

**ES**

## EXECUTIVE SUMMARY

### ES.1 Introduction

M/s Yaragatti Sugars Pvt Ltd. is planning to Establish a 120 KLPD Distillery along with incineration boiler to generate 5 MW power at M Chandargi village, Ramdurg Taluk, Belagavi district, Karnataka.

According to EIA Notification dated 14<sup>th</sup> September 2006, the project falls under 5 (g) and Category “A”. Therefore, it’s necessary for M/s Yaragatti Sugars Pvt Ltd to obtain Environmental Clearance from Ministry of Environment, Forest and Climate Change (MoEF), Government of India, New Delhi.

### ES.2 Project Description

M/s Yaragatti Sugars Pvt Ltd., are planning to Establish a 120 KLPD Distillery (Rectified Spirit/ Ethyl alcohol/ Extra Neutral Alcohol/ Ethanol) along with incineration boiler to generate 5 MW power with total land area of 33 acres 39 Guntas at M Chandargi village, Ramdurg Taluk, Belagavi district, Karnataka. Salient features of the proposed project are detailed below:

**Table ES.1 Salient features of the proposed project**

Sl.No	Items	Particulars
1	Objective of the Project under consideration	Establishment of a 120 KLPD Distillery (Rectified Spirit/ Ethyl alcohol/ Extra Neutral Alcohol/ Ethanol) along with incineration boiler to generate 5 MW power.
2	Promoters	Yaragatti Sugars Pvt Ltd
3	Total Investment, Rs	110.01 Crores
4	Project location	Sy No 181/1, 181/2, 181/3, 181/4, 181/5, 185/1, 185/2 M Chandargi village, Ramdurg Taluk, Belagavi district, Karnataka.
5	Latitude	16°02'29.51" N
6	Longitude	75°05'47.01" E
8	Extent of land	33 Acres 39 Guntas
9	Category of Project	5 (g) Distillery
10	Man Power required	340
11	Fresh Water demand and Source	960 KLD Source: Malaprabha River
12	Power supply	<u>During construction phase:</u> 500 kwh –from HESCOM <u>During operation phase, 2.455 MW</u>
13	Number of working days	Distillery: 300 days

## ES 2.1 Raw material Requirement

List of raw material required for Distillery unit and Incineration boiler are as follows:

**Table ES.2 Raw material requirement – Distillery**

Sl. No	Raw Material	Quantity/60 KLPD	Source
1	Molasses	480 MT	<ul style="list-style-type: none"> <li>• The Ghataprabha SSKN Gokak</li> <li>• Shree Halasidhanath SSKN Nippani</li> <li>• Lailasugars Pvt Ltd</li> <li>• Shiraguppi Sugars Works Ltd Kagawad</li> <li>• Shree Someshwar SSKN Sidasamudra</li> <li>• Belgaum Sugars Pvt Ltd, Hudali</li> </ul>
2	Sulphuric Acid	240-260 lit	Belagavi/ Kolhapur
3	Nutrients N, P	72 Kg	Belagavi/ Kolhapur
4	Turkey Red Oil (TRO)	240-260 Kg	Belagavi/ Kolhapur

**Table ES.3 Raw material for 5 MW Incineration Boiler**

Fuel	Quantity in TPD	Source
Spent wash (concentrated)	262	Own Distillery unit
Bagasse	216	From nearby sugar industries

## ES 2.2 Process flow diagram

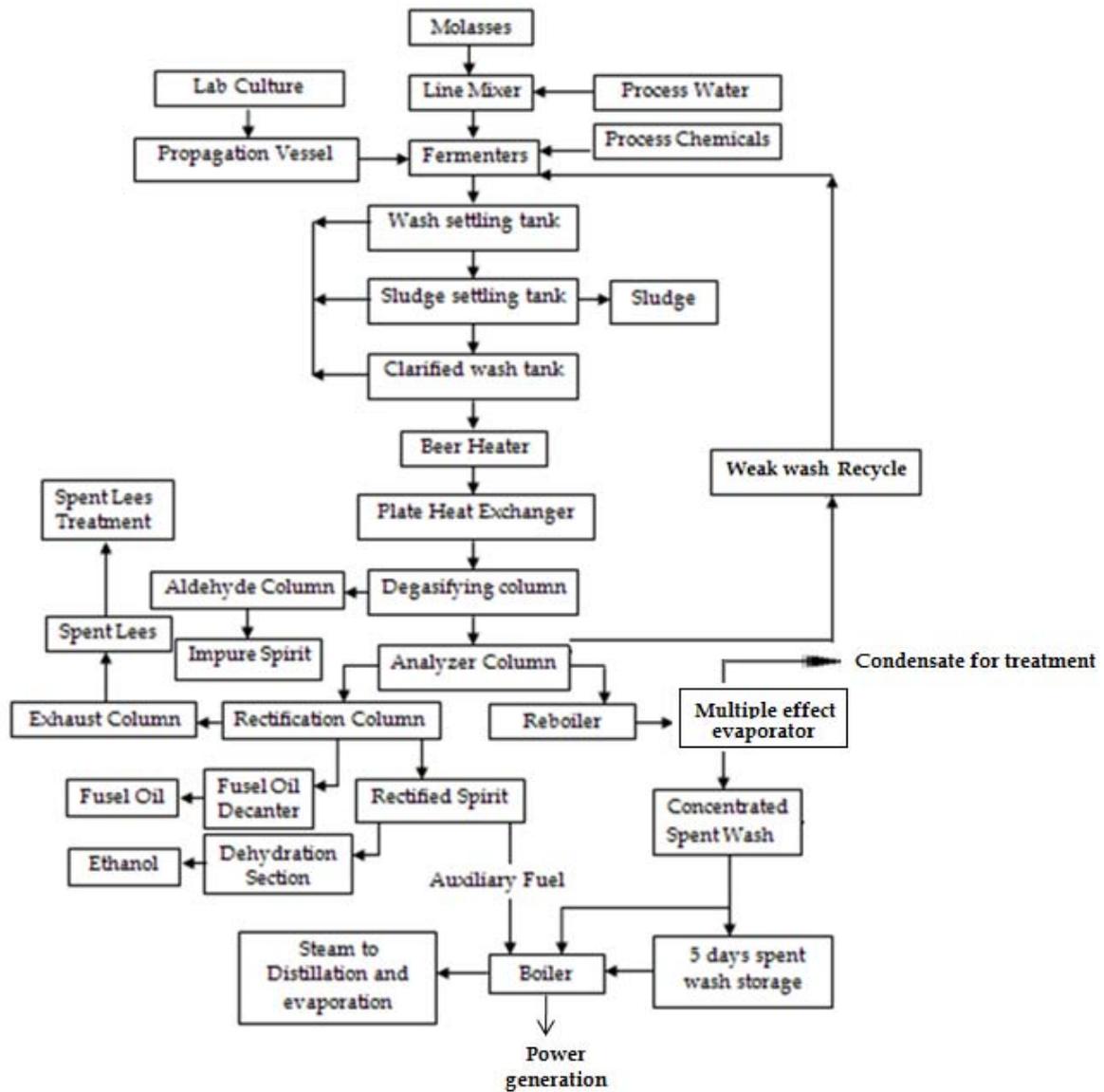


Fig ES.1 Process flow diagram

## ES 2.3 Products

Following table lists the final product details.

**Table ES.4 Proposed Product Mix**

Sl.No	Product	Quantity
<b>Products</b>		
1	Ethanol (RS/ENA/AA)	120 KLPD
2	Power	5 MW/hr

## ES.3 Description of the Environment

In order to assess the baseline environmental status of the project, monitoring of various environmental attributes were conducted by EHSCPL during December 2016 - February 2017. In addition to the baseline environmental monitoring, field inspection in the study area, collection of secondary information for all the environmental components and discussions with the officials and local public were conducted by the study team.

**Land Use:** The study area of 10 Km radius from the project site comprises of mixed land use – residential, commercial, industrial and agricultural activities. Majority of the area is crop land (89.62 %) followed by Scrub-Forest (7.65 %)

**Land Environment:** Soil samples were collected at nine locations. The soils of the region can broadly be classified into red soils and black soils. These soils vary in depth and texture, depending on the parent rock type, physiographic settings and climatic conditions. By and large, black soils predominates the Deccan Trap terrain and the red soils are found in the southwestern and southeastern part of the district in gneissic terrain

**Meteorology:** Meteorological monitoring was carried out at project site during December 2016 - February 2017. Watchdog 2900 ET was installed at site to record Solar Radiation (Watt / sq. m), Relative Humidity (%), Temperature (°C), Rainfall (mm), Wind Direction (Deg), Wind Gust (km/hr), Wind Speed (km/hr) and Dew Point (°C). The maximum mixing height of 4000 mt above ground level is observed while the minimum mixing height observed is 40 mt. Temperature during the study period was in the range of 11.4°C – 36.5°C. On an average the temperature of 24°C was observed.

**Air Environment:** Ambient air quality monitoring was carried out at eight locations. The results of the AAQM reveals that, measured values for PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, NO<sub>2</sub>, CO, NH<sub>3</sub>, O<sub>3</sub> were within the NAAQ standards, 2009 and parameters like Benzene, Benzo(a) pyrene, Arsenic, were not detected. Nickel and lead were detected in trace quantities. The ambient air quality was found to be satisfactory.

**Noise Levels:** Ambient Noise Level Monitoring conducted at 8 locations in and around the proposed project site was found within the CPCB standards.

**Surface and ground water quality:** Ten Groundwater (Bore well water) samples were collected in the study area and have been analyzed for describing the baseline water environment. Most of the heavy metals in all samples were found below detectable limits. Overall, all the samples collected from the study area were found to be fit for human consumption.

The study area does not have any manmade water tanks except for the natural ponds. Due to the scanty rainfall over the last few years, the tank and streams hold water only during

monsoon season. Torangatti lake and Korakoppa halla was dry during study period, samples could not be collected from the lake / halla, so samples were collected from the nearby borewells.

**Geology:** Major part of the study area in the north and central part of the study area is occupied with Deccan Trap formations. Deccan Traps in the area are having near horizontality of the flows through the region. Deccan Trap stone waste is seen in around the villages in the entire study area. The other rock formations in the study area are conglomerates, Dolomites, Banded Hematite Quartzites, Chert Breccia, Lime stones, Arenite and haless. The general character of the Deccan traps exposed in the study area is a gentle rolling country presenting a monotonous landscape, bare of vegetation and covered over by extensive spreads of black soil

**Hydrology:** Hydrogeological surveys were carried out in and around the study area during January- 2017. Depth to water level in the study area varied from 54 – More than 70 m below ground level (bgl). Water table elevation in the area ranges from less than 575 m above mean sea level (amsl) to more than 600 m amsl. Over the vast area it is more than 600 m amsl.

**Biological Environment:** During the survey, 22 tree species were identified in the study area belongs to 14 families. Fabaceae species (n=9) are found common in the region. The diversity of shrubs in the study area is limited (n=9) and due to the summer, herbaceous community (n=14) was dry and disappeared as they are seasonal to monsoon and post monsoon. There are no protected areas, eco-sensitive areas around and no specific wildlife habitat has been observed in the study area. Godachi Reserve Forest (1648.20 ha) is located at a distance of 7.2 km from the project site in Ramdurg Taluk of Belagavi District. In Godachi RF, *Sitana ponticeriana* (Fan throated lizard) found common and whereas in the study area many of the shepherds reported the occurrence of Fox, Wolf, Jungle cat and Spotted deer. The study area is completely agricultural landscape and as such no stress has been found on any species habitat in the study area. Project site is vacant and on the bunds, sparse distribution of trees were evidenced. Total 30 trees are present in the project site belongs to 4 species of different families each.

**Socio Economic Studies:** Focal group discussions and structured interactions with stakeholders were organized in all the 17 villages surrounding 10 km radius of the project. The participants include villagers from all walks of life. Structured questionnaires were used for the interactions and information to be collected and the overall impression of the villagers about the sugar factory was good. The company provides them employment and several local developments in the area are steered by them. This includes provision for drinking water, improved facilities in schools, better roads, and supports for festivals in temples, etc.

## **ES.4 Anticipated Environmental Impacts and Mitigation Measures**

### **ES 4.1 Land Environment**

**During construction** phase, the land use of the project site area will get modified by the implementation of the proposed project. The probable impacts will arise due to site leveling/clearing, excavation, laying foundation and other construction activities. Hence, impact is considered to be permanent in nature with the development of new land use.

Activities such as clearing, leveling, cutting and filling, foundation works through excavation will significantly leads to dislodging of soil particles and intern erosion due to loosening of top soil. Removal of earth material also results in formation of scars (i.e., pits unused and not

suitably rehabilitated). The impacts may also be anticipated due to dumping of solid wastes (from labour camps), remains of excess excavated earth material and from debris. However, these impacts are short term and likely to be insignificant. It may cause some other secondary impacts such as decrease the water infiltration and also reduce the ground water level in the region. Hence suggested green belt development and rain water harvesting plan for the proposed project site will improve the situation.

**During operation phase,** the installation of the 1 boiler of 40 TPH with its stack of 70 mt height and other sizeable structures would substantially alter the place and rural landscape. However, the development of green belt will largely offset the change to the existing landscape and will provide visual comfort. The spent oil generating from the 1500 KVA D.G. set and steam turbines are categorized as Hazardous waste may lead to soil pollution, which need to be disposed off to the authorized recyclers/reclamation units as per the Pollution Control Board guidelines

M/s Yaragatti Sugars Pvt Ltd will implement zero wastewater discharge methodology at Distillery. Hence, there would be no impact due to any treated wastewater disposal on land as the same will comply with KSPCB discharge standards for on land for irrigation / gardening / Greenbelt Development.

The soils within the impact zone might undergo changes due to deposition of pollutants from the discharge of treated effluent which will be utilized for on land for irrigation/gardening; where in the fertility of the land is anticipated for improvement.

## **ES 4.2 Air Environment**

**During construction phase:** The impact of construction activities on air quality is a cause for concern mainly in the dry months due to settling of dust particles. The main sources of emission during the construction period are the movement of equipments at site and dust emitted during leveling, grading, earthworks, foundation works and other construction related activities. The impact of such activities would be temporary and restricted to the construction phase. The impact will be confined within the project boundary and is expected to be negligible outside the project boundaries.

**During the operation Phase:** The main sources of Air Pollution in the proposed project are the operation of Boiler. Even though DG set will be used at site, for the prediction of air pollution from the project, it is not included as the same will be only used during power failure during initial stages and rest of the time, captive power will be utilized from cogeneration unit. Stacks/chimneys will be provided to Boiler and D.G.Set as per KSPCB Norms. ESP will be provided to the boiler of 40 TPH with stack height of 70 mt. From the Air quality modeling studies, it is found that, impact on air quality will be minimum during this stage with the installation of APC. Greenbelt development of 33% of total land will create aesthetic environment and also acts as a pollution sink for pollutant emissions.

## **ES 4.3 Noise Environment**

During construction phase, various sources of noise pollution will be from the operation of machineries like compactors, concrete plant, cranes etc. Other sources of noise pollution during construction period includes movement of vehicles for unloading of construction materials, fabrication, handling of equipment and materials, operation of batching plants. Overall, the impact of noise generated on the environment is likely to be insignificant, reversible and localized in nature and mainly confined to the day time. Construction

equipment generating minimum noise and vibration will be chosen. Construction activities will be restricted only during day time.

Noise generating machinery operations at Distillery unit are Concentration Process, Steam Production, mixers, pumps, boiler, etc. Provision of insulating caps and ads at the exit of noise source on the machinery are proposed. The use of damping materials such as thin rubber / lead sheet for wrapping the work places line compressors, generators sets. Shock absorbing techniques will be adopted to reduce impact; Ear plugs will be provided to the workers exposed to high noise prone activity and it will be enforced to be used by the workers; Greenbelt/Landscape development along the periphery of the proposed site will act as a noise attenuator. Monthly ambient noise level monitoring will be conducted during construction phase and operation phase to conform to the KSPCB stipulated standards both during day and night time. D.G.Sets with acoustic enclosures will be used.

#### **ES 4.4 Water Environment**

During construction stage, water will be drawn from the nearby villages from existing tube-wells through tankers. During operation phase, fresh water requirement of the plant is proposed to be met by Malaprabha River / Borewell.

In order to reduce the impact on ground water quality during the construction stage, the sewage generated from the labour activities will be disposed through Septic Tank & Soak Pit. During the operation phase, effluent will be treated in CPU of capacity 1000 KLD. The treated effluent will be reused for on land for irrigation/gardening/greenbelt development. The sewage generated from the domestic activities as estimated 16 KLD is disposed to septic tank and soak pit. The spentlees and condensate generated in the Distillery section will be treated in the CPU section and spent wash will be concentrated and used as fuel in the incineration boiler and intern generating 5 MW power.

All along the internal road network, storm water drains will be provided to collect water during rains. The storm water collection system will be designed in such a manner so that storm water from garden, parking area, roadways and lawns is used for recharging of ground water through Recharge shafts (5 No's). Rainwater harvesting sump of capacity 100 KL (6m X 6m X 3m) proposed.

#### **ES 4.5 Biological Environment**

**During construction phase:** The impact of construction activities would be primarily confined to the project site. There is no direct impact on biological environment (flora and fauna) due to the project. However, changes occurring on air, water and land environment will have indirect impact. Removal of 30 nos. of trees belongs to 4 families will be a significant impact to the region. All the trees are common and the relocation of these trees are impossible. These trees shall have the capacity of sequestering 0.6 tonnes of CO<sub>2</sub> per year. Removal of these trees will have impact on reducing carbon sequestration in the study area. During construction phase, movement of vehicles carrying construction materials to site emit gases such as CO, NO<sub>x</sub>, Sulphur Oxides, Lead, Particulate Matter and HC.

**During Operation phase:** Industrial emissions contribute to Green House Gases in the atmosphere. Forests and trees shall have the capacity of accumulating atmospheric CO<sub>2</sub>. The trees in the study area sequestering 69,990 tonnes of CO<sub>2</sub>/year. *Tamarindus indica* (4.03 tonnes/tree/Yr), *Mangifera indica* (2.58 tonnes/tree/Yr) and *Azadirachta indica* (2.48 tonnes/tree/Yr) are the major species of accumulating more carbon in the study area

## ES 4.6 Socio Economic Environment

During construction the peak workforce strength would rise-up to hundred persons. Though the technical persons and skilled labors would by and large be hired from outside the study area, bulk of the labor force would comprise of unskilled and semi-skilled workers. A substantial number of persons would presumably be recruited from the surrounding areas itself.

Construction of any major industrial project invariably results in socio-economic changes. The influx of material and money lead to change the economic status of the community. Markets, workshops and commercial centers would develop in the area.

Moreover, a sizeable number of service class people who are directly connected with the operation of the plant, e.g. house servants, workshops, washer man, shopkeepers etc. will flow in from the neighboring areas. As the plant and its ancillary facilities act as an active nucleus of activity, a shift of population towards this center will also occur within the study area.

During operation phase, there will be a large flow of financial and material resources; there remains a large possibility of growth of population in the business, trade, commerce and service sector. Thus, a simple backward community may be transformed into a semi-urban complex within a short time frame. At the same time, however, farmers may be induced to adopt more intensive agricultural and animal husbandry practices, resulting in higher production and boosting up of the area economy.

## ES 4.7 Solid Waste

During construction phase, solid wastes such as excavated soil, debris, metal waste and domestic waste will be generated. The solid waste generated from labour sheds of about 38 Kgs/day will be composted. Excavated soil/earth will be reused within the site. Debris will be reused in internal drain/road works. Metal waste/scrap waste will be disposed off to recyclers.

During Operation phase, the solid waste generated such as Bagasse, will be used as fuel in incineration unit, boiler-ash, yeast sludge & sludge generated from UASB process will be mixed in required proportions and re-used as manure and domestic organic solid waste will be composted, while the inorganic solid waste will be handed over to authorised recyclers.

## ES.5 Environmental Monitoring Program

**Table ES.5 Environmental Monitoring Programme during Construction Phase**

Sl. No	Particulars of the Monitoring	No. and Place of Monitoring	Monitoring frequency	Parameters for Monitoring	Monthly Budget (Rs.)
1	Ambient Air Quality Monitoring - 24 Hrs	3 Nos Near main gate, Construction area- distillery, Labour camp	Monthly	PM <sub>10</sub> , PM <sub>2.5</sub> , SO <sub>2</sub> , NO <sub>2</sub>	8500/-
2	Ambient Noise Level Monitoring - 24 hrs	3 Nos Near main gate, , construction area- distillery, Labour	Monthly	Leq Day dB(A) and Leq Night dB(A)	8400/-

Sl. No	Particulars of the Monitoring	No. and Place of Monitoring	Monitoring frequency	Parameters for Monitoring	Monthly Budget (Rs.)
		camp			
3	Ground Water Quality	1 No Near Labour camp	Monthly	pH, Colour, Odour, Turbidity, Total Dissolved Solids, Total Hardness, Ca, Mg, SO <sub>4</sub> , F, NO <sub>3</sub> , DO, Cl, Fe, Coliform Count.	1800/-
4	Soil quality	1 No Near Labour camp	Once in season	Color, pH, Conductivity, Moisture Content, Calcium, magnesium, Nitrogen Phosphorous, Potassium, Organic Matter, Sulphate, Chloride.	1850/- (616/- per month)

**Table ES.6 Monitoring Schedule for Environmental Parameters during operation phase**

Sl. No.	Particulars	Monitoring frequency	Duration/ type of monitoring	Important parameters for monitoring	Monthly Budget (Rs.)
I	Air Quality				
1	Ambient Air Quality Monitoring within premises - 4 locations <ul style="list-style-type: none"> <li>• Near main gate</li> <li>• Near Boiler house</li> <li>• Distillery unit</li> <li>• Near CPU</li> </ul>	Once in a month	24 hrly sample	PM <sub>10</sub> , PM <sub>2.5</sub> , SO <sub>2</sub> , NO <sub>2</sub>	11,200/-
2	Stack/Chimney Monitoring for Boiler, D.G set (1500 KVA)- 1 sample 40 TPH boiler - 70 m chimney	Once in a month	Grab	SO <sub>2</sub> , PM, NMHC & CO	4000/-
II	Water Quality				
1	Ground water analysis within the premises and in nearby villages - 2 samples	Once in a month	Grab	As per drinking water quality standards (IS10500:2012)	6000/-

Sl. No.	Particulars	Monitoring frequency	Duration/ type of monitoring	Important parameters for monitoring	Monthly Budget (Rs.)
2	Effluent - CPU inlet	Once in a fortnight	Grab	BOD, COD, pH, TSS, oil and grease	800/- (1600/- per month)
3	Effluent- CPU outlet	Once in a fortnight	Grab	pH, BOD, COD, TSS, Oil & Grease	800/- (1600 /- per month)
III	Soil Quality				
1	Soil quality analysis (landscape area where treated water is being utilised)	Once in season	Grab	pH, C, Organic matter, N, K, P.	1,000/- (333/- per month)
IV	Ambient Noise level monitoring :- near Main Gate/Boundary, boiler section, Turbine area, Distillery section D.G Set Room, Godowns	Once in a Month	24Hrs Monitoring	Noise levels in dB (A) both during day & night time.	16800/-

M/s Yaragatti Sugars Pvt Ltd will implement various productivity management programs in the plant to improve the work environment, effective housekeeping and environment quality. All the necessary steps will be taken in the plant to meet standards prescribed by the Karnataka State Pollution Control Board /Central Pollution Control Board / KSEIAA / MoEF.

## ES.6 Risk Assessment and Disaster Management Plan

Fire Detection System is to be installed in the control room. The duties and responsibilities of different co-ordinators of Onsite Disaster Management Plan will be displayed in the Control Room.

### ES.6.1 Occupational Health and safety Measures:

- All precautionary methods will be adopted by the company to reduce the risk of exposure of employees to occupational safety and health hazards.
- Pre & post medical check-ups will be done of all the employees. Employees will be regularly examined and the medical records will be maintained for each employee. Pulmonary function test and periodical medical checkup shall be done once in every year. The following tests will be conducted for each worker as Occupational health surveillance programme: Lung Function Test, Radiology – X-ray, Pulmonary Function Test, and Audiometric Test.
- For the safety of workers, personnel protective appliances like hand gloves, goggles, aprons, ear muffers, nose mask etc. will be provided.
- Proper ventilation system will be provided in the process area.

## ES.7 Project Benefits

- The company's management will recruit semi skilled & unskilled workers from the nearby villages, thereby improving in the social status of the villagers. It creates employment opportunities to 340 No's directly & 200 No's indirectly. Socio-economic status of the surrounding farmers will improve.
- The easy availability of infrastructure, man power, raw materials will reduce the production cost as well as demand supply gap. The same will bring revenue to the state exchequer by way of Duties and Taxes.
- The development of green belt in and around the plant premises will improve on the aesthetics of the area. Moreover, it will help in reducing the noise levels within the plant boundary.
- The setting up of the proposed plant will help in providing employment to local people.
- There will be an increase in indirect employment and earnings of the small time shop owners like tea vendors, transporters, etc.
- The implementation of Rain Water Harvesting Scheme will help in increasing the ground water level of the area.
- The Project proponent has planned to contribute in socio-economic development of the area and will organize Blood donation camps, Education Programmes, Health camps, Health awareness programmes etc and will continue to do so.

## ES.8 Environmental management plan

**Table ES.7 EMP during operational phase of the project**

Activity	Anticipated Impacts	Environmental Management Plan
<b>1. Land</b>		
Disposal of spent wash	Soil contamination & Groundwater contamination	Spent wash generated from the distillation will be concentrated in the multiple effect evaporator and used as fuel in the incineration boiler
<b>2. Air</b>		
Boiler, Fermentation section, DG set	Gaseous emissions	<ul style="list-style-type: none"> <li>• Boiler of 40 TPH will be connected with ESP and to the chimney of 70 mt.</li> <li>• 30 mt above the ground with acoustic enclosures will be provided for DG Set (1500 KVA) and HSD (High Speed Diesel) with sulphur content of &lt;0.05% will be used for D.G.Sets.</li> <li>• Monitoring of stack emissions will be carried out monthly to ascertain the performance of the air pollution control equipments.</li> <li>• Ladder, port hole, power supply points are provided to the boiler for monitoring of emissions.</li> <li>• Water spraying will be adopted at loading and unloading points and bagasse storage yards which will reduce fugitive emissions due to movement of truck.</li> </ul>

Activity	Anticipated Impacts	Environmental Management Plan
		<ul style="list-style-type: none"> <li>• All the internal roads will be asphalted to reduce the fugitive dust due to truck movement.</li> <li>• Greenery cover will be provided. For this, the project has proposed to have greenery cover of 33% of the total site area.</li> <li>• A good housekeeping and proper maintenance will be practiced in the industry, which helps in controlling pollution.</li> <li>• Proper maintenance air pollution control equipment</li> <li>• Regular maintenance of vehicles and machinery's in order to control emissions.</li> </ul>
	Bagasse storage	<ul style="list-style-type: none"> <li>• Designing of stockpiles to reduce exposure to prevailing winds;</li> <li>• Minimising the distance that bagasse falls during movement;</li> <li>• Fully enclosing the bagasse handling conveyors, particularly transfer points;</li> <li>• Installing belt cleaning systems so that bagasse is not carried back on the underside of conveyor belts;</li> <li>• Implementing bagasse dust management plan that prescribes mitigation measures for unfavourable weather conditions;</li> <li>• Installing water spray system to reduce dust emissions around, and from, the site;</li> </ul>
Vehicular traffic	Exhaust Emissions	<ul style="list-style-type: none"> <li>• The conditions of the internal roads will be checked &amp; maintained at least once in a year.</li> <li>• Trained securities will be deployed to guide the vehicles for smooth entry/exit without causing any traffic congestion.</li> <li>• Greenery development will create aesthetic environment and also acts as a pollution sink for dust emissions.</li> </ul>
<b>3. Surface and Ground Water</b>		
Generation of spentwash, Sewage, Storm water run off	Ground water & soil pollution, flooding	<ul style="list-style-type: none"> <li>• The spent wash generation in the process will be subjected to concentration in the multiple effect evaporator and further used as fuel in the incineartion boiler along with bagasse/agrobased fuel.</li> <li>• Spentlees and condensate polishing pond of 1000 KLD will be installed.</li> <li>• Achieve Zero Discharge at distillery unit</li> <li>• Storm water drains will be provided to avoid flooding in the proposed Storm water gutters/drains will be constructed in the premises on either side of the haul roads (0.8m X 0.6m) and along the periphery.</li> <li>• Garland channels will be provided around the storage yards.</li> </ul>

Activity	Anticipated Impacts	Environmental Management Plan
		<ul style="list-style-type: none"> <li>• As per estimation rain water thus collected and harvested of about 72000 lts/annum will be used for greenery development/ sprinkling applications and non potable uses thereby conservation fresh water requirement.</li> <li>• Rainwater harvesting sump of capacity 100 KL is proposed for implementation</li> <li>• 5 recharge shafts will be provided for the purpose of ground water recharge which will be constructed along the way of internal drains.</li> </ul>
<b>4. Geology and Hydrology</b>		
Extraction of water	Depletion of water table	<ul style="list-style-type: none"> <li>• Since, there is no water extraction from the Borewell for the project, no impact anticipated.</li> <li>• However, implementation of recharge to ground water body through rainwater harvesting.</li> <li>• Conjunctive use of surface and ground water ensures rise in ground water level and improves water quality.</li> </ul>
<b>5. Noise</b>		
Manufacturing process, cogeneration unit, transportation of raw materials and finished products, D.G Set operation, Vehicular traffic,	Increase in noise levels	<ul style="list-style-type: none"> <li>• Personnel working near noisy areas will be provided with adequate personal protective equipment such as earplugs and earmuffs, use of which will be strictly enforced.</li> <li>• Sophisticated and low noise generating equipments will be selected.</li> <li>• Proper mounting of equipments and providing noise insulating enclosures or paddling where practicable.</li> <li>• The equipments will be maintained at all times to ensure permissible noise levels.</li> <li>• Appropriate advanced silencers, acoustic barriers; vibration-reducing pads will be provided for all noise generating equipments.</li> <li>• The sources of continuous noise generating equipment such as compressors, pumps etc will be designed to have noise level not exceeding 85-90 dB (A).</li> <li>• It would be ensured that there would not be any operator near the noise generating equipments on continuous basis.</li> <li>• Boundary walls and dense greenery will be erected to act as acoustic barriers.</li> <li>• Adequate and appropriate type of greenery will be developed in and around the proposed project site for noise mitigation in the area.</li> <li>• Proper maintenance of machineries especially oiling and greasing of bearing and gears etc.</li> <li>• 33 % land area around the factory is covered with greenery.</li> </ul>

Activity	Anticipated Impacts	Environmental Management Plan
		<p>It includes greenery of 6 to 10 m width around storage yards.</p> <ul style="list-style-type: none"> <li>• Trees are planted on either side of the roads with in the factory premise and with in the vicinity around the factory.</li> <li>• Trees species are selected as per guidelines of CPCB.</li> </ul>
<b>6. Solid and Hazardous Waste</b>		
Domestic garbage, solid waste from sugar industry, cogeneration unit	Improper handling will affect the land/soil and water environment	<ul style="list-style-type: none"> <li>• Yeast sludge and ash from incineration boiler will be mixed in required proportion and used as manure.</li> <li>• Used oil from DG set, spent turbine oil will be used as lubricant within the industry.</li> <li>• Domestic organic solid waste will be composted, while the inorganic solid waste will be handed over to nearby authorised recyclers.</li> </ul>
<b>7. Ecology and Biodiversity</b>		
Green belt development	Improvement of local flora and fauna	With the development of green belt inside the project, will increase the movement of birds, butterflies, etc positively. Watch & ward arrangements with proper watering during summer.
<b>8. Socio-economics</b>		
Quality of Life, Sharing of local resources	Employment generation, Improvement in quality of life, development of infrastructure facilities, increase in housing accommodation,	<ul style="list-style-type: none"> <li>• There is a great possibility of industrialization in the vicinity of the proposed sugar complex. This is likely to bring drastic changes by transforming this backward area into an industrially developed one.</li> <li>• The project has very strong positive impact, which is likely to result in the improvement of economic situation of nearby Villages</li> <li>• Overall peoples' perception on the project is a mix of advantages and disadvantages. On one hand, they expect job opportunities, market expansion etc. as advantages and on the other hand they are worried about the damage to agriculture.</li> <li>• As an impact of identification of the project, small-scale industrial economy is likely to flourish in the surrounding area. The small-scale industrial units are expected to get financial supports from the financial institutions and banks. In this way, an overall development may take place in this area.</li> <li>• The process of development will have maximum impact on the lifestyle of the local people. The project and the consequent peripheral industrial economy will generate income to the local and migrated people which will increase the aggregate demand. This demand will get realized in the market and finally, lead to the market in the locality of the project. Market expansion supported by expected</li> </ul>

Activity	Anticipated Impacts	Environmental Management Plan
		<p>infrastructural developments like roads, electricity, water supply etc. will result in improving the economic development in the entire region.</p>
Occupational Safety and Health	<p>Diminishing health of workers due to exposure to dust, noise, etc.,</p>	<ul style="list-style-type: none"> <li>• All precautionary methods will be adopted by the company to reduce the risk of exposure of employees to occupational safety and health hazards.</li> <li>• Pre &amp; post medical check-ups will be done of all the employees. Employees will be regularly examined and the medical records will be maintained for each employee. Pulmonary function test and periodical medical checkup shall be done once in every year. The following tests will be conducted for each worker as Occupational health surveillance programme: Lung Function Test, Radiology – X-ray, Pulmonary Function Test, and Audiometric Test.</li> <li>• For the safety of workers, personnel protective appliances like hand gloves, goggles, aprons, ear mufflers, nose mask etc. will be provided.</li> <li>• Proper ventilation system will be provided in the process area.</li> </ul>

**Budgetary provision:** Capital investment to be made on environmental management measures is Rs. 6.2 Crores and Rs. 42 Lakhs/ year will be reserved as recurring cost.