PRE-FEASIBILITY REPORT

ON

PROPOSED PROJECT

OF

MANUFACTURING OF

ORGANIC CHEMICALS

OF

AARTI INDUSTRIES LIMITED
(APPLE ORGANICS DIVISION)

LOCATED AT

Plot No. 609/610, 100

Shed area, GIDC Estate,

Vapi.396 195

CONTENTS

LIST OF TABLES

LIST OF FIGURES

1.0 EXECUTIVE SUMMARY

M/s. Aarti Industries Limited (Apple Organics Division) first obtained CCA order 3431, issued on 16/08/2004. Further it was extended by CCA order no. AWH-73091 dated 14/09/2015 for manufacturing of Synthetic Organic products mentioned in below table no.1. Now the unit wants to go for proposed expansion in same plant at Plot No. 609/610, 100 shed area, GIDC Estate, Vapi, Valsad, Gujarat 396 195. The proposed products are mentioned in Table no. 2.

M/s. Aarti Industries Limited is a fast growing basic organic chemical manufacturing group. The group turnover is around Rs. 5000 crores. The group has several small, medium and large scale industries at various locations. The locations include Vapi, Sarigam, Jhagadia, Dahej, Kutch Etc. in Gujarat and Tarapur at Maharashtra. Aarti Industries Limited is having state of art R&D facilities centrally located at Vapi. One of the important task of R&D is finding green chemistry routes for existing as well as proposed products. After developing the products, the group requires pilot scale facilities at pilot scale scaling of operation is carried out, plant parameters are established and product approvals are undertaken. M/s. Aarti Industries Limited (Apple Organics Division) is a pilot scale facility of M/s. Aarti Industries Limited here various facilities are established to carryout following unit operations like:

- Chlorinated Process
- Hydrogenation/Reduction Process
- Nitration Process
- Nitro Anisole Process
- Fluorination Process
- De-Nitro Chlorination Process
- Ammoniation Process
- Bromination & Deamination Process
- Sulphanation Process
- Alkylation Process
- Dehalgenation Process
- Condensation Process
- Cyclization Process

- Esterfication
- Diazotisation Process
- Acetylation & Hydrolysis Process

Once products are optimized for manufacturing process and market, the technical know how is passed on to sister concern group companies and at M/s. Aarti Industries Limited (Apple Organics Division) new products are started. Thus the project proponent has proposed to carry out various products based on above unit operations. The names of products may get change at several intervals.

(Based on effluent load production will be controlled)

List of proposed products is mentioned in table no.1 As per EIA notification 2006, the proposed expansion is falling under category 5(f).

TABLE NO 1:

LIST OF PRODUCTS AS PER CCA AWH-73091

Sr. No.	Name of Product	Quantity in MT per Month
1.	Para Chloro Aniline **OR**	20
2.	3,4 Di Chloro Aniline **OR**	18
3.	2,5 Di Chloro Aniline **OR**	18
4.	Mix of 3,4 DCA & 2,3 DCA **OR**	18
5.	Ortho Anisidine **OR**	20
6.	Para Toludene **OR**	20

TABLE NO 2:

LIST OF PROPOSED PRODUCTS

Sr. No.	List of Process	Quantity (MT/Month)
1.	**CHLORINATED PROCESS AND/OR**	**100**
1.1	Mono Chloro Benzene, Ortho Di Chloro Benzene, Para Di Chloro Benzene A**ND/OR**	
1.2	123,124 Tri Chloro Benzene-(Benzene) A**ND/OR**	
1.3	Para Nitro Toluene (2chloro 4 Nitro toluene) A**ND/OR**	
1.4	Mono Dichloro Benzene A**ND/OR**	
1.5	Ortho chloro toluene / Para chloro toluene A**ND/OR**	

1.6	6-Chloro 2-Nitro Toluene 4-Chloro 2-Nitro Toluene A**ND/OR**	
1.7	Pivalyl Chloride A**ND/OR**	
1.8	2-Ethyl Hexanyl Chloride A**ND/OR**	
1.9	Iso Nonyl Chloride A**ND/OR**	
1.10	2,4,6 Trichloro Aniline (TCAN) A**ND/OR**	
1.11	2, 6 – Dichloro para nitro aniline (2,6 DCPNA) A**ND/OR**	
1.12	Any other similar products from process	
2.	**HYDROGENATION/REDUCTION PROCESS AND/OR**	
2.1	Ortho Toludene A**ND/OR**	
2.2	M- O &Para Chloro Aniline A**ND/OR**	
2.3	3,4-2,3-2,5 dichloro Aniline A**ND/OR**	
2.4	3,4 & 4,4Diamino Diphenyl Ether A**ND/OR**	
2.5	Di Floro Benzene (1-3) A**ND/OR**	
2.6	Mixing of 2, 4 / 2, 5 DCA A**ND/OR**	
2.7	Mixing of 2, 5 / 2, 6 DCA A**ND/OR**	
2.8	Mixing of 2, 4 / 2, 5 / 2, 6 DCA A**ND/OR**	
2.9	2,4 Dichloro Aniline / 2,6 DiChloro Aniline / 3,5 DiChloro Aniline A**ND/OR**	
2.10	2,4,5 Trichloro Aniline A**ND/OR**	
2.11	Meta / Ortho / Para Phenylene Di Amine A**ND/OR**	
2.12	3,4 Diamino Diphenyl Ether / 4,4 Diamino Diphenyl A**ND/OR**	
2.13	Ether A**ND/OR**	
2.14	Ortho / Para / Meta Anisidine A**ND/OR**	
2.15	Chloro Fluoro Aniline A**ND/OR**	
2.16	Ortho / Para /Meta Cumidine A**ND/OR**	
2.17	Para /Meta Amino Phenol A**ND/OR**	
2.18	Toludines A**ND/OR**	
2.19	Aniline A**ND/OR**	
2.20	Para / Meta / Ortho Floro Aniline A**ND/OR**	
2.21	Di Floro Aniline (1:3) A**ND/OR**	
2.22	4-Floro-N-Isopropyl Aniline A**ND/OR**	
2.23	4-Chloro-NIsopropyl Aniline A**ND/OR**	
2.24	2 Methoxy 4 Nitro Aniline (Scarlet R - from partial hydrogenation of 24 Dinitro Anisole) A**ND/OR**	
2.25	2,4 Di Amino Anisole A**ND/OR**	
2.26	N-N Disec Butyl PPDA A**ND/OR**	
2.27	Meta Xilidine A**ND/OR**	
2.28	4 Chloro 2,5 Dimethoxy Aniline A**ND/OR**	
2.29	N,N Di Sec terteary butyl para phenylene Diamine A**ND/OR**	

2.30	DCBH (Di Chloro Benzene Hydro chloride) A**ND/OR**	
2.31	3,5/2,6 DFA (Di Flouro Aniline) A**ND/OR**	
2.32	Di Anisidine A**ND/OR**	
2.33	OT Base A**ND/OR**	
2.34	Any other similar products from process	
3.	**NITRATION PROCESS AND/OR**	
3.1	3-4,2-3,2-5,2,4 Dichloro N Benzene A**ND/OR**	
3.2	Di Chloro Di Fluoro Nitro Benzene A**ND/OR**	
3.3	Ortho Nitro Chloro Benzene/ Para Nitro Chloro Benzene/ Meta Nitro Chloro Benzene A**ND/OR**	
3.4	2,4 Di Nitro Chloro Benzene A**ND/OR**	
3.5	2,4,5 Tri Chloro Nitro Benzene/ 2,3,4 Tri Chloro Nitro Benzene A**ND/OR**	
3.6	4-Nitro N-methyl Phthalimide A**ND/OR**	
3.7	2 EHN (Ethyl Hexanol Nitration) A**ND/OR**	
3.8	Any other similar products from process	
4.	**NITRO ANISOLE PROCESS AND/OR**	
4.1	Ortho Nitro Anisole **AND/OR**	
4.2	Para Nitro Anisole **AND/OR**	
4.3	2,4-Di Nitro Anisole **AND/OR**	
4.4	2 Methoxy 5 Chloro Nitro Benzene (from 25 DCNB) **AND/OR**	
4.5	Any other similar products from process	
5.	**FLUORINATION PROCESS AND/OR**	
5.1	Para Fluoro Nitro Benzene **AND/OR**	
5.2	Di Fluoro Nitro Benzene **AND/OR**	
5.3	Any other similar products from process	
6.	**DE-NITRO CHLORINATION PROCESS AND/OR**	
6.1	2,6Di Chloro Fluoro Benzene **AND/OR**	
6.2	2,6 Di Chloro-benzonitrile **AND/OR**	
6.3	Di Chloro Di Fluoro Benzene **AND/OR**	
6.4	Meta Dichloro Benzene **AND/OR**	
6.5	2,4 Diflouro Chloro Benzene **AND/OR**	
6.6	2,4 Dichloro Fluoro Benzene **AND/OR**	
6.7	1,3 Dichloro 4,6 Diflouro Benzene **AND/OR**	
6.8	Para Fluoro Chloro Benzene **AND/OR**	
6.9	Ortho Fluoro Chloro Benzene **AND/OR**	
6.10	Any other similar products from process	
7.	**AMMONIATION PROCESS AND/OR**	
7.1	Di Chloro Ortho Nitro Aniline **AND/OR**	
7.2	Ortho Nitro Aniline-Para Nitro Aniline **AND/OR**	
7.3	Any other similar products from process	
8.	**BROMINATION&DEAMINATION PROCESS AND/OR**	

8.1	345Tri Fluoro Bromine Benzene	
8.2	2 Bromo 4 Flouro Acetanilide **AND/OR**	
8.3	Di Chloro Bromo Benzene **AND/OR**	
8.4	Any other similar products from process	
9.	**SULPHANATION PROCESS AND/OR**	
9.1	4B Acid **AND/OR**	
9.2	Any other similar products from process	
10.	**ALKYLATION PROCESS AND/OR**	
10.1	Methyl Ethyl Aniline **AND/OR**	
10.2	Any other similar products from process	
11.	**DEHALGENATION PROCESS AND/OR**	
11.1	1,3 Di Fluoro Benzene **AND/OR**	
11.2	Any other similar products from process	
12.	**CONDENSATION PROCESS AND/OR**	
12.1	Di Nitro Di Phenyl Ether **AND/OR**	
12.2	Any other similar products from process	
13.	**CYCLIZATION PROCESS AND/OR**	
13.1	Di Amino Phenyl Benzimidazole **AND/OR**	
13.2	Para flouro Anisol **AND/OR**	
13.3	Quinalphose (TECH) (Diethyl 2-Hydroxy Thiophosphoryl Chloride)**AND/OR**	
13.4	Any other similar products from process	
14.	**ESTERFICATION AND/OR**	
14.1	Ester **AND/OR**	
14.2	Any other similar products from process	
15.	**DIAZOTISATION PROCESS AND/OR**	**75**
15.1	25&23Di Chloro Phenol **AND/OR**	
15.2	-3,5 Di Chloro Nitro Benzene **AND/OR**	
15.3	Para Flouro Phenol (PFP)**AND/OR**	
15.4	Any other similar products from process	
16.	**ACETYLATION & HYDROLYSIS PROCESS AND/OR**	**20**
16.1	Meta Nitro Para Anisidine **AND/OR**	
16.2	Meta Nitro Para Toludiene **AND/OR**	
16.3	Any other similar products from process **AND/OR**	
	Total	**100 MT/Month or 75 MT/Month or 20MT/Month**
17.	**BY PRODUCTS**	
17.1	30% Hydrochloric Acid	202
17.2	Spent Acid	327
17.3	Aluminum Oxide (Al2O3)	4
17.4	Sodium Chloride (NaCl)	44.5
17.5	Ortho Nitro Phenol (ONP)	3.5

17.6	Calcium Chloride (Cacl2) solution	149
17.7	Potassium Chloride (KCL)	187.5
17.8	Acetic Acid (CH3COOH)	10
	Total	**927.5**

COST OF PROJECT

The expansion will be carried out at existing plot located in GIDC. The expected cost of proposed expansion is Rs. 500 Lacs. The total plot area of the unit is 1752 sq. m. The existing green belt area is approx. 183 sq. m. After expansion, the green belt area will be remaining same.

FUEL & ELECTRICITY CONSUMPTION

As per consent

As per consent, the unit is using 1MT/day of furnace oil as fuel for Boiler. The existing electricity load is 125 KVA from DGVCL.

Proposed scenario

Natural gas of 894 SCM/Hr. will be used in boiler instead of furnace oil. The unit is proposing 3 stacks from reactors out of which 2 stacks will be connected to water scrubber followed by alkali scrubber and the other one stack will be connected to water scrubber followed by acid scrubber.

The existing electricity consumption is 125 KVA and electricity consumption due to proposed expansion will be 125 KVA. Total electricity requirement after proposed expansion will be 250 KVA.

WATER CONSUMPTION

As per consent

The source of water is GIDC. In the existing scenario, the unit is using 18 KLD fresh water for industrial and domestic purpose.

Proposed scenario

For proposed expansion, the unit has proposed 32 KLD of water consumption. The total fresh water consumption after expansion will be 50 KLD.

WASTE WATER GENERATION, TREATMENT & DISPOSAL

As per consent

As per consent, the industrial effluent generation is 4.5 KLD and sewage generation is 2 KLD.

Existing effluent is treated in ETP having primary, secondary and tertiary treatment. Treated water is sent to CETP.

Proposed scenario

Due to proposed expansion, additional total industrial effluent generation will be 15.5KLD. Hence, after expansion total industrial effluent generation will be 20 KLD (4.5 KLD existing + 15.5 KLD proposed). Due to proposed expansion, additional sewage generation will be 2 KLD. Hence, after expansion sewage generation will be 4 KLD (2 KLD + 2 KLD).

Existing and proposed effluent will be treated in unit's own ETP. In which existing waste water is treated in Effluent treatment plant and after treatment, treated water is sent to CETP - Vapi Waste & Effluent Management Co. Limited. The Membership Letter is attached as Annexure- XI. We will discharge additional quantity of effluent in CETP .

GASEOUS EMISSION

As per consent:

FLUE GAS EMISSION

As per CCA order no. AWH- 73091, the unit has one stack of boiler having 11 m height.

Now, the unit has proposed one D.G set of 250 KVA. Thus there will be proposed one D.G set stack having height 11 m.

PROCESS EMISSION

There is no process gas emission stack in existing unit.

The unit is proposing 3 stacks from reactors out of which 2 stacks will be connected to water scrubber followed by alkali scrubber and the other one stack is connected to water scrubber followed by acid scrubber.

HAZARDOUS WASTE MANAGEMENT

As per consent

As per CCA order no. AWH-73091, the hazardous waste generation are ETP waste (1 MT/Year), Used oil (10 Lit/Year), Discarded containers/Bags (1000/Year), Process waste (2.4 MT/Year).

ETP waste, Process waste containing organics complex are disposed to TSDF/CHWIF. Used oil is reused in unit itself and Discarded Container/Bags are disposed by sold to authorize recyclers.

Proposed scenario

After proposed expansion, hazardous waste generation details will be ETP waste (300 MT/Year), Distillation Residue (240 MT/Year), Used oil (50 Lit/Year), Discarded containers/Bags (1000 Nos/Year), Spent Carbon (0.5 MT/Month). Spent Catalyst (5 MT/Year) and Insulation waste (what so ever generated).

ETP waste, Distillation Residue will be disposed to TSDF. Used oil will be sold to registered reprocessor and Discarded Container/Bags will be sold to authorize recyclers. Spent catalyst and spent carbon will be sent for co-processing.

2.0 INTRODUCTION

2.1 THE PROJECT

M/s. Aarti Industries Limited (Apple Organics Division) first obtained CCA order-3431, issued on date:16/08/2004, which was extended in CCA AWH-40083 dated 01/01/2011, which is now further extended in CCA AWH-73091 dated 14/09/2015 for manufacturing of products mentioned in Table 1. The unit has proposed expansion for manufacturing of existing products and new products. Proposed production capacity is mentioned in Table no.2.

As per EIA notification 2006, the proposed expansion is falling under category 5(f).

2.2 PROJECT PROPONENT

The list of Directors is given in Table no.3.

TABLE NO 3:

CONTACT DETAILS OF DIRECTORS

Sr. No.	Name of Director	Designation	Address	Telephone No.
1.	Shri.Rajendra V. Gogri	Chairman& Managing Director	1401, Antriksh. Murar road, Mulund (w), Mumbai 400080	022-67976666
2.	Shri.Rashesh C. Gogri	Vice chairman& Managing Director	601,Antriksh Morar Road, Mulund (W) Mumbai 400080	022-67976666
3.	Shri. Parimal H. Desai	Whole-Time Director	A/1403 14TH Floor, Runwal Heights, L.S.B. Marg, Mulund (W) Mumbai- 400080	022-67976666
4.	Shri.Manoj M. Chheda	Whole-Time Director	Dunhill Villa CO.OP.HSG.SOC.Ltd., Besant Road, Santa Cruz (W), Mumbai- 400054	022-67976666
5.	Shri.Kirit R. Mehta	Whole-Time Director	10, Pushpendra Mension, Feroz shah Mehta Road, Santa Cruz (W),	0260-2400059 2400366

Sr. No.	Name of Director	Designation	Address	Telephone No.
			Mumbai– 400054	
6.	Smt. Hetal Gogri Gala	Whole - Time Director	558-B, Gopal Sadan, Block no. 801, 8TH Floor, Jamshed Road, Matunga(E), Mumbai– 400019	022 – 67976666
7.	Shri. Renil R. Gogri	Whole - Time Director	1401, Antriksh. Murar Road Mulund (W) Mumbai-400080	022 – 67976666

The directors of the company have good experience in handling the production management, financial management and all the allied areas.

2.3 NATURE OF PROJECT

Existing activities involves organic chemical manufacturing unit. The unit has proposed expansion for organic manufacturing products. Proposed productions scenario is mentioned in Table 1.

2.4 MARKET FEASIBILITY

The unit does contribute towards improving their quality of life since the end users of products are industries ranging from agrochemicals and dyes to specialty chemicals and pharmaceuticals - markets that are critical to long-term sustainability. By supplying high quality and good value products to all customers, the unit indirectly helps people to have access to better medicines, fertilizers and diverse items of daily use. In other words, greening the supply chain management plays a significant role in the unit's business strategy. The products are highly influenced by the market demand and market rates.

Various products listed in Table 1 are used in manufacturing of:

- Inks- used in manufacturing of sheet –fed offset, web offset, News Paper, UV screen, gravure and Flexo.
- Paints- used in manufacturing of Air drying enamel, stoving paints, Acrylic paints, and Automotive paints Industrial paints and Cement Paints.
- Plastics- used in manufacturing of LDPE, HDPE, PVC, Polypropylene, Poly carbonate, Polystyrene.
- Textile- used in manufacturing of Emulsion paste for Pigment printing
- Agrochemicals

The Golden corridor of Gujarat from Dahej to Vapi has presence of lots of industries manufacturing Organic chemicals. Hence, local market is already available.

AARTI has privilege of catering to its export customers in countries such as USA, UK, Germany, Spain, Italy, Switzerland, Belgium, Japan, Korea, China, Russia, etc

3. PROJECT DESCRIPTION

3.1 TYPE OF PROJECT

The proposed project is not including any interlinked and interdependent projects.

3.2 PROJECT LOCATION

M/s. Aarti Industries Limited (Apple Organics Division) is located at plot no 609/610, 100 Shed area, GIDC Estate, Vapi-396195, Dist.: Valsad, and Gujarat. It is approximately 27.64km distance from Dist.: Valsad. The approximate geographical positioning of the project site is at Latitude 20°20' 55.194" N, Longitude 72°56'16.5516" E. It has an average elevation of 5 m. The location of the project site can be identified from the location map shown in Figure-1.The salient features of the location of the project site are presented in Table no 4.

TABLE NO 4:

SALIENT FEATURES OF THE PROJECT SITE

Particulars	**Details**
Taluka/ Tehsil	Pardi (approx. 19.42 KM)
District	Valsad (approx. 27.64 KM)
Approx. Geographical positioning	Latitude: 20°20' 55.194" N Longitude: 72°56'16.5516"
Nearest City	Valsad (approx. 27.64 KM)
Nearest Town	Vapi (approx. 4.40 KM)
Nearest Highway	NH8 (approx. 0.30 KM)
Nearest State highway	SH 185 (approx. 0.38 KM)
Nearest Railway line/ Railway station	Vapi (approx. 4.12 KM)
Nearest Airport/ Airbase	Mumbai(approx. 183.38 KM)
Protected Areas/ Sanctuaries	---------

FIGURE 1:
LOCATION OF THE PROJECT SITE

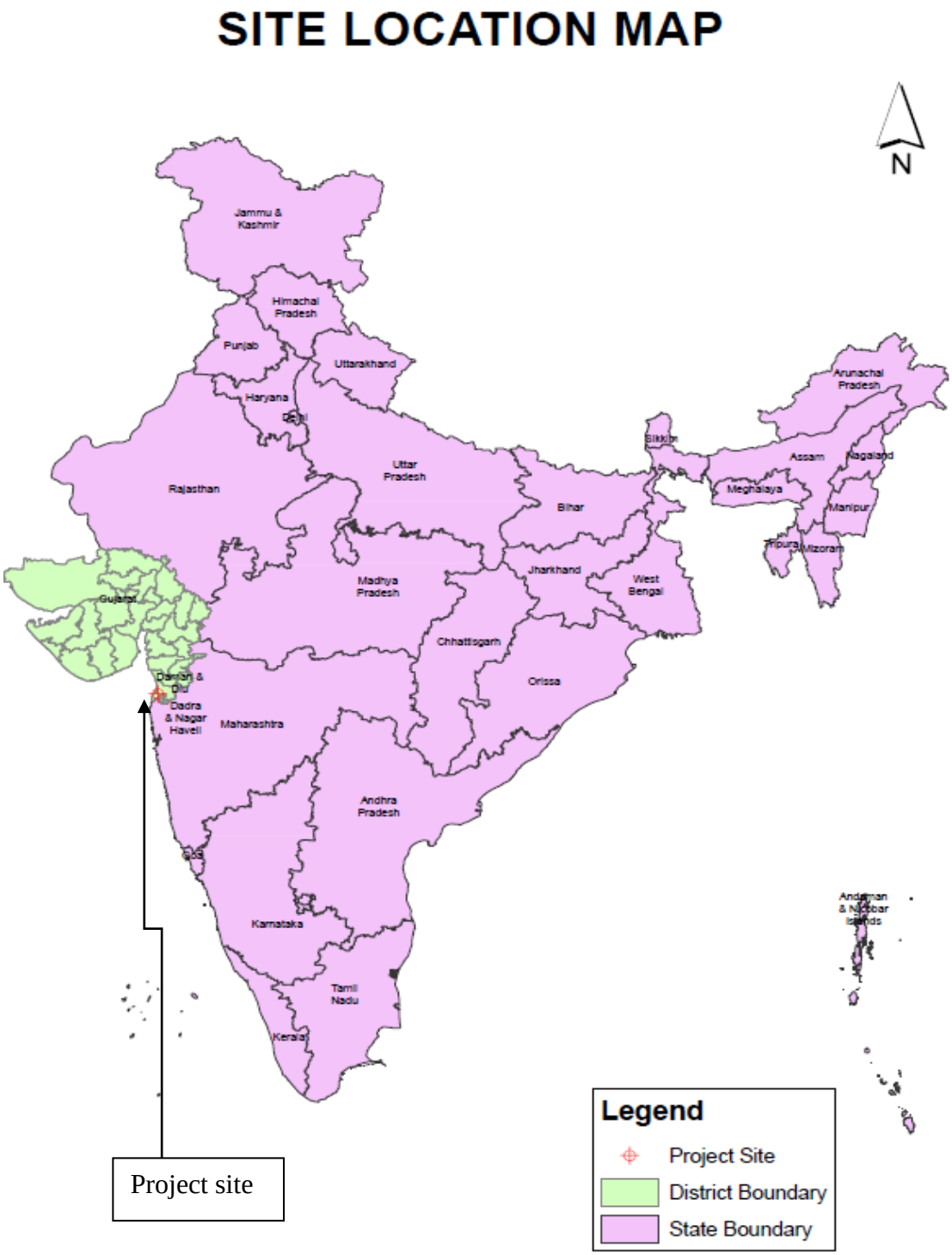
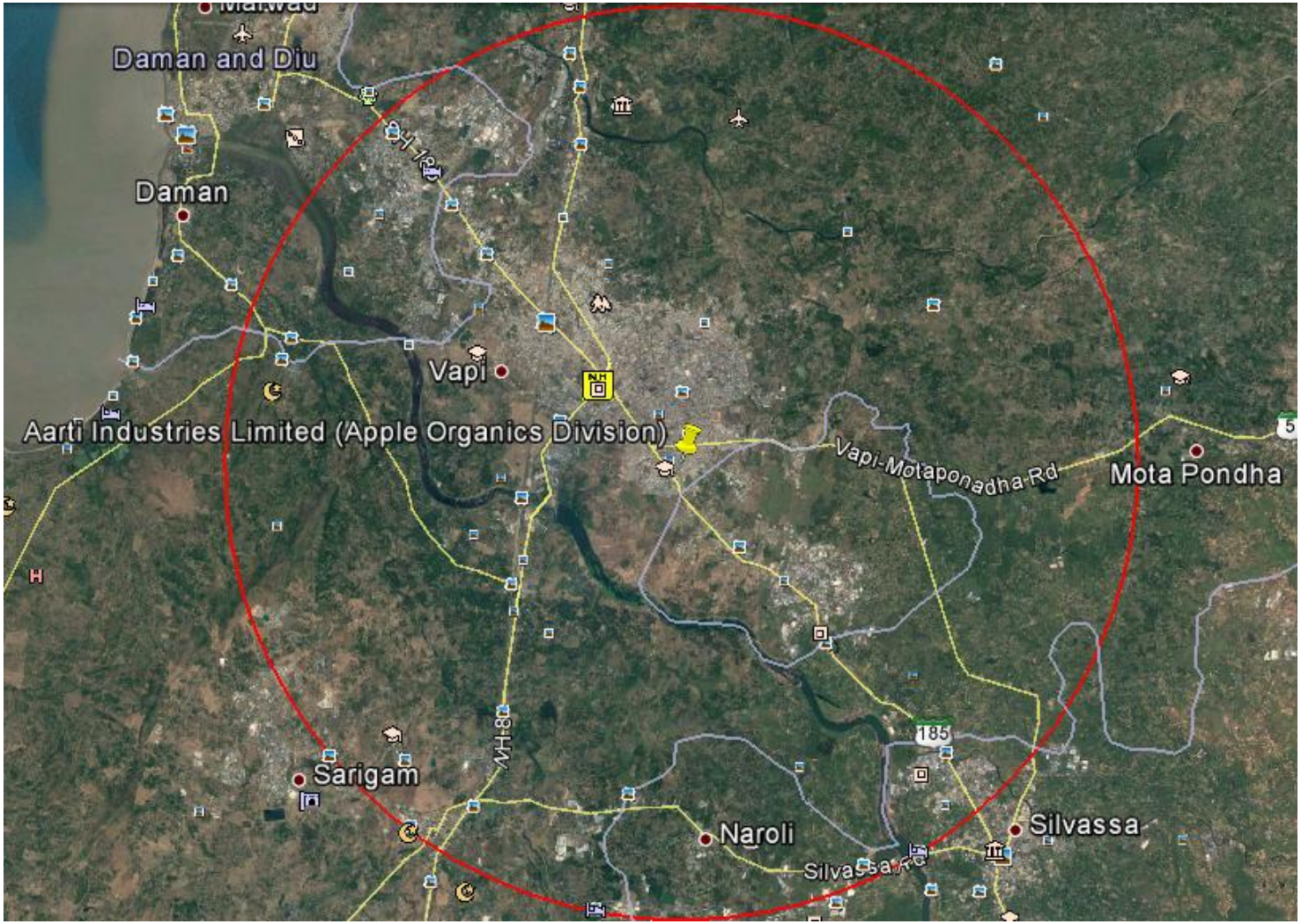


FIGURE 2:

AERIAL VIEW OF THE 10 KM RADIAL DISTANCE FROM THE PROJECT SITE



3.3 SITE SELECTION

The project proponent did not consider any other alternative site for proposed expansion.

3.4 NEIGHBORING INDUSTRIES

The industry is located in an area, which is already industrialized. The industries in the vicinity of the proposed project are given in the table no-5.

TABLE NO 5:

NEARBY INDUSTRIES IN THE VICINITY

Name of Industry	Direction w.r.t project site	Address
Hi Tech Ink Pvt Ltd	South side	Plot No. 633 to 635, 100 Shed area, G.I.D.C. Vapi - 396195
Good Cast Pvt Ltd	West side	Plot Np. 608, 100 Shed Area, G.I.D.C. Vapi - 396195
1) Varada Engineering & Consultant 2) Jhelum Roadways	East Side	Survey No. G-76, Gala No. 01, 100 Shed Area, G.I.D.C. Vapi - 396195
Supreme Transport Pvt Ltd	North Side	Plot Np. 611, 100 Shed Area, G.I.D.C. Vapi - 396195

3.5 SIZE OF PROJECT

The expected cost of proposed expansion of project is Rs.500 lacs. New Plant and machinery installations will also have to be acquired and installed.

Environment Protection and safety systems have also been considered in planning the Cost Projection. The unit will carry out maintenance and necessary modifications in proposed effluent treatment plant. The below given table no-6 shows the break-up of the proposed project cost.

TABLE NO 6:

CAPITAL COST PROJECTION

Sr. No.	Purpose	Existing (Rs. In Lacs)	Proposed (Rs. In Lacs)	Total (Rs. In Lacs)
1.	Land	90	0	90
2.	Building	100	100	200
3.	Plant and Machinery	115	300	415
4.	Env. Protection & Safety			
	a) Effluent treatment Plant	50	70	120
	b) Safety Equipment (PPE, fire extinguishers, Ventilation, etc.)	10	20	30
	C) Green belt development	10	10	20
	Total	**375**	**500**	**875**

3.6 PROCESS TECHNOLOGY

Process details like process description, chemical reactions and mass balance for each grade of products are attached as Annexure-V.

3.7 RAW-MATERIALS

The proposed raw materials are organic and inorganic chemicals and they will be purchased from the local/ Indian market. Details of raw-material consumption are attached as Annexure- IV.

3.8 RESOURCE OPTIMIZATION/RECYCLING AND REUSE

The unit will recover calcium chloride solution and sale it as a co-product.

The unit will recover sodium chloride solution and sale it as a co-product.

3.9 RESOURCE REQUIREMENTS

3.9.1 LAND

The plot has been purchased by M/s. Aarti Industries Ltd. (Apple Organics Division) from GIDC. The total plot area of the unit is 1752 sq. m. The Green belt area is 183 sq. m.

3.9.2 BUILDING

The proposed expansion will take place, and new buildings will be constructed.

3.9.3 POWER AND FUEL

TABLE NO 7:
POWER AND FUEL REQUIREMENT

Sr. No.	Name	Requirement		Total	Source
		Existing	Proposed		
1	Diesel	0	75 Lit/HR	75 Lit/Hr.	DG set
2	Energy - Electricity	125 KVA	125 KVA	250 KVA	DGVCL
3	Natural Gas	0	894 SCM /hr	894 SCM/hr.	GSPC
4	Furnace Oil	1 MT/Day	0	1 MT/Day	--

3.9.4 WATER

The category wise bifurcation of the water requirement is given in Table no 8. The source of water will be from GIDC water supply scheme.

TABLE NO 8:

CATEGORY-WISE WATER REQUIREMENT

Sr. No.	Section	Water Consumption KL/Day		
		Existing	Proposed	Total after Expansion
1	Domestic	3	2	5
2	Industrial			
	Process	4	12	16
	Washing	0	3	3
	Boiler	5	10	15
	Cooling	3	3	6
	Gardening	3	2	5
	Total (Industrial)	**15**	**30**	**45**
	Total(Industrial + Domestic)	**18**	**32**	**50**

3.9.5 MANPOWER

The manpower required for the project as well as during the construction/ commissioning activities will be employed from the local area.

TABLE NO 9:

MAN POWER REQUIREMENT

Phase of project	Type of labor	No. of workers (Existing)	No. of workers (Proposed Scenario)	No. of workers (Total)
During construction	Contractual	0	15	15
During commissioning	Contractual	0	10	10
During operations	Managerial	3	2	5
	Skilled	15	20	35
	Un-skilled	22	7	29
Total		**40**	**54**	**94**

3.10 MITIGATION MEASURES & EMP

Based on overall manufacturing & operation activities, the mitigation measures have been proposed by the company for the control of the anticipated pollution load.

3.10.1 WASTEWATER MANAGEMENT

3.10.1.1 WASTEWATER GENERATION

The category-wise bifurcation of the anticipated wastewater generation details is given in Table 10.

TABLE NO-10:

CATEGORY-WISE WASTEWATER GENERATION

Sr. No.	Section	Waste Water Generation KL/Day		
		Existing	**Proposed**	**Total after expansion**
1	**Domestic**	**2**	**2**	**4**
2	**Industrial**			
	Process	3	10	13
	Washing	0	3	3
	Boiler	1	1	2
	Cooling	0.5	1.5	2
	Gardening	0	0	0
	Total (Industrial)	**4.5**	**15.5**	**20**
	Total(Industrial + Domestic)	**6.5**	**17.5**	**24**

3.10.1.2 WASTEWATER CHARACTERISTICS

Existing & proposed effluent characteristic before treatment and after treatment in ETP is covered in Table no. 11.

TABLE NO-11:

WATEWATER CHARACTERISTICS

Sr. No	Parameters	Units	Before Treatment	After Treatment	Inlet norm of CETP
1	pH	--	5-7	6-8	5-9
2	Total Suspended Solids	mg/l	100-150	<100	600
3	Total Dissolved Solids	mg/l	9000-10000	<9000	--
4	Ammonical Nitrogen	mg/l	10-30	<10	50
5	B.O.D.3 days at 27°C	mg/l	1200-1700	<500	500
6	C.O.D.	mg/l	4000-5000	<2000	2000

3.10.1.3 WASTEWATER TREATMENT & DISPOSAL

EFFLUENT TREATMENT SCHEME (EXISTING& PROPOSED)

ETP PROCESS DESCRIPTION:

The waste water from process, washing, cooling, steam condensates, floor washing, etc. is coming through drain line from plant to the oil and grease traps. Here oil and grease is trapped floating on the water, which is to be removed manually. Through this trap, water flows to neutralization cum primary settling tank. Here all different quality water pH is adjusted to 7.5. In these tanks an agitation is provided by stirrer. In this primary treatment chemicals used are sulphuric acid, caustic lye, hydrated lime, alum and polyelectrolyte.

Neutral water from this tank is settled out and clear effluent overflow to collection tank. The settled sludge from bottom of the settling tank will be taken in sludge drying bed where dry the sludge. The dry sludge is packed in plastic bags and stored in storage area. Collected effluent of collection tank is continuously feeded to the aeration tank. Aeration tank contains huge qty. of biomass and a diffuser system to provide sufficient oxygen required for bio-degradation of the organic matters. Water treated in this aeration tank then continuously flows to secondary setting tank, where the bio sludge settles at the bottom. Thick slurry of this bio-sludge from the bottom tank is pump backed to aeration tank to maintain "MLSS". If it is an excess then it is transferred to sludge drying beds.

Overflow of effluent from the secondary settling tank to collection tank by gravity. Collected effluent of collection tank is taken to high pressure sand filter where filter the effluent after that effluent is taken to carbon column. Where reduce the colour and decrease the COD value. The final treated effluent will be discharged to GIDC under ground drainage system, which will be ultimately disposed to CETP for further treatment. If CETP membership is not obtained/ allotted, the extra quantity will be recycled back by RO and MEE.

DETAILS OF ETP UNITS

TABLE NO-12:

ETP DETAILS

Sr. No.	**Particular**	**Existing Capacity in M^3**	**Proposed additional Capacity in M^3**
1.	Oil & Grease Trap	11	--
2.	Neutralization cum settling tank	6.6	--
3.	Equalization Tank	--	6.6
4.	Filter press	1.2	2
3.	Collection Tank	1.6	3
4.	Aeration Tank	13	40
5.	Secondary Settling Tank	5	15
6.	Collection Tank 2	1.26	3
7.	Sand Filter	1.5	-
8.	Carbon Column 2	0.15	0.5
9.	Lime Preparation Tank	0.98	--
10.	Sludge Drying Bed	1.69	--

FLOW DIAGRAM OF ETP (EXISTING & PROPOSED):

FIGURE 3:

EXISTING ETP FLOW DIAGRAM

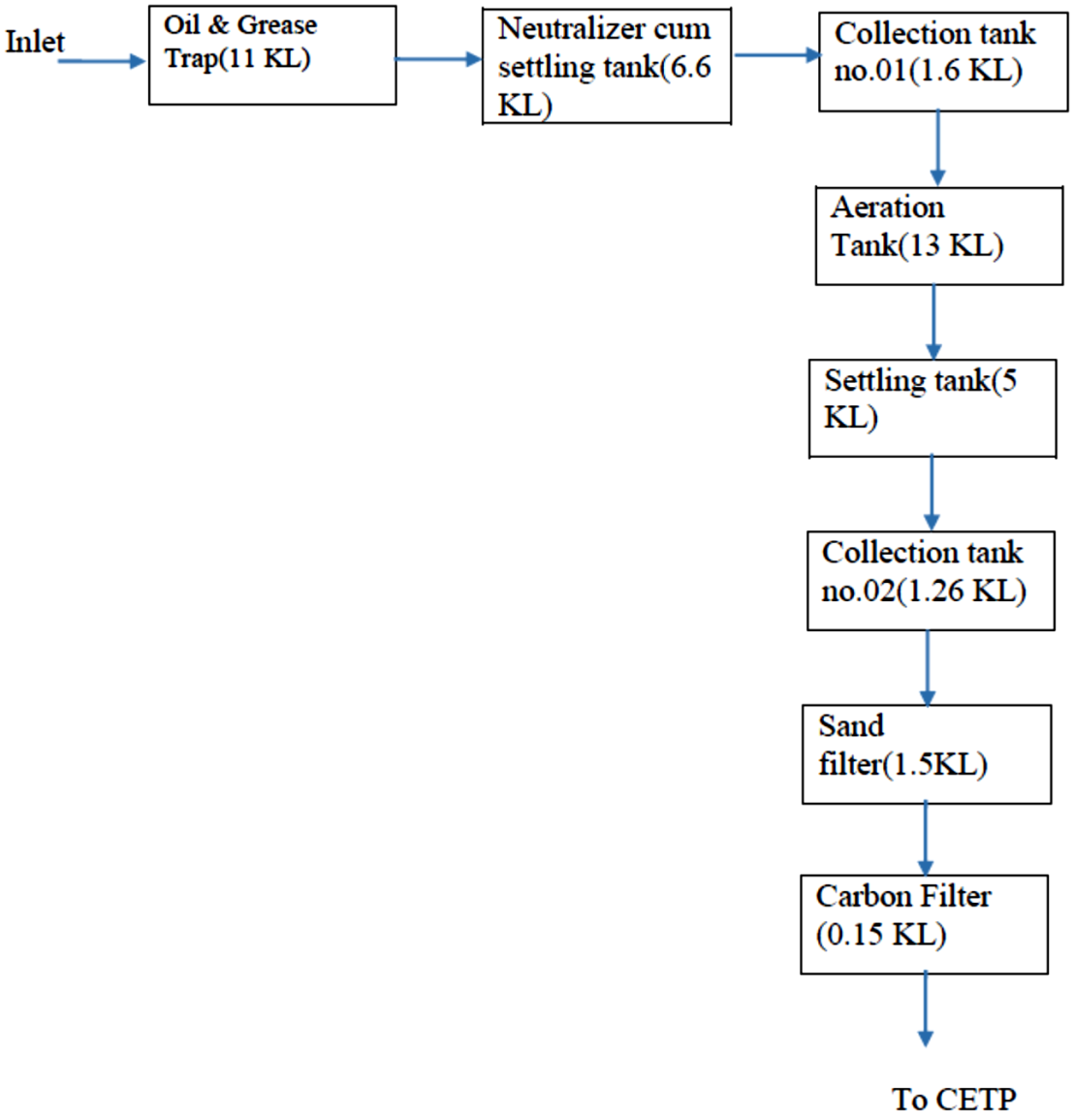
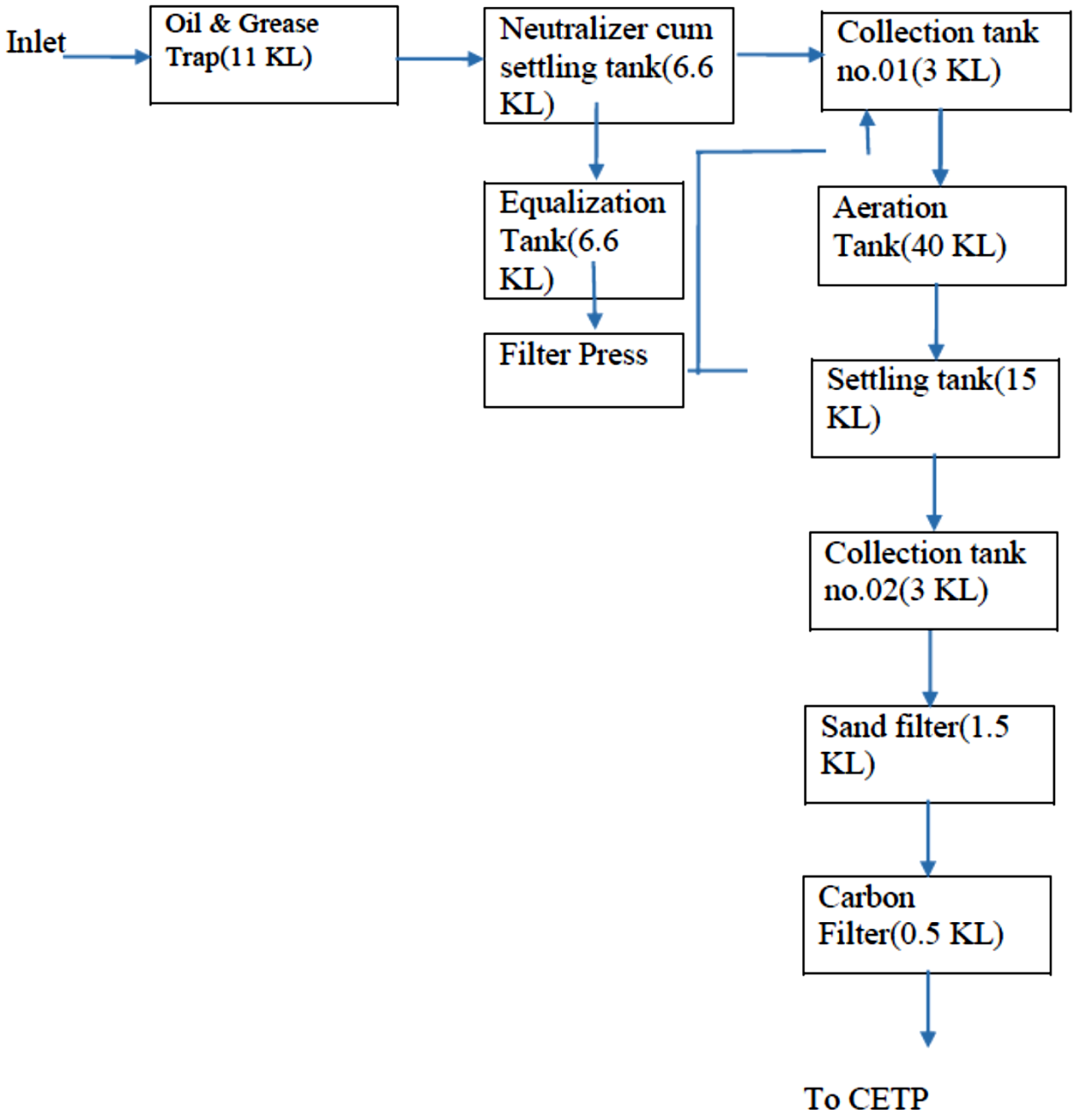


FIGURE 4:

PROPOSED ETP FLOW DIAGRAM



3.10.2 GASEOUS EMISSIONS & CONTROL

3.10.2.1 FLUE GAS EMISSIONS

As per CCA order no. AWH- 73091, the unit has one stack of Steam Boiler having 11 m height.

Now, the unit has proposed one D.G set of 250 KVA having height of 11 meters.

3.10.2.2 PROCESS EMISSION

As per Consent, there is no process stacks. There will be 3 additional stacks of process emission after proposed expansion. Details are given in table no. 13 below.

TABLE NO-13:

PROCESS GAS EMISSION

Sr No.	Stack attached to	Stack Height in meter	APCM	Probable Pollutants	Permissible Limit
Proposed					
1	Plant-1	11 m	Water Scrubber followed by Alkali Scrubber	HCl NO_x Br_2 HB_r NO_2 Cl_2	20 mg/Nm^3 25 mg/Nm^3 09 mg/Nm^3 20 mg/Nm^3 25 mg/Nm^3 09 mg/Nm^3
2	Plant-2	11 m	Water Scrubber followed by Alkali Scrubber	HCl NO_x Br_2 HB_r NO_2 Cl_2	20 mg/Nm^3 25 mg/Nm^3 09 mg/Nm^3 20 mg/Nm^3 25 mg/Nm^3 09 mg/Nm^3
3	Plant-3	11 m	Water Scrubber followed by Acidic Scrubber	NH_3	175 mg/Nm^3

3.10.2.3 FUGITIVE EMISSIONS

There will be no volatile or low boiling chemicals to be used in the process. Hence, chances of fugitive emissions are reduced to a great extent by providing proper control measures.

However, following steps will be taken to reduce chances of fugitive emissions:

- All raw-materials will be stored in drums/ bags in a well-ventilated raw material storage area.
- All reactions will be taken in closed reactor system.
- The fugitive emissions in terms of handling losses will be reduced by proper storage and handling. Raw-material feeding will be carried out by pumps.
- Regular monitoring will be done of piping and fittings for checking of any leakages.
- Good housekeeping will be maintained in the plant

3.10.3 HAZARDOUS/ NON-HAZARDOUS WASTE MANAGEMENT

The following type of hazardous waste will be generated from the operational activities. All the waste will be stored separately in a designated storage area. The details about quantity of hazardous waste generation, storage, and disposal for existing and proposed are attached as Annexure-IX.

In addition to the provision of above, we will ensure proper management for hazardous waste as below:

(A) Transportation of hazardous waste to the TSDF Site will be governed as per the guidelines and accompanied with Form-13.

(B) Annual returns of the disposal of wastes in Form-4 will be uploaded online and submitted regularly to the local office of the GPCB.

3.10.4 NOISE CONTROL & ODOUR

The major noise generation is from D.G. Set. It is installed in a closed room, acoustic enclosure is provided around it. Ear plugs are provided to the operating personnel in boiler room.

The following steps will be taken for Odour control.

(A) Raw-material feeding will be carried out by pumps.

(B) All reactions will be taken in closed reactor system.

(C) Roof top ventilation will be provided in the entire plant area.

Regular monitoring will be done of piping and fittings for checking of any leakages.

3.10.5 STORAGE, HANDLING AND TRANSPORT OF HAZARDOUS CHEMICALS

The storage and mode of transport of chemicals will be done as per detailed MSDS and Chemical hazards guide (NIOSH) for the hazardous chemicals.

Few chemical to be used in the proposed activities are listed as ‘Hazardous Chemicals’ as per the Schedule-1 of the MSIHC Rules, as amended in 2000.

3.10.6 HEALTH AND SAFETY MEASURES

Few chemical to be used in the proposed activities are listed as ‘Hazardous Chemicals’ as per the Schedule-1 of the MSIHC Rules, as amended in 2000.

Physical hazards may manifest as fires, explosions, excessive temperatures, or the release of large volumes of gas or toxic or flammable gases or vapors. According to Schedule 2 & 3 of MSIHC Rules,

Moreover transport activity will be through drums, so there will be manual loading and unloading and no unloading through pipe at the site. Hence, the risk of static charge generation during transfer of such chemicals is not significant.

4.0 SITE ANALYSIS

4.1 CONNECTIVITY

The site is located at plot no. 609/610, 100 Shed area GIDC Estate, Vapi- 396 195, Dist. Valsad. The site is 4.41 km from Vapi town and 0.30 Km from National highways. The land and Infrastructure is already available. The raw materials are easily available through the easy transport via road connectivity. The Vapi has railway station and connected to Mumbai- Amadavad rail line. The site is in the existing unit compound.

4.2 LAND USE AND LAND OWNERSHIP

The proposed project site is into the GIDC Estate, Vapi, and Gujarat which is meant for this type of industries. The land is on plot no. 609/610, 100 Shed area, GIDC Estate, Vapi- 396 195, Dist. Valsad. The total plot area of the unit is 1752 sq. m.

Land ownership is with project proponents.

4.3 EXISTING LAND USE

Proposed expansion will be in present plot only. The same land use status will be maintained.

4.4 EXISTING INFRASTRUCTURE

The plant is located in a well-developed industrial zone, which have all essential facilities such as well-connected road network with ease of transportation, arrangement for supply of water and power to industries, effluent disposal facilities etc. Infrastructure is made available through Govt. approved authorized agencies.

4.5 SOIL CLASSIFICATION

The soils of the district are derived from the Deccan trap which is main rock formation of the district. The soil of the district can be classified as light, medium and heavy according to depth, texture and location. There is sandy loam to loamy in texture, brownish black in color.

4.6 CLIMATE DATA (SECONDARY SOURCES)

The climate is characterized by oppressive summer dampness in the atmosphere nearly throughout the year, heavy south- west monsoon rainfall and a mild winter.

The year may be divided in to four seasons. From December to February is known as winter or cold season. The summer or hot season is from March to May and south- west monsoon season is from June to September, while October and November is the post monsoon season.

Valsad is the nearest meteorological observatory station to the project site. The various meteorological details of Valsadstationfor the year March 2014 to May 2014are given in Table no. 14.

TABLE NO 14:

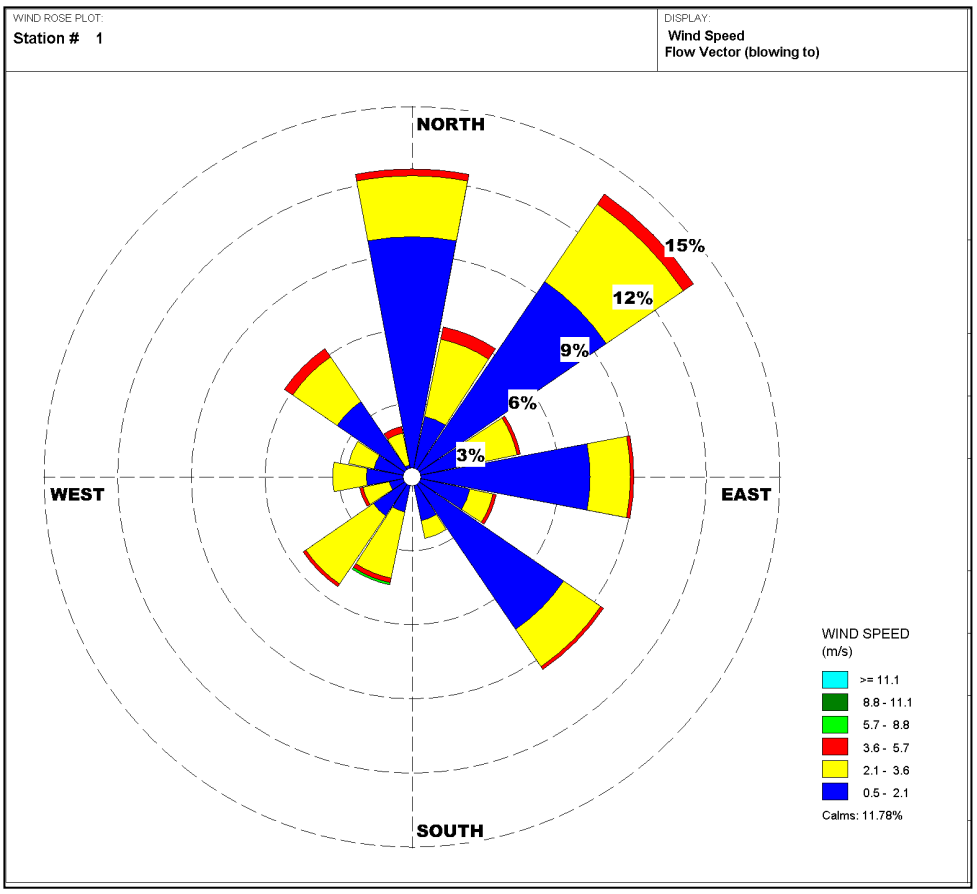
MICRO METEOROLOGICAL DATA

(Data from Indian Meteorological Department, Ahmadabad, Station:-VALSAD)

Month	--	**Temp. (°C)**	**Relative Humidity (%)**	**Rainfall mm**
March-14	Min	12.8	24	0.0
	Max	33.6	85	
	Average	23.2	54.5	
Apr-14	Min	19.2	33	0.0
	Max	40	84	
	Average	29.6	58.5	
May-14	Min	19.2	39	0.0
	Max	36.6	81	
	Average	27.9	60	

FIGURE 5:

WIND ROSE DIAGRAM FOR PERIODOF MARCH 2014 TO MAY 2014



4.7 SOCIAL INFRA STRUCTURE

The Vapi city falls at Pardi Taluka of Gujarat. It is positioned on the bank of River Daman Ganga. It is situated to east of Daman (Central Territory) and to the West of Dadra and Nagar Haveli. Vapi is largely an industrial area dominated by small scale industries, especially chemical plants.

Infrastructure like Airport is at the distance of 183.38km (Mumbai) in south direction. Nearest habitation is Vapi Town, 4.41 km away from project site in West direction. All the required infrastructure facilities are available in this town. National highway no.8 is 0.30 km away in west direction from project site.

5.0 PLANNING BRIEF

5.1 PLANNING CONCEPT

Vapi is largely an industrial area dominated by small scale industries, especially chemical plants.

Vapi in Gujarat has a largest industrial area with common effluent treatment plant and land fill site. Govt. agencies provide many basic facilities like uninterrupted water supply, power and road network.

5.2 POPULATION PROJECTION

As per provisional reports of Census India, Population of Vapi in 2011 is 1, 63,605 of which male and female are 94,338 and 69,267 respectively. The sex ratio of Vapi city is 734 per 1000 males.
In education section, total literates in Vapi city are 1, 43,706 of which 83,720 are males while 59, 986 are females. Average literacy rate of Vapi city is almost 100 Percent.

5.3 LAND USE PLANNING

The proposed project is in the established GIDC industrial area. This is not a prime agriculture land.

5.4 ASSESSMENT OF INFRASTRUCTURE DEMAND

M/s. Aarti Industries Ltd. (Apple Organics Division) shall get water from GIDC water supply scheme. So there will be no additional stress on ground water resources and there will be no adverse effect on the ground water resources available in the nearby area. The unit has 125 KVA connected load form DGVCL as per CCA. Additional requirement for proposed expansion will 125 KVA. Thus the total requirement of electricity will be 250 KVA. The transportation facilities will also expect to improve due to increase in the movement of workers and raw material and finished products.

5.5 AMENITIES

The available basic amenities are as under:

(A) Education Facilities:

Education Facilities are available and the literacy rate is about 45.67 % within 5 km periphery. All the villages have a minimum of one primary school.

(B) Medical Facilities:

The medical facilities are available in satisfactory amount in study area. These facilities are available in form of child welfare Centre, primary health sub Centre, and allopathic dispensary, maternity & child welfare centers, registered private medical practitioners and family welfare Centre within the range.

(C) Drinking water Facilities & Power Supply:

All the villages have potable water supply and in 100% area the drinking water is supplied through taps, wells and tube wells. All the villages have power supply facilities in the study region.

(D) Post, Telegraph & Telephone facilities

The information collected clearly indicates that the infrastructural facilities are provided by respective government agencies for the development of this area. For communication purpose, post office and phones are available in most of the villages. The villages having Non-availability of these facilities can get these facilities within 5-10km distance.

(E) Transport Facilities:

Bus services are available in all the villages of the study region within 5 km area and are the most preferable mode of transport in the region. Auto-rickshaw is also used as transport facility. Villages are connected with paved roads.

Source: 2011, Census.

6.0 PROPOSED INFRASTRUCTURE

6.1 PROCESSING AREA

The process area will cover Plant, Raw material storage area, Hazardous waste storage area, ETP and utilities. The process area covered by the unit at ground level will be 536.54sq. m.

6.2 NON PROCESSING AREA

The non process area will cover Admin Building, Canteen and security cabin. The non process area covered by unit at ground level will be 278.54 sq.m.

6.3 GREEN BELT

Out of the total land area of 1752sq. m. approximately 183 sq. m. is utilized for green belt development. There will be provision of budget of 10 lakh rupees for green belt development.

6.4 SOCIAL INFRASTRUCTURE

The availability of basic amenities is covered as under:

(A) Training & Education: All the employees will be trained and educated periodically about the hazardous nature of chemicals used in the process. Also, training for firefighting, work permit system, first aid, safe handling of hazardous chemicals and integrating safety, in all activities.

(B) Medical facility: Pre-employment medical checkup at the time of employment. In order to safe guard the health of the employees, all the employees undergo periodic health checkup.

(C) Drinking water: There will be provision of Aqua Guard/R.O. at different places to provide purified water for drinking purpose.

(D) Transportation: The unit will provide basic transportation facility for workers.

(E) Telegraph & Post: There will be provision of telephone, fax & internet facility.

(F) Power supply: There will be connected load of 250 KVA from DGVCL.

6.5 DRINKING WATER MANAGEMENT

The source of water is already availability from existing water works of GIDC and the same is adequate and satisfactory. The unit has proposed 5 KL/Day water for domestic purpose.

6.6 SEWERAGE SYSTEM

The sewage will be sent to soak pit /septic tank.

6.7 INDUSTRIAL WASTE MANAGEMENT

The hazardous waste like ETP waste, used oil, discarded containers/bags/liners, Process waste containing organic complex will be generated from proposed project activity. The hazardous waste management and disposal is shown in Annexure-IX.

6.8 SOLID WASTE MANAGEMENT

The record of non-hazardous solid waste like, Fibber board drum, Polyethylene bag, Rubber Hose pipe, glass, wooden waste etc. will be mentioned.

6.9 POWER REQUIREMENT & SUPPLY

At present, the unit has 125 KVA connected load. As per CCA, and additional 250 KVA connected load for proposed expansion.

7.0 REHABILITATION AND RESETTLEMENT(R &R) PLAN

The proposed project is located in Vapi Industrial Estate, Tal. Pardi, Dist.: Valsad and the project is. There will be no any human settlement affected by proposed project. So, there is no requirement of any R & R Plan.

8.0 PROJECT SCHEDULE & COST ESTIMATES

8.1 PROJECT IMPLEMENTATION SCHEDULE

TABLE 15:

PROJECT IMPLEMENTATION SCHEDULE

Project implementation schedule after getting NOC from GPCB		
Sr. No.	**Activity**	**Required Period**
1.	Civil work	Immediately after getting NOC
2.	Procurement of machinery	1 month after getting NOC
3.	Eraction& installation of machinery	Immediately after competition of activity no.2
4.	Trial of machinery & equipments	Within 1 months after competition of activity no.3
5.	Commercial activity	1 months after competition of activity no.4

8.2 ESTIMATED PROJECT COST

Details for estimated project cost is covered in table no 6.

9.0 ANALYSIS OF PROPOSAL

All the manpower is utilized from local region around Vapi. Company shall also try to provide indirect employment opportunities by availing local contract services during transportation during operational phase. The company intends to donate 5% of the profit to agencies like social welfare societies for projects carried out in nearby village for their welfare and upliftment.