



Matrix Fine Sciences Pvt. Ltd.

Regd Office : 12, Shilp Nagar, Railway Station Road, Aurangabad- 431 005 (M.S.) India.

Factory Address : D-8, MIDC Industrial Area, Paithan, Dist.-Aurangabad - 431 148 (M.S.) India.

E-mail: info@matrixfinesciences.com / admin@matrixfinesciences.com

Website : www.matrixfinesciences.com **Mob.**: +91 855 198 0888 **Tel.**: + 91 2431 232901 / 902

CIN : U24233MH2013PTC243185

To,

Date: 14/01/2019

The Member Secretary (Industry-2)
Ministry of Environment & Forest
Vayu Wing Indira Paryavaran Bhavan,
Jor Bagh, Lodhi Road,
New Delhi- 110003

Subject: Regarding submission of Additional Details Sought on date 2nd January 2019 vide MoM of 1st EAC (Industry-2) held on 19th to 20th December 2018.

Respected Sir,

With reference to the above mentioned subject and additional information required as per the Minutes of 1st EAC (Industry-2) held on 19th to 20th December 2018.

We are submitting herewith the additional information/ details sought by MS (EAC Industry-2) for your perusal. Please process our application as early as possible and oblige.

Thanking You

Yours Faithfully

For Matrix Fine Sciences Pvt Ltd.

Matrix Fine Sciences Pvt. Ltd.

Director

Additional Details Sough by Committee and Input by Project Proponent

ADS # 1: Higher concentration GLCs in respect of all the air pollutants namely PM₁₀, PM_{2.5} & SO₂ due to the proposed expansion.

Response: As per revised AAQ modeling for the expansion project following are the GLCs in respect of all the air pollutants namely PM₁₀ PM_{2.5} & SO₂ due to the proposed expansion.

Industry shall provide 1 no. of Boiler of capacity 7 TPH & Thermopack for proposed expansion project. Boiler will be run on Coal. DG Set of capacity of 750 KVA shall be provided as backup supply in case of failure of electricity. **Table 1** presents the details of Boiler and the stack for air pollution dispersion. Isopleths depicted in **Fig.1, Fig.2 & Fig.3** respectively.

Fig.1: Isopleth of PM₁₀

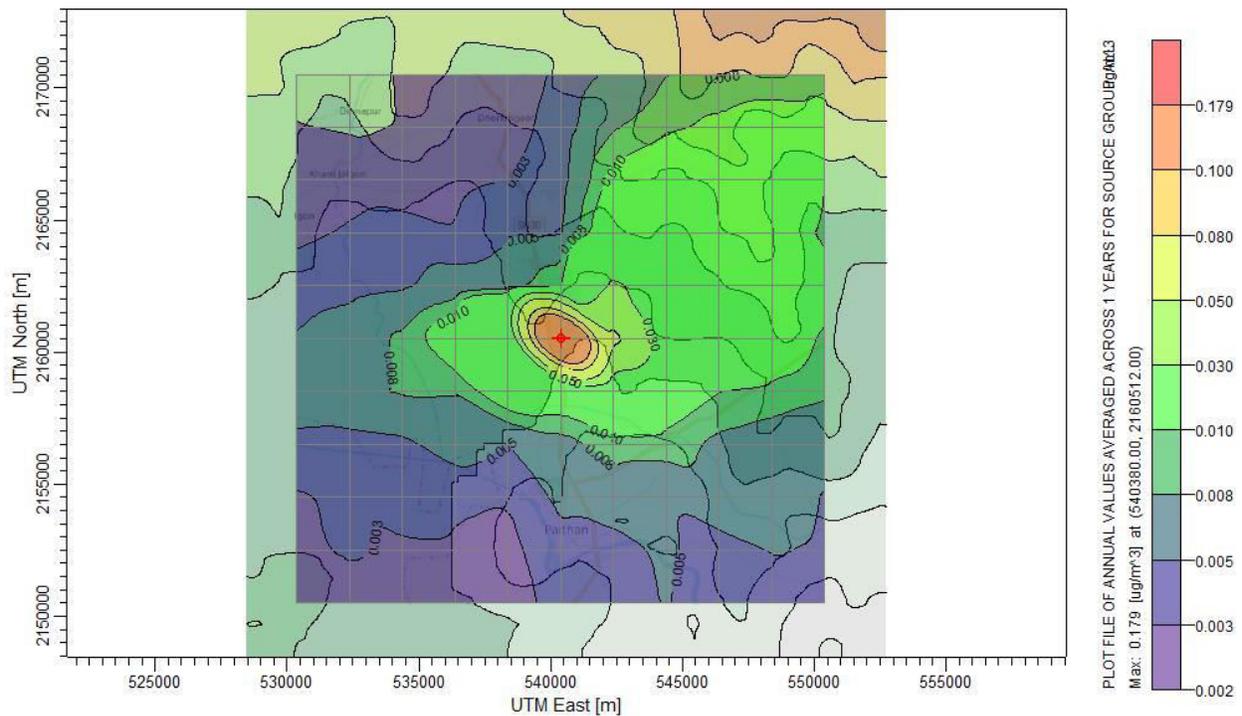


Fig.2: Isopleth of PM_{2.5}

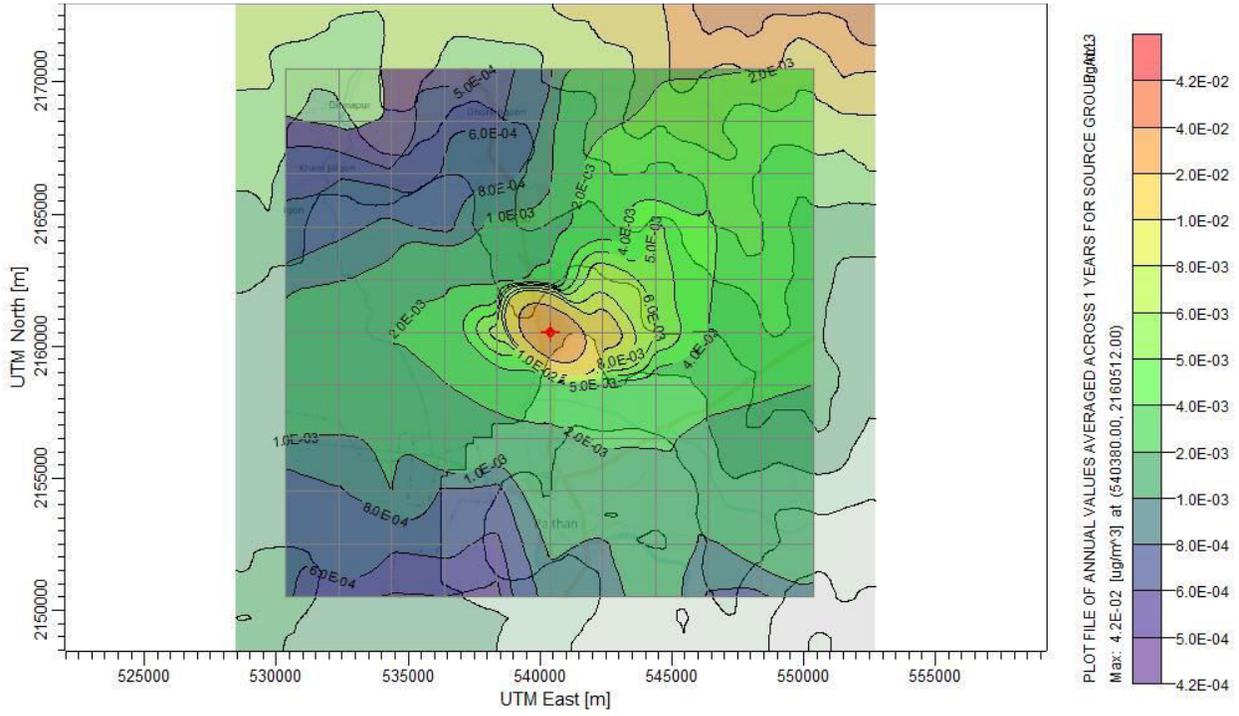


Fig. 3: Isopleth of SO₂

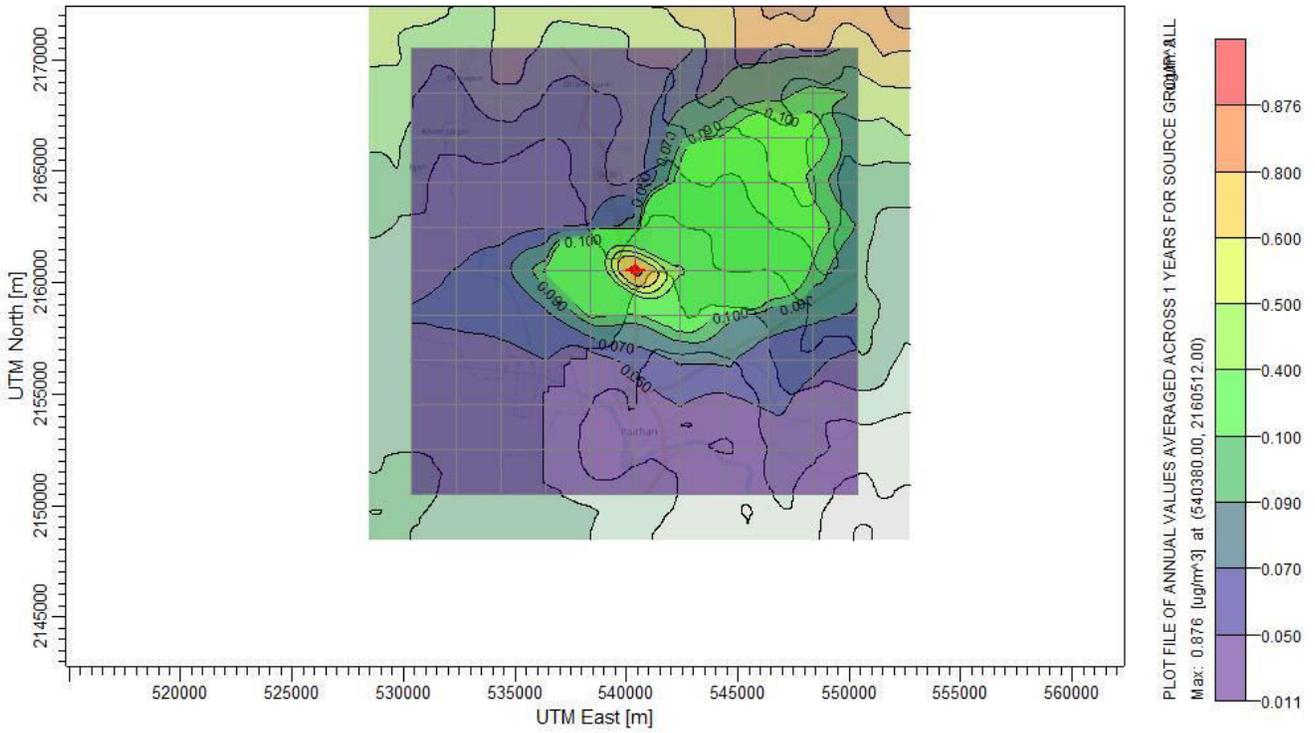


Table 1: Model Input Details for Proposed Project

| Sr. No. | Details | Unit | Proposed Boiler II (7 TPH) | Proposed Thermopack |
|---------|---------------------------------|-------|-------------------------------|------------------------|
| 1. | Fuel Type | -- | Coal | Coal |
| 2. | Fuel Quantity | MTD | 16 | 7.2 |
| 3. | Fuel Quantity | Kg/Hr | 666.66 | 300 |
| 4. | Flue Gas Temperature | Deg K | 403 | 403 |
| 5. | Stack Gas velocity | m/s | 12 | 12 |
| 6. | Stack Height | m | 30 | 30 |
| 7. | Stack Diameter | m | 0.5 | 0.5 |
| 8. | Sulphur % | % | 0.5 | 0.5 |
| 9. | SO ₂ | Kg/D | 160 | 72 |
| 10. | Sulphur Emission Rate | gm/s | 1.85 | 0.83 |
| 11. | PM ₁₀ Emission Rate | gm/s | 0.17 | 0.17 |
| 12. | PM _{2.5} Emission Rate | gm/s | 0.04 | 0.04 |

**Table 2: First Three Highest 24-Hourly Average Ground Level Concentration (GLC)
Values PM₁₀ & PM_{2.5}**

| Highest Value | Location with reference to Project Site | GLC PM ₁₀ | Average Concentration PM ₁₀ | Resultant Concentration | GLC PM _{2.5} | Average Concentration PM _{2.5} | Resultant Concentration |
|-------------------|---|----------------------|--|-------------------------|-----------------------|---|-------------------------|
| I st | 1050 m in SE Direction | 0.17 | 48.60 | 48.77 | 0.04 | 27 | 27.04 |
| II nd | 1050 m in SE Direction | 0.17 | 48.60 | 48.77 | 0.04 | 27 | 27.04 |
| III rd | 1150 m in SE Direction | 0.17 | 48.60 | 48.77 | 0.04 | 27 | 27.04 |

Note: All units are expressed in µg/m³

**Table 3: First Three Highest 24-Hourly Average Ground Level Concentration (GLC)
Values of SO₂**

| Highest Value | Location with reference to Project Site | GLC SO ₂ | Average Concentration SO ₂ | Resultant Concentration |
|-------------------|---|---------------------|---------------------------------------|-------------------------|
| I st | 1050 m in SE Direction | 0.87 | 19.35 | 20.22 |
| II nd | 1050 m in SE Direction | 0.87 | 19.35 | 20.22 |
| III rd | 1150 m in SE Direction | 0.87 | 19.35 | 20.22 |

Note: All units are expressed in µg/m³

The maximum Ground Level Concentration for SO₂ was found to be 0.87µg/m³ and for PM₁₀ & PM_{2.5} was found to be 0.17 µg/m³ & 0.04 µg/m³ respectively.

Thus, the AAQ due to the gaseous emission like PM₁₀, SO₂, from the stack will not have significant effect.

The incremental ground level concentration of various pollutants at all the ambient air monitoring locations is negligible. Hence there will be not significant impact on the air quality of surroundings areas due to proposed expansion.

ADS 2:-Usage of coal having Sulphur content less than 0.5%.

Response:

The fuel proposed for boiler & Thermopack shall be coal, having Sulphur % less than 0.5. At present the coal for exiting Boiler & Thermopack is procured from reputed supplier. An analysis report of coal is enclosed as below.

Coal Analysis Report

17/09/2018 MV DACC EGEO.jpg



AA0080C07A

PT. SURVEYOR CARBON CONSULTING INDONESIA (SCCI)
INDEPENDENT ASSURANCE SERVICES

Job No. : SMD 17908 QQ

CERTIFICATE OF SAMPLING AND ANALYSIS

Vessel : MV. DACC EGEO
Quantity : 59,350 MT
Port of Loading : SAMARINDA ANCHORAGE, EAST KALIMANTAN, INDONESIA
Description of Goods : STEAM (NON COKING) COAL IN BULK OF INDONESIAN ORIGIN
B/L Date : 30 June 2018

THIS IS TO CERTIFY, that we have performed the inspection of the coal consignment nominated above. Gross samples were drawn manually by grab during loading to the vessel in accordance with ASTM D2334/D2234M-10 Standard Methods. Samples were prepared and analyzed in accordance with ASTM Standard Methods, the result are as follows:

| Test | | | Actual Result | |
|-------------------------|---------|-------|---------------|----------------------|
| Total Moisture | PCT | (ADB) | : 25.61 | ASTM D3302/D3302M-15 |
| Inherent Moisture | PCT | (ADB) | : 10.11 | ASTM D3173-11 |
| Ash Content | PCT | (ADB) | : 5.46 | ASTM D3174-12 |
| Volatile Matter | PCT | (ADB) | : 38.73 | ASTM D3179-11 |
| Fixed Carbon | PCT | (ADB) | : 37.70 | By Difference |
| Sulphur | PCT | (ADB) | : 0.48 | ASTM D4239-14 |
| Gross Calorific Value | Kcal/Kg | (ARB) | : 4855 | ASTM D5865-13 |
| Hard Groove Index (HGI) | | | : 47 | ASTM D409/D409M-12 |
| AFT IDT | Deg C | | : 1190 | ASTM D1857/D1857M-16 |
| Size (0-50mm) | PCT | | : 92.33 | ASTM D4749-87 (2012) |

Jakarta, 05 July 2018
ISSUED BY
PT. SCCI AT LOAD PORT




Wally Anindya
Operation Manager

The certificate reflects the finding at time and place of inspection and does not refer to any other matter. This certificate is issued without prejudice and on the understanding that it does not release parties from their contractual obligations. All aspects covered in this report have been carried out to the best of our knowledge and ability and in accordance with practice and standard generally accepted in such the industry. It is issued to the service of immediate use and the signatory shall not be held responsible for any errors or omissions.

SCCI

ADS 3:-Health and safety management plan, including that for toluene.

Response: As per received ADS we have incorporated Health and safety management plan, including that for toluene as below.

General Health Management Plan: Assessment and Monitoring of Exposure to Chemical Hazards

Assessment and monitoring of exposure to hazardous chemical substances is an important aspect of initial and ongoing risk assessment and control. The primary prevention strategy should always be to prevent exposure to agents associated with toxic effects. When it is not possible to prevent such exposures, then the appropriate strategy is to limit exposure and minimize the possibility of adverse health effects. Exposure monitoring encompasses two basic techniques viz. environmental air monitoring (occupational hygiene) and biological monitoring. Environmental and biological monitoring is the way of investigating different problems and should be seen as complementary procedures. A practical approach in setting up an exposure monitoring programme for hazardous chemical substances is outlined in **Table 1**. Adverse health effects associated with exposure to toluene according to target organ system and appropriate tests used in medical surveillance in given in **Table 2**.

Table 1: A stepwise approach to developing an exposure monitoring programme for hazardous chemical substances

| | |
|--|---|
| Step 1 | What is the nature of the job? - outline the various activities. |
| Step 2 | Identify the hazardous chemicals associated with exposure to chemicals in the various activities. |
| Step 3 | Identify the potential routes of exposure to the particular hazardous chemical substance. |
| Steps 1-3 are part of the risk assessment process. If a potential health risk is identified, proceed to Step 4. | |
| Step 4 | If the exposure route is mainly airborne, proceed to environmental monitoring (EM). |
| Step 5 | If the exposure route is mainly through non-inhalation routes (skin, ingestion) or if major reliance on personal protective equipment, proceed to biological monitoring (BM). |
| Step 6 | Develop a sampling strategy for EM and/or BM based on exposure zone characterization (groups of workers performing similar activities). For EM, it is preferable to do personal sampling. The timing of the sampling strategy for BM is based on the biological half-life of the substance in the sample medium (blood, urine) concerned. Conduct sampling in a standardized manner. Ensure that samples are appropriately stored after collection. |
| Step 7 | Identify the appropriate analytical test that has a high degree of validity and a quality-certified laboratory that will conduct the analysis of samples. |
| Step 8 | Decide beforehand the criteria to be used to define an abnormal test result using the DOL /ACGIH /NIOSH OELs for airborne substances or Department of Lab (DOL)/ACGIH BEIs for BM samples. |
| Step 9 | Outline the process of referral to confirm abnormal result in the case of BM, removal |

| | |
|---------|--|
| | of the person from exposure; determining the presence of adverse health effects through medical surveillance and/or diagnostic medical assessment; initiating treatment in instances of acute toxicity; and where appropriate submitting a workers' compensation claim (COIDA) should there be abnormal results. |
| Step 10 | Outline the procedure for notification of employer, worker (ongoing worker notification procedures) and enforcement agency (notify incident to DOL) as to the outcome of the exposure assessment. |
| Step 11 | Ensure input of the information obtained in this process into systems and procedures in assessing the efficacy and improvement of existing control measures such as engineering controls, work procedures, education and training. |
| Step 12 | Ensure evaluation and audit of the programme on a regular basis. |

Health Management plan for Solvents including Toluene

Following solvents and chemicals used can have effect on workers' health based upon NFPA values, MSDS and available literature. Chemicals which have Nh values more than or equal to 3 are considered as chemicals which can affect workers' health on long term exposure.

Table 2: Nature of Hazard of Chemical

| Sr. No. | Chemical | Liquid/ Gas at storage Conditions | Nf value | Nh Value | Nr Value | Nature of Hazard Toxic/Reactive/ Fire (From NFPA rating) |
|---------|---------------------|-----------------------------------|----------|----------|----------|---|
| 1. | Acetic Anhydride | Liquid | 2 | 3 | 1 | Flammable |
| 2. | Sulphuric Acid | Liquid | 0 | 3 | 2 | Corrosive, Water Reactive |
| 3. | Acetic Acid | Liquid | 2 | 3 | 0 | Flammable, irritant |
| 4. | Para Formaldehyde | Solid | 2 | 3 | 0 | Irritant |
| 5. | Potassium Acetate | Solid | 1 | 2 | 0 | Irritant |
| 6. | Potassium Hydroxide | Solid | 0 | 3 | 1 | Corrosive |

Following Solvents are stored in underground tanks

Table 3: NFPA rating for these solvents

| Sr. No. | Chemical | Max. qty required per Month | Maximum qty stored MT/m ³ | Nf | Nh | Nr |
|---------|----------|-----------------------------|--------------------------------------|----|----|----|
| 1. | Heptane | 75 KL | 100 m ³ | 3 | 1 | 0 |
| 2. | Methanol | 50 KL | 40 m ³ | 3 | 2 | 0 |
| 3. | Toluene | 20 KL | 20 m ³ | 3 | 2 | 0 |
| 4. | Acetone | 40 KL | 20 m ³ | 3 | 2 | 1 |

Health Management Plan for Solvents

Depending on their physical characteristics, certain chemicals have an affinity for specific target organs or body systems. Once deposited, they cause impaired functioning of the normal metabolic processes, which if permanent, ultimately results in disease.

Following are the steps to prevent adverse effect on workers' health.

Environmental monitoring and control: Measures the airborne concentration of the chemical in the workplace environment and control concentration less than Permissible levels. The plan has already been given

Medical surveillance: Aims to identify workers with early adverse health effects, which are likely to be reversible or do not progress to significant functional impairment when exposure conditions are improved. By carrying out regular medical examination of workers, specifically medical tests which are aimed for checking the effects of chemicals which affect target organs. These will be decided in consultation with qualified medical practitioner

Following table shows effects of solvent, of these solvents, toluene will only be used.

Information about Acetic Anhydride

IDLH = 200 ppm

Exposure Limits: TWA 5 ppm

Exposure Routes: inhalation, ingestion, skin and/or eye contact

Symptoms: conjunctivitis, lacrimation (discharge of tears), corneal edema, opacity, photophobia (abnormal visual intolerance to light); nasal, pharyngeal irritation; cough, dyspnea (breathing difficulty), bronchitis; skin burns, vesiculation, sensitization dermatitis

Target Organs: Eyes, skin, respiratory system

Personal Protection required

Information on Acetone

Inhalation:

Eight-hour acetone exposure levels in the workplace air of the exposed workers ranged from 988 to 2,114 mg/m³ (416 to 890 ppm). The mean length of exposure was 14 years.

Gastrointestinal Effects

Acetone-exposed workers increased prevalence of gastrointestinal symptoms (nausea, loss of appetite, hyperacidity, bad taste, abdominal pains). Eight-hour acetone exposure levels in the workplace air of the exposed workers ranged from 988 to 2,114 mg/m³ (416 to 890 ppm); the mean length of exposure was 14 years.

Musculoskeletal Effects

Increased prevalence of rheumatic symptoms (pain in bones, joints, muscles) was reported among acetone-exposed workers.

IARC Carcinogenicity classification: No

Three types of effects on the human body given in the table are:

1. Acute
2. Chronic
3. Allergic

Acute

The effect is exerted immediately or within a few hours of exposure (implies rapid accumulation at the target organ site; the severity of the reaction is directly proportional to the exposure dose rate) e.g. chemical asphyxiants (cyanide, carbon monoxide, hydrogen sulphide, nitrogen dioxide), irritants (chlorine, sulphur dioxide, ammonia) and corrosives (acids).

Chronic

The effect is exerted after months or years of exposure (implies gradual accumulation at the target organ site; severity is directly proportional to the exposure dose rate) e.g. heavy metallic toxins such as lead. Certain substances demonstrate a delayed effect following a prolonged latency period (can occur with prolonged exposure or transient exposure) e.g. carcinogens such as asbestos.

Allergenic

The effect is exerted through the immune system (multiple initial doses result in sensitization with the accumulation of antibodies; subsequent low-level exposure triggers a response; pronounced individual susceptibility) e.g. respiratory and skin sensitizers (chrome, nickel, platinum salts).

Medical Management Guidelines for Toluene

Synonyms include methyl benzene, methyl benzol, phenyl methane and toluene.

- Persons exposed only to toluene vapor do not pose substantial risks of secondary contamination. Persons whose clothing or skin is contaminated with liquid toluene can cause secondary contamination by direct contact or through off-gassing vapor.
- Toluene is a colorless liquid with a sweet, pungent, benzene-like odor which provides an adequate warning of hazardous concentrations. Toluene is volatile, readily producing flammable and toxic concentrations at room temperature. Its vapor is heavier than air and may accumulate in low-lying areas.
- Toluene is absorbed rapidly after inhalation and ingestion. It is absorbed slowly through intact skin; however, percutaneous absorption may contribute to total body burden.

Exposure by ingestion or inhalation can cause systemic effects. No information was found to suggest that the pharmacokinetics of toluene in children is different than in adults. Toluene crosses the placenta and is excreted in breast milk.

Routes of Exposure

- **Inhalation**

Toluene is readily absorbed from the lungs, and most exposures to toluene occur by inhalation. Toluene's odor is discernable at a concentration of 8 ppm, which is 25 times less than the OSHA PEL (200 ppm); therefore, odor generally provides adequate warning of acutely hazardous concentrations. Its vapor is heavier than air and may cause asphyxiation in enclosed, poorly ventilated, or low-lying areas.

- **Skin/Eye Contact**

Toluene vapor is only mildly irritating to mucous membranes; however, liquid toluene splashed in the eyes can result in corneal injury. Repeated or prolonged skin contact with liquid toluene can defect the skin, causing it to crack and peel. Absorption is slow through intact skin; however, toluene absorbed through the skin may contribute to total body burden.

- **Ingestion**

Acute systemic toxicity can result from ingestion of toluene.

- **Standards and Guidelines**

OSHA PEL (permissible exposure limit) = 200 ppm (averaged over an 8-hour work shift)

OSHA ceiling = 300 ppm

OSHA STEL (short-term exposure limit) = 500 ppm (10-minute exposure)

NIOSH IDLH (immediately dangerous to life or health) = 500 ppm

ACGIH TLV (threshold limit value) = 50 ppm (averaged over an 8-hour work shift)

Cardiovascular

- Massive doses of toluene can cause cardiac abnormalities. Toluene may lower the threshold of the heart to the effects of epinephrine, potentially disrupting the heart rhythm.

Pre-hospital Management

Victims exposed only to toluene vapor do not pose substantial risks of secondary contamination to rescuers outside the Hot Zone.

Symptoms of toluene poisoning include CNS effects (headache, dizziness, ataxia, drowsiness, euphoria, hallucinations, tremor, seizures, and coma), ventricular arrhythmias, chemical pneumonitis, respiratory depression, nausea, vomiting, and electrolyte imbalances.

There is no antidote for toluene. Treatment consists of support of respiratory and cardiovascular functions.

Transport to Medical Facility

Only decontaminated patients or patients not requiring decontamination should be transported to a medical facility. "Body bags" are not recommended.

Patients with evidence of substantial inhalation exposure (e.g., confusion, syncope, or coma) and all patients who have ingested toluene should be transported to a medical facility for evaluation. Others may be discharged at the scene after their names, addresses, and telephone numbers are recorded. Those discharged should be advised to seek medical care promptly if symptoms develop

Following table shows effects of solvents on organs because of long term exposure at more than permissible limits for a long time.

The effects on target organs will be due to prolonged and continuous exposure to the concentration beyond permissible values given in below table.

Chronic Exposure

Chronic toluene exposures at less than 200 ppm have been associated with headache, fatigue, and nausea. Odour threshold value is 25 ppm which is much less than 200 ppm.

Carcinogenicity

The International Agency for Research on Cancer has determined that toluene is not classifiable as to its carcinogenicity to humans. The EPA has determined that toluene is not classifiable as to its human carcinogenicity.

Table 3: Health effects due to exposure of Toluene

| Adverse health effects associated with exposure to hazardous chemical substances according to target organ system and appropriate tests used in medical surveillance | | | | |
|---|---|---|---|---|
| Target organ system | Examples of hazardous chemicals | Health effects | Symptoms of impaired function | Medical surveillance tests |
| Liver | - solvents (toluene, trichlorethylene, xylene, dinitrobenzene) - ethanol - arsenic | - hepatitis, cirrhosis, - production of toxic chemical metabolites | - jaundice, dark urine - abdominal pain and swelling | - liver function tests (transaminases: ALT, AST, Gamma-glutamyl transpeptidase: GGT) |

ADS 4:-Different sources of volatile organic matter to be equipped with suitable control devices to limit the concentration within 99.52%

Response: As per received ADS, details on sources of volatile organic matter with suitable control devices to limit the concentration within 99.52%

For the expansion of project total seven products (Synthetic organic chemicals) proposed, out of the seven products one product (i.e. Vitamin Powder) does not involve any chemical reaction or use of any solvent which can be prospective source of VOC. List of the solvents with boiling point used for manufacturing for proposed product given in **Table 1**.

None of the Product raw materials includes any solvent or raw material that has boiling point less than 50 °C, and no gas of any potential hazard in view of VOC is generated. Different sources of volatile organic matter to be equipped with suitable control devices to limit the concentration within 99.52 are given in **Table 2**.

Table 1: Solvents Used and Boiling Point

| Sr No. | Name of Product | Name of VOC [Solvent used in the process] | Boiling Point |
|--------|----------------------|---|------------------------|
| 1. | Alpha Tocopherol | Methanol, Heptane | 64.70°C, 98°C |
| 2. | Steryl Ester | Heptane | 98 °C |
| 3. | Tocopherol Acetate | Acetic anhydride | 139 °C |
| 4. | Tocopherol Succinate | Heptane | 98°C |
| 5. | Vitamine E | Methanol, Heptane, Toluene | 64.7 °C, 98 °C, 114 °C |
| 6. | Squalene | Methanol | 64 °C |
| 7. | Vitamine Powder | No Solvent as VOC | NA |

Table 2: VOC source and recommended device/ Equipment to control the VOC to limit the concentration to 99.52 %

| Process Operation and potential source of VOC | Recommended Device /Equipment/utility |
|---|--|
| Charging of solvent in the Reactor | 1. The provision of overhead tank or addition tank. None of the solvents shall be charged directly in the Reactor. |
| Reactor -Equipment | 1. The various accessories and joints shall be provided with tongue and groove flanges and flange joints shall be provided with appropriate guard or calms to avoid escape of any vapors or liquid. 2. The Reactor drive system shall be provided with mechanical seal to restrict any possible escape of such solvent to surrounding atmosphere. |
| Condenser | 1. Condenser shall be of appropriate capacity and utility. Recommended is chilled water, cooling water with inlet supply temperature 20°C |

| | |
|--|---|
| | <ol style="list-style-type: none"> 2. Recommended to install a sub cooler as secondary condenser of appropriate capacity and provision of chilled brine as utility. 3. Condenser vents shall be connected to a dump tank having jacket and provision of cooled water circulation as utility. 4. The Dump tank shall be provided with a vent with minimum height of 12 feet with flame arrestor |
| Reaction mass Filtration | <ol style="list-style-type: none"> 1. Filters shall be of suitable capacity and closed and not open to air or surrounding atmosphere. Open Nutsh Filters shall not be used which are open to surrounding air. 2. Nitrogen gas with oxygen content less than 0.0009 shall be purged. 3. The filtrate having product shall be collected in the close vessel with appropriate vent height and provision of flame arrestor 4. The close vessels as storage tank shall have jacket with cooled water circulation. |
| centrifuge | <ol style="list-style-type: none"> 1. Centrifuge equipment shall be 4 suspension and top or bottom discharge. 2. The operation shall be in close loop and not manually charged with product slurry for separation for solid and liquid. 3. The vent of the centrifuge shall be connected with close tank with bellow additional vent with flame arrestor. 4. The filtrate shall be collected in a close tank or receiver with appropriate jacket utility. [Cooled water or chilled water] 5. The transfer of filtrate to the distillation vessels or for recovery shall be through appropriate pump with mechanical seal and in close loop. |
| Charging Tanks | <ol style="list-style-type: none"> 1. Charging tanks shall be suitable size and shall be connected to main or bulk storage tank. 2. Supply line shall be of lower size than the Return or overflow line to avoid any overflow by any means. 3. The pumps shall be provided with mechanical seal and cut off device so that it will stop once a appropriate level is reached. 4. An alarm system shall be provided |
| Dosing Pumps | <ol style="list-style-type: none"> 1. Dosing pumps shall be installed to avoid manual operation in the case where a addition of a reactant is required to be controlled with time. |
| Drying Operation | <ol style="list-style-type: none"> 1. In case of atmosphere drying operation, the dryers shall be provided with utility cut of device so that overheating shall be controlled. 2. In case of vacuum drying operation non Return valves and utility auto control device shall be suitable installed. 3. The dryer exhaust or vent shall be connected to water Scrubber so that the solvent vapors shall be appropriately scrubbed and will not be realest to air or surrounding atmosphere. |
| Distillation column or recovery system | <ol style="list-style-type: none"> 1. All the flange joints shall be appropriately covered with flange guards. |

| | |
|---|---|
| | <ol style="list-style-type: none"> 2. Condensers shall be of appropriate capacity and utility. 3. Condenser vent shall be of appropriate height and shall be connected to a tank with secondary vent and appropriate jacket cooling system. 4. Distilled solvent shall be transferred in a close loop. 5. Solvent distillation Residue shall be discharged with Nitrogen blanketing and in close containers. 6. Solvent containers or drums shall be sealed appropriately. |
| <p>Training for avoiding wrong operation for escape of VOC and causing health hazard.</p> | <p>The working staff and rest all the employs in the manufacturing and factory premises shall be trained for the various operations in line with standard operating Procedure</p> <ol style="list-style-type: none"> 1. On job training 2. Class Room training. |

ADS 5:- Revised water balance and the expected characteristics for the treated effluent.

Response: As per received ADS, revised water balance with expected characteristics for the treated effluent is given below.

#Water Requirement

The total water requirement for expansion is about 205 m³/day of domestic, greenery, process, boiler and cooling purposes. Out of this fresh water requirement is 205 m³/day and 40 m³/day shall be from recycle of treated effluent by passing through Reverse osmosis membrane. The water supply will be through the Maharashtra Industrial Development Corporation (MIDC). The revised water budget for proposed expansion is given in **Table 1**.

Table 1: Water Budget

| Sr. No | Particulars | Justification | Input | Loss | Reason for Losses | Effluent |
|--------------|----------------------------------|--|---------------------|---------------------|--------------------------|---------------------|
| | | | m ³ /day | m ³ /day | | m ³ /day |
| 1. | Domestic | 300 nos. x 50 lit/head/day | 15 | 3 | Consumption, Evaporation | 12 |
| 2. | Process | -- | 22 | 15 | Evaporation | 7 |
| 3. | Process Washings | -- | 3 | -- | -- | 3 |
| 4. | Cooling tower Makeup | Capacity 1000 TR, 5% losses of recirculation rate 3660 m ³ /day | 183 | 170.5 | Evaporation | 12.5 |
| 5. | Boiler Makeup | Actual water requirement 168 m ³ /day 90% condensate recovery | 17 | 14 | Evaporation | 3 |
| 6. | DM water / Softener Regeneration | -- | 5 | 0 | -- | 5 |
| Total | | | 245 | 202.5 | | 42.5 |

Note:

- **Freshwater water requirement- 205 m³/day**
- **Total Effluent to RO Plant from Expansion Project: 42.5 m³/day**
- **Recycle of effluent after RO: 40 m³/day**

#Effluent Treatment Scheme for Waste Water

The effluent generated from the production activities (LCOD) will be collected in collection tank. The effluent from collection tank is transferred to screening sump for trapping coarse solids. The coarse solids will be manually skimmed out and collected in a drum for disposal. The effluent then shall flow by gravity to the oil and grease traps for trapping oils by virtue of its immiscibility. The oil floats at the surface and shall be skimmed out by using oil skimmer and collected in drums for disposal. The effluent devoid of oils flows to the equalization and neutralization tank for equalizing the organic and hydraulic load. Provision of acid / alkali dosing for neutralization of effluent is made near the tank. The neutralizing agents will be dosed from the respective dosing tanks. The content of equalization tank shall be mixed with help of coarse diffused aeration system. The pH is to be intermediately checked with the help of pH indicator till the pH value of 7.5 to 8 is achieved. The equalized and neutralized effluent is then pumped to flash mixer for primary clarification.

The primary settling tank shall be provided with the sloping bottom for effective removal of solids. The clarifier mechanisms will be fitted on the primary clarifier for effective scraping of the solids from the walls and bottom. The settled solids are drained into the sludge drying beds for dewatering. Primary settling tank is followed by aeration tank for aeration treatment.

Tertiary treatment includes following units;

1. Holding tank
2. Pressure Sand Filter
3. Activated Carbon filter

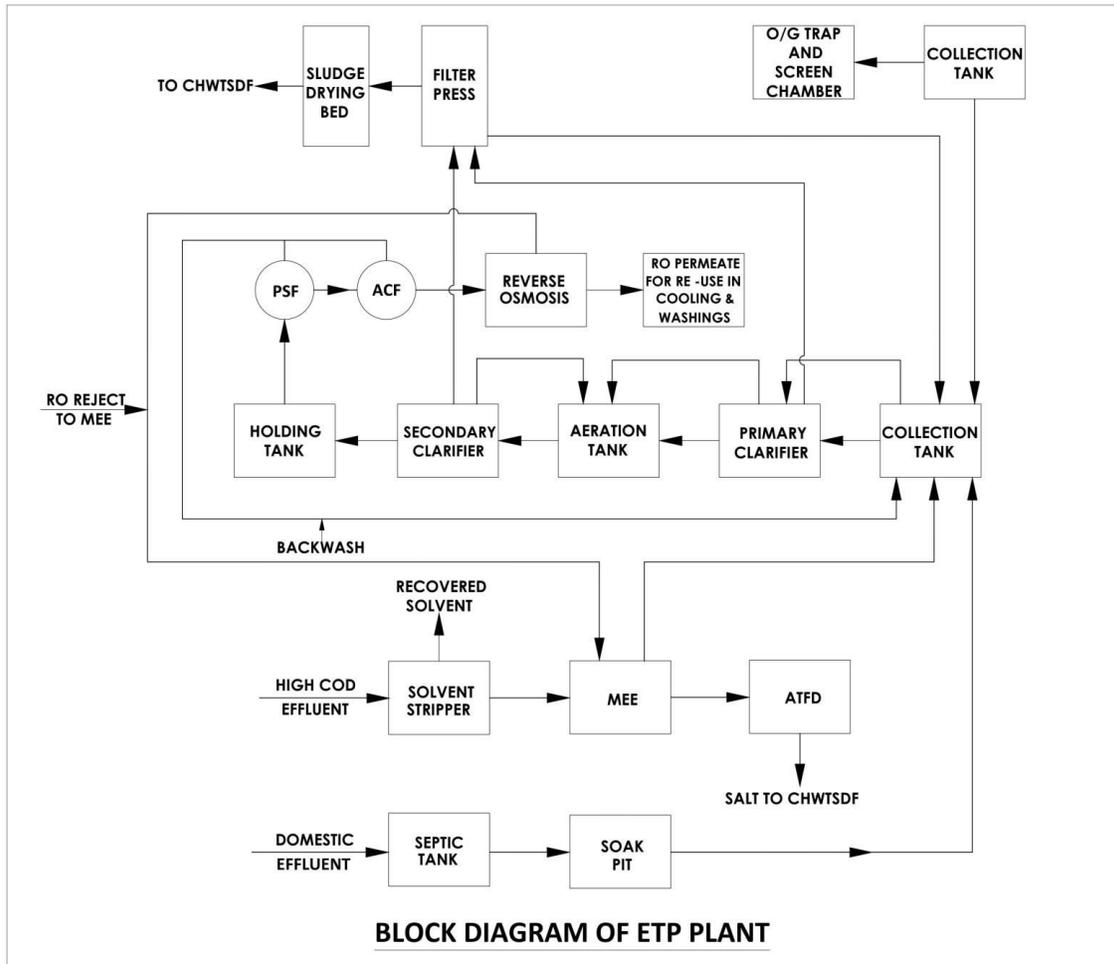
Tertiary treatment consists of pressure Sand Filter and Activated Carbon Filter, which will remove traced suspended solids which have escaped settlement and dissolved organics, color and odor. After treatment in ETP Followed by RO, permeate from RO will reused for the cooling and reject will be sent to MEE. Hence there will no discharge of treated effluent and unit will maintain Zero Liquid Discharge. The treated effluent is used for cooling & washing. **Figure 1** shows the Flow Diagram of ETP.

HCOD Effluent: After proposed expansion, total effluent generation from project will be segregated into high COD/TDS and low concentration stream. High concentrated wastewater stream from manufacturing process will be treated in proposed stripper followed by Multiple Effect Evaporator. Treated water from stripper will be sent to MEE. Condensate water from MEE will be sent to ETP along with low COD/TDS effluent. The solids from evaporator shall be disposed off to CHWTSDF.

After treatment in ETP Followed by RO, permeate from RO will reused for the cooling and reject will be sent to MEE. Hence there will no discharge of treated effluent and unit will maintain Zero Liquid Discharge. The characteristic of trade effluent expected is given in **Table 1, Table 2 & Table 3 respectively.**

Domestic Effluent: The domestic effluent shall be treated in septic tank followed by soak pit. The overflow of soak pit shall be mixed to ETP for further treatment.

Figure 1: Flow Diagram of Effluent Treatment Plant



The characteristic of trade effluent expected are as follows,

Table 1: Characteristics of Untreated Effluent

| Sr. No. | Parameter | Unit | Value |
|---------|----------------------|-------|-------------|
| 1. | pH | -- | 5.0-8.0 |
| 2. | COD | mg/ l | 6,000-8,000 |
| 3. | BOD @27°C for 3 days | mg/ l | 3,000-3,500 |
| 4. | TDS | mg/ l | 800-1,000 |
| 5. | O& G | mg/ l | 10 |
| 6. | TSS | mg/ l | 400-500 |

Table 2: Characteristics of High COD Effluent

| Sr. No. | Parameter | Unit | Value |
|---------|-----------|-------|-----------------|
| 1. | pH | -- | 4.0-9.0 |
| 2. | COD | mg/ l | 25,000- 150,000 |
| 3. | TDS | mg/ l | 100,000-150,000 |
| 4. | O& G | mg/ l | 10 |

Table 3: Characteristics of Treated Effluent after Tertiary Treatment

| Sr. No. | Parameter | Unit | Value |
|---------|----------------------|-------|---------|
| 1. | pH | -- | 7.0-8.0 |
| 2. | COD | mg/ l | <25 |
| 3. | BOD @27°C for 3 days | mg/ l | <10 |
| 4. | TSS | mg/ l | <10 |
| 5. | O& G | mg/ l | Nil |
| 6. | TDS | mg/ l | <200 |

ADS 6:- Plan for waste management, including ash.

Response: As per received ADS, waste manage plan including ash is given below.

The main solid waste from Industry will be in form of process waste and residues form solvent recovery. This waste will be transported to CHWTSDF for proper treatment and ultimate disposal.

The empty drums will be recycled or given back to the original vendors for utilization.

Waste Generated from Other Sources

1] Disposal of barrels/containers used for hazardous waste and chemicals.

- The containers and barrels used for handling of hazardous chemicals are cleaned and dried, these cleaned barrels and containers are stored in separate area.
- After careful inspection of quality control these containers are used for collecting spent solvents, residues.

2] Waste generated from treatment of HCOD effluent

The solid residue after evaporation shall be disposed off to CHWTSDF. The quantification of Hazardous /solid waste generated from the factory presented in presented in Table 1.

Table 1: Hazardous Waste

| Sr. No. | Process | Category | Category No | Proposed Kg/M | Remark/Disposal practice |
|---------|--|---|-------------|---------------|---|
| 1. | Purification, water treatment, of exhaust air waste, waste water from the processes- sludge from waste water treatment | ETP Sludge | 34.3 | 75 | CHWTSDF |
| | | MEE Salt | 34.3 | 27900 | |
| 2. | Production | Residue and Waste | 28.1 | 142 | CHWTSDF |
| 3. | General | Off Specification Product | 28.4 | 50 | CHWTSDF |
| 4. | Disposal of barrels containers used for handling hazardous waste and chemicals | Discarded containers barrels used form HW and chemicals | 33.3 | 100 | Sale to authorized recycler |
| 5. | Process | Spent Solvent | 20.2 | 183.48 | Sale to authorized Recycler, Re-processor |
| 6. | Process Solvent Recovery | Distillation Residue | 20.3 | 1226 | CHWTSDF |
| 7. | Spent Oil/used oil | Industrial operations using | 5.1 | 50 | Sale to authorized Recycler/ Reused |

| | | | | | |
|--|--------------|--|--|---------------------------------|--------------|
| | | mineral/synthetic oil as lubricant in hydraulic systems or other application | | | as lubricant |
| | Total | | | 29.72 MT/Month | |

All the above waste will be transported to the CHWTSDF/authorized vendor for proper treatment and ultimate disposal.

The non-hazardous waste will be disposed by sale to authorized re-users / recyclers. Boiler ash will be sale to Brick Manufacturer. A copy of agreement made with brick manufacturer is enclosed as given below.

Table 2: Non Hazardous Solid Waste

| Sr. No. | Category | Unit of Measure | Proposed Qty/Month | Remark/Disposal practice |
|---------|--------------------------------|-----------------|--------------------|---|
| 1. | Canteen Waste | Kg | 10 | Sale to authorized re-users / recyclers |
| 2. | Packing waste | Kg | 200 | |
| 3. | Office waste | Kg | 50 | |
| 4. | Boiler Ash (Coal Ash-Proposed) | MT | 38.1 | Sale to Brick Manufacturer |
| | Total | MT/Month | 38.36 | |

Copy of Agreement

भारतीय गैर न्यायिक
एक सौ रुपये
Rs 100
रु. 100
भारत INDIA
INDIA NON JUDICIAL
GOVT. OF INDIA
NOTARY
SK. Shaikh M.A.R.
Paithan (MS)
Aurangabad (MS)
Reg.No. 10440
महाराष्ट्र
राज्य
कार्यालय
पैठण
03 DEC 2018
परवाना क्र. ABD-01
रूपकोषागार अधिकारी पेटण
14-12-2018
7469
200
1 JAN 2019
परवाना क्र. ABD-01
कोट क्र. 3103001
AGREEMENT
This Agreement (the "Agreement") is made and entered into this January 1, 2019 (the "Effective Date") by and between Matrix Fine Sciences Private Limited with its principal place of business located at B-8, Paithan MIDC, Aurangabad (the "Company") and Shaikh Majid Shaikh Amir with its principal place of business located at Paithan, Aurangabad (the "Brick Manufacturer") (hereinafter referred to individually as a "Party").
WHEREAS, the Company is in the business of manufacturing of tocopherols;
WHEREAS, the Brick Manufacturer has expertise in the area manufacturing of bricks;
WHEREAS, the Company desires to engage the Brick Manufacturer to purchase Fly-Ash (by-product) from the Company and the Brick Manufacturer is willing to procure such material from the Company;
ATTESTED
SHAIKH SHAIKH M.A.R.
1 JAN 2019

NOW, THEREFORE, the Parties hereby agree as follows:

1. Engagement and Terms:

- **Engagement:** The Company hereby engages the Brick Manufacturer to purchase Fly Ash from The Company on a daily basis.
- **Transportation:** All transportation that is required to lift the product from premises of The company shall be arranged by the Brick Manufacturer on a daily basis. The mode of transportation will be trucks which are suitable for carrying load of Fly-Ash Namely Fly Ash Bulkers or Cement Bulkers.
- Brick Manufacturer is well informed about the procedure of loading and carrying Fly Ash which will be issued on "Free of Charge Basis.
- Brick Manufacturer shall be responsible for coordinating with all agencies including but not limited to MPPCB, legal, statutory, regulatory authorities, insurance, local bodies, etc.
- The agreement shall ensure use of fly ash only for designated purpose of brick manufacturing and not to dispose off to create nuisance. The agreement shall make him responsible for same.
- Brick Manufacturer shall ensure timely and continuous out flow of ash from Matrix Fine Sciences Pvt Ltd and transportation of the same to desired location.

2. Agreement Period

- (a) **Commencement.** This Agreement shall commence on the Effective Date.
- (b) **Termination.** This Agreement may be terminated by the Company, without cause and without liability, by giving written notice of such termination to the Brick Manufacturer.

IN WITNESS WHEREOF, and intending to be legally bound, the Parties have duly executed this Agreement by their authorized representatives as of the date first written above.

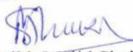
Signed for and on behalf of
Matrix Fine Sciences Private Limited

Name: Kalim Inamdar
Title: Sr. Executive



Signed for

Shaikh Majid Shaikh Amir
Vil Sunadar, Pathan


Name: Shaikh Majid Shaikh Amir
Title: Proprietor



1 JAN 2019
ATTESTED

SHAIKH SHAKIL A.R.
B.Sc.LL.B.
Govt of India
Advocate & Notary Public
Paithan Dist. Aurangabad (M.S.)
Reg No 10440

