## EXECUTIVE SUMMARY

### ES-1 Introduction

**Fig. ES -1: Google Earth Image: Delta Finochem Pvt. Ltd.**

The expansion project is a Brownfield Project. As per the Environment Impact Assessment Notification 2006 & recent amendments till date, the project comes in Schedule 5 (f) Category - A under Synthetic Organic Chemicals Manufacturing Units. The company has been classified as small Scale Industry and is categorized under Red category industry by Maharashtra Pollution Control Board. The company is located at Gut no. 350/1, 350/2, 350/3, village Wadivarhe, Taluka Igatpuri, district Nashik, State Maharashtra.

### ES-2 History of the project

M/s. Delta Finochem Pvt. Ltd. is an API, intermediates and synthetic organic chemicals manufacturing industry. The company was established in 1978. It has started its present manufacturing unit in 1994. Presently the company have valid EC F. No. J-11011/162/2011-IA-(II)-I dt. 31/03/2015 and valid consent to operate no. Format 1.0/BO/AS(T)/ NK-18813-15 & NK-19238-15/R-O-A/ GEN- 05810 dated 04/05/2016. Now the company has proposed additional manufacturing capacity to the tune of 11397.3 MT/year of APIs and intermediate chemicals and 1380 MT/year of by-products. The total manufacturing capacity will be 13619.3 MT/year for API and intermediate chemicals and a by-products with a capacity of 1380 MT/year.

**Table No. ES-1: Salient Features of the Project**

| Sr. No | Component | Status | | |
|---|---|---|---|---|
| 1 | Product Type | API and Intermediate chemicals | | |
| 2 | Project Type | expansion | | |
| 3 | Schedule as per EIA Notification,2006 | 5(f) | | |
| 4 | Category of Project | 'A' | | |
| | | | | |
| 5 | **Area Details (in Sq.m.)** | | | |
| | | **Existing** | **Proposed** | **Total** |
| i. | Total Plot Area | 20200 | 60400 | 80600 |
| ii. | Built-up Area | 9500 | 15000 | 24500 |
| iii. | Parking area | 1500 | 6560 | 8060 |
| iv. | Greenbelt Area | 5273.18 | 10265.55 | 15338.73 |
| | | | | |
| 6 | **Production Details (MT/A)** | | | |
| | | **Existing, MT/A** | **Proposed, MT/A** | **Total, MT/A** |
| | **Products** | | | |
| | API | 240 | 1839.8 | 2079.8 |
| | Intermediates | 1982 | 9557.5 | 11539.5 |
| | **Total** | **2222** | **11397.3** | **13619.3** |
| | **By-products** | **0** | **1380** | **1380** |
| | | | | |
| 7 | **Budgetary Allocation (in Rs. lakhs)** | | | |
| i. | Project Cost | 2005.48 | | |
| ii. | EMP Cost | 270 | | |
| | Recurring EMP cost | 45.55 | | |
| | | | | |
| 8 | Man power | 180 | 100 | 280 |
| | | | | |
| 9 | **Power Requirement** | | | |
| | Connected Load (KW) | 650 | 350 | 1000 |
| | | | | |
| 10. | **Fuel Requirement** | | | |
| i | Boiler : FO (MT/month) | 19 | 21 | 40 |
| ii. | D.G. set: HSD (L/hr) | 60 | 60 | 120 |
| | | | | |
| 11 | **Utility Capacity** | | | |
| i. | Boiler (T/hr) | 1.1 | 3.5 | 1.1 TPH boiler (standby)<br>3.5 TPH boiler (Primary) |

| | | | | |
|---|---|---|---|---|
| ii | D.G. Set (KVA) | 550 | 550 | 2*550 |
| | | **Existing** | **Proposed** | **Total** |
| iv | Water Consumption (CMD) | 46 | 513 | 559 |
| | | | | |
| 12 | **Scrubber Details** | | | |
| | Scrubber (water circulation flow) | 25 cu.m/hr * 3 | 25 cu.m/hr * 2 | 25 cu.m/hr * 5 |
| | | | | |
| 13 | **Stack Details** | | | |
| i. | Boiler Stack | 30 m | 30 m | 2 boiler stacks of 30 m Height |
| ii. | Scrubber Stack | 3*11 m above ground | 2*11 m above ground | 5 scrubber stacks 11 m above ground. |
| iii. | D.G. Set | 10 m above ground | 10 m above ground | 2 stacks of 10 m high above ground. |
| | | | | |
| 14 | **Effluent Details** | | | |
| i | Sewage (CMD) | 4.0 | 6.0 | 10.0 |
| ii | Effluent treatment | Effluent is treated in ETP consisting of primary, secondary and tertiary treatment. Treated effluent is purified by RO plant and permeate is used for industrial processes. RO reject is treated in MEE and MEE condensate flow is connected to aeration tank of ETP | | |
| iii | Effluent (CMD) | 11.3 | 52.3 | 63.6 |
| | | | | |
| 15 | **ETP Details** | | | |
| i. | Sewage treatment | Sewage is treated in septic tank and the overflow is mixed with process effluent in aeration tank of ETP. | | |
| ii | ETP capacity (CMD) | 15 | 135 | 150 |
| | The existing project is ZLD project. The expansion will also be run as ZLD unit | | | |
| | | | | |
| 16 | **Details of Hazardous Waste** | | | |

| | **Particulars** | **HW Category*** | **Existing** | **Proposed** | **Total** | **Method of Disposal** |
|---|---|---|---|---|---|---|

| | | | | | | |
|---|---|---|---|---|---|---|
| i. | Distillation residue | 20.3 | 1 MT/month | 10 MT/month | 11 MT/month | CHWTSDF, Ranjangaon |
| ii. | Spent Solvents | 20.2 | 10 kL/month | 50 kL/month | 60 kL/month | Recycle, reuse/sale to authorized party, CHWTSDF, Ranjangaon |
| iii. | Discarded containers barrels/liners/ plastic bags/ PPE etc | 33.1 | 300 nos/month | 900 nos/month | 1200 nos/month | CHWTSDF, Ranjangaon /Sale to authorised party |
| iv. | Chemical sludge from wastewater treatment | 35.3 | 0.58 MT/A | 29.42 MT/A | 30 MT/A | CHWTSDF, Ranjangaon |
| v. | Evaporator residue | 37.3 | - | 1.5 MT/d | 1.5 MT/d | CHWTSDF, Ranjangaon |

| 17 | **Details of Non-Hazardous Waste** | | | | |
|---|---|---|---|---|---|
| i. | Particulars | Existing | Proposed | Total, | Method of Disposal |
| | Office waste & plastic scrap | 5 kg/day | 3 kg/day | 8 kg/day | Sale to MPCB approved scrap dealers |

*Schedule I, The Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016

**ES-3 Justification of project**

With the purpose of narrowing the bridge between demand and supply of API and intermediate chemicals in domestic and global market and to manufacture product as per current demand scenario. There will be some employment generation for semi skilled and unskilled labour for the local population. The present market change and demand of different types and class of APIs in the market led the proponent to change the production capacity of existing products and introduction of new products.

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**ES-4 Process Description:** The process of the company is depicted in Figure. ES - 2.

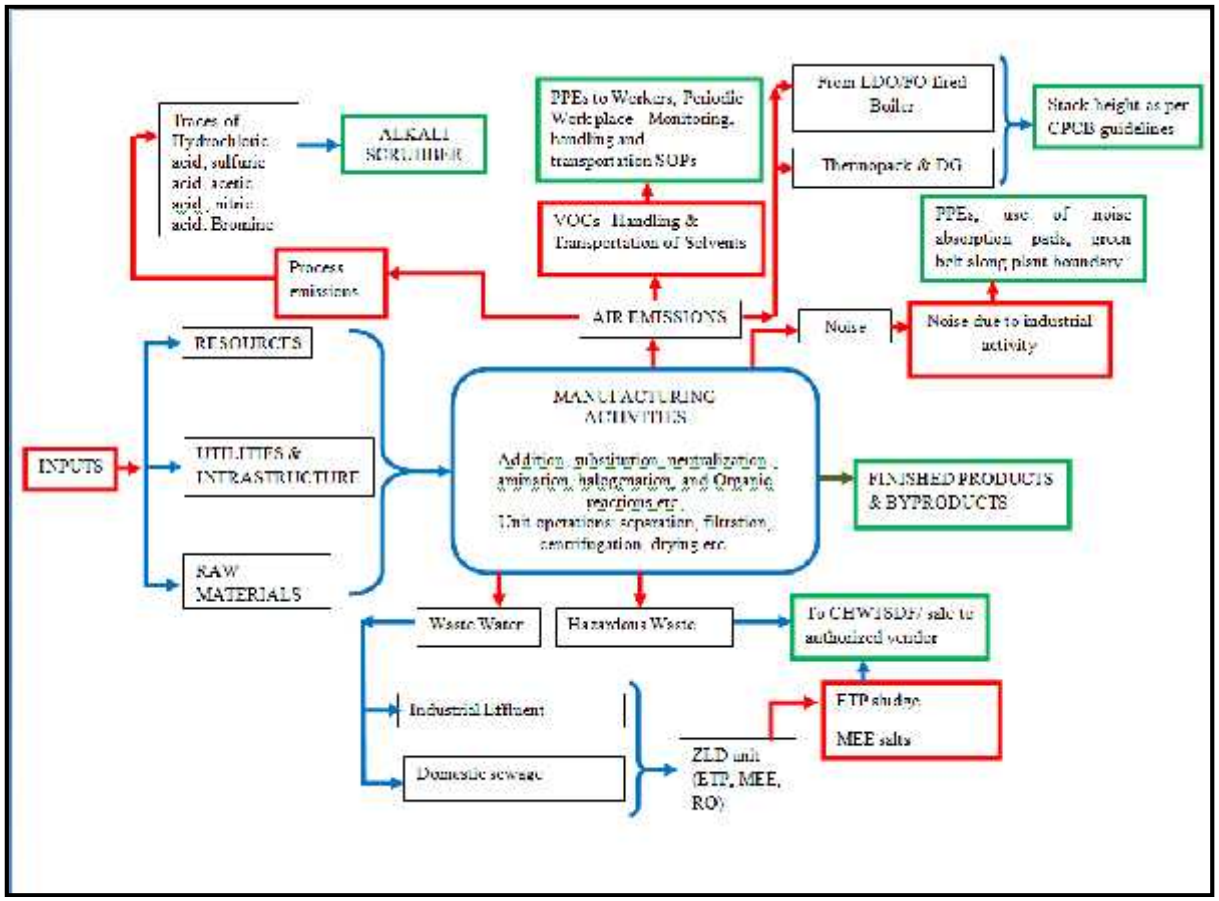


**Figure No. ES-2: Process Description Diagram**

**ES-5 Baseline Environmental Status**

The study area is 10 km radial distance from centre of existing plant site. All the monitoring has been completed in various locations within the study area during the period of October 2017 - December 2017. The findings of the baseline environmental status on Land (Topography, Soil Quality, Land Use Pattern), Micrometeorology (Temperature, Humidity, Rainfall, Wind Speed), Air (Ambient Air Quality - PM10, PM2.5, SO2, NOX, CO), Noise Level, Ecological Environment (flora and fauna), Socio Economic Conditions are presented in the report and interpreted with reference to Standards.

**ES-5.1 Air Environment**

**$PM_{10}$**

The study reveals that maximum concentration was observed to be in the range of 67.3 & 86.1 µg/m$^3$. The highest 24-hourly concentration was recorded at sampling location A1 which is an industrial premises. Although the industry is not located in the industrial estate it is surrounded by many other industries which ultimately add to the traffic load in the subjected area. At the same time minimum concentration was observed at location A4 which is a remote area. The average concentration of $PM_{10}$ can be said to be ranged between 61.9-81.0 µg/m$^3$. The minimum concentration at location A4 (Sanjegaon) can be said due to its remote location and minimal human activity in and around the monitoring station. Therefore experiences minimal levels of pollution.

**$PM_{2.5}$**

The major source of $PM_{2.5}$ is said to be the combustion of fossil fuels, fire wood, etc. The maximum of $PM_{2.5}$ (48.2 µg/m$^3$) during the study period was recorded at location A1, whereas the minimum 24.5 µg/m$^3$ concentration was recorded at A5 location which is a remote area. The minimum concentration indicates that the area experiences minimal combustion and vehicular activity. On the other hand high concentration at location A1 indicates that the area experiences high emissions from combustion of fossil fuel and vehicular movement in the surroundings. The average concentration of $PM_{2.5}$ during the study period was computed to be in the range of 27.8-38.3 µg/m$^3$. It should be noted that the concentration of $PM_{2.5}$ was observed to be within the standards prescribed by the CPCB.

**Sulphur dioxide ($SO_2$)**

High level of $SO_2$ in ambient air indicates the presence of combustion of fossil fuel in the vicinity. The ambient air monitoring results indicate that the highest average concentration of $SO_2$ is experienced at location A1. The emission from other industries & constant traffic and regular movement of heavy vehicles which are diesel driven around the project area can be considered as the principle source of emission for $SO_2$. The average concentration of $SO_2$ recorded at all the monitoring locations during the study period ranged between 9.1-13.1 $\mu g/m^3$ respectively. It should be noted that maximum average concentration was recorded at location A1 while the lowest can be observed at location A4. The location A4 is scarcely populated and is remotely located. Hence low levels of anthropogenic activities and emissions are observed in the area. The concentration of $SO_2$ was within the CPCB limit at all the location.

**Oxides of Nitrogen ($NO_X$)**

The various forms of Nitrogen in NO, $NO_2$ and $N_2O$ are collectively called as Oxides of Nitrogen. The highest value of $NO_X$ during the monitoring period was observed at location A1 while the minimum average was recorded at A4. The average concentrations were in the range of 19.1-28 $\mu g/m^3$. The maximum 24 hourly value of $NO_X$ was recorded at the monitoring location A1 (32.1$\mu g/m^3$) whereas the minimum concentration of NOx was recorded at location A5 (13.2 $\mu g/m^3$). It should be noted that the both location A4 & A5 experience less vehicular activity resulting in minimal concentration of pollutants.

**Carbon monoxide (CO)**

The anthropogenic source of CO is due to incomplete combustion of fuel majorly in absence of air. The maximum concentration of CO estimated at all locations during the study period can be observed to be within 0.8 to 2.3 $mg/m^3$ respectively. The minimum concentration at all locations ranged between 0.4 - 0.9 $mg/m^3$. The highest average is calculated at location A1 and the lowest average was estimated to be at location A4 in Sanjegaon.

**Hydrochloric Acid (HCl)**

The results revealed that the values of HCl were detected to be below the minimum detection limit at all the monitoring locations.

**VOC.**

Based on the above results it can be stated that the values of VOC were found to be below detection limit at all the monitoring locations.

**Monitoring of Additional Parameters:**

The monitoring for additional parameters in ambient air namely Ozone, Lead, Ammonia, Arsenic, Nickel, Benzene & Benzopyrene (a) was conducted within the project premises (A1 location). The results for these parameters are presented in Table 3.6.

The analysis of additional parameters monitored for ambient air quality at the location A1 reveals that the values did not exceed the limits prescribed by CPCB, during the sampling period. The concentration of Ammonia varied between 68 to 93 $\mu g/m^3$. The average concentration of Ammonia was estimated to be 84 $\mu g/m^3$. The values of Ground level ozone were estimated to be within the range of 28 to 38 $\mu g/m^3$. The average concentration was computed to be 31 $\mu g/m^3$. The presence of heavy metals such as lead, arsenic and nickel & Benzene, Benzo (a) pyrene were estimated to be below the detectable limits and thus their presence can be said to be negligible.

**Conclusion:**

The descriptive statistics of the monitoring at all the locations are indicating that pollution levels did not exceed the standards prescribed by the CPCB.

It should be noted that $98^{th}$ Percentile values computed at all the sampling locations were similar to the maximum value observed at most of the locations indicating a negligible variance in the observations obtained.

Furthermore, the additional parameters monitored at the sampling location no. A1 indicated that even those parameters did not exceed the standards provided by CPCB.

It can be concluded that the background air quality around the project area is not polluted as the parameters were well within the prescribed CPCB limits.

***ES-5.2 Noise Environment***

Noise monitoring was conducted as per the standard operating procedures.

**Industrial Zone**

The day time noise level at the project premises was observed to be 69.0 dB (A) while during night time the noise level was recorded to be 58.4.0 dB (A). It should be noted that the noise levels during the day time as well as night time were estimated to be under the prescribed standards by Central Pollution Control Board.

**Residential Zone**

The noise monitoring conducted at seven locations for 24hr, once in a week and average hourly readings were recorded. The minimum noise level recorded during the daytime was observed at location N6, where as the maximum noise levels can be observed at location N2. The location N2 is densely populated village and hence can give rise to high noise level in the surroundings. It should be noted that the permissible limits for noise did not exceed at any of the locations selected for sampling.

***ES-5.3 Water Environment***

- ***Surface Water Study***

The results presented in the earlier section are discussed and concluded in this section. The values obtained are compared with the standards prescribed for the respective designated use of the water body as categorized in the earlier part of the study. The analysis helps to concluded that the pH of all the samples was found to vary between: 7.4 – 8.2. It should be noted that the values obtained were within the desirable limit for pH as prescribed by CPCB. The total hardness was observed to be ranging between 187 to 296 mg/l. The maximum value of hardness was recorded at SW6 and the minimum value was recorded at SW1. The concentration of Total Dissolved Solids was estimated in the range of 248 mg/l to 340 mg/l. The maximum concentration of Total Dissolved Solids (TDS) was observed at SW7 whereas the minimum TDS concentration was observed at SW2. The Chemical Oxygen Demand (COD) & Biochemical Oxygen Demand (BOD) values were calculated to be in the range of 9.2 mg/l to 19.3 mg/l & 4.2 mg/l to 6.4 mg/l respectively.

The presence of heavy metals like Arsenic, Mercury, Lead, Chrominum, Zinc, Nickel & Cadmium were found out to be below the detection limit for all the water samples. It should be noted that the iron content in all of the samples of surface water bodies were below the detection limit. Fluoride was detected in lower concentrations ranging from 0.22-0.4 mg/l. The nitrate concentration was observed to be in the range of 1.5 - 6.6 mg/l. The

microbiological samples for total coliforms were found to be present in all the surface water bodies samples. Ecoli was present in location SW3, SW5, SW6, SW7 & SW8 rest in all the other location it was absent. It should be noted that in case of the selected water bodies (SW1 to SW5) classified under category "B", the parameters were found to be below the prescribed limits except for BOD concentration. It can be continued for its designed use as per Inland Surface Water Standards after disinfection and necessary treatment.

The results for location SW6 to SW8 categorized in category "E" indicated that all the parameters were found to be within the prescribed limits.

- ***Ground Water Study***

The above results indicate that the pH of all the ground water samples was within the prescribed standards following in the range of 7.1 - 7.8.

The concentration of heavy metals like arsenic, chromium, lead, mercury, nickel & cadmium were below the detection limit. Iron was not detected in any of the ground water samples. Zinc was observed in the range of <0.1-1.9 mg/lit which is well below the acceptable standards of IS: 10500:2012.

The hardness of all the ground water samples was found to be ranging between 162-593 mg/lit. The value of hardness was exceeding the acceptable limit but was within the permissible limit at all the locations. It should be noted that some of the ground water samples in the study area can be termed as hard water.

It can be observed that the values for total dissolved solids in all the sampling locations were estimated to be under the permissible standards for drinking water. The concentration of total dissolved solids ranged between 132-529 mg/lit. The maximum concentration was observed at location GW 1 whereas the minimum concentration was observed at GW5.

It should be noted that the microbiological analysis of all the samples indicate that e-coli was absent in all the ground water samples. The presence of total coliforms in all the samples is indicating that the anthropogenic activity in the surrounding area can be a possible source of contamination.

The fluoride concentrations is ranging between 0.2 - 0.6 mg/l. The presence of the fluoride in all the water samples is mostly due to geogenic in nature. The nitrates concentrations were ranging between 3.0 -11.2 mg/l well below the acceptable limits of drinking water. The probable sources of nitrates in the ground water could be the use of fertilizers in the nearby agricultural activity. The nitrate concentrations are higher in the study area which was compared with the secondary data of Govt. Of India, Ministry Of Water Resources, Central Ground Water Board 2014.

The COD and BOD values of all the ground water samples were found to be below the detection limit.

Thus based on the above results it can be stated that the water from the said samples can be considered fit for domestic purpose with basic primary treatment.

***ES-5.4 Soil Environment***

The findings of the study reveal that pH of the soil in the study area ranged between 7.1 – 8.3 which is an indicative of the neutral to slightly alkaline nature of soil. The values for Nitrogen at all locations varied between 40.35 - 65.25 kg/ha. Maximum concentration of nitrogen was observed at location S6.

The concentration of phosphate was estimated to be between 15.45-25.2 kg/ha. The highest concentration can be observed at location S8, while the lowest concentration can be observed at location S5.

It is important to note that the concentration of potassium was found to be ranging between 158.4 to 511.8 kg/ha.

Based on the above findings it can be concluded that the soil samples can be classified as per table 3.19 falls under less to medium fertile soils. The presences of heavy metals in all the soil samples were below the detection limit except the concentration of chromium which is 0.5-3.4 mg/kg.

***ES-5.5 Biological Environment***

The proposed project activity does not involves any sort of habitat loss also of the recorded 89 plant species, 34 faunal species from primary data and 11 faunal species from secondary data none belongs to any categories of concern as per IUCN assessment and nor is listed Schedule - I (fauna) as the WPA (1972).

Of the recorded plant and animal species none was rare, endemic & did not belong any categories of concerns moreover the recorded plant & animal species were extremely common for the study area and had a very wide range of presence & abundance across the entire Nashik district.

Moreover the proposed project activity does not pose any threat to any species of conservation importance also does not involve any sort of liquid or solid discharge/disposal on the ground or in the water bodies within the study area & project plot being located well within the precincts of an area which already prevails industrial type of use no adverse impacts are anticipated on the surrounding biotic environment.

### *ES-5.6 Socio Environment*

The objective was achieved analyzing the data collected through the assessment tool mentioned in method section above. To avoid repetition and to maintain simplicity the findings of the actual survey are presented in tabular form.

**Table No. ES-2: Descriptive Statistics indicating mean and standard deviation (N=5 0)**

| Variables | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|
| Age | 19 | 66 | 32 | 11 |
| Accessibility & satisfaction | 13 | 27 | 18 | 06 |
| Impact | 14 | 32 | 19 | 7 |
| Attitude towards Delta Finochem Pvt. Ltd | 21 | 37 | 28 | 8 |

**Correlation analysis & interpretation:**

The data collected by the assessment tool had three variables namely; accessibility of public resources and its satisfaction, impact of industrial activity of Delta Finochem Pvt. Ltd and attitude towards Delta Finochem Pvt. Ltd. The data of 50 participants was put for correlation analysis. The data was found to be normally distributed hence; the data fulfils the assumptions of parametric statistics. Based on this information Pearson product-moment correlation was conducted.

It is found that accessibility of public resources and its satisfaction is significantly correlated in positive direction with impact of Delta Finochem Pvt. Ltd activity (r = .78; p = .02). This indicates that accessibility of public resources will lead to low impact of industry activities and vice versa. Accessibility of public resources and its satisfaction is also found to be significantly correlated with attitude towards Delta Finochem Pvt. Ltd. industry activity (r = -.42; p = .08) but in negative direction. This indicates that accessibility due to accessibility of public resources there is positive inclination for Delta Finochem Pvt. Ltd. industry activity in the study area. Further, it is also found that impact of industrial activity is significantly correlated with attitude towards industrial activity (r = -.51; p = .02). This indicates that due to low impact there is positive attitude towards among the participants in the study area (Table 3.29).

**Table No. ES-3: indicating Pearson's correlation among variables** (N=50)[1]

| | Accessibility & satisfaction | Impact | Attitude towards Delta Finochem Pvt. Ltd. |
|---|---|---|---|
| Accessibility & Satisfaction | 1 | - | - |
| Impact | .78** | 1 | - |
| Attitude towards Delta Finochem Pvt. Ltd | -.42* | -.51 | 1 |

** Correlation is significant at the 0.02 level. * Correlation is significant at the 0.08 level.

**Conclusion:**

This finding indicate that the sample is somewhere satisfied with the accessibility of public recourses and the activity of the industry Delta Finochem Pvt. Ltd. will not hamper or impact

in any way to them. Hence, the attitude towards industrial activity is also found to be favorable.

**ES-6 Prediction of Impacts & Mitigation Measures**

The summary of mitigation measures is presented in tabulated format in Table ES-4

**Table No. ES-4: Summary of Impacts & Mitigation Measures**

| A) Construction Phase | | | | |
|---|---|---|---|---|
| **Sr. No** | **Environmental Parameters** | **Aspect Attributes** | **Impact** | **Proposed Mitigation Measures** |
| 1. | Air Quality | Minor dust emissions from handling & transportation of cement/concrete/ stone aggregates. | Workers getting exposed to the dust pollution generated due to the construction activity can suffer from respiratory problems and prolonged exposure can lead to malfunctioning of lungs. | Traffic management for loading and unloading of the materials. Regular sprinkling of water on the working site, Avoiding Cement dust emission, Managing stockpiles. Creating wind barrier for controlling the dust emissions. |
| 2. | Noise Quality | Noise generated from construction equipments/machinery like spade, shovel, dabber, drill, hammer, concrete mixer etc. Transportation of construction materials. | The impacts of high noise level would be Temporary/Permanent hearing loss, Mental disturbance, Increase in heart rate, Affecting worker's performance. | Appropriate PPEs will be provided to the workers. Implementation of Traffic management. Development of Green belt. |
| 3. | Water Quality | Water used for construction activity mainly for concrete mixing, sprinkling etc. | Contamination of the soil and nearby water bodies due to the surface runoff. | Proper surface water runoff management would be implemented. Storm water drain would be provided. |
| 4. | Solid Waste Management | No demolition work is envisaged | Unhealthy Work Conditions at project site. | The solid waste generated in the construction phase |

| | | | | |
|---|---|---|---|---|
| | | however minor quantities of solid waste generation is anticipated in the form of concrete/construction materials left over. | | would be disposed off through local Municipal Corporation. |

**B) Operational Phase**

| Sr. No. | Environmental Parameters | Aspect Attributes | Impact | Proposed Mitigation Measures |
|---|---|---|---|---|
| 1. | Air Quality | Operation of Boiler<br>Gaseous emission from manufacturing process, Non spontaneous emissions from Transportation of raw materials & finished goods.<br>VOC emission generated due to the handling and storage of the solvents & other raw materials. | The Maximum Incremental concentration of pollutants are,<br>$PM_{10}$ - 0.13µg/$m^3$<br>$PM_{2.5}$ - 0.1µg/$m^3$<br>$SO_2$ – 6.38 µg/$m^3$<br>NOx - 0.11 µg/$m^3$ & CO-0.00001 mg/$m^3$<br>The Health effects related to particulate matter are majorly respiratory, pulmonary injury & lung cancer etc. Exposure to $SO_2$ and NOx majorly leads to respiratory problems. Carbon monoxide decreases the oxygen carrying capacity of the blood by reducing the hemoglobin. The health effects related to VOC emission are eye, nose and throat irritation headaches, loss of coordination and nausea, damage to liver, kidney and central nervous system etc.<br>The air emissions in | 1. The existing boiler have stack of 30 m height additional boiler also will be provided appropriate Stack of 30 m<br>2. 2 alkali & 1 acid scrubbers of 25 cu.m/hr circulation capacity are used presently to scrub the process emissions. Two additional alkali scrubber of 25 cu.m/hr capacity will be installed to effectively scrub the gases from the manufacturing process.<br>3. The roads within the premises are paved to avoid the dust generation from vehicular activity. In the expansion project the roads will be paved to reduce dust generation<br>4. It will be ensured that all the transportation vehicles have a valid PUC (Pollution under Control) Certificate.<br>5. Proper servicing & maintenance of vehicles will be carried out.<br>6. Regular sweeping of all the roads & floors will be done. |

| | | | | |
|---|---|---|---|---|
| | | | long course of time may affect the immediate surrounding vegetation stature physically (leaf senescence, hampered growth etc.) & biologically thus may affect the overall surrounding ecology. | 7. The existing thick green belt along the plant boundary will help to capture the fugitive emission. Additional 10 m wide green belt will be developed around plant boundary to reduce fugitive emissions in atmosphere.<br>8. Industry shall ensure that at no point of time the air emission concentrations exceed the prescribed standards. |
| 2. | Noise Quality | Operation of Boiler, Reactors, ancillary utilities & transportation activity. | The impacts of high noise level would be Temporary/Permanent hearing loss,<br>Mental disturbance<br>Increase in heart rate<br>Decreasing in workers performance due to psychiatric disorder<br>Workers developing Tinnitus due to high level of noise exposure on regular basis.<br><br>The increased noise level may induce locale level disturbances/ temporary migration of fauna in the immediate vicinity of the project area. | 1. Acoustic enclosure will be provided to the high noise generating equipments for attenuation of noise level during operation.<br>2. Boilers will be placed in a confined space viz. boiler house where the surrounding walls acts as a barrier for noise propagation.<br>3. Isolation of high intensity noise generating equipments.<br>4. Using engineering controls for reducing the noise level.<br>5. Appropriate traffic management to be implemented.<br>6. Green belt developed around the company premises will acts a noise barrier.<br>7. Appropriate PPE should be provided to workers. |

| | | | | |
|---|---|---|---|---|
| 3. | Water Quality | 1. Effluent from manufacturing process.<br>2. Effluent from Scrubber operations<br>3. Blow down water from Boiler and Cooling Tower.<br>4.Domestic wastewater | Indiscriminate release/discharge of effluents may contaminate the surrounding surface and groundwater & there by affecting the overall ecology & agricultural productivity. | The present ZLD treatment scheme will be continued after expansion.<br><br>1. The HTDS effluent from manufacturing process along with Blow down of Boiler & Cooling Tower and RO reject stream is treated in MEE. The recovered /condensate water is then sent to ETP for further treatment. The MEE salt is disposed to CHWTSDF, Ranjangaon.<br><br>3. Low COD/TDS effluent, domestic effluent & Condensate from salt recovery unit is treated in the ETP comprising primary, secondary and tertiary treatment stages.<br><br>4. Treated effluent from ETP is further treated by RO system. The RO permeate is used for process use and RO reject is treated in MEE. |
| 4. | Solid Waste Management - Hazardous Waste | 1. Hazardous waste generated from the manufacturing process.<br>2. Sludge generated from the ETP operation.<br>3. Residue generated from the MEE operation. | Unscientific handling & disposal may lead to contamination of surrounding soil, water sources & there by affecting the ecology & health of the workers coming in direct contact with the hazardous waste like skin allergies/rashes/burns etc. | 1. Hazardous waste, empty containers generated from the manufacturing process presently disposed to CHWTSDF, Ranjangaon.<br>2. Sludge generated from the ETP operations are disposed to - CHWTSDF, Ranjangaon.<br>3. Waste salt generated from MEE is presently disposed to - CHWTSDF, Ranjangaon. |

| | | | | |
|---|---|---|---|---|
| | | | | In future same practice will be followed. |
| | Solid Waste Management - Non Hazardous waste | 1. Scrap Metal<br>2. Scrap Plastic<br>3. Office Waste<br>4.Food Waste<br>5. Carboys & wooden pellets | 1.Hap-Hazard handling & storage may lead to inadequate open space in plant premises & it may lead to rodent breeding. | Designated area for Scrap materials is provided in the plant.<br><br>Scrap materials is recycled through registered scrap vendors.<br><br>Daily housekeeping waste and small amount of food waste is disposed through local waste management facility. |

**ES-7 Risk Assessment Study**

Risks likely to pose harm to man, environment or property associated with various activities are addressed in this report. Such activities include transport, storage; handling and usage of hazardous raw materials & fuels etc. To calculate the risk involved in the process of the proposed project; ALOHA 5.2.2 is performed for all tanks. Based on the unsafe distances identified by the software output, the MCLS (maximum credible loss scenario) for the factory works out to about 8100 meter for Hydrochloric acid gas release. The scenario considered for assessing

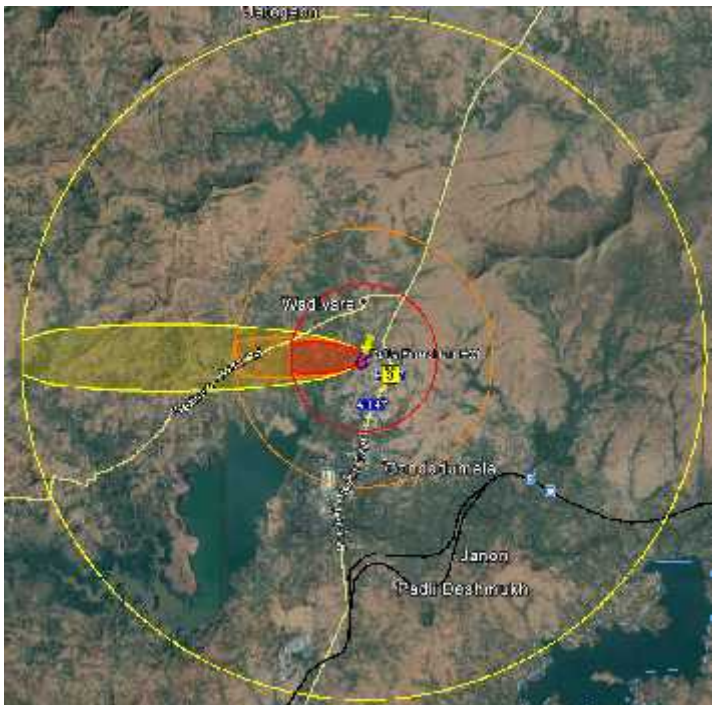


**Fig. ES- 3 Maximum credible Loss Scenario: M/s Delta Finochem Pvt**

the impact by quantitative risk assessment was taken from CPR18 E. The probability of occurrence of the scenario is $5 \times 10^{-7}$ $y^{-1}$ which is very less. The Disaster management plan highlights the suggestive measures to be taken during the occurrence of such an accident. The scenario is presented in adjoining Figurer (Figure. ES- 9).

DOW index was performed for five different materials. The degrees of hazard for all the materials were understand to be light. Fire & explosive Index for ethyl chloroformate was higher than the other materials i.e. 84.09. Therefore the radius and area of exposure was calculated for ethyl chloroformate drum storage. The radius of exposure for ethyl chloroformate is determined to be 21.01 m & area of exposure is around 1386.07 sq. m. The impact would be confined within the factory boundaries. It will lead to an onsite emergency situation which could be handled through appropriate mitigation measures

According to the Mond's Index the highest toxicity is calculated for the storage of ammonia gas i.e. 10.18 indicating high degree of hazard. ammonia is poisonous gas. On direct contact it can result in Breathing difficulties, headache, dizziness, tiredness, nausea and vomiting. To reduce the intensity of the hazard following recommendation and suggestion should be followed.

**ES-8 Disaster management plan**

In view of the chemical industry, Onsite and Offsite Emergency Plans are important hence, has been prepared for the industry. During operational phase, surrounding population shall be made aware of safety precautions to be taken in case of any emergency situation due to the overall project activity. On-site disaster management plan and Off-site emergency management plan, commands communication and controls will be established and maintained. Adequate provisions like emergency response, response organization, response plan, Material Safety Data Sheets (MSDs), command and control, capabilities, transportation, medical facilities, mitigation measures, training, education, public awareness emergency plan review etc. to control any disaster situation will be made available.

**ES-9 CSR Activity**

After establishment of the project, company will carry out following ESC activities

- Initiatives for clean environment in the nearby areas under Swachh Bharat Abhiyan.

- Improving access to quality education for primary level (6-14 years) children for improving their learning levels and ensuring continuity in formal schools.
- To undertake lake cleaning project for increasing the water holding capacity of lakes
- Strengthening primary health centers in nearby community.

The proposed CSR activities and the budgetary allotment for the same is presented in Table ES-5

**Table No. ES-5: List of CSR Activity**

<table>
<tr><th>Cost of Proposed Project</th><th>Cost for the CSR Activity</th><th>Year of Implement ation</th><th>Amount in Rs.</th><th>Activity</th><th colspan="2">Cost estimation</th></tr>
<tr><td rowspan="3">20.06 Cr. is the Project Cost.</td><td rowspan="3">50.15 Lakh.</td><td rowspan="3">2017</td><td rowspan="3">10.80469 Lakh</td><td rowspan="3">Contribution to the prime minister national relief fund.<br><br>Cleaning of lake in village Vellhali, Taluka Igatpuri, District Nashik, Maharashtra to increase the water holding capacity of the lake</td><td>Particulars</td><td>Amount (Approx.)</td></tr>
<tr><td>Prim minister national relief fund</td><td>8,30,469/-</td></tr>
<tr><td>Lake cleaning project.</td><td>2,50,000/-</td></tr>
</table>

<table>
<tr>
<td></td>
<td></td>
<td>2018</td>
<td>9.25 Lakh</td>
<td>Providing modern teaching facilities to schools in Wadiwardhe, Vilholi, Muranmi , Mukane and Gond-Dhumal such as Projector, Computer and Projector Screen .</td>
<td>
<table>
<tr><th>Particulars</th><th>Amount (Approx.)</th></tr>
<tr><td>Computer (10 nos.)</td><td>4,00,000/-</td></tr>
<tr><td>Projector (5 no.)</td><td>3,50,000/-</td></tr>
<tr><td>Projector Screen (5no.)</td><td>50,000/-</td></tr>
<tr><td>Laboratory consumables</td><td>1,25,000/-</td></tr>
</table>
</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2019</td>
<td>10.03 Lakh</td>
<td>2) Organizing Health Check-up camp for nearby villages other nearby village Schools</td>
<td>
<table>
<tr><th>Particulars</th><th>Amount (Approx.)</th></tr>
<tr><td>Normal Health Checkup</td><td>2,50,000/-</td></tr>
<tr><td>Checkup by Eye-Specialist</td><td>2,50,000/-</td></tr>
<tr><td>Checkup by ENT Specialist</td><td>2,00,000/-</td></tr>
<tr><td>Checkup by Dentist</td><td>1,50,000/-</td></tr>
<tr><td>Blood Tests for Blood group, WBC Count, ESR, Platelet Count, etc.</td><td>1,53,000/-</td></tr>
</table>
</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2020</td>
<td>10.03 Lakh</td>
<td>Donation to economically backward patients to avail expensive medical facility<br><br>Lake cleaning project in nearby villages Muranmbi,</td>
<td>
<table>
<tr><th>Particulars</th><th>Amount (Approx.)</th></tr>
<tr><td>Donation for cancer treatment, heart by-pass surgery, angioplasty, joint replacement, dialysis</td><td>5,00,000/-</td></tr>
<tr><td>Lake cleaning by removing</td><td>5,03,000/-</td></tr>
</table>
</td>
</tr>
</table>

<table>
<tr><td rowspan="2"></td><td rowspan="2"></td><td></td><td></td><td>Mukane</td><td>debris from lakes in</td><td></td></tr>
<tr><td>2021</td><td>10.03 Lakh</td><td>Providing basic amenities to the Primary health Care Center located at Vilholi, Gond-Dhumala, Gadgasangvi, Lahangewadi.</td><td colspan="2"><table>
<tr><th>Particulars</th><th>Amount (Approx.)</th></tr>
<tr><td>Heath care center building renovations</td><td>3,00,000/-</td></tr>
<tr><td>Modern equipment in health center</td><td>3,00,000/-</td></tr>
<tr><td>laboratory instruments</td><td>1,00,000/-</td></tr>
<tr><td>Laboratory consumables</td><td>1,03,000/-</td></tr>
<tr><td>Equipment like heart rate monitor, glucometer, blood pressure monitor</td><td>80,000/-</td></tr>
<tr><td>beds</td><td>120000/-</td></tr>
</table></td></tr>
</table>

## ES-10 Occupational Health Measures

The company is strictly implementing the rules of Factories Act 1948 & the Maharashtra Factories Rules, 1963 regarding the occupational health facilities to be provided to the workers of the company. The industry has provided decontamination facilities for the workers. The health records of the workers are maintained. Company has provided Personal Protective Equipments (PPEs) to their all workers, while periodic medical health checkup as Occupational Health & Safety measures is being carried out. For the continuous and continual development, the company will train & educate the operators and workers with the environment, health & safety rules & regulation, procedure and measures.

## ES-11 Post Project Monitoring Plan

Monitoring of environmental parameters shall be done as per the guidelines provide by MoEF/CPCB/SPCB. The method followed shall be recommended / standard method approved/recommended by MoEF/CPCB. The Table ES-6 explains the approach for environmental monitoring program.

**Table No. ES-6: Environmental Monitoring Program**

| Sr. no | Activity/Area | Pollutant | Pollutant Characteristics | Frequency | Period |
|---|---|---|---|---|---|
| OPERATION PHASE | | | | | |
| 1. | Vehicular Movement | Dust Emission | CO, $SO_2$, $NO_X$, SPM in Ambient Air | Intermittent / Periodic | Quarterly |
| 2. | Boiler/Hot Air Generator | Air emissions | CO, $SO_2$, $NO_X$, SPM from boiler | Intermittent / Periodic | Quarterly |
| 3. | Scrubbers | Air emissions | $SO_2$, Acid fumes | Intermittent / Periodic | Quarterly |
| 3. | Boiler Area, ETP, Work Place Area | Sound | Noise Level dB (A) | Intermittent / Periodic | Quarterly |
| 4. | Effluent treatment plant | All parameters | pH, O & G, TDS, TSS, COD, BOD. Heavy Metals & Organic | Intermittent / Periodic | Weekly |

| | | | | | |
|---|---|---|---|---|---|
| | | | Compounds specific to project | | |
| 5. | Hazardous Wastes | E.T.P sludge, MEE residue, Distillation Residue | H.W. characteristics | As per the requirement of CHWTSDF providers | Once in a Year |
| 6. | Work Place | Air pollutants, Heavy metals | Volatile Organic Compounds | Intermittent / Periodic | Monthly |

**ES - 12 EMP Cost & Budgetary Allocation**

The proposed capital investment of the company is envisaged to be 20.05 Cr. rupees and the proposed capital investment for Environmental Pollution Control Measures is around 2.7 Cr. rupees

The cost details for Environmental Management are as below

**Table No. ES-7: Cost details for Environmental Management**

| **Sr. No.** | **Parameters** | **Capital Cost (Rs.)** | **Recurring Cost per annum (Rs.)** |
|---|---|---|---|
| 1 | Air Pollution Control | 40,00,000 | 8,00,000 |
| 2 | Water Pollution Control | 2,00,00,000 | 22,00,000 |
| 3 | Noise Pollution Control | 2,00,000 | 30,000 |
| 4 | Environment Monitoring and Management | 0 | 10,00,000 |
| 5 | Occupational Health | 5,00,000 | 75,000 |
| 6 | Green Belt | 13,00,000 | 2,00,000 |
| 7 | Solid Waste Management | 3,00,000 | 2,00,000 |
| 8 | Water conservation | 7,00,000 | 50,000 |
| **Total cost (Rs.)** | | **2,70,00,000** | **45,55,000** |