EXECUTIVE SUMMARY OF ENVIRONMENT IMPACT ASSESSMENT

FOR

"MANUFACTURING SPECIALTY CHEMICALS AND DISINFECTANT CHEMICALS IN EXISTING UNIT BY SALTS AND CHEMICALS PVT. LIMITED AT VILLAGE & PO - SUGANDHA, DIST. - HOOGHLY, WEST BENGAL - 712102"

Item: 5(f) Category: B

SUBMITTED BY

M/S SALTS AND CHEMICALS PVT. LIMITED

at Village & PO - Sugandha, Dist. - Hooghly, West Bengal - 712102

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(NABET/EIA/1821/RA 0098)

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EXECUTIVE SUMMARY

1. Introduction

An ISO 9001:2015 CERTIFIED organization, M/s Salts and Chemicals Private Ltd. has an existing unit for manufacturing different kinds of Industrial Chemicals like metal pre-treatment chemicals, galvanizing Chemicals, water treatment chemicals & heat treatment chemicals, operating since 1994 at Village + PO – Sugandha, Dist. – Hooghly, West Bengal – 712 102.

The existing unit is having valid Consent to Operate [Letter no. CO118084 vide memo no. 539/hg-co-s/97/0787 dated 07/08/19] and Hazardous Waste Authorization [Letter No. 74/2S(HW)-749/2000-2001].

The company has now proposed for manufacturing of Specialty Chemicals and Disinfectant Chemicals within the existing unit premises at Village & PO – Sugandha, District – Hooghly, West Bengal – 712 102.

As per EIA Notification S.O. No. 1533 issued on 14th September, 2006 and its subsequent amendments, the proposed Specialty Chemicals Manufacturing Activity falls under Project/Activity 5(f) i.e., Synthetic Organic Chemicals Industry while manufacturing of disinfectant chemicals does not fall under the purview of EIA notification. The project is located in a non-notified industrial area. But it shall be considered as Category B project as it is a small synthetic organic chemical manufacturing unit with water consumption less than 25 KLD (ref: MoEF&CC notification dated 25 June 2014].

M/s Salt and Chemicals Pvt Limited had submitted application in Form 1 on 03/09/2021 for approval of Terms of Reference (TOR) and standard TOR was issued by SEIAA vide letter no. 237/EN/T-II-1/163/2021 dated 16th February 2022.

M/s Ind Tech House Consult, Delhi, a NABET Accredited EIA consultant has been engaged to prepare an Environmental Impact Assessment Report (EIA) for the proposed project.

2. Project Location

The project site is located on the eastern side of SH 13 at village Sugandha near the crossing of State Highway 13 (also known as Delhi Road in the area) and Chunchura-Dhaniakhali Road. Geographical Coordinates of Four Corner Points of the Project Site –

A- 22°54’27.04” N, 88°20’18.35” E

B- 22°54’29.35” N, 88°20’19.82” E

C- 22°54’29.71” N, 88°20’17.23” E

D- 22°54’27.51” N, 88°20’16.57”

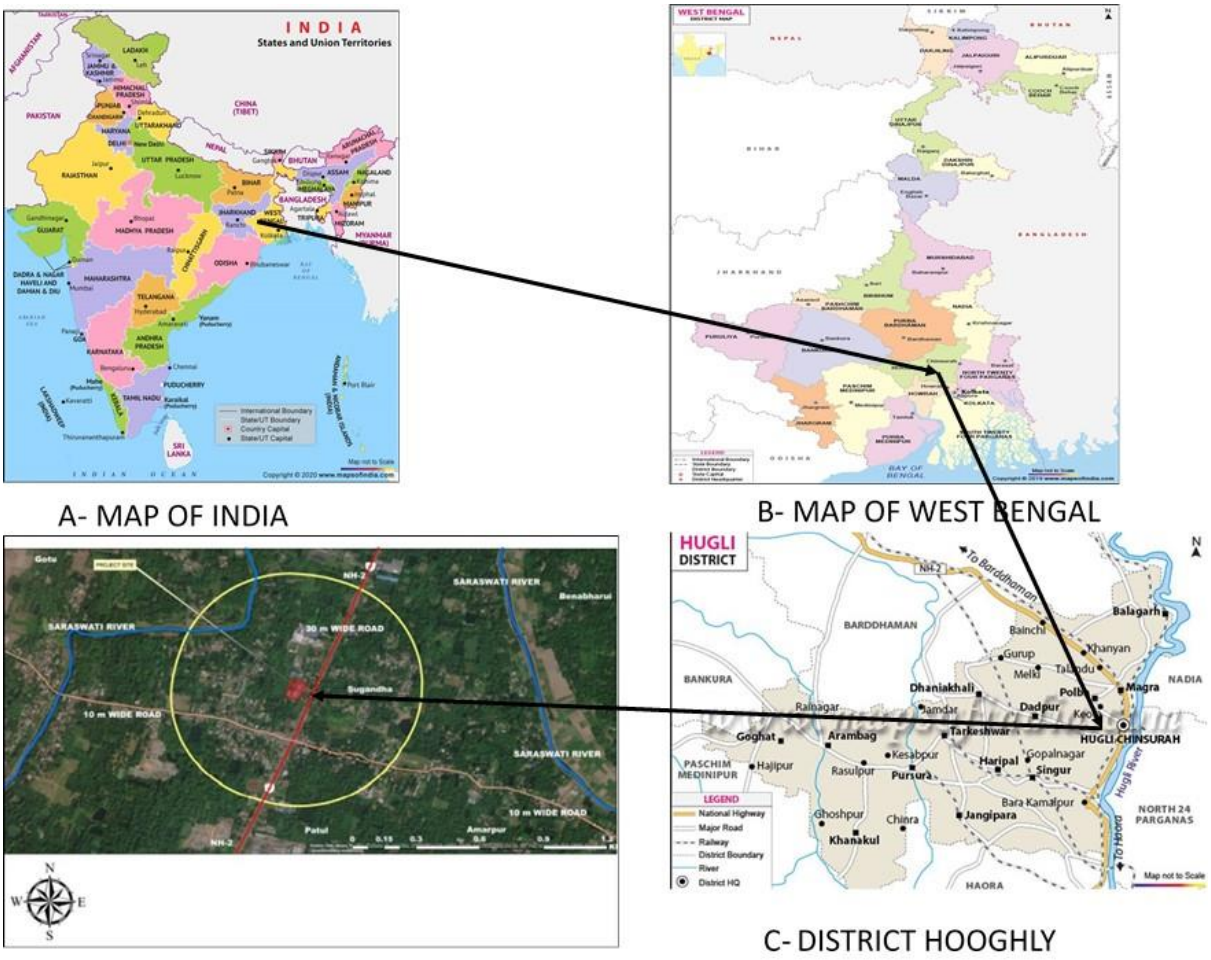

Figure 1: Project Site Location

3. Salient Features of the Project

1	Name of the Company	**M/s Salts and Chemicals Pvt. Ltd.**
2	Registered Office Plant Address	**Registered Office** Vill & P.O. - Sugandha, Hooghly, West Bengal 712 102 **Plant Location:** Vill & P.O. - Sugandha, Tehsil - Polba Dadpur, Hooghly, WB
3	Name of the Directors	Mr. Sumit Kumar Biswas [Managing Director], Mr. Debdeep Biswas [Director]
4	Proposed Sector	5(f) Synthetic Organic Chemical industry [Category B]
5	Land	1.17 acre in possession of the company
6	SOI Topo Sheet No.	79 B/5
8	Proposed Project	Manufacturing of Specialty Chemicals and Disinfectant Chemicals in existing premises of Salts and Chemicals Pvt. Ltd. The specialized chemicals are Polyamine based Chemical, Acrylic

		Polymer, Acrylic Emulsion with target production capacity of 1100 MT per Annum.
9	Cost of proposed Project	INR 22,47,000/-
10	Total Manpower	Existing – 32 including management staff Proposed additional – Nil
11	Total Power Requirement	**Existing Project** – 60 KVA Source: WBSEDCL Emergency Power: 1 x 30 KVA DG set **Proposed project** – Additional demand: Ni Existing load is sufficient to run the proposed production and no extra power required for this purpose.
12	Total Water Requirement Source Permission	Total during post expansion: 11 KLD Fresh water **Existing:** Fresh water - 7.5 KLD. **Proposed:** Additional fresh water 3.5 KLD **Source:** Onsite abstraction of groundwater through tube-well. **Permission –** District Level Ground Water Resource Development Authority approval obtained.

4. Size or magnitude of operation

This is a small scale project. The project falls under Category B as per EIA Notification 2006. Total plot area of existing premises is 1.17 acre (4734.822 sq. m). Out of total 1.17 acre land, Greenbelt [already developed] is on 0.38 acre [33.32%].

Proposed expansion will be carried out within the existing sheds of the existing premises. No additional manpower will be required during operation phase. Existing infrastructure and utilities will be used. New installation includes –

- Two Nos. 1 KL SS Reaction Vessels
- Three Nos 3 KL SS Reaction Vessels
- Air-Cooled Chiller 25 TR.

5. Products and Capacities

Proposed Product and Capacity

S. No.	Proposed product	Product	Target Capacity per annum
1	Specialized Chemicals **[falls under the purview of EIA notification]**	Polyamine based chemical	400 MT
2		Acrylic polymer	300 MT
3		Acrylic emulsion	400 MT
4	Disinfectant Chemicals **[does not come under the**	Antimicrobial toilet cleaner	60 MT
5		Hand sanitizer	12 MT

6	**purview of EIA notification]**	Bio disinfectant	12 MT
7		Anti-microbial phenyl	60 MT
8		Poly ferric sulphate	500 MT
9		Liquid hand wash	12 MT

Existing Unit with Production Capacity
[does not come under the purview of EIA notification]

S. No.	Product	Production Capacity per month
1	Different Phosphate salt	42 MT
2	Galvanising Chemicals	369 MT
3	Heat Treatment Chemicals	56.5 MT
4	Metal Treatment Chemicals	59.5 MT
5	Water Treatment chemicals	40 MT
6	Ammonium Hydroxide 10% solution [By-product]	10 MT
7	Chemlub Group	2 MT
8	Forging Lubricant	10 MT
9	Biuret	2.5 MT
10	Electroplating Chemicals	15 MT
11	Zinc Chloride	60 MT
12	Zinc Phosphate	11 MT
13	Nickel Carbonate	0.2 MT
14	Sodium Nitrate	10 MT
15	Potassium Nitrate	10 MT

6. Existing Land Area

The existing unit is spread over an area of 1.17 acre. The land has been classified as KARKHANA by Office of the Sub-Divisional Land & Land Reforms Office.

Land Utilization Statement of the Project Site

S. No.	Particulars	Area (Sqm)	% Percentage
1	**Plot Area**	**4675.65**	**100**
2	**Covered Area**	**2178.73**	**46.6**
3	**Open Area**	**648.6**	**13.87**
4	**Road Area**	**290.43**	**6.21**
5	**Garden Area**	**1557.89**	**33.32**

S. No.	Covered Area Breakup	Area (Sqm)
1	Office Area	143.81
2	Total Manufacturing area	1661.87
3	Proposed Storage Area	74.78
4	Existing storage Area	224.48
5	DG & Electrical area	32.79
6	ETP AREA	41

	Total Covered Area	**2178.73**

7. Requirement of Raw Material, Water, Power and Manpower

Raw Materials

All raw materials are presently sourced through domestic traders and transported by road. The same will be continued for the proposed project.

Raw material consumption and Storage for proposed Speciality Chemicals

S. No.	Raw Material	Consumption/ month	Max Storage at Site
1	Di-methyl Amine	15 MT	30 MT
2	Epichlorohydrin	13 MT	25 MT
3	Acrylic Acid	20 MT	30 MT
4	Sodium Hypophosphite	0.7 MT	2 MT
5	Ammonium Persulphate	0.3 MT	1 MT
6	Caustic soda	0.7 MT	500 KG.
7	Acid Thickener	0.1 MT	15 MT
8	Styrene	7.5 MT	30 MT

Raw Material Consumption and Storage for Proposed Disinfectant Chemicals [not covered under EIA notification]

S. No.	Raw Material	Consumption/ month	Max Storage at Site
1	Sulphuric Acid	4.2 MT	16 MT
2	Hydrochloric Acid	1.75 MT	12 MT
3	Ferrous Sulphate	21 MT	30 MT
4	Iso-propyl Alcohol	0.5 MT	2 MT
5	Glycerin	0.05 MT	1 MT
6	Chlorohexidine	0.01 KG.	200 KG.
7	Sodium Lauryl Sulphate	0.05 KG.	200 KG.
8	Pine Oil	3.55 MT	5 MT
9	Hydrogen Peroxide	3.1 MT	5 MT
10	Acid Slurry	0.65 MT	1 MT
11	Turkey Red Oil	0.8 MT	0.8 MT

Major Raw material consumption for existing unit
[not covered under EIA notification]

S. No.	Raw Material	Consumption/ month
1	Soda Ash	14 MT
2	Phosphoric acid	20 MT
3	Hydrochloric Acid	18 MT
4	Caustic soda	8 MT
5	Ammonium Chloride	9 MT

Water Requirement

The Existing fresh water requirement is 7.5 KLD. For the proposed expansion project additional fresh water requirement is 3.5 KLD. Total water requirement during post expansion operation will be 11 KLD Fresh water. The total fresh water will be sourced through onsite ground water abstraction through tube-well for which necessary permission has been obtained.

Existing and Proposed Water Requirement

Existing Fresh water requirement	Proposed Project Fresh Water Requirement
Total Consumption - 7.5 KLD • Domestic - 3 KLD • Industrial - 4 KLD • Cooling – 0.5 KLD.	• Domestic – Nil [as no additional manpower would be engaged]. • Additional industrial freshwater -3.5 KLD - Vessel washing - 0.5 KLD - RO unit - 3 KLD

Power Requirement

Power is sourced from WBSEDCL. Existing power supply of 60 KVA would be sufficient to cater the proposed project. One 30 KVA DG set is installed in the existing project for emergency backup supply. No additional emergency arrangement is required.

Skilled and Trained Manpower

The existing manpower of the company is approx. 32 including management staff. However, as of now no additional manpower is planned for the proposed project. The existing manpower would be sufficient to run the proposed manufacturing activity.

Existing Infrastructure

Approach Road, Boundary wall, Production Shed, Administrative office, Gate, ground water abstraction facility, water reservoir, greenbelt, parking area, ETP and other utility units available inside the existing plant premises will be sufficient to cater the proposed project.

8. Process Description in Brief (specifically indicating gaseous emissions, liquid effluents and solid and hazardous wastes. Material Balance shall be presented):

Proposed Speciality chemicals will be manufactured in stainless steel reactors using batch process in which a defined quantity of product is made from a fixed input of raw materials during a measured period of time. The process involves feeding accurately measured amounts of starting materials into a vessel followed by a series of processes involving mixing, heating, cooling, making more chemical reactions and then quality testing followed by packaging. The maximum temperature maintained in the reactor vessel will be 80 -85°C. Reactors will be fitted with condenser. Reactor jacket will be provided to circulate hot and cold water for the purpose of heating and cooling purpose.

9. Cost of the project & Time of Completion

Estimated project cost-The overall estimated project cost for the proposed unit is INR 22,47,000/-

- Plant & Machinery 17.69 Lakh INR
- Other Utilities & Preliminary Expenses 4.78 Lakh INR

The proposed project is expected to start operation after 3-6 months from obtaining the Environment Clearance. The industry will take all necessary approvals from the concerned authorities before start of production activity.

10. Baseline Environment Data

Baseline data was generated during post-monsoon season from 3rd October 2021 to 23rd December 2021. 10 km area around the site was considered as study area. Data was generated by following the standard procedures of the Ministry of Environment Forests and Climate Change and Central Pollution Control Board. Meteorological data on wind speed, wind direction, relative humidity and temperature was generated.

Predominant wind direction during the study period was from North to south W to E and maximum wind speed was in the range of 3.6- 5.7m/s.

Baseline data on ambient air quality (5 locations), noise quality (5 locations), ground water quality (1 location), surface water quality (3 locations), soil quality (3 locations) was generated. As this is a very small unit and uses clean fuel [LPG] in utility units, the less no. of monitoring locations has been considered and proposed during TOR approval.

Ambient air quality: PM_{10} concentration in the study area varied from 82 to 224 µg/m^3, $PM_{2.5}$ concentrations in the study area varied from 51-121 µg/m^3, SO_2 concentration in the study area varied from 6.1 to 9.2 µg/m^3, NO_2 concentration in the study area varied from 16.4 to 25.3 µg/m^3

Average concentration of PM10 and PM2.5 exceeded at all monitored locations and its continuous exposure to human being can have health impacts. Other parameters like SO2, NO2 were found well within the NAAQS, 2009 limits as specified by CPCB.

Ambient noise quality: Day time noise level (6 am to 10 pm) was found between 51.46 to 56.55 dB(A). Night-time (10 pm to 6 am) noise level was found between 41.16 to 42.42 dB (A). The noise level was found well within the national standards for industrial area in all the five locations.

Surface water quality: Analysis results of surface water show that pH varies from to 7.10 to 7.25, Dissolved Oxygen varies from 3.9 to 6.1 mg/l. BOD varies from 3.0 to 12 mg/l, COD varies from 16 to 56 mg/l, Total Dissolved Solids varies from 208 to 374 mg/l, Total coliform varies from 220 to 900 MPN/100 mg/l. Coliform presence was seen in all the surface water samples. This may be due to bathing of cattle and disposal of raw sewage into streams.

Groundwater quality: Result of analysis shows that all parameter except total alkalinity [as CaCO3] are well within both Acceptable and Permissible limit of BIS Specification IS 10500-2012. Therefore, no negative impacts were noticed due to the existing project activity at project site.

Soil quality: Soils of study area are sandy loam by nature. Specific Conductivity and pH are in normal range. Organic matter content is sufficient. The concentration of Nitrogen, Phosphorus and Potassium were medium. The soils of study area are fit for paddy cultivation.

Landuse & Landcover: The land use map reveals that about 38.54% of the study area is cropped land and almost same percentage of study area is covered with plant/vegetation [37.26%] followed by habitation area of 21.02% and water body of about 3.18%. Dense habitation areas are mainly located on eastern side of the study area on both sides of Hooghly River.

Groundwater Resources & Category: Dynamic Ground water resources of Aquifer –I in the area under study have been calculated on the basis of GEC (1997) methodology by CGWB and State Water Investigation Department (SWID). On the basis of ground water resource calculation (2011) and water level trend, 5 blocks viz. Pandua, Chinsurah-Magra, Polba-Dadpur & Singur blocks of Hooghly district have been categorized as 'Semi-Critical' blocks.

Eco-sensitive Areas around the project site: There is no protected area under any international conventions, national or local legislation for their ecological, landscape cultural or other related value within 15 km of project site.

Flora and Fauna: The biological environment in the surrounding of the study area is dominated by grasses with scattered tree/Shrub species. The area is devoid of any kind of vulnerable, endangered and critically endangered flora and fauna.

Demography and Socio-economy: The project site is located in Polba-Dadpur block which is a community development block that forms an administrative division in Chinsurah sub-division of Hooghly district. The block has sufficient educational facilities, primary health centre, hospital. The area has several industries located on both sides of SH13. The area is very well connected by road and rain to Howrah city and Kolkata. As per social survey conducted in nearby area around the project site, main source of occupation of the people is agriculture but a large number of people work in nearby industries.

The study area covers a total of 263 villages and towns with urban, semi-urban and rural background. As per 2011 census, the total population of study area is 1035,743 and 243,540 households with 75.8% literate population.

11. Anticipated Environmental Impact and Mitigation Measures

11.1 Construction Phase Impacts & Mitigation Measures

Existing infrastructure, utilities and existing production shed will be used for the proposed project. No construction activity is proposed for this project except installation of reactors with supporting apparatus and provision of raw material storage. Thereby, apart from very minor localized construction impacts at the project site like reactor foundation within the existing shed, no adverse impact on the surface features of the surrounding areas is anticipated.

11.2 Operation Phase Impacts & Mitigation Measures

Impacts on Air Quality

The proposed specialty chemical manufacturing process activities will be carried out in batch reactor. The process of mixing, heating, cooling will be carried out in closed reactor where no process emission is anticipated. Therefore, resulting emission and discharge of pollutants from the proposed project activities will be very minimal for any environmental concerns.

The main sources of existing point sources of air pollution are LPG fired pot furnace [2 nos.], hot air generator and one DG set of capacity 30 KVA used as back up during power cut. No additional utility units are proposed.

Existing Point Sources of Emission and Control Systems

	Air Pollution Source	Fuel Used	Emission Limit	Stack Height
1	Pot Furnaces [2 Nos.] Capacity - 50 kg/hr	LPG	PM <150 mg/Nm^3	12 ft
2	Hot Air generator Capacity - 50 kg/hr	LPG	PM <150 mg/Nm^3	12 ft
3	DG set [30 KVA]	HSD	PM <150 mg/Nm^3	8 m

Since the project proponent is using clean fuel [LPG] for the above utility units, very little emission is anticipated from the operation of utility units. Also, the baseline scenario of ambient air quality has already captured the emission level of the existing operation and no change is anticipated due to the proposed project. The utility units will comply with stipulated emission norms.

Fugitive Emissions: Fugitive emissions are emissions expected from material handling, storage, transferring and from unit operations. The storage of raw materials may also lead to fugitive emissions unless adequate mitigation measures are adopted. To control fugitive emissions generated during handling and manufacturing process, mitigation measures like storage of limited quantity of hazardous chemicals at site, closed handling, separate storage area, provision of personal protective equipment for workers will be adopted. Work zone monitoring will be done.

Impacts on Ambient Noise

The noise levels at the source for similar type of units will be in the range of 55-65 dB(A). The same has been observed during project site ambient noise monitoring done for baseline study. Also, as per noise modeling considering worst case scenario, that the noise impact will become insignificant at the plant boundary and will further decrease at nearest human settlements outside the plant boundary. The noise level will remain at 48.8 dBA at nearest habitation, which is within the prescribed National Standards.

Impacts on Water Resource and Quality

Fresh water requirement for the existing plant is met through onsite groundwater abstraction using existing one tube-well and the same will be continued for the proposed project to withdraw additional 3.5 KL only. Approval for water abstraction is in place.

Wastewater Management - The main sources of industrial wastewater generation are from vessel washing and RO rejects. Besides a small quantity of wastewater will be generated from domestic usages. Domestic effluent [approx. 2 KLD] is discharged through septic tank and drain. No additional domestic effluent would be generated due to the proposed expansion as manpower would remain same.

Domestic effluent (sewage) -

Existing – approx. 2 KLD is discharged through septic tank and drain.

Proposed – No significant increase in quantity as existing workforce would continue.

Industrial effluent –

Existing –Approx. 1000 lit/day

Proposed – Approx. 2000 lit/day [vessel washing - 500lit/day + RO rejects - 1500 lit/day]

Wastewater Management

The existing unit has one effluent treatment plant which will be augmented by adding one more reaction tank. Industrial effluent will be treated by Ferrous Sulphate and Hydrogen Peroxide or Poly Ferric Sulphate. Then the effluent will go to the existing Neutralizing Tank [neutralized with lime] and then go to existing clarifier for settling.

Some part of the treated effluent will be recycled in toilets through dual plumbing and RO treatment plant. Rest of the treated effluent will be discharged to drain after passing through carbon filter. No wastewater without treatment will be discharged outside the plant premises under any circumstances. The treated effluent will comply with permissible standard for discharge of effluent to surface drain.

Storm Water Discharge **-** The runoff water from the building roofs, paved areas and from open areas will be directed through the ditches to the covered storm water drainage and discharged to outside drain along the highway. As the proposed project is a chemical unit, no RWH structure to recharge the ground aquifer would be developed.

Solid Waste Management

Municipal solid waste from existing office area is very limited in quantity [approx. 3 kg/day] and disposed through authorized vendors as per norms of the local authority. No additional generation of municipal waste is anticipated due to proposed project.

Hazardous Waste Generation and Disposal – Details of hazardous wastes generation from the existing unit and estimated generation from the proposed unit is given below. The existing unit has obtained HW authorization from State Pollution Control Board. Agreement with the West Bengal Waste Management Limited for disposal of hazardous wastes from the existing unit is in place. HW authorization will be renewed with updated generation and disposal of hazardous wastes due to the proposed project.

Hazardous Waste Generation and Disposal Details

Waste Detail	Existing generation Quantity	Additional generation from proposed project	Mode of Disposal
ETP sludge	approx. 310 kg/month	Approx. 60 kg/month	Will be stored safely in HDPE bags at a designated place within the premises and disposed through the common HWTSDF at regular interval.
Sludge and filter press cake generated from production of Zinc Compounds	approx. 60 kg/month	Nil	
Empty barrels/liners/ containers contaminated with hazardous wastes/ chemicals	Approx. 10-15 barrels/containers per month	Approx. 8-10 barrels/containers per month	Most of it will be used in product packaging and rest will be disposed through authorized recyclers.

Impacts on Biological Environment

There are no endangered species of flora and fauna in the impact area, the project does not pose any direct threat to the survival of species. The impact on biotic environment is neutral with the effect confined mainly to the site area. There will be no loss of habitation as the proposed project will be executed within the existing premises.

Impact on Traffic

The raw material and finished products will be transported through road. SH-13 is adjacent to project site. There will be very little increase in traffic due to the proposed project. As estimated the maximum additional traffic will be approx. 2-3 small trucks [carrying capacity 3-4 T] per day. Therefore, there will be negligible impact on the existing traffic due to the proposed project. However, mitigation measures like vehicle movement during daytime, proper covering during transportation, designated parking only within premises, separate entry for trucks and employees will be continued.

Impact on Socio-economy and Mitigation Measures

There is no resettlement due to this project. Land is already under the possession of the project proponent. The proposed project will influence growth in industrial sector of local area. However, as of now, no additional manpower is proposed. If required in future, preference to local people shall be given in employment as per skills.

12. Environmental Monitoring Program

It is proposed to monitor Ambient Air Quality (AAQ) for PM10, PM2.5, SO2 and NOX, work zone VOC concentration, stack emissions of pot furnace, hot air generator for PM & CO, noise levels on yearly basis. Water, treated wastewater are monitored on half yearly basis, while soil analysis may be conducted once in a year.

The inhouse laboratory conducts regular monitoring of wastewater quality to check the performance of the existing ETP and the same would be continued for the proposed project operation period.

Environmental Monitoring Program for Operation Phase

SN	Particulars	Monitoring Location	Parameters	Frequency
1	Stack Emission from a) Pot Furnace b) Hot Air Generator c) DG set [as back up]	Project Site	 PM, CO PM, CO PM, SO_2, NO_x, CO	Yearly or as per condition in CTO issued by SPCB or EC granted by SEIAA
2	Work place monitoring near reactors/process area	Project Site	VOCs	
3	Ambient Air Quality	Boundary of Project Site	$PM_{2.5}$, PM_{10}, SO_2, NOx, CO	Yearly
4	Ambient Noise Level	Boundary of Project Site	L10, L50, L90, Ld, Ln, Leq, Ldn, Lmin, Lmax	Yearly
5	Soil quality	Project Site	Basic Parameters	Yearly
6	Ground Water	Project Site or near project site	As per IS:10500	Yearly
7	Wastewater Quality	Onsite ETP inlet and outlet	pH, TSS, TDS, BOD, COD, O&G as per CTO granted by the WBPCB	Yearly or as per condition of CTO issued by SPCB or approved EC

SN	Particulars	Monitoring Location	Parameters	Frequency
8	Fresh water and wastewater quantity	Project site	Meter reading should be recorded on regular basis.	Periodically
8	Hazardous Waste	Project Site	Logbook shall be maintained to record waste generation quantity, storage and disposal through authorized vendor.	Periodically
9	Health Conditions / Accidents	Project Site	Follow-up medical checkups of workers. Safety records and monitoring of plant safety.	As per Factories Act.

13. Risk Mitigation

The proposed project will use hazardous chemicals like Di Methyl Amine, Epichlorohydrin, Iso Propyl Alcohol. Styrene in the process which will be stored and handled in compliance with MSIHC rules. These are listed in Part II of Schedule 1 of MSIHC Rule. All the above mentioned chemicals will be stored in limited quantity at site much below the threshold limit as mentioned in the MSIHC rule. The chemicals will be stored in in tightly closed MS drums and kept in a separate storage area inside the factory premises complying with applicable norms. Existing Fire approval will be updated. The proposed storage area has been earmarked in the layout plan and it has been kept at the extreme south side of the premises near gate no. 1 and away from the other activity area of the plant. Maximum storage of hazardous chemicals proposed at site are as follows –

Items	Max storage	Method of storage
Di-methyl Amine	30 MT	Barrel
Epichlorohydrin	25 MT	Barrel
Iso-propyl Alcohol	2 MT	Barrel
Styrene	15 MT	Barrel

Public Receptors within 250 m radius of the Plant

i. South and West – Vacant Land and Sughandha Village [approx. 100 m away]

ii. North – An old age Home and Bengal School of Technology

iii. East -SH 13 and then habitation [Nearest Vedam Resort at a distance of 100m]

Hazards associated with Storage of Hazardous Chemicals

SN	Material Stored	Risk Involved	Probable Causes	Effect	Control Measures Proposed
1	Di-methyl Amine [30 MT]	Highly	Leakage in	• Dangerous	• Store in tightly closed

		Flammable Harmful if inhaled.	container Nearby ignition source Glands/seal leaks in valves, pumps during transfer of materials.	Fire hazard • Toxic by inhalation • Toxic when contact with Skin • Toxic if swallowed Danger of very serious irreversible effects	container in an isolated cool well-ventilated area away from heat • Sources of ignition such as smoking, open flame should be prohibited near storage and handling area • Use only non-sparking tools when opening and closing the containers
2	Epichlorohydrin [25 MT]	Flammable liquid and vapor Causes severe skin burns and eye damage			• Must be stored in tightly closed, containers in fire-proof, cool, dry rooms away from heat. • Use explosion proof electrical/ventilating / lighting equipment • Use only non-sparking tools
3	Iso-propyl Alcohol [2 MT]	Highly Flammable	Leakage in container Nearby ignition source	Highly flammable	• Must be kept away from all possible ignition sources, including heat, sparks, and flames
4	Styrene [15 MT]	Highly Toxic, Highly Flammable, Corrosive	• Glands/seal leaks in valves, pumps • Hose/pipe failure, leakage from flanged joints carrying styrene • Loading and unloading process. • Nearby ignition sources • Fire due to Bottom nozzle failure • Damage of Pump discharge nozzle	• Highly flammable • Toxic by inhalation • Toxic when contact with Skin • Toxic if swallowed • Danger of very serious irreversible effects	• Take care of adverse weather conditions. • Separate from strong oxidant. • Fire hydrant system shall be installed. • Safety shower and eye washer shall be installed near storage area. • Guidelines to restrict storage quantity shall be followed. • Flame proof Electrical fittings shall be provided at flammable storage area.

Onsite Disaster management Plan will be prepared in detail before commencement of operation. To reduce the risk of fire hazard and health hazard, the following measures recommended –

1) As materials will be stored in barrels in small quantity, the effect of any accident in worst scenario is envisaged to be within the project premises. However, the worst case could affect road traffic and some minimal direct effect on nearby establishments is possible. The road is close by and hence close co-ordination with the local authorities is important.
2) In case of fire situations, use water spray to keep fire-exposed containers cool. Do not move the load if exposed to heat.
3) Ensure that combustible flammable material is not placed near the storage area and in the other decanting and filling areas. These could include oil filled cloth, wooden supports, oil buckets etc. These must be put away and the areas kept permanently clean and free from any combustibles. Secondary fires probability would be greatly reduced as a result of these simple but effective measures.
4) All safety and health codes prescribed by the BIS will be implemented through the Integrated Management System.
5) Safety data sheets of the chemicals will be displayed at specific locations (near the storage and handling areas).
6) Firefighting facilities will be established as per Fire approval. The existing approval from the Fire Department will be updated.
7) Fire extinguishing equipment, sand buckets, water sprinklers and water hoses will be provided at all convenient point.
8) For detection and protection of the plant against fire hazard, any one or a combination of the following systems will be adopted; Hydrant system, medium velocity spray system, Portable fire extinguishers, Fire alarm system
9) Hydrocarbon detector will be provided in storage are and Process Area.
10) Training of workers in fire-fighting, escape, operation of emergency switches etc. is vital. The FIRE ORDERS drills, MOCK DRILLS etc. are the best ways of ensuring emergency preparedness.
11) Personnel involved in handling of the hazardous chemicals will be properly trained and made aware of the safety data and related first-aid measures.
12) Storage areas shall have appropriate signs and notices and be clearly marked-out. All containers and packages shall be clearly labelled. Where spillage of any stored substance could be harmful to the environment, the area shall be appropriately kerbed or bunded.
13) The maximum storage capacity of storage areas shall be stated and not exceeded and the maximum storage period for containers shall be specified and adhered to.
14) Appropriate storage facilities shall be provided for substances with special requirements; (eg., flammable, sensitive to heat or light) and formal arrangements shall be in hand to keep separate packages containing incompatible substances (both “pure” and waste).
15) Compatibility will be taken care while deciding storage location of individual chemicals. The flammable chemicals are stored away from oxidizing chemicals like hydrogen peroxide and nitrates.

16) Containers shall be stored with lids, caps and valves secured and in place and this also apply to emptied containers.
17) All stocks of containers, drums and small packages shall be regularly inspected (at least weekly) and Procedures shall be in place to deal with damaged or leaking containers.

Fire Response System – The fire response system would be as per approved Fire license. The existing Fire License will be updated. Existing Fire License is enclosed.

- **Fire Water Supply:** an underground water reservoir of capacity 1 lakh lit will be provided for firefighting purpose in case of emergency along with overhead storage tank of 20 KL capacity. Dedicated supply of firewater will be made available in the plant. Foam tank will be provided to mitigate in case of fire.

- **Fire Detection and Alarm System:** Unit shall provide automatic fire detection system which includes heat, smoke detector to give audio alarm. This in turn helps in early detection of the fire and to start fire-fighting activity at early stage.

- **Sprinkler system:** Sprinklers will be provided in chemical storage area.

- **Fire Extinguishers:** Fire Extinguishers will be placed throughout the premises.

14. Project Benefits

The establishment of the proposed project of manufacturing Specialty Chemicals will enable Indian industries to get customized, user friendly and safe chemicals from the domestic market. It will encourage growth of industrial sector in local area. Further, there will be increased revenue to the government in the form of taxes & duties which will find its way to support and development of the region over all.

15. OCCUPATIONAL HEALTH

Direct exposure to chemicals or raw materials may affect health of employees. Chemicals used for process is handled in closed handling facilities. Personal Protective Equipment (PPE) i.e., hand gloves, safety goggles, safety shoes, safety helmets, respiratory masks etc. will be provided to all the to all workers, as per requirement.

The project proponent shall follow a medical program of pre-employment screening, periodic medical examination, emergency treatment and record keeping and review. The pre-employment screening and periodic medical examination shall follow the guidelines of factories act. The pre-employment screening shall obtain medical history, occupational history followed by physical examination and baseline monitoring for specific exposures. All employees have to undergo yearly medical checkups.

16. Greenbelt Development:

Approx. 1558 Sqm [33%] of plot area has been already developed under green belt within the existing premises. Native tree species such as mango, neem, gulmohar, hibiscus, Ixora etc. have been planted; tall trees on the outer row and shrubs on inner row.

Additionally, a thick green area of approx. 15m width has been developed outside the premises on east along the boundary adjacent to SH 13. Greenery development work will be continued throughout the life of the project.

17. Environment Management Plan

The management plan has been prepared after evaluating various mitigation and control measures to address the impacts identified, predicted and monitored. In order to implement the recommended mitigation measures during operation phase, budgetary provision of INR 8.5 lakh as capital expenditure and INR 3.4 lakh as annual expenditure has been planned. Environmental awareness programs for the employees will be conducted. Cleanliness and hygiene will be ensured in the plant.

Summarized Environment Management Plan during Post Project Operation Phase

Particulars	Mitigation Measures	Responsibility
Air Environment During Operation Phase	Fugitive Emission / Diffuse Emission • Closed transfer of solvents and other raw materials from respective storage to reactors in the production blocks. • Air operated diaphragm (AOD) pumps for drum transfer • Powder Transferring system • Mechanical seals will be provided for all the reactors. • Good House Keeping Practices & Predictive Preventive Maintenance to ensure that emissions, leakages & spillages are contained. • Personal Protective Equipment (PPE) will be provided to workers. • Periodic proactive maintenance to be conducted. • Proper work area ventilation will be provided. Point Source of Emissions • No additional point source of emission due to the proposed project as existing utility units will be sufficient to cater the proposed project. • Clean fuel LPG is used in existing pot furnace, hot air generators. • A small back up diesel generator set of 30 KVA used as back up during power cut. • Pot furnace, hot air generators, DG sets are already provided with individual stacks of adequate height as per norms. The unit has already developed adequate green area of approx. 1558 sqm [33.32%] within the premises. Additionally, the company has developed a thick green belt outside the boundary along SH13.	Env. Management Dept.

Water Environment During Operation Phase	• Industrial wastewater will be treated in existing onsite ETP and recycled within the premises to the extent possible. Rest if any, will be discharged to outside drain. • Domestic wastewater will be disposed through septic tank and soak pit. • No untreated effluent will be discharged outside. • ETP inlet and outlet effluent monitoring will be done regularly to check the working of ETP. • Stormwater runoff will be discharged separately to outside nallah on east of the project site along SH 13. • Proper collection, segregation and disposal of solid wastes as per norms. • Proper storage and disposal of hazardous wastes. • Separate storage of raw materials and liquid chemicals on impervious floor. • Ensure prompt cleaning up of accidental spillages, if any.	Env. Management Dept.
Solid Waste During Operation Phase	• Some quantities of hazardous wastes are generated from the existing unit which are stored temporarily within the premises and disposed through common HWTSDF. The unit has obtained HW authorization from Pollution Control Board and also has an agreement with West Bengal Waste Management Limited. • **Additional Hazardous wastes** likely to be generated from the proposed project are – 1) ETP sludge – stored onsite safely and disposed through authorized agency to the common HWTSDF. 2) Empty barrels/containers/liners contaminated with hazardous chemicals /wastes – Disposed through the authorized recyclers. • HW Authorization will be renewed with additional waste generation details. • Record keeping and submission of returns to be continued as existing as per rules. • **MSW** – to be disposed through authorized vendor as per local body norms.	Env. Management Dept
Noise Environment During Operation Phase	• Regular equipment maintenance and better work habits will be adopted. • Generator set is already provided with acoustic enclosure. • Necessary safety and personal protective equipment such as ear plugs, ear muffs etc. will be provided to the workers • Maintaining the existing green belt within the premises and outside the premises to reduce the noise level.	Env. Management Dept
Occupational Health of Employees	• First aid facility shall be provided by the staff. Serious cases will be referred to nearby Hospital depending on the need. • Pre-employment and periodic medical examination of all employees. • Provision of masks and ear-muff / ear plugs, helmets to workers.	HR

	• Periodic monitoring of work place ambient air quality [VOC].	
Traffic Management	• Very few additional traffic increase [maximum 2 trucks per day] resulting in negligible additional impact due to proposed project. • Adequate truck parking place already existing within the premises. Vehicles are parked strictly within the premises. • Separate entry and exit gate for trucks and employees/visitors. • Provision of rest room with toilets.	HR and security
Greenbelt Development	• 33% [1558 Sqm] already developed green area within the premises. • Additionally, thick greenbelt has been developed outside the boundary along the SH13. • Fast growing perennial, evergreen and ornamental plants of local species have been selected in green belt.	Management
Risk Mitigation	• Standard recommended separate storage of hazardous chemical with fire proof arrangement and hydrocarbon detector. • Standard recommended risk mitigation measures for reducing spillages, fire, burns, injury, and avoiding accidents etc. during operation phase of the project shall be implemented. • Comprehensive DMP shall be prepared before commencement of plant operation. • Mock drills shall be done on regular basis. • Safety data sheets of the chemicals will be displayed at specific locations (near the storage and handling areas). • Firefighting facilities will be established as per Fire approval. The existing approval from the Fire Department will be updated. • Personnel involved in handling of the hazardous chemicals will be properly trained and made aware of the safety data and related first-aid measures.	Plant Incharge
Monitoring the pollution levels, Data keeping, transmitting and implementing ISO systems	As per Environmental Monitoring program	Management

Proposed EMP Budget during operational phase

Environment Budget (operational phase)		
Component	**Capital Cost (in INR lakh)**	**Recurring Cost (in INR Lakh/ Annum)**
Water Pollution control [ETP, segregation of effluent, treatment, recycling etc.]	07	01
Solid waste Management [Non-hazardous, hazardous and MSW]	Nil	01
Landscaping and maintenance of existing greenbelt	Nil	0.5
Occupational Health	Nil	0.2
Plant Safety and Risk mitigation measures	1	0.1
Environment Management Dept. Staff, furniture, computers and printers	0.5	0.1
Environment Monitoring & reporting through existing Inhouse Facility and external agency	Nil	0.5