

# **PREFEASIBILITY REPORT**

*Prepared for*

**M/s. Alagawadi Bireshwar Sugars Private Limited**

*For*

**Expansion of Sugarcane Crushing Unit from 4500 TCD to 12000 TCD, Co-generation Unit from 14 MW to 39.6 MW and Establishment of 180 KLD Multi feed (Grain/ Cane Juice/ BH-Molasses & C-Molasses) based Distillery Unit**

*At*

Sy. No. 98/1, 98/2, 100/3, 100/4, 101/1B, 101/2, 101/1A, 101/3A, 101/3B, 102/3F, 102/3E, 102/3D, 102/3K, 102/3B, 102/3A, 103/15, 103/14, 103/13, 103/12, 103/11, 103/10, 103/9, 103/8, 103/7, 103/6, 103/5, 103/4, 103/3, 103/2, 103/1, 104/2, 104/3, 104/4A, 104/4B, 104/1B, 104/1A, 105/1A, 105/1B, 106/1A, 106/1B, 106/1K, 107/3, 107/4, 107/5, 107/6, 107/7, 107/8, 107/9, 107/10, 108/3, 108/2, 183/1, 184/1, 184/2, 185/1 of Alagawadi Village, Raibag Taluk, Belgaum District, Karnataka State

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**NABET/EIA/2124/RA 0241**

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## CHAPTER 1- Executive Summary

### 1.0 Executive Summary

M/s. Alagawadi Bireshwar Sugars Private Limited proposed for Expansion of Sugarcane Crushing Unit from 4500 TCD to 12000 TCD, Co-generation Unit from 14 MW to 39.6 MW and Establishment of 180 KLD Multi feed (Grain/ Cane Juice/ BH - Molasses & C Molasses) based Distillery Unit at Sy. No. 98/1, 98/2, 100/3, 100/4, 101/1B, 101/2, 101/1A, 101/3A, 101/3B, 102/3F, 102/3E, 102/3D, 102/3K, 102/3B, 102/3A, 103/15, 103/14, 103/13, 103/12, 103/11, 103/10, 103/9, 103/8, 103/7, 103/6, 103/5, 103/4, 103/3, 103/2, 103/1, 104/2, 104/3, 104/4A, 104/4B, 104/1B, 104/1A, 105/1A, 105/1B, 106/1A, 106/1B, 106/1K, 107/3, 107/4, 107/5, 107/6, 107/7, 107/8, 107/9, 107/10, 108/3, 108/2, 183/1, 184/1, 184/2, 185/1 of Alagawadi Village, Raibag Taluk, Belagavi District.

Sl. No	Items	Particulars
1.	Name of the Project	Expansion of Sugarcane Crushing Unit from 4500 TCD to 12000 TCD, Co-generation Unit from 14 MW to 39.60 MW and Establishment of 180 KLD Multi feed (Grain/ Cane Juice/ BH - Molasses & C Molasses) based Distillery Unit by M/s. Alagawadi Bireshwar Sugars Private Limited
2.	Objective of the Project	Expansion of Sugarcane Crushing Unit from 4500 TCD to 12000 TCD, Co-generation Unit from 14 MW to 39.60 MW and Establishment of 180 KLD Multi feed (Grain/ Cane Juice/ BH - Molasses & C Molasses) based Distillery Unit
3.	Promoters	Mr. Gurunath N Joshi, Director M/s. Alagawadi Bireshwar Sugars Private Limited
4.	Total Investment, Rs.	651.58 Crore (Existing 232.57 Crore + Proposed 419.01 Crore).
5.	Project Location	Sy. No. 98/1, 98/2, 100/3, 100/4, 101/1B, 101/2, 101/1A, 101/3A, 101/3B, 102/3F, 102/3E, 102/3D, 102/3K, 102/3B, 102/3A, 103/15, 103/14, 103/13, 103/12, 103/11, 103/10, 103/9, 103/8, 103/7, 103/6, 103/5, 103/4, 103/3, 103/2, 103/1, 104/2, 104/3, 104/4A, 104/4B, 104/1B, 104/1A, 105/1A,

		105/1B, 106/1A, 106/1B, 106/1K, 107/3, 107/4, 107/5, 107/6, 107/7, 107/8, 107/9, 107/10, 108/3, 108/2, 183/1, 184/1, 184/2, 185/1 of Alagawadi Village, Raibag Taluk, Belagavi District.
6.	Category of the Project	Category A- 5 (j) , 5(g) & 1(d)
7.	Extend of Land	The total land is 189 Acres 05 Guntas out of which 87 Acres 37 Guntas is already converted to industrial purpose. The process of Industrial conversion for remaining 101 Acres 08 Guntas is under process.
8.	Man Power	During Construction: 300 Nos. During Operation: 425 Nos.
9.	Water Demand and Source	We had applied for permission to draw 4000 KLD water from River Krishna the same shall be applicable for proposed project also. Request letter submitted to Krishna Bhagya Jal Nigam Ltd., (KBJNL) on 10.03.2021 for supply of 4000 KLD of water. It is under progress. Water Availability: <ul style="list-style-type: none"> <li>• From River Krishna : 720000 KL @ 180 days (From June to November)</li> <li>• Condensate water from Sugar Plant: 405000 KL</li> </ul> Total Quantity of Water Available : 1125000 KL Water Requirement: <ul style="list-style-type: none"> <li>• For Sugar &amp; Co-Gen unit: 256250 KL</li> <li>• For Distillery unit : 356400 KL</li> </ul> For Domestic use : 36500 KL Total Quantity required : 649150 KL Total 2330 KLD of Fresh water is required during Season, out of which 1250 KLD for Sugar & Co-Gen Unit and 1080 KLD @ 6 KL/KL of Alcohol.
10.	Power Supply	Total Power required: During Construction Phase - 500 kW/h Power requirement will be met from existing D.G. Set of Capacity 1500 KVA. During Operation Phase: For Co-Gen Unit - 4.0 MW/Hr For Sugar Plant - 12.0 MW/Hr For Distillery Unit - 3.5 MW/Hr Power requirement will be met from 39.60 MW Co-generation Unit & for backup

		power D.G. Set of Capacity 1500 KVA will be used and the excess power of 20.1 MW will be sold out to power grids.
11.	Latitude & Longitude	16°30'21.07"N and 74°53'51.56"E
12.	No. of working days	Sugar - 135 days Distillery & Co-gen - 330 days

## CHAPTER 2 - Introduction of the Project/Background Information

### 2.1 Identification of Project and Project Proponent

M/s. Alagawadi Bireshwar Sugars Pvt. Ltd. proposed for Expansion of Sugarcane Crushing Unit from 4500 TCD to 12000 TCD, Co-generation Unit from 14 MW to 39.60 MW and Establishment of 180 KLD Multi feed (Grain/ Cane Juice/ BH - Molasses & C Molasses) based Distillery Unit located at Sy. No. 98/1, 98/2, 100/3, 100/4, 101/1B, 101/2, 101/1A, 101/3A, 101/3B, 102/3F, 102/3E, 102/3D, 102/3K, 102/3B, 102/3A, 103/15, 103/14, 103/13, 103/12, 103/11, 103/10, 103/9, 103/8, 103/7, 103/6, 103/5, 103/4, 103/3, 103/2, 103/1, 104/2, 104/3, 104/4A, 104/4B, 104/1B, 104/1A, 105/1A, 105/1B, 106/1A, 106/1B, 106/1K, 107/3, 107/4, 107/5, 107/6, 107/7, 107/8, 107/9, 107/10, 108/3, 108/2, 183/1, 184/1, 184/2, 185/1 of Alagawadi Village, Raibag Taluk, Belagavi District.

The total land is 189 Acres 05 Guntas out of which 87 Acres 37 Guntas is already converted to industrial purpose. The process of Industrial conversion for remaining 101 Acres 08 Guntas is under process. Total capital investment of the proposed project is Rs. 419.01 Crores. The nearest village to the project site is Alagawadi village located at a distance of 2.09 Km from the project site.

#### Promoters:

The proposed Multi feed Distillery unit will be undertaken & implemented by the management of M/s. Alagawadi Bireshwar Sugars Pvt. Ltd. The management has made a detailed study of the entire project, planning and implementation of the project.

Table 2.1: Promoters with their Designation

Sl. No	Name	Designation
1.	Sri S S Mallikarjun	CMD
2.	Mrs. Prabha Mallikarjun	Director
3.	Mr. Gurunath Joshi	Director
4.	Mr. G A Prakash	Director
5.	Mr. K Saravana	Director

### 2.2 Brief Description of the Nature of the Project

M/s. Alagawadi Bireshwar Sugars Pvt. Ltd., (ABSPL) was incorporated in the year of 27.04.2006 and obtained Consent for Establishment (CFE) from Karnataka State Pollution Control Board (KSPCB) vide letter No. 326909, dated: 21/09/2021 for Sugarcane crushing unit of capacity 4500 TCD and Power generation of capacity 14 MW at Alagawadi Village, Raibag Taluk, Belgaum District, Karnataka. The Sugar Plant and the Co-gen unit for which CFE is obtained, the construction work is under process and it will be implemented by 2022.

Now, the management has decided to go for Expansion of Sugarcane Crushing Unit from 4500 TCD to 12000 TCD, Co-generation Unit from 14 MW to 39.6 MW and Establishment of 180 KLD Multi feed (Grain/ Cane Juice/ BH - Molasses & C Molasses) based Distillery Unit located at Sy. No. 98/1, 98/2, 100/3, 100/4, 101/1B, 101/2, 101/1A, 101/3A, 101/3B, 102/3F, 102/3E, 102/3D, 102/3K, 102/3B, 102/3A, 103/15, 103/14, 103/13, 103/12, 103/11, 103/10, 103/9, 103/8, 103/7, 103/6, 103/5,

103/4, 103/3, 103/2, 103/1, 104/2, 104/3, 104/4A, 104/4B, 104/1B, 104/1A, 105/1A, 105/1B, 106/1A, 106/1B, 106/1K, 107/3, 107/4, 107/5, 107/6, 107/7, 107/8, 107/9, 107/10, 108/3, 108/2, 183/1, 184/1, 184/2, 185/1 of Alagawadi Village, Raibag Taluk, Belagavi District. The total land is 189 Acres 05 Guntas out of which 87 Acre 37 Guntas is already converted to industrial purpose. The process of Industrial conversion for remaining 101 Acre 08 Guntas is under progress .The total land area including existing and proposed expansion is 189 Acres 05 Guntas. Sugarcane and Grains required for the project is sourced from surrounding allotted villages and the Cane Juice, B- Heavy Molasses and C-Molasses from Sugar industry will be the major source of raw material for production of Ethanol.

### **2.3 Need for the project and its importance to the country and/or region**

The demand for expanding sugar unit from 4500 TCD to 12000 TCD and co-generation unit from 14 MW to 39.60 MW in Alagawadi Village, Raibag Taluk and Belagavi District has been receiving encouraging support among the farming community due to the following reasons.

- Increase in area under sugar cultivation.
- Supply of Sugar cane from nearby villages.
- The viability of the sugar factory is improved due to cogeneration, which is also a need of the State to have more power to meet the growing power demand in the State.

The establishment of Multi feed distillery will be within the existing premises of sugar and co-gen unit. Required material will be procured from existing sugar unit. The promoter anticipating the positive impact of the project on the society which will provide employment to local population, improve the economy and profitability of the project thus promoters decided to establish the multi feed distillery unit.

### **2.4 Demand Supply Gap**

The existing Sugar factories could not crush all available cane from the areas of operation and hence, rest of the sugarcane is being taken to the sugar factories in neighbouring taluks of Raibag. Presently, the cane grown by farmers are diverting to the sugar factories located in neighbouring taluks, in this connection farmers are suffering like delay in disposal, less price, less payment etc., Thus, the farmers are facing problems of disposal of sugarcane in 3-4 seasons. This situation has demanded to need Sugar units at this area.

The demand for electrical power has been increasing at a faster pace after the country's economic development pace speeded up, especially in Karnataka which has been the hub of software services. The effective generation of power has not been meeting the demand and the same trend is expected to continue, especially during the peak hours and summer seasons. Hence, there is good scope for exporting power to the third parties using the state grid through power traders / purchasers.

Presently the demand for the production of alcohol has increased. The production in India has tremendously increased in the subsequent years which in turn improving the economy of the country and providing employment to many people.

### **2.5 Imports vs. Indigenous production**

Not Applicable

### **2.6 Export possibility and Domestic/Export markets**

The product will be utilized for domestic use.

### **2.7 Employment Generation (Direct & Indirect) due to the project**

The plant will be designed with necessary control instrumentation and will be on continuous automatic operation.

The personnel required for all the operation are mentioned below. The man power required for the industry is 425 Numbers which include permanent and contract basis employees.

Skilled	200
Semiskilled	125
Unskilled	100

## CHAPTER 3 - Project Description

### 3.1 Type of Project

Proposed Expansion of Sugarcane Crushing Unit from 4500 TCD to 12000 TCD, Co-generation Unit from 14 MW to 39.6 MW and Establishment of 180 KLD Multi feed (Grain/ Cane Juice/ Molasses) based Distillery Unit at Sy. No. 98/1, 98/2, 100/3, 100/4, 101/1B, 101/2, 101/1A, 101/3A, 101/3B, 102/3F, 102/3E, 102/3D, 102/3K, 102/3B, 102/3A, 103/15, 103/14, 103/13, 103/12, 103/11, 103/10, 103/9, 103/8, 103/7, 103/6, 103/5, 103/4, 103/3, 103/2, 103/1, 104/2, 104/3, 104/4A, 104/4B, 104/1B, 104/1A, 105/1A, 105/1B, 106/1A, 106/1B, 106/1K, 107/3, 107/4, 107/5, 107/6, 107/7, 107/8, 107/9, 107/10, 108/3, 108/2, 183/1, 184/1, 184/2, 185/1 of Alagawadi Village, Raibag Taluk, Belgaum District, Karnataka State. The total land area including existing and proposed expansion is 189 Acres 05 Guntas of Alagawadi Village, Raibag Taluk, Belagavi District. Sugar Cane required for the project is sourced from surrounding allotted villages and the Cane Juice, B- Heavy Molasses and C-Molasses from Sugar industry will be the major source of raw material for production of Ethanol.

Following is plant configuration and production capacity:

Sl. No.	Particulars	Quantity	Existing	Expansion/ Establishment	Total
<b>Products</b>					
1.	Sugar Cane Crushing	TCD	4500	7500	12000
2.	Rectified Spirit/Ethanol/ Extra Neutral Alcohol(ENA)	KLD	-	180	180
3.	Power	MW	14.00	25.6	39.60
<b>By- Products</b>					
1.	Spent wash powder or Potash derived from molasses	TPD	-	201	201
2.	DDGS (Dried Distillers Grains Soluble)	TPD	-	144	144
3.	Bagasse	MT/day	1350	2094	3444

### 3.2 Location of Project

Table 3.1: Location Details

Sl.No	Particulars	Details
1.	Name of the industry	M/s Alagawadi Bireshwar Sugars Private Limited
2.	Location	Sy. No. 98/1, 98/2, 100/3, 100/4, 101/1B, 101/2, 101/1A, 101/3A, 101/3B, 102/3F, 102/3E, 102/3D, 102/3K, 102/3B, 102/3A, 103/15, 103/14, 103/13, 103/12, 103/11, 103/10, 103/9, 103/8, 103/7, 103/6, 103/5, 103/4, 103/3, 103/2, 103/1,

		104/2, 104/3, 104/4A, 104/4B, 104/1B, 104/1A, 105/1A, 105/1B, 106/1A, 106/1B, 106/1K, 107/3, 107/4, 107/5, 107/6, 107/7, 107/8, 107/9, 107/10, 108/3, 108/2, 183/1, 184/1, 184/2, 185/1 of Alagawadi Village, Raibag Taluk, Belgaum District, Karnataka State
3.	Latitude & Longitude	16° 30' 16.38" N & 74° 53' 53.93" E
4.	Total Land, Acre	The total land is 189 Acres 05 Guntas out of which 87 Acre 37 Guntas is already converted to industrial purpose. The process of Industrial conversion for remaining 101 Acre 08 Guntas is under progress
5.	Nearest Town	Raibag - 12.55 Km, W
6.	Nearest Village	Alagawadi Village-2.09 Km, SW
7.	Nearest Highway	State Highway-31 (Gokak - Athani Road) Located at a distance of about 4.17 Km from the proposed project site in South East direction.
8.	Nearest Water Body	<ul style="list-style-type: none"> <li>• Harugeri Kere- 5.0 Km, NE.</li> <li>• Krishna River- Located at a distance of about 12.80 Km from the project site in the Northeast direction.</li> <li>• Kempanjali Kere- 12.53 Km, SW.</li> </ul>
9.	Nearest Industries	<ol style="list-style-type: none"> <li>1. Shri Bramhanand Jaggery industries- Adjacent to Project Site, S.</li> <li>2. Askins Biofuels Pvt. Ltd - Adjacent to Project Site, S.</li> <li>3. Soveriegn Industries Ltd. -15.16 Km, NE</li> <li>4. Shivshakti Sugars Limited Yadrav- 17.89 Km, NW.</li> <li>5. Ugar Sugar Factory-17.50 Km, NW.</li> </ol>
10.	Interstate Boundary	Nil
11.	Nearest Reserve Forest	<ul style="list-style-type: none"> <li>• Shahu Park RF- 8.6 Km, SW</li> <li>• Rajaram RF-10.7 Km, SW</li> </ul>

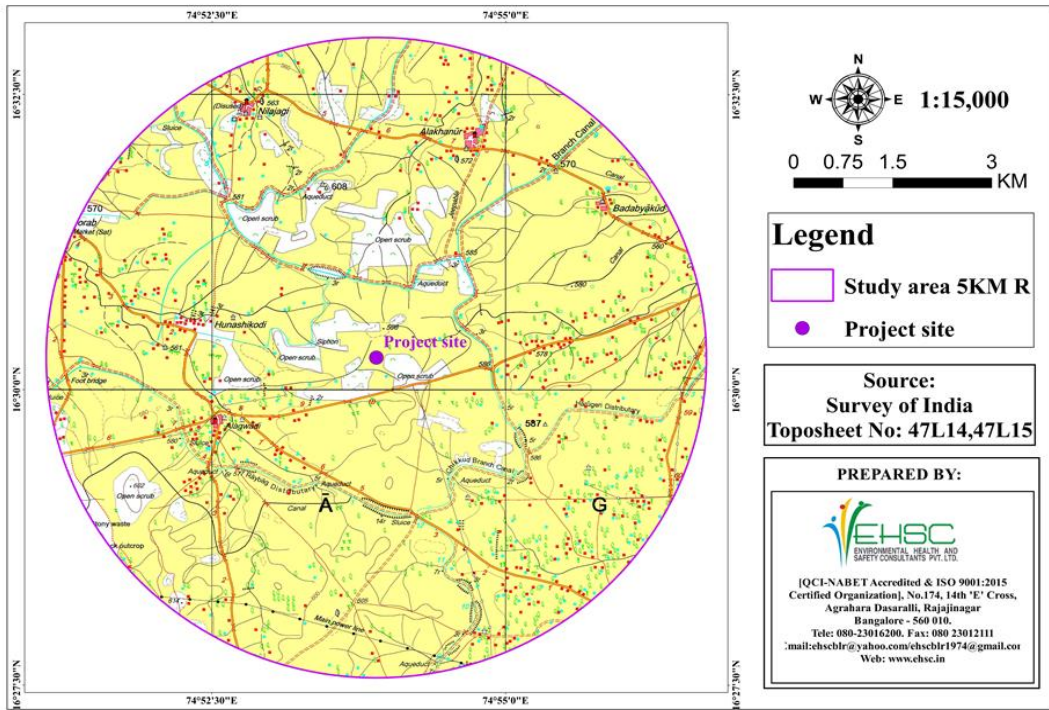


Fig 3.1 Topo sheet showing the location of proposed project site within 5 Km radius (Topo sheet No: 47L14 & 47L15)

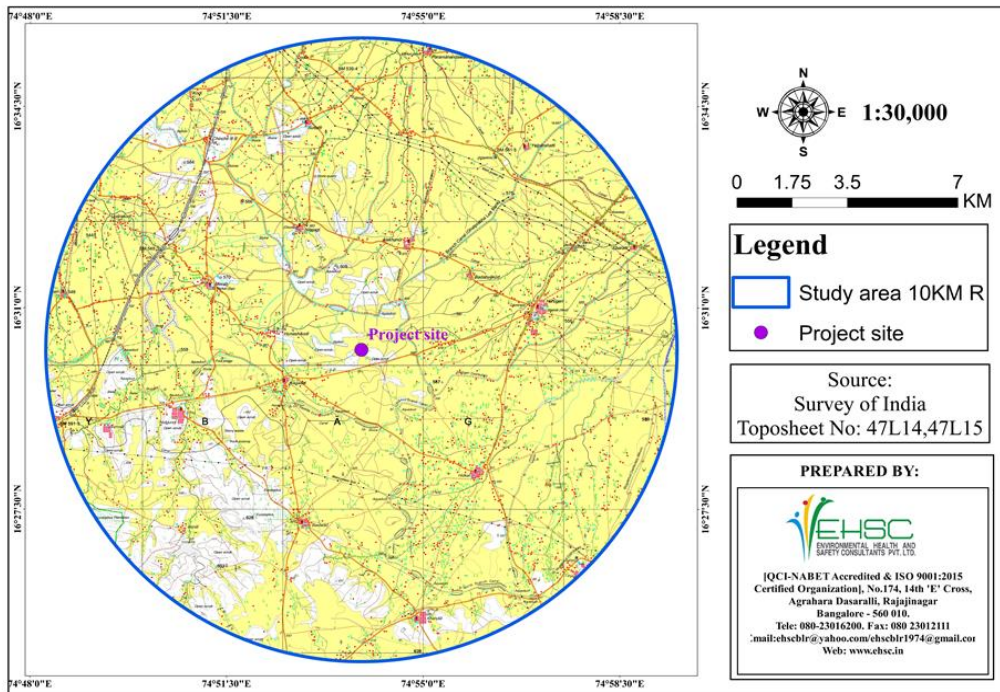


Fig 3.2 Topo sheet showing the location of proposed project site within 10 Km radius (Topo sheet No: 47L14 & 47L15)



Fig 3.3 Google image of the project with 10 kms radius demarcation around the project site



Fig 3.4 Proposed Site Photographs



Fig 3.5 Proposed Site Surrounding Photographs

**3.3 Details of alternative sites, considered and the basis of selecting the proposed site particularly the environmental considerations gone onto should be highlighted.**

Not Applicable. Since proposed project is coming up on existing premises of M/s. Alagawadi Bireshwar Sugars Pvt. Ltd.

### **3.4 Size & Magnitude of Operation**

The project proponent proposes for Expansion of Sugarcane Crushing Unit from 4500 TCD to 12000 TCD, Co-generation Unit from 14 MW to 39.60 MW and Establishment of 180 KLD Multi feed (Grain/ Cane Juice/ BH - Molasses and C Molasses) based Distillery Unit.

### **3.5 Manufacturing Process**

#### **3.5.1 Sugar manufacturing process**

##### **➤ Extraction of Cane Juice from Cane**

The cane which brought from fields by Lorries and tractors, weighed and unloaded in the cane carrier for extraction of juice from Sugarcane. The unloaded cane will pass through preparatory devises (Chopper, leveler and fiberize). The preparatory devises will cut the cane stalks into pieces. The prepared cane enters mills, consists of multiple units of three roller combination through which the prepared cane. To aid in the extraction of juice spraying thin juice from previous mills and water before last mill, directed on the blanket of Bagasse as it emerges from each mill help to leach out the sugar. In the best mill 95% of the sugar will goes to the juice.

### ➤ Uses of Bagasse

The residue that leaves the last mill is called Bagasse contains un-extracted sugar, woody fibre and water. This material goes to boilers as fuel to produce steam. The generated steam will be used in turbines for power generation. The out let of the turbine, i.e. low pressure steam will be used for mill juice processing. The condensed water will be sent back to boiler for steam generation. The excess Bagasse can be utilized for paper, particle board, power generation during off crushing season and also cattle feed.

### ➤ Purification of Cane Juice - Clarification

The extracted juice from mills is strained to remove Bagasse particles before sending for process. This juice will sent through a mass flow meter and the quantity automatically recorded. The dark green juice from mills is acidic and turbid. The universal process employed to remove both soluble and insoluble impurities is called Sulphitation process. The Juice will be heated up to 70 to 75 degree centigrade to avoid inversion. In our plant as a measure of steam economy primary heating is being done by plate type heat exchanger using heat energy available from the condensates of evaporators and pans.

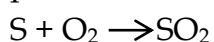
### ➤ Liming and sulphitation

This is a process of adding milk of lime (Ca [OH]<sub>2</sub>) to the juice will be done simultaneously in juice sulphiter, thereby increasing the final pH of juice to 6.9 to 7.2.

$$\text{CaO} + \text{H}_2\text{O} \rightarrow \text{Ca}(\text{OH})_2 + \text{colour}$$

The aim of this neutralization is to remove colorants from the juice, neutralize organic acids and the formation of tri-calcium phosphate and sulfate, which are products that, on sedimentation, carry with them impurities present in the liquid. Lime consumption (CaO) ranges from 0.18 to 0.25% on cane according to the treatment strength required.

The absorption of the SO<sub>2</sub> gas (sulfur dioxide) by the juice takes place in juice sulphitor. The SO<sub>2</sub> gas is produced in the factory by burning S (sulfur) in the presence of air, in special furnaces, causing the reaction:



The main objectives of Sulphitation are:

- Inhibiting reactions causing colour formation;
- Coagulation of soluble colloids;
- Formation of CaSO<sub>3</sub> (calcium sulfate) precipitation;

Decreasing the viscosity of the juice and consequently of the syrup, to reduce viscosity and remove the coloring matters present in the juice. This ultimately facilitates better evaporation and crystal development.

Average consumption of sulfur can be estimated at between 0.05% to 0.06% on Cane. The sulphited juice is heated to approximately 101 to 103°C to accelerate and facilitate the coagulation and flocculation of colloids and non-sugar proteins, emulsify fats and waxes, or in other words accelerate the chemical process, increasing decanting efficiency, and also enabling removal of gas from the juice. The

juice purification by removing the flocculated impurities from the previous treatments. This process is carried out continuously in equipment called a clarifier. The Clarified juice is removed from the upper part of SRTC and sent to the evaporation section for concentration. The mud will be withdrawn from the bottom of the SRTC and sent to rotary vacuum filter. In rotary vacuum filters, juice and filter cake will be separated by vacuum. The cake that is discharged is applied to fields as fertilizer and in some countries cane wax is extracted from this cake.

#### ➤ **Evaporation**

The clarified juice obtained in the Clarifiers constitutes 75% water. The first stage of concentration is carried out in equipment called the evaporator, which operates continuously. The evaporator consists of five bodies, connected in series so that the juice undergoes progressive concentration from the first effect to the last effect to evaporate 75% of water which is present in the juice we require steam. Hence exhaust steam from turbines at a pressure of 1.5 Kg/cm<sup>2</sup> at 133 degree cent. Will be fed to the I effect of evaporator. Subsequently due to the evaporation of the water in the first effect will yield the same amount of vapour which will fed to the succeeding bodies. Due to the difference in the pressure and the vacuum in the bodies the evaporation of juice will takes place in all the evaporators. Initially clarified juice will have a brix of 14-16° , reaching 55 - 65° Brix from the out let of the V body. This syrup is passed through a tower consists of absorption of the SO<sub>2</sub> (sulfur dioxide) by the syrup, lowering its original pH from 6.4 - 6.8 to 4.6 - 5.2. The water vapour generated from 1<sup>st</sup> evaporator will be used in subsequent bodies and the generated condensate will be utilized for cane juice extraction at mills, muddy juice filtration at vacuum filters, Milk of lime preparation, pan washing and centrifugal. The excess condensate will be cooled and used for plant utilities and on land irrigation.

#### ➤ **Crystallization**

Crystallization takes place in single effect vacuum pan, the syrup obtained from the evaporator will be boiled until saturated with sugar. At this point 'seed grain' is added to serve as nuclei for the sugar crystals and more syrup is added as the water evaporates. Continuing the above process the pans are filled up till the desire size crystals are built up and dropped in mixers called crystallizers. The sugar and syrup forms a dense mass known as massecuite.

Separation of Sugar and Liquid by Centrifugal Force

From the crystallizers, the massecuite will be cured in the centrifugal machines. In centrifugal the sugar and molasses will be separated.

In centrifugal there are two types of machines

- Continuous centrifugal Machines
- Batch type centrifugal machine.

The continuous centrifugal machines will be used for low grade massecuites like B and C Masscults. The separated molasses will be taken back to the process for extracting the dissolved sugar which is present in molasses. The separated sugar having low purity is made as a magma in magma minglers and it will be melted in

the sugar melter and will be taken back to the A massecuite boiling. High grade massecuite i.e., A-Massecuite will be cured in the Batch type centrifugals. The sugar discharged from the batch centrifuges has a high moisture level with temperature of around 60 to 65 degree centigrade.

➤ **Re-boiling of Liquid**

The aim of sugar boiling is to recover more sugar and send less purity of Molasses (Final Molasses) as by-product.

**'A' Massecuite**

From syrup and second grade sugar used as 'seed' nuclei and high purity washings from high grade sugar (AL Molasses) high grade or 'A' Massecuite is boiled. From this 'A' massecuite we get white sugar, 'A' Heavy molasses and AL molasses. This AL light molasses will be sent back for 'A' Massecuite boiling. The AH molasses is being sent for 'B' Massecuite boiling.

**'B' Massecuite**

The AH Molasses is taken in to batch pan and boil till the super saturation stage. At this point 'seed slurry' is added to serve as nuclei for the sugar crystals. Continuing the boiling by feeding AH till the crystals size reaches to 160 to 180 Microns. The grain will be transferred to vacuum crystallisers, further boiling takes place in continuous vacuum pans. The continuous pan out let massecuite size will be 250 to 300 microns. The 'B' grade massecuite separation we will get B seed and B heavy molasses. The part of B seed will be sent for A graining and balance for melting. B heavy molasses sent for 'C' Boiling.

**'C' Massecuite or Low Grade Massecuite**

As this is the important massecuite from which mother liquor goes out as Final Molasses must be of low purity. Hence, more number of small crystals must be present to have larger area to deposit or de-sugar the mother liquor. Here the crystals are smallest to achieve our aim.

Graining is done using 'C' light and AH molasses in batch pan and boiled till the super saturation stage. At this point seed slurry of 3 to 4 microns is added to serve as nuclei for the sugar crystals. Continuing the boiling by feeding C light and BH molasses till the crystals size reaches to 70 to 90 microns. The grain will be transferred to C vacuum crystallizer. Further boiling takes place in continuous pans by feeding BH molasses. The crystals size of pan out let is 150 to 180 microns. The massecuite dropped to Mono Vertical crystallizer for cooling. During cooling of the massecuite the temperature brings down to 42 to 43 Degree Centigrade to achieve maximum sugar recovery. The cooled massecuite fed to continuous centrifugals for separation. The separated mother liquor termed Final Molasses will sent to distillery industry. The sugar separated from first curing is mixed with water and sent for second curing. During second curing we will get C seed and C Light molasses. C seed will be sent for 'A' boiling and C Light molasses sent for C boiling.

➤ **Drying**

The separated sugar from 'A' centrifugals cooling and drying of the sugar is carried out in a multi tray hopper, in the hopper the cold and hot air will be pass in co-current direction to bring down the moisture and temperature of the marketable sugar.

From the drier, the sugar is passes through grader where the separation of sugar of various grades depending on the size and colour like L-30, M-30, S-30 and SS-31 will takes place. The graded sugar will be collected in bins. The sugar from the bins will be weighed in automatic weighing scale, stitched and will be sent to the sugar go down. Sugar is stored in 50kg PP bags and 100 kg "A" twill gunny bags in sugar go down.

All the above procedure explained in detail adopted in manufacturing of white crystal sugar by Double Sulphitation process.

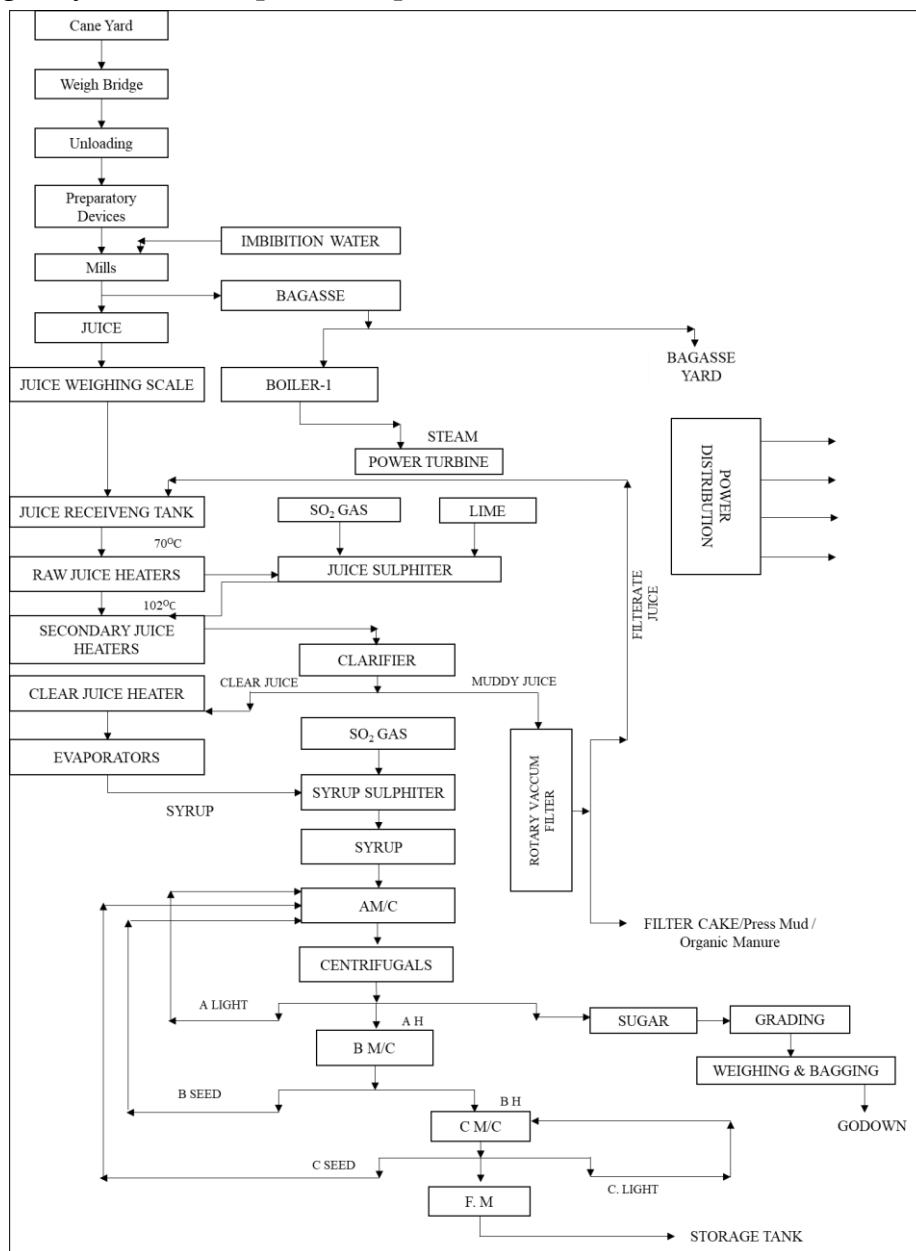


Fig 3.6 Process Flow diagram of Sugar industry Manufacturing Process of Ethanol Production

### 3.5.2 Process Description of Cane Juice and Molasses Based Ethanol Production

The available sugarcane in the vicinity of the project site is transported to the industry which is weighed and fed to the feeder. The sugarcane is cut and crushed in mill where approximately 95% juice is extracted. The extract is carried to the storage tanks for further process. Prior to subjecting the extract to fermentation section a specific study of mass balance and chemical composition is studied, during the process few chemicals and nutrients are added to activate the juice for fermentation. The syrup is fed to fermentation section with addition of culture for further process. The water content in the section is reduced and the syrup is prepared for distillation process. In the distillation column the water content is reduced to get 94.68% rectified spirit. In order to get 100% ethanol by removing 6% of water content special process for removal of water is required for manufacturing of absolute alcohol. In order to extract water from alcohol it is necessary to use some dehydrate or entrainer, which is capable of separating, water from alcohol.

The detailed process description is explained below:

The process of converting syrup to Alcohol can be divided into following sub sections:

- Feed Preparation and weighing
- Yeast Propagation and Continuous / Fed Batch Fermentation
- Multi-pressure Distillation

#### ➤ Feed preparations and weighing

The cane juice / B-Heavy Molasses / C-Molasses stored in a storage tank are first weighed in a tank with load cells / Mass Flow Meters so that accurate quantity can be fed to the fermentation section. The weighed molasses then transferred from tank to the diluter in fermentation section where it is diluted with water and effluent of Distillation unit and then fed to the fermenter.

#### ➤ Yeast Propagation and Continuous / Fed Batch Fermentation

In this process, highly efficient yeast strain under aseptic conditions will be propagated in yeast culture vessel.

The ready yeast seed is then transferred from Culture vessel to fermenter. The glucose in media gets converted to ethanol, in each of the 3 fermenters operating in continuous cascade mode. CO<sub>2</sub> liberated during reaction is sent to CO<sub>2</sub> scrubber for recovery of ethanol otherwise being lost in vent. The equipment is well de-signed to achieve enhanced efficiencies through better sugar/ yeast contact by shearing and mixing, efficient oxygen etc., The sludge is separated from wash after fermentation in a wash settling tank with lamellar assembly and then concentrated in centrifugal decanter. In cascade mode of operation, the yeast is recycled by using centrifugal yeast separators and then acidified in yeast acidification tank. The yeast slurry is then reactivated and again sent to 3'd culture vessel.

#### ➤ Multi-pressure Distillation

The fermentation wash containing Alcohol, non-fermentable solids and water is supplied to Distillation to separate the alcohol and other impurities as a continuous

flow. The distillation system is designed for premium quality Extra Neutral Alcohol. The system consists of 7 columns, namely CO<sub>2</sub> Stripper, Stripper column, Pre-reactor column, Extraction column, Rectification Column, Refining Column, Fusel Oil column. Wash is fed to CO<sub>2</sub> stripper column to remove CO<sub>2</sub> gas present in wash. Alcohol is stripped off water in stripper column. The distillate from stripper column is fed to pre-rectifier column to remove most of fusel oil and the distillate from pre-rectifier column is fed to extraction column after dilution with DM, water. In extraction column most of the high boiling impurities separate from ethanol in presence of water. The bottom ethanol water mixture is pre-heated by system condensate and spent lees before being fed to rectifier column. In rectifier column product rectifier spirit is taken out from top tray and fed to refining column where mainly methanol impurities are separated. Pure ENA is obtained at bottom, which is cooled and stored. The impure spirit from top of pre-rectifier column, extraction column, rectifier column and refining column are top and balance alcohol is recycled to pre-rectifier column. The alcohol containing fusel oil from pre-rectifier and rectifier column is also fed to fusel oil column. The top vapours from stripper column, Extraction column and fusel oil column are condensed in evaporator for spent wash concentration. The rectifier column, fusel oil column and pre-rectifier column get heat from stream. Rectification column and pre-rectifier column works under positive pressure. The top vapours from rectifier column are condensed in stripper column for giving heat to stripper re-boiler. Most of the other columns work under vacuum.

➤ **Stillage processing**

The spent wash will be sent to Bio-Digester to produce Methane Gas, Bio-Methanated Spent Wash BMSW at approximate 7.28 % wastewater (w/w) concentration ( in case of C-Molasses as Feed), approximate 6.50 % wastewater (w/w) concentration ( in case of B- Heavy Molasses as Feed), approximate 1.90 % wastewater (w/w) concentration (in case of Cane Juice/Syrup as Feed) is further concentrated in a multi effect evaporator to approximate 55% w/w. the concentrated spent wash will be further dried in spray dryer using boiler flue gas or hot air to evaporate up to 92%. Spent wash powder @ 92% concentration is cooled to room temperature and bagged as spent wash powder or potash derived from spent wash, which shall be sold as fertilizer. In this case the Boiler will be operated using bagasse & Bio Gas as Main fuel & Steam Coal as supporting Fuel to cater power and steam requirement of distillery plant.

➤ **Molecular sieve dehydration for fuel grade Anhydrous Alcohol**

Rectified spirit at Azeotropic concentration is pumped by a feed pump to the dehydration plant. The rectified spirit containing 95 % alcohol and 5 % water will first pass-through feed economizer, then through a vaporizer cum super heater which will convert the rectified spirit feed to superheated vapours. The superheated vapour will pass through a sieve column, which is already regenerated and pressurized to working pressure. All the water vapours present in vapour mixture

are adsorbed in the column. Along with alcohol traces of alcohol are also adsorbed in the column.

The Anhydrous alcohol vapours free from water vapours exhausted from the column are duly condensed in the re-boiler at the recovery column and is further passed through feed economizer to preheat the incoming feed and then to a final product cooler. After saturation of sieve column with water, the flow will be shifted to the next sieve column, which is already regenerated and pressurized. After completion of dehydration cycle, the sieve column saturated with water is regenerated by evacuation of adsorbed water and alcohol. The evacuated vapours are condensed. The condensed mixture of alcohol and water is then fed to a recovery column, which enriches the stream back to azeotropic composition. This sequence of adsorption and regeneration of sieve column continues.

➤ **Potash Derived from Spent wash drying**

The generated spent wash from a distillery industry is highly acidic, dark coloured and effective pollutant to environment. The present proposal involves manufacturing of spent wash powder from raw spent wash using Bio-Methanation technology. The spent wash will be used as a raw material for the production of organic fertilizer and Biogas. This eliminates the impacts of spent wash on environment. An organic fertilizer derived from spent wash drying has high contents of potassium and other nutrients which are required for plant growth in the agriculture field. The generated raw spent wash will be first treated in Bio-methanation plant to produce biogas and then it will be concentrated in Multiple-Effective Evaporator (MEE) further it will be dried through spray driers to remove moisture content up to 92 - 95 %. The dried spent wash powder is packed and sold out in local market as organic fertilizer.

➤ **Bio-Methanation**

The distillery effluent is known as spent wash and it is a highly concentrated liquid with a high organic and inorganic content. In Distillery industry spent wash treatment and disposal is one of the major issue. Distillery effluent is having considerable organic matter which can be bio degradable. In the process of bio methanation (anaerobic digestion), the bio degradable organic matter are getting converted into Biogas, thus reducing the BOD level to 80 to 90% and COD level 60% to 75 %. Bio Methanation System is based on the concept of conversion organic matter into biogas. The process of conversion of organic matter into bio gas occurs through a group of bacteria. It has to be carried out anaerobically, since the bacteria which produce methane gas from effluent are strictly anaerobes. Hence here two functions are carried out simultaneously. One is the degradation of organic matter to volatile acids. The second thing is the methane gas is produced from volatile acids.

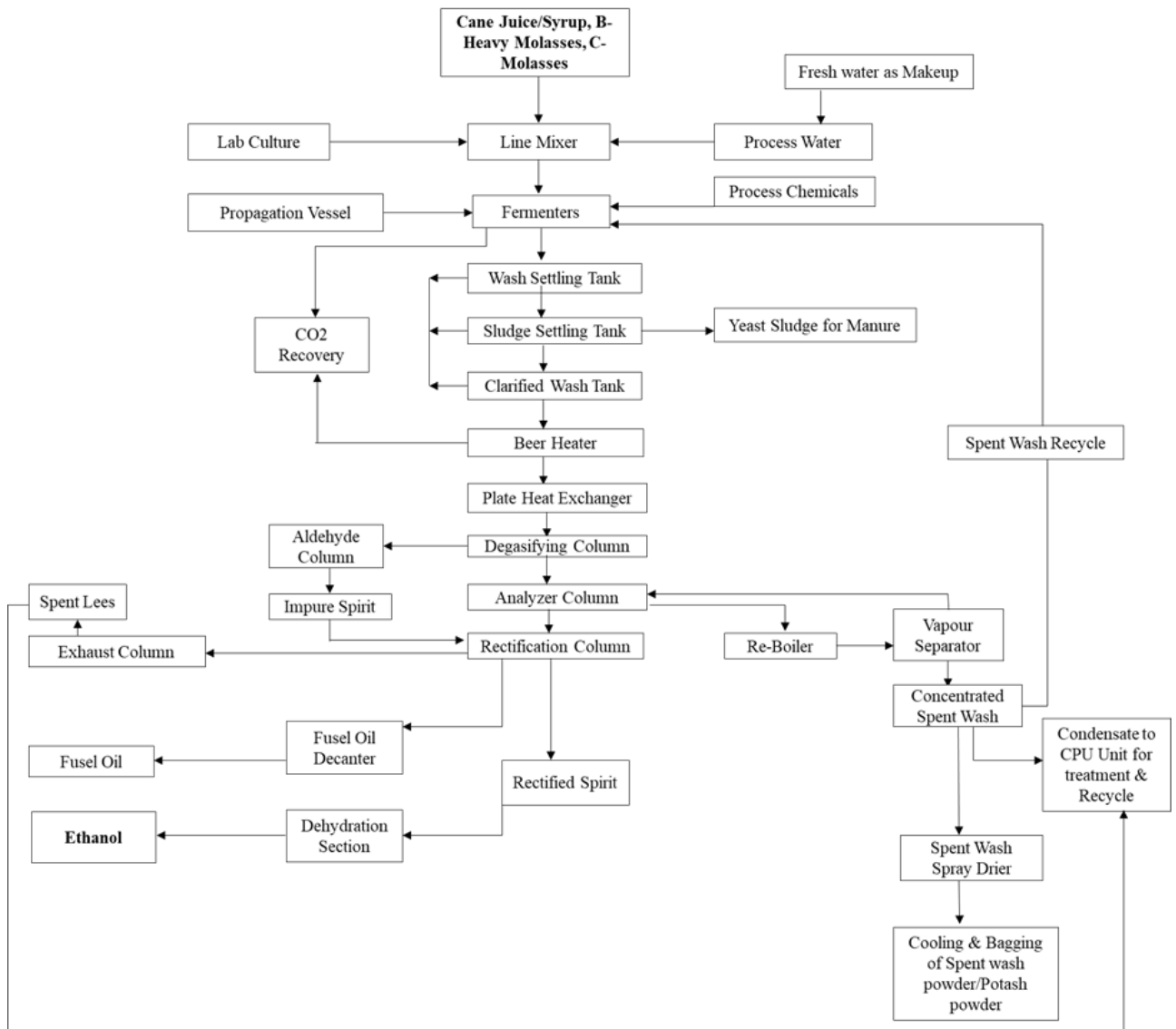


Fig 3.7 Process flowchart- Cane Juice and Molasses based Distillery

### 3.5.3 Process Description of Grain Based Ethanol Production

#### ➤ Grain Milling

Milling is required to reduce the particle size of raw material (Grain). The milling section of the plant has the necessary equipments for cleaning of raw materials followed by Milling so as to get the desired particle size. The raw material first taken out from the storage section and send to the milling section. The grain is taken through the bucket elevator to the top floor and fed through pre-cleaning devices like Sieves to separate oversize, de-stoner to remove stones, Magnetic Separators to remove Iron particles, if any. The grain is then fed to the Hammer Mills to mill and produce flour of desired particle size. The lower particle size increases the total surface area per unit weight and makes the starch accessible to gelatinization during slurry preparation. The flour is then conveyed using screw conveyors and bucket elevators and then weighed before fed to the slurry tank. The slurry of the milled raw material is prepared in water and this slurry is then further sent for liquefaction.

### ➤ **Liquefaction Section**

Liquefaction initiates the conversion of starch into simple molecules of dextrin. It is divided into three sub processes.

#### **2.6.5.2.3 Pre Liquefaction**

This involves partial liquefaction of starch, into sugars in presence of enzyme, at a temperature well below the gelatinization temperature. After milling, the flour is mixed with hot water in a small slurry-making tank, which has low speed agitator. The gentle mixing of flour with hot water is carried out to eliminate any lump formation. The slurry is then transferred to a main slurry tank, where chemicals required for maintaining the stability of the enzymes and for adjusting pH and also some portion of liquefaction enzyme is added. The slurry is then pumped to a high-pressure jet cooker using slurry transfer pumps.

### ➤ **Jet Cooking**

This step involves the cooking of starch slurry with live steam so as to instantaneously raise its temperature. This gelatinizes and opens up starch molecules, thus making it accessible to enzyme action. Jet cooking also sterilizes the slurry. The jet cooker is basically Venturi type device where, the heating of slurry takes place instantaneously. The Jet cooker outlet cooked slurry passes through a holding coil which allows further break down of starch molecules into smaller molecules due to turbulence inside the coil. At the end of the holding coil, the pressure is reduced and the slurry flash cooled into the flash tank. The temperature drops due to flashing of slurry and the escaped steam vapours are condensed in flash condenser and sent back for slurry making in the slurry tank. The cooled slurry is then taken to liquefaction tank for addition of liquefaction enzyme and for further breakdown of starch molecules.

### ➤ **Post Liquefaction**

The jet-cooked slurry is again held at high temperature in presence of enzyme to complete the process of liquefaction in the liquefaction tank. The pH is adjusted in this tank as the liquefaction enzyme is at its best activity. After liquefaction, the slurry is cooled using plate heat exchangers and sent to Scarification tank.

### ➤ **Partial Pre Saccharification Process**

Scarification is the formation of sugars. Here, it is done enzymatically by breakdown of dextrin. Here a second enzyme for further breakdown and release of sugars acts upon the dextrin. The Saccharification is carried out using amylo glycosidase enzyme to initiate the Saccharification, which is also called partial pre Saccharification PPSF method. The addition of saccharifying enzyme & holding for 1 hour will help in release of initial sugars.

### ➤ **Fermentation Section**

Fermentation has been developed to further improve the operating parameters of the plant in terms of high fermentation efficiency, higher alcohol percent, and trouble free and higher consistency of the performance parameters over longer period. Most

modern ethanol production plants adopt this fermentation technology. It is adaptable to fed batch process. The fermentation process employs a special yeast culture and yeast management system, which can withstand variations in the grain quality, temperature and other shock loads.

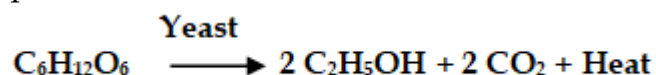
Fermentation plant consists of four numbers Fermenter with all the accessories like, Plate Heat Exchangers for cooling, Air spargers, Broth mixers, and Air blowers etc. Hence it gives a tremendous advantage in maintaining the yeast population and in combating the bacterial infection. Grain flour after weighing is diluted to an appropriate sugar concentration while pumping through slurry tank, saccharification tank & next in to fermenter. To help the fermentation sustain, the assimilable nitrogen are added in the medium in the form of Urea and DAP as required. Temperature in the Fermenter is maintained to an optimum level as required for efficient reaction with the help of Plate Heat Exchanger and recirculation pumping system. This recirculation also helps in proper mixing of fermented wash. Air blower is provided to supply the necessary oxygen required for the yeast. The CO<sub>2</sub>, which is liberated, is scrubbed with water, in the CO<sub>2</sub> Scrubber. This CO<sub>2</sub> contains ethanol, which is recovered by collecting water from CO<sub>2</sub> Scrubber in to Fermenter. The fermented wash collected in the Buffer Wash Tank is then pumped to Analyzer or Primary column for distillation. A closed loop cooling tower system with an induced draft-cooling tower with circulation pumps is also provided to ensure higher cooling efficiency and to minimize water wastages.

Fermentation is a bio-chemical reaction. This means both biological (related to living things) and chemical matters are involved in the process.

Living yeast cells participate on biological activity, while sugar (C<sub>12</sub>H<sub>22</sub>O<sub>11</sub>) as chemical is involved in the fermentation process used for the manufacturing of alcohol.

In principle, glucose molecules are consumed by living yeast cells and in turn they excret ethanol molecules and liberate carbon dioxide. This is an exothermic reaction, thus generates heat as the reaction proceeds in forward direction.

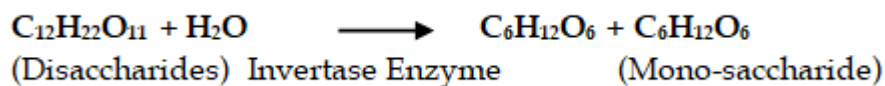
Following equation represents the fermentation reaction:



Commercially, pure glucose is not economic choice. Thus sugars (disaccharides) are used for the industrial production of alcohol.

Living yeast cell generates an enzyme, called as invertase enzyme, at the cell wall surface. These enzymes hydrolyze one sugar molecule (disaccharide) into two mono-saccharide molecules, called as glucose and fructose. This mono-saccharide is involved in conversion to alcohol.

Following equation represents the hydrolysis of sugar to glucose & fructose at cell surface:



Fermentation is a complex process. It involves multiple reactions in parallel as well as in series. Though we require ethanol as product, but many other side products are formed involving multiple reactions. This reduces the conversion efficiency of glucose to ethanol. Optimum conditions of fermentation system favor glucose conversion to ethanol, while suppressing other reaction steps.

Living yeast cells are industrially used for the conversion of sugars to alcohol. These yeast cells generate invertase enzyme, which hydrolyses sugar molecules into glucose and fructose molecules.

Saccharomysis Cerevisea strains are used in the distillery plants for the production of fuel ethanol from cereal grains.

Typical life cycle of yeast cells is divided into following four phases:

- Birth
- Growth
- Multiplication
- Death

All these four phases are considered while designing fermentation system.

Bacteria are the enemy of yeast cells. Basically it grows at faster rate and suppresses yeast activity.

Various process parameters are considered for best productivity of the yeast cells. These conditions also ensure higher production efficiency, good quality product and with minimum initial as well as operating cost involved.

The fermented wash collected in the Buffer Wash Tank & then pumped to Analyzer column for distillation. A closed loop & induced draft cooling tower with circulation pumps is also provided to ensure higher cooling efficiency and to minimize water wastages.

#### ➤ Multi Pressure Vacuum Distillation

The vacuum distillation has many advantages over conventional atmospheric distillation plants like lower energy requirement, better quality products and less scaling on the distillation trays due to sludge. The vacuum distillation produces ethanol of international quality standards and there is a lot of demand of ethanol from the vacuum distillation process. Alcohol quality, which is produced from this latest technology, meets to most of the international quality standards like US, British and Japanese standards.

The vacuum distillation approximately requires 50 % less steam as compared to conventional old distillation technologies. The vacuum distillation consists of distillation columns with high efficiency column trays, condensers, Reboilers, vacuum pumps and reflux pumps.

In this vacuum distillation, alcohol is separated and concentrated using principal of fractional distillation. This is based on difference in boiling points of involved compounds in mixture. There are eight distillation columns in the system. These are

Primary column, Degasser column, Pre-Rectifier column, Hydro - extractive distillation column, Rectifier column, Refining column, De- Recovery Column and De-Aldehyde Column.

➤ **Primary Cum Degasser Column**

Primary column (Analyzer Column) is operated under vacuum and it is heated using the top vapours of the Rectifier column. The vacuum operation of the Primary column decreases the overall energy requirement of column. Due to vacuum, scaling is also reduced in this column & plant can be operated for long time smoothly.

The fermented wash is preheated using a beer heater and followed by a plate heat exchanger, then it is fed at the top of Degasser column. The pre heating of mash in two stages recovers energy and saves steam required for the distillation.

Degasser column separates the impurities on the basis of boiling point. These impurities are sent to De-aldehyde column.

Alcohol and other volatile compounds are separated from the top of the Primary Column & fed to Pre- Rectifier Column.

The semi-solid waste in fermented wash is reached at the bottom of Primary column. This semi-solid waste is called as thin slop & sent to further recovery of valuable DDGS & process condensate water.

➤ **Primary Rectifier Column**

Primary Rectifier Column is driven on steam indirectly with the help of one reboiler. This column gets feed from Analyzer column & Dealdehyde Column. This column is operated under vacuum condition to reduce the steam consumption & better quality. Heavy & Light Fusel Oils are separated from this column & fed to De-fusel Oil Column.

Impure spirit is also separated from the condenser of this column. Column top vapors are condensed in one beer heater & remaining in condensers.

Alcohol is concentrated in this column & spent water (spent lees) is separated from the bottom of the column.

➤ **Recovery Column**

All fusel oil & esters impurities are fed to this column. Heavy Fusel Oil & Light Fusel Oil is drawn out from the column & concentrated in decanters. Water is also used for washing of fusel oil & to recover the alcohol. When fusel oil is get concentrate in decanter, fusel oil transferred to fusel oil storage.

➤ **Dehydration Technology**

Molecular sieve technology works on the principle of pressure swing adsorption. Here water is removed by adsorbing on surface of 'Molecular Sieves' and then cyclically removing it under different conditions (steaming).

Molecular sieves are nothing but synthetic Zeolite typically 3A Zeolite. Zeolites are synthetic crystalline Alumino silicates. This material has strong affinity for water. They adsorb the water when heated (and pressurized) and desorbs the water under vacuum. This principle is used to dehydrate ethanol. The crystalline structure of

Zeolite is complex and gives this material the ability to absorb or reject material based on molecular sizes. Water molecule can enter the sieve and be adsorbed, but larger alcohol molecule will not be retained and will go through the bed. There can be two beds in parallel. Once a particular bed is saturated with water, the anhydrous alcohol is re-circulated to remove water from the bed under vacuum. The operation is called regeneration of bed; so that adsorbed water is desorbed from the bed. Till that time, other bed is used for dehydration.

#### ➤ **Evaporation**

In Evaporation consists of falling film evaporators. It gets heat from steam. There are five falling film evaporator. Vapours of last evaporator get condensed in a surface condenser. CIP connection for all evaporator is provided for cleaning purpose.

In EVAPORATION first evaporator get heat from the steam provided. Thin slop vaporized in first stage give energy to second stage. There are total five falling film evaporator. Evaporators are in forward feed arrangement. Vapours of Second evaporator are fed to third effect Evaporator. Vapours of Third evaporator are fed to fourth effect Evaporator. Then, Vapours of fourth evaporator are fed to fifth effect Evaporator. Falling film evaporators can be operated at very low temperature differences between the heating media and the boiling liquid, and they also have very short product contact times, typically just a few seconds per pass. These characteristics make the falling film evaporator particularly suitable for thin slop evaporation.

In Evaporation there is specifically designed thin slop distributors for the proper distribution of thin slop in tubes. Specific design of the liquid distribution system achieve full and even product wetting of the tubes. Because of the low liquid holding volume in this type of unit, the falling film Evaporator can be started up quickly and changed to cleaning mode easily.

In Evaporation falling film evaporators are highly responsive to alterations of parameters such as energy supply, vacuum, feed rate, concentrations, etc. it will be equipped with a well-designed automatic control system therefore it can produce a very consistent concentrated product.

In Evaporation is an operation used to remove a liquid from a solution, suspension, or emulsion by boiling off some of the liquid. It is thus a thermal separation, or thermal concentration, process. We define the evaporation process as one that starts with a liquid product and ends up with a more concentrated liquid as the main product from the process.

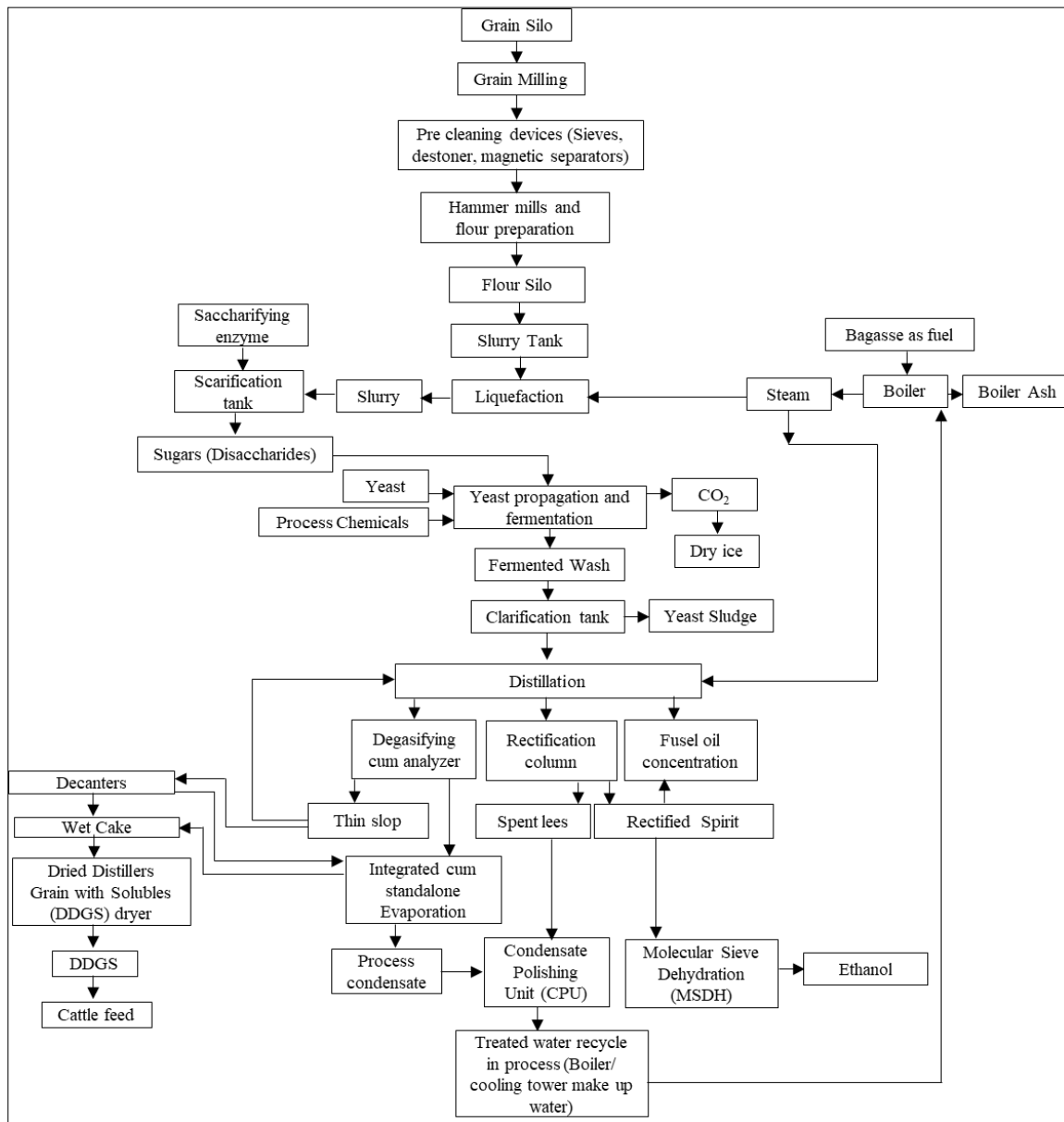


Fig 3.8 Process flowchart- Grain based distillery

### 3.6 Raw Material Requirement for proposed project

The raw material for Sugar Plant is Sugarcane of quantity 12000 TCD procured from farmers of allotted villages and the raw material required for 180 KLD Distillery unit will be Cane Juice, B-Heavy Molasses, C- Molasses from own Sugar Plant and Grains will be from nearby market. The details of the same are given in below tables:

Table 3.2 Raw Material Requirement for Sugar Plant

Sl.No.	Raw Material	Quantity		Mode of Transport	Source
		Existing Proposal	Expansion Proposal		
1	Sugarcane	4500 TCD	7500 TCD	By Truck and Tractors	Allotted Villages
<b>Consumables (Chemicals)</b>					
<b>For Sugar Plant</b>					
2	Lime	6.75	11.25	Trucks	Market
3	Sulphur	2.70	4.5	Trucks	Market
4	Phosphoric acid	0.05	0.083	Trucks	Market

5	Flocculants	0.01	0.016	Trucks	Market
6	Caustic Soda Flakes	0.4	0.66	Trucks	Market
<b>For ETP &amp; WTP</b>					
7	Lime	0.1	0.16	Trucks	Market
8	Ferric Chloride	0.1	0.16	Trucks	Market
9	Flocculants	0.01	0.016	Trucks	Market
10	Sodium Hypo Chlorite	0.25	0.4	Trucks	Market
11	Caustic Soda Flakes	0.05	0.08	Trucks	Market
12	Hydrochloric Acid	0.2	0.35	Trucks	Market
<b>Consumables (Oil &amp; Grease)</b>					
13	Oil	0.15	0.25	Trucks	Market
14	Grease	0.03	0.05	Trucks	Market

Table 3.3 Raw Material Requirement for Distillery unit and Co-gen unit

Sl. No.	Raw Material	Quantity	Transportation	Source	Storage
1	Cane Juice / Syrup	2700 TPD or 675 TPD @ 60 Brix	Pipeline for Internal	Own Production	Mild Steel Tanks
2	B-Heavy Molasses	591 TPD	Pipeline for Internal	Own Production	Mild Steel Tanks
3	C- Molasses	756 TPD	Pipeline for Internal/Tankers for shifting from other factories	Own Production/ other sugar factories	Mild Steel Tanks
4	Grain	461 TPD	Trucks	From nearby Market	Stored in Grain silos
<b>Chemicals / Nutrients</b>					
1	Sulphuric Acid	360 litre	Lorry tanker	Nearby Manufacturers	M S Tank with Fume absorbing facility
2	DAP	180 Kg	Lorry	Local	50 Kg Bags
3	Urea	660 Kg	Lorry	Local	50 Kg Bags
4	Antifoam HCL Caustic lye	360 kg 660 kg 660 kg	Lorry Tanker Lorry	Nearby Manufacturers	50 Kg Bags Acid proof MS tank SS Storage tank
5	Yeast culture /Enzyme	330 kg	Lorry	From Manufacturers	10 kg drum
<b>Fuel for Boiler</b>					
1	Bagasse as fuel for Boiler	3444 TPD	By Belt Conveyor	In-house	Storage yard
2	Bio Gas	48 TPD	Through pipeline from Gas Holder	In-house	Gas Holder
3	Indian / Imported Coal	168 TPD	By Belt Conveyor	From Market	Storage yard

Table 3.4 Quantity of Grain/Cane juice/Molasses Required

Sl. No.	Item	Cane Juice 180 KLD	B-Molasses 180 KLD	C-Molasses 180 KLD	Grain (Maize) 180 KLD
1	Sugarcane to produce Feed Stock for Distillery unit, MT	486000	818307	315693	--
2	Molasses Generation, MT	--	53190	14206.19	--
3	Alcohol Yield, Ltr / MT	70.00	320	250	410
4	Alcohol Production, Ltr	34020000	17010000	1526500	7788690
5	Ethanol Production, Ltr	32400000	16200000	1450175	7417800
6	Per Day Production, Ltr	180000	180000	180000	180000
7	No of days working	180	90	18.79	41.21
8	Total no of working days	288.79			41.21
9	Target working days per year	330.00			
10	Grain required for balance days (41.21 days), MT	--	--	--	18997

Table 3.5 Raw Material Specifications - Cane Juice/Syrup, B-Heavy Molasses &amp; C-Molasses

Sl. No.	Item	Unit	Cane Juice	B-Molasses	C-Molasses
1	pH	No.	3.5 - 4.0	3.5 - 4.0	3.5 - 4.0
2	Brix	%	50-55	85	82-85
3	Total Solids in Feed	% w/w	7.3 to 7.4	18 - 18.1	16.9 - 17
4	Fermentable Sugars	% w/w	50 min.	55 min.	44 min.

Table 3.6 Raw Material Specifications for Grains

Sl. No.	Item	Unit	Maize Corn	Broken Rice	Bajra
1	Moisture	%	08 - 12	10 -12	10 - 12
2	Starch	%	60 - 64	66 - 70	57 - 58
3	Protein	%	09 - 12	04 - 07	08 - 09
4	Fats & Oils	%	3.5 - 5.0	0.4 - 1.0	0.8 - 1.5
5	Crude Fiber	%	1.5 - 2.0	0.2 - 0.5	2.0 - 2.5
6	Ash	%	1.0 - 1.5	0.5 - 0.7	0.5 - 0.7
7	Other Organics	%	07 - 09	04 - 10	09 - 12
8	Yield of Alcohol	% v/v	402 - 430	442 - 468	380 - 390

**Steam Requirement including Spent Wash Concentration**

A. Wash to ENA	25.830 TPH @ 4.5 kg /cm <sup>2</sup> (g) 09.975 TPH @ 1.5 kg /cm <sup>2</sup> (g) Total: 35.805 TPH (4.77 Kg/Litre of Alcohol)
B. Wash to Ethanol	23.550 TPH @ 4.5 kg /cm <sup>2</sup> (g) 9.680 TPH @ 1.5 kg /cm <sup>2</sup> (g) Total:33.230 TPH (4.43 Kg/Litre of Alcohol)

**3.7 Resource optimization/recycling and reuse envisage in the project, if any, should be briefly outlined.**

Not applicable.

**3.8 Availability of water its source, Energy/power requirement and source should be given**

**Water Requirement**

Total water requirement for proposed Expansion of Sugarcane Crushing Unit from 4500 TCD to 12000 TCD, Co-generation Unit from 14 MW to 39.60 MW and Establishment of 180 KLD Multi feed (Grain/ Cane Juice/ BH - Molasses and C-Molasses) based Distillery Unit will be Fresh water will be 1080 KLD (@ 6 KL/ KL of alcohol). Sugar Complex water requirement is 1250 KLD having source of water from River Krishna, the same shall be utilized for the proposed project.

**Power Requirement**

For construction phase, Power requirement will be 500 kWh and power required for the same will be met using power from 1500 KVA D.G. set. During operational phase the total power requirement for sugar, Co-gen and Distillery Unit will be 19500 kWh and power required for the same will be met from new 39.60 MW Co-Gen Power Plant.

**3.9 Quantity of waste to be generated (liquid and solid) and scheme for their Management/disposal**

Water required for the proposed project is sourced from Krishna River.

Water consumption and management / disposal as below;

Sl. No.	Fresh Water Required	Unit	Water Consumption during Season			Waste water generation in KLD	Treat-ment / Disposal
			Existing 4500 TCD & 14 MW	Expansion of 7500 TCD sugarcane crushing, 25.60 MW Co-gen & 180 KLD Distillery	Total		
1	For Sugar Plant	KLD	Nil	Nil	Nil	850	To ETP
2	Make up water for Co-Gen cooling water	KLD	650	50	700	50	To ETP
3	Boiler Feed	KLD	169	81	250	50	To ETP
4	RO Reject, Filter Backwash and Regenerations, etc.	KLD	150	50	200	200	To ETP
5	Domestic Use	KLD	100	-	100	100	To STP
Water required for Sugar & Co-Gen Unit		KLD	1069	181	1250	1250	
Water required for Distillery		KLD	0	1080	1080	1555	Recycled through CPU
Total Water required during Season		KLD	1069	1261	2330		

Note:

- No fresh water required for Process, except during initial start-up. Water generated from Sugarcane is used for Process requirement.
- Make up water Co-Gen cooling tower will be very less during Season, as maximum quantity of Steam from Turbine is extracted to for Process use.

Fresh water required for the proposed 180 KLD Multi feed Distillery @ 6.0 ltr/ltr will be 1080 KLD.

Table 3.7 Water Requirement

Sl. No.	Description	Total Water required in KLD	Water Recycled in KLD	Fresh Water required in KLD	Remark
1.	Process water for fermentation section	1440	945	495	Condensate from Spent wash evaporator is recycled after treatment in CPU.
2.	DM Water for Alcohol Dilution @ 2.5 Litre/Litre of Alcohol	450	225	225	After 50% spent lees recycle. Balance 50% treated in CPU and used for Cooling Tower make up
3.	Soft water for cooling tower make up	545	225	320	After CPU treated water recycled
4.	Soft water for Vacuum Pumps & Machinery Cooling	200	160	40	After 90 % recycling of Air blower and vacuum pump sealing water
<b>Total Water Requirement</b>		<b>2635</b>	<b>1555</b>	<b>1080</b>	

### 3.9.1 Wastewater generation and its management

The generated domestic sewage is disposed to STP of capacity 10 KLD.

The generated domestic sewage is disposed to septic tank followed by soak pit.

The generated spent wash 1440 KLD will be concentrated to 60% Brix & dried to produce spent wash powder.

Condensate & Spent Lees are treated in separate CPU of Capacity 3000 KLD and 1600 KLD, and then it will be reused in Process. The wastewater will be recycled completely maintaining Zero Liquid Discharge.

The trade effluent generated will be treated in existing ETP of capacity 1250 KLD. The treated water is used for on land for irrigation after confirming the norms stipulated by KSPCB.

### 3.9.2 Solid Waste generated and its management

Sl. No.	Solid Waste	Quantity	Method of collection	Mode of Disposal
1	Yeast sludge from fermenter and digester	5.40 TPD	Mechanical conveyor	Used as manure.
2	Sludge from CPU	0.150 TPD	Sludge drying beds	
3	Fly Ash	28.5 TPD	Mechanical conveyor into common silo for further disposal	Sold to brick manufacturers, Excess will be used in landfilling.
	Bottom Ash	12.5 TPD		
4	Bagasse	3444 TPD	Mechanical conveyor	Used as boiler feed.
5	Press mud	480 TPD	Mechanical conveyor	Used as manure
6	ETP Sludge	112 Kg/day	Mechanical conveyor	Used as manure
7	DDGS	144 TPD	Stored in common silo	Will be sold as cattle feed/fish feed.
8	Domestic solid waste	60 Kg/day	Segregated. Domestic organic solid waste will be composted, while the inorganic solid waste will be handed over to nearby KSPCB authorized recyclers.	Nearby municipal agencies & recyclers.
<b>Hazardous Waste Generation Details</b>				
1	Used oil from DG sets	0.500 Kl/A	Stored at an identified place with proper sign board, Stored in leak proof sealed barrels	Usually the oil is very less, Used as lubricants for Conveyor chains and sprockets within the industry to avoid use of fresh oil.
2	Oil Soaked Cotton waste	100 Kg/A	Storage Yard	Used for light up/start-up of Boiler
3	Empty Barrels /Containers	30-50 no's	Storage Yard	Disposed to Local farmers and Employees for house hold usage.

## CHAPTER 4 - Site Analysis

### 4.1 Connectivity

The Project site is well accessed by SH 53 (Jamkandi Miraj Road) – 6.80 Km, NE; SH-31 (Gokak-Athani Road) – 4.17 Km, SE; SH-73 (Raibag-Gokak Road) – 12.56 Km, SW. The nearest populated village is Alagawadi which is located at distance of 2.09 km in southwest direction and Raibag is located in West direction – 12.55 Km away from the plant.

The nearest villages are Alagawadi – 2.09 Km, SW. There are no eco-sensitive locations such as National park, archaeological structure, wild-life sanctuary, bio-sphere reserve within 10 km radius around the site. Raja Ram park RF 10.7 Km, SW Shahu Park RF – 8.6Km, SW, Krishna River located at a distance of 12.80 Km, N.

Within 10 Km there is a Harugeri Kere which is Located at a distance of about 5.0 Km from the project site in the Northeast direction and the State Highway 31 Located at a distance of about 4.42 Km from the proposed project site in South direction. Shahu Park RF is located at a distance of about 8.6 Km from the proposed project site in Southwest direction.

Table 4.1 Salient features of the proposed project site

Sl. No.	Features	Particulars
1.	Location	Sy. No. 98/1, 98/2, 100/3, 100/4, 101/1B, 101/2, 101/1A, 101/3A, 101/3B, 102/3F, 102/3E, 102/3D, 102/3K, 102/3B, 102/3A, 103/15, 103/14, 103/13, 103/12, 103/11, 103/10, 103/9, 103/8, 103/7, 103/6, 103/5, 103/4, 103/3, 103/2, 103/1, 104/2, 104/3, 104/4A, 104/4B, 104/1B, 104/1A, 105/1A, 105/1B, 106/1A, 106/1B, 106/1K, 107/3, 107/4, 107/5, 107/6, 107/7, 107/8, 107/9, 107/10, 108/3, 108/2, 183/1, 184/1, 184/2, 185/1 of Alagawadi Village, Raibag Taluk, Belgaum District, Karnataka State.
2.	Present land use	The total land area including existing and proposed expansion is 189 Acres 5 Guntas. The total land is 189 Acres 5 Guntas out of which 87 Acre 37 Guntas is already converted to industrial purpose. The process of Industrial Conversion for remaining 101 Acres 8 Guntas is under progress.
3.	Temp. Max and Min	Max. 27° C to 42° C & Min. 13.9° C
4.	Average Humidity	75%
5.	Annual Rainfall	769.1 mm
6.	Soil Type	Deep Black Soil
7.	Topography	Flat
8.	Nearest Village	Alagawadi-2.09 Km SW
9.	Nearest Town	Raibag-12.55 Km, W
10.	Latitude	16°30'21.07"N
11.	Longitude	74°53'51.56"E

Table 4.2 Environmental Setting around the proposed site, within 10 kms radius

Sl. No.	Salient Features	Distance from project site (in Km)/ Direction
1	Nearest Water Bodies	<ul style="list-style-type: none"> <li>• Harugeri Kere - 5.0 Km, NE</li> <li>• Krishna River - 12.80 Km, NE.</li> <li>• Kempanjali Kere - 12.53Km, SW</li> </ul>
2	Nearest National Park/ Wildlife Sanctuaries	Nil
3	Nearest Village	Alagawadi Village - 2.09 Km, SW
4	Nearest Airport	<ul style="list-style-type: none"> <li>• Kolhapur airport - 67.25 Km, NW</li> <li>• Belagavi airport - 76.64 Km, SW</li> </ul>
5	Nearest Railway Station	<ul style="list-style-type: none"> <li>• <u>Chinchli Railway Station</u> - 7.63 Km, NW.</li> <li>• Raibag Railway Station - 9.32Km,SW.</li> </ul>
6	Nearest Highway	<ul style="list-style-type: none"> <li>• SH-31 (Gokak-Athani Road) - 4.17 Km, SE;</li> <li>• SH 53 (Jamkandi Miraj Road) - 6.80 Km, NE;</li> <li>• SH-73 (Raibag-Gokak Road) - 12.56 Km, SW;</li> </ul>
7	Nearest Religious Place	<ul style="list-style-type: none"> <li>• Birappa Temple - 0.5 Km, SE;</li> <li>• Hanuman Mandir - 1.90 Km, NW</li> </ul>
8	Reserve Forest	<ul style="list-style-type: none"> <li>• Shahu Park RF - 8.6 Km, SW.</li> <li>• Raja Ram park RF - 10.7 Km, SW;</li> </ul>
9	Nearest Biosphere Reserve	Nil
10	Nearest densely populated place	<ul style="list-style-type: none"> <li>• Harugeri - 5.17 Km, NE</li> <li>• Raibag - 12.55 Km, W</li> </ul>
11	Nearest Industries	<ul style="list-style-type: none"> <li>• Shri Bramhanand Jaggery industries- Adjacent to Project Site, S.</li> <li>• Askins Biofuels Pvt. Ltd - Adjacent to Project Site, S.</li> <li>• Soveriegn Industries Ltd. OP - 15.16 Km, NE.</li> <li>• Shivshakti Sugars Limited, Yadrav- 17.89 Km, NW.</li> <li>• Ugar Sugar Factory-17.50 Km, NW.</li> </ul>
12	Nearest Defense Installation	Nil
13	Interstate Boundary	Nil

#### 4.2 Land Use and Land Ownership

M/s Alagawadi Bireshwar Sugars Private Limited is located at Sy. No. 98/1, 98/2, 100/3, 100/4, 101/1B, 101/2, 101/1A, 101/3A, 101/3B, 102/3F, 102/3E, 102/3D, 102/3K, 102/3B, 102/3A, 103/15, 103/14, 103/13, 103/12, 103/11, 103/10, 103/9, 103/8, 103/7, 103/6, 103/5, 103/4, 103/3, 103/2, 103/1, 104/2, 104/3, 104/4A, 104/4B, 104/1B, 104/1A, 105/1A, 105/1B, 106/1A, 106/1B, 106/1K, 107/3, 107/4, 107/5, 107/6, 107/7, 107/8, 107/9, 107/10, 108/3, 108/2, 183/1, 184/1, 184/2, 185/1 of Alagawadi Village, Raibag Taluk, Belgaum District, Karnataka State. The total land is 189 Acres 5 Guntas out of which 87 Acre 37 Guntas is already converted to

industrial purpose. The process of Industrial conversion for remaining 101 Acres 8 Guntas is under progress.

### 4.3 Topography (along with map)

The topography of the land is flat.

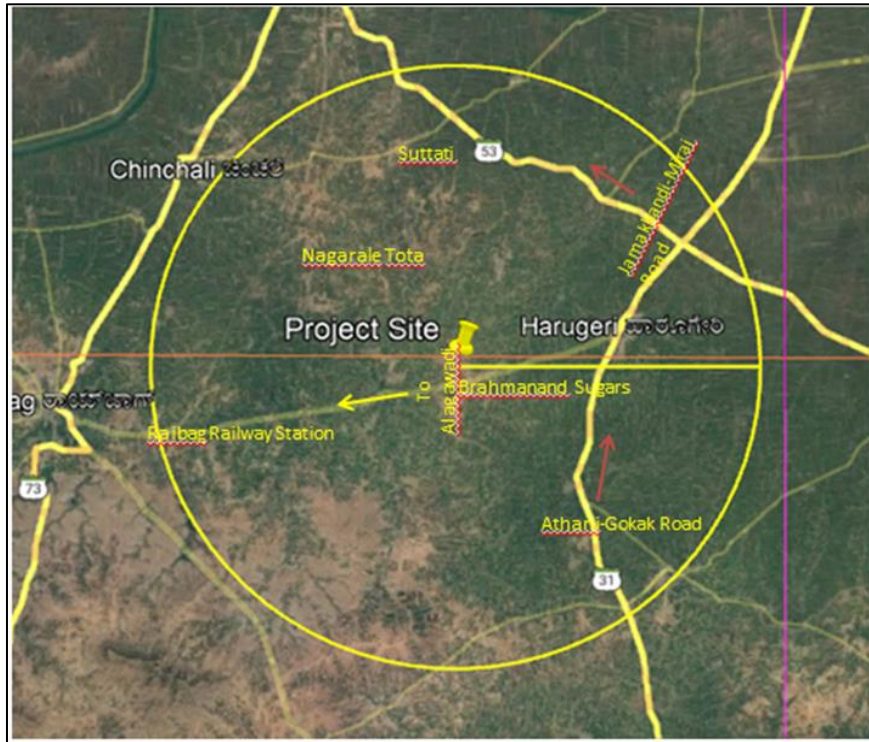


Fig 4.1 Aerial View of Proposed site - 10 Km Radius

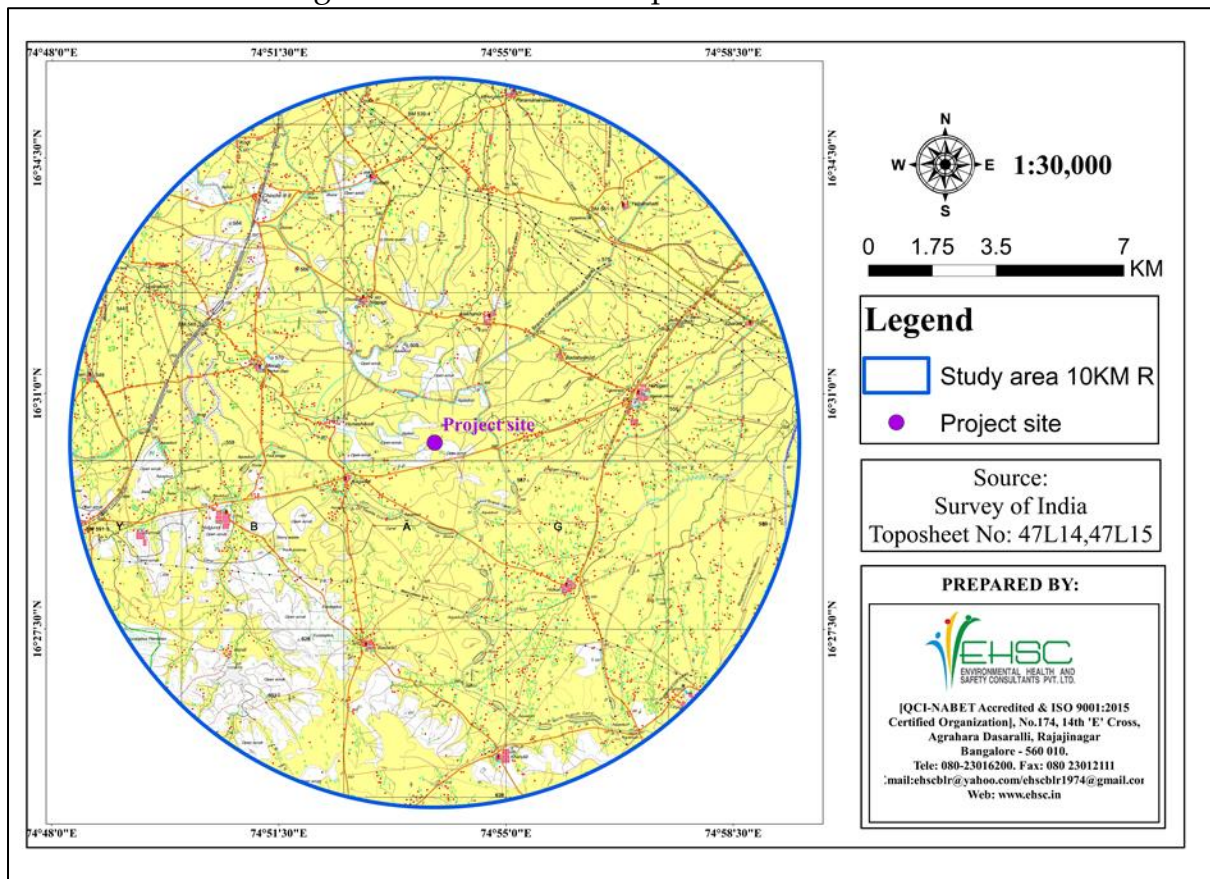


Fig 4.2 Toposheet showing the location of proposed project site within 10 Km radius (Toposheet No: 47L14 & 47L15)

**4.4 Existing land use pattern (agriculture , non- agriculture, forest, water bodies including area under CRZ), shortest distances from the periphery of the project to periphery of the forest, national park, wild life sanctuary, eco sensitive areas, water bodies ( distance from, the HFL of the river). In case of the notified industrial area a copy of the Gazette notification should be given.**

189 Acres 5 Guntas of land is envisaged for the proposed project. The total land is 189 Acres 5 Guntas out of which 87 Acre 37 Guntas is already converted to industrial purpose. The process of Industrial Conversion for remaining 101 Acre 8 Guntas is under progress.

There are no ecological sensitive places like national park, sanctuary, biosphere reserve, etc. within 10 km radius of the proposed site. Few reserve forest exists Shahu Park RF- 8.6 Km, SW, Rajaram RF-10.7 Km, SW.

The Project site is well accessed by Jamkandi Miraj Road (SH 53)- 6.80 Km, NE; Gokak-Athani Road (SH-31) - 4.17 Km, SE; Raibag-Gokak Road (SH-73) - 12.56 Km, SW.

#### **4.5 Existing Infrastructure**

The project site is well connected with (SH 31) Gokak – Athani Road at a distance of 4.17 Km, SE from the project site. The Project site is well accessed by Jamkandi Miraj Road (SH 53)- 6.80 Km, NE; Raibag-Gokak Road (SH-73) – 12.56 Km, SW.

#### **4.6 Soil Classification**

The soils of Belagavi district 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 predominate the Deccan Trap terrain and the red soils are found in the southwestern and south eastern part of the district in gneissic terrain. These soils in turn can be grouped into seven categories as given below, out of which the first five cover large tracks of land while the last two are local in nature.

#### **4.7 Climate and Rainfall Data from Secondary Source**

The climate of the district as a whole can be termed as semi-arid. The variation in the maximum temperature during the year ranges from 27°C to 35.7°C and minimum from 13.9°C to 20.6°C. The district experiences pleasant winters and hot dry summers. The hot season extends from March to May, during which the daily maximum temperature often shoots up to 35.7°C. The annual rainfall in the region is about 566 mm. Type of soil present is deep black soil and red soil.

#### **4.8 Social Infrastructure available**

The Project site is well connected by SH-31. (Gokak – Athani Road) The nearest populated village is Alagawadi which is located at distance of 2.09 Km in southwest direction and Raibag is located in West direction – 12.55 km away from the plant and Raibag Taluk located at 12.55 Km to W.

## CHAPTER 5 -Planning

### 5.1 Planning concept (type of industries, facilities, transportation, etc.) Town and Country planning Development authority classification.)

The proposed project is Expansion of Sugarcane Crushing Unit from 4500 TCD to 12000 TCD, Co-generation Unit from 14 MW to 39.60 MW and Establishment of 180 KLD Multi feed (Grain/ Cane Juice/ BH - Molasses and C Molasses) based Distillery Unit a proposed to develop in the existing Sugar and Cogeneration industry with a total area of 189 Acres 5 Guntas.

The Project site is well accessed by SH-31. The nearest populated village is Alagawadi which is located at distance of 2.09 Km in southwest direction and Raibag is located in West direction - 12.55 km away from the plant and Raibag Taluk located at 12.55 Km to W.

### 5.2 Population Projection

- Belagavi with a total population of 47,79,661 is the 2nd most populous district in the State. The district ranks 1st in terms of rural population and 3rd in terms of urban population.
- Belagavi district accounts for 7.8 percent of the total population of the State, second only to Bangalore District. With the decadal growth rate of 13.4 percent, it ranks 12th in the State in terms of decadal growth rate. The district with a Sex ratio of 973 holds 21st rank in the State, the same rank as in 2001 Census.
- The district with a Sex ratio of 934 among the child population in the age-group 0-6 holds the penultimate rank of 29th in the State. The proportion of child population, (0-6 age-group) is 13.1 percent in the district and ranks 9th in the State. The district has a literacy rate of 73.5 percent and is placed at 16th rank in the State.
- The male literacy rate in the district is 82.2 percent and the female literacy rate is 64.6 percent. The male - female literacy gap in the district is 17.6 percentage points, which is higher than the male - female literacy gap registered by the State (14.4 percentage points). The Scheduled Caste population contributes 12.1 percent to the total population of the district and the Scheduled Tribe population contributes 6.2 percent. The district has registered a work participation of 44.1 percent and stands at 22nd rank in the State.
- The work participation rates for male and female population are 56.6 and 31.1 respectively in the district. Among the total workers in the district 82.4 percent are Main workers and 17.6 percent are Marginal workers. Major work force of 64.6 percent is engaged in Agricultural sector i.e., Cultivators (33.8 percent) and Agricultural Labourers (30.8 percent). Cultivators constitute 33.8 percent of the total workers in the district and the district holds 5th rank in the State. In Belagavi district 2.9 percent of the total workers are engaged in Household Industry and 32.5 percent are other workers. About 55.9 percent of the total population in the district is non-workers.
- Belagavi is the largest district in the state with the total area of 13433 sq. km. The district has a density of 356 and is placed at 8th rank in the State. Belagavi District has the 1,275 number of villages, 18 Statutory Towns and 13 Census Towns.

- The project will be providing employment to nearly 79 workers. The local persons will be given preference in employment as per the qualification and technical competencies. The above man power covers the top management, middle and junior level executives and other supporting staff including workforce.

### 5.3 Land use planning (breakup along with green belt etc.)

Table 5.1 showing break up of present land use

Sl. No.	Description	Area required for Existing proposal in Acres : Guntas	Area required for Proposed proposal in Acres : Guntas	Total Area in Acres
1	Green Belt Area 33% of Plot Area	30 : 00	32 : 17	62 : 17
2	Parking Area (15% of the Total Area)	6 : 00	24 : 00	30 : 00
3	Sugar Plant	23 : 37	5 : 03	76 : 00
	Distillery Unit Area	-	22 : 00	
	Co-gen Unit	18 : 00	7 : 00	
4	Land Reserved for Future Development	-	1 : 28	1 : 28
5	Roads	8 : 00	7 : 00	15 : 00
6	Officers and workers colony	2 : 00	2 : 00	4 : 00
<b>Total Area</b>		<b>87 Acres 37 Guntas</b>	<b>101 Acres 08 Guntas</b>	<b>189 Acres 05 Guntas</b>

### 5.4 Assessment of Infrastructure Demand (Physical & Social)

The road facility available shall be maintained. Infrastructure facilities like road transport, post & telegraph, telephone, banks, etc are basics for each and every area. There will not be any negative impact on the living conditions of the people. With upcoming of this industry the surrounding areas are expected to improve by way of socio-economic development due direct and in direct employment. The project will also improve business opportunities in the locality.

### 5.5 Amenities facilities

A well planned office will be provided having sufficient space to accommodate executives and staff. It will be equipped with telephones and internet facilities. Facilities like canteen, rest room will be provided in the proposed plant as basic facilities to workers.

## CHAPTER 6 - Proposed Infrastructure

### 6.1 Industrial Area (Processing area)

Total site area & the area break-up is given below.

Sl. No.	Proposed Facilities	Plinth area in acres
1	Total area	189 Acres 05 Guntas
2	Green Belt Area	62 Acres 17 Guntas

### 6.2 Residential Area (Non Processing Area)

No colonization is proposed in the proposed project.

### 6.3 Green belt

33% of the total land availability will be reserved for plantation i.e. Green belt development plan

- Green belt of 33% of the area will be developed in the plant premises as per CPCB guidelines.
- The tree species to be selected for the plantation are pollutant tolerant, fast growing, and wind firm, deep rooted. Plantation is proposed comprising of an outer most belt of taller trees which will act as barrier.

### 6.4 Social Infrastructure

M/s. ABSPL has already developed very good social infrastructure for its existing sugar and co-gen units. With the start of construction phase, various employment opportunities will be generated. Several persons will be benefited with contract works, employment through contractor and transport related business avenues. People will be provided with direct and in direct employment such as contract work, development work.

### 6.5 Connectivity

The Project site is well accessed by SH-31. The nearest populated village is Alagawadi which is located at distance of 2.09 Km in southwest direction and Raibag is located in West direction - 12.55 km away from the plant and Raibag Taluk located at 12.55 Km to W has very good connectivity to all villages, industries in the surroundings of the proposed project.

### 6.6 Drinking Water Management

Drinking water for the proposed project will be met through Krishna River which is located at a distance of 12.80 Km away from the project site.

The major objective and benefit of utilizing Environmental Management Plan in project planning stage itself, is to prevent avoidable losses of environmental resources and values as a result of Environmental Management Plan. Environmental Management Plan includes protection/mitigation/enhancement measures as well as suggesting post project monitoring programme. It may often suggest additional project operations that have to be incorporated in the conventional operation.

The assimilative capacity of the study area is the maximum amount of pollution load that can be discharged in the environment without affecting the designated use and is governed by dilution, dispersion and removal due to Physic-chemical and biological processes. The EMP is required to ensure sustainable development in the

study area of the proposed plant site, hence it needs to be all encompasses plan for which the proposed industry, Government, regulating agencies like pollution control board working in the region and more importantly the affected population of the study area need to extend their cooperation and contribution. It has been evaluated that the study area has not been affected adversely as there are no major polluting industries in the study area and likely to get economic incentive. The affected environmental attributes in the region are air quality, water quality, soil, land use, ecology and public health. The management action plan aims at controlling pollution at the source level to the possible extent with the available and affordable technology followed by treatment measures before they are discharged. Environmental management plan aims at the preservation of ecosystem by considering the pollution abatement facilities at the plant commencement.

### 6.7.1 Sewerage System

Domestic effluent is treated in septic tank and soak pit. Industrial effluent will be treated in the ETP.

### 6.8 Industrial Management

Effluent generated will be treated in the ETP and treated water will be used within the plant premises for irrigation purposes after confirming norms stipulated by KSPCB.

Condensate polishing unit (CPU) : A well designed CPU will treat all condensate & regeneration wastewater etc., to the level fit for recycling for process & cooling tower makeup etc.,

### 6.9 Solid Waste Management

Sl. No.	Solid Waste	Disposal
1.	Yeast Sludge	Dried in sludge bed and used as manure.
2.	ETP Sludge	Used as manure.
3.	CPU Sludge	Used as manure.
4.	Boiler ash	Ash generated will be sold to brick manufacturers.
5.	Press Mud	Used as manure
6.	DDGS	Sold as cattle feed to farmers
7.	Domestic Solid waste	Segregated into organic and inorganic solid waste and handed over Municipal solid waste management plant

### 6.10 Power Requirement & Supply Source

For Operation of proposed project total power requirement will be 19500 kWh and it will be met from the new 39.60 MW Co-Gen Unit.

## **CHAPTER 7 - Rehabilitation and Resettlement (R & R) Plan**

### **7.1 Policy to be adopted (Central/State) in respect of the project affected persons including home outees, land outees and landless laborers (a brief outline to be given)**

Not applicable. No rehabilitation and resettlement is required as the land is in the name of M/s. Alagawadi Bireshwar Sugars Pvt. Ltd. and ABSPL is operating their existing sugar manufacturing unit & co-gen unit with all necessary permits from various departments including KSPCB. They have land of 189 Acres 8 Guntas in the existing premises same will be utilized for the Expansion of Sugarcane Crushing Unit from 4500 TCD to 12000 TCD, Co-generation Unit from 14 MW to 39.60 MW and Establishment of 180 KLD Multi feed (Grain/ Cane Juice/ BH-Molasses and C - Molasses) based Distillery Unit.

## CHAPTER 8 - Project Schedule & Cost Estimation

### 8.1 Project Schedule

The plant will be implemented in 24 months from the date of receipt of Environmental Clearance from the Hon'ble MoEF & CC and CFE from KSPCB.

### 8.2 Project Cost

Sl. No.	Particulars	Phase - I		Phase - II		Distillery Unit 180 KL D	Amount in Lakhs
		4500 TCD Sugar	14 MW Co-Gen	7500 TCD Sugar	25.60 MW Co-Gen		
1	Land	500	200	600	550	450	2300
2	Site Development	48	45	62	60	70	285
3	Civil Works	2346	1046	1734	2423	2244	9763
3	Indigenous plant & machinery	10124	5959	8107	8024	11741	43955
4	Misc. Fixed Assets	230	201	342	283	325	1381
5	Prel. & Pre-operative expenses	1015	545	1106	1314	676	4692
6	Contingencies	214	120	179	310	232	1055
7	Working Capital margin	564	64	805	285	10	1728
	<b>Total</b>	<b>15077</b>	<b>8180</b>	<b>12935</b>	<b>13249</b>	<b>15748</b>	<b>651.58 Crores</b>

## **CHAPTER 9 - Analysis of Proposal**

The proposed manufacturing of sugar, co-gen unit and ethanol makes the country that much less dependent on imports of the petroleum products. With the implementation of the proposed project socio-economic status of the local people will improve substantially. This will help in up-liftment of the socio-economic status of the people in the area.

**APPENDIX I**  
**(See paragraph – 6)**  
**FORM 1**

**(I) Basic Information:**

Sl. No.	ITEM	DETAILS
1.	Name of the Project/s	<b>Expansion of Sugarcane Crushing Unit from 4500 TCD to 12000 TCD, Co-generation Unit from 14 MW to 39.60 MW and Establishment of 180 KLD Multi Feed (Grain/Cane Juice/BH- Molasses &amp; C-Molasses) based Distillery Unit at Alagawadi Village, Raibag Taluk, Belagavi District Karnataka by M/s. Alagawadi Bireswar Sugars Private Limited (ABSPL)</b>
2.	S.No. in the Schedule	<b>Category A- 5 (j) , 5(g) &amp; 1(d)</b>
3.	Proposed capacity/area/length/tonnage to be handled/command area/lease area/number of wells to be drilled	<b>Expansion of Sugarcane Crushing Unit from 4500 TCD to 12000 TCD, Co-generation Unit from 14 MW to 39.60 MW and Establishment of 180 KLD Multi Feed (Grain/Cane Juice/BH- Molasses &amp; C-Molasses) based Distillery Unit</b>
4.	<b>New/Expansion/Modernization</b>	<b>Expansion</b>
5.	Existing capacity/Area etc.	<b>Existing Sugarcane Crushing Unit of capacity 4500 TCD and 14 MW Co-generation Unit.</b>
6.	Category of Project i.e., 'A' or 'B'	<b>A</b>
7.	Does it attract general condition? If yes, please specify.	<b>No</b>
8.	Does it attract specific condition? If yes, please specify.	<b>No</b>
9.	Location Plot/Survey/Khatha No. Village Tehsil District State	<b>Sy. No. 98/1, 98/2, 100/3, 100/4, 101/1B, 101/2, 101/1A, 101/3A, 101/3B, 102/3F, 102/3E, 102/3D, 102/3K, 102/3B, 102/3A, 103/15, 103/14, 103/13, 103/12, 103/11, 103/10, 103/9, 103/8, 103/7, 103/6, 103/5, 103/4, 103/3, 103/2, 103/1, 104/2, 104/3, 104/4A, 104/4B, 104/1B, 104/1A, 105/1A, 105/1B, 106/1A, 106/1B, 106/1K, 107/3, 107/4, 107/5, 107/6, 107/7, 107/8, 107/9, 107/10, 108/3, 108/2, 183/1, 184/1, 184/2, 185/1 of Alagawadi Village, Raibag Taluk, Belgavi District, Karnataka State.</b>
10.	Nearest railway station/airport along with distance in Kms.	<b>Railway Station:</b> • <b>Chinchli Railway Station- 7.63 Km,</b>

		<p>NW.</p> <ul style="list-style-type: none"> <li>• Raibag Railway Station-9.32 Km, SW.</li> </ul> <p>Airport:</p> <ul style="list-style-type: none"> <li>• Kolhapur airport-67.25 Km, NW.</li> <li>• Belgaum airport-76.64 km, SW.</li> </ul>
11.	Nearest Town, City, District Headquarters along with distance in Kms.	<b>Raibag located at a distance of 12.55 Km from the plant.</b>
12.	Village Panchayat, Zilla Parishad hudali, Municipal Corporation, Local body (complete postal addresses with Telephone Nos. to be given).	<b>Alagawadi Gram Panchayat - Government office Belagavi District Alagawadi, Karnataka 591317 PDO-09880125563</b>
13.	Name of the Applicant	<b>Mr. Gurunath N Joshi, Director</b>
14.	Registered Address	<b>Regd. Office: # 627, Kalleshwara Rice Mill Compound, RMC Road, Anekonda, Davangere - 577001</b>
15.	Address for Correspondence	<b>Mr. Gurunath.N.Joshi Director, M/s. Alagawadi Bireshwar Sugars Private Limited Alagawadi Village, Raibag Taluk, Belgaum District - 591317 absplcpl@gmail.com Mobile No. 9731598560</b>
	Name	
	Designation (Owner/Partner/CEO)	
	Address	
	Pin Code	
	E-mail	
	Telephone No.	
Fax No.		
16.	Details of Alternative Sites examined, if any. Location of these sites should be shown on a topo-sheet.	<b>No</b>
17.	Interlinked Projects	<b>No</b>
18.	Whether separate application of interlinked project has been submitted?	<b>Not Applicable</b>
19.	If yes, date of submission	<b>Not Applicable</b>
20.	If no, reason	<b>Not Applicable</b>
21.	Whether the proposal involves approval/clearance under: if yes, details of the same and their status to be given.	<b>No  No Not Applicable.</b>
	(a) The Forest (Conservation) Act, 1980?	
	(b) The Wildlife (Protection) Act, 1972?	
	(c) The C.R.Z Notification, 1991?	
22.	Whether there is any Government Order/Policy relevant/relating to the Site?	<b>IEM: 1025/SIA/IMO/2015, dtd. 07.07.2015 valid up to 07.07.2023.</b>
23.	Forest land involved (hectares)	<b>No</b>
24.	Whether there is any litigation pending against the project and/or land in which the project is propose to be setup?	<b>No</b>
	(a) Name of the Court	

	(b) Case No. (c) Orders/directions of the Court, if any and its relevance with the proposed project.	
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**(I) Activity:**

**1. Construction, operation or decommissioning of the Project involving actions, which will cause physical changes in the locality (topography, land use, changes in water bodies etc.)**

Sl. No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities /rates, wherever possible) with source of information data
1.1	Permanent or temporary change in land use, land cover or topography including increase in intensity of land use (with respect to local land use plan)	Yes	The total land is 189 Acres 05 Guntas out of which 87 Acres 37 Guntas is already converted to industrial purpose. The process of Industrial conversion for remaining 101 Acres 08 Guntas is under process.
1.2	Clearance of existing land, vegetation and buildings?	Yes	Clearing of vegetation will be done before commencement of the construction work. The same will be compensated through greenbelt development.
1.3	Creation of new land uses?	No	The total land is 189 Acres 05 Guntas out of which 87 Acres 37 Guntas is already converted to industrial purpose. The process of Industrial conversion for remaining 101 Acres 08 Guntas is under process.
1.4	Pre-construction investigations e.g. bore houses, soil testing?	Yes	Investigations e.g. bore houses, soil testing will be carried out.
1.5	Construction works?	Yes	Buildings & foundations required for 12000 TCD Sugarcane crushing, 39.60 MW Co-generation and 180 KLD Multi feed (Grain/ Cane Juice/ BH-Molasses & C-Molasses) based Distillery Unit will be constructed.
1.6	Demolition works?	No	No demolition work involved.
1.7	Temporary sites used for construction works or housing of construction workers?	Yes	During construction period, temporary Labour camps will be provided within the site.
1.8	Above ground buildings, structures or Earthworks including linear structures, cut and fill or excavations?	Yes	Establishment of the Industry will involve construction of above ground buildings and structures. Land filling will be carried out in the low laying areas of the project site.
1.9	Underground works including mining or tunneling?	No	Not applicable
1.10	Reclamation works?	No	Not applicable
1.11	Dredging?	No	Not applicable

1.12	Offshore structures?	No	<b>Not applicable</b>
1.13	Production and manufacturing processes?	Yes	<b>Expansion of Sugarcane Crushing from 4500 TCD to 12000 TCD Co-gen from 14 MW to 39.60 MW Distillery - Ethanol/ENA: 180 KLD By – Products : 1. Potash Powder (Juice/Syrup/BH-Molasses/C-Molasses) - 201 TPD 2. Dried Distillers Grain Soluble (Grain based) – 144 TPD</b>
1.14	Facilities for storage of goods or materials?	Yes	<b>Necessary raw material storage tanks will be provided within the Distillery premises.</b>
1.15	Facilities for treatment or disposal of solid waste or liquid effluents?	Yes	<b>Effluent generated will be treated in ETP of capacity 1250 KLD and condensate from sugar and distillery unit will be treated in separate CPU of Capacity of 3000 KLD and 1600 KLD with Zero Liquid Discharge (ZLD). 100% treated effluent will be recycled.</b>
1.16	Facilities for long term housing of operational workers?	No	<b>Not applicable</b>
1.17	New road, rail or sea traffic during construction or operation?	No	<b>Not applicable</b>
1.18	New road, rail, air waterborne or other transport infrastructure including new or altered routes and stations, ports, airports etc.?	No	<b>Not applicable</b>
1.19	Closure or diversion of existing transport routes or infrastructure leading to changes in traffic movements?	No	<b>Not applicable</b>
1.20	New or diverted transmission lines or pipelines?	Yes	<b>Required transmission lines and pipelines will be installed for power transmission and for spent wash /spent lees.</b>
1.21	Impoundment, damming, culverting, realignment or other changes to the hydrology of watercourses or aquifers?	No	<b>Not applicable</b>
1.22	Stream crossings?	No	<b>Not applicable</b>
1.23	Abstraction or transfers of water form ground or surface waters?	Yes	<b>We had applied for permission to draw 4000 KLD water from River Krishna the same shall be applicable for proposed project also. Request letter submitted to Krishna Bhagya Jal Nigam Ltd., (KBJNL) on 10.03.2021 for supply of 4000 KLD of water. It is under progress. Water Availability:</b>

			<ul style="list-style-type: none"> <li>• From River Krishna : 720000 KL @ 180 days (From June to November)</li> <li>• Condensate water from Sugar Plant: 405000 KL</li> </ul> <p><b>Total Quantity of Water Available : 1125000 KL</b></p> <p><b>Water Requirement:</b></p> <ul style="list-style-type: none"> <li>• For Sugar &amp; Co-Gen unit: 256250 KL</li> <li>• For Distillery unit : 356400 KL</li> </ul> <p><b>For Domestic use : 36500 KL</b></p> <p><b>Total Quantity required : 649150 KL</b></p> <p>Total 2330 KLD of Fresh water is required during Season, out of which 1250 KLD for Sugar &amp; Co-Gen Unit and 1080 KLD @ 6 KL/KL of Alcohol.</p>
1.24	Changes in water bodies or the land surface affecting drainage or run-off?	No	<b>Not applicable</b>
1.25	Transport of personnel or materials for construction, operation or decommissioning?	Yes	<p><b>Labour camp will be provided with all facilities within the proposed site and transport of construction materials will be mainly through trucks.</b></p> <p><b>Manpower requirement for proposed project during construction is 300 Nos and during Operation is 425 No's.</b></p>
1.26	Long-term dismantling or decommissioning or restoration works?	No	<b>Not applicable</b>
1.27	Ongoing activity during decommissioning which could have an impact on the environment?	Yes	<b>There is a short-term effect on environment during construction of proposed expansion of sugarcane crushing, co-generation and establishment of 180 KLD Multi feed (Grain/Cane Juice/Molasses) based Distillery unit.</b>
1.28	Influx of people to an area in either temporarily or permanently?	Yes	<b>Manpower requirement for proposed project during construction is 300 Nos. and during Operation is 425 Nos.</b>
1.29	Introduction of alien species?	No	<b>Not applicable</b>
1.30	Loss of native species or genetic diversity?	Yes	<b>If any, will be compensated through green belt development.</b>
1.31	Any other actions?	Yes	<b>Proposed green area of 33 % is scientifically planned with more of native species.</b>

**2. Use of Natural resources for construction or operation of the Project (such as land, water, materials or energy, especially any resources which are non-renewable or in short supply):**

Sl. No	Information/checklist confirmation	Yes/No	Details thereof (with approximate quantities /rates, wherever possible) with source of information data
2.1	Land especially undeveloped or agricultural land (ha)	No	The proposed expansion of sugarcane crushing, co-generation and establishment of multi feed (Grain/Cane Juice/BH-Molasses) based 180 KLD Distillery unit is going to be developed on the land of 189 Acres 05 Guntas.
2.2	Water (expected source & competing users) unit: KLD	Yes	Source of water is from Krishna River. Fresh Water requirement for the project is 2330 KLD.
2.3	Minerals (MT)	No	Not applicable
2.4	Construction material – stone, aggregates, sand / soil (expected source – MT)	Yes	As estimated: Sand -11500 MT Coarse aggregate -12000m <sup>3</sup> Fine aggregate -4150 m <sup>3</sup> Cement -2500 MT Steel -1500 MT Bricks -12500 MT
2.5	Forests and timber (source – MT)	No	Not applicable
2.6	Energy including electricity and fuels (source, competing users) Unit: fuel (MT), energy (MW)	Yes	<b>Total Power required:</b> <b>During Construction Phase – 500 kW/h</b> Power requirement will be met from existing D.G. Set of Capacity 1500 KVA. <b>During Operation Phase:</b> <b>For Co-Gen Unit – 4.0 MW/Hr</b> <b>For Sugar Plant – 12.0 MW/Hr</b> <b>For Distillery Unit – 3.5 MW/Hr</b> Power requirement will be met from 39.60 MW Co-generation Unit & for backup power D.G. Set of Capacity 1500 KVA will be used and the excess power of 20.1 MW will be sold out to power grids.
2.7	Any other natural resources (use appropriate standard units)	No	Not applicable

**3. Use, storage, transport, handling or production of substances or materials, which could be harmful to human health or the environment or raise concerns about actual or perceived risks to human health.**

Sl. No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
3.1	Use of substances or materials, which are hazardous (as per MSIHC rules) to human health or	Yes	Used oil from DG sets and Transformers, Oil Soaked Cotton waste.

	the environment (flora, fauna, and water supplies)		
3.2	Changes in occurrence of disease or affect disease vectors (e.g. insect or water borne diseases)	No	<b>Not applicable</b>
3.3	Affect the welfare of people e.g. by changing living conditions?	Yes	<b>Socio-economic status of the surrounding area will improve.</b>
3.4	Vulnerable groups of people who could be affected by the project e.g. hospital patients, children, the elderly etc.,	No	<b>Not applicable</b>
3.5	Any other causes	No	<b>Not applicable</b>

**4. Production of solid wastes during construction or operation or decommissioning (MT/month)**

<b>Sl. No.</b>	<b>Information/Checklist confirmation</b>	<b>Yes/No</b>	<b>Details thereof (with approximate quantities/rates, wherever possible) with source of information data</b>
4.1	Soil, overburden or mine wastes	Yes	As soon as the construction work is over debris will be cleared and all un built surfaces reinstated. Scientific green area plan will be implemented with maximum No. of native species.
4.2	Municipal waste (domestic and or commercial wastes)	Yes	Organic solid wastes such as garden trash, vegetable wastes, food waste and Inorganic solid wastes such as Papers, plastics, floor sweepings etc., will be generated from the industry premises. The organic and inorganic wastes will be segregated and handed over to Municipal Solid waste management unit on day to day basis.
4.3	Hazardous wastes (as per Hazardous Waste Management Rules)	Yes	Used Oil from the D.G. Sets and Transfers oil (Category 5.1) Oil soaked cotton waste (Category 5.2)
4.4	Other industrial process wastes	Yes	Bagasse: 3444 TPD Bottom Ash: 12.50 TPD Fly Ash: 28.50 TPD Total Ash: 41.00 TPD Press Mud: 480 TPD ETP sludge: 112 Kg/day Yeast from Distillery: 5.40 TPD CPU Sludge: 0.150 TPD DDGS: 144 TPD
4.5	Surplus product	No	Surplus power from Co-gen unit is sold to HESCOM or through Open Access.
4.6	Sewage sludge or other sludge from effluent treatment	Yes	ETP sludge – 112 Kg/day CPU Sludge – 0.150 TPD STP Sludge - 0.85 Kg/Day

4.7	Construction or demolition wastes	Yes	The generation of waste material is inevitable during the construction activity. Waste is generated at different stages of the construction activity. Waste during construction activity relates to excessive cement mix or left over concrete after the work is over, rejection caused due to change in design or wrong workmanship etc. Concrete appears in two forms in the waste - structural elements of building have reinforced concrete, while foundations have mass non-reinforced concrete. Excavation of earth and rock generates muck. Other wastes include topsoil, clay, sand, and gravel. These are re-used for backfilling and for formation of internal roads, pavements, drains etc.
4.8	Redundant machinery or equipment	No	No redundant machinery
4.9	Contaminated soils or other materials	No	Not applicable
4.10	Agricultural wastes	No	Not applicable
4.11	Other solid wastes	No	Any other solid waste generated will be collected, segregated and will be disposed-off scientifically as per KSPCB guidelines.

#### 5. Release of pollutants or any hazardous, toxic or noxious substances to air (Kg/hr)

Sl. No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
5.1	Emissions from combustion of fossil fuels from stationary or mobile sources	Yes	Emissions from boiler & DG Sets, boiler will be provided with ESP & chimney as per norms & DG Sets will be provided with stack as per norms & it will be used only during power failure.
5.2	Emissions from production processes	Yes	Emission from Boiler section, (Bagasse + Coal 15%) – PM, NO <sub>x</sub> , SO <sub>2</sub> . From fermentation section – CO <sub>2</sub> No Incineration Boiler for Distillery unit, Steam required for Distillery is met through Co-Gen Boilers only.
5.3	Emissions from materials handling including storage or transport	Yes	Dust emissions arise during loading and unloading of the raw materials Vehicular exhaust (PM, SO <sub>x</sub> , NO <sub>x</sub> , CO <sub>2</sub> & CO etc.,).
5.4	Emissions from construction activities including plant and equipment	Yes	During construction phase:- Particulate Matter (PM <sub>10</sub> , PM <sub>2.5</sub> ) would be the predominant pollutant generated from construction activities. The gaseous emissions such

			<p>as SO<sub>2</sub>, NO<sub>2</sub> and unburnt hydrocarbons would be generated from the construction equipment's and vehicles.</p> <p>The main sources of emission during the construction period are the operations of construction equipment &amp; movement of construction vehicles within the site and dust emission during the earthwork for leveling, grading, foundation work and other construction activities. The dust emitted during the above mentioned activities depend upon the type of soil being excavated and the ambient humidity levels. The impact is likely to be for short duration and confined locally to the construction site.</p> <p>Exhaust emissions from vehicles and equipment deployed during the construction phase also result in marginal increase in the levels of SO<sub>2</sub>, NO<sub>2</sub>, Particulate Matter (PM<sub>10</sub>, PM<sub>2.5</sub>) and unburnt hydrocarbons. It may, therefore, be deduced that construction activities may cause changes in the PM levels locally. The impact will, however, be reversible, marginal, and temporary in nature. The impact of such activities would be temporary and restricted to the construction phase only. The impact will be confined within the project boundary and is expected to be negligible outside the project boundaries. Proper upkeep and maintenance of vehicles, sprinkling of water on roads in construction site, provision of sufficient plantation etc. are some of the proposed measures that would greatly reduce the impact on the air quality during the construction phase of the project.</p>
5.5	Dust or odors from handling of materials including construction materials, sewage and waste	Yes	<b>Dust can be noticed during loading and unloading of raw materials. Sewage will be treated in STP.</b>
5.6	Emissions from incineration of waste	No	<b>Not applicable</b>
5.7	Emissions from burning of waste in open air (e.g. slash materials, construction debris)	No	<b>Not applicable</b>
5.8	Emissions from any other sources	No	<b>Not applicable</b>

**6. Generation of Noise and Vibration, and Emissions of Light and Heat:**

<b>Sl. No.</b>	<b>Information/Checklist confirmation</b>	<b>Yes/No</b>	<b>Details thereof (with approximate quantities/rates, wherever possible) with source of information data with source of information data</b>
6.1	From operation of equipment e.g. engines, ventilation plant, crushers	Yes	From cogeneration process there will noise from the turbines area close to 85 dBA & same is limited to turbine area There will be tolerable noise from cooling towers. Noise from backup DG Sets is controlled by installing DG Sets on anti-vibrating mountings & in acoustic enclosures. This noise is limited to power failure only.
6.2	From industrial or similar processes	Yes	From cogeneration process there will noise from the turbines area close to 85 dBA & same is limited to turbine area. There will be tolerable noise from cooling towers. Noise from backup DG Sets is controlled by installing DG Sets on anti-vibrating mountings & in acoustic enclosures. This noise is limited to power failure only. The noise levels in and around the proposed industry are maintained within the stipulated norms both during the day and night time as per KSPCB norms.
6.3	From construction or demolition	No	Not applicable
6.4	From blasting or piling	No	Not applicable
6.5	From construction or operational traffic.	Yes	Heavy construction traffic for loading and unloading, fabrication and handling of equipment and construction materials are likely to cause an increase in the ambient noise levels. Further to minimize potential noise level impacts, major construction activities will be scheduled during normal daylight working hours. The contractor will be instructed to use all machinery of recent vintage with appropriate noise muffling devices resulting in the least possible noise. Overall, the impact of noise generated on the environment is likely to be insignificant, reversible and localized in nature and mainly confined to daytime and reduces gradually as the project progresses.
6.6	From lighting or cooling systems	Yes	Cooling towers noise levels are tolerable & is limited to cooling tower

			<b>area only.</b>
6.7	From any other sources	No	<b>Not applicable</b>

**7. Risks of contamination of land or water from releases of pollutants into the ground or into sewers, surface waters, groundwater, coastal waters or the sea:**

<b>Sl. No.</b>	<b>Information/Checklist confirmation</b>	<b>Yes/No</b>	<b>Details thereof (with approximate quantities/rates, wherever possible) with source of information data</b>
7.1	From handling, storage, use or spillage of hazardous materials	Yes	<b>HSD (Sulphur Content&lt;0.05%) is used in DG Sets. DG set used oil will be stored at an identified place, in leak proof barrels and will be handed over to KSPCB authorized reproprocessors.</b>
7.2	From discharge of sewage or other effluents to water or the land (expected mode and place of discharge)	Yes	<b>During operational phase trade effluent generated from Sugar unit will be treated in ETP of capacity 1250 KLD and utilized on-land for irrigation purpose after confirming the standards stipulated by KSPCB. Condensate Polishing unit of 3000 KLD will be established to treat the excess condensate generated from Sugar Cane. Spent Wash generated from Distillery unit will be concentrated by dryers to make spent wash powder / Potash derived from Molasses. Condensate Polishing unit of 1600 KLD will be established to treat the Condensate from Distillery unit to recycle the same to Fermentation section. Sewage generated will be treated in STP.</b>
7.3	By deposition of pollutants emitted to air into the land or into water	No	<b>Not applicable</b>
7.4	From any other sources	No	<b>Not applicable</b>
7.5	Is there a risk of long term built-up of pollutants in the environment from these sources?	No	<b>All pollutants are handle in a scientific manner thus there is no risk anticipated for long term built-up of pollutants in the environment from any of the source.</b>

**8. Risk of accidents during construction or operation of the Project, which could affect human health or the environment**

<b>Sl. No.</b>	<b>Information/Checklist confirmation</b>	<b>Yes/No</b>	<b>Details thereof (with approximate quantities/rates, wherever possible) with source of information data</b>
8.1	From explosions, spillages, fires etc., from storage, handling, use or production of hazardous substances	No	<b>Not applicable</b>
8.2	From any other causes	No	<b>Not applicable</b>

8.3	Could the project be affected by natural disasters causing environmental damage (e.g. Floods, earthquakes, landslides, cloudburst etc.)?	No	Not applicable
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**9. Factors which should be considered (such as consequential development) which could lead to environmental effects or the potential for cumulative impacts with other existing or planned activities in the locality**

Sl. No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
9.1	Lead to development of supporting Utilities, ancillary development or development stimulated by the project which could have impact on the environment e.g.: <ul style="list-style-type: none"> <li>Supporting infrastructure (roads, power supply, waste or waste water treatment, etc.)</li> <li>housing development</li> <li>extractive industries</li> <li>supply industries</li> <li>other</li> </ul>	Yes	<ul style="list-style-type: none"> <li><b>Internal roads will be constructed</b></li> </ul>
9.2	Lead to after-use of the site, which could have an impact on the environment	No	Not applicable
9.3	Set a precedent for later developments	No	Not applicable
9.4	Have cumulative effects due to proximity to other existing or planned projects with similar effects	No	Not applicable

**(III) Environmental Sensitivity**

Sl. No.	Areas	Name/ Identity	Aerial distance (within 15 km.) Proposed project location boundary
1	Areas protected under international conventions, national or local legislation for their ecological, landscape, cultural or other related value	Yes	<ul style="list-style-type: none"> <li><b>Shahu Park RF- 8.6 Km, SW</b></li> <li><b>Rajaram RF-10.7 Km, SW</b></li> </ul>
2	Areas which are important or sensitive for ecological reasons - Wetlands, watercourses or other water bodies, coastal zone, biospheres, mountains, forests.	Harugeri Kere	<b>5.0 Km, NE</b>
		Krishna River	<b>12.80 Km, NE</b>
		Kempanjali Kere	<b>12.53 Km, SW</b>
		Ghataprabha LBC	<b>12.2 Km, SE</b>

		Chikkud Branch Canal	2.2 Km, SE
3	Areas used by protected, important or sensitive species of flora or fauna for breeding, nesting, foraging, resting, overwintering, migration	Yes	<ul style="list-style-type: none"> <li>• Harugeri Kere-5.0 Km, NE</li> <li>• Krishna River-12.80 Km, NE</li> <li>• Kempanjali Kere-12.53 Km, SW.</li> </ul>
4	Inland, coastal, marine or underground waters	Yes	<ul style="list-style-type: none"> <li>• Harugeri Kere-5.0 Km, NE</li> <li>• Krishna River-12.80 Km, NE</li> <li>• Kempanjali Kere-12.53 Km, SW.</li> </ul>
5	State, National boundaries	No	Nil
6	Routes or facilities used by the public for access to recreation or other tourist, pilgrim areas	Yes	<ul style="list-style-type: none"> <li>• SH-31 (Gokak-Athani Road) - 4.17 Km, SE;</li> <li>• SH 53 (Jamkandi Miraj Road) - 6.80 Km, NE;</li> <li>• SH-73 (Raibag-Gokak Road) - 12.56 Km, SW;</li> </ul>
7	Defense installations	No	Nil
8	Densely populated or built-up area	Yes	<ul style="list-style-type: none"> <li>• Harugeri – 5.17 Km, NE</li> <li>• Raibag – 12.55 Km, W</li> </ul>
9	Areas occupied by sensitive man-made land uses ( <i>hospitals, schools, places of worship, community facilities</i> )	Yes	Raibag – 12.55 Km, W
10	Areas containing important, high quality or scarce resources ( <i>ground water resources, surface resources, forestry, agriculture, fisheries, tourism, minerals</i> )	No	Nil
11	Areas already subjected to pollution or environmental damage. ( <i>those where existing legal environmental standards are exceeded</i> )	No	Nil
12	Areas susceptible to natural hazard which could cause the project to present environmental problems ( <i>earthquakes, subsidence, landslides, erosion, flooding or extreme or adverse climatic conditions</i> )	No	Nil

**Proposed Terms of Reference: Attached as Annexure**

“I hereby give an undertaking that the data and information given in the application and enclosures are true to the best of my knowledge and belief and I am aware that if any part of the data and information submitted is found to be false or misleading at any stage, the project will be rejected and clearance given, if any to the project will be revoked at our risk and cost”.

**Date:**  
**Place:**

**M/s. Alagawadi Bireshwar Sugars Private Limited,**



  
**Gurunath N. Joshi**  
**Director**