Pre-Feasibility Report for

New Synthetic Organic Chemical Manufacturing Unit

By

M/s. Veeral Additives Private Limited

PROJECT TERMED UNDER SCHEDULE 5 (f) (SYNTHETIC ORGANIC CHEMICALS)

CATEGORY - B

Prepared By

M/s Veeral Additives Private Limited
Plot No. K-4/2, Additional MIDC, Mahad
Dist: Raigad – 402 309
Maharashtra, India

Chapter 1 Executive Summary

Company Profile

M/s Veeral Additives Private Ltd is established company for manufacture of specialty chemicals.

The company is yet to start any production activities & this is the first project by the Company. Though the project proponent is Veeral Additives Private Ltd, the entire project will be handled and executed by Vinati Organics Ltd & Viral Alkalis Limited through its employees.

Vinati Organics Limited started operations in its first plant in Mahad in 1992, with its focus on Isobutyl Benzene (IBB). A decade later, in 2002, it started commercial production in its second plant in Lote, producing 2-Acrylamido-2-methyl propane Sulphonic acid. Vinati Organics Limited (VOL) has enhanced the scope of its facilities and now also produces organic intermediates and aromatics.

IBB, a specialty organic intermediary, is used as a raw material for the manufacture of Ibuprofen, an anti-inflammatory analgesic bulk drug.

2-Acrylamido-2-methylpropane Sulphonic acid, a specialty monomer finds several applications in oil-field recovery, water treatment, acrylic fiber manufacturing, adhesives, personal care products, medical hydrogel, mining industry, coatings and as dispersing and flocculating agents.

Vinati Organics Limited is the world's largest manufacturer of both 2-acrylamido-2-methylpropane Sulphonic acid and IBB.

In June 2010, the company started producing Isobutylene (IB), one of the key components used to manufacture 2-Acrylamido-2-methyl propane sulphonic acid. Apart from being used internally, IB is also sold to agrochemical and antioxidant industry.

M/s Viral Alkalis Limited a group company of Vinati Organics Limited (VOL) was started in 1995-1996 to mainly recover the inorganic salts from the aqueous stream generated in Vinati Organics Limited and since then the plant is running continuously to recover inorganic salts which are sold in market for different applications.

Veeral Additives (through its parent company Viral Alkalis Limited) now proposes to establish a new manufacturing facility of Antioxidants at plot no- K-4/2, Additional Mahad MIDC, Dist Raigad.

Plot plan possession receipt / plot possession letter is at **Annexure I**

The google image of the plot site is at **Annexure – II**

Proposed Layout Plan for new establishment is attached as **Annexure–III**.

Prior Environmental Clearance is mandated by Ministry of Environment and Forests, as vide EIA Notification SO 1533, dated September 14, 2006 and its amendments for Synthetic Organic chemicals manufacturing units. This project falls under category 'B' and schedule item no. 5(f): Synthetic organic chemicals manufacturing.

The project brief is summarized in the table below,

Project summary at a glance

Sr No	**Particulars**	**Details**
1	Name of Company	Veeral Additives Private Ltd.
2	Products	Anti-Oxidants
3	Location	Plot no K-4/2 Additional Mahad MIDC area, Dist Raigad Pin 402 309 Maharashtra.
4	Name of the project	Manufacture of Anti-Oxidants (40,000 TPA) and its by products
5	Total land area of the plot	20000 sq m (~5 Acres)
6	Major raw material	Refer chapter 3
7	Water	Total water requirement will be 744 cmd, out of which fresh water requirement of 537 CMD will be source from MIDC & balance will be fulfilled by treated recycle.
8	Power	Total power requirement is ~ 2000 KVA. It will be sourced from MSEDCL.
9	Proposed manpower	75 No (permanent 40 & Contract 35)
10	Waste water quantity (estimate)	Trade effluent 201 cmd Domestic effluent 6 cmd Total effluent generation: 207 cmd It will be treated and totally recycled/reused within site. Proposed project will maintain Zero Liquid Discharge facility.
11	Air emissions	The air emissions will be from boiler, Thermic fluid heater and DG set. DG set shall act as stand by source of electricity for the site. Adequate stack height as per statutory norms will be provided to Boiler / TFH/DG sets. Suitable scrubber system will be used for Metilox/AO 1010/1076 & HCl Scrubber will be used for AO 168
12	Solid Waste	Refer chapter 3
13	Project cost estimate	~ 110 Crores

The Land shall be used as "Industrial" land thus there shall be no change in land use.

This industrial plot is allotted by MIDC to Veeral Additives Private Limited.

(Plot allotment letter / plot possession letter is at **Annexure I).**

MIDC has provided all basic infrastructures like Electrical Power, water supply, the internal road network, external approach road and networking with CHWSTDF (Common Hazardous Waste Storage Treatment and Disposal Facility).

There is no sensitive establishment in the vicinity such as health resort, hospital, archaeological monuments, sanctuaries, etc.

The land and infrastructure is made available by MIDC and the raw material is easily available through the easy transport via road connectivity by local suppliers as well as imported one.

Chapter 2 Introduction of the Project

2.1 Identification of the project and Project Proponent

This is a new and first project by the project proponent, (Veeral Additives Private Limited) which is backed up by well-known group M/s Vinati Organics Limited.

2.2 Need of project with description for region and country

Market size and volumes

The quantity of antioxidants generally added to polymers is 0.1% of its weight. (i.e. 1,000 MT of AO required per 1 million MT of polymers). In 2016, the total demand of Antioxidants for fresh polymers was projected close to 282,000 TPA. However, globally there was an additional demand of antioxidants from polymer reprocessing facilities over and above the demand for fresh polymers. This reprocessing market for Antioxidant is close to 20% of that for fresh polymers. So, we can assume that the total Antioxidant demand ought to be close to 3,38,400 MT globally. The Global market for antioxidant is expected to grow at a steady pace of 2-3 % annually for the next 5-7 years based on the additional polymer capacities expected to come up in the Middle East.

Most of the growth in demand is expected to come from Asia and Middle East where new polymer capacities are planned.

Globally, BASF, Songwon, SI Group, Addivant, Adeka, Jiyi, Richyu, Everspring, Kaoching are the leading manufacturers of Antioxidants. The German chemical giant BASF is the global leader for antioxidants followed by the Korean major Songwon. The Antioxidant industry has been in a consolidation phase for some time now. Recently, the antioxidant division of Albemarle of the US was taken over by SI Group. The chemical major Chemtura hived off its antioxidant business into independent Addivant and Songwon in India took over an antioxidant plant from Sequent Scientific at Panoli.
Currently, the supply demand scenario for antioxidants is as below:

Product	Demand (2016) [MT]	Capacity (2016) [MT]
AO 1010	1,10,000	1,20,000
AO 1076	18,000	19,000
AO 1330	9,000	8,000
AO 168	1,10,000	1,50,000

Thus, we can see that the capacities are nearly full with a need for new capacity necessary in the coming years considering additional polymer capacities in Middle East and Asia.

As far as India is concerned, the total demand of antioxidants put together is close to 10,000 MT. There are currently two capacities for antioxidants in India.

- HPL Additives – They manufacture AO 1010 & AO 168 and have a capacity of around 8,000 MT. However, they have not been able to use this capacity completely due to technical & quality factors.
- Songwon Specialities India – They have a capacity to manufacture AO PEPQ, an organophosphite based antioxidant with a capacity of 1,000 MT.

Thus, HPL Additives will be the only potential competitor for these products in India. The quality of antioxidants from HPL Additives is not very encouraging and most of the Indian manufacturers currently import a large quantity of their AO 1010 & AO 1076 demand.
The imports of Antioxidants for the previous 2 years are given below:

Antioxidant	**Imports (2015-16)**	**Imports (2016-17)**
AO 1010	2,015	2,321
AO 1076	662	649
AO 168	3000	3500
Total	**5677**	**6470**

In addition to the import of pure antioxidants, there is also some import of blends of antioxidants which contain mixtures of primary and secondary antioxidants. However, since there are numerous brand names and tradenames of antioxidants, all of which could not be included in the above table, it is difficult to ascertain the exact volumes for the import of blends but one can safely assume that the volume is substantial.
Based on the port-wise import and export data for 2,4-DTBP and 2,6-DTBP available, and subtracting the amount of other antioxidants exported by HPL, we estimate that HPL additives currently makes around 3,200 MT of AO 1010 and close to 1000 MT of AO 168.
Considering all above details the current conservative estimate of Indian demand for these products is as follows:

Antioxidant	**Demand (MT)**
AO 1010	5,521
AO 1076	649
AO 168	4370
Total	**10,540**

Thus, almost half on of the Indian demand of phenolic antioxidants is met through imports. Korea, Europe, Taiwan and China are the countries from where these antioxidants are imported.

The major consumers of antioxidants in India are the polymer manufacturers, which constitute fresh polymers. The major consumers of Antioxidants are:

- Reliance Industries
- HMEL
- IOCL
- Haldia Petrochem
- ONGC
- MRPL

Currently, more than 40 % of the antioxidant demand in India is from Reliance Industries Limited. With additional polymer capacities of OPAL (ONGC) and HMEL coming up in the near future, the projected demand for the antioxidants will increase by the end of 2017. Future plans of IOCL and BPCL include a PP and PE plant and hence the demand for the antioxidant is expected to further increase in the future. Thus, the demand of antioxidants in India is on a rise.

Capacities planned

Based on the current demand and some demand coming up in the future and based on discussions with the consumers of antioxidants in India, we believe that in India by 2018; there will be a demand of close to 11000 MT (18000) of AO 168, AO 1010 and AO 1076 put together. In the future, the demand is expected to increase even further as new petrochemical complexes come-up in India. We also intend to supply the antioxidants to the growing polymer market in the Middle-East.

We intend to establish a plant of around 24000 TPA for phenolic and phosphite based antioxidants put together with approximate individual capacities of 8000 TAP each

For AO 1010, the current imports are around 2300 MT. Thus, out of the total capacity of 8000 MT, around 2300 MT will be used for import substitution. We aim to get a market share of close to 1000 MT from HPL Additives. (30% share). Addition of new polymer capacities by OPAL and Assam refinery, the demand of antioxidants is bound to increase and by the time the plant comes up, the projected Indian demand for AO 1010 will increase by around 1500 MT. So, we plan to sell around 4800 MT of AO 1010 in domestic markets. The remaining capacity of around 3200 MT will be sold as blends in domestic markets and a part will be exported. We aim to export the product to the middle east where there is going to be a major growth in Antioxidant use.

For AO 1076, we aim to substitute the imports which will consume around 650 MT. Based on discussions with Reliance Industries Limited, we understand that there is going to be an increase

in demand of AO 1076 at their factory and they could buy to the extent of 1000 MT in the future. The remaining capacity will be sold as blends in domestic markets and a part will be exported. We aim to export the product to the middle east where there is going to be a major growth in Antioxidant use.

For AO 168, the current imports are around 3470 MT. Thus, out of the total capacity of 8000 MT, about half will be used for import substitution. We aim to get market share from HPL Additives for AO 168 to the extent of around 500 MT. A part of the remaining 4000 MT of AO-168 will be sold as blends in domestic markets and a part will be exported. We aim to export the product to the middle east where there is going to be a major growth in Antioxidant use.

Considering the announcements from OPAL and other government controlled petrochemical complexes, it is believed that there will be a growth in polymer capacity in India and hence the demand for antioxidants will be on a rise and domestic demand for Antioxidants is bound to increase at a faster pace than global demand growth rate. Also, considering the additional polymer capacities in Middle East, especially Iran and Saudi Arabia, the demand for antioxidants will increase in the region and Veeral Additives Private Limited aims to cater to this demand.

2.3 Brief Description of Project

Size: It is proposed to produce following products at the site.
The proposed products are summarized below,

Sr. No	Product / By product	Proposed production capacity (TPA)
	Product	
1	Anti-Oxidants AO-1010 & AO-1076	16,000
2	Anti-Oxidants AO- 168	8,000
3	Intermediate for Anti-Oxidants (Metilox)	16,000
	Total	**40,000**
	By Products	
1	Methanol	1600
2	32% HCl	6000
	Total	**7600**

2.4 Employment Generation due to Project (Direct and indirect)

The proposed establishment of plant at plot K-4/2 will certainly help in in employment generation. The proposed project will have employment generation for operation, maintenance, Packaging, Dispatch, administration etc. Also there is great potential for employment in the downstream industries.

Chapter 3 Project Description

3.1 Type of Project:

The project is for manufacture of Synthetic organic chemicals (anti-oxidants and intermediate) as follows:

Sr. No	Product / By product	Proposed production capacity (TPA)
	Product	
1	Anti-Oxidants AO-1010 & AO-1076	16,000
2	Anti-Oxidants AO- 168	8,000
3	Intermediate for Anti-Oxidants (Metilox)	16,000
	Total	**40,000**
	By Products	
1	Methanol	1600
2	32% HCl	6000
	Total	**7600**

3.2 Location of the Project

Details of Nearest Infrastructure Facilities

Sr. No	Destination	App. Distance of Project Site
01	Nearest Town	
	Mahad	9 km
02	Nearest National Highway (Mumbai Goa)	
	NH-66	9 km
03	Nearest Airport	
	Mumbai	177 km
04	Nearest Railway Station	
	Karanjadi	17 km
05	Nearest Port	
	JNPT	190 km

The project is proposed at Plot No K-4/2 Additional Mahad MIDC, Dist. Raigad Maharashtra.

The Geographical Location of this plot is at 18^0 6' 32.72" N Longitude and 73^0 31' 0.26" E Latitude with an elevation of 39 meter above sea level MSL.

Site coordinates are as follows:

Direction	Longitude	Latitude
North east corner	18^0 6' 36.00" N	73^0 31' 04.15" E
North west corner	18^0 6' 37.78" N	73^0 31' 04.08" E
South east corner	18^0 6' 30.33" N	73^0 31' 00.31" E
South west corner	18^0 6' 31.89" N	73^0 30' 57.10" E

This site is in premises of MIDC Estate which is meant for these types of Industries.

GPS Location on Google Imagery of the proposed site is attached as **Annexure II**.

Land Form: Land is on plain contour, it is flat terrain.

Land Ownership: Land ownership is with project proponents (Veeral Additives Private Limited).

Existing Land use Pattern: The Land is reserved for Industrial use & the proposed project shall be at the same plot.

Existing Infrastructure: Presently there is an existing Infrastructure around the site.

Infrastructure like water, electricity, telephone facility, roads already available. Other Infrastructure like, hospital, school, housing, entertainment, daily needs are available easily at Mahad Town (Which is at distance of about 9 km).

Additional Mahad MIDC provides many basic facilities like uninterrupted water supply, power and Road Network. When various sites were seen, this site appeared to be environmentally best as also from the business angle and therefore this option was finally adopted. This site is inside the campus of the MIDC and means safe transportation, less need of Utilities, less constructing buildings and roads, less fuel, less water with optimization of infrastructure.

There is no sensitive establishment in the vicinity such as health resort, hospital, and archaeological monuments.

The location justification for the project is as under

a. Availability of required land and infrastructure for locating the establishment for the synthetic organic chemical manufacturing.
b. Suitability of land from topography & geological aspects, synergy and business point of view
c. Proximity to rail / road to facilitate transport of equipment / materials/ product
d. Availability of adequate quantity of water to meet water requirements.

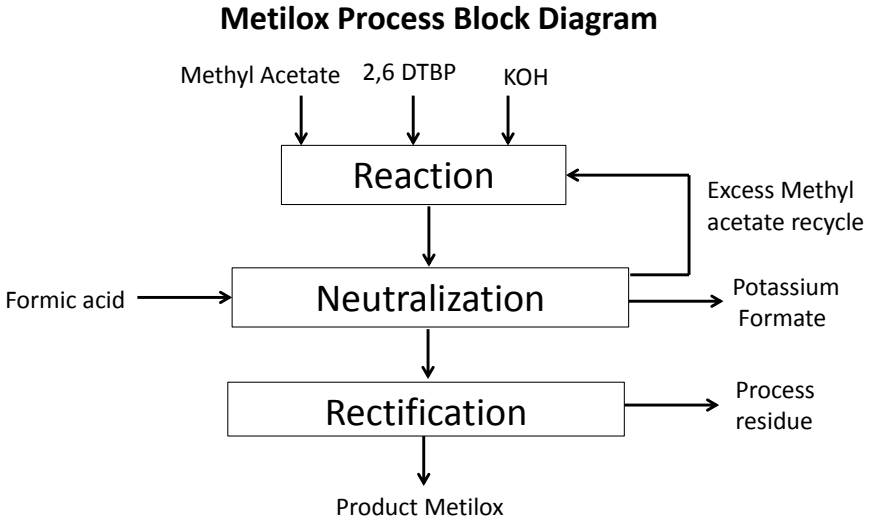
Lay-Out

Refer **Annexure III** for the proposed plant site layout plan.

3.3 Project Description with Processes Details:

Manufacturing Process: Intermediate for Anti-Oxidant (Metilox)

Process Block diagram of Metilox process

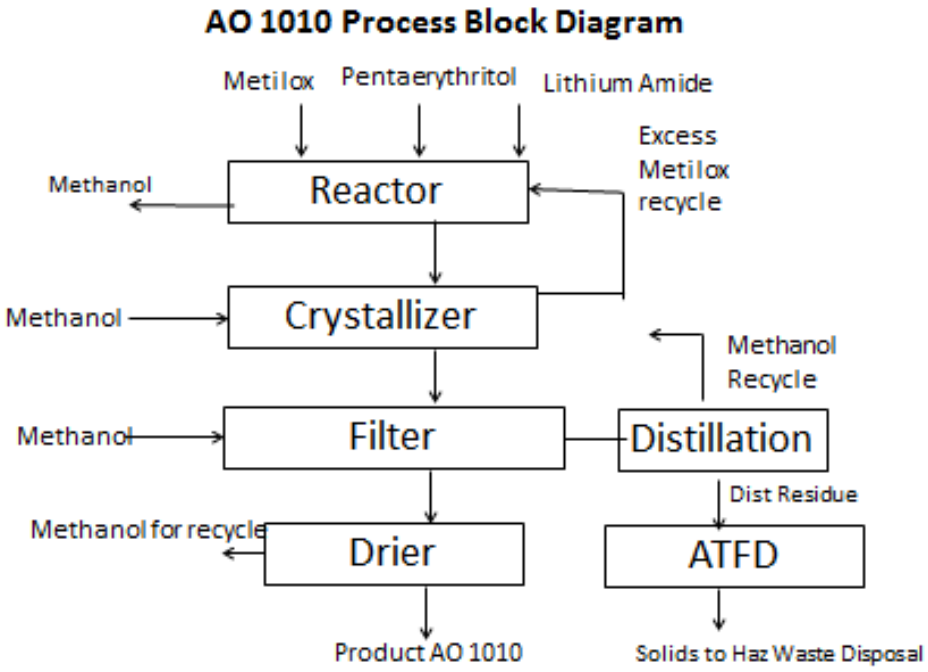


Broad manufacturing process of the Intermediate required for Anti-Oxidants is described below.

Di-tertbutyl phenol and Methyl acrylate are reacted in presence of Alkali metal Hydroxide (which is catalyst) over a period of 3-4 hrs to form the desired Intermediate. Excess charged Methyl Acrylate is recovered and are recycled. Catalyst from reaction mixture is removed by reacting it with weak acid.

The reaction mass is then sent to distillation where product is recovered under vacuum and kept in molten state. The residue from the reaction mix is washed with Methanol and then the mix will be sent to Common ATFD facility where Methanol will be recovered and almost dry solids will collected and sent to Hazardous Waste Disposal.

Manufacturing Process for Anti-Oxidant (AO-1010)

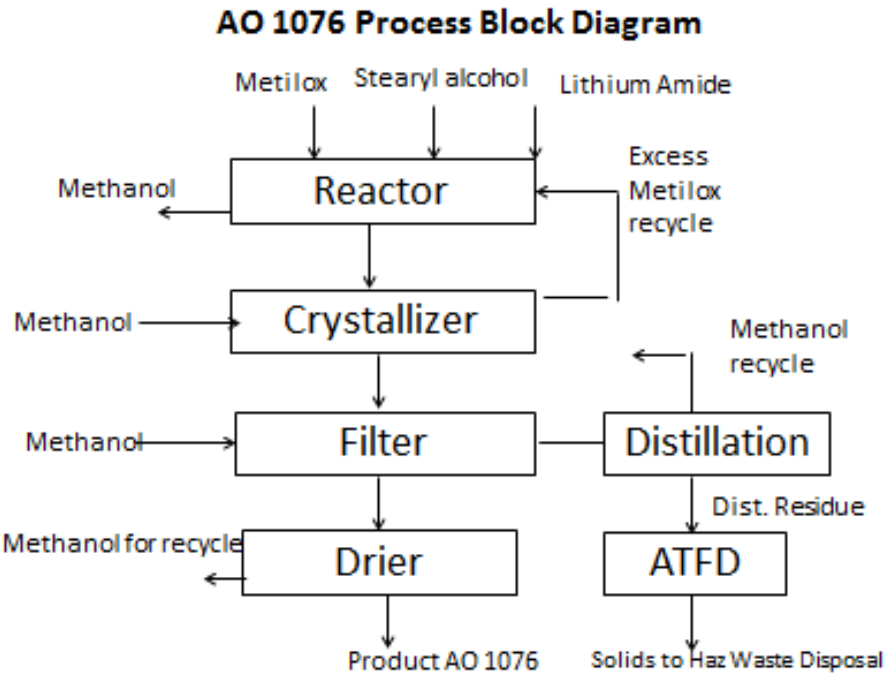


Molten Intermediate from the above section is reacted with Pentaerythritol and catalyst under vacuum at around 170°C. During reaction first methanol is generated which is recovered and reused/sold after passing through distillation section. Unreacted/slightly excess charged Intermediate is also recovered and recycled back (as it is). After this the reaction mass is sent to Crystallizer. Methanol is used as crystallizing medium and weak acid is again used to remove the catalyst.

After Crystallization is over the slurry is filtered to isolate the product in wet cake form by use of filtration equipment like ANF or continuous filter. The cake is given Methanol wash twice to remove any impurities and ML is collected for Methanol recovery. 2nd wash of Methanol is reused as first wash in next batch.

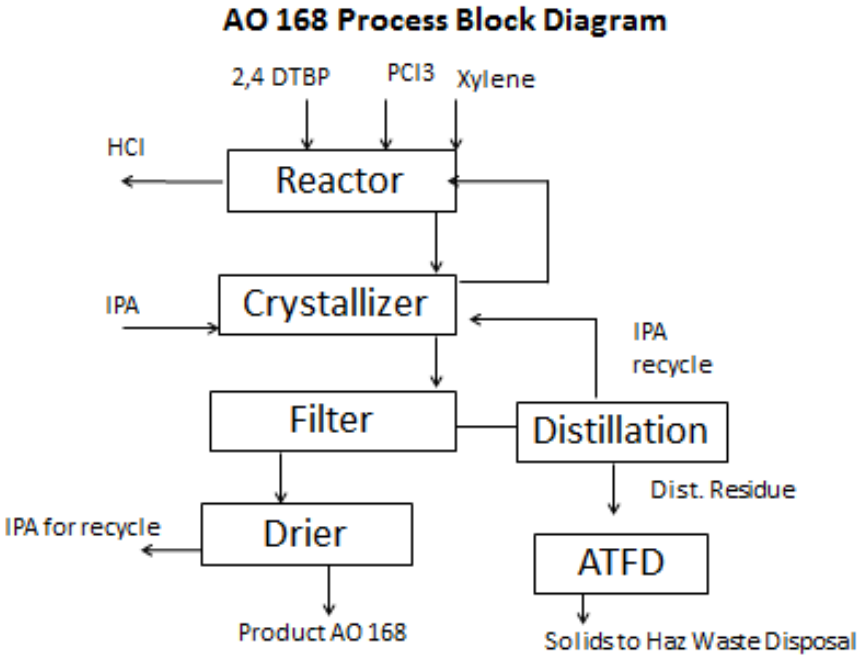
Wet cake from Filtration stage is dried in suitable dryer. ML collected during filter is sent to recovery of Methanol by distillation. Residue of distillation (generally kept in pumpable format) is sent to Common ATFD facility where Methanol will be recovered and almost dry solids will collected and sent to Hazardous Waste Disposal.

Manufacturing Process for Anti-Oxidant (AO-1076)



Manufacturing process for AO-1076 is exactly same as AO-1010. Only Pentaerythritol is replaced by Stearyl Alcohol. All steps and process are same as AO-1010.

Manufacturing Process for Anti-Oxidant (AO-168)



Di-tert butyl Phenol is charged in the reactor with Xylene. Catalyst is added. The mixture is cooled and then PCl3 is added at controlled rate with all precautions. The fumes of HCl are absorbed in scrubber system which generates 32% HCl as byproduct. The reaction mass is then

heated to desired temperature slowly. It is kept at that condition for 3-4 hrs for completion of reaction. After the reaction is over the mass is neutralized by using weak base like amine. The neutralize mass is sent to Xylene recovery section where Xylene is recovered and recycled back. The reaction mass which mainly now contains product is transferred to Crystallizer where IPA is added and the mixture is cooled to about 25-30 °C. Porduct AO 168 precipitates/crystallizes out which is filtered and dried. ML (which is basically IPA) is sent for recovery and reuse.

3.4 Raw Material for finished Product:

Raw Materials:

The raw materials required for the proposed production capacity is submitted herein below.

Source for Raw Material Procurement: Raw Material is easily available in the local market.

Mode of Transport of Raw Materials: Few of the raw materials will be transported locally and few will be imported from the International Market. Mode of transport to site is by road truck/tankers.

List of Raw Material & Storage

No	Raw Material	Unit	Proposed annual consumption
1	2,4 Di-tert Butyl Phenol	Tons	8500
2	2,6 Di-tert Butyl Phenol	Tons	10200
3	Potassium Hydroxide (32% in Methanol)	Tons	250
4	Methyl Acrylate	Tons	5000
5	Formic Acid	Tons	100
6	Pentaerythritol	Tons	1000
7	Alkali Amide	Tons	20
8	Stearyl Alcohol	Tons	4500
9	PCl3	Tons	1700
10	DMF	Tons	55
11	Xylene (Net consumption)	Tons	200
12	Isopropyl Alcohol (Net consumption)	Tons	450
13	Methanol (During start up)	Tons	50

Proposed major bulk storages at site are as follow:

Sr. No	Raw material	State	No of tanks	Proposed liquid storage capacity of tank (KL)
1	2,6 DTBP	Molten Solid	1	500 (15 Days requirement)
2	2,4 DTBP	Molten Solid	1	400(15 Days requirement)
3	Methanol	Liquid	1	200
4	Isopropyl Alcohol	Liquid	1	200/ 300
5	Methyl Acrylate	Liquid	1	200/ 300
6	Xylene	Liquid	1	50

7	FO/LDO/HHC	Liquid	1	50/100 (based on boiler /TFH capacity)
7	KOH	Liquid	1	50

3.5 Resource Optimization:

Veeral Additives Private Ltd is desirous to establish the manufacturing facilities for the product indicated above. The resource optimization shall be carried out at the site and with other Vinati organic sites in order to reduce wastage and minimum transport needs.

3.6 Availability of Resources (Water, Energy/Power Requirement):

Power: The proposed power requirement for the facility is ~ 2000 KVA which will be source from MSEDCL grid.

It is proposed to install 1 Nos of DG sets of 500 KVA capacity based on HSD as fuel as emergency backup in case of power outage.

Water: The total water requirement is about 744 cmd for domestic, process, Boiler/cooling and gardening purpose. It will be source from MIDC water works.

Fresh water requirement and waste water generation for proposed establishment shall be as follows:

Water requirement

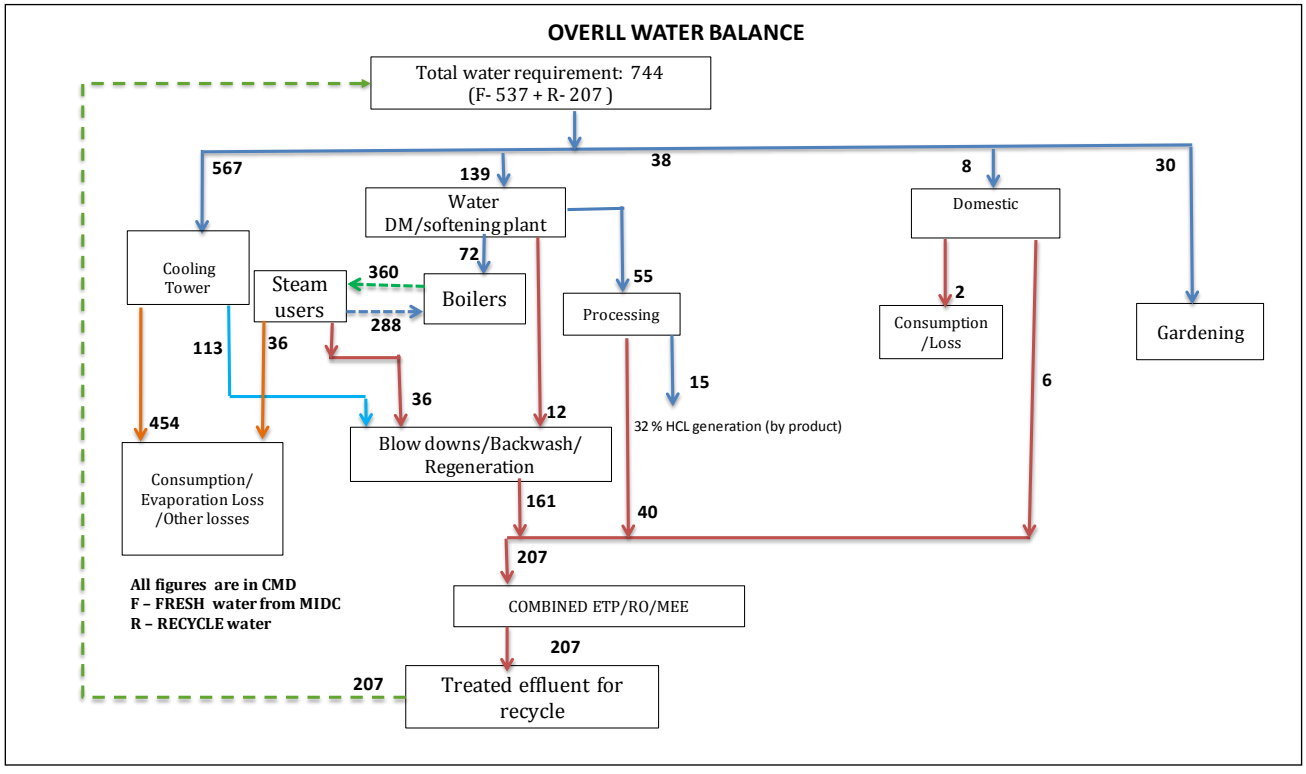
No.	Description	Proposed water requirement (cmd)
1	Domestic	8
2	Industrial cooling/boilers	567
3.	Processing	139
4.	Gardening	30
	Total	**744**

Waste water

No.	Description	Proposed generation (cmd)	Disposal
1.	**Trade effluent**	201	Both effluent sterams will be treated in combined effluent treatment plant and treated effluent will be totally recycled. (ZLD unit)
2.	**Domestic effluent**	6	
	Total	**207**	-

Summary of water requirement, loss/consumption and waste water generation is as follows,

Particular	Consumption (CMD)			Loss (CMD)			Effluent (CMD)		
Water requirement	**Existing**	**Proposed**	**Total**	**Existing**	**Proposed**	**Total**	**Existing**	**Proposed**	**Total**
Domestic	0	8	**8**	0	2	**2**	0	6	**6**
Industrial Processing	0	55	**55**	0	15	**15**	0	40	**40**
Cooling and boiler feed	0	651	**651**	0	490	**490**	0	161	**161**
Gardening	0	30	**30**	0	30	**30**	0	0	**0**
Total	**0**	**744**	**744**	**0**	**537**	**537**	**0**	**207**	**207**



Manpower: Expected manpower requirement for the establishment shall be as follows:

Description	Proposed, No (approx.)
Permanent	45

Contract	30
Total	**75**

Steam / Process heat Requirement: The steam requirement and process heat requirement for the proposed set up shall be met from the steam generator and Thermic fluid heater respectively.

The fuel requirement shall be as follows

Sr No	Capacity	Nos	Fuel requirement
1	Thermopac (3 MKcal/hr)	01	FO: 8.4 TPD
2	Steam generator (15 MT/hr)	01	FO: 21 TPD **OR** LDO: 20 TPD **OR** HHC: 21 TPD

Stacks of requisite heights for above shall be provided as per statutory norms.

DG Set:

1 DG sets of total 500 KVA capacity are proposed to be installed at this site.

Their fuel requirement (only in case of emergency) shall be as follows:

Sr No	Capacity	Nos	Fuel requirement
1	500 KVA *(emergency use only)*	1	HSD: 100 lit/hr

3.7 Waste Generation and its treatment, disposal

I. Solid Waste

(a) Non-Hazardous Solid Waste:

Sr No	Type of Waste	Quantity	UOM	Mode of Disposal
1	Rubber, Hand gloves, PVC shoes, Tarpaulin, Hose pipes	2	TPA	Sale for offsite recycling/ CHWTSDF
2	Insulating material	1	TPA	Sale to authorized vendor/ CHWTSDF
3	Iron scrap, Glass, Paper, Plastic bottles etc	5	TPA	Sold to scrap dealer for recycle

(b) Hazardous Waste:

The quantification of hazardous solid waste generated from present activity and proposed activities is presented as follows*:*

Sr No	Category	Type of Waste	Quantity*	UOM	Mode of Disposal

1	5.1	Used/ Spent Oil	1	KLPA	CHWTSDF/ Sale to Authorized party approved by MOEF/CPCB/MPCB
2	34.3	Haz. waste from Process ATFD (Organic Residue)	1000	TPA	CHWTSDF
3	33.3	Discarded Drums, carboys etc	1000	Nos/annum	Authorized MPCB Drum Recycler
4	21.1	Paint cans, brush etc	1	TPA	CHWTSDF
5		E Waste	100	Kg per year	Auth. scrap dealers

***** Estimate, Quantity shall be worked out during EIA stage.

Chapter 4 Site Analysis

4.1 Connectivity:

This proposed Veeral Additives' new facility shall be located at Plot K-4/2, Additional Mahad MIDC in Raigad district, Maharashtra. The Site is about 9 km from Mahad.

The land and infrastructure is made available by MIDC and the raw material is easily available through the easy transport via road connectivity.

4.2 Land form, Land use and Land ownership:

Land Form: Land is on plain contour, it is flat terrain.

Land Ownership: Land ownership is with project proponents (Veeral Additives Private Ltd)

4.3 Topography:

The district has three physiographic divisions i.e. (i) Coastal zone in west covers about 20% percent of the district (ii) Central zone covers about 1/3 rd of the district, consisting of fertile land in low lying area (iii) Hilly zone in the eastern part highly uneven in altitude and covered with forest. This hill range is characterized by ruggedness and uneven topography, with crestline of peaks and saddles forming the eastern horizon. Ulhas, Panvel and Patalganga are the three main rivers in northern part. Kundalika River is the main river in central part whereas in the southern part Savitri River is the main river.

The soils in the district are formed from the Deccan Trap which is predominating rock formation with small out crops of Laterite at a few places in the Poladpur taluka and Matheran hill. The soils are grouped as Forest, Varkas, Rice, Khar or Saline, Coastal Alluvium and Laterite as per the location and topographical situation.

4.4 Existing land use pattern:

Vacant MIDC plot

4.5 Existing Infrastructure:

Vacant MIDC plot. Infrastructure is provided by additional Mahad MIDC.

4.6 Soil Classification:

SOILS:

The soils of the district are formed from the Deccan trap which is the predominating rock formation of this district with small out-crops of laterite at a few places in the Poladpur taluka and in the Matheran hills. Various types of these soils are marked out as per topographical situation and location. They ' are generally grouped as forest, *varkas,* rice, *khar* or salt, coastal alluvial and laterite soils.

Forest soils:

These soils are not used for agricultural purposes but yield valuable forest products such as teak-wood, *hirda* (myrobalan), *beheda,* pepper, etc. However, these soils are heavily eroded due to grazing and cutting of the forest trees.

Varkas soils:

These soils are located just below the forest soils all along the steeper slopes. They are shallow in depth, which varies only between a foot and a foot and a half, heavily eroded and sandy in texture and yellowish red to yellowish grey in colour with acidic reaction. They are poor in organic matter and nitrogen and possess very little retentivity of moisture. They yield*kharif* millets but the production thereof could be increased with the addition of bulky manures, lime and nitrogenous and phosphatic fertilisers.

Rice soils.

The district is the second largest producer of rice in the Maharashtra State. The region is peculiarly terraced and, though the small strips in between the two terraces are levelled, it is difficult to get even a few *gunthas* of land in one piece in a levelled condition. The depth varies between two and six feet. They are loamy in texture, yellowish or reddish grey in colour, neutral in reaction and almost devoid of lime. They are formed from the trap rock from the Sahyadri ranges under heavy rainfall and humid climatic conditions. The linear response of rice to the application of nitrogenous, phosphatic and potassic fertilisers is observed in these soils. Addition of bulky manures in these soils is also found to be advantageous from the point of view of yield. There are some patches of *manat* soils in Mangaon taluka which are rich in clay and silt and which become stiff and hard when dry.

Khar soils.

These soils are situated on the flat, levelled land near the sea at the point of creeks formed due to the rivers. They are flat clay to clay loam in texture and reddish or yellowish grey in colour. These soils contain hardly more than one per cent of soluble salts. These soils are formed due to the deposition of salts by the sea or from lands reclaimed from the sea. Large tracts of land are going out of cultivation due to the ingress of the sea and, in order to reclaim these lands, the Government have formed the Khar Land Development Board which has undertaken ambitious projects of the reclamation of *khar* lands.

Coastal alluvium soils.

These soils are found all along the coast and at places where there are no creeks. They are deep soils developed on flat land and loamy in texture with reddish grey colour. They are devoid of clay fraction or humus and are open in nature. The profile is difficult to differentiate and is excessively drained. Calcium carbonate is found in abundance throughout the profile but calcium has not entered the clay complex. The sub-soil water level is only from ten to fifteen feet deep. The salt contents of the well water are higher in the proximity of the sea; but due to excellent drainage, its use has not produced any deleterious effects. The soils are almost neutral or slightly on the alkaline side of neutrality. Good garden crops like coconut, areca-nut, plantain, etc., are grown in these soils, depending upon the availability of water.

Laterite soils.

Out-crops of laterite rock are observed amongst the Sahyadri ranges amidst the trap rock mainly at Matheran and in the Poladpur taluka. These soils mostly occur on the mountain peaks. They are coarser in texture, wherever there are no forests. They are yellowish-red in colour and shallow in depth and yield coarse millets and niger. The heavy rains in the mountainous regions thoroughly leach the soils turning them acidic in reaction and devoid of calcium carbonate. They are rich in sesquioxides, the ratio of silica to sesquioxides being less than two. But they are generally poor in exchangeable bases or in fertility constituents. However, the soils from the forest region are well-supplied with nitrogen and organic matter.

4.7 Climate data from secondary sources:

Climate:

Mahad comes in Raigad district of Maharashtra. The climate of this district is typical of that on the west coast of India, with plentiful and regular seasonable rainfall, oppressive weather in the hot months and high humidities throughout the year. The summer season from March to May is followed by the south-west monsoon season from June to September. October and November form the post-monsoon or the retreating monsoon season. The period from December to February is the cold season.

Rainfall:

The district has a network of eleven rain gauge stations with records extending to 82 years for most of the stations. The south-west monsoon commences by about the first week of June and the rains continue till about the beginning of October. The average annual rainfall for the district as a whole is 3,028.9 mm. (119.25"). The rainfall increases rapidly from the coast Howards the Western Ghats on the eastern border of the district. In the coastal strip the annual rainfall decreases from south to north. Uran and Alibag at the northern end of the coast get annually 2,072.3 mm. (81.58") and 2,080.8 mm. (81.92") of rain, respectively, Matheran gets as much as 5,167.5 mm. (203.45") of rain annually. Nearly 95 per cent, of the annual rainfall is received during the south-west monsoon months, and the rainfall in October forms the major portion of the rest. July is the month with the heaviest rainfall, the same being 38 per cent of the annual rainfall.

Temperature:

Being a coastal district the diurnal (daily) and seasonal variations of temperature are not large. The period from March to May is one of increasing temperatures. May is the hottest month with a mean daily maximum temperature at 31.7°C (89.1°F) and the mean daily minimum temperature at 26.4°C (79.5°F). Fresh breezes from the sea relieve the oppressive heat particularly in the coastal regions in the afternoons. The onset of the south-west monsoon early in June brings down the temperatures slightly. After the withdrawal of the south-west monsoon by the end of September the day temperatures increase slightly and the weather in October and November is almost like the summer months. In the period from December to February the weather is cooler than in the post-monsoon months.

Humidity:

The air is humid throughout the year. Relative humidity is on an average over 80 per cent during the south-west monsoon season. In the rest of the year the relative humidity is between 65 per cent and 75 per cent.

Cloudiness:

During the south-west monsoon season skies are heavily clouded to overcast. In May and October the clouding is moderate. Clear or very lightly clouded skies are common in the rest of the year.

Winds:

Winds are very strong and blow from west or south-west during monsoon season. During the period from October to December winds are generally moderate but sometimes strong in October and blow from directions between north-east and south-east. In the three months from January to March the winds continue to be moderate and are predominantly from directions between north and east. In April while there is a slight strengthening of wind, the direction is variable. In May there is a further strengthening of winds and the directions are between south-west and north-west.

Special weather phenomena:

In association with cyclonic storms in the Arabian sea in the post-monsoon months and to a lesser extent in May, the district experiences very strong winds, sometimes reaching gale force, particularly very near the coast and also heavy widespread rain. Occasionally these storms may cross the coast in the northern part of the district and cause heavy damage. Thunderstorms occur in April and May and just before the onset of the monsoon and in the late September to the middle of November.

Chapter 5 Planning Brief

5.1 Planning Concept:

- Plot is at well-established Additional Mahad MIDC area
- Purified Water supply from MIDC
- Well-developed roads and connectivity.
- Infrastructure facilities available established MIDC site
- Integration with the existing nearby Vinati organics manufacturing facility

5.2 Population Projection:

In 2011, Raigad district had population of 2,634,200 of which male and female were 1,344,345 and 1,289,855 respectively. In 2001 census, Raigad had a population of 2,207,929 of which males were 1,117,628 and remaining 1,090,301 were females. Raigad District population constituted 2.34 percent of total Maharashtra population.

In 2001 census, this figure for Raigad District was at 2.28 percent of Maharashtra population. There was change of 19.31 percent in the population compared to population as per 2001. In the previous census of India 2001, Raigad District recorded increase of 20.99 percent to its population compared to 1991.

The initial provisional data released by census India 2011, shows that density of Raigad district for 2011 is 368 people per sq. km. In 2001, Raigad district density was at 309 people per sq. km. Raigad district administers 7,152 square kilometers of areas.

5.3 Assessment of Infrastructure Demand (Physical and Social):

No major infrastructure demand is envisaged as the proposed site is in well-developed MIDC area.

Chapter 6 Proposed Infrastructure

Since the establishment is planned at new site in developed industrial area, no special/specific development is anticipated. Company will have to do site development only. Company has not planned any residential area at the proposed site as MIDC has already existing Residential areas earmarked for housing colonies. Company has already housing colony in that area. For additional essential manpower company may decide at later date about building additional colony building.

6.1 Industrial area:

Veeral Additives Private Ltd. , Plot no K-4/2, Additional Mahad proposes to set up plant for manufacture of synthetic organic chemical (Anti-Oxidants) based on demand and market projection.

6.2 Residential Area:

No Residential area has been proposed within the plant site.

6.3 Green Belt:

Green belt of adequate area within and around the project site shall be carried out as per industries norms and requirement.

6.4 Social Infrastructure:

Local people will be given preference wherever found suitable for all the jobs in the plant, direct as well as indirect. Thus the project shall have a positive impact on the employment pattern of the region. Economic status of the local population will improve due to increased ancillary/business opportunities, thereby making positive impact. Educational, medical & housing facilities will improve due to the proposed project.

6.5 Connectivity:

This proposed project facility shall be located at Additional Mahad MIDC area, in Raigad district, Maharashtra. The Site is 9 km from Mahad town and 17 km from nearest railway Station. The land and infrastructure is made available by MIDC and the raw material is easily available through the easy transport via road connectivity.

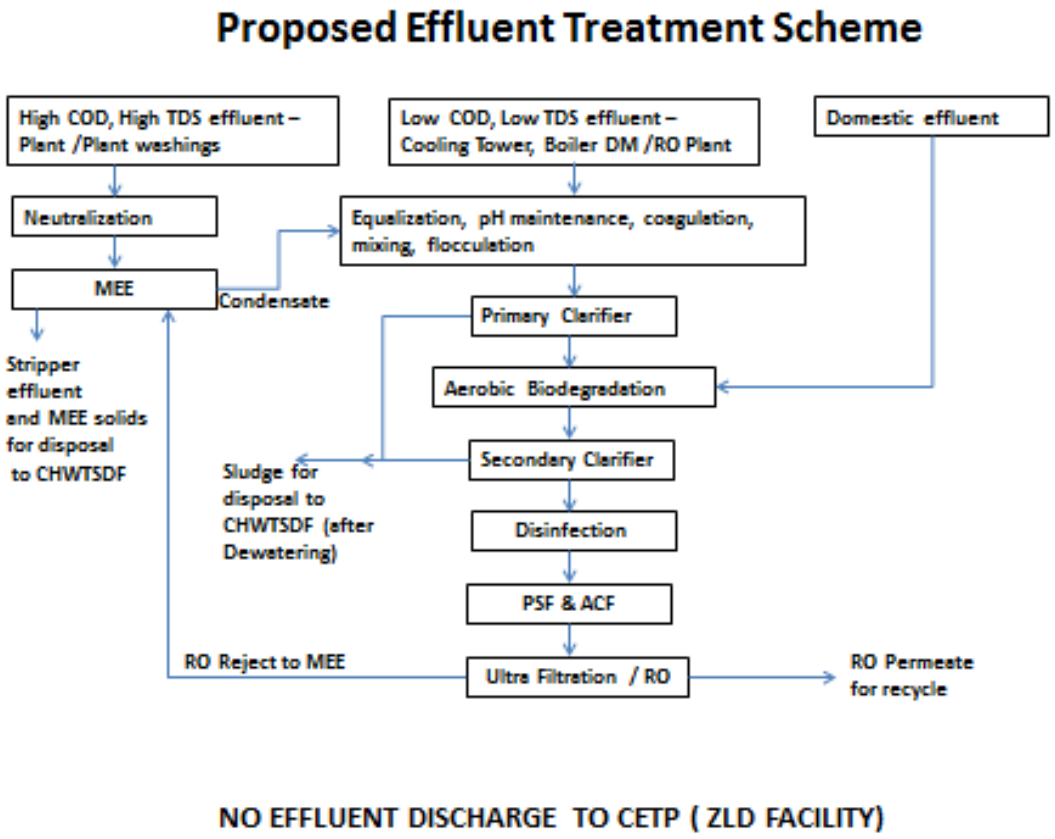
6.6 Water Management:

The total water requirement is about 745 cmd for Domestic, boiler/cooling, Greenery and process. The source of water shall be from MIDC and recycled water. About 540 CMD water will be sourced through the good offices of MIDC.

6.7 Waste water treatment system:

Effluent Treatment Plant Scheme

Following scheme is proposed to be adopted at site



Effluent will get generated from different sources during the manufacturing of Antioxidants at VOL, Additional Mahad facility.

The sources of effluent are:

- Metilox Plant

- AO1010/AO1076 Plant
- AO 168 Plant
- Plant equipment / Floor washings
- Cooling Tower (CT) Blowdown (BD)
- Boiler Blowdown
- DM plant regeneration and
- Domestic use

Other sources from effluent will get generated are:

- ETP RO Reject and
- MEE Condensate

Proposed Effluent management scheme is described below.

High COD High TDS Effluent will be segregated from Low COD & Low TDS effluent& will be imparted separate treatment so as to ensure undisturbed performance of conventional treatment system of the ETP.

High COD High TDS effluent have been identified as generating from Antioxidant Plants washing, ETP. RO Reject. Low COD & Low TDS effluent will get generated from CT BD, Boiler BD, DM plant regeneration, MEE condensate and Domestic use.

High COD High TDS effluent will be treated in a well-designed Multiple Effect Evaporator (MEE) and Low COD Low TDS effluent will be treated in an adequate capacity Effluent Treatment Plant (ETP) with a provision of a Reverse Osmosis (RO) facility to ensure the quality of treated effluent for recycle back in the process.

High COD High TDS effluent generated from Antioxidant Plants and ETP RO Reject will be collected in an Equalization tank from where it will be pumped to a Neutralization Tank for neutralization with Caustic Solution. The neutralized effluent will be transferred to MEE Feed tank for feeding to the Stripper section of the MEE. The stripped effluent will be sent to Common Hazardous Waste Treatment Disposal Facility (CHWTSDF) at Taloja. Effluent after stripping organics will be fed to the 3 effect Evaporator for concentration of dissolved solids which will be separated in an Agitated Thin Film Dryer (ATFD) downstream. The separated solids from ATFD

will be sent to CHWTSDF at Taloja. The condensate from the evaporator will be transferred to the equalization tank of ETP for conventional treatment.

Low COD Low TDS effluent generated from CT BD, Boiler BD and MEE Condensate will be collected in an Equalization tank and then pumped to Neutralization tank where neutralization will be effected by Hydrated Lime. The neutralized effluent will flow by gravity to a coagulation tank for coagulation of solids with Alum and the Flash Mixed with a Polyelectrolyte for further Flocculation in a Flocculator. The flocculated solids will be separated in a Primary Clarifier from where the separated and settled solids will be transferred to a Sludge Collection Tank for further dewatering through a suitable mechanical dewatering device. The dewatered solids will be sent to CHWTSDF at Taloja. The overflow from clarifier will be transferred to Aeration tank of adequate capacity for aerobic biodegradation by suspended growth aerobic activated sludge process. Oxygen in the form of air will be supplied through tubular membranes by a well-designed diffused aeration system. The aerobically biodegraded effluent will flow by gravity to a Secondary Clarifier to separate the biomass and transfer back to aeration tank to maintain the process parameters. Excess biomass will be withdrawn from the system and will be transferred to Sludge Collection Tank for further dewatering through a suitable mechanical dewatering device. The dewatered solids will be sent to CHWTSDF at Taloja. The overflow from the clarifier will collected in a disinfection tank and imparted oxidation with hypochlorite solution to destroy escaping bacteria. The disinfected effluent will be filtered through a Pressure Sand Filter (PSF) to trap the suspended solids and then will be passed through an Activated Carbon Adsorber (ACG) to adsorb trace organics, color and odor. The treated effluent will be collected in treated effluent collection tank from where part of the effluent will be used for backwash of PSF and ACF. The backwash will be collected in the equalization tank of ETP.

Entire treated effluent will be recycled within the plant premises for various usages.

Chapter 7 Rehabilitation and Resettlement (R & R Plan)

The proposed new facility shall be at plot of the company which is located in Additional Mahad MIDC area. It does not require acquisition of Land and the Infrastructure so there is no any kind of activity of Rehabilitation and Resettlement carried out.

Chapter 8 Project schedule and cost estimates

8.1 Time schedule of the Project

It is expected that the project shall be completed within 12 months from date of grant of Environmental clearance.

8.2 Estimated project cost (Economic Viability of the Project)

Total estimated project cost is Approx. 110 Crores

Chapter 9 Analysis of Proposal

9.1 Financial and Social Benefits

The proposed Anti-Oxidants project envisages

- For the Domestic market, an Import substitution
- Direct employment to locals and will prompt ancillary business
- Export benefits

Annexure I
Land allotment/ownership letter

–: महाराष्ट्र औद्योगिक विकास महामंडळ :–

(महाराष्ट्र शासनाचा अंगिकृत व्यवसाय)

ताबा पावती

महाराष्ट्र औद्योगिक विकास महामंडळाच्या वतीने श्री. डी. एन. कदम, प्रमुख भुमापक आणि मेसर्स अल्फा कुलथर्म प्रा.लि. च्या वतीने श्री. सुधीर के. सिन्हा, यांनी आज अतिरिक्त महाड औद्योगिक क्षेत्राच्या के विभाग, जिल्हा रायगड मधील २०००० चौरस मीटर क्षेत्रफळ असलेला भूखंड कमांक के–४/२ हा, त्याची भूखंडाच्या जागेवर प्रत्यक्ष मोजणी व सीमांकन केल्यानंतर, त्याचा ताबा त्यांनी स्वाधीन केला व घेतला आहे.

ठिकाण :–अतिरिक्त महाड औदयोगिक क्षेत्र. दिनांक · १२/११/२००८.

श्री.डी. एन. कदम यांनी ताबा दिला.

श्री.सुधीर के. सिन्हा यांनी ताबा घेतला.

For ALPHA KOOLTHERM PVT. LTD.

Director

प्रमुख भूमापक,
म.औ.वि.म.
महाड.

(वाटपग्राही किंवा त्याच्या प्रतिनिधीची सही व पदनाम)

सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF CORPORATE AFFAIRS

Office of the Registrar of Companies
Everest, 100 Marine Drive, Mumbai, Maharashtra, India, 400002

Certificate of Incorporation pursuant to change of name
[Pursuant to rule 29 of the Companies (Incorporation) Rules, 2014]

Corporate Identification Number (CIN): U24100MH2007PTC174331

I hereby certify that the name of the company has been changed from ALPHA KOOLTHERM PRIVATE LIMITED to VEERAL ADDITIVES PRIVATE LIMITED with effect from the date of this certificate and that the company is limited by shares.

Company was originally incorporated with the name ALPHA KOOLTHERM PRIVATE LIMITED.

Given under my hand at Mumbai this Eleventh day of January two thousand eighteen.

DS MINISTRY OF CORPORATE AFFAIRS 23

RAMDAS GUPTA

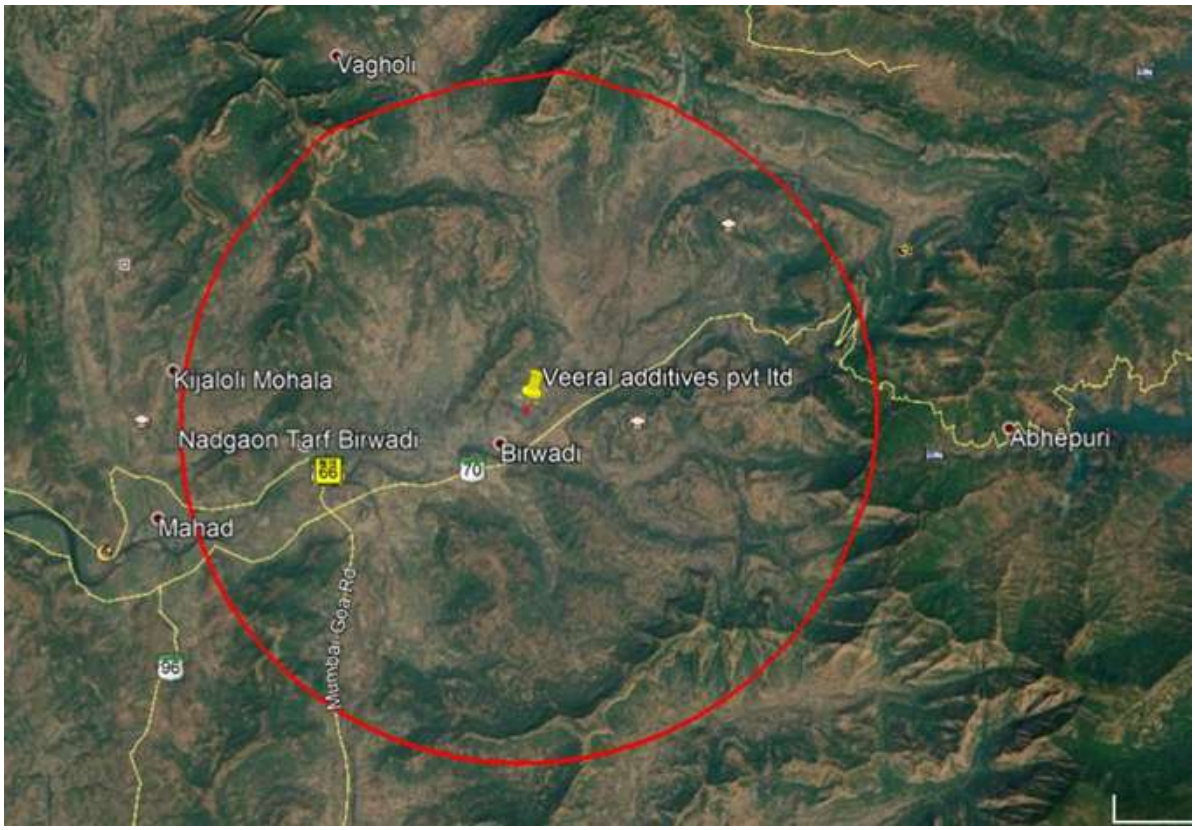
Registrar of Companies
RoC - Mumbai

Mailing Address as per record available in Registrar of Companies office:

VEERAL ADDITIVES PRIVATE LIMITED

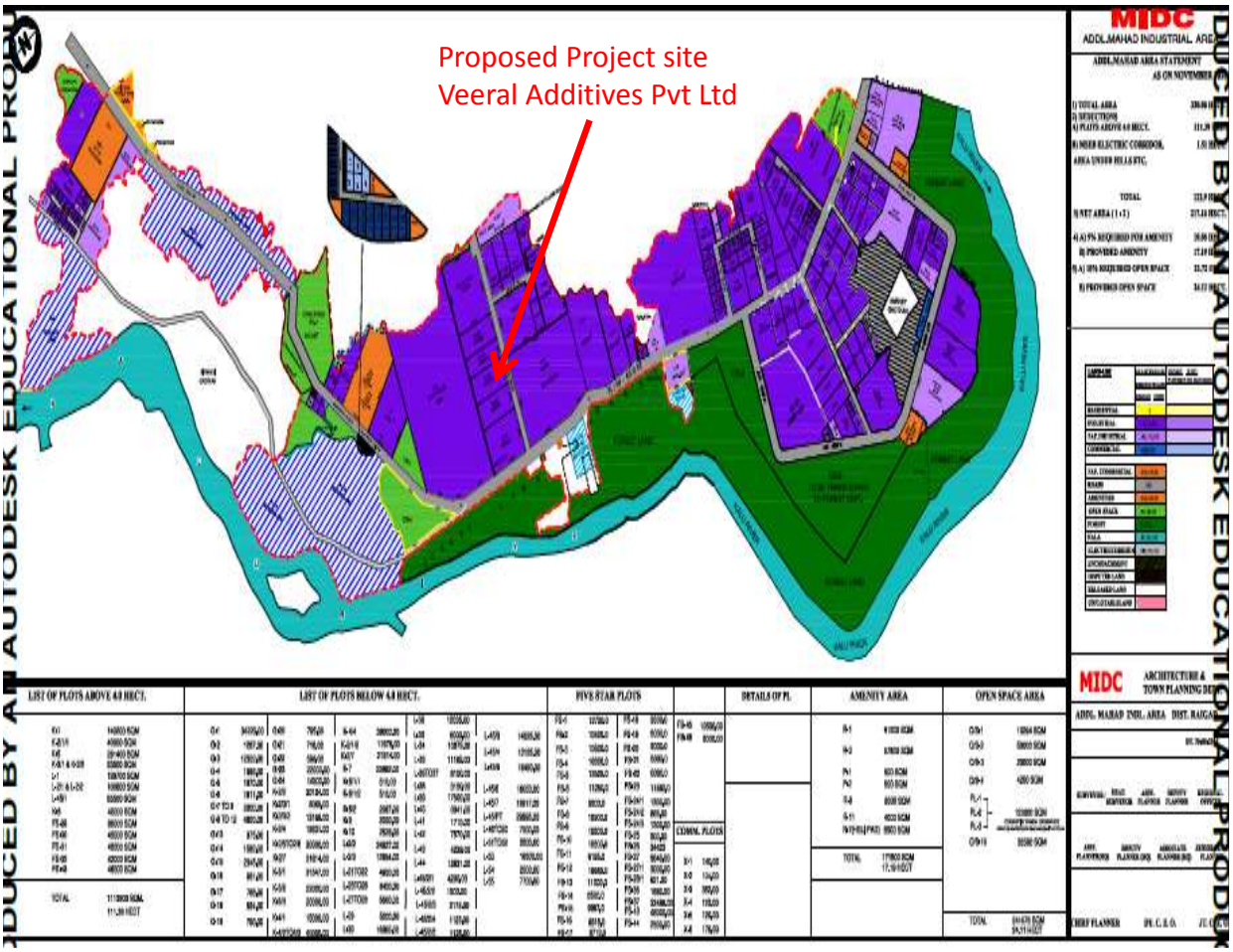
Parinee Crescenzo, 11th Floor, 1102, "G" Block,, Plot No.C-38 & C-39,Bandra Kurla Complex,Bandra E, Mumbai, Mumbai City, Maharashtra, India, 400051

Annexure II



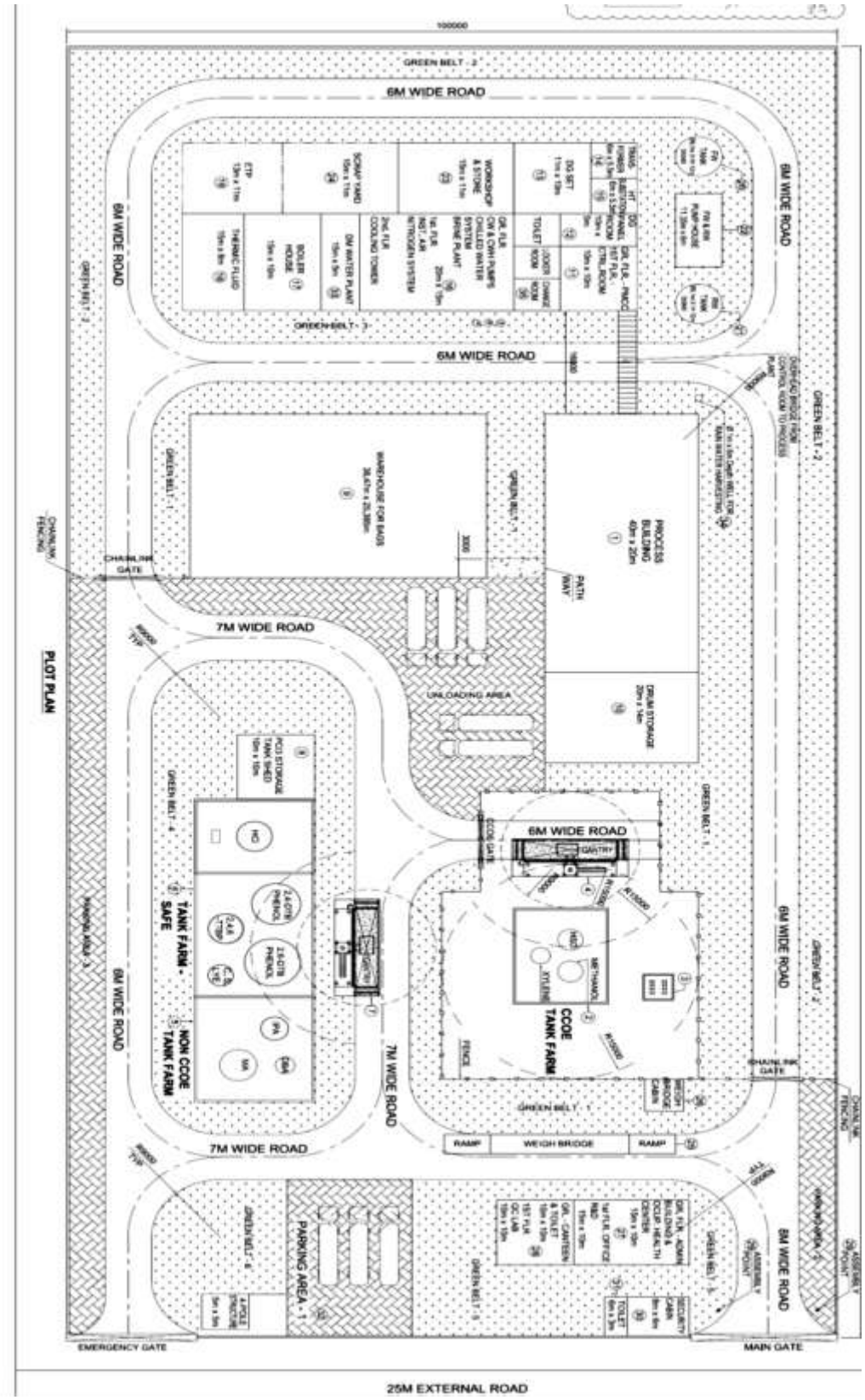
Site & surrounding study area of 10 km

Site & surrounding study area of 1 km



MIDC layout showing Proposed Plot No K 4/2

Annexure III
Proposed Layout Plan



SN	AREA DESCRPTION	AREA (Sq. M)	TOTAL AREA (Sq. M)	Percentage, %
1.	TOTAL PLOT AREA		20000	100
2.	OCCUPIED AREA		11336.37	56.682
2.1.	FACILITIES	5561.514		
2.2.	ROADS	4834.065		
2.3.	Open Area Inside CCOE Fence	940.795		
3.	PARKING AREA		2032.253	10.161
3.1.	PARKING AREA - 1	391.255		
3.2.	PARKING AREA - 2	174.721		
3.3.	PARKING AREA - 3	544.706		
3.4.	UNLOADING AREA	834.571		
3.5.	GANTRY BAY	87.00		
4.	GREEN BELT AREA		6631.370	33.157
4.1.	GREEN BELT - 1	2001.076		
4.2.	GREEN BELT - 2	1654.618		
4.3.	GREEN BELT - 3	979.109		
4.4.	GREEN BELT - 4	1001.415		
4.5.	GREEN BELT - 5	673.842		
4.6.	GREEN BELT - 6	321.313		