salt of ethylene bis dithio carbamate

Mancozeb

MASS BALANCE FOR MANCOZEB

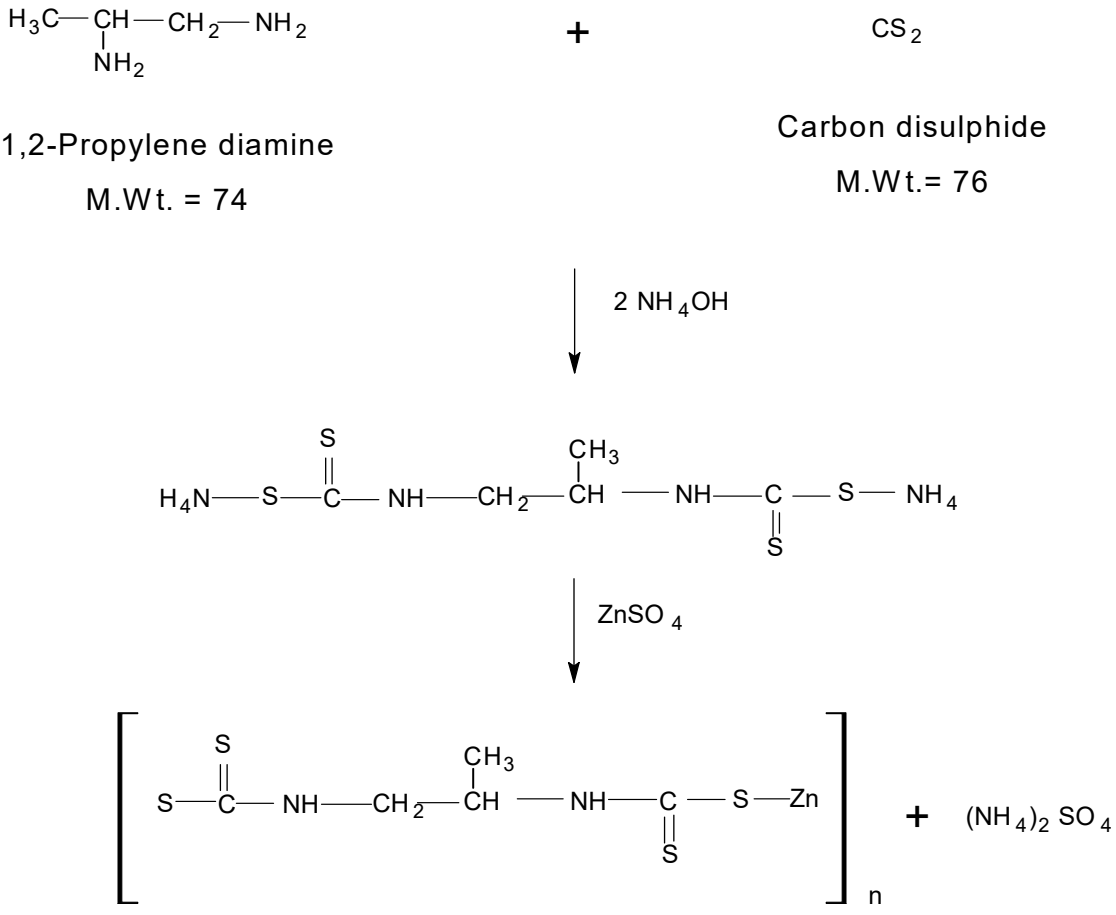
INPUT	MT	OUTPUT	MT
Ethylene diamine	0.206	Mancozeb	1
Carbon disulfide	0.572	Carbon disulfide	0.054
Sodium hydroxide (47%)	0.58	Sodium Sulphate solution (12 to 15%)	4.8
Manganese Sulphate (27%)	1.906	Losses	0.57
Zinc Sulphate (32%)	0.166	Condensate water recycled	0.124
SLS	0.033		
HMTA	0.02		
Water	3.065		
TOTAL	**6.548**	**TOTAL**	**6.548**

D2: PROPINEB

Manufacturing Process:

Water is charged into the rector and carbon disulfide is added at room temperature and then 1,2- Propylene diamine is dissolved in water and the solution is added initially 20 % of the total amount and then the remaining 80 % is added simultaneously with 15 % ammonia to form disodium salt of is propylene bis dithiocarbamate which on further reaction with zinc sulfate (21 %) to convert into zinc iso propylene bis dithiocarbamate (Propineb) which is further subjected to filtration, washing and 30 – 35 % slurry is made to spray drier followed by drying in RVD.Fillers like SLS , stabilizer, HMTA as diluents to make 80 % technical grade with zinc content of 18 – 20 %.

Chemical Reaction:



1,2-Propylene diamine

M.Wt. = 74

Carbon disulphide

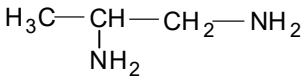
M.Wt.= 76

Propineb

M.Wt:= 289.8

MASS BALANCE FOR PROPINEB

Chemical Reaction:



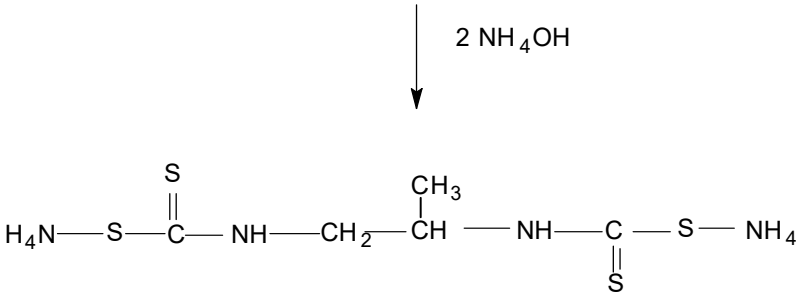
1,2-Propylene diamine

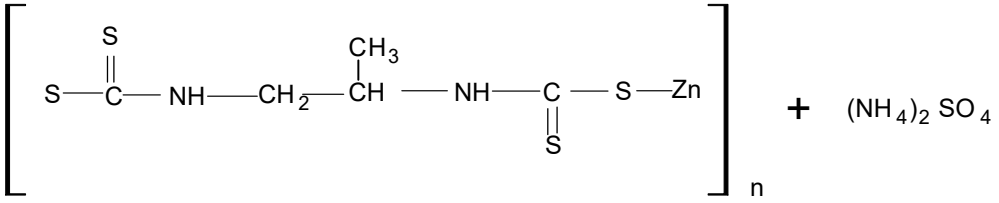
M.Wt. = 74

+

Carbon disulphide

M.Wt.= 76





Propineb

M.Wt:= 289.8

MASS BALANCE FOR PROPINEB

INPUT	MT	OUTPUT	MT
1,2 –PDA	0.252	Propineb	1
Carbon disulfide	0.6	Carbon disulfide	0.064
Ammonia solution (15%)	0.729	Ammonium Sulphate solution	6.77
Zinc Sulphate solution (21%)	2.396	Losses	2.087
SLS	0.035		
HMTA	0.0086		
Water	5.9		
TOTAL	**9.921**	**TOTAL**	**9.921**

D3: : **AZOXYSTROBIN**

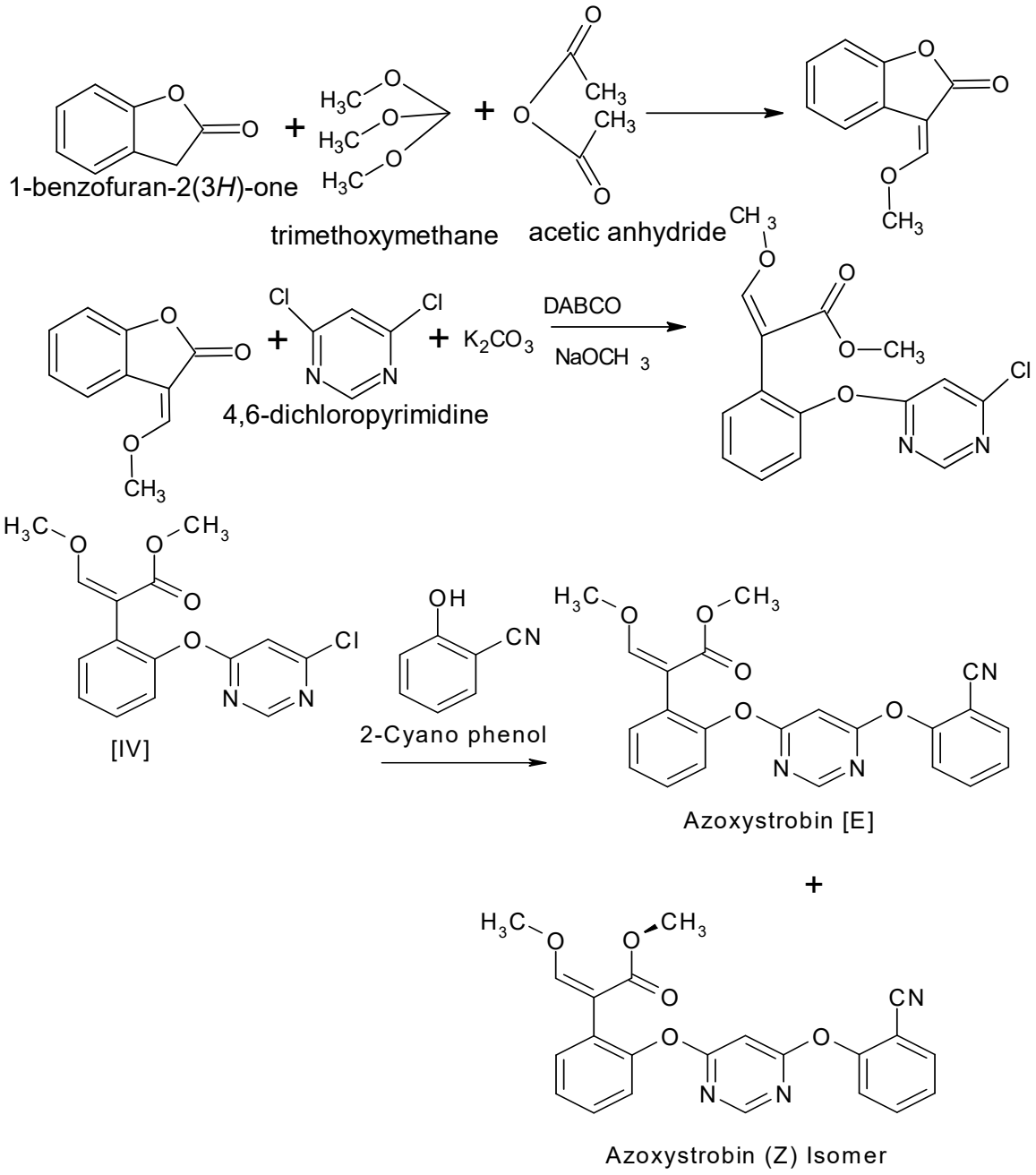
Manufacturing Process:

Charge Toluene in and Benzofuranone in the toluene.

Charge Trimethyl orthoformate in the above reaction mass.Charge Acetic anhydride in the reaction mass under stirring at RT.Heat the reaction mass for 100-105^{0}C temp. for 6-7 hours.Check % Benzofuranone. It should be less than 5-6% in the reaction mass.Charge Toluene in the reaction mass at RT.Charge K2CO3 (Potassium Carbonate) in the reaction mass.Cool down the reaction mass upto 0^{0}C temp. .Charge Sodium methoxide in the chilled 0^{0}C-5^{0}C temp.. Reaction mass.Stirr the reaction mass for 30 mints at 0^{0}C-5^{0}C.Charge DEBCO at 0^{0}C-5^{0}C.Charge 4, 6-Di Chloro Pyrimidine at 0^{0}C-15^{0}C.Cook the reaction mass at 0^{0}C-15^{0}C for two hours.Filter the reaction mass at 0^{0}C-15^{0}C under vacuum & remove inorganic solid waste.Give water wash 1000gms *02 to organic phase at Room temperature.Collect the organic phase & charge methyl sulfonic acid.Recover the toluene at 60^{0}C-65^{0}C under 745-750 mm Hg vacuum.Intermediate [E]-Methyl-[2]-[2-(6-chloro Pyrimidine-4-yloxy) phenyl]-3-methoxy- propionate **obtained**.

Charge ACTN in the above made intermediate [E]-Methyl-[2]-[2-(6-chloro Pyrimidine-4-yloxy) phenyl]-3-methoxy- propionate.Charge 2-Cyano phenol in the above organic mass.Heat the reaction mass (2-Cyano phenol & 3-Methoxy propionate mixer) up to 50^{0}C temp. and make homogeneous.Cool down the above made mixer up to Room temperature.Charge ACTN and stirrer & condenser.Charge Potassium Carbonate in the ACTN.Charge DEBCO in the Potassium carbonate & ACTN mixer at RT.Heat the reaction mass upto 50^{0}C temp. Add above made (point: 04) 2-Cyano phenol & 3-Methoxy propionate mixer in the reaction mass within 15-20 mints. at 50^{0}C-60^{0}C temp..Heat the reaction mass up to reflux temp..Maintain the reaction mass temp. for 4-5 hours.Check % 2-Cyano Phenol. It should be less than 4%.Filter the reaction mass at RT.Recover ACTN from the organic phase at 60^{0}C-65^{0}C under 745-750 mm Hg vacuum. Charge Methanol in the above mass.Heat the reaction mass for dissolution upto 62^{0}C-65^{0}C.Maintain for one hour temp.at 62^{0}C-65^{0}C.Cool down the reaction mass 5^{0}C temp. per half an hour till 02^{0}C-05^{0}C temp..Main the temp. 02^{0}C-05^{0}C for one hour.Filter the crystalized mass at 02^{0}C-05^{0}C under vacuum.Dry in oven at 65^{0}C temp. in atmospheric condition.Dry Azoxystrobin obtains.

Reaction Scheme:



MASS BALANCE FOR AZOXYSTROBIN

INPUT	MT	OUTPUT	MT
Trimethyle Ortho Formate	1.155	Azoxystrobin	1
Acetic Anhydride	2.89	Methyle Acetate,	2
2(3)Benzofuranon	0.895	Acetic Acid,	1.22
Mdc	1.459	Acetic Anhhy	1.021
Methanol	1.97	Wet Solid	1.076
Toluene	2.4	Water (Aq)	81.81
Potassium Carbonate	2.01	Losses	0.812
Sodium Methoxide	0.199		
4,6 Dichloro Pyrimidin	0.524		
Teda	0.08		
Methyle Sulfonic Acid	0.058		
Di-Methoxy	1.273		
Acetonitrile	3.519		
2-Cyno Phenol	0.521		
Recycle Cond. Water	61.709		
2% Koh Solution	8.277		
TOTAL	**88.939**	**TOTAL**	**88.939**

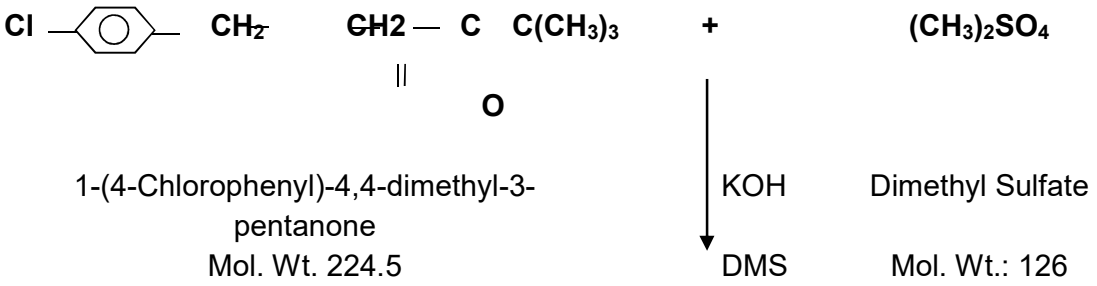
D4: TEBUCONAZOL

Manufacturing Process:

DMS along with HRT Ketone and KOH with the presence of DMSO4 are taken for the preparation of Oxirane to which DMS and water are added after the completion of HRT Ketone <0.5% is achieved start collection of DMS using hot water at 38-40 and slowly increase to 75 deg C to recover Allow the reaction mass to settle and separate aqueous layer The organic is recycled thru Sparkler filter to remove particles. After clear organic transfer the mass to which 1,2,4-triazole, KOH and n-Butanol are added and after the 1,2,-4-triazole is less than 0.5% it is subjected to solvent recovery and the residue obtained is washed with water to get tebuconazole.

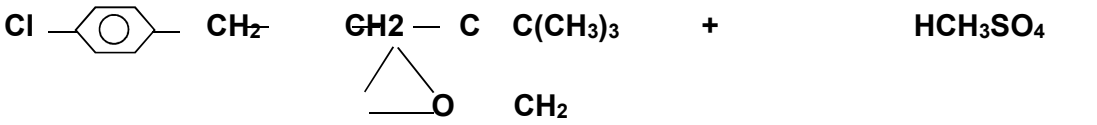
CHEMICAL REACTION:

OXIRANE SYNTHESIS



1-(4-Chlorophenyl)-4,4-dimethyl-3-pentanone
Mol. Wt. 224.5

Dimethyl Sulfate
Mol. Wt.: 126

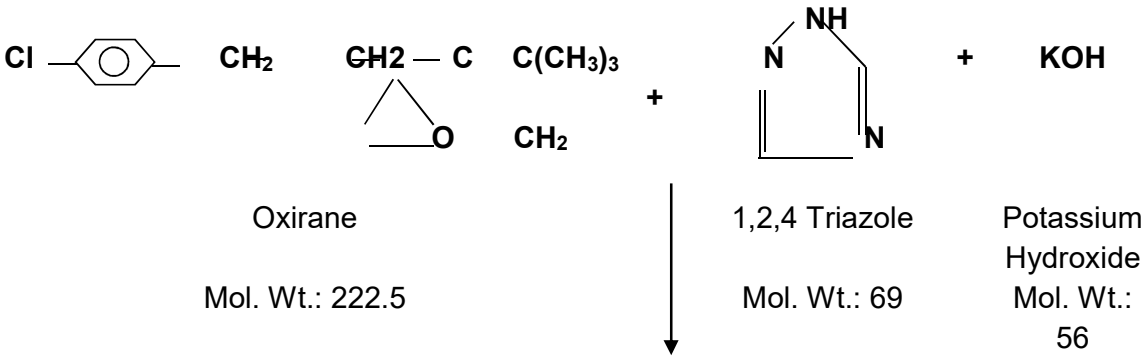


Oxirane

Mol. Wt.: 238.5

Methyl Hydrogen Sulfate
Mol. Wt.: 112

TEBUCONAZOLE SYNTHESIS



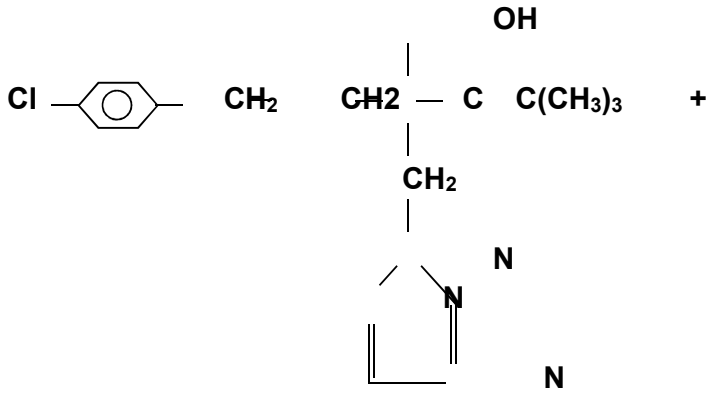
Oxirane

Mol. Wt.: 222.5

1,2,4 Triazole

Mol. Wt.: 69

Potassium Hydroxide
Mol. Wt.: 56



Tebuconazole
Mol. Wt.: 307.5

Potassium Hydroxide
Mol. Wt.: 56

MASS BALANCE FOR TEBUCONAZOLE

INPUT	MT	OUTPUT	MT
Ketone	0.975	Tebuconazol	1
DMS	1.733	Aqueous layer	4.409
DMSO4	0.881	Water	0.017
KOH	0.774	Rec. n-Butanol	0.32
Water	2.25	DMS Rec.	1.3
1,2,4-Triazole	0.273	Losses	0.24
n- Butanol	0.4		
TOTAL	**7.286**	**TOTAL**	**7.286**

D5: WETTABLLE SULPHUR 80 WP

Manufacturing Process:

Charge micronized sulfur and blend it with the adjuvant propol DSN and homogenize then add the dispersing agent propol BX and mix the reaction mixture and then add china clay and blend the product and subject it to jet milling for getting the product.

MASS BALANCE FOR SULPHUR 80 WP

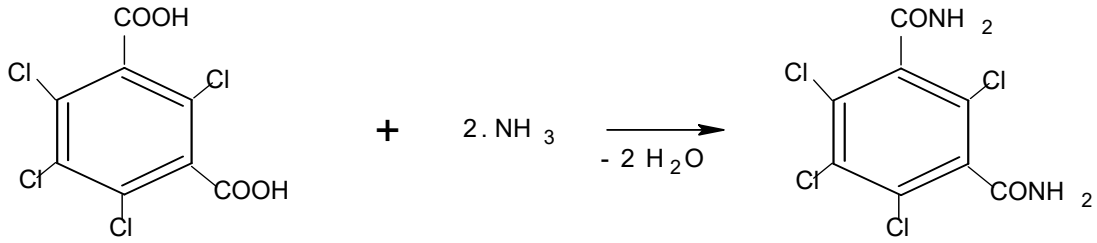
INPUT	MT	OUTPUT	MT
Micronized Sulfur	0.821	**SULPHUR 80 WP**	1
Propol DSN	0.06		
Propol BX 80	0.02		
China Clay	0.099		
TOTAL	**1.000**	**TOTAL**	**1.000**

D6: CHLOROTHALONIL

Manufacturing Process:

Tetrachloroisophtalic acid on ammonylsis forms its ammonium salt, which on further reaction with phosphorous Pentoxide forms the product Chlorothalonil.

Chemical Reaction:



Tetrachloro isophthalic acid

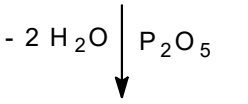
M. Wt. = 304

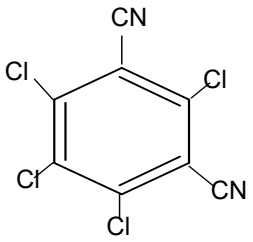
Ammonia

M. Wt. = 17

Amide

M. Wt. = 302





Chlorothalonil

M.Wt.= 265.9

MASS BALANCE FOR CHLOROTHALONIL

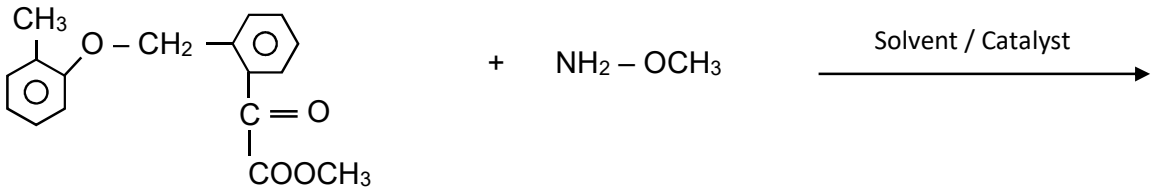
INPUT	**MT**	**OUTPUT**	**MT**
Tetrachloroisophthalic acid	0.745	Water	0.088
Ammonia	0.083	Water	0.088
P2O5	0.348	CHLOROTHALONIL	1
	0		0
TOTAL	**1.176**	**TOTAL**	**1.176**

D7: PRODUCT: KRESOXIM METHYL (TECH)

MANUFACTURING PROCESS:

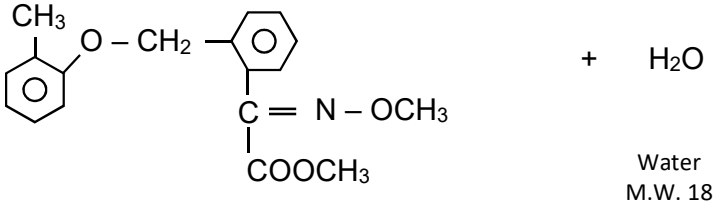
2-(α- tolyloxymethyl)phenyl oxo methyl acetate (TMPOMA) is reacted with Methoxy amine in presence of Solvent and catalyst, which forms Kresoxim Methyl Solution. On crystallization, slurry filtration and cake washings by toluene and water respectively we get wet cake. Mother Liquor and toluene wash are collected and toluene is distilled out to recover and recycle. Finally wet cake with water is taken for drying to get Kresoxim Methyl Tech. of 94% purity.

CHEMICAL REACTIONS:



2-(α- tolyloxymethyl)phenyl oxo methyl acetate
M.W. 284.4
(TMPOMA)

Methoxy amine
M.W. 47



Kresoxim Methyl
Methyl(E)-2-methoxyimino [2-(o-tolyloxymethyl)phenyl]acetate
M.W. 313.4
($C_{18}H_{19}NO_4$)

Water
M.W. 18

MASS BALANCE FOR KRESOXIM METHYL

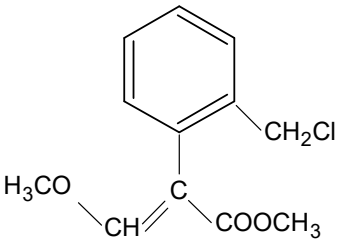
INPUT	MT	OUTPUT	MT
2-(α- tolyloxymethyl) phenyl oxo methyl acetate (TMPOMA)	0.961	Kresoxim methyl	1.064
Methoxy Amine	0.164	Aqueous layer	0.171
Solvent	5	Rec. Solvent	4.58
Catalyst	0.01	Residue	0.02
Water	0.2	Sol Losses	0.5
TOTAL	**6.335**	**TOTAL**	**6.335**

D8: PICOXYSTROBIN

Brief Process:

Picoxystrobin is prepared by condensation of 2 – Hydroxy – 6 – trifloro pyridine with (E) – 2- (2- Chloromethyl) phenyl – 3 – methoxy acrylate Under phase transfer condition .

Reaction chemistry

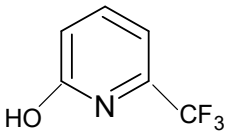


(E) -2 - (2 - Chloromethyl) Phenyl - 3 - Methoxyacrylate

M.F. = $C_{12}H_{13}O_3Cl$

M. WT. = 240. 5

+



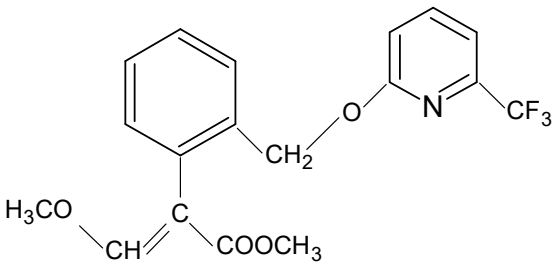
2-Hydroxy - 6 - triflorormethyl pyridine

M. F. = $C_6H_4NOF_3$

M.WT. 163

MDC

TEBA



Picoxystrobin

$C_{18}H_{16}F_3NO_4$

M.WT.= 367

+

HCl

Hydrochloric acid

M. WT. = 36. 5

Mass Balance:

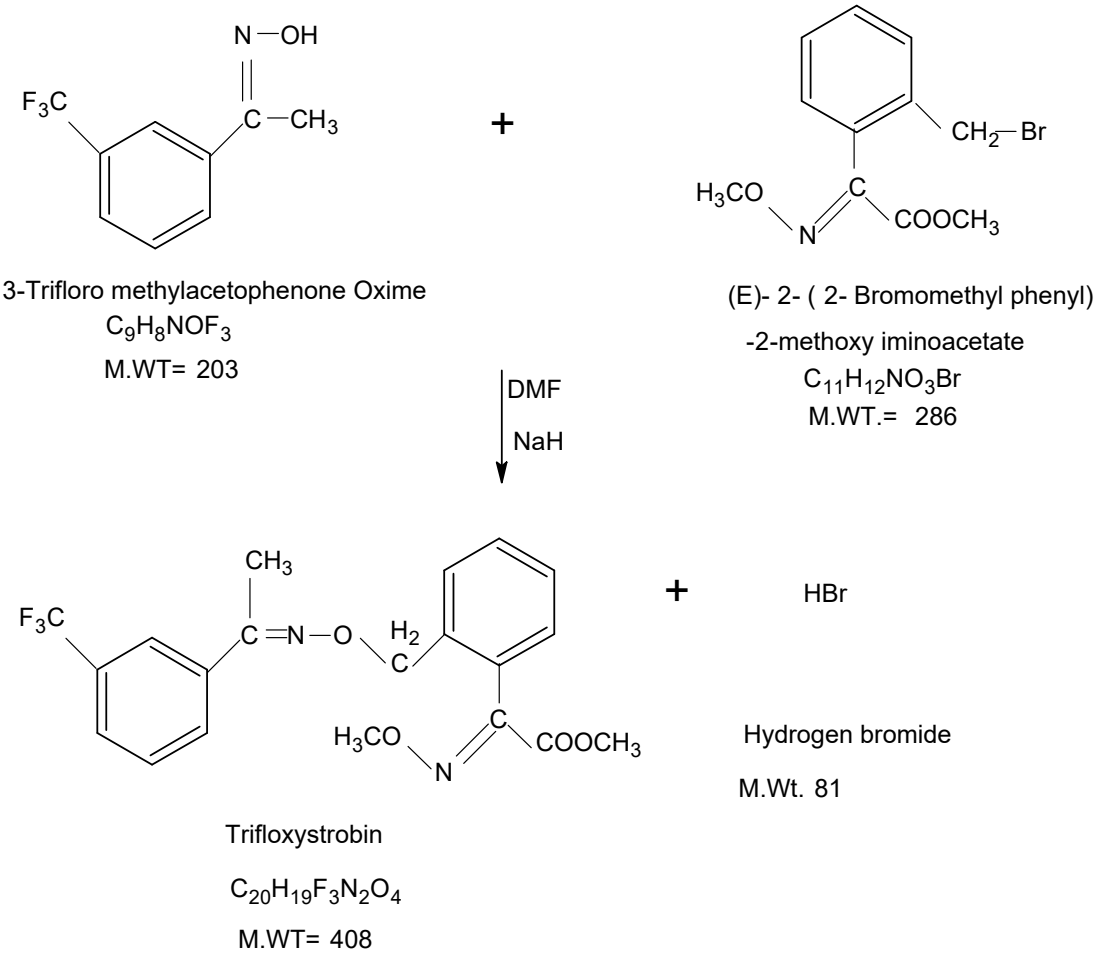
INPUT	MT	OUTPUT	MT
(E) – 2- (2- Chloromethyl) Phenyl – 3 – methoxy acrylate	0.697	Picoxystrobin	1
2 – Hydroxyl – 6 – trifloro Pyridine	0.554	MDC	2.272
MDC	2.381	Effluent	1.486
TEBA	0.0034	Losses	0.237
Water	1.36		
TOTAL	**4.995**	**TOTAL**	**4.995**

D9: TRIFLOXYSTROBI

Brief Process:

Charge solution of 3-triflоromethyl acetophenone Oxime in DMF added drop wise to stirred suspension of NaH in DMF stirred for one hour, The reaction mixture was cooled to 0 deg and added drop wise solution of (E)- 2- (2- Bromomethyl phenyl) -2-methoxy iminoacetate after addition of (E)- 2- (2- Bromomethyl phenyl) -2-methoxy iminoacetate solution the reaction mixture is cooking for 3 hours . After reaction add ethyl acetate for the extraction of product. Separated organic layer and organic layer wash with brine solution and concentrated organic layer obtained Trifloxysrobin.

Reaction chemistry



3-Trifloro methylacetophenone Oxime

$C_9H_8NOF_3$

M.WT= 203

(E)- 2- (2- Bromomethyl phenyl) -2-methoxy iminoacetate

$C_{11}H_{12}NO_3Br$

M.WT.= 286

Hydrogen bromide

M.Wt. 81

Trifloxystrobin

$C_{20}H_{19}F_3N_2O_4$

M.WT= 408

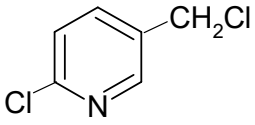
MASS BALANCE FOR TRIFLOXYSTROBIN

INPUT	MT	OUTPUT	MT
3-Triflouromethyl acetophenone oxime	0.566	Trifloxystrobin	1
(E)- 2- (2- Bromomethyl phenyl) -2-methoxy iminoacetate	0.797	Hydrogen bromide	0.226
DMF	4.178	Recover DMF	3.969
NaH	0.064	Recover ethyl acetate	4.662
Water	2.228	ML of Ethyl acetate	3.334
Ethyl acetate	8.356	Losses	0.742
		Effluent	2.256
TOTAL	**16.189**	**TOTAL**	**16.189**

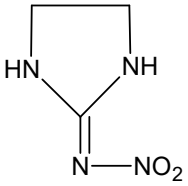
GROUP-5
E1: IMIDACLOPRID

Manufacturing Process:
Imidacloprid is prepared by reaction of 2-Chloro-5-chloromethylpyridine in presence of solvent and Nitroiminoimidazolidine with Caustic flakes. After the completion of CCMP the product is subjected to filtration to remove the formed salt followed by recovery of solvent. To the residual mass is added water, followed by filtration to obtain Imidacloprid.

Chemical Reaction



+



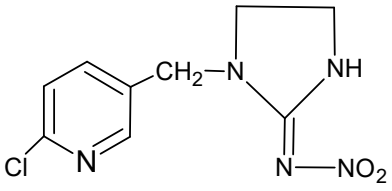
2-Chloro-5-Chloromethyl Pyridine

Mol. Wt. 162

Nitroiminoimidazolidine

Mol. Wt. 130

DMF | NaOH



+ NaCl

Imidacloprid

Mol Wt. = 255.5

Sodium Chloride

Mol Wt. = 58.5

MASS BALANCE FOR NITRO IMIDACLOPRID

INPUT	MT	OUTPUT	MT
Nitro Imino Imidazolidine	0.822	Imidacloprid	1
2-Chloro-5-Chloro methyl pyridine	0.831	Aqueous mass	3.044
NaOH flakes	0.246	DMF	5.25
DMF	5.7	Salt cake	0.37
HCl (30%)	0.1	Loss	0.735
Water	2.7		
TOTAL	**10.399**	**TOTAL**	**10.399**

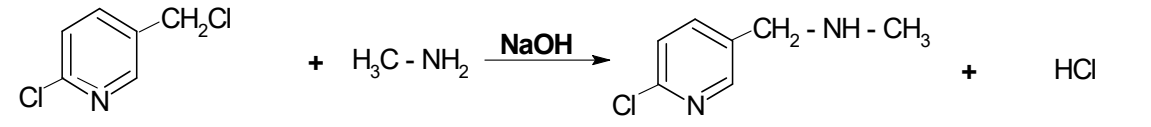
E2: ACETAMIPRID

Manufacturing Process:

To Methanolic solution of mono methylamine is added a mixture of (CCMP + MeOH) and Caustic flakes. The reaction mixture is subjected to distillation for recovery of MMA and on addition of CMI to the residual mixture gives Acetamiprid.

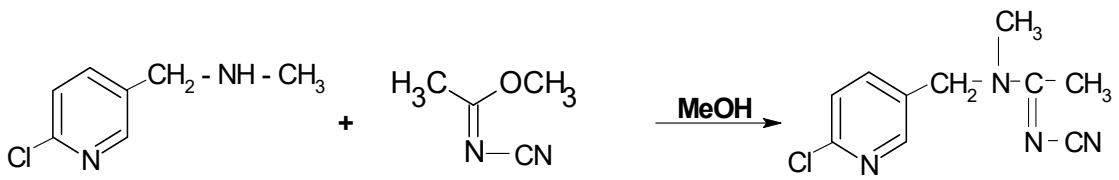
Chemical Reaction:

STAGE : I



2-Chloro-5-Chloromethyl Pyridine	Mono Methyl Amine	N-Methyl-2-Chloro-5-Pyridyl Methyl amine (MACMP)	Hydrochloric acid
Mol. Wt. 162	Mol. Wt. 31	Mol Wt. 156.5	Mol Wt. 36.5

STAGE : II



N-Methyl-2-Chloro-5-Pyridyl Methyl amine (MACMP)	Cyano Methyl Imidoate (CMI)	Acetamiprid
Mol Wt. 156.5	Mol Wt. 98	Mol Wt. 222.5

MASS BALANCE FOR ACETAMIPRID

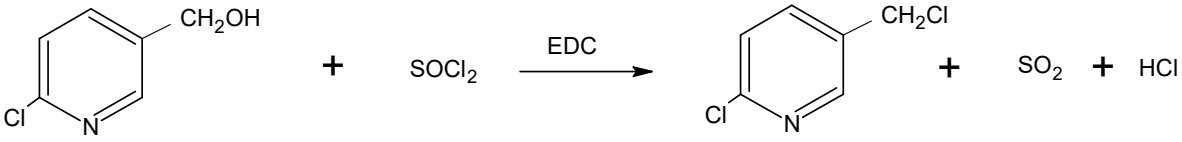
INPUT	MT	OUTPUT	MT
MMA+ methanol	7.75	Acetamiprid	1
Catalyst	0.004	Aqueous mass	8.57
2-Chloro-5-Chloro methyl pyridine	0.993	MMA+ Methanol	7.65
Methanol	0.525	Loss	0.97
Cyano methyl Imidoate	0.605		
NaOH flakes	0.24		
Water	8		
HCl (30%)	0.1		
TOTAL	**18.217**	**TOTAL**	**18.217**

E3: 2- Chloro-5-Chloro Methyl Pyridine

Manufacturing Process:

2-chloro –5-hydroxy methyl pyridine is added to ethylene dichloride and tri methyl amine to which is added Thionyl chloride the mass is refluxed and after distillation gives 2-chloro-5-chloro methyl pyridine the gases generated are SO2 and HCl which is scrubbed.

Chemical Reaction:



2-chloro-5-hydroxy methyl pyridine

M.F.=C_6H_6ONCl

M.wt.=143.5

Thionyl chloride

M.F.=$SOCl_2$

M.wt.=119

2-chloro-5-chloro methyl pyridine

M.F.=$C_6H_5NCl_2$

M.wt.=162

MASS BALANCE FOR 2- Chloro-5-Chloro Methyl Pyridine

INPUT	MT	OUTPUT	MT
2- chloro 5- chloro methyl pyridine	1.008	2- Chloro-5-Chloro Methyl Pyridine	1
		Rec. EDC	6.017
Ethylene dichloride	6.5	Rec. SOCl2	0.172
Triethyl amine	0.009	Loss	0.26
		Residue	0.068
TOTAL	**7.517**	**TOTAL**	**7.517**

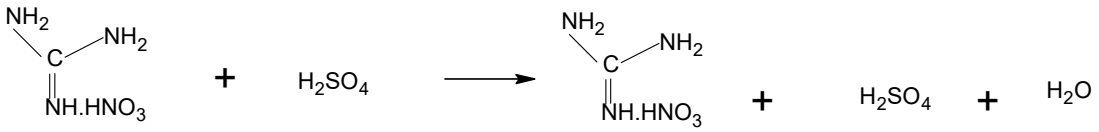
E4: Nitroimino Imidazolidine

Manufacturing Process:

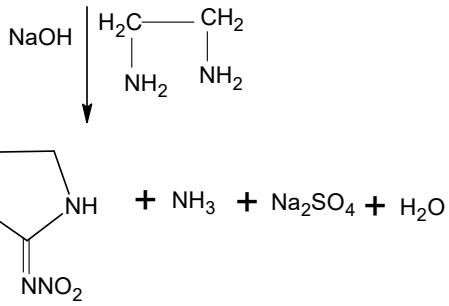
Guanidine nitrite is added slowly to concentrated sulfuric acid in presence of catalyst and water to yield nitro guanidine, which is further hydrolyzed with caustic in presence of ethylene diamine to give Nitroimino Imidazolidine

Chemical Reaction:

Stage-1



Guanidine nitrate	Sulphuric acid	Nitro Guanidine	Sulphuric acid
M.F.=$CH_6N_4O_3$	M.F.=H_2SO_4	M.F.=$CH_4N_4O_2$	M.F.=H_2SO_4
M.wt.= 122	M.wt.= 98	M.wt.= 104	M.wt.= 98



Nitroimino imidazolidine

M.F.=$C_3H_6N_4O_2$

M.wt.= 130

MASS BALANCE FOR NITRO IMINO IMIDAZOLIDINE

INPUT	MT	OUTPUT	MT
Sulphuric acid	1.93	Nitro imino imidazolidine	1
Guanidine nitrate	1.173	Water	4.215
EDA	0.708	Effluent	5.044
Water	4.914	Na2SO4	0.678
NaOH (30%)	3.09	Loss	1.234
Defomer	0.356		
TOTAL	**12.171**	**TOTAL**	**12.171**

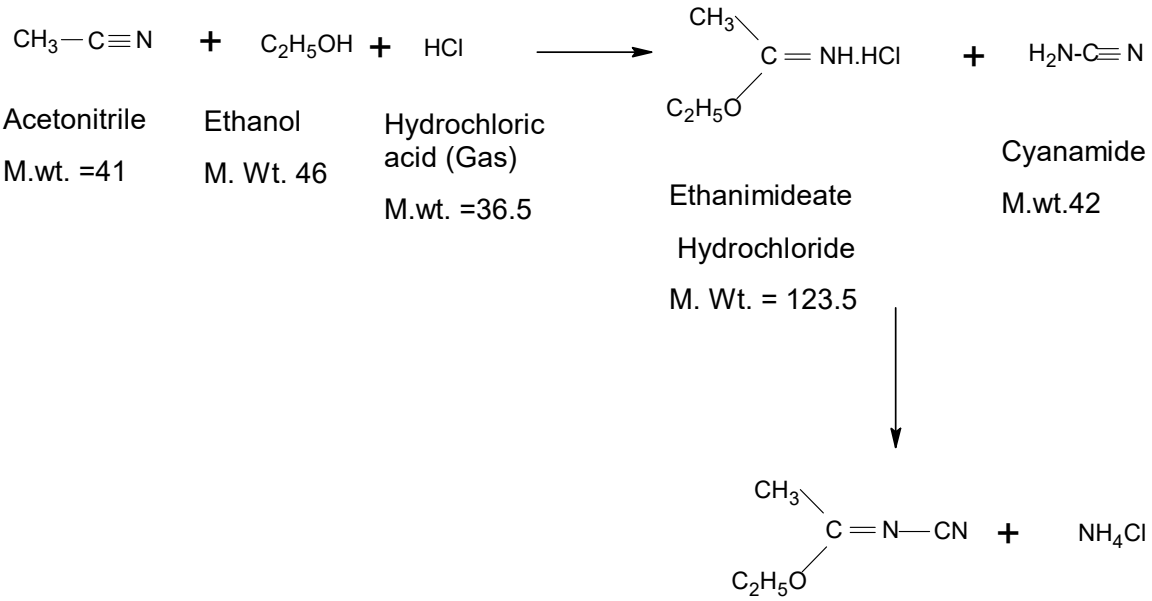
E5: ETHYL-N-CYANOETHANIMIDEATE

Manufacturing Process:

Acetonitrile and ethanol in presence of dry Hydrochloric acid leads to the formation of the intermediate ethaneimidate hydrochloride which on condensation with cyanamide yields Ethyl-N-Cynoethanimideate and by product ammonium chloride.

Chemical Reaction:

Cyano methyl Imidoate



Ethyl-N-Cyanoethanimideate

M. Wt. = 112

MASS BALANCE FOR CYANO METHYL IMIDOATE

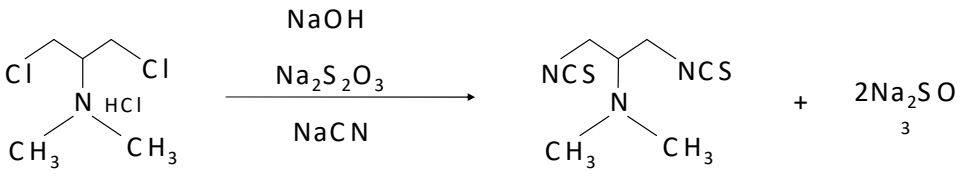
INPUT	MT	OUTPUT	MT
Acetonitrile	0.456	Cyanomethyl Imidoate	1
Dry HCl	0.533	Aqueous mass	4.808
Methanol	0.378	MDC	7.066
MDC	7.22	Loss	0.19
Cyanamide (25%)	2.333		
Water	1.111		
NaOH (47%)	1.033		
TOTAL	**13.064**	**TOTAL**	**13.064**

E6: Cartap Hydrochloride

Manufacturing Process:

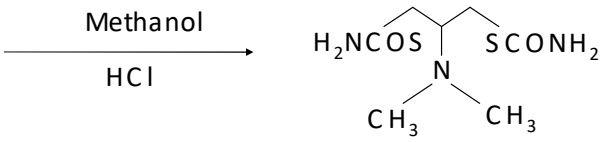
The 2-dimethylamine-1,3-dichloropropane hydrochloride was reacted with Sodium thiosulphate, caustic soda and sodium cyanide to give 2-dimethyl amino 1,3-dichloro Cyano propane which in turn was treated Methanolic hydrochloride acid to give CARTAP HCl.

CHEMICAL REACTION OF CARTAP HCl



2-dimethylamino-1,3-dichloropropane HCl
Mol. Wt. 192.5

2-Dimethylamine-1,3-dithiocyanatopropane
Mol. Wt. 201



CARTAP HCl
Mol. Wt. 273.5

Mass balance for Cartap Hydrochloride

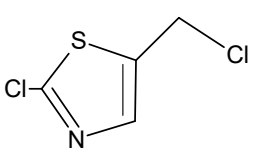
INPUT	MT	OUTPUT	MT
2-Dimethylamino-1,3-Dichloropropane HCl	0.796	Cartap hydrochloride	1
Sodium thiosulphate	1.403	Methanol recover	5.7
Sodium cyanide	0.812	Aqueous mass	3.75
Water	2	Loss	0.75
NaOH	0.459	Sodium sulphite	1.27
Dry HCl	1		
Methanol	6		
TOTAL	**12.470**	**TOTAL**	**12.470**

E7: Thiamethoxam

Manufacturing process:

2-chloro-4-chloro methyl isothiazole is react with oxadiazinamine in presence of DMC & K2CO3 to give thimethoxam.

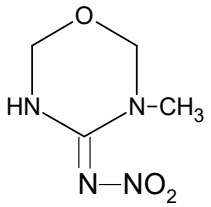
Chemical Reaction:



2-Chloro-4-Chloro Methyl iso Thiazole

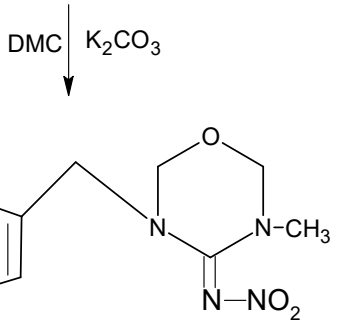
M. Wt. = 168.1

+



Oxadiazinamine

M. Wt. = 160.1



Thimethoxam

M. Wt. = 291.7

MASS BALANCE FOR Thiamethoxam

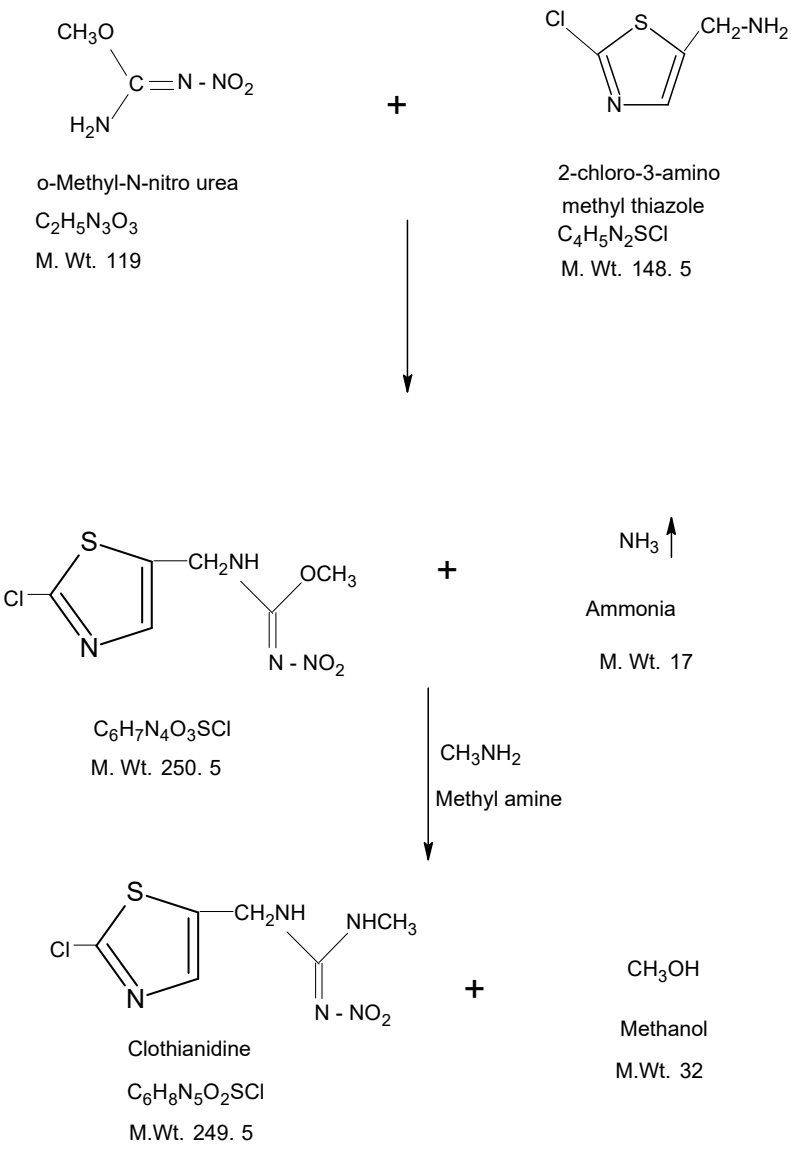
INPUT	MT	OUTPUT	MT
2-chloro-5-chloromethyl thiazole	0.771	Thiamethoxam	1
3-methyl-4-nitro imino per hydro 1,3,5-oxadiazine	0.81	Aqueous mass	5.2
DMC	1.2	DMC	0.9
Tmac	0.0367	Loss	0.351
K2CO3	0.95		
HCl (30%)	1.11		
NaOH	0.0734		
Water	2.5		
TOTAL	**7.451**	**TOTAL**	**7.451**

E8 CLOTHIANIDIN

Brief Process :

Charge acetonitrile, add o-methyl-N-nitro urea and 2-chloro-3-amino- methyl thiazole . The reaction mixture stir at 20°C for 18 hours.Add methyl amine. After completion of the reaction, distillation of acetonitrile and methanol.Rsidue dump in water, filter and dry.

Reaction chemistry



INPUT	MT	OUTPUT	MT
2-chloro-5-amino methyl thiazole	0.702	Clothianidine	1
ACN	1.422	NH3 gas	0.08
o- methyl –N-nitro urea	0.564	ACN + methanol	1.422
Methyl amine	0.369	Effluent	1.984
Water	1.89	Losses	0.461
TOTAL	**4.947**	**TOTAL**	**4.947**

E9: EMAMECTIN BENZOATE

Manufacturing Process:

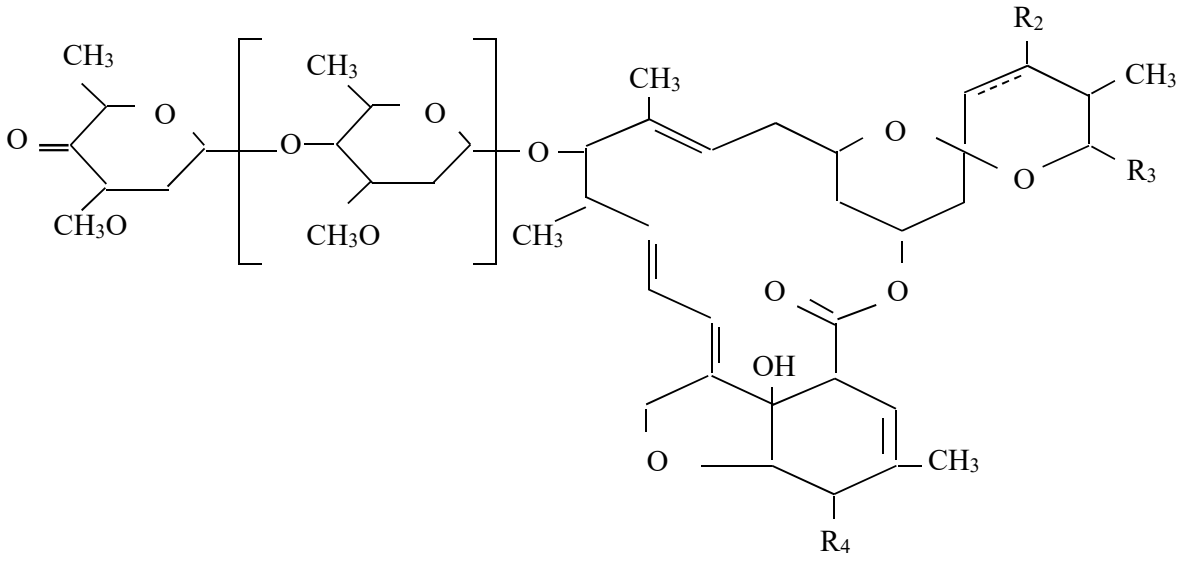
Step -1

Avermactine is added to Methanol and acetic acid and is purged with methyl amine gas and butyl dimethylsilyl chloride to obtain Emamectin. Solvent is distilled and crude Emamectin is purified ethyl acetate the material is filtered and dried. Solvent is distilled.

Step-2

Methanol is taken is solvent to which benzoic acid is added and stir Emamectin is condensed to this reaction mass at reflex temperature and material is cooled and filtered. The solvent is distilled and the material is dried to obtain Emamectin benzoate.

Chemical Reaction:



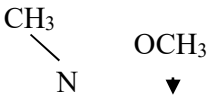
$R_2 = CH_3CH_2-$ = A_{1a}

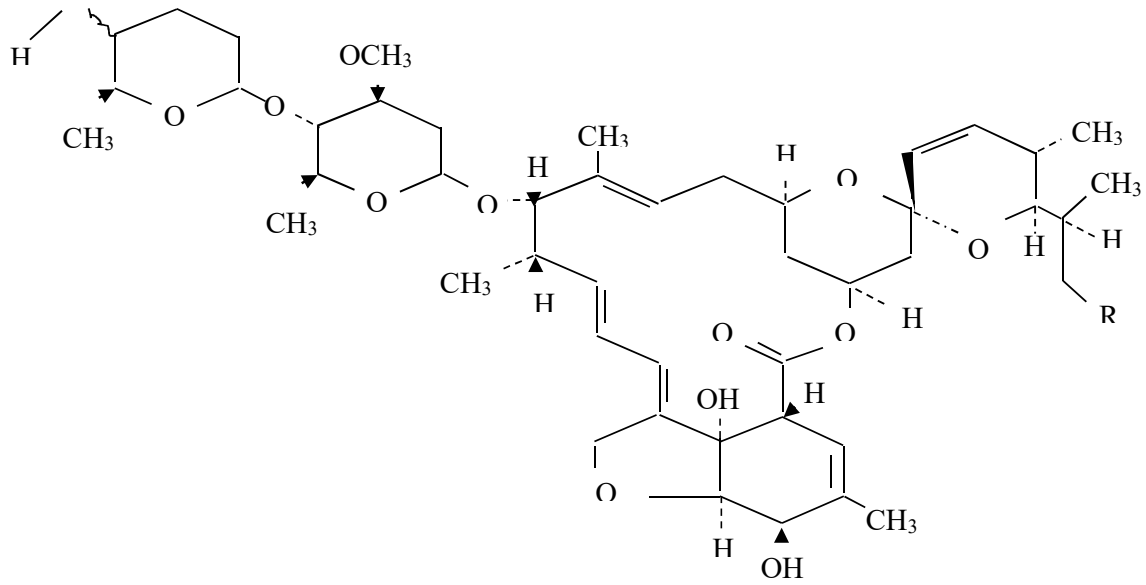
$R_2 = CH_3-$ = A_{1b}

M. Formula = $C_{48}H_{70}N_2O_{14}$ M. Wt. = 898

M. Formula = $C_{47}H_{68}N_2O_{14}$ M. Wt. = 884

Avermactine

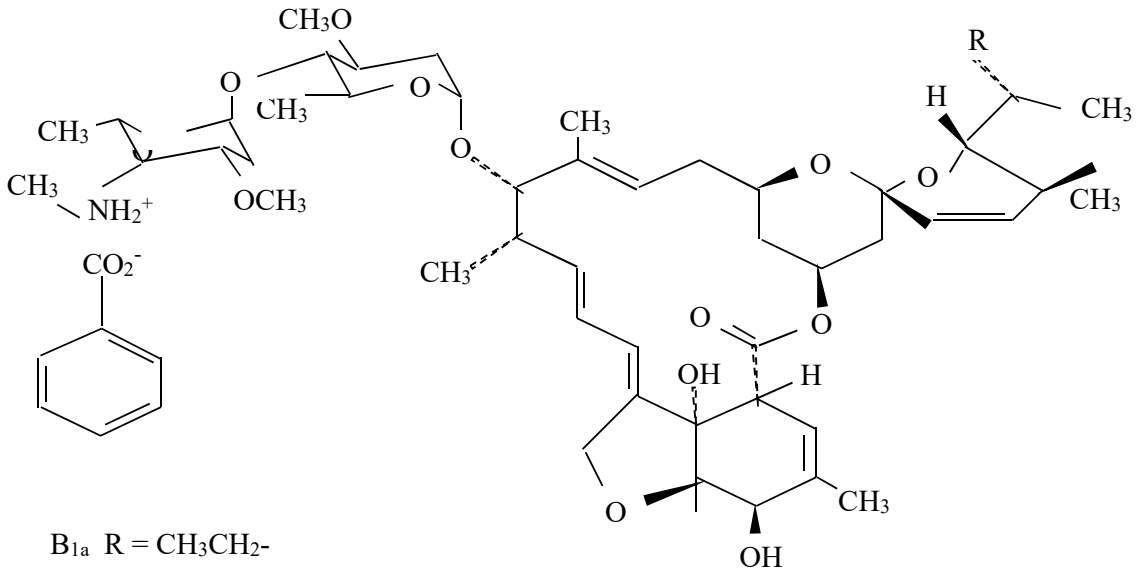




$R_2 = CH_3CH_2-$ = B_{1a} M. Formula = $C_{49}H_{75}NO_{13}$ M. Wt. = 872

$R_2 = CH_3-$ = B_{1b} M. Formula = $C_{48}H_{73}NO_{13}$ M. Wt. = 872

Emamectin Benzoic acid



B_{1a} R = CH_3CH_2-

B_{1b} R = CH_3-

$R_2 = CH_3CH_2-$ = B_{1a} M. Formula = $C_{56}H_{81}NO_{15}$ M. Wt. = 1008

$R_2 = CH_3-$ = B_{1b} M. Formula = $C_{55}H_{79}NO_{15}$ M. Wt. = 994

MASS BALANCE FOR EMAMECTIN BENZOATE

INPUT	MT	OUTPUT	MT
Methyl amine	0.04	Emamectin benzoate	1
Avermectin	1.074	Aqueous mass	5.46
Methanol	1.3	Methanol	1.34
Acetic acid	0.054	Losses	0.255
Tert butyl dimethyl silyl chloride	0.044	EDC	1.2
Water	5	Ethyl acetate	0.76
Sodium carbonate	0.36		
EDC	1.25		
Ethyl acetate	0.76		
Benzoic acid	0.133		
TOTAL	**10.015**	**TOTAL**	**10.015**

E10: INDOXACARB(TECH)

MANUFACTURING PROCESS :-

PART - I

Step – 1

5-Chloro Indenone is reacted with Dimethoxy Carbonate in presence of Dimethoxy Ethane –Solvent and catalyst to give Beta Keto Ester of 5-Chloro Indenone.

Step – 2

Beta Keto Ester is further reacted with 3^0– Butyl Hydro Peroxide in presence of Xylene – Solvent and Base Cinchonine to give Hydroxy Beta Keto ester.

Step – 3

Hydroxy Beta Keto Ester is further reacted with Phenyl Methyl Hydrazine Carboxylate (Benzyl Carbazate) in presence of Methanol – solvent and catalyst to give Carbazate compound.

Step – 4

Carbazete Compound further undergoes cyclization reaction in presence of Methylal – Catalyst and EDC – Solvent to give an intermediate as Oxadiazine compound.

PART – II

Step – 1

Para Tri Fluoro Methoxy Aniline (PTFMA) reacts with Methyl Chloro Formate to give the carboxylate compound of PTFMA.

Step – 2

Carboxylate Ester of PTFMA further reacts with Sodium Hydride in presence of Dimethyl Ether (Mono Glyne) and MDC – Solvent to give the sodium salt of PTFAM Carboxylate.

Step - 3

Further Sodium Salt of PTFMA Carboxylate undergoes the Phosgenation reaction by Phosgene in presence of MDC – Solvent to give the chlorinated Intermediate.

PART – III

Step – 1

Oxadiazine compound of Part – 4 and Phosgenated compound of Part – 3 undergoes condensation reaction to give and Intermediate as – I.

Step – 2

The above compound – I further undergoes Hydrogenation reaction by Hydrogen in presence of catalyst to give Crude Indoxacarb which is further crystallized from Methyl Acetate to give Oxi-Urea compound.

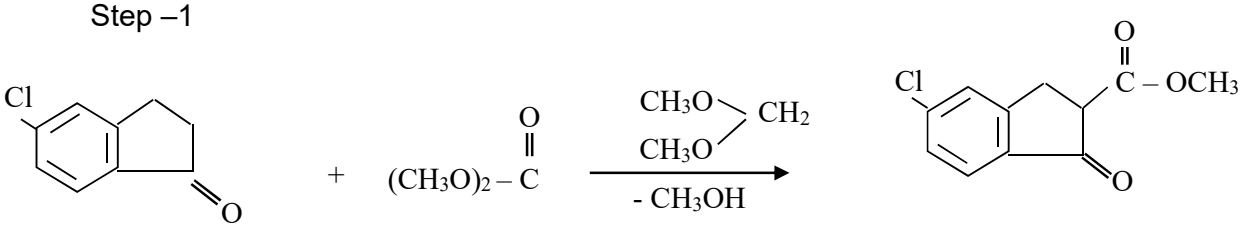
Step – 3

Oxi-Urea compound on treatment of Silica and Sodium Bicarbonate gives the final product Indoxacarb 95%.

CHEMICAL REACTIONS :-

Part – I

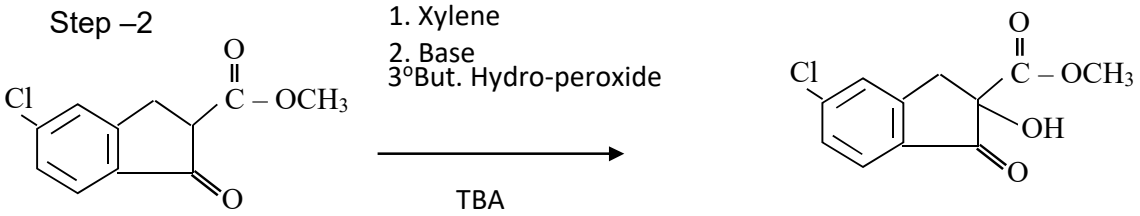
Step –1



5-Chloro Indenone
M.W. 166.5

Beta Keto Ester

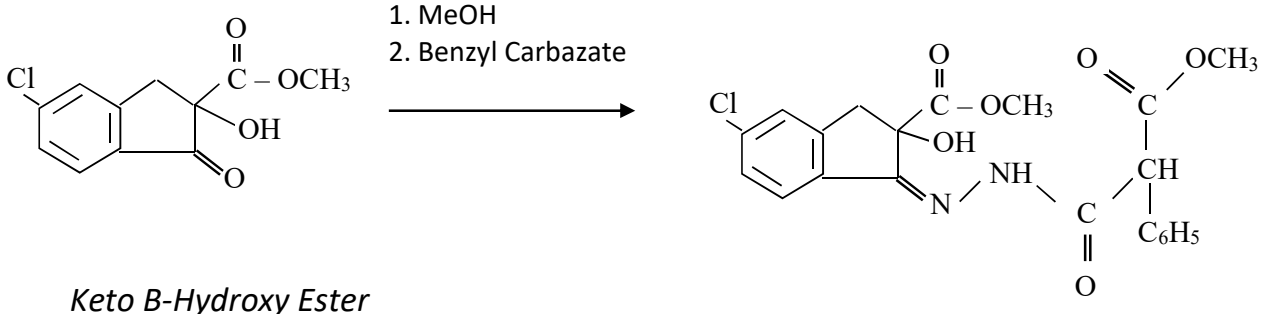
Step –2



Keto B-Ester

Keto B-Hydroxy Ester

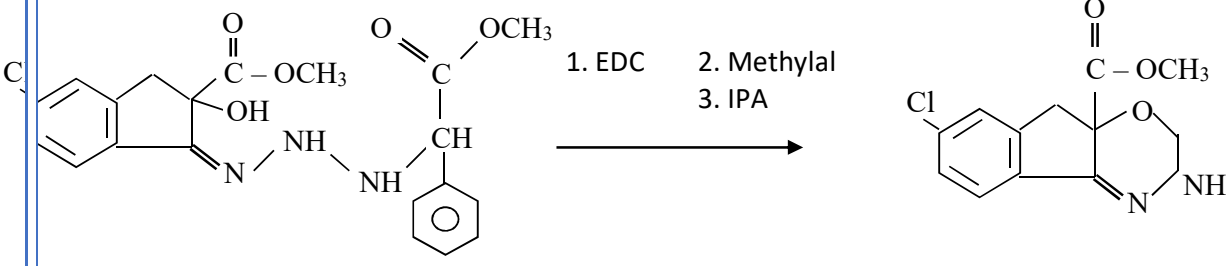
Step – 3



Keto B-Hydroxy Ester

Carbazate Compound

Step – 4

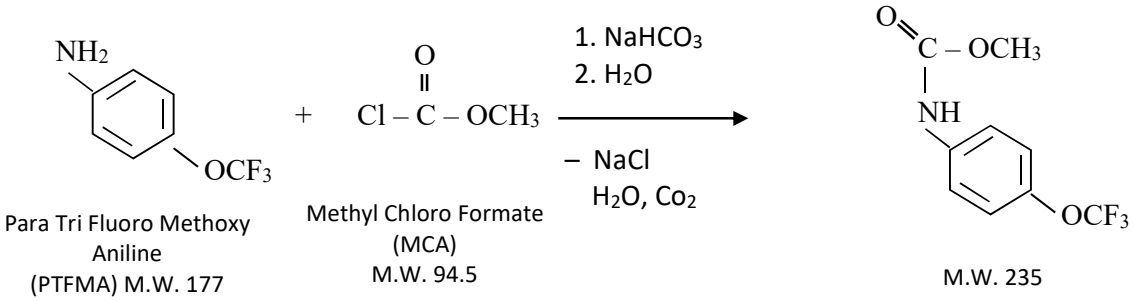


Carbazate Compound

Oxadiazine

Part – II

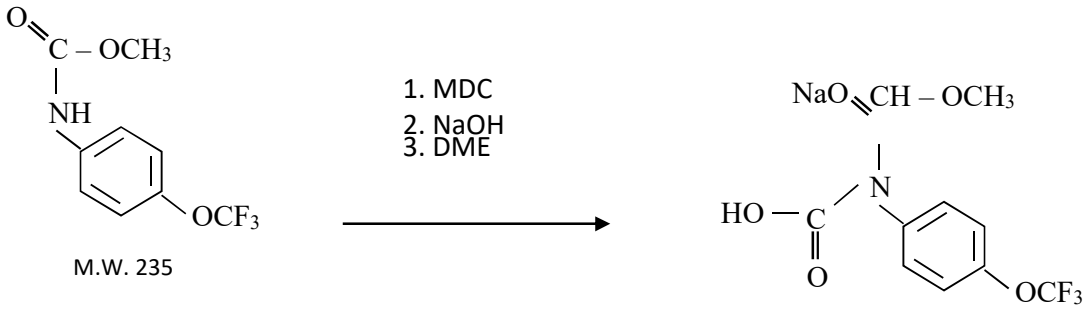
Step – 1



Para Tri Fluoro Methoxy Aniline (PTFMA) M.W. 177

Methyl Chloro Formate (MCA) M.W. 94.5

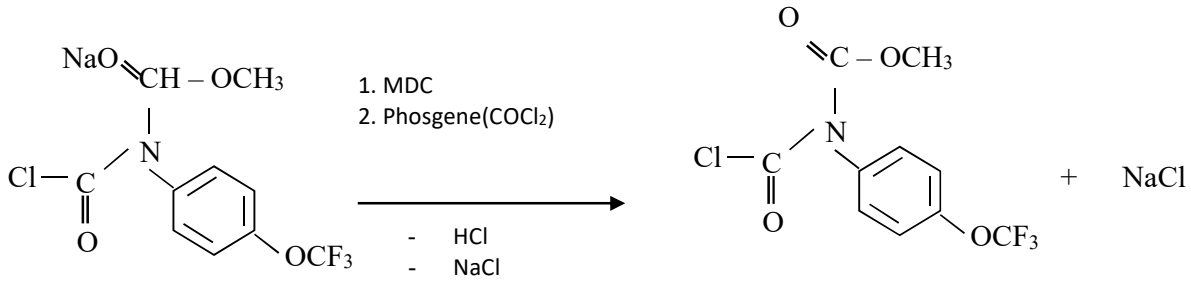
M.W. 235



M.W. 235

M.W. 279

Step – 2

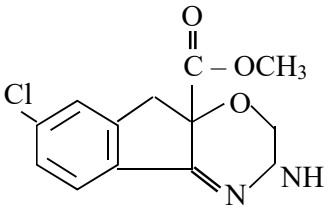


M.W. 279

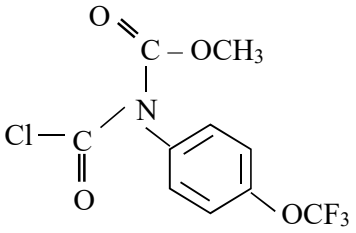
M.W. 297.5

PART – III

Step - 1



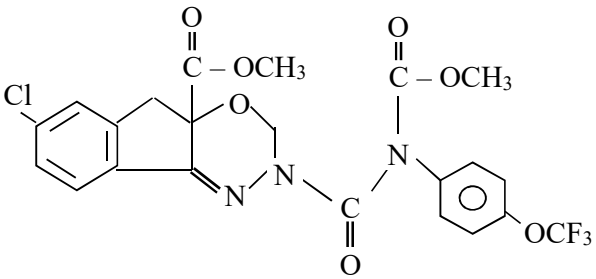
+



M.W. 297.5

Oxadiazine

Condensation →



Indoxacarb

MATERIAL INPUT (QUANTITY IN MT)

INPUT	MT	OUTPUT	MT
Dimethoxy Ethane	2.8	INDOXACARB	1
Dimethoxy Carbonate	0.345	Aqueous mass	3.255
5 Chloro Indenone	0.55	Rec.DMF	2.7
Sodium hydride	0.32	Rec. Xylene	2.612
Water	3.6	Re. Cincho	0.095
HCl 3%solution	0.8	Methanol Rec.	0.135
Mix Xylene	4.4	Rec. IPA	0.345
Cinchonine	0.1	Water wash recycle	1
Butyl Hydro peroxide	0.32	Rec. MDC	2.65
Methanol	0.25	Rec. Hexane	0.674
EDC	0.1	Org ML	0.791
NaHCO3	0.06	Loss	0.123
IPA	0.425		
Phosgene	0.56		
Hexane	0.75		

TOTAL	**15.380**	**TOTAL**	**15.380**

GROUP-F
F:01 Metiram

Manufacturing Process Description

Step I:

First Carbon Disulphide is reacted with Ethylenediamine in the presence of ammonium hydroxide solution and water at 38-40°C. The reaction results into formation of Di ammonium salt of Ethylene Bisdithio Carbamate Hexahydrate (DAH). On completion of reaction the reaction mass is subjected to CS_2 recovery at 55-58°C. The recovered CS_2 is recycled in the system. The pH is maintained around 9 with the yield around 94%. This material is transferred to another vessel for water washing; this is gives to washed sodium salt.

Step II:

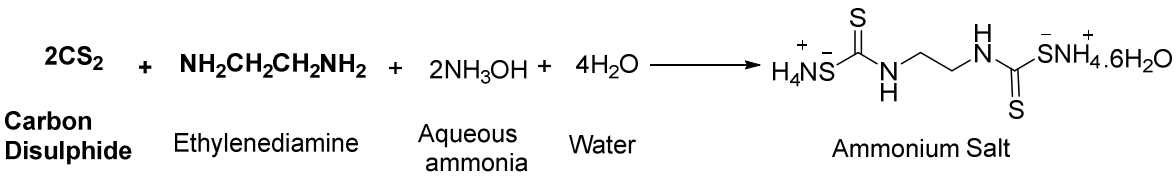
The Di ammonium salt of Ethylene Bis Dithio Carbamate Hexahydrate (DAH) so formed is further reacted with zinc sulphate, and sulphuric acid in aqueous medium at a temperature of 30°C. In this reaction ammonium ion is replaced by zinc. The product so formed is separated from the aqueous by filtration and this step leads to the formation of Matiram. The Matiram formed is then washed with water two times to obtain cake.

Step III:

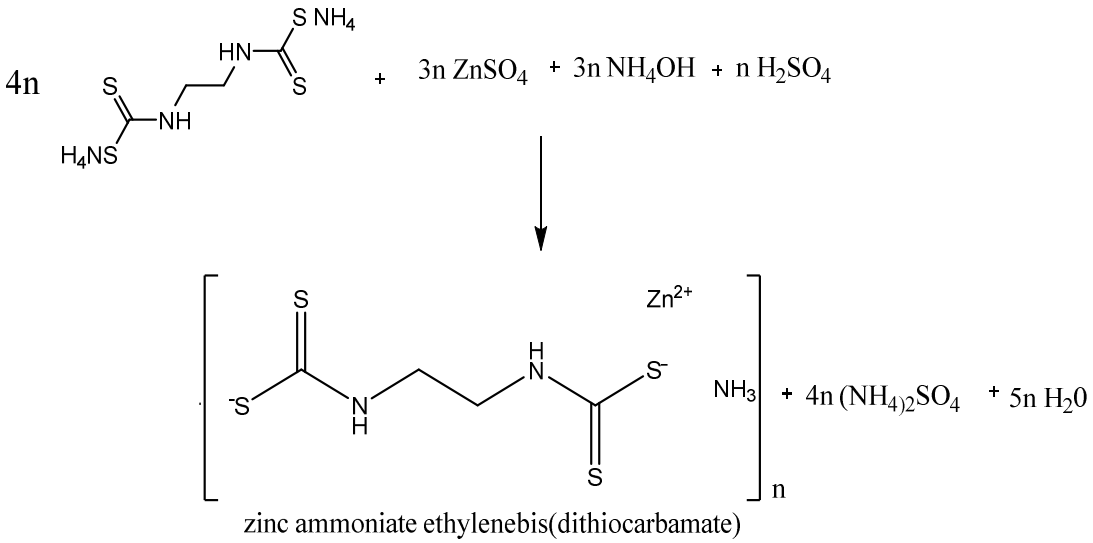
To the obtained cake, additives like HMTA (hexamethylenetetramine) and SLS (sodium lignosulphonate) are added as per the requirements of the technical. The crude product is then dried to get Metiram Technical. The yield is around 88% with a minimum purity as per the specifications >85%.

Synthetic Scheme for Metiram:

Step I



Step-2



zinc ammoniate ethylenebis(dithiocarbamate)

Metiram

Mass Balance:

INPUT	MT	OUTPUT	MT
Ethylene diamine (55%)	0.372	Metiram	1.000
Water	2.356	Effluent	4.870
Carbon disulphide	0.582	Loss	0.310
Ammonium hydroxide (25%)	2.216		
H2SO4	0.580		
ZnSo4 (32 %)	0.021		
SLS	0.033		
HMT	0.020		

TOTAL	6.180	TOTAL	6.180

F02 : Cyproconazole

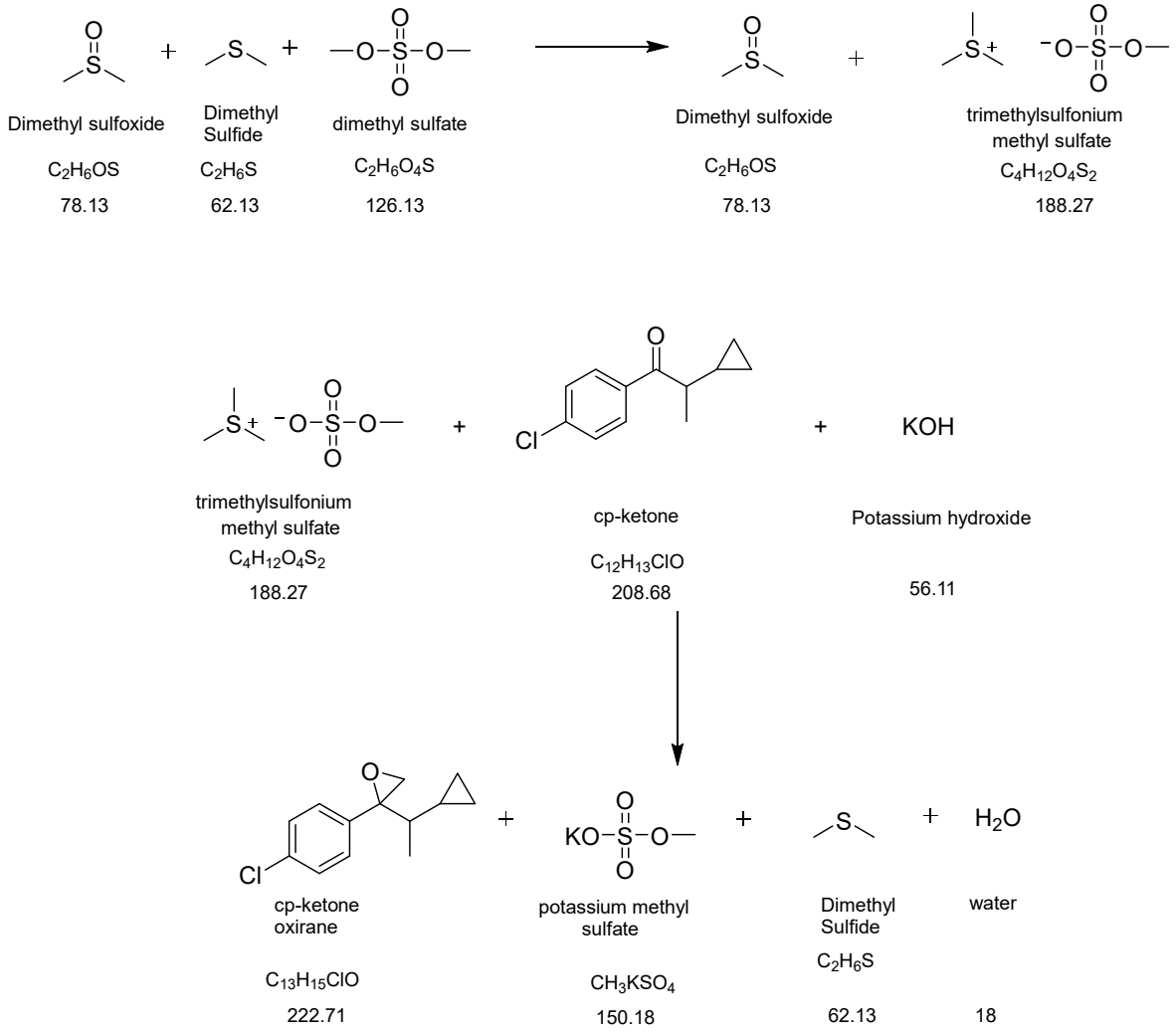
Process Description

Charge toluene, DMSO, $DMSO_4$ in a 1 lit. 4-Neck RBF, equipped with stirrer, thermopocket, reflux condenser in a water bath. Then raise temperature of mixture to 35-40 ^oC, then start addition of DMS in a 1 hrs, then cook the mass for 3 hrs at 40-42 ^oC, after cooking start addition of cp-ketone in a 1 hrs at same temperature, after completed of addition, charge KOH flakes in a lot wise (4 lot) within 3 hrs, then cook the mixture at 40-42 ^oC for 6-8 hrs and monitor reaction by GC for unreacted cp-ketone.

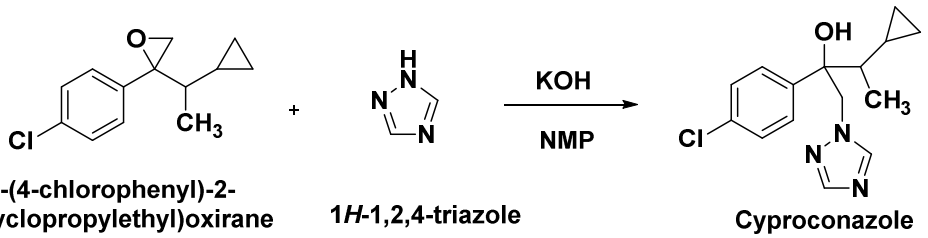
Step-1 Preparation of Oxirane from Cp-ketone

Reaction Chemistry

cp-ketone to oxirane reaction chemistry



Step-2 Preparation of Cyproconazole from Oxirane
Reaction chemistry



2-(4-chlorophenyl)-2-(1-cyclopropylethyl)oxirane
Molecular Weight: 222.71

1*H*-1,2,4-triazole
Molecular Weight: 69.07

Cyproconazole
Molecular Weight: 291.78

Process Description

Charge 5 vol NMP solvent, 1,2, 4-Triazole, KOH flakes and CP-oxirane in a neat, clean & dry placed in 1000 ml 4-Neck RBF equipped with stirrer, thermometer pocket and reflux condenser in an oil bath. Raise the temperature of mixture to ~135°C and maintain at ~130-135^{0}C for 2 hr. Monitor the reaction by HPLC for unreacted CP-Oxirane

Mass Balance:

INPUT	MT	OUTPUT	MT
DMS	0.3810	Cyproconazole	1.0000
DMSo	0.1600	Filtrate (Incineration)	5.4700
DMSO4	0.7690	Wash Soln (incineration)	0.8400
Toluene	1.5300	Oxirane	0.9300
Cp-Ketone	0.9330	Loss	0.4100
KOH Flakes	0.7480	1st NMP	0.5000
Water	16.4520	2nd NMP	4.0100
1st HCL	0.4100	Aq. Layer (Incineration)	0.8200
Oxirane	0.9330	ML Organic (MEE)	2.4400
124 triazole	0.3770	Mix WML (MEE)	3.0910
NMP Solvent	4.6630	Water evaporation	1.6100
EDS Solvent	3.4970	Rec. Toluene	1.4100
35% HCL	1.0210	Main Filtrate MEE	7.9000
21% Soda Soln	1.1570	Loss	2.6000
TOTAL	**33.0310**	**TOTAL**	**33.0310**

ANNEXURE- IV
WATER AND WASTEWATER DETAILS

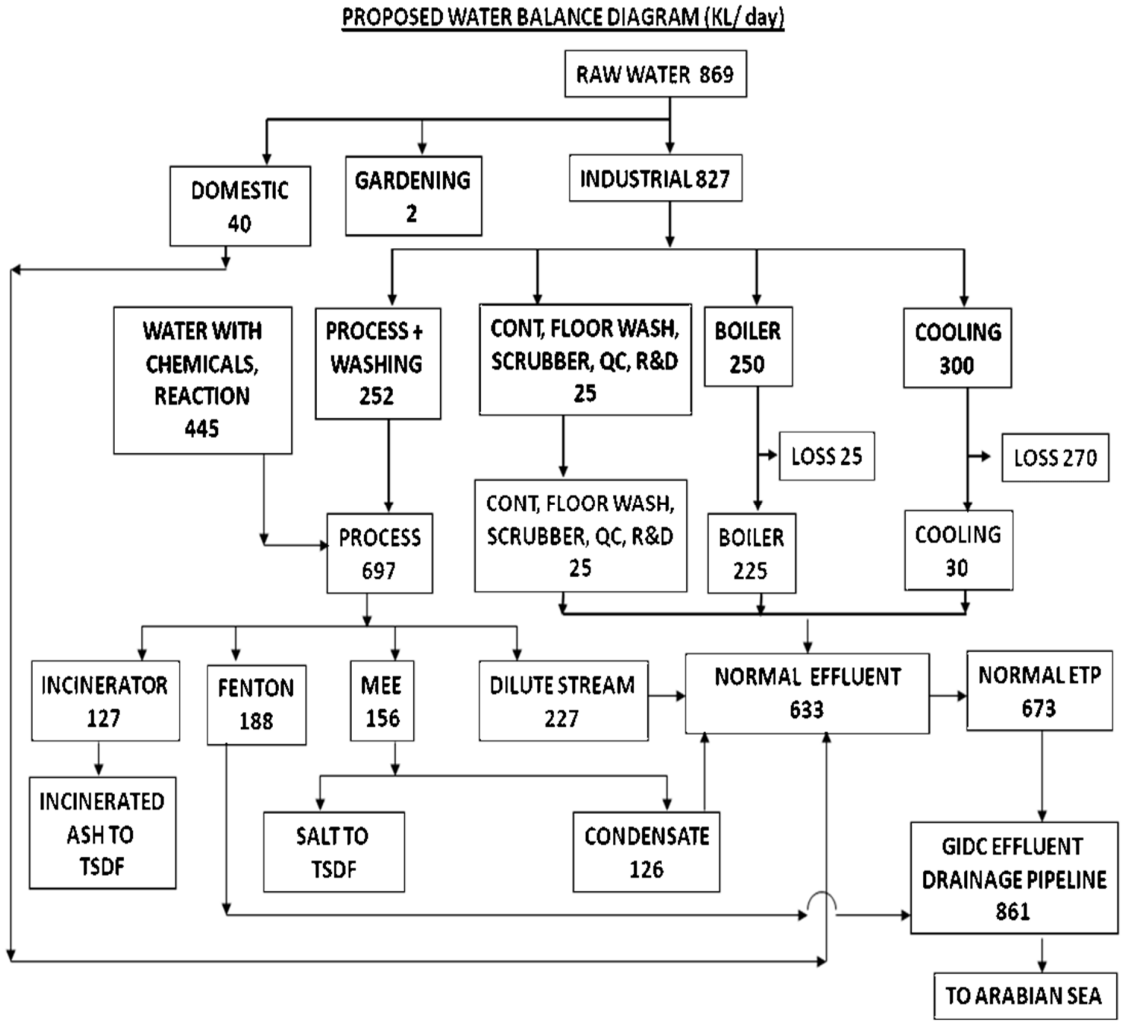
WATER CONSUMPTION

Usage	KL/Day			
	As Per Existing EC	As Per Valid CCA	Proposed (Additional)	Total after Expansion
(A) Domestic	40.0	70.0	0.0	70.0
(B) Gardening	2.0	10.0	8.0	18.0
(C) Industrial				
Process	252.0	192.78	564.79	816.29
Washing	25.0	50.0	-25.0	25.0
Boiler	250.0	235.0	400.0	650.0
Cooling	300.0	230.0	200.0	500.0
Total (Industrial)	**827.0**	**707.78**	**1139.79**	**1991.29**
Total (A+B+C)	**869.0**	**787.78**	**1147.79**	**2079.29**

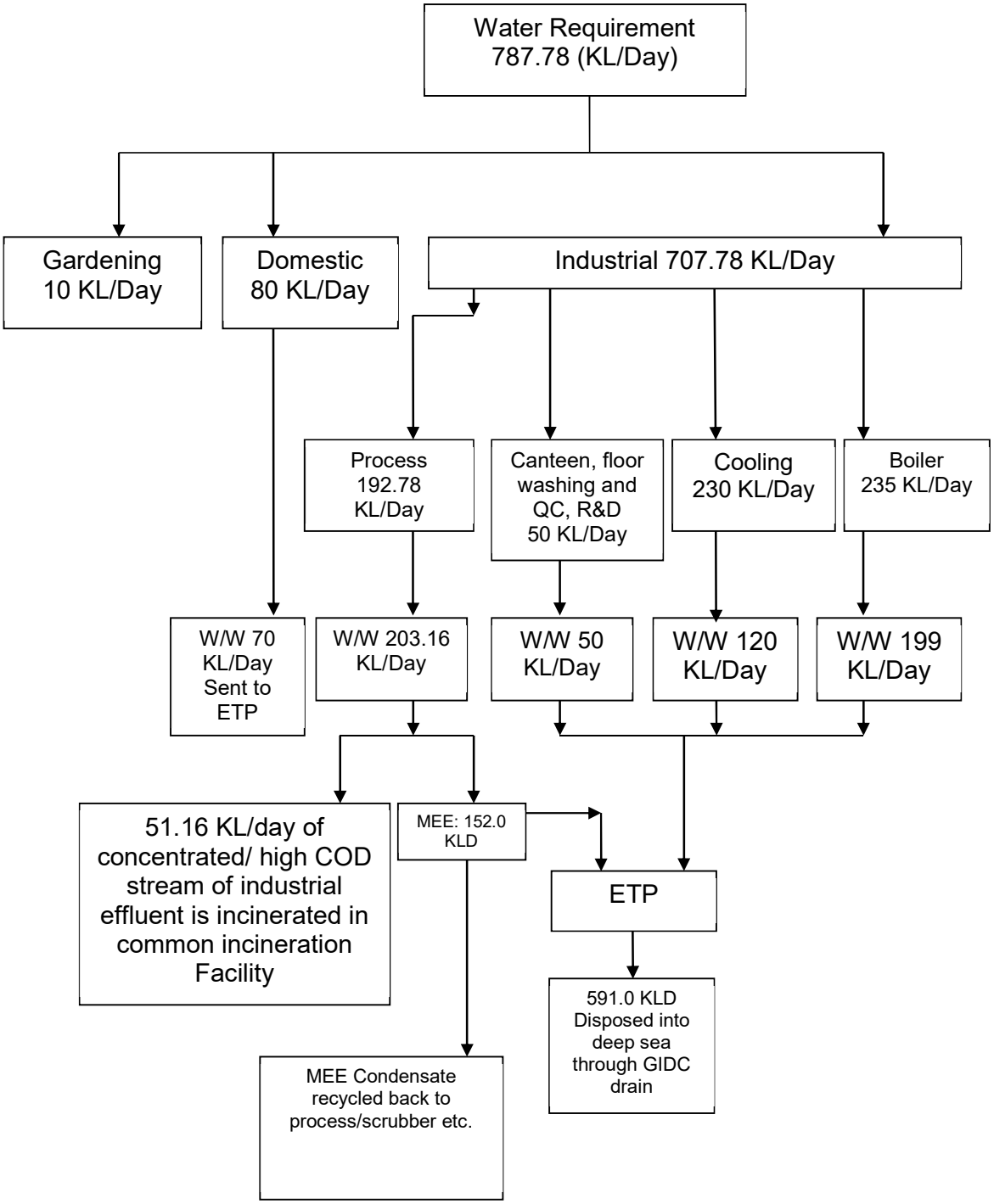
WASTEWATER GENERATION

Usage	KL/day			
	As Per Existing EC	As Per Valid CCA	Proposed (Additional)	Total after Expansion
(A) Domestic	40.0	70.0	-14.0	56.0
(B) Industrial				
Process	541.0	203.16	336.35	877.35
Washing	25.0	50.0	0.0	25
Boiler	225.0	199.0	375.0	600
Cooling	30.0	120.0	370.0	400
Total (Industrial)	**821.0**	**572.16**	**1081.35**	**1902.35**
Total (A+B+C)	**861.0**	**642.16**	**1097.35**	**1958.35**

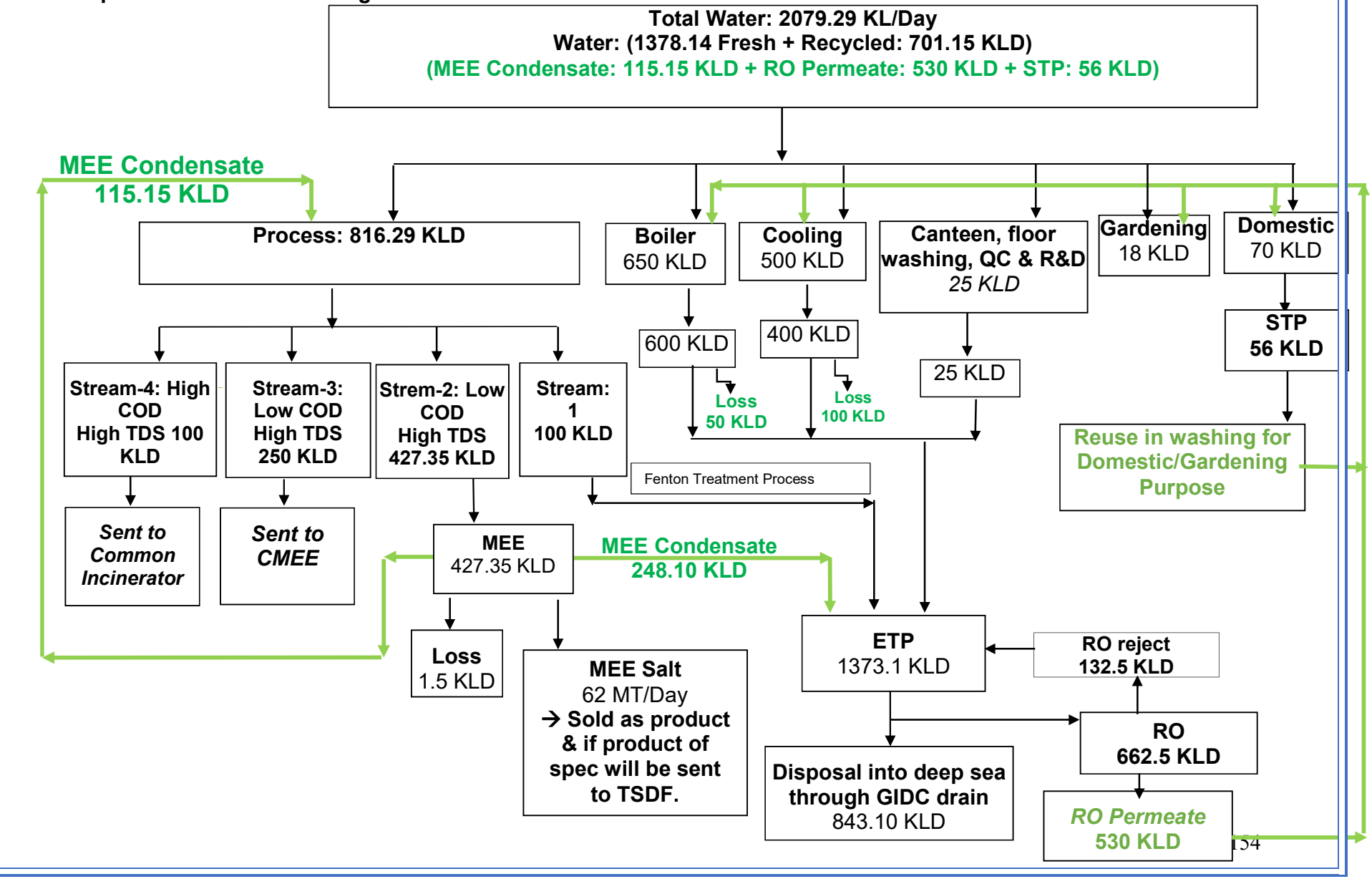
WATER BALANCE DIAGRAM (As Per Existing EC)



WATER BALANCE DIAGRAM (As Per Valid CCA)



Total Proposed Water Balance Diagram



As Per EC

Water & Wastewater Details:

- Total raw water requirement is Water: 869.0 KLD which is met through GIDC water supply.
- Industrial Wastewater generation will be 861 KLD and segregated into high COD/TDS and low COD/TDS effluent streams.
- High COD/Organic waste / toxic aqueous effluent will be incinerated. High COD/TDS effluent stream will be passed though stripper and evaporated though MEE.
- Low COD/TDS effluent stream will be treated in effluent treatment plant (ETP) and treated effluent will be discharged to deep sea though a GIDC conveyance pipelines after conforming to the standards prescribed for the effluent discharge and obtaining permission from the GPCB.

As Per Valid CCA

Water & Wastewater Details:

- Total raw water requirement is Water: 797.78 KL/Day which is met through GIDC water supply.
- The total effluent generation will be 642.16 KLD (Industrial: 572.16 KLD + Domestic: 70 KLD).
- Concentrated /high TDS stream of industrial effluent from process shall be sent to evaporation system. Condensate from MEE shall be recycled back to process/scrubber etc. or balance quantity sent to ETP for treatment. The generating solids after settlers, nutch filters and centrifuged shall be sold to end users or disposed off at approved TSDF Site.
- **Total 591 KLD** of biological industrial effluent along with sewage shall be sent to ETP for primary, secondary, and tertiary treatment. After treatment the treated effluent shall be sent for disposal into GIDC underground drainage-Dahej Vilayat Disposal System up to the sea.
- **51.16 KLD of concentrated / high COD Stream of industrial effluent shall be incinerated common incineration facility.**

Total After EC Expansion

Water & Wastewater Details:

- Total raw water requirement is: 2079.29 KL/Day which is met through GIDC water supply.
- The total effluent generation will be 1958.35 KLD (Industrial: 1902.35 KLD + Domestic: 56.0 KLD).
- **Stream-1: Total 100 KLD** High COD and Low TDS stream of industrial effluent from process shall be treated in Fenton treatment and after filtration clear effluent will treat in ETP. **Total 1373.1.10 KLD** from **(100 KLD Fenton Treated, Boiler Blow Down: 600 KLD, Cooling Blow Down: 400 KLD & Canteen, floor washing, QC & R&D: 25 KLD, MEE Condensate: 248.10 KLD)** of biological industrial effluent shall be sent to ETP for primary, secondary, and tertiary treatment in RO total 530 KLD RO permit recycled back in boiler and cooling tower. Remaining treated effluent total 843.10 KLD shall be sent for disposal into GIDC underground drainage-Dahej Vilayat Disposal System up to the sea.
- **Stream-2: Total 427.35 KLD** Concentrated /high TDS stream of industrial effluent from process shall be treated in in House MEE plant. Total 115.15 KLD Condensate from MEE shall be recycled back to process/scrubber etc. or remaining 248.10 KLD sent to ETP for treatment. The generating solids after settlers, nutch filters and centrifuged shall be sold to end users or disposed of at approved TSDF Site.
- **Stream-3: 250.0 KLD** Concentrated /high TDS stream of industrial effluent from process shall be sent to outside approved Common MEE for evaporation system.
- **Stream-4: 100.0 KLD** of concentrated / high COD Stream effluent shall be sent to common incineration facility.
- **Domestic 56.0 KLD Will Be treated in STP Plant & Reuse in Gardening or Washing for Domestic Purpose.**

ANNEXURE-V

TREATMENT PROCESS

Company shall have an Effluent treatment plant consisting of primary, secondary and tertiary treatment units. The effluent confirming the GPCB standards shall be collected in the central collection tank before it is discharged into GIDC sewer. The details of ETP are as follows.

PROCESS DESCRIPTION: ETP (EFFLUENT TREATMENT PLANT)

PROCESS DESCRIPTION:

For the proposed pesticide manufacturing unit, the raw water will be utilized for Processing, Cooling, Washing, Boiler, Scrubber and domestic purpose. The Effluent generated from the same sources will be segregated based on its bio-degradability. High TDS effluent generated from the process will be sent to Proposed Evaporation System. Water will be evaporated, condensed and recycled to process/scrubber/sent to Proposed Effluent Treatment plant (ETP). After recovery of solvent from mother liquor, water will be sent to ETP. The biodegradable effluent will be sent to ETP.

Primary Treatment:

The biodegradable effluent will be first passed through the Oil & Grease tank to remove oil & grease content from the effluent. The effluent will be equalized & then neutralized by addition of either acid or caustic. The pH will be adjusted to 7.5 (range 6.5 to 8.5). The mixing will be provided by flash mixers. There will be two nos. of equalization and two nos. of neutralization tanks. Once pH is achieved, then the neutralized wastewater will be collected into sludge sump and then transferred to sludge drying bed / filter press.

Secondary Treatment:

The whole secondary treatment facility will be designed based on transportation of effluent (except sludge) by gravity go to first stage aeration tank having Ten days Hydraulic Retention Time (HRT). Here, bio-degradation of organic matter will take place by biomass with diffused aeration system. The overflow of the Aeration Tank will go to the first stage Flocculator (Gravity Settling Clarifier). The sludge of Flocculator clarifier will be partially recycled & wasted. The overflow of the first stage Flocculator clarifier will go to the second stage aeration and then to secondary settling tank, having the same HRT & capacity. The overflow of the settling tank will be moved forward for tertiary treatment.

Tertiary Treatment:

For the finishing of the treated effluent getting from the overflow of the settling tank, tertiary treatment will be introduced. The overflow of the settling tank will be overflow by gravity to a collection sump from where it will be passed through pressure sand filter & activated carbon filter. The final treated effluent will be collected in collection sump and discharged through GIDC sewer line to deep sea.

DETAILS PROPOSED CONVENTIONAL EFFLUENT TREATMENT PLANT

Total normal effluent per day : 1400 m^3/day
Design basis : 1500 m^3/day

Sr. No.	Title	Qty.	Size/Capacity	Cap. each	Total cap.
1	Oil and Grease tank	1	1.4 x 6 x 1.25(H)	10.5	
2	Collection tank for normal effluent	1	25 x 10 x 6 (H)	1500	
3	Neutralization Tank with 7.5 HP MSRL agitator	2	2.25 x2.25 x 4.5	20	40
4	Transfer pump – 1	2	40 M^3/HR, 5 HP		
5	Flash Mixer -1 with 2 HP agitator	1	1.6 dia x 2.5	5	5
6	Clarifloculator	1	Ø=10, SWD=3.	235.5	235.5
7	Mechanism for Clariflocculator	1	2HP		
8	Sump for primary sludge	1	2 x 2 x 2	8	8
9	slurry type Filter pump	2	7.5 HP	10 M^3/HR	
10	PP Filter press for dewatering sludge	2 + 1	1200 x 1200 x 40 PP plates		

11	Activated Charcoal Bed Filter	2	D=1.25, H=2.75.	3.37	3.37
12	Secondary Aeration Tank – I	1	25 x 16 x 5.5 H	2500	2500
13	Diffused aeration system with microfine diffusers and diffuser grid	lot	65 mm OD x 2000 mmx 150 sets		
14	Twin lobe air blower	2	1250 nm^3 / hr x 2 nos at 6000 mmwg.		
15	Bioclarifier – 1	1	Ø=10, SWD=3.	235.5	235.5
16	Clarifier Mechanism	1	2 HP		
17	Bio sludge recirculation pumps	2	22.5 M^3/HR, 5 HP		
18	Aeration tank – II	1	L=12, W=12, D=4.5	575	575
19	Diffused aeration system with microfine diffusers and diffuser grid	lot	65 mm OD x 2000 mm x 50 sets		
20	Twin lobe air blower	2	350 nm^3 / hr x 2 nos at 6000 mmwg.		
21	Bioclarifier – 2	1	Ø=10, SWD=3	235.5	235.5
22	Clarifier Mechanism	1	2 HP		
23	Bio sludge recirculation pumps	2	5 M^3/HR, 1 HP		
24	Secondary Clarifier	1	Ø=10, SWD=3	235.5	235.5
25	Mechanism for Secondary Clarifier	1	1 HP		
26	Flash mixer	1	Ø=3.5, SWD=2.85	27.4	27.4
27	Flash mixer agitator	1	3 HP		

28	Clarifier III	1	Ø=10, SWD=3	34.54	34.54
29	Clarifier Mechanism	1	1 HP		
30	sludge sump –III	1	L=1.58, W=1.2, D=3.85	7.3	7.3
31	SLUDGE PUMP	2	7.5 M^3/HR, 3 HP		
32	Filter feed sump	1	D=2.25, H=2.75	3.37	3.37
33	Pressure sand filter	2	D=2.25, H=3	3.37	3.37
34	Carbon bed pressure filter	2	D=2.25, H=3	3.37	3.37
35	Filter feed pump	2	40 M^3/HR, 5 HP		
36	Back wash pumps	2	15 M^3/HR, 5 HP		
37	PE solution tank with mixer	1	D=1.25, H=1.25	1.53	1.53
38	Lime slurry tank with mixer	1	D=1.25, H=1.25	1.53	1.53
39	Alum solution tank with mixer	1	D=1.00, H=1.05	1.53	1.53
40	$FeSO_4$ solution tank with mixer	1	D=1.25, H=1.25	1.53	1.53
41	Treated water sump	1	L=4, W=4, D=2.5	40	40
42	GUARD Pond – I, II,	2	L=12, W=12, D=7	1000	2000

CHARACTERISTICS OF UNTREATED AND TREATED EFFLUENT:

Sr. No.	Parameters	Unit	GPCB Norms for treated effluent	Raw effluent (Mancozeb)	Boiler	MEE cond	Cooling	Drum washing	Domestic	normal process	Effluent to ETP	Eff after treatment	Mancozeb after treatment	Mixed effluent to GIDC pipeline
1	pH	pH unit	6.5 To 8.5	6.5	9	7.1	7.4	7.02	6.2	5.8	7	7.1	7.2	72
2	Temperature	°C	40	28	38	35	30	30	30	28	30	30	30	30
3	Colour	Pt-Co scale	100	172	70	65	55	340	110	145	150	80	60	70
4	Suspended Solids	mg/l	100	220	186	20	45	240	450	356	316	56	45	50
5	Oil and Grease	mg/l	10	2	3.6	0.2	13.4	15.6	10.2	30	14.2	0.2	0.2	0.2
6	Phenolic Compound	mg/l	1	ND	0	0	0	1.2	1.5	ND	1.2	0.8	0	0.6
7	Cyanides	mg/l	0.2	ND	0	0	0	0	0	ND	0	0	0	0
8	Sulphides	mg/l	2	Nil	0	0	0	4.3		2.8	1.2	0.2	0	0.2

9	Ammoniacal Nitrogen	mg/l	50	Nil	0	20	0	17	64	125	70	40	0	30
10	BOD (5 days at 200C)	mg/l	30	70	25	135	25	250	300	1500	559	25	20	24
11	COD	mg/l	250	3110	250	450	150	865	600	6200	2332	240	235	239
12	Chlorides	mg/l	600	NIL	1400	160	2100	2250	1250	1400	1222	550	1100	670
13	**Sulphates**	mg/l	**1000**	95302	120	20	400	180	250	120	124	65	65000	14220
14	Total Dissolved Solids	mg/l	2100	133500	2400	200	4800	3165	2100	10400	4801	1020	133500	29899
15	**Phosphate**	mg/l	**5**	Nil	0	0	0.8	10	3	8	6.5	1.1	0.2	1
16	Insecticides/Pesticides	mg/l	Absent	1.2						ND			ND	
17	**Qty of effluent kl/day**			**188**	**225**	**126**	**30**	**25**	**40**	**227**	**673**	**673**	**188**	**860**

DETAILS OF MENCOZEB EFFLUENT TREATMENT PLANT

Mancozeb Effluent Stream Treatment Plant with Fenton Reagent:

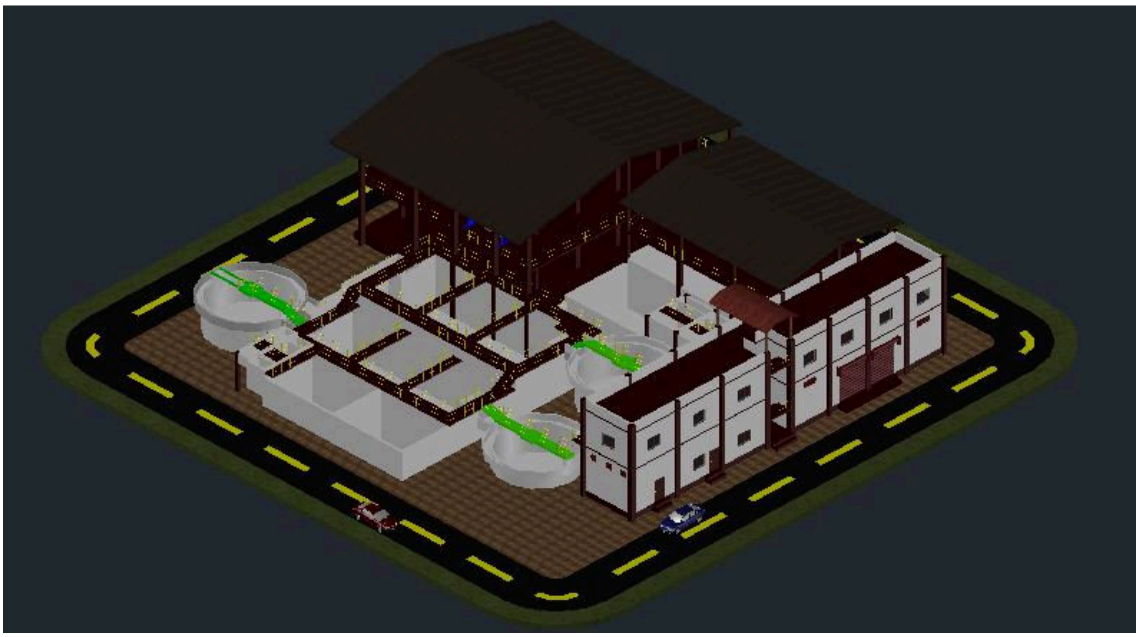
Hydraulic load : 490 m^3/day

Design load : 550 m^3/day

No	Name of unit	Dimensions	Capacity	Nos	total vol.	MOC	Agitator details			
							Type	RPM	MOC	Motor
1	Effluent collection tank		200	2	400	RCC				
2	Effluent transfer pump		10 m^3/hr	2						
3	Rotameter 3 - 30 kl/hr			1						
4	Magnetic flow meter with totalizer			1						
5	Soda ash preparation tank	1.6 Ø x 2.5	5	2	10	MS	Turbine	100	MS	3
6	Soda ash dozing pump									
7	Static mixer for alkaline pH	100 dia x 20								
8	Buffer tank	2.2 dia x 3.3	12.5	1	12.5	MS/ epoxy	Turbine	100	MS	
9	Flash Mixer/ flocculator	2 dia x 3.3	10	1	10	MS/Epoxy	Turbine	100	MS	
10	Lamella Clarifier with tubedeck	4 x 2 x 2.5	20	1	20	MS/Epoxy				
11	Holding tank		20	1	20	RCC				
12	Filter pumps		10 m^3/hr	2		CI				
13	Cartridge Filter 5 m3/hr		5 m^3/hr	4		PP				
14	Clear Effluent Collection Tank		20	2	40					
15	Clear Effluent Transfer pump		10 m^3/hr	2		CI				
16	Flow meter (magnetic type)		3 - 30 m^3/hr							
17	Static mixer for acidic Ph	150 dia x 5		1		PP				

18	acid solution tank		5	2	10	HDPE				
19	FeSO4 solution tank		5	1	5	HDPE				
20	Mixing Tank 1		10	1	10	RCC	Turbine	100	MSRL	3
21	Mixing tank no.2		20	2	40	RCC	turbine	100	MSRL	12.5
22	Mixing tank no.3		10	2	20	RCC	turbine	100	MSRL	7.5
23	Mixing tank no.4		10	1	10	RCC	turbine	100	MSRL	3
24	H2O2 solution tank		5	2	10	HDPE	turbine	100	SS	1.5
25	Carbon Slurry Preparation Tank		5	2	10		paddle	50	MS	2
26	Lime slurry preparation tank		5	2	10		paddle	50	MS	2
27	PE solution preparation tank		5	1	5		turbine	100	SS	1.5
28	Flash Mixer/flocculator		5	1	5				MSRL	2
29	Primary Clarifier	5 dia x 3	58.9	1	58.9				MS	
30	Treated Effluent Holding Tank		20	2	40					
31	Filter pump	10 m^3/hr		2						
32	Sand Filter	1.5dia x 2.5	4.5	1	4.5					
33	Carbon Filter	1.5 dia x 2.5	4.5	1	4.5					

Proposed ETP



1.0 PROCESS DESCIPTION

1) The low COD streams from the manufacturing process plants and utilities effluent shall be passed through Screen Chamber (SC) where manual screen (S-01) shall be provided to remove floating material. Then effluent shall be passed through O & G Trap (OGT-01) where O & G shall be removed from the top manually and collected in O & G Collection Tank (OGCT-01) then effluent will be collected in Collection cum Equalization Tanks (CETs-1). Pipe grid is provided at bottom of the CET-01 to keep all suspended solids in suspension and to provide proper mixing. 2 nos. of Air Blowers (B-01) shall supply air through diffusers to pipe grid.

2) Then after, equalized wastewater shall be pumped to Neutralization tanks (NT-01-A/B) where Alkaline solution shall be added from Alkaline Dosing Tank with help of Dosing Pumps to bring neutral pH. Then Alum shall be dosed from Coagulant Dosing Tank (CDT-01) to carry out coagulation. Then effluent shall pumped to Semi-Automatic Filter Press (FP-01-A/B) where Polyelectrolyte shall be dosed from Polyelectrolyte Dosing Tank (PEDT) help of Dosing Pumps to improve dewatering of sludge in sludge line. Sludge will be dewatered in Filter Press -A/B and Filterate from Filter Press shall be sent to Aeration Tank-01. The sludge cake shall be collected and packed into the plastic bags and stored in the HWSA for ultimate disposal to TSDF. Here neutralisation Tank and Filter press shall be used alternately

3) In Aeration Tank, organics matter is removed with the help of bacteria in presence of oxygen provided by centrifugal blower through diffused aeration system. Also, MLSS and MLVSS ratio shall be maintained to ensure active microorganisms' growth. Oxygen shall be supplied by 2 nos. of air blowers(B-02) through diffusers. Air blowers also keep MLSS in suspension.

4) Then the overflow of the AT-01 shall be diverted into the Secondary Clarifier (SCL-01) for biomass separation. An appropriate retention time is given to the effluent to ensure proper settling. The sludge settles down into the bottom of the SCL-01and required amount of settled sludge shall be pumped to Neutralisation Tanks.

5) Then after, overflow (clear supernatant) of SCL-01 shall be collected Moving Bed Bioreactor (MBBR-01). Here, again biodegradation of left out organic matter of the wastewater shall be carried out by bacteria (attached growth) in the MBBR-01 and for that oxygen shall be supplied by blowers (B-03) with help of fine bubble diffusers. Sludge Settle at the bottom of SCL-02 shall be pumped to Neutralisation Tank where it will be mixed with raw effluent.

6) Then after, supernatant from SC-02 shall be collected in Intermediate Sump (IS-01). Then effluent from the IS-01 shall be pumped to Dual Media Filter (DMF-01) to remove Suspended Solids from effluent and polishin`g Treatment. Then Filtrate water shall be collected in Treated Water Tanks (TWT-01) before Aqua-Air® AEEPL/51063/R1/2021 Page 3 final disposal to GIDC drain. In case of Emergency, Guard Pond (GP-01) shall be provided to store effluent before disposal.

7) Back wash from DMF-01 shall be collected in Drain Pit and then pumped back to collection cum equalization tank (CET-01) for further treatment.

Existing

DETAILS OF PROPOSED MULTIPLE EFFECT EVAPORATION SYSTEM

Multiple Effect Evaporator is designed to handle the following streams
MOC of equipment will be Graphite/SS

A) Plant Capacity (Continuous)

Plant will be designed to handle the following streams of effluent:

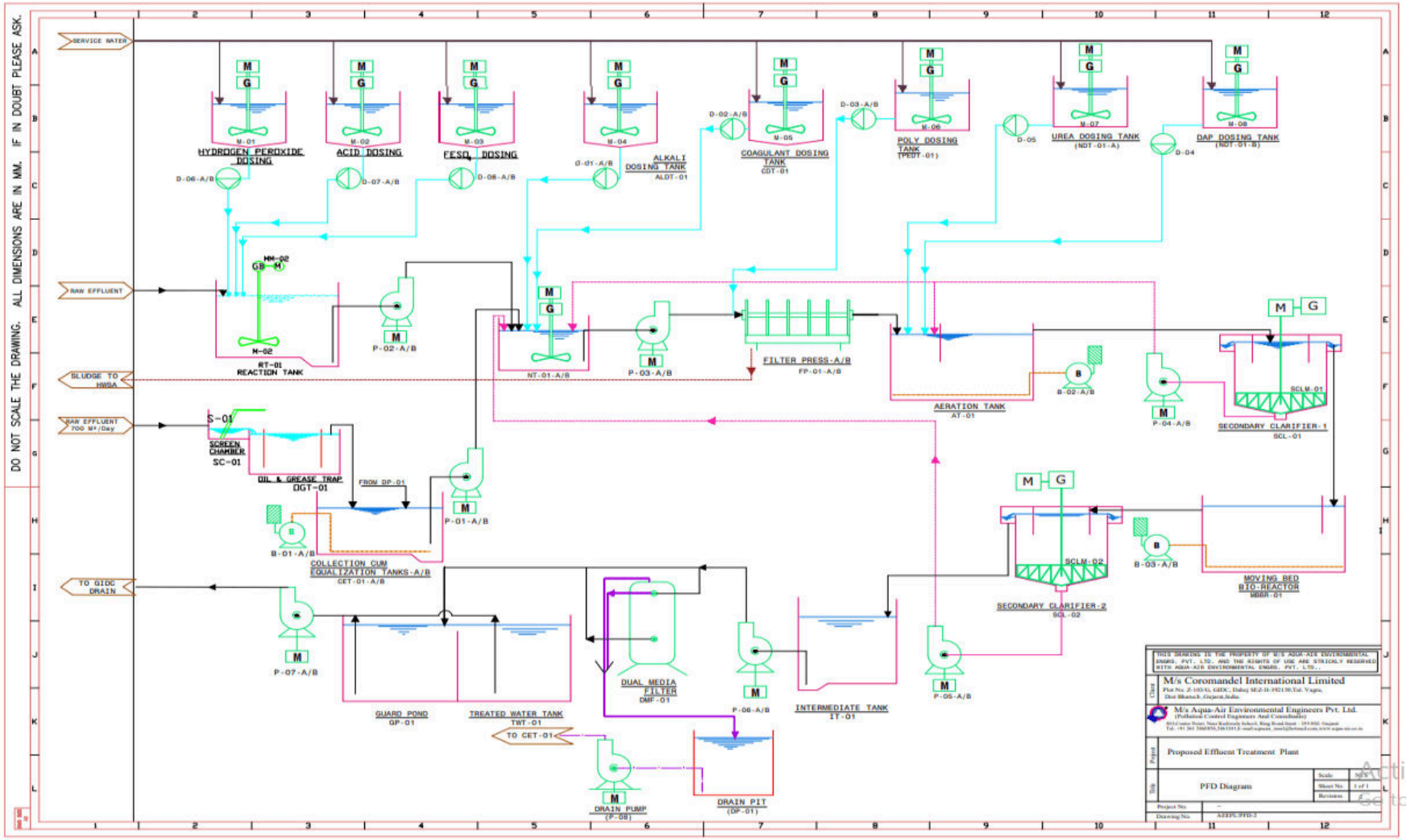
a) Stream 1: NH_4Cl handling capacity: 400 KL/Day
   Components: 13-16% HCl and 14-16% HCl

b) Stream 2: Sodium Chloride Handling Capacity: 200 KL/Day
   Components: 28-30% HCl

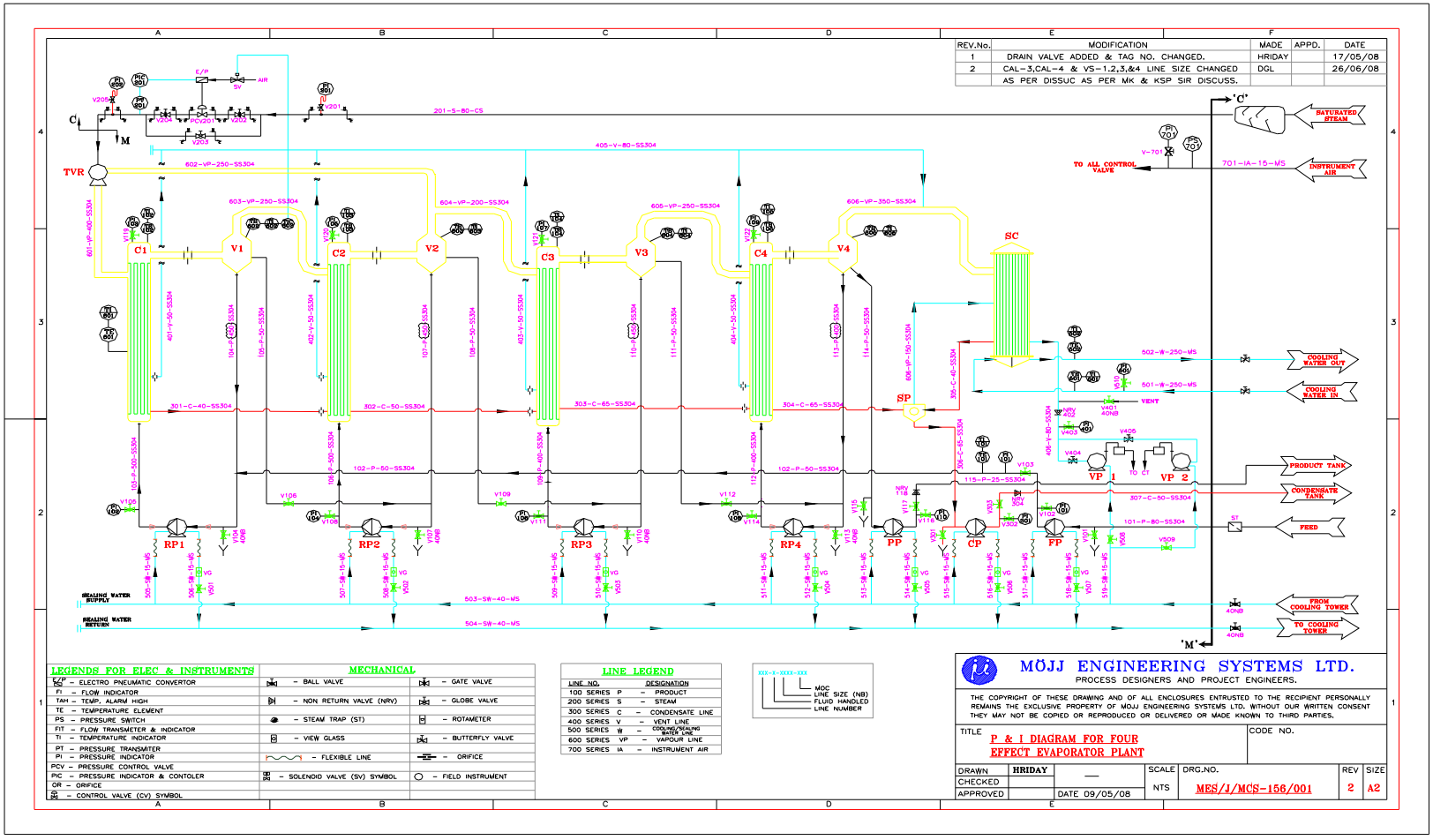
c) Stream 3: Sodium Sulphate Handling Capacity: 500 KL/Day
   Components: 18-20% Sodium Sulphate

Total Handling Capacity of all streams: 1100 KL/Day

FLOW DIAGRAM OF PROPOSED ETP



Flow Diagram of Multiple Effect Evaporator



ANNEXURE-VI
DETAILS OF STACKS & VENTS

As Per EC Flue Gas Stack

Sr. no.	Source of emission With Capacity	Stack Height (meter)	Type of Fuel	Quantity of Fuel	Type of emissions i.e. Air Pollutants	Air Pollution Control Measures (APCM)
1	Boiler -1 (12.0 TPH * 2 Nos.)	30	Natural Gas/FO/LDO	40360 m3/Day	SPM SO2 NOX	Adequate Stack Height
2	Thermic Fluid Heater	11	Natural Gas	500 m3/Day		Adequate Stack Height
3	D G Set 1000 KWH * 2	12	HSD	8000 Lit/Day		Adequate Stack Height
4	Incinerator	45	Natural Gas	800 m3/Hr		Adequate Stack Height

As Per Valid CCA Flue Gas Stack

Sr. no.	Source of emission With Capacity	Stack Height (meter)	Type of Fuel	Quantity of Fuel	Type of emissions i.e. Air Pollutants	Air Pollution Control Measures (APCM)
1	Boiler -1 [10 TPH]	45	Natural Gas	20160 m^3/Day	SPM SO2 NOX	Adequate Stack Height
2	D G Set 1000 KWH * 2	12	HSD	8000 Lit/Day		Adequate Stack Height

As Per EC Expansion Flue Gas Stack

Sr. no.	Source of emission With Capacity	Stack Height (meter)	Type of Fuel	Quantity of Fuel	Type of emissions i.e. Air Pollutants	Air Pollution Control Measures (APCM)
1	Boiler -1 (12.0 TPH * 2 Nos.)	45	Natural Gas/LDO	40360 m3/Day	SPM SO2 NOX	Adequate Stack Height
2	Boiler -2 (25.0 TPH * 1 Nos.)	45	Bio-Briquettes	75MT/Day		ESP + Water Scrubber
3	Thermic Fluid Heater (Kcal/hr)	11	Natural Gas/LDO	500 m3/Day		Adequate Stack Height
4	D G Set 1500 KWH * 2	12	HSD	9000 Lit/Day		Adequate Stack Height
5	Incinerator	45	Natural Gas/LDO	800 m3/Hr		Adequate Stack Height

As Per EC Process Vent

Sr. no.	Source of emission With Capacity	Stack Height (meter)	Type of emissions i.e. Air Pollutants	Air Pollution Control Measures (APCM)
1	Reactor of m-Phenoxy Benzaldehyde & DMAC	20	Cl2	Alkali Scrubber
2	Reactor of CMAC, Lambda Cyhalothric Acid Chloride, DMAC, Permethrin, Bifenthrin, TCAC, chlorpyrifos, picloram, Imazethapyr, Azoxy storbin, chlororthalonil, Picoxy storbin, CCMP, Ethyl-N-Cynoethanimideate, Thiamethoxam, Clothianidin	20	HCL	Water Scrubber, Ventury Scrubber
3	Reactor of m-Phenoxy benzaldehyde, Profenophos	20	HBR	Alkali Scrubber
4	Reactor of CMAC, Lambda Cyhalothric Acid Chloride, DMAC, TCAC, Bispyribac Sodium, Chlorothalonil, CCMP	30	SO2	Alkali Scrubber & Ventury Scrubber
5	Reactor of CMAC, DMAC	20	SO3	Alkali Scrubber & Ventury Scrubber

As Per Valid CCA Process Vent

Sr. No.	Stack attached to	Stack Height	Air Pollution Control Measures	Pollutants	Permissible Limit mg/Nm3
	Existing				
1.	Mancozeb Reactor/ Propineb Reactor	30	Air blower, ventury scrubber	CS2	180 mg/Nm3
2.	Spray Dryer/ Propineb Spray Dryer	30	Bag Filter	PM	20 mg/Nm3
3.	Mancozeb/ Propineb Precipitation Reactor	30	Air blower, ventury scrubber	CS2	180 mg/Nm3
4.	EDA/PDA Dilution Reactor Scrubber	30	Air blower, ventury scrubber	NH3	30mg/Nm3
5.	Mancozeb/ Propineb Bag house blower vent	14	Bag Filter	PM	150 mg/Nm3
6.	Sodium Sulphate Dryer in MEEs	30	Bag Filter	PM	150 mg/Nm3
7.	EDA Storage tank Scrubber.	7	ventury scrubber	NH3	30 mg/Nm3
8.	Formulation Section	15	Bag Filter	HCL CL2 SO2 H2S NH3 NOx HF	20 mg/Nm3 5.0 mg/Nm3 40 mg/Nm3 05 mg/Nm3 30 mg/Nm3 25 mg/Nm3 6.0 mg/Nm3
	Proposed				
1	Kresoxim-methyl/ Amide Reactor Scrubber	30	Acidic scrubber	NH3	30 mg/Nm3
2	Picoxystrobin Reactor scrubber	30	Alkali scrubber	HCL	20 mg/Nm3
3	Reactor of Cartap Hydrochloride	30	Water Scrubber	PM	20 mg/Nm3
4	Mancozeb 75% WDG	30	Water Scrubber	PM	20 mg/Nm3

5	Macozeb/Propineb Conveying line Bag house blower vent	28	Bag Filter	PM	20 mg/Nm3
	Total After proposed expansion				
1.	Mancozeb Reactor/ Propineb Reactor	30	Air blower, ventury scrubber	CS2	180 mg/Nm3
	Reactor of Cartap Hydrochloride		Water scrubber	HCL	20 mg/Nm3
2	Spray Dryer/ Propineb Spray Dryer	30	Bag Filter	PM	20 mg/Nm3
3	Mancozeb/ Propineb Precipitation Reactor	30	Air blower, ventury scrubber	CS2	180 mg/Nm3
	Picoxystrobin Reactor scrubber		Alkali scrubber	HCL	20 mg/Nm3
4	EDA/PDA Dilution Reactor Scrubber	30	Air blower, ventury scrubber	NH3	30 mg/Nm3
	Kresoxim-methyl/ Amide Reactor Scrubber	30	Acidic scrubber	NH3	30 mg/Nm3
5	Mancozeb/ Propineb Bag house blower vent	14	Bag Filter	PM	20 mg/Nm3
6	Macozeb/Propineb Conveying line Bag house blower vent	28	Bag Filter	PM	20 mg/Nm3
7	EDA Storage tank Scrubber.	7	ventury scrubber	NH3	30 mg/Nm3

As Per EC Expansion Process Vent:

Sr. No.	Plant	Stack attached to	Stack Height	Air Pollution Control Measures	Para-meters	Permissible Limit Mg/NM3
Group A						
1	m-Phenoxy Benzaldehyde	Reactor of m-Bromo Benzaldehyde	20	Water Scrubber	HCl	20
2	Cypermethric Acid Chloride	Reactor of Cypermethric Acid Chloride	20	Alkali Scrubber	HCl SO2	20 40
3	Lamda Cyhalothric Acid Chloride	Reactor of Lambda Cyhalothric Acid Chloride	20	Alkali Scrubber	HCl SO2	20 40
4	Delta Methric Acid Chloride	Reactor of Deltamethric Acid Chloride	20	Alkali Scrubber	HCl SO2	20 40
5	Cypermethrin (T) & Beta, Zeta, Theta etc Isomers	All reactors common vent	--	Sodium Hypochloride Solution	--	--
6	Alphamethrin (T)					
7	Deltamethrin (T)					
8	Permethrin (T)	Reactor of Permethrin	20	Water Scrubber	HCl	20
9	Lamda Cyhalothrin (T)	All reactors common vent	--	Sodium Hypochloride Solution	--	--

10	Bifenthrin (T)	Reactor of Bifenthrin acid chloride	20	Water Scrubber	HCl	20
Group B						
1	MMP	No Process Gas Emission	--	--	--	--
2	Profenofos	Reactor of Propfenofos	20	Water Scrubber	HBr	20
3	DETC	Reactor of Monoester and Diester	20	Alkali Scrubber	HCl	20
4	DMTC					
5	DMTC Amide	DMTC Amide Reactor	20	Acidic Scrubber	NH3	30
6	TCAC	Reactor of TCAC	20	Alkali Scrubber Two scrubber in series	HCl SO2	20 40
7	Chlorpyriphos	HTCP Reactor	20	Water Scrubber-Alkali Scrubber	HCl	20
Group C						
1	PMIDA	PMIDA reactor	20	Water Scrubber	HCl	20
2	Glyphosate (T)	Glyphosate reactor	20	1st water scrubber 2nd Acid media	NH3	30
3	Triclopyr Butotyl Ester	--	--	--	--	--
4	Bispyribac Sodium	--	--	--	--	--
5	Pichloram	Picloram Reactors	20	Alkali Scrubber	HCl	20

6	Fluroxypyr	--	--	--	--	--
7	Imazethapyr	Imazethapyr Reactors	20	Alkali Scrubber	HCl	20
8	Glufosinate Ammonia	--	--	--	--	--
9	Ethoxysulfuron	--	--	--	--	--
Group D						
1.	Mancozeb/ Propineb Tech.	Mancozeb/ Propineb Precipitation Reactor scrubber	30	Air blower, ventury scrubber	CS2	180 mg/Nm3
		EDA/PDA Dilution Reactor Scrubber	30	Air blower, ventury scrubber	NH3	30 mg/Nm3
		Mancozeb/ Propineb Bag house blower vent	14	Bag Filter	PM	20 mg/Nm3
		Mancozeb/ Propineb Conveying line Bag house blower vent	28	Bag Filter	PM	20 mg/Nm3
		EDA Storage tank Scrubber.	7	ventury scrubber	NH3	30 mg/Nm3
		Mancozeb/ Propineb Precipitation Reactor	30	Air blower, ventury scrubber	CS2	180 mg/Nm3
		Automatic Bagging machine vent	14	Bag Filter	PM	20 mg/Nm3
3.	Azoxystrobin	--	--	--	--	--
4.	Tebuconazol	--	--	--	--	--

5.	Wettable Sulphur	--	--	--	--	--
6.	Chlorothalonil	--	--	--	--	--
7	Kresoxim-methyl	Kresoxim-methyl/ Amide Reactor Scrubber	20	Acidic scrubber	NH3	30 mg/Nm3
8.	Picoxystrobin	Picoxystrobin Reactor scrubber	20	Alkali scrubber	HCL	20 mg/Nm3
9.	Trifloxystrobin	Trifloxystrobin Reactor scrubber	20	Alkali scrubber	Br2	5 mg/Nm3
Group E						
1	Imidacloprid	No Process emission	--	--	--	--
2	Acetamiprid	CCMP Reactor	20	Alkali Scrubber	HCl SO2	20 40
3	2-Chloro-5-Chloro Methyl Pyridine Nitro Imino Imidazolidine	--	--	--	--	--
4	Ethyl-N-Cynoethanimidte	--	--	--	--	--
5	Cartap	Reactor of Cartap Hydrochloride	20	Water Scrubber	HCl	20
6	Thiamethoxam	--	--	--	--	--
7	Clothianidin	--	--	--	--	--
8	Emamectin Benzoate	--	--	--	--	--
9	Indoxacarb	--	--	--	--	--

Group- F						
1	Metiram		30	Air blower, ventury scrubber	CS2	180 mg/Nm3
Group- G						
2	Cyproconazole	Salt preparation reactor	30	Air blower, ventury Water Scrubber	HCL	20 mg/Nm3
		Salt neutralizatio n reactor	30	Air blower, ventury scrubber	CO2	
Formulation Stack: -						
1	Mancozeb 75% WDG	WDG Bag House	30	Bag Filter	PM	20mg/Nm3
2	Formulation Area	ACM/Jet Mill	15	Bag Filter	PM	20mg/Nm3

EC Expansion Process Vent Attached to:

Sr. No.	Plant	Stack attached to	Stack Height	Air Pollution Control Measures	Para-meters	Permissible Limit Mg/NM3
	OTHERS					
1	HCl Storage Tank	HCl Storage Tank	11	Water Scrubber	HCl Cl2	20 05
2	Chlorine Shed	Chlorine Shed	13.5	Alkali Scrubber	Cl2	05
3	Drum filling station	Drum filling	11	Alkali Scrubber	Odour	Nil

ANNEXURE-VII
TOTAL POWER & FUEL EQUIREMENT & SOURCE OF POWER

As Per Existing EC Power Requirement: 4000 KVA

As Per EC Expansion Power Requirement: 5000 KVA

As Per EC Fuel Details:

Sr. No.	Fuel	Quantity
6.	Natural Gas/FO/LDO (Boiler)	20160 m3/Day
7.	Natural Gas (TFH)	500 m3/Day
8.	HSD (DG Set)	8000 Lit/Day
9.	Natural Gas (Incinerator)	800 m3/Hr

As Per Valid CCA Fuel Details:

Sr. No.	Fuel	Quantity
3.	Natural Gas	20160 m3/Day
4.	HSD	8000 Lit/Day

As Per EC Expansion Fuel Requirement.

Sr. No.	Fuel	Quantity
1.	Natural Gas/LDO (Boiler)	40360 m3/Day
2.	Natural Gas/LDO (TFH)	500 m3/Day
3.	HSD (DG Set)	9000 Lit/Day
4.	Natural Gas/LDO (Incinerator)	800 m3/Hr
5.	Briquettes for 25 TPH Boiler	75 MT/Day

ANNEXURE-VIII

HAZARDOUS WASTE GENERATION AND DISPOSAL

Sr. No.	Type of Waste	Category	Unit	Quantity (MT/Annum)				Mode Of Disposal
				As Per EC	As Per Valid CCA Existing	Additional	Total	
1.	Spent Carbon	29.5	MT/Annum	348.0	432.0	0.0	432	Collection, Storage, transportation, disposal at approved CHWIF or Co-processing facility.
2.	Residue to incinerator	29.1	MT/Annum	1956.0	773.0	3413.0	5369	
3.	Process waste	29.1	MT/Annum	1164.0	2160.0	0.0	2160.0	
4.	Incinerated ash	36.2	MT/Annum	1824.0	0.0	-1824.0	0.0	Collection, Storage, transportation, disposal at approved TSDF facility and /or Co processing
5.	ETP waste	29.2	MT/Annum	240.0	7440.0	1676.0	8000.0	
6.	Salt from MEE	--	MT/Annum	6084.0				
7.	Spent oil	5.5	KL/Annum	0.0036	6.0	6.0	12.0	Collection, Storage, transportation, disposal by selling to registered re-refiners.
8.	Discarded containers	33.1	Nos./Annum	18000 Nos.	1670400 Nos.	0.0	1670400 Nos.	Collection, Storage, transportation, disposal by selling to registered re-processors and/or
9.	Discarded Liners/ HDPE	33.1	MT/Annum	72000 Nos.	1440000 Nos.	684 MT	720 MT	

	bags/ Paper bags							Incineration or Co processing facility.
10.	Date expired and off-specification pesticides	29.3	MT/Annum	--	600	0.0	600	Collection, Storage, transportation, disposal at approved CHWIF or Co-processing facility.
11.	Sludge from wet scrubber	37.1	MT/Annum	--	120	0.0	120.0	Collection, Storage, transportation, disposal at approved TSDF facility.

ANNEXURE-IX
DETAILS OF HAZARDOUS CHEMICALS STORAGE & HANDLING

Sr. No.	Name of the Hazardous Substance	Existing Storage	Proposed Storage	Mode of Storage	Storage Condition	Actual Storage	State & Operating pressure & temperature	Possible type of Hazards
1	Ethylene Diamine	50 KL	-	Tank	Over Ground	40KL*1	NTP	Toxic & Flammable
2	Carbon disulphide	90 KL	-	Tank	Over Ground, horizontal tank submerged in water	40KL *1 50KL*1	NTP	Toxic & Flammable
3	Sodium Hydroxide	40 KL	-	Tank	Over Ground	40 KL * 1	NTP	Corrosive
4	Manganese Sulphate	100 KL	100 KL	Tank	Above Ground	100 * 2	NTP	Non-Hazardous
5	Zinc Sulphate	40 KL	-	Tank	Above Ground	40 KL* 1	NTP	Non-Hazardous
6	SLS	10 MT	-	Bags	Above Ground	25 KG * 400 Nos.	NTP	Non-Hazardous
7	HMTA	10 MT	-	Bags	Above Ground	25 KG * 400 Nos.	NTP	Non-Hazardous
8	1,2 –PDA	0.0	2 KL	Drum	Above Ground	200 Lit * 10 Nos.	NTP	Toxic
9	Ammonia solution	0.0	5 KL	Tank	Above Ground	5 KL * 1 Nos.	NTP	Corrosive

10	Ammonium hydroxide (25%)	0.0	2 KL	Drum	Above Ground	200 Lit * 10 Nos.	NTP	Corrosive
11	Sulphuric Acid	15 KL	30 KL	Tank	Over Ground	15 KL *3	NTP	Corrosive
12	DMS	0.0	5 KL	Drum	Above Ground	200 Lit * 25 Nos.	NTP	Toxic & Flammable
13	DMSO	0.0	5 KL	Drum	Above Ground	200 Lit * 25 Nos.	NTP	Toxic & Flammable
14	DMSO4	0.0	5 KL	Drum	Above Ground	200 Lit * 25 Nos.	NTP	Toxic & Flammable
15	Toluene	0.0	30 KL	Tank	Under Ground	30 KL *2	NTP	Toxic & Flammable
16	Cp Ketone	0.0	5 KL	Drum	Above Ground	200 Lit * 25 Nos.	NTP	Flammable
17	KOH Flakes	0.0	2 MT	Bags	Above Ground	50 kg * 40 Nos.	NTP	Corrosive
18	HCL	0.0	20 KL	Tank	Over Ground	20.0 KL*3	NTP	Corrosive
19	1,2,4 triazole	0.0	5 KL	Drum	Above Ground	200 Lit * 25 Nos.	NTP	Flammable
20	NMP	0.0	5 KL	Drum	Above Ground	200 Lit * 25 Nos.	NTP	Flammable
21	EDC	0.0	5 KL	Drum	Above Ground	200 Lit * 25 Nos.	NTP	Flammable
22	Ethylene Dichloride	0.0	40 KL	Tank	Over Ground	20 KL *2	NTP	Toxic & Flammable
23	Benzaldehyde	0.0	20 KL	Tank	Over Ground	20 KL * 1	NTP	Toxic & Flammable

24	IPA	0.0	20 KL	Tank	Under Ground	20 KL * 1	NTP	Flammable
25	Isobutylene	0.0	20 KL	Tank	Over Ground	10 KL *2	NTP	Flammable
26	Hexane	0.0	80 KL	Tank	Under Ground	20 KL *4	NTP	Flammable
27	MEOH	0.0	20 KL	Tank	Under Ground	20 KL * 1	NTP	Flammable
28	Phenol	0.0	40 KL	Tank	Over Ground	40 KL * 1	NTP	Toxic & Flammable
29	Acrylonitrile	0.0	18 KL	Tank	Over Ground	10 KL * 1	NTP	Toxic & Flammable
30	TBA	0.0	25 KL	Tank	Over Ground	25 KL * 1	NTP	Toxic & Flammable
31	Acetonitrile	0.0	15 KL	Tank	Over Ground	15 KL * 1	NTP	Corrosive
32	Aluminium Chloride	0.0	80	Tank	Over Ground	15KL * 2	NTP	Corrosive
33	Thionyl Chloride	0.0	20	Tank	Over Ground	15KL * 1	NTP	Toxic
34	NaCN	0.0	10	Bags	Inside special room	10 KL*1	NTP	Highly Toxic
35	Bromine	0.0	20	Bottle/Tank	Over Ground	20 KL * 1	NTP	Corrosive & Toxic
36	Chlorine	0.0	4.5	Cylinders	Over ground in cylinders	900 kg* 10 Nos.	NTP	Corrosive & Toxic

ANNEXURE-X

SOCIO - ECONOMIC IMPACTS

1) EMPLOYMENT OPPORTUNITIES

During construction phase, skilled and unskilled manpower will be needed. This will temporarily increase the employment opportunity. Secondary jobs are also bound to be generated to provide day-to-day needs and services to the work force. This will also temporarily increase the demand for essential daily utilities in the local market. The manpower requirement for the proposed diversification is expected to generate some permanent jobs and secondary jobs for the operation and maintenance of plant. This will increase direct / indirect employment opportunities and ancillary business development to some extent for the local population. This phase is expected to create a beneficial impact on the local socio-economic environment.

2) INDUSTRIES

During construction of the project, the required raw materials and skilled and unskilled laborers will be utilized maximum from the local area. The increasing industrial activity will boost the commercial and economic status of the locality, to some extent.

3) PUBLIC HEALTH

During construction period, workers will be provided with basic amenities like safe water supply, low cost sanitation facilities, first aid, required personal protective equipment, etc. Otherwise, there could be an increase in diseases related to personal hygiene. Emission, if uncontrolled from process and utility stacks may cause discomfort, burning of eyes to the recipients in the down wind direction. This may be caused due to the failure of control equipment / process. The company regularly examines, inspects and tests its emission from sources to make sure that the emission is below the permissible limit. Hence, there will not be any significant change in the status of sanitation and the community health of the area, as sufficient measures will be taken and proposed under the EMP.

4) TRANSPORTATION AND COMMUNICATION

Since the new factory will have proper linkage for the transport and communication, the development of this project will not cause any additional impact. In brief, as a result of the project there will be no adverse impact on communication, as sufficient measures will be proposed to be taken under the EMP. The proposed project is not expected to make any significant change in the existing status of the socio - economic environment of this region.

ANNEXURE-XI

PROPOSED TERMS OF REFERENCE FOR EIA STUDIES

1. Executive Summary

2. Introduction

i. Details of the EIA Consultant including NABET accreditation
ii. Information about the project proponent
iii. Importance and benefits of the project

3. Project Description

i. Cost of project and time of completion.
ii. Products with capacities for the proposed project.
iii. If expansion project, details of existing products with capacities and whether adequate land is available for expansion, reference of earlier EC if any.
iv. List of raw materials required and their source along with mode of transportation.
v. Other chemicals and materials required with quantities and storage capacities
vi. Details of Emission, effluents, hazardous waste generation and their management.
vii. Requirement of water, power, with source of supply, status of approval, water balance diagram, man-power requirement (regular and contract)
viii. Process description along with major equipments and machineries, process flow sheet (quantities) from raw material to products to be provided
ix. Hazard identification and details of proposed safety systems.
x. Expansion/modernization proposals:
    a. Copy of all the Environmental Clearance(s) including Amendments thereto obtained for the project from MOEF/SEIAA shall be attached as an Annexure. A certified copy of the latest Monitoring Report of the Regional Office of the Ministry of Environment and Forests as per circular dated 30th May, 2012 on the status of compliance of conditions stipulated in all the existing environmental clearances including Amendments shall be provided. In addition, status of compliance of Consent to Operate for the ongoing / existing operation of the project from SPCB shall be attached with the EIA-EMP report.
    b. In case the existing project has not obtained environmental clearance, reasons for not taking EC under the provisions of the EIA Notification 1994 and/or EIA Notification 2006 shall be provided. Copies of Consent to Establish/No Objection Certificate and Consent to Operate (in case of units operating prior to EIA Notification 2006, CTE and CTO of FY 2005-2006) obtained from the SPCB shall be submitted. Further, compliance report to the conditions of consents from the SPCB shall be submitted.

4. Site Details

i. Location of the project site covering village, Taluka/Tehsil, District and State, Justification for selecting the site, whether other sites were considered.
ii. A toposheet of the study area of radius of 10km and site location on 1:50,000/1:25,000 scale on an A3/A2 sheet. (Including all eco-sensitive areas and environmentally sensitive places)
iii. Details w.r.t. option analysis for selection of site
iv. Co-ordinates (lat-long) of all four corners of the site.
v. Google map-Earth downloaded of the project site.
vi. Layout maps indicating existing unit as well as proposed unit indicating storage area, plant area, greenbelt area, utilities etc. If located within an Industrial area/Estate/Complex, layout of Industrial Area indicating location of unit within the Industrial area/Estate.
vii. Photographs of the proposed and existing (if applicable) plant site. If existing, show photographs of plantation/greenbelt, in particular.
viii. Landuse break-up of total land of the project site (identified and acquired), government/private - agricultural, forest, wasteland, water bodies, settlements, etc shall be included. (Not required for industrial area)
ix. A list of major industries with name and type within study area (10km radius) shall be incorporated. Land use details of the study area
x. Geological features and Geo-hydrological status of the study area shall be included.
xi. Details of Drainage of the project upto 5km radius of study area. If the site is within 1 km radius of any major river, peak and lean season river discharge as well as flood occurrence frequency based on peak rainfall data of the past 30 years. Details of Flood Level of the project site and maximum Flood Level of the river shall also be provided. (Mega green field projects)
xii. Status of acquisition of land. If acquisition is not complete, stage of the acquisition process and expected time of complete possession of the land.
xiii. R&R details in respect of land in line with state Government policy

5. Forest and wildlife related issues (if applicable):

i. Permission and approval for the use of forest land (forestry clearance), if any, and recommendations of the State Forest Department. (if applicable)
ii. Landuse map based on High resolution satellite imagery (GPS) of the proposed site delineating the forestland (*in case of projects involving forest land more than 40 ha)*
iii. Status of Application submitted for obtaining the stage I forestry clearance along with latest status shall be submitted.
iv. The projects to be located within 10 km of the National Parks, Sanctuaries, Biosphere Reserves, Migratory Corridors of Wild Animals, the project proponent shall submit the map duly authenticated by Chief Wildlife Warden showing these features vis-à-vis the project location and the recommendations or comments of the Chief Wildlife Warden there on

v. Wildlife Conservation Plan duly authenticated by the Chief Wildlife Warden of the State Government for conservation of Schedule I fauna, if any exists in the study area
vi. Copy of application submitted for clearance under the Wildlife (Protection) Act, 1972, to the Standing Committee of the National Board for Wildlife

6. Environmental Status

i. Determination of atmospheric inversion level at the project site and site-specific micrometeorological data using temperature, relative humidity, hourly wind speed and direction and rainfall.
ii. AAQ data (except monsoon) at 8 locations for PM10, PM2.5, SO2, NOX, CO and other parameters relevant to the project shall be collected. The monitoring stations shall be based CPCB guidelines and take into account the pre-dominant wind direction, population zone and sensitive receptors including reserved forests.
iii. Raw data of all AAQ measurement for 12 weeks of all stations as per frequency given in the NAQQM Notification of Nov. 2009 along with – min., max., average and 98% values for each of the AAQ parameters from data of all AAQ stations should be provided as an annexure to the EIA Report.
iv. Surface water quality of nearby River (100m upstream and downstream of discharge point) and other surface drains at eight locations as per CPCB/MoEF&CC guidelines.
v. Whether the site falls near to polluted stretch of river identified by the CPCB/MoEF&CC, if yes give details.
vi. Ground water monitoring at minimum at 8 locations shall be included.
vii. Noise levels monitoring at 8 locations within the study area.
viii. Soil Characteristic as per CPCB guidelines.
ix. Traffic study of the area, type of vehicles, frequency of vehicles for transportation of materials, additional traffic due to proposed project, parking arrangement etc.
x. Detailed description of flora and fauna (terrestrial and aquatic) existing in the study area shall be given with special reference to rare, endemic and endangered species. If Schedule-I fauna are found within the study area, a Wildlife Conservation Plan shall be prepared and furnished.
xi. Socio-economic status of the study area.

7. Impact and Environment Management Plan

i. Assessment of ground level concentration of pollutants from the stack emission based on site-specific meteorological features. In case the project is located on a hilly terrain, the AQIP Modelling shall be done using inputs of the specific terrain characteristics for determining the potential impacts of the project on the AAQ. Cumulative impact of all sources of emissions (including transportation) on the AAQ of the area shall be assessed. Details of the model used and the input data used for modelling shall also be provided. The air quality contours

shall be plotted on a location map showing the location of project site, habitation nearby, sensitive receptors, if any.

ii. Water Quality Modelling – in case of discharge in water body

iii. Impact of the transport of the raw materials and end products on the surrounding environment shall be assessed and provided. In this regard, options for transport of raw materials and finished products and wastes (large quantities) by rail or rail-cum road transport or conveyor-cum-rail transport shall be examined.

iv. A note on treatment of wastewater from different plant operations, extent recycled and reused for different purposes shall be included. Complete scheme of effluent treatment. Characteristics of untreated and treated effluent to meet the prescribed standards of discharge under E (P) Rules.

v. Details of stack emission and action plan for control of emissions to meet standards.

vi. Measures for fugitive emission control

vii. Details of hazardous waste generation and their storage, utilization and management. Copies of MOU regarding utilization of solid and hazardous waste in cement plant shall also be included. EMP shall include the concept of waste-minimization, recycle/reuse/recover techniques, Energy conservation, and natural resource conservation.

viii. Proper utilization of fly ash shall be ensured as per Fly Ash Notification, 2009. A detailed plan of action shall be provided.

ix. Action plan for the green belt development plan in 33 % area i.e. land with not less than 1,500 trees per ha. Giving details of species, width of plantation, planning schedule etc. shall be included. The green belt shall be around the project boundary and a scheme for greening of the roads used for the project shall also be incorporated.

x. Action plan for rainwater harvesting measures at plant site shall be submitted to harvest rainwater from the roof tops and storm water drains to recharge the ground water and also to use for the various activities at the project site to conserve fresh water and reduce the water requirement from other sources.

xi. Total capital cost and recurring cost/annum for environmental pollution control measures shall be included.

xii. Action plan for post-project environmental monitoring shall be submitted.

xiii. Onsite and Offsite Disaster (natural and Man-made) Preparedness and Emergency Management Plan including Risk Assessment and damage control. Disaster management plan should be linked with District Disaster Management Plan.

8. Occupational health

i. Plan and fund allocation to ensure the occupational health & safety of all contract and casual workers

ii. Details of exposure specific health status evaluation of worker. If the workers' health is being evaluated by pre designed format, chest x rays, Audiometry,

Spirometry, Vision testing (Far & Near vision, Colour vision and any other ocular defect) ECG, during pre placement and periodical examinations give the details of the same. Details regarding last month analyzed data of above mentioned parameters as per age, sex, duration of exposure and department wise.

iii. Details of existing Occupational & Safety Hazards. What are the exposure levels of hazards and whether they are within Permissible Exposure level (PEL)? If these are not within PEL, what measures the company has adopted to keep them within PEL so that health of the workers can be preserved

iv. Annual report of health status of workers with special reference to Occupational Health and Safety.

9. Corporate Environment Policy

i. Does the company have a well laid down Environment Policy approved by its Board of Directors? If so, it may be detailed in the EIA report.

ii. Does the Environment Policy prescribe for standard operating process / procedures to bring into focus any infringement / deviation / violation of the environmental or forest norms / conditions? If so, it may be detailed in the EIA.

iii. What is the hierarchical system or Administrative order of the company to deal with the environmental issues and for ensuring compliance with the environmental clearance conditions? Details of this system may be given.

iv. Does the company have system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the company and / or shareholders or stakeholders at large? This reporting mechanism shall be detailed in the EIA report

10. Details regarding infrastructure facilities such as sanitation, fuel, restroom etc. to be provided to the labour force during construction as well as to the casual workers including truck drivers during operation phase.

11. Enterprise Social Commitment (ESC)

i. Adequate funds (at least 2.5 % of the project cost) shall be earmarked towards the Enterprise Social Commitment and item-wise details along with time bound action plan shall be included. Socio-economic development activities need to be elaborated upon.

12. Any litigation pending against the project and/or any direction/order passed by any Court of Law against the project, if so, details thereof shall also be included. Has the unit received any notice under the Section 5 of Environment (Protection) Act, 1986 or relevant Sections of Air and Water Acts? If so, details thereof and compliance/ATR to the notice(s) and present status of the case.

13. 'A tabular chart with index for point wise compliance of above TORs.

14. The TORs prescribed shall be valid for a period of three years for submission of the EIA-EMP reports.

The following general points shall be noted:

i. All documents shall be properly indexed, page numbered.

ii. Period/date of data collection shall be clearly indicated.

iii. Authenticated English translation of all material in Regional languages shall be provided.
iv. The letter/application for environmental clearance shall quote the MOEF file No. and also attach a copy of the letter.
v. The copy of the letter received from the Ministry shall be also attached as an annexure to the final EIA-EMP Report.
vi. The index of the final EIA-EMP report must indicate the specific chapter and page no. of the EIAEMP Report
vii. While preparing the EIA report, the instructions for the proponents and instructions for the consultants issued by MOEF vide O.M. No. J-11013/41/2006-IA.II (I) dated 4th August, 2009, which are available on the website of this Ministry shall also be followed.
viii. The consultants involved in the preparation of EIA-EMP report after accreditation with Quality Council of India (QCI) /National Accreditation Board of Education and Training (NABET) would need to include a certificate in this regard in the EIA-EMP reports prepared by them and data provided by other organization/Laboratories including their status of approvals etc. Name of the Consultant and the Accreditation details shall be posted on the EIA-EMP Report as well as on the cover of the Hard Copy of the Presentation material for EC presentation.

TORs' prescribed by the Expert Appraisal Committee (Industry) shall be considered for preparation of EIA-EMP report for the project in addition to all the relevant information as per the 'Generic Structure of EIA' given in Appendix III and IIIA in the EIA Notification, 2006. Where the documents provided are in a language other than English, an English translation shall be provided. Public hearing is exempted under the provisions as per para 7(i) Stage III 3(i)(b) of the EIA Notification,2006. The EIA report shall be submitted to the Ministry for obtaining environmental clearance.

ANNEXURE-XII
GIDC LETTER FOR WATER SUPPLY

ANNEXURE-XIII
TSDF & CHWIF MEMBERSHIP CERTIFICATE

ANNEXURE-XIV
GIDC PLOT TRANSFER LETTER.

Dahej SEZ Ltd.
Block No.5, 4th Floor
Udyog Bhavan, Sector - 11
Gandhinagar - 3820 .., Gujarat, India
Phone +91-79-23250659 / 23241590
Fax (079) 23241736
e-mail ceo@dahejsez.com, ceodsl@yahoo.in
website www.dahejsez.com

April 29, 2010

No. DSL/SABERO ORGANICS /ALT/391

To
Mr. S.R.B. Nair
Director
Sabero Organics Gujarat Limited
Plot No. 2102,
G.I.D.C., Sarigam,
Dist. Valsad – 396 155
Gujarat.
Fax : (0260) 3918500

Sub: Offer-cum-Allotment for plot in Dahej SEZ
Ref: Your application dated 10-03-2010

Dear Sir,

With reference to your application as above, we are happy to allot plot of land in Dahej Special Economic Zone and hereby issuing offer-cum-allotment letter.

The allotment of land is as per following details:

A.	Plot No. Z/103/G	:	Area: 51659.39 sq.mts. (Tentative)
B.	Rate	:	Rs. 990/- per sq.mt.
C.	Allotment Price	:	Rs. 5,11,42,796/-
D.	Contribution towards Gujarat PCPIR Welfare Society	:	Rs. 7,74,891/- @ Rs. 15/- per sq.mtr.
E.	Total : (C + D)	:	Rs. 5,19,17,687/-

1

1. **Procedure of obtaining possession:-**

On receipt of this letter, you will be required to send the offer amount as mentioned below. While sending the offer amount, please send the "Acceptance-cum-Undertaking of offer letter" which is also enclosed.

2. Please note that if the offer amount is not received by us within a period of 30 days from receipt of this letter, the offer will stand automatically cancelled, EMD forfeited and you will not be entitled to get the land at the offered price and will also lose priority and your application shall be automatically treated as closed.

3. You will be required to execute "Agreement" in the enclosed format as per DSL policy. It is not necessary for you to execute this agreement in our presence but you can execute it and send it by post.

4. **Offer amount:-**

(a) The offer price for plot area of 51659.39 sq. mtrs. @ Rs. 990/- sq.mt. works out to Rs. 5,11,42,796/-. You are required to make payment of Rs. 5,06,42,796/- after adjusting deposit of Rs. 5.00 lacs paid by you, being 100% of the total price of the plot.

(b) You are also required to make payment of contribution towards Gujarat PCPIR Welfare Society @ Rs. 15/- per sq.mt. which works out to Rs. 7,74,891/-

(c) You may make payment by DD / Cheque in favor of Dahej SEZ Ltd. payable at Gandhinagar.

5. The plot is offered in Part II area of Dahej SEZ where you will set up an industrial unit for manufacturing of Agrochemicals and Formulations. The sketch showing location of land is enclosed. The area of the plot is tentative and subject to survey and measurement. You will be required to pay the difference of land price as per confirmed plot area as per survey and measurement.

6. According to the policy of the Company, you are required to get the building plans approved within a period of 6 months from Dahej SEZ Development Committee and you shall commence the production within 3 years (plot having area more than 10,000 sq.mts.) from the date of allotment as also shall intimate the date of production to the company, failing which the Company is entitled to take back the possession of the plot unless extension is given by the Company.

7. Please note that DSL has considered water supply capacity of 33,000 litres per day/hect. and Effluent Disposal Pipeline (EDP) facility of 30,000 litres per day/hect. under the allotment price charged to you. Any higher requirement over and above this entitlement is to your account.

water supply
discharge
5.09 Hec
×30 KL
= 152 KL
= 168 KL

Area Sq.Mtrs.	Entitlement Water	EDP	Your requirement Water	EDP
1	2		3	
51659.39 (tentative)	0.17 MLD	0.15 MLD	0.70 MLD	0.50 MLD

Excess Quantity Water	EDP	Indicative Extra Rate Water	EDP	Indicative Extra Amount Payable Water	EDP
4		5		6	
0.53 MLD*	0.35 MLD	Rs.1.65 Crores Per MLD	Rs.1.19 Crores Per MLD	Rs. 0.87 Crore	Rs.0.41 Crore

The above extra charges are tentative subject to finalization.

You will undertake to pay the extra charge for the excess quantity of water and EDP as and when fixed by DSL for providing the same to you. The decision of the DSL shall be binding and that the company shall not raise any dispute legally or otherwise for additional charges.

8. If not submitted, you shall have to produce the project report and certificate indicating authorized, subscribed & paid up capital of the company, name of directors/share holders and their holding in the company.

9. Before acceptance of this offer-cum-allotment letter, you may inspect the plot and shall execute undertaking in the enclosed proforma to that effect.

10. **Special Conditions** :

Dahej SEZ Ltd. has allotted the Plot No. Z/103/G to you on your production of Letter of Approval No. Dahej SEZ/II/19/2009-10/1120 dated 26-04-2010 issued by the Development Commissioner, Government of India, Ministry of Commerce & Industry, 4th Floor, Fadia Chambers, Ashram Road, Ahmedabad-380 009.

(b) You shall strictly adhere to all the terms and conditions stipulated in the aforesaid Letter of Permission. You will also have to follow all provisions under the SEZ Act, 2005, SEZ Rules, 2006 and Gujarat SEZ Act, 2004.

(c) The detailed terms and conditions for allotment of land in Dahej SEZ along with the Application Form and Undertaking signed by you shall form a part of the Allotment Letter.

(d) You will obtain all environmental clearances concerning the project at your cost. You will be permitted to start construction of your building only on submission of certified copy of the environmental clearances. You will adhere to all the terms and conditions stipulated in the said environmental clearances.

(e) The rain water harvesting system shall be developed by the individual industry.

(f) You are required to set up all pollution mitigation machinery, including necessary treatment to gaseous, liquid or solid waste, as stipulated on the environment clearance.

(g) In case of failure to adhere to the terms and conditions of the environment clearance/s and consequent direction by Central Pollution Control Board or Gujarat Pollution Control Board or any other enforcement agency, DSL shall be competent to withhold water and/or power supply and also refuse to accept the effluents in the collection and disposal system.

(h) DSL does not propose to operate any Common Effluent Treatment Plant. Treatment of effluents will primarily be the responsibility of the allottee.

(i) DSL does not propose to operate any Solid Waste Disposal Site. You shall have to make your own arrangement for treatment and disposal of the solid waste at your own expense. For the purpose, you have the option to take the benefit of the Solid Waste Disposal Site developed at Ankleshwar, GIDC Estate.

(j) You will endeavour to recycle the liquid effluents to the extent possible to minimise the use of water. You will also make efforts to apply non-conventional sources of energy. You will endeavour for construction of green buildings. You will ensure maximum tree plantation.

(k) As a developer of the SEZ, DSL is required to submit various returns/information to the Development Commissioner, Govt. of India, Ministry of Commerce & Industry, 4th Floor, Fadia Chambers, Ashram Road, Ahmedabad-380 009. You will ensure submission of periodic information about your unit as may be required. The details would be communicated to you separately.

(l) DSL is in the process of developing various infrastructure in the SEZ which is expected to be completed by September 2010. Our planning is to put you into possession of surveyed and demarcated plot so that you can go ahead with securing various clearances for your project,

including environment clearances, prepare building plans, obtain approval from the Dahej SEZ Development Committee of the building plans in conformity with the General Development Control Regulations for SEZ published by Govt. of Gujarat, start construction of your factory buildings etc. We propose to put the internal infrastructure within the SEZ in place by the time your factory building is completed. DSL will not entertain any dispute about delay in provision of internal infrastructure within the SEZ.

(m) Capital cost of various infrastructure is included in the allotment price charged to you. However, you are expected to pay the service charges for the repairs and maintenance of the infrastructure, salary/ remuneration paid to the Development Commissioner for deployment of staff in the SEZ, expenditure incurred for maintenance of security personnel, office expenditure for SEZ staff etc. as may be fixed by the Dahej SEZ Development Committee. Bills for service charges depending on the area of the plot allotted to you will be issued on quarterly basis which shall be paid within 30 days failing which DSL will recover interest @ 13% per annum on the amount under default.

(n) You will be required to pay Non-Agricultural Assessment and such other revenue charges as may be levied by the Govt. of Gujarat. Similarly, at a later date, if the SEZ is declared as a 'Notified Area', you will pay the Notified Area Tax as may be fixed.

(o) DSL will execute in your favour lease-deed for an initial tenure of thirty years on 100% payment of land price and additional cost of infrastructure, if any. On expiry of the 30 years' tenure, the lease-deed shall be extended for a further period of 30 years per annum. Meanwhile, you are required to pay lease-rent @ Rs. 1/- per sq.mtr. per annum for the first tenure of 30 years modified from time to time. Lease- rent shall be payable every quarter along with service charges.

(p) As regards supply of water, the allottee shall abide by the conditions laid down in that behalf by the Company from time to time.

1. Plot - having area upto 10,000 sq.mtr. - 2 years.
2. Plot- having area more than 10,000 sq.mtr- 3 years or from the date of commencement of actual consumption of water whichever is earlier. On failure to pay the minimum charges, the purchaser shall be liable to the actions including Termination of Agreement and subsequent steps. Water Supply Rules framed by GIDC will apply mutantis mutandis.

(q) In case of power supply, the allottee may approach to Torrent Energy Ltd. (TEL) and follow procedure as under :-

(i) the allottee has to complete formalities of signing Agreement, payments of Security Deposit and complete wiring of electrical installation as per I.E. rules and submit the test report for wiring from licensed electrical contractor before release of power connection.

(ii) the allottee is liable to pay the charges for the power supply to the co-developer as per applicable rules and regulations.

(iii) the supply of voltage and source of power supply shall be decided by the Co-developer;

(iv) the allottee has to pay for cost of augmentation of sub-station on its pro-rata demand basis and at the rate and policy prevalent in the Company / Co-Developer;

(v) the allottee will not hold DSL responsible for delay in availability of power.

(r) For obtaining drainage connection in the effluent disposal pipeline, the allottee shall treat the effluent to the standards of NOC/consent of the Gujarat Pollution Control Board and the rules and regulations covered under (The Water Prevention and Control of Pollution Act, 1974) and (The Air Prevention and Control Pollution Act, 1981 and E.P. Act 1986) with all latest amendments and any other laws that may be in force from time to time. Failure on this part to comply with such provisions shall entitle the company to disconnect the drainage connection to the allottee. The company would also take any such action as required or as directed by Industries Commissioner under any statute or as directed by any statutory, competent authority. The allottee shall have to take Drainage Connection when intimated by the Company and shall have to pay all the necessary charges towards capital amount recovery and shall have to pay regular drainage cess as fixed by the Company from time to time. While taking drainage connection, the allottee shall have to comply with all regulations contained in Drainage Regulations 1990 of GIDC.

(s) pThe allottee shall engage local persons to the maximum extent possible. "A Local Person" means a person domiciled in Gujarat State for a minimum period of 15 years. So far as menial workers, such as watchman, labour, sweepers, drivers, etc. are concerned, preference should be given to land-losers (including their family members) or local villagers.

(t) It is in the interest of the allottee to acquaint himself about various provisions of Acts, Rules etc. Some of the important Acts/Rules are stated below.

Sr. No.	Particulars	Website
1.	SEZ Act, 2005 & SEZ Rules, 2006	sezindia.ic.in
2.	Gujarat SEZ Act, 2004 & GDCR for SEZ's.	ic.gujarat.gov.in
3.	GIDC Water Supply Rules and GIDC Drainage Rules	gidc.gov.in.

(u) In the unlikely event of any dispute, the competent court for jurisdiction purpose will be the designated court for SEZ's in Gujarat when notified. In the meanwhile, the jurisdiction shall be a competent court at Gandhinagar or Ahmedabad in Gujarat. Once again we welcome you to Dahej SEZ and request you to send us the forms of agreement duly executed along with offer acceptance/undertaking at your end at the earliest but not later than 30 days in order to enable us to hand over the possession of the plot to you.

Thanking you,

Yours faithfully,

R.J. Shah
Chief Executive Officer
Dahej SEZ Limited

Encl: 1. Sketch showing location of land
2. Acceptance Letter (Specimen Copy).
3. Agreement Form (Specimen Copy)

Copy f.w.cs. to:
1. Development Commissioner,
Dahej Special Economic Zone,
4th Floor, Fadia Chambers, Ashram Road, Ahmedabad-380 009
2. The Executive Engineer, GIDC, Bharuch
3. Assistant Manager (Inf.), DSL, Dahej Office

ANNEXURE-XV
COMMON MEE MEMEBERSHIP CERTIFICATE

BEIL INFRASTRUCTURE LIMITED
(Formely Known As Bharuch Enviro Infrastructure Limited)

28TH FEBRUARY, 2022

TO
COROMANDEL INTERNATIONAL LTD – DAHEJ
PLOT NO. Z-103/G,
DAHEJ SEZ - II,
TAL: VAGRA,
DAHEJ.

Sub: Membership Certificate for Common Multi Effect Evaporation Facility

Dear Sir,

We hereby certify that you have become member for the Common Multi Effect Evaporation facility of **BEIL INFRASTRUCTURE LIMITED** (FORMERLY KNOWN AS BHARUCH ENVIRO INFRASTRUCTURE LTD), at GIDC, Dahej Unit. You have booked **6000 KL/YEAR** quantity of Waste Water to treat in our Common MEE. Your Membership No. is **MEE/OTH/036.**

Waste will be accepted after submitting valid authorization of GPCB.

1) **Total capacity of CMEE Plant at Dahej:** 73000 KL/YEAR
2) **Consented Capacity of CMEE:** 73000 KL/YEAR
3) **Occupied Capacity of CMEE:**. 64223.400 KL/YEAR
4) **Spare Capacity of CMEE:** 08776.600 KL/YEAR

Thanking you,

Yours faithfully,
For, BEIL INFRASTRUCTURE LIMITED

AUTHORISED SIGNATORY

TSDF MEMBERSHIP CERTIFICATE

BEIL INFRASTRUCTURE LIMITED
(Formely Known As Bharuch Enviro Infrastructure Limited)

REF: BEIL/ANK/2022

26TH FEBRUARY, 2022

To,
COROMANDEL INTERNATIONAL LTD – DAHEJ
PLOT NO. Z-103/G,
DAHEJ SEZ - II,
TAL: VAGRA, DAHEJ.

Sub: Membership Certificate for Common Solid Waste Disposal Facility

Dear Sir,

We hereby certify that you have become member of the common Solid/Hazardous Waste Disposal Facility developed by For, BEIL INFRASTRUCTURE LIMITED (Formerly Known as Bharuch Enviro Infrastructure Ltd)., at GIDC, DAHEJ. You have booked solid waste quantity **1000 MT/ Year** (Original Booked Quantity **200 MT** + Increased Quantity **800 MT**). Your Membership No. **is OTH/707.**

1) Total TSDF Capacity of BEIL Dahej: 1900000 MT
2) Total Consented Capacity: 1900000 MT
3) Total Occupied Capacity: 0737129.63 MT
4) Spare Capacity: 1162870.37 MT

Thanking you,

Yours faithfully,
For, BEIL Infrastructure Limited
(Formerly Known as Bharuch Enviro Infrastructure Ltd)

AUTHORISED SIGNATORY

SEPPL CERTIFICATE

DETOX INDIA
operated by VEOLIA

"Certificate"

Certificate No.:100684

To Whomsoever it may concern

This is to certify that

COROMANDEL INTERNATIONAL LTD.

PLOT NO. Z/103/G,
DAHEJ SEZ-II,
TAL: VAGRA,
BHARUCH

is a valid member of

SAFE ENVIRO PRIVATE LIMITED

SEPL - Magnad

for

Integrated Common Hazardous Waste Management Facility

This membership is valid for a period of

05 Years

Date of Issue :14-07-2021
Date of Expiration : 14-07-2026
Place of Issue : Surat

For, Safe Enviro Private Limited

Director

SUBJECT TO SURAT JURISDICTION

Safe Enviro Private Limited
Corporate Office : Detox House, Opp. Gujarat Samachar Press, Udhna Darwaja, Ring Road, Surat-395 002 (Guj.) INDIA
Ph. : +91 261 2351248, 2346181, E-mail : sepl.magnad@gmail.com | CIN : U51101GJ2015PTC083237

DETOX GROUP

Saurashtra Enviro Projects Pvt. Ltd.

Integrated Common Hazardous Waste Management Facility

Certificate

Certificate No : 1200000856

To Whomsoever it may concern

This is to certify that

COROMANDEL INTERNATIONAL LIMITED

PLOT NO. Z/103/G
DAHEJ SEZ-II,
TAL;VAGRA,

BHARUCH

is a valid member of

SAURASHTRA ENVIRO PROJECTS PVT. LTD.

for Integrated Common Hazardous Waste Management Facility.

This membership is valid for a period of

5 Years

Date of issue : 24.02.2017
Date of expiration : 23.02.2022
Place of issue : Surat

For, Saurashtra Enviro Projects Pvt. Ltd.

Director

SUBJECT TO SURAT JURISDICTION

Corporate Office : Detox House, Opp. Gujarat Samachar Press, Udhna Darwaja, Ring Road, Surat - 395 002. (Guj.)
p. +91 261 2351248, 2346181 f. +91 261 2354068
e. info@sepplindia.com w. www.detoxgroup.in
CIN :- U51100GJ2006PTC047689

ANNEXURE-XVI
COPY OF EXISTING EC & ITS COMPLIANCE

①

F. No. J-11011/425/2010- IA II (I)
Government of India
Ministry of Environment and Forests
(I.A. Division)

Shiraz
A. Kekunaya
N M Kulkarni
Mr Sitaram CIL
Mr. Surendra Mishra.

Paryavaran Bhawan
CGO Complex, Lodhi Road
New Delhi – 110 003

E-mail : aditya.narayan@nic.in
Telefax : 011: 2436 0549
Dated 16th October, 2012

To,

Shri Rajesh Sharma, Director
M/s Sabero Organics Gujarat Limited.
Plot No. 2102, GIDC, Sarigam
District Valsad – 396155, Gujarat

E-mail: mails@sabero.com ; srb.nair@sabero.com ; Fax No.: 0260-3918500.

Subject: Pesticide & Pesticide Intermediate Plant (4108 MTPM) at Plot No. Z/103/G, SEZ-2, Dahej, District Bharuch, Gujarat by M/s Sabero Organic Gujarat Ltd– Environmental Clearance reg.

Ref. : Your letter no. nil dated 26th April, 2011.

Sir,

Kindly refer your letter dated 26th April, 2011 alongwith project documents including Form I, Terms of References, Pre-feasibility Report, EIA/EMP Report and subsequent submission of additional information vide letters dated 30th June, 2011, 3rd January, 2012 and 13th February, 2012 regarding above mentioned project.

2.0 The Ministry of Environment and Forests has examined the application. It is noted that proposal is for setting up of Pesticide & Pesticide Intermediate Plant (4108 MTPM) at Plot No. Z/103/G, SEZ-2, Dahej, District Bharuch, Gujarat by M/s Sabero Organic Gujarat Ltd. Total plot area is 51,653.7 m^2. Narmada River and Arabian Sea is located at 2 and 1.5 km respectively. Total cost of the project is Rs 6151.73 Lakhs. Dahej Reserve Forest (2.92 Km), Luvara RF (5.20 Km) and Ratnapur, Kariya, Rampur, Asnavi RFs are located within 10 Km. Unit will be operated for 330 days. Following products will be manufactured :

S. N.	Products	Production Capacity		Remarks
		MTPA	MTPM	
	GROUP A			
1	m-Phenoxy Benzaldehyde	2000	167	Either of the products should be manufactured and the total production of this group should not exceed 6000 MTPA
2	Cypermethric Acid Chloride	2000	167	
3	Lamda Cyhalothric Acid Chloride	150	13	
4	Delta Methric Acid Chloride	240	20	
5	Cypermethrin (T) & Beta, Zeta, Theta etc Isomers	6000	500	
6	Alphamethrin (T)	180	15	
7	Deltamethrin (T)	180	15	
8	Permethrin (T)	600	50	

9	Lamda Cyhalothrin (T)	400	33	
10	Bifenthrin (T)	300	25	
	MAX. PRODUCTION OF GROUP A	**6000**	**500**	
	GROUP B			
1	MMP	1200	100	Either of the products should be manufactured and the total production of this group should not exceed 15000 MTPA
2	Profenofos	10000	833	
3	DETC	2000	167	
4	DMTC	2000	167	
5	DMTC Amide	15000	1250	
6	TCAC	5000	417	
7	Chlorpyriphos	3000	250	
	MAX. PRODUCTION OF GROUP B	**15000**	**1250**	
	GROUP C			
1	PMIDA	2000	167	Either of the products should be manufactured and the total production of this group should not exceed 5000 MTPA
2	Glyphosate (T)	4000	333	
3	Triclopyr Butotyl Ester	1000	83	
4	Bispyribac Sodium	500	42	
5	Pichloram	1000	83	
6	Fluroxypyr	1500	125	
7	Imazethapyr	1500	125	
8	Glufosinate Ammonia	1000	83	
9	Ethoxysulfuron	5000	417	
	MAX. PRODUCTION OF GROUP C	**5000**	**417**	
	GROUP D			
1	Mancozeb Tech.	15000	1250	Either of the products should be manufactured and the total production of this group should not exceed 15000 MTPA
2	Propineb	2000	167	
3	Azoxystrobin	2000	167	
4	Tebuconazol	5000	417	
5	Wettable Sulphur	5000	417	
6	Chlorothalonil	1000	83	
7	Kresoxim-methyl	2000	167	
8	Picoxystrobin	2000	167	
9	Trifloxystrobin	2000	167	
	MAX. PRODUCTION OF GROUP D	**15000**	**1250**	
	GROUP E			
1	Imidacloprid	1000	83	Either of the products should be manufactured and the total production of this group should not
2	Acetamiprid	1000	83	
3	2-Chloro-5- Chloro Methyl Pyridine	8300	692	
4	Nitro Imino Imidazolidine	600	50	
5	Ethyl-N-Cynoethanimideate	1000	83	
6	Cartap	1000	83	

(3)

7	Thiamethoxam	1500	125	exceed 8300 MTPA
8	Clothianidin	2000	167	
9	Emamectin Benzoate	2000	167	
10	Indoxacarb	3000	250	
	MAX. PRODUCTION OF GROUP E	**8300**	**692**	
	TOTAL PRODUCTION OF ALL GROUPS	**49300**	**4108**	

S. N.	By products	Production capacity, (MTPM)
1	HCl Soln. (30%)	3210
2	HBr Soln. (30%)	869
3	Na_2SO_3 soln. (20%)	3465
4	Na_2SO_4 soln. (20%)	521
5	$AlCl_3$ soln.	683
6	Sodium chloride salt	6
7	KBr salt	164
8	$CuCl_2$ soln.	83
9	NH_4Cl	508
10	Bromobenzene	13
11	NaBr soln.	1091

3.0 Stack of adequate height will be provided to natural gas fired boiler and thermic fluid heater. Adequate scrubbing system will be provided to the process vents to control process emissions viz. SO_2, HBr, HCl, H_2S and Cl_2. In order to control odour, outlet of process vents will be connected to the incinerator. Total fresh water requirement from GIDC water supply will be 869 m^3/day. Industrial wastewater generation will be 861 m^3/day and segregated into high COD/organic waste, high COD/TDS and low COD/TDS effluent streams. High COD/organic waste/ toxic aqueous effluent will be incinerated. High COD/TDS effluent stream will be passed through stripper and evaporated through MEE. Low COD/TDS effluent stream will be treated in effluent treatment plant (ETP) and treated effluent will be discharged to deep sea through a GIDC conveyance pipeline after conforming to the standards prescribed for the effluent discharge and obtaining permission from the GPCB. Incinerator will be designed as per CPCB guidelines. Incinerated ash, ETP sludge and MEE residue salt will be sent to treatment storage disposal facility (TSDF) for hazardous waste. Organic process waste and spent carbon will be incinerated. Waste oil/spent oil will be sold to registered recyclers/re-processors.

4.0 Public hearing was exempted as per section 7 (i), (iii) Stage (3), Para (i)(b) of EIA Notification, 2006.

5.0 All units producing technical grade pesticides are listed at S.N. 5(b) under category 'A' and appraised at Central level.

6.0 The proposal was considered by the Expert Appraisal Committee (Industry-2) in its 15th 25th, 28th and 32nd meetings held during 22nd-23rd October, 2010, 28th–30th July, 2011, 20th-21st October, 2011 and 16th–17th February, 2012 respectively. The Committee recommended the proposal for environmental clearance.

7.0 Based on the information submitted by the project proponent, the Ministry of Environment and Forests hereby accords environmental clearance to above project under the provisions of EIA Notification dated 14th September 2006, subject to the compliance of the following Specific and General Conditions:

A. **SPECIFIC CONDITIONS:**

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

ii) Recommendations of the State Forest Department shall be obtained regarding likely impact of the proposed plant on the surrounding reserved forests viz. Dahej Reserve Forest (2.92 Km), Luvara RF (5.20 Km) and Ratnapur, Kariya, Rampur, Asnavi RFs and implemented.

iii) Stack of adequate height shall be provided to natural gas fired boiler and thermic fluid heater. Online oxygen analyzer shall be installed to ensure air/fuel ratio and combustion efficiency.

iv) Two stage/three stage alkali scrubber shall be provided to process vent to control SO_2, HBr, HCl, H_2S and Cl_2 emissions. The scrubbing media shall be sent to effluent treatment plant (ETP) for treatment. Efficiency of air pollution control device shall be monitored regularly and maintained properly. At no time, the emission levels shall go beyond the prescribed standards. The system shall be interlocked with the pollution control equipments so that in case of any increase in pollutants beyond permissible limits, plant shall be automatically stopped. Stack monitoring shall be done regularly and report shall be submitted to Gujarat Pollution Control Board (HSPCB) and the Ministry's regional office at Bhopal.

v) In order to control odour, outlet of process vents shall be connected to the incinerator.

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

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

viii) For further control of fugitive emissions, following steps shall be followed :

i. Closed handling system shall be provided for chemicals.

ii. Reflux condenser shall be provided over reactor.

iii. System of leak detection and repair of pump/pipeline based on preventive maintenance.

iv. The acids shall be taken from storage tanks to reactors through closed pipeline. Storage tanks shall be vented through trap receiver and condenser operated on chilled water.

v. Cathodic protection shall be provided to the underground solvent storage tanks.

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

x) Continuous monitoring system for VOCs and chlorine, shall be installed at all important places/areas. Effective measures shall be taken immediately, when monitoring results indicate above the permissible limits. All necessary steps shall be taken for monitoring of HCl and HBr in the proposed plant.

xi) Alarm for chlorine leakage if any in the liquid chlorine storage area shall be provided alongwith automatic start of the scrubbing system.

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

xiii) The company shall upload the status of compliance of the stipulated environmental clearance conditions, including results of monitored data on its website and shall update the same periodically. It shall simultaneously be sent to the Regional office of MOEF, the respective Zonal office of CPCB and the HSPCB. The levels of PM_{10}, SO_2, NO_X, VOCs, Cl_2, HCl, HBr, CO and HC (Methane and Non-methane) in ambient air and emissions from the stacks shall be monitored and displayed at a convenient location near the main gate of the company and at important public places.

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

xv) Solvent management shall be carried out as follows :

i. Reactor shall be connected to chilled brine condenser system

ii. Reactor and solvent handling pump shall have mechanical seals to prevent leakages.

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

iv. Solvents shall be stored in a separate space specified with all safety measures.

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

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

xvi) Total water requirement from GIDC water supply shall not exceed 869 m^3/day and prior permission shall be obtained from the concerned Authority. No ground water shall be used.

xvii) As proposed, industrial effluent generation shall not exceed 861 m^3/day. Effluent shall be segregated into High COD, High TDS and low COD/TDS effluent streams. High COD effluent /mother liquor should be incinerated. High TDS effluent shall be treated through stripper followed by MEE. Low COD/TDS effluent shall be treated in ETP. Treated effluent shall be discharged to deep sea through a separate conveyance pipeline of GIDC after conforming to the standards prescribed for the effluent discharge and obtaining permission from the GPCB. No process effluent shall be discharged in and around the project site. Water quality of treated effluent shall be monitored regularly and monitoring report shall be submitted to the GPCB. Domestic wastewater should be treated in STP. Water quality of treated effluent shall be monitored regularly.

xviii) Treated effluent shall be passed through guard pond. Online continuous pH meter, TOC analyzer and flow meter shall be installed to monitor the treated water quality.

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

xx) Incinerator comprising primary and secondary chamber shall be designed as per CPCB guidelines. SO_2, NOx, HCl and CO emissions shall be monitored in the stack regularly.

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

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

taken for fire fighting facilities in case of emergency. Membership of TSDF for hazardous waste disposal shall be obtained.

xxiii) As proposed, ETP sludge, incineration ash and evaporation residue shall be sent to TSDF site. High calorific value waste such as spent organic shall be sent to cement factory/incinerated.

xxiv) The Company shall strictly comply with the rules and guidelines under Manufacture, Storage and Import of Hazardous Chemicals (MSIHC) Rules, 11989 *as* amended in October, 1994 and January, 2000. All Transportation of Hazardous Chemicals shall be *as per* the Motor Vehicle Act (MVA), 1989.

xxv) The company shall undertake following waste minimization measures :-

a. Metering and control of quantities of active ingredients to minimize waste.

b. Reuse of by-products from the process as raw materials or as raw material substitutes in other processes.

c. Use of automated filling to minimize spillage.

d. Use of Close Feed system into batch reactors.

e. Venting equipment through vapour recovery system.

f. Use of high pressure hoses for equipment clearing to reduce wastewater generation.

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

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

xxviii) Green belt shall be developed at least in 33 % of the plant area in and around the plant premises to mitigate the effects of fugitive emissions all around the plant as per the CPCB guidelines in consultation with DFO. Thick greenbelt with suitable plant species shall be developed around the proposed pesticide unit to mitigate the odour problem. Selection of plant species shall be as per the CPCB guidelines.

xxix) The company shall make the arrangement for protection of possible fire and explosion hazards during manufacturing process in material handling.

xxx) Provision shall be made for the housing for the construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile sewage treatment plant, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structure to be removed after the completion of the project. All the construction wastes shall be managed so that there is no impact on the surrounding environment.

B. GENERAL CONDITIONS:

i. The project authorities shall strictly adhere to the stipulations made by the Gujarat Pollution Control Board.

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

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

(7)

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

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

vi. During transfer of materials, spillages shall be avoided and garland drains be constructed to avoid mixing of accidental spillages with domestic wastewater and storm water drains.

vii. Usage of Personnel Protection Equipments by all employees/ workers shall be ensured.

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

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

x. The company shall undertake CSR activities and all relevant measures for improving the socio--economic conditions of the surrounding area.

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

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

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

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

xv. The project proponent shall also submit six monthly reports on the status of compliance of the stipulated Environmental Clearance conditions including results of monitored data (both in hard copies as well as by e-mail) to the respective Regional Office of MoEF, the respective Zonal Office of CPCB and the Gujarat Pollution Control Board. A copy of Environmental Clearance and six monthly compliance status report shall be posted on the website of the company.

xvi. The environmental statement for each financial year ending 31st March in Form-V as is mandated shall be submitted to the Gujarat Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the

website of the company along with the status of compliance of environmental clearance conditions and shall also be sent to the Bhopal Regional Offices of MoEF by e-mail.

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

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

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

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

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

(A.N. Singh)
Dy. Director (S)

Copy to :-

1. The Principal Secretary, Forests & Environment Department, Government of Gujarat, Sachivalaya, 8th Floor, Gandhi Nagar - 382 010, Gujarat.
2. The Chief Conservator of Forests (Western Zone), Ministry of Environment & Forests, Regional Office, E-5, Arera Colony, Link Road -3, Bhopal -462 016, M.P.
3. The Chairman, Central Pollution Control Board Parivesh Bhavan, CBD-cum-Office Complex, East Arjun Nagar, New Delhi - 110 032.
4. The Chairman, Gujarat State Pollution Control Board, Paryavaran Bhawan, Sector 10 A, Gandhi Nagar-382 043, Gujarat.
5. Monitoring Cell, Ministry of Environment and Forests, Paryavaran Bhavan, CGO Complex, New Delhi.
6. Adviser, IA II(I), Ministry of Environment and Forests, Paryavaran Bhavan, CGO Complex, New Delhi.
7. Guard File/Monitoring File/Record File.

(A.N. Singh)
Dy. Director (S)

EC EXTENSION LETTER & NAME CHANGE OF SABERO TO COROMANDEL

F. No. J-11011/425/2010-IA.II (I)
Government of India
Ministry of Environment, Forest & Climate Change
Impact Assessment Division
***

Indira Paryavaran Bhavan,
Vayu Wing, 3rd Floor, Aliganj,
Jor Bagh Road, New Delhi-110 003

Dated: 30th June, 2020

To,

M/s Coromandel International Limited
Plot No.Z/103/G, SEZ-2, Dahej,
District **Bharuch** (Gujarat)

Sub: Pesticide & Pesticide Intermediate Plant (4108 MTPM) located at Plot No.Z/103/G, SEZ-2, Dahej, District Bharuch (Gujarat) - Transfer of environmental clearance - reg.

Sir,

This has reference to your proposal for transfer of environmental clearance dated 16th October, 2012 to the above project, from M/s. Sabero Organic Gujarat Ltd. to M/s. Coromandel International Limited.

2. The Ministry has granted environmental clearance to the project for Pesticide & Pesticide Intermediate Plant (4108 MTPM) located at Plot No.Z/103/G, SEZ-2, Dahej, District Bharuch (Gujarat) in favour of M/s. Sabero Organic Gujarat Ltd vide letter dated 16th October, 2012.

3. It has been informed that that the name of company has been changed from M/s Sabero Organic Gujarat Ltd to M/s Coromandel International Limited. The certificate of incorporation dated 4th January, 2014, obtained from Registrar of Companies, Ministry of Corporate affairs. Thus necessitating transfer of all requisite approvals in the new name of the company.

4. M/s Sabero Organic Gujarat Ltd has given No Objection Certificate to change the name of the unit from M/s Sabero Organic Gujarat Ltd to M/s Coromandel International Limited. Also, M/s Coromandel International Limited has submitted an affidavit to abide by the terms and conditions stipulated in the environmental clearance dated 16th October, 2012 issued in the name of M/s Sabero Organic Gujarat Ltd.

5. As per the relevant provisions of the EIA Notification, 2006, the environmental clearance to the project for Pesticide & Pesticide Intermediate Plant (4108 MTPM) located at Plot No.Z/103/G, SEZ-2, Dahej, District Bharuch (Gujarat) granted by the Ministry vide letter dated 16th October, 2012 is hereby transferred ***from*** M/s Sabero Organic Gujarat Ltd to M/s Coromandel International Limited on the same terms and conditions under which prior environmental clearance was granted.

6. This issues with approval of the competent authority.

(Dr R B Lal)
Additional Director/ Scientist E

(डा. आर. बी. लाल)
(Dr. R. B. LAL)
वैज्ञानिक 'ई'/Scientist 'E'
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
Min.of Environment,Forest and Climate Change
भारत सरकार, नई दिल्ली
Govt. of India, New Delhi

Copy to: -

(i) The Dy. Director General (Western Zone), MoEF&CC, Regional Office, E-5, Arera Colony, Link Road -3, Ravishankar Nagar, **Bhopal** - 462 016 (MP)

(ii) The Member Secretary, Gujarat Pollution Control Board, Paryavaran Bhawan, Sector 10 A, **Gandhi Nagar**-382 043 (Gujarat)

(iii) Guard File/Monitoring File/Website/Record File

(Dr R B Lal)
Additional Director/ Scientist E

EC EXTENSION LETTER VALID UPTO 16/10/2022

F. No. J-11011/425/2010-IA.II (I)
Government of India
Ministry of Environment, Forest & Climate Change
Impact Assessment Division
***

Indira Paryavaran Bhavan,
Vayu Wing, 3rd Floor, Aliganj,
Jor Bagh Road, New Delhi-110 003

Dated: 30th June, 2020

To,

M/s Coromandel International Limited
Plot No.Z/103/G, SEZ-2, Dahej,
District **Bharuch** (Gujarat)

Sub: Pesticide & Pesticide Intermediate Plant (4108 MTPM) by M/s Coromandel International Limited located at Plot No.Z/103/G, SEZ-2, Dahej, District Bharuch (Gujarat) - Extension of validity of Environmental Clearance - reg.

Sir,

This refers to your online proposal No. IA/GJ/IND2/116626/2019 for extension of validity of the environmental clearance dated 16th October, 2012 granted by the Ministry for Pesticide & Pesticide Intermediate Plant (4108 MTPM) at Plot No.Z/103/G, SEZ-2, Dahej, District Bharuch (Gujarat).

2. The proposal was considered by the Expert Appraisal Committee (Industry-2) in the Ministry in its meeting held on 13-15 April, 2020. The Committee has **recommended** for extension of validity of the EC dated 16th October, 2012 for a period of three years, i.e. till 16th October, 2022, to complete the work as per scope of the project.

3. Based on recommendations of the EAC, the Ministry of Environment, Forest and Climate Change hereby accords approval for extension of validity of the environmental clearance dated 16th October, 2012 for a period of three years i.e. up to 16th October, 2022.

4. All other terms and conditions stipulated in the environmental clearance dated 16th October, 2022 shall remain unchanged.

5. This issues with the approval of the Competent Authority.

(Dr. R. B. Lal)
Additional Director/ Scientist E

(Dr. R. B. LAL)
वैज्ञानिक 'ई'/Scientist 'E'
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
Min.of Environment,Forest and Climate Change
भारत सरकार, नई दिल्ली
Govt. of India, New Delhi

Copy to: -

1. The Dy. Director General (Western Zone), MoEF&CC, Regional Office, E-5, Arera Colony, Link Road -3, Ravishankar Nagar, **Bhopal** - 462 016 (MP)
2. The Member Secretary, Gujarat Pollution Control Board, Paryavaran Bhawan, Sector 10 A, **Gandhi Nagar**-382 043 (Gujarat)
3. Guard File/Monitoring File/Website/Record File

(Dr. R. B. Lal)
Additional Director/ Scientist E

CERTIFIED EC COMPLIANCE

SPEED POST

भारत सरकार
GOVERNMENT OF INDIA
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
MINISTRY OF ENVIRONMENT, FOREST & CLIMATE CHANGE

सत्यमेव जयते

एकीकृत क्षेत्रीय कार्यालय,
Integrated Regional Office,
"केन्द्रीय पर्यावरण भवन"
"Kendriya Paryavaran Bhavan"
लिन्क रोड नं0–3/Link Road No. 3
ई–5,रविशंकर नगर/E-5.Ravishankar Nagar,
दूरभाष/Phone: 0755-2426611, 2466525,
फैक्स/Fax: 0755-2463102
भोपाल (म0प्र0)/Bhopal(M.P.)-462016
अणुडाक/e-mail: rowz.bpl-mef@nic.in

File No.: 5-5/2013(Env) /217 Dated: 01/11/2021

To

The Director, Monitoring Cell,
Ministry of Environment, Forest and Climate Change,
Indira Paryavaran Bhawan,
Jorbagh Road, Aliganj, New Delhi-110003

Sub : Pesticide & Pesticide Intermediate Plant (4108 MTPM) at Plot No. Z/103/G, SEZ-2, Dahej, District Bharuch, Gujarat by M/s. Coromandel International Ltd. (Formerly: M/s Sabero Organic Gujarat Ltd.) - Environmental Clearance reg.

Ref: Ministry's letter No. J-11011/425/2010-IA.II (I) dated 16.10.2012

महोदय,

उपरोक्त संदर्भित पत्र के संदर्भ में उक्त परियोजनाओं को पर्यावरणीय दृष्टिकोण से अनुमति देते समय अनुबद्ध शर्तों के अनुपालन एवं certification of complianceके निर्देशानुसार, पर्यावरणीय अनुमति दिनांक 16.10.2012 का अनुवीक्षण प्रतिवेदन (मॉनिटरिंग रिपोर्ट) एतद् द्वारा संलग्न कर प्रेषित है। यह सक्षम प्राधिकारी द्वारा अनुमोदित है।

भवदीय

संलग्न: उपरोक्तानुसार

(डॉ. एस. के. लाल)
वैज्ञानिक 'सी'

Copy to:

1. The Joint Secretary, Ministry of Environment, Forest and Climate Change Indira Paryavaran Bhawan, Jorbagh Road, Aliganj, New Delhi – 110003-for kind information please.
2. Mr. Nischal Tawar, GM, Unit Head,M/s. Coromandel International Ltd. Plot No. Z/103/G, SEZ-2, Dahej, District Bharuch, Gujarat -for kind information please.

(डॉ. एस. के. लाल)
वैज्ञानिक 'सी'

Monitoring the Implementation of Environmental Safeguards
Ministry of Environment, Forest & Climate Change
Integrated Regional Office, Bhopal
MONITORING REPORT

PART – I

DATA SHEET

Sr. No.	Particular	Reply
1	Project type: Pesticides Manufacturing Plant	RED / LARGE / Pesticides (technical) (excluding formulation) / In Operation
2	Name of the Project	M/s. Coromandel International Limited Dahej Unit
3	Clearance letter (s)/OM No. & date	EC granted vide letter no. J-11011/425/2010-IA-II (I) dated: 16 October, 2012
4	Location: a) District (s) b) State (s) c) Location Latitude/Longitude	PLOT NO:Z-103/G, SEZ Dahej, SEZDahej, Dahej - 392130 DIST : Bharuch , TAL : Vagra a) Bharuch, b) Gujarat, The longitude and latitude of the projects are 21°40'49.4616"N & 72°33'00.0396"E
5	Address for Correspondence a) Address for the concerned project Partner (with pin code & telephone/telex/fax numbers) b) Address for executive project engineer/manager	M/s. Coromandel International Limited Dahej Unit PLOT NO:Z-103/G, SEZ Dahej, SEZDahej, Dahej - 392130 DIST : Bharuch , TAL : Vagra a) NA b-1) Mr. Nischal Tawar GM Unit Head M/s. Coromandel International Limited Dahej Unit PLOT NO:Z-103/G, SEZ Dahej, SEZDahej, Dahej - 392130 DIST : Bharuch , TAL : Vagra. b-2) Mr.Prathmesh bhatt AGM SHE M/s. Coromandel International Limited Dahej Unit PLOT NO:Z-103/G, SEZ Dahej, SEZDahej, Dahej - 392130 DIST : Bharuch , TAL : Vagra.
6	Salient features a) Of the project b) Of the EMP	a) Unit has not Started Construction Activity for the existing EC. b) Budget allocated by proponent for environmental management plan (EMP) is as under. 1. Capital cost towards Pollution control measures: Rs.13,96,32,467 Cr.
7	Breakup of the project area a) Submergence area: forest & non-forest b) Others	a) No forest land is acquired. So there is no submerging area of forest & non-forest. b) Break up of project area is given below: Total Plot Area: 51639 Sq.m Total Built Area:24355.77 Sq.m Total Open Plot Area & Road: 36189.39 Sq.m Total Green Belt Area: 6790 Sq.m
8	Breakup of the project affected population with enumeration of those loosing house/dwelling units only agricultural land only both dwelling units & agricultural land & landless	Company acquired the land from GIDC, so No housing dwelling units were affected. a) Land Looser were not SC, ST/Adivasi

Summary note:

i. **Implementation of conditions:**

Out of total 52 conditions, it may be seen that 14 are complied, 16 are being complied, 18 are agreed to comply, 01 is compliance in progress, 2 are partly complied and 01 not applicable. PP assured to ensure compliance of the conditions and agreed to follow the stipulation. These have been explained in the foregoing compliance report against each of the conditions, and the PP needs to take necessary and time bound action for early compliance in respect of the relevant conditions. A time targeted action taken report shall be furnished to MOEFCC, IRO in this regard within 30 days of receipt of the said letter.

ii. **Review w.r.f to MoEF&CC's letter dated 16 October, 2012:**

PP proposed for Expansion of Pesticide Specific Intermediates with capacity enhancement in Group-D products (as listed below) from the existing capacity, 1250 MTPM and 15000MTPA to 5586MTPM and 67020 MTPA, Hence, proposed for enhancement in total production from 49300 MTPA to 101328 MTPA. Further, also proposed for enhancement in production capacity of byproduct Na2SO4- 99% i.e from 521 MTPA to 1000MTPA in existing Premises at Plot No. Z/103/G, SEZ-2, Dahej, Dist: Bharuch, Gujarat of M/s. Coromandel International Limited.

	GROUP D	MTPM	MTPA
1	Mancozeb Tech.	2918	35020
2	Propineb	250	3000
3	Cyproconazole	250	3000
4	Metiram	583	7000
	TOTAL PRODUCTION OF GROUP D	**5586**	**67020**

Further, PP informed that the unit is preparing TOR Application for Getting TOR from MOEF&CC, New Delhi, and preparing EIA report. As and when unit obtained the EC compliance, unit will apply for the EC application. In accordance which, certified EC Compliance report was sought. The certified compliance report has been prepared on the basis of site visit on 24.07.2021.

iii. **Court cases and show cause/closure notices:**

PP submitted that there is no any court case against the project. Further, PP stated that 3 Show Cause issued by GPCB during last 3 years to the PP. Show cause notice received from GPCB are already complied with.

(Aswathy Bhaskaran)
Research Officer

(Dr. S. K. Lal)
Dy. Director/Scientist-C

Action taken Plan for Partially Complied Conditions

<table>
<tr><th>No.</th><th>Brief Specification</th><th>Compliance Report</th><th>Action Plan</th></tr>
<tr><td>A</td><td>SPECIFIC CONDITIONS:</td><td></td><td></td></tr>
<tr><td>xiii</td><td>The company shall embark sufficient funds for recurring cost per annum to implement the conditions stipulated by ministry of environment and forest as well as state government along with implementation schedule for all the condition stipulated herein. The funds so embarked for environment management/ pollution control measures shall not be diverted for any other purpose.</td><td>Partially complied and will be complied.
<table>
<tr><th>Sr. No.</th><th>Plant / Instrument</th><th>Cost Breakup</th></tr>
<tr><td>1.</td><td>ETP including land cost</td><td>42351345</td></tr>
<tr><td>2.</td><td>MEE</td><td>55736672</td></tr>
<tr><td>3.</td><td>Scrubbers – All plant</td><td>9015437</td></tr>
<tr><td>4.</td><td>TOC Analyzer</td><td>1463168</td></tr>
<tr><td>5.</td><td>Multi Cyclone including ESP</td><td>24751474</td></tr>
<tr><td>6.</td><td>CEMS online measuring system</td><td>6314371</td></tr>
</table></td><td>CEMS system will be install in this financial year</td></tr>
<tr><td>xv</td><td>The project proponent shall also submit six monthly reports on the</td><td>Partially complied and will be complied.
We have obtained the Environmental Clearance of our project on 16/10/2012. Environmental Clearance of project is converted in Consent to Operate. Now company will</td><td>Inprogress
Six monthly compliance report submitted</td></tr>
</table>

	status of compliance of the stipulated Environmental Clearance conditions including results of monitored data (both in hard copies as well s by e-mail) to the respective Regional Office of MoEF, the respective Zonal Office of CPCB and the Gujarat Pollution Control Board. A copy of Environmental Clearance and six monthly compliance status reports shall be posted on the website of the company.	submit EC Compliance report to MoEF&CC, Bhopal on regular basis.	
xvi	The environmental statement for each financial year ending 31st March in Form-V as is mandated shall be submitted to the Gujarat Pollution	Complied Environment statement for the financial year ending on 31st March 2020 in **Form-V Submitted.**	**Inprogress** Environment statement for the financial year ending on 31st March 2020 in **Form-V Submitted to PCB.**

	Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of environment clearance conditions and shall also be sent to the Bhopal Regional Offices of MoEF by E-Mail.	 Coromandel FUTURE POSITIVE CIN : L24120TG1961PLC000892 PCB ID: 29307 28th Jun 2021 To, Unit Head, Bharuch region, Gujarat Pollution Control Board, Sector 10-A, Paryavaran Bhavan, Gandhinagar, Gujarat, 382 010. Respected Sir, **Sub: Submission of Environmental Statement in Form-V for the year 2020-21.** We are pleased to enclose herewith Environmental Statement in Form-V for the year 2020-21 along with all annexures. Thanking you, Yours faithfully, **For COROMANDEL INTERNATIONAL LIMITED, DAHEJ** N G Tawar **Nischalsinh Tawar.** **Unit Head** Encl: a/a **Coromandel International Limited** **Crop Protecion Division** Plot No.Z-103/3, Dahej SEZ II, Po. Lakhigam, Ta. Vagra, Dist Bharuch-392130. Gujarat, India T : (02641) 291110 **Registered Office** : Coromandel House' 1-2-10, Sardar Patel Road, Secunderabad 500 003. Telangana, India. T : +91 40 27842034 F : +91 40 27844117 E : mail@coromandel.murugappa.com W : www.coromandel.biz murugappa **Please refer Annexure-6**	

ANNEXURE-XVII
COPY OF VALID CCA

GUJARAT POLLUTION CONTROL BOARD
PARYAVARAN BHAVAN
Sector-10-A, **Gandhinagar** 382 010
Phone : (079) 23222425
(079) 23232152
Fax : (079) 23232156
Website : www.gpcb.gov.in

BY R.P.A.D

CONSOLIDATED CONSENT & AUTHORIZATION (CC&A)
CCA (AWH-105105)

NO: GPCB/BRCH-B/CTE–39(6)/ID-29307/555278 **Date:** 19/2/2020

To,
M/s. Coromandel International Limited.
PLOT.NO:- Z-103/G,
GIDC DAHEJ,
TAL: VAGRA, DIST: BHARUCH.

SUB: Amendment to Consolidated Consent & Authorization (CC&A) under various Environmental Acts Rules.

REF: 1) Previously issued CC& A issued order no. AWH-94543 vide letter no: **GPCB/BRCH-B/CCA–39(4)/ID-29307/478317, Dated: 10/12/2018** under various Environmental Acts/Rules.
2) Your application for CCA Amendment Inward no: 162989 dated: 05/09/2019.

Sir,

This has reference to the CCA issued vide letter no: **GPCB/BRCH-B/CCA–39(4)/ID-29307/478317, Dated: 10/12/2018** under the provisions of the various Environmental Act/ Rules, which stands amended as under.

Validity of this order is up to 02/05/2023.

1. Condition no: 2 (of the CCA dated: 10/12/2018) stands amended and shall be read a under.

NAME OF THE PRODUCTS ALONG WITH QUANTITY:

Sr. No.	Name of the Products	Total Quantity MT/Annum			Remark
		Existing	propo sed	Total	
AGROCHEMICAL FORMULATION					
1.	Mancozeb 80% WP	26400	--	26400	
2.	Mancozeb 75% WP	12000	--	12000	
3.	Mancozeb 75% WDG	12000	--	12000	
4.	Mancozeb SC (420-600 gm/Ltr)	3300	--	3300	
5.	Mancozeb SE (420-500 gm/lit)	3300	--	3300	
6.	Mancozeb OS 600 gm/lit	3300	--	3300	
7.	Mancozeb (63%) +Carbendazim (12%)	1680	--	1680	
8.	Mancozeb (64%) + Metalyxyl (8%)	1680	--	1680	
9.	Mancozeb (64%) + cymoxanil (8%)	1680	--	1680	
10.	Propineb 70% WP	9240	--	9240	
11.	Glyphosate 71% ammonium salt(prills)	4620	--	4620	
12.	Chlorpyriphos 20% EC	11040	--	11040	
13.	Monocrotophos 36% SL	7920	--	7920	
14.	Monocrotophos 40% SL(W/V)	2640	--	2640	
15.	Diclorovos 76% EC	1980	--	1980	

GUJARAT POLLUTION CONTROL BOARD
PARYAVARAN BHAVAN
Sector-10-A, **Gandhinagar** 382 010
Phone : (079) 23222425
(079) 23232152
Fax : (079) 23232156
Website : www.gpcb.gov.in

16.	Acephate 40% SL	1680	--	1680	
17.	Acephate 75% SP	8520	--	8520	
18.	Acephate 75% prills	660	--	660	
19.	Acephate 95% prills	1800	--	1800	
20.	Acephate 97% prills	1800	--	1800	
21.	Chloropyriphos 38.7% EC	1680	--	1680	
22.	Chloropyriphos 480 gm/lit EC	1680	--	1680	
23.	Chloropyriphos 50% EC	1680	--	1680	
24.	Chloropyriphos 50% + Cypermethrine 5% EC	1680	--	1680	
25.	Cypermethrin 10% EC	4980	--	4980	
26.	Cypermethrin 25% EC	1980	--	1980	
27.	Methamidophos 600 gm/lit SL	5280	--	5280	
28.	Imidaclopyrid 17.8% SL	4980	--	4980	
29.	Alphamethrin 5% EC	1200	--	1200	
30.	Alphamethrin 10% EC	1200	--	1200	
31.	Alphamethrin 2.5% EC	2388	--	2388	
32.	Permethrin25% EC	1200	--	1200	
33.	Permethrin 40 % EC	780	--	780	
34.	Deltamethrin 2.8% EC	6420	--	6420	
35.	Cypermethrin 5 % EC	9900	--	9900	
36.	Cypermethrin 20% EC	2472	--	2472	
37.	Lambdamethrin 5%EC	6000	--	6000	
38.	Lambdamethrin 10%EC	3000	--	3000	
39.	Bifenthrin 10% EC	2400	--	2400	
40.	Bifenthrin 2.5 % EC	1200	--	1200	
41.	Tricyclazol 75% WP	720	--	720	
42.	Thiamethoxam 25% WG	1320	--	1320	
43.	Sulphur 80% WG	9000	--	9000	
44.	Sulphur 55.15% SC (800 gm/ltr)	9000	--	9000	
45.	Sulphur 40% SC	9000	--	9000	
AGROCHEMICAL TECHNICAL					
	GROUP C				
1.	Triclopyr Butotyl Ester	--	1000	1000	Either or combination of products shall be manufactured and the total production of this group should not exceed 5000 MTPA
2.	Fluroxypyr	--	1500	1500	
3.	Ethoxysulfuron	--	5000	5000	
MAX. PRODUCTION OF GROUP C				**5000**	
	GROUP D				
1	Mancozeb Tech.	15000	--	15000	Either or combination of products shall be manufactured and the total production of
2	Propineb	2000	--	2000	
3	Trifloxystrobin	2000	--	2000	
4	Tebuconazol	5000	--	5000	
5	Wettable Sulphur	--	5000	5000	
6	Chlorothalonil	1000	--	1000	

GUJARAT POLLUTION CONTROL BOARD
PARYAVARAN BHAVAN
Sector-10-A, **Gandhinagar** 382 010
Phone : (079) 23222425
(079) 23232152
Fax : (079) 23232156
Website : www.gpcb.gov.in

7	Kresoxim-methyl	2000	--	2000	this group should not exceed 15000 MTPA
8	Picoxystrobin	2000	--	2000	
MAX. PRODUCTION OF GROUP D		**15000**		15000	
	GROUP E				
1	Acetamiprid	--	1000	1000	Either or combination of products shall be manufactured and the total production of this group should not exceed 8300 MTPA
2	2-Chloro-5- Chloro Methyl Pyridine	--	8300	8300	
3	Nitro Imino Imidazolidine	--	600	600	
4	Ethyl-N-Cynoethanimideate	--	1000	1000	
5	Cartap	--	1000	1000	
6	Clothianidin	--	2000	2000	
7	Emamectin Benzoate	--	2000	2000	
8	Indoxacarb	--	3000	3000	
MAX. PRODUCTION OF GROUP E		--	8300	**8300**	
TOTAL PRODUCTION OF ALL GROUPS (C+D+E)		28300			--
By-Product					
1	**Na2SO4**	6768	5522	12290	--

2. **SPECIAL CONDITIONS:**

- For Recovery of Na_2SO_4 as by Product unit shall use 10% sodium sulphate (Na_2SO_4) solution is generated in process as mother liquor and subjected to pre-treatment with soda ash and caustic solution in pre-treatment section. Pre- treatment mother liquor shall be fed in to MEE to concentrate up to 50% slurry solution.
- Unit shall reduce the moisture below 2% from the concentrated slurry solution.

3. **CONDITIONS UNDER WATER ACT:-**

2.1 Condition no: 4.1 (of the CCA dated: 10/12/2018) stands amended and shall be read as under,
The quantity of total fresh water consumption shall not exceed **787.78 KL/day**.
(**500** KLD Existing + **287.78** KLD Proposed.)

a) Domestic – **80 KL/day** (**476** KLD Existing + **231.78** KLD Proposed)
b) Industrial – **707.78 KL/day** (**500** KLD Existing + **287.78** KLD Proposed)
c) Gardening – **10 KL/day** (**12** KLD Existing - **2** KLD Proposed)

2.2 Condition no: 4.2 (of the CCA dated: 10/12/2018) stands amended and shall be read as under,
The quantity of total waste water generation shall not exceed 642.16 KL/day.
(150 KLD Existing + 492.16 KLD Proposed)

a) Domestic. – **70 KL/ day.** (12 KLD Existing + 58 KLD Proposed)
b) Industrial – **572.16 KL/day.** (138 KLD Existing + 433.16 KLD Proposed)

2.3 Condition no: 4.4 (of the CCA dated: 10/12/2018) stands amended and shall be read as under,
Concentrated/ high TDS stream of industrial effluent from process shall be sent to evaporation system, condensate from MEE shall be recycled back to process/scrubber etc. or balance quantity sent to ETP for treatment. The generating solids after settlers, nutch filters and centrifuged shall be sold to end users or disposed off at approved TSDF site.

2.4 Condition no: 4.5 (of the CCA dated: 10/12/2018) stands amended and shall be read as under,
51.16 KL/day of concentrated/ high COD stream of industrial effluent shall be incinerated common incineration Facility.

2.5 Condition no: 4.6 (of the CCA dated: 10/12/2018) stands amended and shall be read as under,

GUJARAT POLLUTION CONTROL BOARD
PARYAVARAN BHAVAN
Sector-10-A, **Gandhinagar** 382 010
Phone : (079) 23222425
(079) 23232152
Fax : (079) 23232156
Website : www.gpcb.gov.in

Total 591 KL/day of biological industrial effluent along with sewage shall be sent to ETP for primary, secondary and tertiary treatment. After treatment the treated effluent shall be sent for disposal into GIDC underground drainage-Dahej Vilayat Disposal system up to the sea.

4. **CONDITIONS UNDER AIR ACT:-**

4.5 Condition no: 5.1 (of the CCA dated: 10/12/2018) stands amended and shall be read as under,
The following shall be used as fuel in the Boiler as following rates:

Sr. no.	Fuel	Quantity		
		Existing	proposed	Total
1	Natural Gas	20160 m3/day	NIL	20160 m3/day
2	HSD	--	8000 Lit/Day	8000 Lit/Day

4.6 Condition no: 5.2 (of the CCA dated: 10/12/2018) stands amended and shall be read as under
The flue gas emission through stack attached to Boiler /D G Set shall conform to the following standards:

Sr. No.	Stack Attached to	Stack height (M)	Parameter	Permissible limit
Existing				
1.	Boiler (10 TPH)	45	Particulate Matter SO_2 NO_x	150 mg/Nm^3 100 ppm 50 ppm
Proposed				
2.	D.G. Set 2 nos. (1000 KWH) (stand by)	12	Particulate Matter SO_2 NO_x	150 mg/Nm^3 100 ppm 50 ppm

4.7 Condition no: 5.3 (of the CCA dated: 10/12/2018) stands amended and shall be read as under

The Process emission through various stacks/ vents of reactors, process, and vessel shall conform to the following standards:

Sr. No.	Stack attached to	Stack Height (M)	Air Pollution Control	Pollutant	Permissible Limit
Existing					
1	Mancozeb Reactor/ Propineb reactor	30	Air blower, ventury scrubber	CS_2	180 mg/Nm^3
2	Spray Dryer/ Propineb Spray Dryer	30	Bag Filter	Particulate Matter	20 mg/Nm^3
3	Mancozeb/ Propineb precipitation reactor	30	Air blower, ventury scrubber	CS_2	180 mg/Nm^3
4	EDA/PDA Dilution Reactor Scrubber	30	Air blower, ventury scrubber	NH_3	30 mg/ Nm^3

GUJARAT POLLUTION CONTROL BOARD
PARYAVARAN BHAVAN
Sector-10-A, **Gandhinagar** 382 010
Phone : (079) 23222425
(079) 23232152
Fax : (079) 23232156
Website : www.gpcb.gov.in

5	Mancozeb / Propineb bag house blower vent	14	Bag Filter	Particulate Matter	150 mg/Nm^3
6	Sodium sulphate dryer in MEEs	30	Bag filter	Particulate Matter	150 mg/Nm^3
7	EDA storage tank scrubber	7	ventury scrubber	NH_3	30 mg/ Nm^3
8	Formulation section	15	Bag Filter	HCl Cl_2 SO_2 H_2S NH_3 NOx HF	20 mg/ Nm^3 5 mg/ Nm^3 40 mg/ Nm^3 5 mg/ Nm^3 30 mg/ Nm^3 25 mg/ Nm^3 6 mg/ Nm^3
Proposed					
1	Kresoxim-methyl/ Amide Reactor Scrubber	30	Acidic scrubber	NH3	30 mg/Nm3
2	Picoxystrobin Reactor scrubber	30	Alkali scrubber	HCL	20 mg/Nm3
3	Reactor of Cartap Hydrochloride	30	Water Scrubber	HCl	20 mg/Nm3
4	Mancozeb 75% WDG	30	Water Scrubber	PM	20mg/Nm3
5	Mancozeb/ Propineb Conveying line Bag house blower vent	28	Bag Filter	PM	20 mg/Nm3
Total After proposed expansion					
1	Mancozeb/Propineb reactor Scrubber	30	Air blower, ventury scrubber	CS_2	180 mg/ Nm^3
	Reactor of Cartap Hydrochloride		Water Scrubber	HCl	20 mg/ Nm^3
2	Spray Dryer/Propineb Spray Dryer	30	Bag Filter	PM	20 mg/ Nm^3
3	Mancozeb/Propineb Precipitation Reactor scrubber	30	Air blower, ventury scrubber	CS_2	180 mg/ Nm^3
	Picoxystrobin Reactor scrubber		Alkali scrubber	HCL	20 mg/ Nm^3
4	EDA/PDA Dilution Reactor Scrubber	30	Air blower, ventury scrubber	NH_3	30 mg/ Nm^3
	Kresoxim-methyl/Amide Reactor Scrubber		Acidic Scrubber	NH_3	30 mg/ Nm^3
5	Mancozeb/Propineb Bag house blower vent	14	Bag Filter	PM	20 mg/ Nm^3
6	Mancozeb/Propineb Converying line Bag house blower vent	28	Bag Filter	PM	20 mg/ Nm^3
7	EDA Storage tank Scrubber	7	Ventury scrubber	NH_3	30 mg/ Nm^3

GUJARAT POLLUTION CONTROL BOARD
PARYAVARAN BHAVAN
Sector-10-A, **Gandhinagar** 382 010
Phone : (079) 23222425
(079) 23232152
Fax : (079) 23232156
Website : www.gpcb.gov.in

8	Formulation section	15	Bag Filter	HCl Cl_2 SO_2 H_2S NH_3 NO_x HF	20 mg/ Nm^3 5 mg/ Nm^3 40 mg/ Nm^3 5 mg/ Nm^3 30 mg/ Nm^3 25 mg/ Nm^3 6 mg/ Nm^3
9	Mancozeb 75% WDG	30	Water scrubber	PM	20 mg/ Nm^3
10	Sodium Sulphate Dryer in MEEs	30	Bag Filter	SPM	150 mg/ Nm^3

5. **AUTHORISATION FOR THE MANGEMENT & HANDLING OF HAZARDOUS WASTES Form-2 (See rule 6(2)).**

4.1 Condition no: 6.1& 6.2 (of the CCA dated: 10/12/2018) stands amended and shall be read as under
Number of authorization: **AWH-105105 Date of Issue-05/09/2019.**

M/s. COROMANDEL INTERNATIONAL LIMITED is here by granted an authorization to operate facility for following hazardous wastes on the premises situated at **Plot No. Z-103/G, SEZ DAHEJ, TAL-VAGRA, DIST-BHARUCH.**

Sr. No.	Type of Waste	Category	Quantity (MT/Annum)			Disposal
			Existing	proposed	total	
1	ETP waste/ MEE waste	35.3	4800	+ 2640	7440	Collection, storage, transportation, disposal at approved TSDF facility.
2	Organic Residue	29.1	--	773	773	Collection, storage, transportation, disposal at approved CHWIF or Co-processing facility.
3	Used oil	5.1	6	--	6	Collection, storage, transportation, disposal by selling to registered re-refiners.
4	Discarded containers	33.1	139200 Nos/Month	--	139200 Nos/Month	Collection, storage, transportation, disposal by selling to registered re-processors.
5	HDPE bags	33.1	--	120000 Nos/Month	120000 Nos/Month	Collection, storage, transportation, disposal by selling to registered re-processors.
6	Date expired and off-specification pesticides	29.3	600	--	600	Collection, storage, transportation, disposal at approved CHWIF or Co-processing facility.
7	Spent carbon	36.2	600	-168	432	Collection, storage, transportation, disposed to CHWIF & or Co-processing
8	Process waste	29.2	1800	+360	2160	Collection, storage,

GUJARAT POLLUTION CONTROL BOARD
PARYAVARAN BHAVAN
Sector-10-A, **Gandhinagar** 382 010
Phone : (079) 23222425
(079) 23232152
Fax : (079) 23232156
Website : www.gpcb.gov.in

						transportation, disposed to CHWIF & or Co-processing.
9	Sludge from wet scrubber	37.1	--	120	120	Collection, storage, transportation, disposal at approved TSDF facility.

6. All other condition of CCA vide letter No: - GPCB/BRCH-B/CCA–39(4)/ID-29307/478317, Dated: 10/12/2018, under the provisions of the various Environmental Act/ Rules shall remain unchanged.

For and on behalf of
Gujarat pollution control board

(A. V. Shah)
Sr. Environmental engineer

COPY OF CCA AMENDMENT

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

By R.P.A.D.

CONSOLIDATED CONSENT AND AUTHORIZATION (CC & A – Amendment)
CCA AMENDMENT NO: W-111969

NO: GPCB/BRCH-B/CCA-39(7)/ID-29307/ 588457 DT:: 16/04/2021

TO,
M/S. COROMANDEL INTERNATIONAL LIMITED
PLOT NO. Z-103/G,
DAHEJ SEZ, TAL: VAGRA, DIST: BHARUCH.

SUB: Amendment in Consolidated Consent & Authorization (CC&A) under various Environmental Acts/ Rules.

REF: (1) Your application No. **184789,** dated **18/11/2020.**
(2) CTE Amendment No.109889, dated: 05/11/2020.
(3) CCA Amendment No. AWH – 105105, dated: 19/02/2020.
(4) CTE Amendment No. 98122, dated: 28/03/2019.
(5) CCA No. AWH – 94543, dated: 10/12/2018.

Sir,

This has reference to the CCA order No: AWH-94543, issued vide letter no. **GPCB/BRCH-B/CCA-39(6)/ID-29307/ 478317**, dated 10/12/2018 and further amended dated 19/02/2020 under the provisions of the various Environmental Act/ Rules, which stands amended as under.

The Validity of this order will be up to 02/05/2023.

Specific conditions:

a) Unit shall send high TDS stream of industrial effluent generated from process at CMEE of M/s Detox India Pvt Ltd in case of non-operation of in-house MEE or during maintenance/scaling of in-house MEE only.

1. CONDITIONS UNDER WATER ACT:

1.1 There shall be no change in water consumption and water generation.

1.2 The condition no. 4.4 for Water Consumption under Water Act of CCA order No: AWH-94543, issued vide letter no. NO: GPCB/BRCH-B/CCA-39(6)/ID-29307/ 478317, dated 10/12/2018 and further amended dated 19/02/2020 vide condition no. 2.3 shall now be read as under.

1.3 IN CASE OF OPERATION OF IN-HOUSE MEE:

a) Concentrated/ high TDS stream of industrial effluent from process 152KL/day shall be sent to in-house evaporation system, condensate from MEE is recycled back to process/scrubber etc. or balance quantity sent to ETP for treatment. The generating solids after settlers, nutch filters and centrifuged is sold to end users or disposed off at approved TSDF site.

1.4 **IN CASE OF NON-OPERATION OF IN-HOUSE MEE (OPTIONAL MODE OF DISPOSAL)**

a) In case of non-operation of in-house MEE or during maintenance/ scaling of in-house MEE (optional mode of disposal), Concentrated/ high TDS stream of industrial effluent from process (152 KL/Day) shall be sent to Common MEE Facilities of M/s. Detox India Pvt. Ltd. at Ankleshwar for further treatment & disposal.

2. **All other conditions of the CCA order No: AWH-94543, issued vide letter no. NO: GPCB/BRCH-B/CCA-39(6)/ID-29307/478317, dated 10/12/2018 and further amended dated 19/02/2020 will remain same.**

For and on behalf of
GUJARAT POLLUTION CONTROL BOARD

(P.B. PATEL)
DY. ENVIRONMENT ENGINEER

CCA COMPLIANCE:

VALID CCA COMPLIANCE

This has reference to the CCA issued vide letter no. GPCB/BRCH-B/CCA-39(4)/ID-29307/478317 Dated: 10/12/2018 under the provisions of the various Environmental Act/Rules, which stands amended as under.
Validity of this order is up to 20/05/2023.

1.	**Condition no. 2 (of the CCA Dated: 10/12/2018) stands amended and shall be read as under.**	**Complied**

NAME OF THE PRODUCTS ALONG WITH QUANTITY:

No.	Name of Products	Total Quantity MT/Annum			Remarks
		Existing	Proposed	Total	
AGROCHEMICAL FORMULATION					
1	Mancozeb 80% WP	26400	--	26400	
2	Mancozeb 75% WP	12000	--	12000	
3	Mancozeb 75% WDG	12000	--	12000	
4	Mancozeb SC (420-600 gm/Ltr)	3300	--	3300	
5	Mancozeb SE (420-500 gm/lit)	3300	--	3300	
6	Mancozeb OS 600 gm/lit	3300	--	3300	
7	Mancozeb (63%)+Carbendazim(12%)	1680	--	1680	
8	Mancozeb (64%)+ Metalyxyl (8%)	1680	--	1680	
9	Mancozeb (64%)+ cymoxanil (8%)	1680	--	1680	
10	Propineb 70% WP	9240	--	9240	
11	Glyphosate 71% ammonium salt(prills)	4620	--	4620	
12	Chlorpyriphos 20% EC	11040	--	11040	
13	Monocrotophos 36% SL	7920	--	7920	
14	Monocrotophos 40% SL(W/V)	2640	--	2640	
15	Diclorovos 76% EC	1980	--	1980	
16	Acephate 40% SL	1680	--	1680	
17	Acephate 75% SP	8520	--	8520	

18	Acephate 75% prills	660	--	660	
19	Acephate 95% prills	1800	--	1800	
20	Acephate 97% prills	1800	--	1800	
21	Chloropyriphos 38.7% EC	1680	--	1680	
22	Chloropyriphos 480 gm/lit EC	1680	--	1680	
23	Chloropyriphos 50% EC	1680	--	1680	
24	Chloropyriphos 50% + Cypermethrine 5% EC	1680	--	1680	
25	Cypermethrin 10% EC	4980	--	4980	
26	Cypermethrin 25% EC	1980	--	1980	
27	Methamidophos 600 gm/lit SL	5280	--	5280	
28	Imidaclopyrid 17.8% SL	4980	--	4980	
29	Alphamethrin 5% EC	1200	--	1200	
30	Alphamethrin 10% EC	1200	--	1200	
31	Alphamethrin 2.5% EC	2388	--	2388	
32	Permethrin25% EC	1200	--	1200	
33	Permethrin 40 % EC	780	--	780	
34	Deltamethrin 2.8% EC	6420	--	6420	
35	Cypermethrin 5 % EC	9900	--	9900	
36	Cypermethrin 20% EC	2472	--	2472	
37	Lambdamethrin 5%EC	6000	--	6000	
38	Lambdamethrin 10%EC	3000	--	3000	
39	Bifenthrin 10% EC	2400	--	2400	
40	Bifenthrin 2.5 % EC	1200	--	1200	
41	Tricyclazol 75% WP	720	--	720	
42	Thiamethoxam 25% WG	1320	--	1320	
43	Sulphur 80% WG	9000	--	9000	
44	Sulphur 55.15% SC (800 gm/ltr)	9000	--	9000	

45	Sulphur 40% SC	9000	--	9000	
Agrochemical Technical					
	GROUP-C				
1	Triclopyr Butotyl Ester	--	1000	1000	Either or combination of products shall be manufactured and the total production of this group should not exceed 5000 MTPA.
2	Fluroxypyr	--	1500	1500	
3	Ethoxysulfuron	--	5000	5000	
Max. Production of Group-C				**5000**	

	GROUP-D				
1	Mancozeb Tech	15000	--	15000	Either or combination of products shall be manufactured and the total production of this group should not exceed 15000 MTPA.
2	Propineb	2000	--	2000	
3	Trifloxystrobin	2000	--	2000	
4	Tebuconazol	5000	--	5000	
5	Wettable sulphur	--	5000	--	
6	Chlorothalonil	1000	--	1000	
7	Kresoxim-methyl	2000	--	2000	
8	Picoxystrobin	2000	--	2000	
	Max. Production of Group-D	**15000**		**15000**	
	GROUP-E				
1	Acetamiprid	--	1000	1000	Either or combination of products shall be manufactured and
2	2-chloro-5-chloro methyl pyridine	--	8300	8300	
3	Nitro Imino Imidazolidine	--	600	600	
4	Ethyl-N-Cynoethanimideate	--	1000	1000	

5	Cartap	--	1000	1000	the total production of this group should not exceed 8300 MTPA.
6	Clothianidin	--	2000	2000	
7	Emamectin Benzoate	--	2000	2000	
8	Indoxacarb	--	3000	3000	
	Max. Production of Group-E		**8300**	**8300**	
	TOTAL PRODUCTION OF ALL GROUPS (C + D + E)	**28300**			**--**
	By Product				
1	**Na2SO4**	**6768**	**5522**	**12290**	**--**

2.	**SPECIAL CONDITIONS:**	**Complied**
	• For recovery of Na2SO4 as by product unit shall use 10% sodium sulphate (Na2SO4) Solution is generated in process as mother liquor and subjected to pre-treatment with soda ash and caustic solution in pre-treatment section. Pre-treatment mother liquor shall be fed in to MEE to concentrate up to 50% slurry solution. • Unit shall reduce the moisture below 2% from the concentrated slurry solution.	
3.	**CONDITIONS UNDER WATER ACT:**	
3.1	Condition no. 4.1 (of the CCA dated: 10/12/2018) Stands amended and shall read as under The Quantity of total fresh water consumption shall not exceed 787.78 KL/day. (500 KLD Existing + 287.78 KLD Proposed) a) Domestic: 80.0 KL/Day b) Industrial: 707.78 KL/Day (500 KLD Existing + 287.78 KLD Proposed) c) Gardening: 10 KL/Day (12 KLD Existing - 2 KLD Proposed)	**Complied**
3.2	Condition no. 4.2 (of the CCA dated: 10/12/2018) Stands amended and shall read as under	**Complied**

<table>
<tr><td></td><td>The Quantity of total waste water generation shall not exceed 642.16 KL/day. (150 KLD Existing + 492.16 KLD Proposed)
a) Domestic: 70.0 KL/Day (12 KLD Existing + 58 KLD Proposed)
b) Industrial: 572.16 KL/Day (138 KLD Existing + 433.16 KLD Proposed)</td><td></td></tr>
<tr><td>3.3</td><td>Condition no. 4.4 (of the CCA dated: 10/12/2018) Stands amended and shall read as under
Concentrated/High TDS Stream of Industrial effluent from process shall be sent to evaporation system, condensate from MEE shall be recycled back to process/scrubber etc. or balance quantity sent to ETP for treatment. The Generating Solids after settlers, nutch filters and centrifuged shall be sold to end users or disposed off at approved TSDF site.</td><td>Complied</td></tr>
<tr><td>3.4</td><td>Condition no. 4.5 (of the CCA dated: 10/12/2018) Stands amended and shall read as under
51.16 KL/Day of concentrated/high COD Stream of Industrial effluent shall be incinerated common Incineration Facility.</td><td>Complied</td></tr>
<tr><td>3.5</td><td>Condition no. 4.6 (of the CCA dated: 10/12/2018) Stands amended and shall read as under
Total 591 KL/Day of biological industrial effluent along with sewage shall be sent to ETP for primary, secondary and tertiary treatment. After treatment the treated effluent shall be sent for disposal into GIDC Underground drainage-Dahej Vilayat Disposal System up to the Sea.</td><td>Complied</td></tr>
<tr><td>4.0</td><td>CONDITIONS UNDER AIR ACT:</td><td></td></tr>
<tr><td>4.5</td><td>Condition no. 5.1 (of the CCA dated: 10/12/2018) Stands amended and shall read as under
The following shall be used as fuel in the Boiler as following rates:
<table>
<tr><th>No.</th><th>Fuel</th><th colspan="3">Quantity</th></tr>
<tr><th></th><th></th><th>Existing</th><th>Proposed</th><th>Total</th></tr>
<tr><td>1</td><td>Natural Gas</td><td>20160 m3/Day</td><td>NIL</td><td>20160 m3/Day</td></tr>
<tr><td>2</td><td>HSD</td><td>--</td><td>8000 Lit/Day</td><td>8000 Lit/Day</td></tr>
</table></td><td>Complied</td></tr>
<tr><td>4.6</td><td>Condition no. 5.2 (of the CCA dated: 10/12/2018) Stands amended and shall read as under
The flue gas emission though stack attached to Boiler/DG Set conform to the following standards:
<table>
<tr><th>No.</th><th>Stack Attached to</th><th>Stack Height</th><th>Parameter</th><th>Permissible Limit</th></tr>
<tr><th></th><th>Existing</th><th></th><th></th><th></th></tr>
</table></td><td>Complied</td></tr>
</table>

	1	Boiler (10 TPH)	45	Particulate Matter SO2 NOX	150 mg/Nm3 100 ppm 50ppm	
		Proposed				
	2	DG Set 2 Nos. (1000 KWH) (Stand by)	12	**Particulate Matter** **SO2** **NOX**	**150 mg/Nm3** **100 ppm** **50ppm**	
4.7	Condition no. 5.3 (of the CCA dated: 10/12/2018) Stands amended and shall read as under The Process gas emission though stack/vents of reactors, process, and vessel shall conform to the following standards:					**Complied**

No.	Stack Attached to	Stack Height	APCM	Parameter	Permissible Limit mg/NM3
	Existing				
1	Mancozeb/ Propineb reactor Scrubber	30	Air blower, ventury scrubber	CS_2	180
2	Spray Dryer/ Propineb Spray Dryer	30	Bag Filter	PM	20
3	Mancozeb/ Propineb Precipitation Reactor scrubber	30	Air blower, ventury scrubber	CS2	180
4	EDA/PDA Dilution Reactor Scrubber	30	Air blower, ventury scrubber	NH3	30

5	Mancozeb/ Propineb Bag house blower vent	14	Bag Filter	PM	20	
6	Sodium sulphate dryer	30	Bag Filter	PM	150	
7	EDA Storage tank Scrubber.	7	ventury scrubber	NH_3	30	
8	Formulation Section	15	Bag Filter + Carbon Tower	HCl Cl2 SO2 H2S NH3 NOx HF	20 5 40 5 30 25 6	
	Proposed					
1	Kresoxim-methyl/Amide Reactor Scrubber	30	Acidic Scrubber	NH3	30	
2	Picoxystrobin Reactor Scrubber	30	Alkali Scrubber	HCL	20	
3	Reactor of cartap Hydrochloride	30	Water Scrubber	HCl	20	
4	Mancozeb 75% WDG	30	Water Scrubber	PM	20	
5	Mancozeb/Propineb Conveying line Bag house blower vent	28	Bag Filter	PM	20	
	Total After Proposed Expansion					

1	Mancozeb/ Propineb reactor Scrubber	30	Air blower, ventury scrubber	CS2	180	
	Reactor of cartap Hydrochloride		Water Scrubber	HCL	20	
2	Spray Dryer/ Propineb Spray Dryer	30	Bag Filter	PM	20	
3	Mancozeb/ Propineb Precipitation Reactor scrubber	30	Air blower, ventury scrubber	CS2	180	
	Picoxystrobin Reactor Scrubber		Alkali Scrubber	HCL	20	
4	EDA/PDA Dilution Reactor Scrubber	30	Air blower, ventury scrubber	NH3	30	
	Kresoxim-methyl/Amide Reactor Scrubber		Acidic Scrubber	NH3	30	
5	Mancozeb/ Propineb Bag house blower vent	14	Bag Filter	PM	20	
6	Mancozeb/Propineb Conveying line Bag house blower vent	28	Bag Filter	PM	20	
7	EDA Storage tank Scrubber.	7	ventury scrubber	NH_3	30	
8	Formulation Section	15	Bag Filter + Carbon Tower	HCl Cl2 SO2	20 5 40	

					H2S NH3 NOx HF	5 30 25 6	
	9	Mancozeb 75% WDG	30	Water Scrubber	PM	20	
	10	Sodium Sulphate Dryer in MEEs	30	Bag Filter	SPM	150	
5.0	**AUTHORISATION FOR THE MANGEMENT & HANDLING OF HAZARDOUS WASTES Form-2 (See rule 6(2)).**						
5.1	Condition no. 6.1 & 6.2 (of the CCA dated: 10/12/2018) Stands amended and shall read as under Number of authorization: AWH-105105 Date of Issue-05/09/2019. **M/s. COROMANDEL INTERNATIONAL LIMITED**, is hereby granted an authorization to operate facility for following hazardous wastes on the premises situated at **PLOT NO: Z-103/C, SEZ DAHEJ, DAHEJ- 392130, TAL: VAGRA, Dist: BHARUCH**.						**Complied**

Sr. No.	Hazardous Waste	Category	Quantity (MT/Annum)			Mode Of Disposal
			Existing	Proposed	Total	
1	ETP waste/ MEE waste	35.3	4800	2640	7440	Collection, storage, transportation, disposal at approved TSDF facility.
2	Organic Residue	29.1	0.0	773	773	Collection, storage, transportation, disposal at

						approved CHWIF or Co-processing facility.	
3	Used oil	5.1	6.0	0.0	6.0	Collection, storage, transportation, disposal by selling to registered re-processors.	
4	Discarded containers	33.1	139200 Nos./Month	--	139200 Nos./Month	Collection, storage, transportation, disposal by selling to registered re-processors.	
5	HDPE Bags	33.1	0.0	120000 Nos./Month	120000 Nos./Month	Collection, storage, transportation, disposal at approved CHWIF or Co-processing facility.	
6	Date expired and	29.3	600	0.0	600	Collection, storage, transportation, disposal at	

		off-specification pesticides					approved CHWIF or Co-processing facility.	
	7	Spent carbon	36.2	600	-168	432	Collection, storage, transportation, disposed to CHWIF & or Co-processing.	
	8	Process waste	29.2	1800	360	2160	Collection, storage, transportation, disposed to CHWIF & or Co-processing.	
	9	Sludge form wet Scrubber	37.1	0.0	120.0	120.0	Collection, storage, transportation, disposal at approved TSDF facility.	
6.	**All other condition of CCA vide letter no. GPCB/BRCH-39(4)/ID-29307/478317, Dated: 10/12/2018, under the provisions of the various Environmental Act/Rule Shall Remain unchanged.**							**Noted**

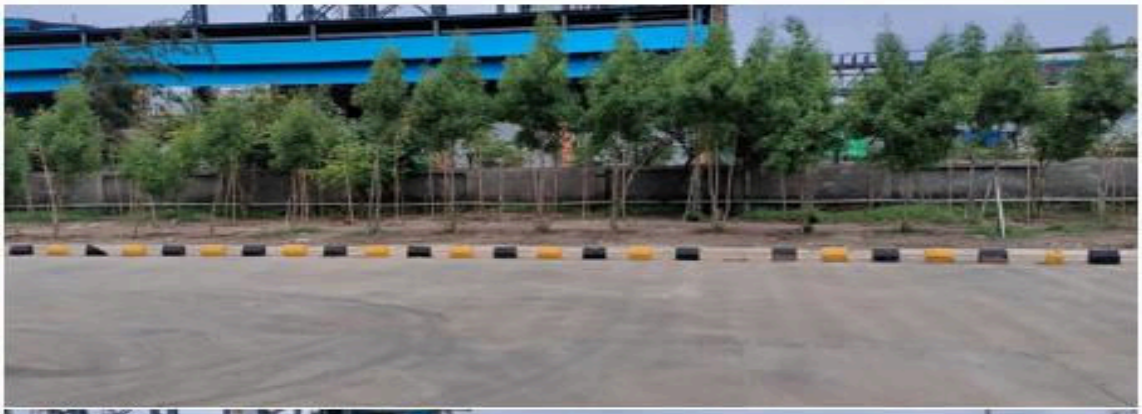
ANNEXURE-XVIII

EXISTING GREENBELT DETAILS

Green belt of 17045.72 m^2 area in and around the plant premises is developed as per the CPCB guidelines in consultation with DFO.

Wide variety of trees like Neem, Gulmohar, conocarpur etc Number of Tree planted in Year 2019-20-170nos year 2020-21-200nos and Year 2021-22- 2150 nos

YEAR	NO. OF TREES
2019	170
2021	200
2022	2150



ANNEXURE-XIX
UNDERTAKING OF BANNED PESTICIDES PRODUCTS

Coromandel
FUTURE POSITIVE
CIN : L24120TG1961PLC000892

UNDERTAKING OF BANNED PESTICIDES PRODUCTS

We, **M/s. Coromandel International Limited**. Proposed Expansion of Pesticide & Pesticide Intermediates Manufacturing Plant of Plot No. Z/103/G, SEZ-2, Dahej, Dist: Bharuch, Gujarat, India. here undertake that Company shall no manufacture of banned pesticides.

Thanking You,
Yours faithfully,
For **Coromandel International Limited**.

AUTHORIZED SIGNATORY

Coromandel International Limited
Crop Protecion Division
Plot No.Z-103/G, Dahej SEZ II,
Po. Lakhigam, Ta. Vagra,
Dist Bharuch-392130. Gujarat, India
T : (02641) 291110

Registered Office : Coromandel House'
1-2-10, Sardar Patel Road,
Secunderabad 500 003, Telengana, India.
T : +91 40 27842034
F : +91 40 27844117
E : mail@coromandel.murugappa.com
W : www.coromandel.biz

murugappa