

# Executive Summary

For

Expansion of Sugar 4500 to 12000 TCD, Distillery 60 KLPD to 90 KLPD  
and Cogeneration power plant 24 MW to 54 MW

At

Kempwad, Tal: Athani, Dist: Belgaum.



By,

M/s. Athani Sugar Ltd.

(Formerly known as Athani Farmers Sugar Factory Ltd.)

Kempwad, Tal: Athani, Dist: Belgaum.

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## 1.0 INTRODUCTION

M/s. Athani Sugars Ltd. (ASL) formerly known as Athani Farmers Sugar Factory Ltd. is a company registered under Companies Act, 1956 with the Registrar of Companies, Karnataka, Bangalore under registration no.08/17806 of 1995 dated 12th May 1995. The certificate of commencement of business was obtained from Registrar of Companies, Karnataka on 20th November 1995. Athani Sugars Ltd started with an installed crushing capacity 2500 TCD in 2001. The factory is situated at Kempwad village, Taluka, Athani Dist., Belgaum Karnataka. The factory has expanded capacity from 2500 to 4500 in year 2006, commissioned 24 MW cogen power in 2012 and expanded distillery to 60 KLPD in year 2013.

ASL proposes to expand sugar crushing capacity from 4500 to 12000 TCD, distillery from 60 to 90 KLPD and set up 24 to 54 MW biomass power plants for making RS/ENA/Ethanol at Kempwad village, Taluka, Athani, Dist., Belgaum Karnataka.

### 1.1 NEED OF PUBLIC HEARING

Moreover, sugar, co-generation power and distillery project proposed to be set up in the State of Karnataka Government require environmental clearance from Ministry of Environment and Forest, New Delhi based on Sept 2006 notification on environment impact assessment by Union Ministry of Environment and Forest vide No. SO 1533 subject to project is located within radius of ten km boundary of reserved forest, ecologically sensitive area which may include National Parks, Sanctuaries, Biosphere Reserves, critically polluted area and interstate boundary shall require environmental clearance from Central Government. Hence ASL submitted an application for environmental clearance to Ministry of Environment and Forest for terms of reference approval for Sugar, Distillery and Cogen power project. The TOR was approved during the expert committee meeting held on Feb 21-22, 2014 held at Ministry of Environment and forest New Delhi vide letter no. J-11011/373 /2013 –IAII (I) dated April 30, 2014.

### 2.0 HIGHLIGHTS OF THE PROJECT

		<b>Existing</b>	<b>Proposed additional</b>	<b>Total</b>
1.	Project	Integrated project	Same	Same
2.	Plant Capacity	Sugar plant 4500 TCD, Distillery plant 60 KLPD and Power plant 24 MW	Sugar plant 7500 TCD, Distillery plant 30 KLPD and Power plant 30 MW	Sugar plant 12000 TCD, Distillery plant 90 KLPD and Power plant 54 MW
3.	Location	Vishnuanna Nagar, Post - Navalihah, Tal. Athani, Dist Belgaum	No change	No change
4.	Latitude Longitude	16°46'13.30"N 74°55'12.90"E	No change	No change
5.	Land Req.	120.5 acres (48.8 ha)	No additional land	120.5 acres (48.8 ha)
6.	Fresh Water KL/annum	245360	(-) 55888 (reduction by 22.78%)	189472
7.	Source	Krishna River	Same	Same

		(permission obtained)		
8.	Fuel, TPA	Bagasse : 2,16,000	Bagasse: 3,60,000	Bagasse: 5,76,000
9.	Estimated Project Cost	already completed	Rs. 161.53 crore	

## 2.1 Raw material for Sugar

Sugarcane is main raw material for sugar which is obtained from Nearby farmers.

### 2.1.1 Raw Material for Power Generation

Total Baggase generated	536640 MT
Season baggase requirement	576000 MT
Baggase from external source	39360 TPA

### 2.1.2 Raw material for Distillery

Molasses required is 97200 MTPA which is obtained from own source.

## 2.2 WATER BUDGET :

Fresh water source: Krishna River

**Existing (245,360 KL/annum)**

Unit	Fresh water (m <sup>3</sup> /day)	Recycled (m <sup>3</sup> /day)	Total (m <sup>3</sup> /day)
<b>Season (160 days)</b>			
Sugar Plant	Nil	500 (Evaporator condensate available from Sugar Plant)	500
Cogen Plant	418	820 (Evaporator condensate available from Sugar Plant)	1238
Distillery	432	638 (From Evaporate condensate from Distillery Unit)	1070
<b>Total</b>	<b>850</b>	<b>1958</b>	<b>2808</b>
<b>Offseason (80 days)</b>			
Sugar Plant	Nil	Nil	Operation closed in offseason
Cogen Plant	935	Nil	935
Distillery	432	638 (From Evaporate condensate from Distillery Unit)	1070
<b>Total</b>	<b>1367</b>	<b>638</b>	<b>2005</b>

### Proposed (189,472 KL/annum)

Unit	Fresh water (m <sup>3</sup> /day)	Recycled (m <sup>3</sup> /day)	Total (m <sup>3</sup> /day)
<b>Season (160 days)</b>			

Sugar Plant	Nil	1200 (Evaporator condensate available from Sugar Plant)	1200
Cogen Plant	448	1220 (Evaporator condensate available from Sugar Plant)	1668
Distillery	Nil	638 (From Evaporate condensate from Distillery Unit)	1400
		+ 534.8 (Evaporator condensate available from Sugar Plant)	
Total	448	3592.8	4268
<b>Offseason (80 days)</b>			
Sugar Plant	Nil	Nil	Operation closed in offseason
Cogen Plant	937.6	Nil	937.6
Distillery	534.8	638 (From Evaporate condensate from Distillery Unit)	1400
<b>Total</b>	<b>1472.4</b>	<b>638</b>	<b>2337.6</b>

### 2.3 SUGAR, ALCOHOL AND COGENERATION PROCESS

Cane from nearby area will be crushed to get sugar cane juice which will further be concentrated to get quality sugar crystals. Uncrystallised sugar collected in molasses will be fermented to form alcohol with Yeast cells.



Alcohol distillation will yield quality rectified alcohol. Spent wash will be used along with press mud to composting. Bagasse from cane crushing and coal will be burnt in 130 T/H boiler for cogeneration of 24 MW power with turbo generator.

Press mud from cane juice filtration will be used in composting and the same will be supplied to cane farmers. Ash from boiler will be sold to brick producers or used in land filling.

### 3.0 BASELINE ENVIRONMENTAL STATUS

#### Salient Features of the site

Particulate	Corresponding Details
Kempwad Village	2 km
Athani Tahsil	16 km
Belgaum City	84 km
Madhbhavi	2 km
Nearest Railway Station	Yadwad 42 Km
Nearest Air Port	Belgaum 90 km
Rainfall	Avg 822 km
Temperature	Max. 40 and Min 8 deg C Avg. 28 deg C
Relative Humidity	65% average
Mean Sea level	878 Mts
Wind Direction	East to West

River	Krishna 13 Km
Lat/Long	74 deg 55' 10" 16 deg 46' 13"
Area	120 acre
Topography of site	Plane with gentle slope
Nearest Ecological Sensitive location	Does not exist in 15 Km radius

### Geographical Location And Physical Aspects

Belgaum district is located in the north-western corner of Karnataka state. It is a frontier district of the State and is bounded on the south-west by Goa, on the west north-west and north by the district of the Ratnagiri, Kolhapur and Sangli of Maharashtra State, on the east by Bijapur district, and on the south by the district of Dharwad and Uttar Kannad. It may be incidentally noted that the jurisdiction of this district extends over 2 villages (of Belgaum taluka) which are located a few Km away from the district borders.

**Wind Speed and Direction:** A metrological station was set up at the premises of ASL. The methodology adopted for monitoring parameters were as per the specification of IS 5182. In addition secondary data from IMD station Belgaum was also obtained.

### 3.2 SALIENT FEATURES OF BASELINE ENVIRONMENTAL STUDIES

Parameters	Study	Inference
Micrometeorological Study	Wind Profile, Temperature, Humidity, rainfall	To assess air pollution impacts on neighboring environment
Air Quality Data	Particulate Matter PM10 and PM 2.5 micron Sulphur Dioxide ( SO2) Oxides of nitrogen (NOx) Carbon Monoxide ( CO)	To assess air quality
Noise Quality	Noise	To identify Noise levels
Water and Soil Study	Physicochemical analysis	To assess quality of water and soil
Socio-Economic Study	Demography and occupation and Amenities in the area	To asses human index

### 3.3 AMBIENT AIR QUALITY MONITORING LOCATIONS

Factory gate, Kempwad, Madhbhavi, Khatav, Siddhewadi, Vishnuwadi, Kidgewadi and Mole  
The ambient air quality observed during the study period is well within the prescribed National Ambient Air Quality Standards.

### 3.4 Noise Environment

The noise levels observed on all locations were in range of 48.2 to 54.2dBA at surrounding villages and 59 dBA at factory gate on the site during day time and 37.1 to 43.8 dBA at surrounding villages and 44.1 dBA at factory gate on the site during night time.

### 3.5 Water Quality

The ground water quality at seven locations was monitored. It was observed the hardness of water was in the range of 110 to 139 mg/l which is on lower side. The water from Krishna river was also analyzed and it was found that it is potable.

### **3.6 Biological Environment**

The study of Flora and Fauna in the 10 Kms radius from the project site was carried out. The eco sensitive and wild life sanctuary was not found in 10 Km radius. In the study area trees like Amba, Sitaphal, Ashok, Saptaparni, Sadaphuli, Bahava, Pimpal, Umbar and some common trees were observed. As regards fauna is concerned, Common Langur, striped Squirrel, Mongoose, and Common Jackle were among the mammals, Common garden lizard, Cobra, Russel viper, Rat Snake from reptiles were noticed. Among the avifauna, Pariah Kite, Sparrow hawk, Blue Rock Pigeon, and House Crow eater were are found.

## **4.0 ENVIRONMENTAL IMPACT PREDICTION**

Environmental impact in the study area reflects in any changes of environmental conditions, adverse or beneficial effects caused or induced by the impact of project if implemented. Superimposition of predicted impact over pre-project base line data shows final picture of environmental conditions. Step of quantitative impact prediction leads to decline suitable environment management plan needed to implement before initiation of project, commissioning stage to mitigate adverse effects on environmental quality. Impact predictions in various areas of air, water, soil, noise, socio-economic for alcohol distillery are given in following sections.

Plant involves activities to set up a plant, machinery, create infrastructure to transport raw material, finished products. It causes various impacts on air & water quality, noise levels, socio-economic environment etc. Next steps describe a brief description of the environmental impacts of proposed distillery project both in construction and operational phases and methodology and results of mathematical and simulation models used in their prediction.

### **4.1 IMPACT DURING CONSTRUCTION PHASE**

Project construction phase will be of one and half year whose activities will surely show effects on land environment, water, air, noise level, soil quality, socio-economic trend etc.

#### **4.1.1 Land Environment**

Some excavation, land filling and development aspects may be needed for leveling of the ground.

#### **4.1.2 Water Environment**

During construction hardly 50m<sup>3</sup> water will be required for slab working. The construction activity will not have any effect on ground as well as surface water. Even the domestic waste water generated in the labour camp is also very low.

### **Mitigation**

Waste water generated during construction is insignificant. Proper sanitation facility will be provided with septic tank so that there will be no negative impact on water.



### 4.1.3 Air Environment

During construction activity there is a probability of increase in SPM due to transportation of trucks, trolleys construction debris, cement etc.

**Mitigation:** all the vehicles permitted at the project site will be possessing Pollution under control certificate. There will be provision of water sprinkling on the project site to control dust emission.

### 4.1.4 Noise Environment

The construction activity will generate noise due to vehicles like trucks and machinery like bulldozers, concrete mixers, cranes etc. the noise levels are between 70 to 80 dB.

**Mitigation:**

All the workers involved in the construction works are provided with ear plugs to avoid continuous exposure of noise. Noise exposure can also be minimized by shock absorbing techniques such as noise barriers, silencers etc. in the equipment.

### 4.1.5 Occupational Safety

During the construction there are chances of minor or major accidents at the site.

**Mitigation:**

All the workers will be provided with helmets, goggles and safety instructions in the form of manuals and also first-aid will be made available.

## 4.2 IMPACT DURING OPERATION PHASE

The operations and their respective impacts in a ethanol manufacturing units are as follows:

### 4.2.1 Impact on Land or soil

The solid waste generated from the ethanol plant is mainly in the form of press mud. This solid waste in case dump on land will create soil degradation or underground water pollution.

**Impact due to solid residue**

Ash formation will occur due to use of Bagasse as fuels in boiler used in distillery unit. Formed ash (small quantity) will be collected, mixed in press mud & distributed free to farmers during season & during off season will be given to nearby brick manufacturers it can also be used as a material for land filling.

**Mitigation:**

Press mud can be used as bio-compost along with spent wash. Fly ash generated during combustion in boiler will be used as a material in land filling as well as in brick manufacturing.

Spent wash from alcohol distillery will be reduced substantially by implementing single stage evaporation technology. Bio-compost equipment use to treat generated spent wash from ethanol plant with culture Micro 110 will give compost to be sold to farmers in vicinity area.

### 4.2.2 Impact on water environment

Water needed for sugar, cogeneration and distillery operation will be available from Krishna river. Around **638** m<sup>3</sup> / day will be recycled from the From Evaporate condensate from proposed Distillery Unit. This water can be used for molasses dilution. The spent wash from the distillery for a 90 KLPD plant will be around 180 KL/ day. In case untreated spent wash is

disposed on the land, there are maximum chances of water pollution. In the effluent treatment section after Bio-gas reactor the Demethanised effluent will be passed through an Evaporation system with seven effect evaporation before Bio-Composting.

**Mitigation:** The zero effluent discharge scheme will be adopted so as to prevent water pollution.

#### **4.2.3 Impact on Air Environment**

The common process involved in the units is the use of boiler and turbine. The air environment gets polluted due to emission of suspended particulate matter having particle size less than 50 microns. It also affects the crops grown in the nearby areas. So it has negative impact on the health of people.

Due to existing state highways & less distances for carts, trucks to reach site the suspended particulate matter generation will be in specified limits.

SPM collected from Bag filter, air heater hoppers, ash from boiler bottom hoppers, total quantity being less than 2 % can be subjected to suitable land fill.

#### **4.2.4 Impact due to transportation**

Vehicle traffic due to transportation of molasses, finished materials alcohol etc. will be increased. Transport of the items will be done with trucks. Traffic with jeeps, buses, cars, ambulance etc. will also be there. Traffic on road will create rise in particulate matter. Metalled roads already exist in the site area which will keep minimum SPM level. Thus fugitive emissions will be at minimum levels.

#### **Mitigation**

AFS puts a strategy to check regularly the PUC of all auto vehicles, servicing & maintenance, in order to have minimum environmental impact due to the vehicle exhaust emission. Garden & tree plantation plans will ensure the target of minimum fugitive emissions. ASL proposes better level of housekeeping in all departments of sugar mill, power generation, and colony area to get clean area.

#### **4.2.5 Impact on Noise environment**

Noise, an unwanted sound, affects human being. Excessive exposure to noise produces varying degree of damage to hearing system. It leads to headache, fatigue etc. the main sources of noise are steam turbine, boiler, DG sets, etc. most of them generate noise level up to 70-90 dB A. Road traffic will also result in rise in noise levels. Continuous exposure of increased level of noise will have an adverse impact on the health of workers as well as the people residing in surrounding area. Prolonged exposure can lead to temporary or even permanent deafness.

Noise making Equipments such as cutters, crushers, mixers, pumps, boilers etc. All connecting roads to plant will be metalled one. Vehicle maintenance, proper lubrication to machinery will be arranged. Tree plantation on the campus and on the connecting roads is initiated and will be done each year.

#### **Mitigation**

All the workers will be provided with ear plugs, proper maintenance of pumps. All the transporters will be advice to carry out regular maintenance of their vehicles.

#### **4.2.6 Impact on Socio-economic environment**

ASL is located in an isolated area. ASL management thought that it would be advantageous to improve the living conditions of people in and around the plant site. It also proposes to employ local skilled and unskilled workers. It will therefore generate employment in the local area. In turn local people can avoid uncertainty of job, raise their living standard, do supplementary jobs of cane & other farming, cattle, poultry, brick making unit etc. thus to stabilize & prosper in life. This will surely be a positive impact.

#### **Socio economic pattern**

ASL has already initiated process to select & employ key persons for project. In nearby period full employment, colony creation will give them space to reside thus to get settled in the area.

### **5.0 Environment Management Plan**

#### **5.1 Air Pollution control**

The following measures shall be adopted for the control of emissions in the sugar, cogen and Distillery unit

- a. A Suitably designed electrostatic precipitator with efficiency of 99.8 % shall be palced downstream of the stack which will separate out the incoming dust in the flue gas and limit the dust concentration at its designed outlet concentration of 150 mg/NM<sup>3</sup>.
- b. For effective dispersion of gases stack height will be 90 M.
- c. Regular preventive maintenance of pollution control equipment shall be carried out.
- d. To reduce fugitive emission water sprinkle ring will be done roads.
- e. Green belt will be developed on both sides of roads.

#### **5.2 Noise Pollution Control**

All rotating equipments shall be lubricated and provided with enclosures as far as possible to reduce noise emissions.

Provision of silencer will be made wherever possible.

#### **5.3 Water Pollution control**

The waste water generated from Sugar and Cogen power plant will be treated in the Effluent treatment plant. The treated water will be diluted with non process waste water after neutralization in polishing pond. The outlet of the polishing pond confirming to the GSR 422 E on land discharge standard is used for green belt development and sugar cane cultivation. Of the area of **120.5** acre available 30 acre is available for green belt.

The treatment of spent wash from Distillery include use of biodigestor, then seven effect evaporator to concentrate spent wash and then residue is taken for producing compost. Hence, as per CPCB norms zero effluent discharge is achieved. The area of Biocompost required is total 10 acre.

The domestic sewage will be disposed by means of septic tank of size 6.0 x 3.0 x 3.0 m followed by dispersion trench of size 5.0 x 4.0 x 2.5m. The quantity of sewage generated will be 4 KLD

## 5.4 SOLID WASTE MANAGEMENT

### PRESSMUD STORAGE YARD

The pressmud storage yard of 75 m x 50 m will be made impervious by constructing it with 300 mm thick stone soling. 200 mm thick base garland canal to collect any leachate or rainy days water. The same water will be collected in a collection tank of 10 m x 10 m x 5 m and the same will be recycled.

ASL will adopt the state of the art continuous fermentation process with Multipressure Vacuum Distillation such that the generation of solid waste such as, yeast sludge is very less as compared to conventional batch process. The volume of sludge is only 0.5 – 1% of the total quantity of fermented wash.

## 5.5 GREEN BELT DEVELOPMENT

Tree plantation is one of the effective remedial measures to control the Air pollution and noise pollution. It also causes aesthetics and climatologically improvement of area as well as sustains and supports the biosphere. It is an established fact that trees and vegetation acts as a vast natural sink for the gaseous as well as particulate air pollutants due to enormous surface area of leaves. It also helps to attenuate the ambient noise level. Plantation around the pollution sources control the air pollution by filtering the air particulate and interacting with gaseous pollutant before it reaches to the ground. Tree plantation also acts as buffer and absorber against accidental release of pollutants. The plantation work for green belt development will be carried out as per CPCB guidelines, local species would be preferred.

For effective control of air pollutants in and around the proposed industry, a suitable green belt is proposed by taking into consideration the following criteria. The green belt would;

- Mitigate gaseous emissions
- Have sufficient capability to arrest accidental release.
- Effective in wastewater reuse.
- Maintain the ecological balance.
- Control noise pollution to a considerable extent.
- Prevent soil erosion.
- Improve the Aesthetics.

**Table for Species in Tree Plantation**

No.	Tree species	Common Name
1	Plumeria pudica	Champak
2	Cassia siamea	Kashid
3	Pongamia pinnata	Karanj
4	Ficus glomerita	Umber
5	Azadirachta indica	Neem
6	Nerium indicum	Kaner
7	Delonix regia	Gulmohar
8	Bauhinia varie	Kanchan
9	Samanea saman	Rain tree
10	Sapindus emarginatue	Ritha
11	Tamarindus indica. Linn	Chinch

12	Anogeissus latifolia	Dhawda
13	Syzygium cimini, Skeels Myrataceae	Jambhul

## 6.0 MONITORING PLAN

### MONITORING FACILITY

It is proposed to get the monitoring work done from the laboratory of MPCB initially. In due course of time MSSL may acquire-monitoring equipments namely High Volume Samplers, Stack Monitoring Kit, Automatic recording Weather Monitoring Station, Noise Monitoring Equipments etc. to carry out environmental monitoring work. The in house monitoring shall be highly recommended to save the cost incurred.

### 6.1 EMP BUDGET

**Capital and operating expenditures for environment protection measures i.e EMP**

Sr.No	Particulars	Capital Cost Lakhs	Recurring Cost per Annum in lakhs
1	Air pollution control, ESP	250	20
2	Water pollution control	140	10
3	Composting	250	25
3	Noise pollution control Enclosure for DG-Set	10	-
4	Occupational Health	2	-
5	Environment Monitoring and management	1	5
6	Green Belt Development	20	2
7	Others-Consultation and Training	-	2
8	Community Development	-	115
	<b>Total</b>	<b>673</b>	<b>179</b>

## 7.0 RISK ASSESSMENT AND DISASTER MANAGEMENT PLAN

### RISK ASSESSMENT :

Industrial accidents results in great personal and financial loss. Managing these accidental risks in today's environment is the concern of every industry including distillery units, because either real or perceived incidents can quickly jeopardize the financial viability of a business. Many facilities involve various manufacturing processes that have the potential for accidents which may be catastrophic to the plant, work force, environment, or public.

The main objective of the risk assessment study is to propose a comprehensive but simple approach to carry out risk analysis and conducting feasibility studies for industries and planning and management of industrial prototype hazard analysis study in Indian context.

Risk analysis and risk assessment (Figure 4-4) should provide details on Quantitative Risk Assessment (QRA) techniques used world-over to determine risk posed to people who work inside or live near hazardous facilities, and to aid in preparing effective emergency response

plans by delineating a Disaster Management Plan (DMP) to handle onsite and offsite emergencies.

QRA may be carried out to serve the following objectives.

1. Identification of safety areas
2. Identification of hazard sources
3. Generation of accidental release scenarios for escape of hazardous materials from the facility
4. Identification of vulnerable units with recourse to hazard indices
5. Estimation of damage distances for the accidental release scenarios with recourse to Maximum Credible Accident (MCA) analysis
6. Hazard and Operability studies (HAZOP) in order to identify potential failure cases of significant consequences

### **Mitigation Measures**

The purpose of mitigation is to identify measures that safeguard the environment and the community affected by the proposal. Mitigation is both a creative and practical phase of the EIA process. It seeks to find the best ways and means of avoiding, minimizing and remedying impacts. Mitigation measures must be translated into action in the correct way and at the right time, if they are to be successful. This process is referred to as impact management and takes place during project implementation. A written plan should be prepared for this purpose, and includes a schedule of agreed actions. Opportunities for impact mitigation will occur throughout the project cycle.

#### **7.1 Health and safety measures:**

- Regular inspection and maintenance of pollution control systems.
- Statutory approvals, waste treatment and disposal including stack emissions etc.
- Full fledged fire protection system.
- Gloves and protective equipment to prevent health hazards.
- Use of splash proof safety goggles and shoes.
- To impart training at various levels including contractors and transport personnel's for observing safe work practices.
- Clearly define the procedures for inspection, operation, and emergency shutdown of the process operations.
- To device systematic accident prevention program to ensure safe and healthy working environment.
- The compliance of all statutory regulations.
- Environment monitoring and control of process parameters at various unit operations by providing control measures in the plant.
- Eliminate unreasonable, research and where appropriate, implement advance technology in the design, production services and to prevent pollution as well as conserve, recover and recycle raw materials.
- The workers exposed to noisy sources will be provided with ear muffs/plugs.

- Preventive maintenance activities so as to have smooth operations.
- Audit programs must be carried out to review the management system for identifying, evaluating and controlling environmental, health and safety hazards.
- The health of the workers will be regularly checked by a well qualified doctor and proper records will be kept for each worker.

## 7.2 DISASTER OR EMERGENCY CONTROL PLAN

ASL already established factory in the Taluka Athani, district Belgaum . Such unit can pose threat of danger / hazard due to storage of hazardous materials. Distillery plant also poses electrocution, fire, and explosion hazards. When the full fledged activity of Ethanol Plant will gear up it will have to follow Factories Act 1948 & Maharashtra Factories Rules 1963 with all amendments till today and any directives from Director Safety, Health & Environment [SHE] will automatically be binding on ASL. In such condition to appoint a qualified Safety Officer is a must & will be an adequate, wise step in such direction. On site and off site disaster control plans and their perfect implementation will be part and parcel of the management & such safety officer. To lessen the probability of hazard to occur & avoid the consequent damage, a disaster management and control plan has to be worked out for whole complex in anticipation to the threat.

## 7.3 TYPE OF DISASTER AT ASL COMPLEX

- Disaster can occur as on site or off site variety i.e. disaster on campus or disaster in nearby area causing indirect damage to site area & the complex.
- Disaster may occur due to two categories, **natural** and **man made** calamities:
- **Natural calamities cover** Flood, Storm / typhoon, Earthquake, Tsunami, Heavy mist, fog, hail storm, Land slide
- **Man made calamities involve** Fire & Explosion, All types of leakages & spillage, Electrocution, excavation, construction, erection, Sabotage, rail & road accidents, mass agitation, Looting, Morcha, war

The identified hazardous areas in the complex are

1. Boiler area - Explosion
2. Oil tanks - Fire and spillage
3. Turbine section - Explosion
4. Electrical rooms - Fire and electrocution
5. Transformer area - Fire and electrocution
6. Cable - Fire and electrocution
7. Storage facilities – Fire / spillage for fuel and alcohol

#### **7.4 SITE EMERGENCY CONTROL ROOM (SECR) & SITE MAIN CONTROLLER**

To assist the disaster control more effectively a site emergency control room (SECR) will be established at the plant site. The SECR may be provided with following sections:

- All site plant layout
- List of important telephone numbers of Chairman & Directors ASL, Chief Engineer, Chief Chemist, Distillery Manager, Administration Manager.
- All material handling & incoming vehicle traffic to be stopped temporarily.
- All out going lines to be used to contact above authorities.
- Captive power plant layout showed with inventories and locations of fuel
- Oil / furnace oil storage tanks, storage yard etc.
- Hazard identification chart, maximum number of people working at a time, assembly points etc

#### **7.5 DISASTER PREVENTIVE MEASURES**

The proposed power plant will have following preventive measures to avoid occurrence of disasters:

- I. Specification & marking of safe area to gather in emergency.
- II. Design, manufacture and construction of plant, machineries and buildings will be as per national and international codes as applicable in specific cases and laid down by statutory authorities.
- III. Provision of adequate access ways for movement of equipment and personnel shall be kept.
- IV. Minimum two numbers of gates to escape during disaster shall be provided.
- V. Fuel oil storage shall be in protected and fenced. The tank will be housed in a dyke wall. As per regulations of CCOE its testing & certification will be performed each 5 years regularly.
- VI. Proper colour coding for all process water, air & steam lines will be done.
- VII. Proper insulation for all steam & condensate, hot water lines will be done.
- VIII. Provision of circuit breakers, isolation switches, signals will be provided as per electricity act & rules.

Proper & rigid bonding and earthing to all equipment will be arranged

#### **7.6 FIRE FIGHTING ARRANGEMENTS**

**BIS 2190** provides Indian standards for fire fighting equipment. All fire fighting equipment and extinguishers have to be planned according to this standard.



There are 4 classes of a fire to occur:

<b>Class</b>	<b>Materials</b>	<b>Extinguisher</b>
A	Cotton, Cloth, paper, wood	Water type
B	Oils, Hydrocarbons, Alcohol, Greases	CO <sub>2</sub> type
C	Gases, CNG, LPG, Acetylene,	Foam type
D	Electrical & metals	Foam

### **Recommendation**

The fire tender, which will be part of project with following minimum fire fighting arrangements shall be procured:

- Water tank - 500 litres
- CO<sub>2</sub> - 2700 litres
- Foam tank - 45 litres
- CO<sub>2</sub> type fire extinguishers - 6 nos of 4.5 kg each

### **CONCLUSION**

M/s. Athani Sugars Ltd. (ASL) is expanding existing capacity of up a Suagr, Cogen and Distillery at Kempwad village, Taluka, Athani Dist., Belgaum Karnataka. The sugar crushing capacity from 4500 to 12000 TCD, distillery from 60 to 90 KLPD and set up 24 to 54 MW biomass power plant. Establishment of the Ethanol plant will add more revenue to farmers. After the establishment of the factory, the standard of living of the entire area will improve. The land & other infrastructure are also available. The design of the proposed project includes measures to control and prevent environment within acceptable limits by providing most recent techniques and necessary equipments. The impacts would be amenable to technological control and effective environmental management in both the phases (construction & Operation).

Based on the above, it is concluded that the adverse environmental impacts due to construction and operation phase can be mitigated to an acceptable level by implementation of various mitigatory measures envisaged.