

# **Executive Summary**

## **New 60 KLPD Sugarcane Juice and Molasses Based Distillery**

At Mirwadi, Dahitane, Tal. Daund, Dist. Pune, Maharashtra

### **Kunjir Bioenergy India LLP.**



#### **ENVIRONMENT CONSULTANT**

##### **SMS ENVO CARE LIMITED**

QCI-NABET Accredited Organization

301, Pentagon P3, Magarpatta city, Hadapsar, Pune 411028, Maharashtra

Tel: 020-66801111, Fax: 020-66801100

Email: [nilesh.deshmukh@smsl.co.in](mailto:nilesh.deshmukh@smsl.co.in)

Website: [www.smsl.co.in](http://www.smsl.co.in), [www.smsenvocare.co.in](http://www.smsenvocare.co.in)



#### **DISTILLERY CONSULTANT**

##### **Business Brains**

Royal Prestige, E-5, 1127, E Ward,

Sykes Extension, Kolhapur 416 001, Maharashtra,

Telephone No: +91 (0) 231+2529813

E-mail: [info@ethanolindia.net](mailto:info@ethanolindia.net)

website: [www.ethanolindia.net](http://www.ethanolindia.net)

#### **Environmental Laboratory Maharashtra Enviro Power Ltd.**

MoEFCC and NABL approved Laboratory

Plot No. P-56, MIDC, Ranjangaon, Taluka- Shirur, Pune 412 220, Maharashtra

**2017**

## EXECUTIVE SUMMARY

### 1. INTRODUCTION

Kunjir Bioenergy India LLP is incorporated on 23 June 2016. Due to emerging market for fuel ethanol company is proposing 60 KLPD Sugarcane Juice and Molasses based distillery at Mirwadi, Dahitane, Tal. Daund, Dist. Pune. Distillery will be operated for 330 days. When molasses availability is fewer Distilleries will be operated on sugarcane juice and molasses both i.e. 150 days sugarcane juice + molasses both and for 180 days molasses will be used. In this case distillery will utilize 333 TPD crushed sugarcane + 144 TPD of molasses for 150 days and 252 TPD molasses for 180 days. If molasses will be available the distillery will be operated for 330 days and will utilize 252 TPD molasses.

### 2. LOCATION OF THE PROJECT

The project is located at Sr. no 47/1, 47/2, 48, 49, 50, 51, 52, 53, Mirwadi, Dahitane, Tal. Daund, Dist. Pune, Maharashtra. Site is geographically located at  $18^{\circ}33'08.44''$  N,  $74^{\circ}10' 23.43''$  E and 529 m above MSL.

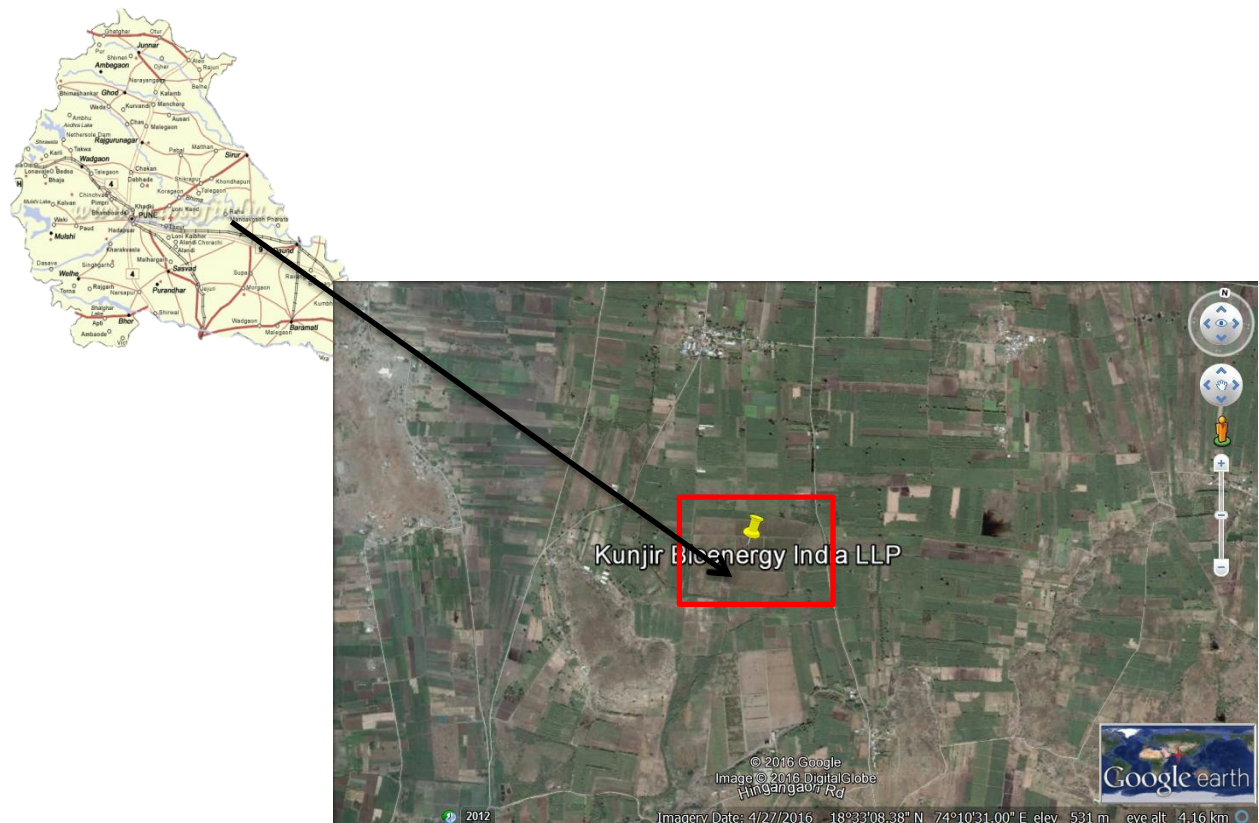


Figure 1: Proposed project location map

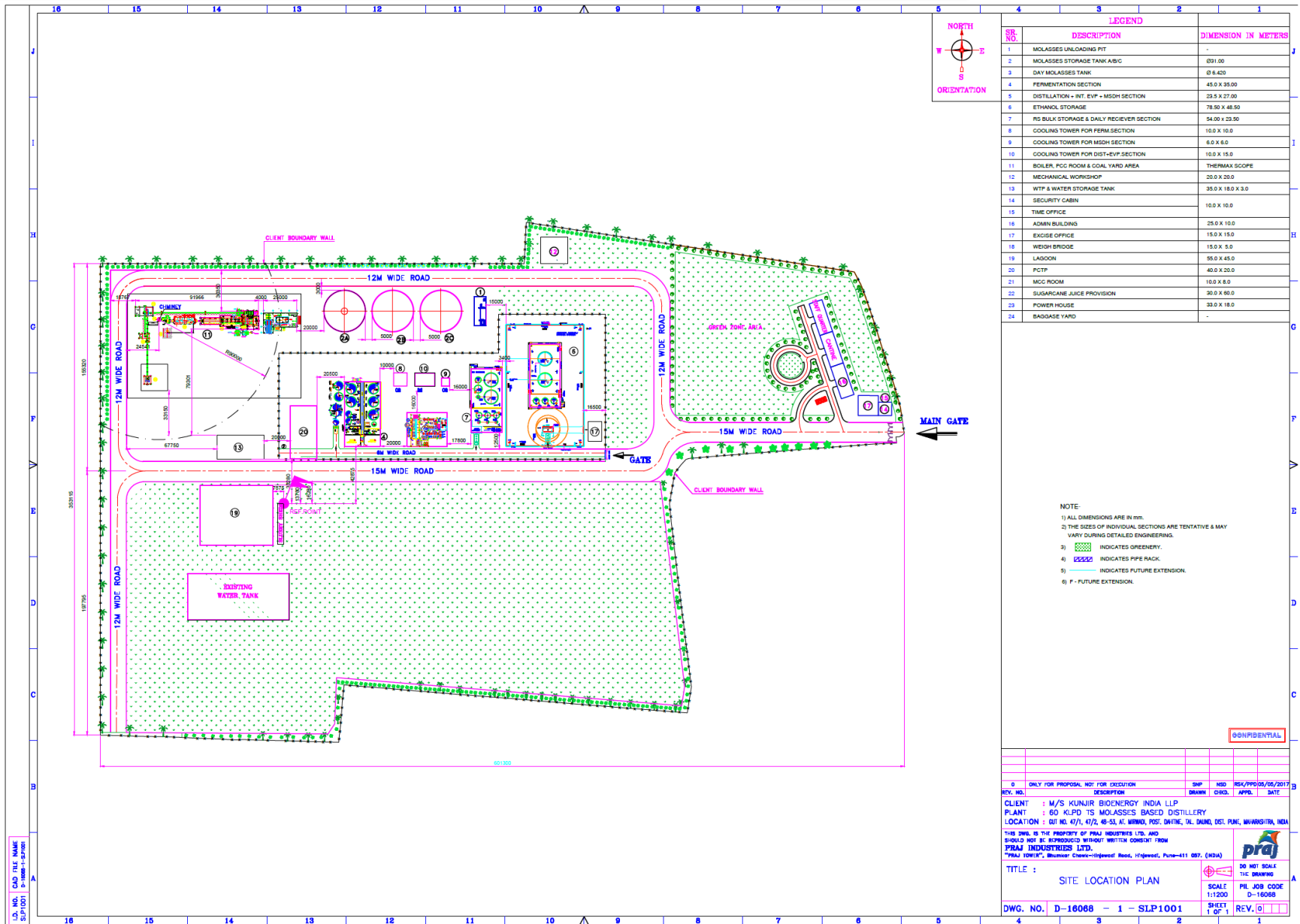


Figure 2: Plant Layout

**Table 1: Land bifurcation**

Sr. No.	Units	Area (sq. m.)
1.	Molasses Storage Tanks	Diameter 31.0
2.	Day Molasses tank	6.420
3.	Fermentation Section	45.0 X 35.0
4.	Distillation Section + In. Evaporation Section + MSDH	23.5 X 27.0
5.	Ethanol Storage	78.50 x 48.50
6.	RS. Bulk storage & daily receiver section	54.00 x 23.50
7.	Cooling tower for fermentation	10.0 X 10.0
8.	Cooling tower for MSDH section	6.0 X 6.0
9.	Cooling tower for Dist. + Int. evaporation	10.0 X 15.0
10.	Boiler, PCC Room and Coal Yard Area	90.0 X 85.0
11.	Mechanical Workshop	20.0 X 20.0
12.	WTP & Water Storage Tank	35.0 X18.0 X 3.0
13.	Time Office	10.0X 10.0
14.	Administration Office	25.0X10.0
15.	Excise Office	15.0 X 15.0
16.	Weigh Bridge	15.0 X 5.0
17.	Lagoon	55.0X 45.0
18.	PCTP	40.0 X 20.0
19.	MCC room	10.0 X 8.0
20.	Sugarcane Juice Provision	30.0 X 60.0
21.	Power House	33.0 X 18.0
22.	Total area	24666.99
	<b>Acres</b>	<b>6.09 acres</b>

### 3. PROJECT INFORMATION IN BRIEF

Brief information of the project is given in Table 2.

**Table 2: Project Information in brief**

Sr. No.	Particulate	Description
1.	Name of the proponent	Kunjir Bioenergy India LLP
2.	Project capacity	Proposed 60 KLPD Sugarcane Juice and Molasses based Distillery
3.	Location of the project	At Sr. No. 47/1, 47/2, 48, 49, 50, 51, 52, 53, Mirwadi, Dahitane, Tal. Daund, Dist. Pune, Maharashtra
4.	Geographic Location	18°33'08.44" N, 74°10' 23.43" E and 529 m above MSL
5.	Land requirement	Total plot area 45.12 acres Built-up area 6.09 acre

Sr. No.	Particulate	Description
		Green belt area 17.78 acres
6.	Product	<ul style="list-style-type: none"> <li>Rectified spirit(RS) :60 KLPD Or</li> <li>Extra Neutral Alcohol (ENA): 60 KLPD Or</li> <li>Absolute Alcohol (AA):60.00 KLPD</li> </ul>
7.	Operation days	330 for only molasses or 150 Days for molasses + sugarcane juice & 180 Days for molasses
8.	Molasses required	252 TPD
9.	Total water	1125 CMD
10.	Source of water	Mula - Mutha River
11.	Electricity	Operating 1980 kW Connected 2690 kW (from own spent wash fired boiler 22.5 TPH)
12.	Steam	18 TPH
13.	Fuel	Indian Coal : 56 TPD Concentered spent wash : 185 TPD
14.	Boiler	22.5 TPH, T.G. 2. MW
15.	DG	500 kVA X 2 Nos.
16.	Spent wash generation	Concentrated spent wash 185 TPD with 55% w/w solids
17.	Effluent treatment system	Spent wash will be concentrers in multi effect evaporator/ Integrated evaporation followed by spent wash fired boiler. Spent lees will be recycled in the process. Process condensate will be treated in Condensate Polishing unit. Cooling tower and boiler blow down water will be used for green belt.
18.	Man-power	100 skilled and unskilled
19.	Total project cost	Rs. 69.3576 cr.
20.	Total EMP cost	Rs. 11.55 cr.

### 3.1 Resource requirement

The detail raw material required for distillery operation listed below in Table 3.

**Table 3: Raw material requirement**

Sr. No.	Name of raw material	Quantity	Storage	Transportation
1.	Molasses	252 Tons	10000 MT X 3 No of tanks	Tanker
2.	Crushed sugarcane + molasses	333 Ton + 144 Ton	Cane yard	Tractors/ Bullock cart
3.	Urea	55 kg/day	In gunny bags	Trucks
4.	Antifoaming agent	190 kg/day	Plastic Carboys	Trucks/tempo
5.	Di-ammonium phosphate (DAP)	40 kg/day	Plastic Carboys	Trucks/tempo
6.	Biocide	13 Liters/day	Plastic Carboys	Trucks/tempo
7.	Sodium-Meta-Bi-Sulfite	45 kg/day	Plastic Carboys	Trucks/tempo

### 3.2 Water requirement and its quantification

For initial startup water requirement will be 1125 CMD and after recycling of 640 CMD water, daily fresh water requirement will be 485 CMD. Source of water will be from Mula- Mutha River. Water storage facility is available with the factory. Detail water breakup is given in Table 4.

**Table 4: Water and wastewater balance for distillery**

Sr. No.	Water inputs	CMD
1.	Process water for fermentation section and CO <sub>2</sub> scrubber	526
2.	Distillation	20
3.	Distillation dilution	63
4.	Water losses from vacuum pump, pump sealing, Air blower	10
5.	Soft water for cooling towers	402
6.	PHE Cleaning	3
7.	Floor washing and other miscellaneous Use	6
8.	Boiler	95
9.	Total water input	1125
<b>10.</b>	<b>Out put</b>	
11.	Spent Lees (PR & Rect.)	150
12.	Process condensate	514
13.	RO reject to Evaporation	54
14.	CT Evaporation & Drift Losses	337
15.	Water losses from vacuum pump, pump sealing, Air blower	0.2
16.	PHE Cleaning	3

17.	Waste water vacuum pump, pump sealing, Air blower	9.8
18.	Boiler blow down	11
19.	Cooling Tower blow down	65
20.	Effluent from WTP	86
21.	Other domestic usage, laboratory uses, cleaning	8
<b>22.</b>	<b>Total Water Output</b>	<b>1246</b>
<b>23.</b>		
24.	Lees recycle for cooling tower make up	150
25.	Process condensate fermentation	383
26.	Process condensate to cooling tower	77
27.	Boiler Blow down to cooling tower	10.6
28.	Air Blower Sealing water to cooling tower	4
29.	Pump sealing and CO <sub>2</sub> scrubber water to process through bearwell	6
30.	CO <sub>2</sub> scrubber beer well to process water for fermentation	1
31.	PHE Cleaning to Fermentation	3
32.	Floor washing waste water to Gardening	5
<b>33.</b>	<b>Total Recycling water per day</b>	<b>640</b>

#### 4. PROCESS DESCRIPTION

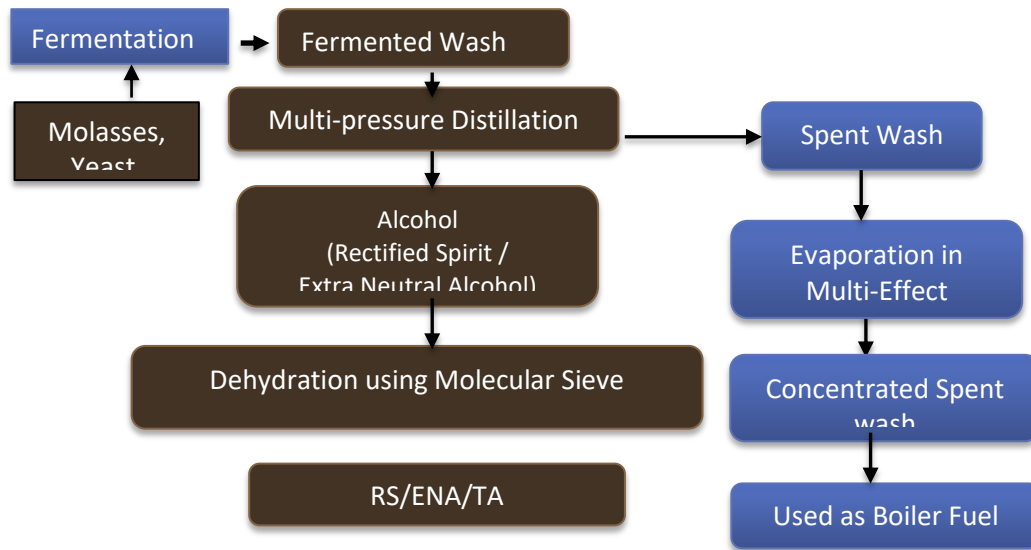


Figure 3: Process flow chart for Distillery operation

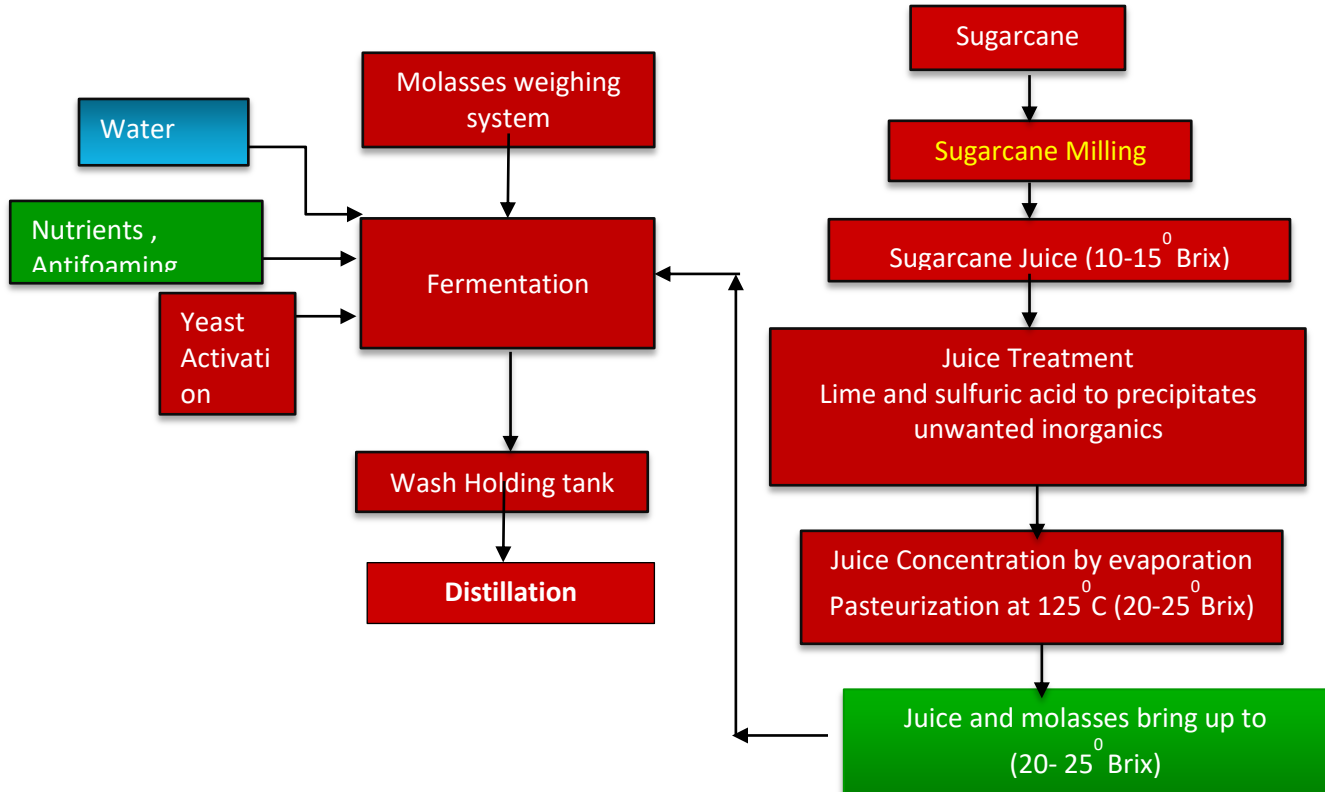


Figure 4: Process flow chart for Sugar Juice and Molasses Fermentation based Distillery operation

## 5. BASELINE ENVIRONMENTAL SETTINGS

Table 5: Environmental setting

Sr. No.	Aspects	Description
1.	Project Location	Sr. no 47/1, 47/2, 48, 49, 50, 51, 52, 53, Mirwadi, Dahitane, Tal. Daund, Dist. Pune, Maharashtra.
2.	Geographical Coordinates	18°33'08.44" N, 74°10' 23.43" E and 529 m above MSL
3.	Toposheet number	47 J/2, 47 J/3, 47 J/6, 47 J/7
4.	Nearest Town	Uruli Kanchan at 8.0 km in SW
5.	Nearest airport	Pune international airport 27 km in NW
6.	No. of Villages in 10 Km Study area	30-35 villages in 10.0 km area
7.	Bio-geographical zone	Semi Aerial
8.	Precipitation	Annual average precipitation of <b>803mm</b>
9.	Temperature	12 °C to 42 °C
10.	Humidity	36 % to 85%
11.	Wind Direction	West to East North west to south East



Sr. No.	Aspects	Description		
12.	Soil Type	Shallow to very deep black soils, red loamy soils, lateritic soils etc.		
13.	Ambient Air Quality	8 Locations	Avg. PM10	44.8 to 83.6 $\mu\text{g}/\text{m}^3$
		24 hourly samples	Avg. PM2.5	28.05 to 43.9 $\mu\text{g}/\text{m}^3$
		Twice a week for	Avg. SO <sub>2</sub>	8.2 to 33.6 $\mu\text{g}/\text{m}^3$
		3 months (in $\mu\text{g}/\text{m}^3$ )	Avg. NO <sub>x</sub>	13.5 to 35.0 $\mu\text{g}/\text{m}^3$
14.	Water Quality (Ground & Surface)	Once in season at 10 locations (Physical, chemical and biological parameters)	Colour	All parameters are within limit except MPN count and E-Coli in surface water.
			pH	
			TDS	
			COD	
			E-Coli	
15.	Noise Quality	Once in season at 9 Locations (Noise levels in dB(A))	Average Day	39.7 to 44.4
			Average Night	35.0 to 40.8
16.	Nearest Water body	Mula-Mutha River is flowing at a distance of 1.5 km in South and Bhima River 3.87 km in West direction from the project site.		
17.	Nearest Village	<ul style="list-style-type: none"> <li>The nearest habitation is village Mirwadi 1.8 km and Hingangaon 1.9 km away from the project site</li> </ul>		
18.	Nearest Railway station	Uruli Kanchan railway station: 8.0 km in South		
19.	Nearest Highway	NH-9 located at a distance of 8.0 km from the plant in South direction.		
20.	Nearest Heritage site	Baleshwar temple 12.0 km in SE Theur Ashtavinayak Chintamani Ganapati Temple at 13.6 km Ranjangaon Maha Ganapati Temple at 23 km in NE		
21.	Nearest densely populated place	Uruli Kanchan at 8.0 km in SW		
22.	Eco-sensitive area	There are no tropical forest, biosphere reserve, national park, wildlife sanctuary, coral formation, defense installations, recreational sites, holiday resorts, pilgrimage site, historically important structures, monuments, etc. within 10 km of the study area		
23.	Nearest IMD station	At Pune 34.69 km in NW (Station ID- 43063)		

## 6. Anticipated Environmental Impacts

Sr. No.	Environmental Facets	Anticipated Impacts
1.	Air Environment	Probable increase in concentration of air pollutants due to process, fugitive and utility emissions.
2.	Water Environment	Generation of industrial & domestic wastewater.
3.	Land Environment	Impacts on land due to improper disposal of hazardous/ solid waste.
4.	Ecological Environment	Positive as greenbelt of appropriate width will be developed and maintained by the company in the area. No impacts are envisaged on aquatic flora & fauna as there will be zero effluent discharge outside the plant premises.
5.	Social Environment	Overall development of the area in respect of the infrastructure development, educational growth, health facilities etc.
6.	Economic Environment	Positive impacts on economy of the region and the country as the Alcohol will be exported and revenue generation.
7.	Noise Environment	Minor increase in noise level within the project area.
8.	Occupational Health & Safety	Major health hazards are identified in worst case scenario.

## 7. Additional Studies

The following Additional Studies were done in reference to the awarded Terms of References issued by MoEFCC, New Delhi vide file noJ-11011/305/2016-IA-II(I) dated 31/01/2017.

- Public Consultation
- Risk Assessment for storage and handling of alcohol and mitigation measure due to fire and explosion and handling areas.

## 8. ENVIRONMENT MANAGEMENT PLAN

### 8.1 Air pollution Management

- Air pollution during construction phase will be due to material handling, dust emission, vehicular movement and emission from machinery. Air emissions/pollution during

operation phase will be mainly from flue gases, manufacturing process, material & Ash handling and from vehicular movement.

- Necessary preventive measures shall be taken during construction phase so that the ambient air quality will conform to National Ambient Air Quality standards.
- To avoid the generation of dust emission water sprinklers will be provided to suppress the dust.
- ESP will be provided to the proposed stack of 58 m height to control the particulate matter emission into the air as main pollution control measures. This boiler shall run on coal and concentrated spent wash.
- Water sprinkler will be provided at coal stack pit and ash disposal area to control fugitive emission.
- Work zone area including internal roads in the plant will be asphalted or concreted. Water spraying system will be installed for regular spraying of water on road and work zone to minimizing fugitive dust emission.
- Vehicular pollution shall be undertaken by use of vehicles with PUC Certificates and regular maintenance of vehicles/machineries.

### **8.2 Noise pollution management**

- Construction work will be carried out during day time only
- The workers working near Noise production machineries will be provided with ear plugs
- Construction equipment and vehicles will be maintained in good running condition
- Noise producing machinery will be placed in acoustic enclosures/acoustic rooms to reduce the noise levels
- Workers working near noisy area shall be provided with ear plugs
- Roads will be maintained in good condition to reduce the noise due to traffic
- Green Belt will be developed in and around the project site

### **8.3 Waste water management**

- Spent wash generated during the process of distillation will be treated in multiple effective evaporators to concentrate the spent wash and it will be used in boiler as a fuel.

- The condensate generated during the process of Multiple Effective Evaporators will be reused in the process consequently decreasing the net water requirement.
- Spent lees will be recycled in the process again.
- Blower blow down will be send the cooling tower make up water,
- Cooling tower blow down will be used for irrigation purpose.

#### 8.4 Land Environment /Solid hazardous waste management

- Yeast sludge mixed with spent wash and incinerated in the boiler or used as manure.
- Ash generated will be given to brick manufacturers.

**Table 7: Solid waste generation quantification**

Sr. No	Solid Waste	Quantity	Disposal
1.	Yeast sludge	9.6 TPD	Shall be used as a manure
2.	Ash	Coal ash: 22.4 TPD Spent wash ash: 24.3 TPD	Spent wash ash is potash rich ash and can be use directly use as manure. Ash will be store in the ash silos, Coal ash will be separately collected in the ash silos and sent to brick manufacturer.
3.	Domestic waste	15-20 kg/d	Local waste collection system
4.	Oil from DG	Negligible	To authorized dealer or mixed with coal and burnt in the boiler.
5.	Discarded drums and containers	Negligible	Will be sold to authorized Recyclers

#### 8.6 Odor Management

Anticipated odor generation sources will be molasses, fermentation unit, spent wash, septic tank, and Yeast storage and bio-methanation process

Following control measures shall be implemented to avoid the odor in the atmosphere:

- Better house-keeping
- Whole process is work under closed conditions, close pipeline.
- Spent wash from evaporation would be in a closed tank and directly send to the incineration in boiler.
- No bio-methanation will be adopted.

- Fermentation unit will be provided with proper cover to avoid the spread of odor and regular steaming of all fermentation equipment's; temperature will be kept under control during fermentation to avoid inactivation/killing of yeast; staling of fermented wash would also be avoided.
- Regular use of bleaching powder in the drains to avoid generation of putrefying micro-organisms.
- Yeast sludge will be dry in drying beds and used as manure.
- Steaming of major pipelines
- Proper operating condition will be maintained.
- Proper cleaning of drains.
- Well planned Greenbelt will be developed in and around the plant premises to suppress the odor.

#### **8.7 Biological Environment Management**

- Greenbelt area will be developed in & around the plant premises and shall be maintained properly.
- There is no any discharge from the project activities. No any impact on the biological environment has been found any alteration or destruction to the biological environment.
- All efforts will be put-up by the factory management to maintain the ecological balance and improve the environment in terms of ecology and green Belt development. Industry will follow the zero discharge norms. Hence no adverse impacts on surrounding ecology.

#### **8.8 Greenbelt Development**

Greenbelt will be developed as per CPCB guidelines. Kunjir Bioenergy India LLP proposes to develop a green belt in **17.78 acres** (39.41% of total land). Details of trees and shrubs to be planted as per the CPCB guideline. Local and native trees will preferably plant. Broad leaves trees will be planted around the industrial area. Avenue plantation will be done along the road sides.

#### **8.9 Occupational Health**

- All safety signs will be placed at proper location.

- First aid kits will be made available at every department
- Pre-employment Medical checkup and periodical medical checkup shall be undertaken to know the occupational health hazards at the early stage.
- Work permit system will be introduced to avoid the entry or un-authorized working to avoid the incidences which can lead to the accident if proper care is not taken
- All arrangement required for Fire hydrant system shall made at every vulnerable location to have the firefighting facility.
- Apart from above, all required Fire Extinguishers shall be provided at appropriate locations
- All staff and workers will be trained in firefighting operations and emergency preparedness plan or to tackle the accident
- Apart from all engineering control measures, if required necessary PPEs shall be provided as last protection measures to the employees.

Good housekeeping also plays important role in avoiding the undesirable incidences / accidents, hence good housekeeping practices will be employed throughout the Factory premises.

## 9. ENVIRONMENTAL MONITORING PROGRAMS

Table 8: Environmental monitoring schedule

Sr. No.	Particulate	Parameters	Number of location	Frequency
1.	Ambient air quality	PM <sub>10</sub> , PM <sub>2.5</sub> , SO <sub>2</sub> , NO <sub>x</sub> , CO, etc.	Ambient air quality at minimum 3-5 locations. 1 location within the plant premises, 1 location in upwind, 1 location in downwind direction and 1 location in cross wind direction.	Monthly
2.	Stack gas	PM, SO <sub>2</sub> and NO <sub>x</sub>	Number of stacks	Monthly
3.	Work place	PM <sub>2.5</sub> , SO <sub>2</sub> , NO <sub>x</sub> , CO, O <sub>3</sub>	Process emission in workplace area/plants (for each area/plant minimum 2 locations and 1 location	Monthly

Sr. No.	Particulate	Parameters	Number of location	Frequency
			outside plant area near vent)	
4.	Waste water	pH, EC, SS, TDS, O&G, Ammonical Nitrogen, COD, BOD, Chloride, Sulphides etc.	Wastewater from all sources. Inlet & outlet of ETP, Condensate treatment plant	Monthly
5.	Surface water and ground water	pH, Salinity, Conductivity, TDS, Turbidity, DO, BOD, Phosphate, Nitrates, Sulphates, Chlorides, Total Coliforms (TC) & <i>E.Coli</i>	3-5 location Ground as well as Surface water	Half yearly
6.	Solid waste	Ash	<ul style="list-style-type: none"> <li>• Process dust generated sludge and ash.</li> <li>• Before used as manure if used manure</li> </ul>	Monthly
7.	Noise	Equivalent noise level - dB (A) at min. Noise Levels measurement at high noise generating places as well as sensitive receptors in the vicinity	5 location At all source and outside the Plant area.	Monthly
8.	Green belt	Number of plantation (units), number of survived plants/ trees, number of poor plant/ trees.	In and around the plant site	Monthly
9.	Soil	Texture, pH, electrical conductivity, cation exchange capacity, alkali metals, Sodium Absorption Ratio (SAR), permeability, porosity.	2-3 near Solid/ hazardous waste storage. At least five locations from Greenbelt and area where manure of biological waste is applied. Near spent wash storage lagoon	Quarterly
10.	Occupational health	Health and fitness checkup of employees getting exposed to	All worker	Yearly/ twice a year

Sr. No.	Particulate	Parameters	Number of location	Frequency
		various hazards and all other staff		

## 10. ENVIRONMENT MANAGEMENT COST

Table 9: Environment Management Cost

Sr. No	Description	Capital Cost (Rs. in lakhs)	Recurring Cost (Rs. in lakhs)
1.	Air Pollution Control	700	10
2.	Water Pollution Control	250	5
3.	Solid waste Management	-	7
4.	Environmental Monitoring and Management	40	3
5.	Rainwater Harvesting	60	15
6.	Occupational Health	25	4.8
7.	Green belt development	40	9
	<b>Total</b>	<b>1115</b>	<b>53.8</b>

## 11. PROJECT BENEFITS

- The industry will be established in the rural region of the state.
- The industry will provide skilled, semi-skilled, unskilled people, direct and indirect employment to more than 70-100 local rural persons.
- It can be stated that by this activity employment potential is certainly increasing in all walks of life – skilled, semi-skilled and unskilled.
- The importance and utility of alcohol is well known as an industrial raw material for manufacture of a variety of organic chemicals including pharmaceuticals, cosmetics, polymers etc.
- Alcohol is a potential fuel when blended with petrol. In the presence of ethanol, petrol burns with more efficiency and low toxic smoke.
- Alcohol is an eco-friendly product and is a substitute to the imported petroleum.
- As sugar cane cultivation is enhances in the country, the production of molasses from the sugar industry has greatly increased.



## 12. CONCLUSION

- Proposed project does not attract rehabilitation and resettlement of people, since the proposed site is in existing sugar factory premises.
- Proposed project does not anticipate any adverse impacts on environment.
- Production process is environmentally safe as ZLD is proposed with efficient mitigation measures implemented.
- Air emissions through stack will be controlled by ESP.
- Loss of vegetation and habitat will not be attributed.
- Workplace/ operation hazards, which will be minimized by providing personal protective equipment's, safety precautions, emergency plan & disaster management plan. Consequently, impacts on air, water, land and ecological environments are insignificant and the socio-economic benefits are predominantly positive.

Thus, overall project features, process, potential of pollution, pollution prevention measures and environmental management plan proposed by proponent illustrates that proposed project will not have any considerable impacts on environment as well as on socio-economic & ecological conditions of the project area. Therefore, proposed project is environmentally safe.