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EXECUTIVE SUMMARY

1.0 INTRODUCTION

M/s. Krantiagrani Dr. G.D. Bapu Lad Sahakari Sakhar Karkhana Ltd., is a co-operative sugar mill located at village Kundal, Tal-Palus, Dist- Sangli, Maharashtra. It was set up in the year 1997 and is registered under the Government of Maharashtra Co-operative Societies Act with registration number SAN/TGN/PRG/S-78/1997 dated 12/05/1997. It was established under the dynamic leadership of freedom fighter late Krantiagrani Dr. G.D. Bapu Lad. The first crushing season of the mill was completed successfully in 2002-03. Currently the mill is working under a visionary Chairman, Mr. Arun (Anna) Lad. During last 17 years, this mill has modernized and subsequently established a cogeneration unit as well as distillery unit. The present installed capacity of the sugar mill is 8,500 TCD along with bagasse-based cogeneration unit of 36 MW and distillery unit of 60 KLPD. The crushing capacity of the mill was increased recently to 8,500 TCD resulting in a proportionate increase in the molasses generation. The ethanol blending programme (EBP) announced by government of India (GoI) looks promising for the distillery industry. Considering all these, the management has decided to expand its distillery capacity from 60 KLPD to 90 KLPD. This will be achieved mainly by modifying the existing setup and addition of few required machines/equipment.

1.1 Selection of Site:

The present site fulfills the industrial site selection criteria of MoEFCC. Molasess will be available from own sugar mill and supplementary from nearby sugar mills. Also, water, electricity, good infrastructure, support facilities and labour etc. is also available in the area. Following Table 1 gives highlights of the project.

Table 1: Highlights of the project

1..	**Project Proponent**	**M/s. Krantiagrani Dr. GD Bapu Lad Sahakari Sakhar Karkhana Ltd.,**	
2.	Project	Expansion of molasses -based distillery unit from 60 to 90 KLPD	
3.	Location of the project	Gat no. 2955, Kundal, Taluka Palus, District Sangli, Maharashtra	
4.	Working days	Year around	
5.	Product	Rectified spirit followed by Anhydrous Alcohol (Fuel ethanol)	**90 KLPD**
		Fusel oil	720 L/day
6.	Effluent Treatment	Integrated Evaporation followed by standalone multi-effect evaporation (MEE) followed by incineration	

	System	For spent lees, condensate and other effluent: Two stage biological treatment followed by tertiary treatment			
7.	Air Pollution Control	Stack of 75 m (with inner diameter of 3 m) with ESP (Electrostatic precipitator)			
INFRASTRUCTURE					
8.	Land	The project proponent holds around 126.4 acres of land which is already under industrial use i.e. for sugar, cogeneration and distillery units. The existing distillery occupies 14.23 acres. Proposed expansion is mainly through modification of existing set up and will not require any additional land.			
9.	Main Raw Material	Raw material	Quantity		
			Existing	Proposed	Total
		Molasses (C-Type) TPD OR Molasses (B-Type) TPD OR Sugarcane juice m^3/day	222	111	333 TPD 300 TPD 2727
11.	Technology for Product Manufacturing	Continuous/Fed-batch fermentation & Multi-pressure-vacuum distillation for the production of Rectified spirit or Extra Neutral Alcohol with Molecular Sieve De-Hydration (MSDH) plant for Anhydrous/Fuel ethanol			
12.	Steam	26.5 TPH Source: Existing incineration boiler with 2 MW STG			
13.	Fuel	Existing Conc. Spentwash 148 TPD + coal 60 TPD After expansion Conc. Spentwash 178.5 TPD + coal 76.5 TPD			
14.	Boiler	Existing incineration boiler of 22 TPH with pressure 45 kg/cm^2 will be used after augmentation			
15.	Power	Existing 1.6 MW After expansion 2 MW (Source: Captive incineration boiler)			
16.	Total Water Requirement	861 m^3/day			
17.	Water Source	Krishna River through canal.			
18.	Manpower	Existing: 137. No new manpower is proposed			
FINANCIAL ASPECTS					
19.	Total Project Cost	**424.75 lakh**			

20.	Capital expenses for environmental management	136.25 Lakhs

2.0 MATERIAL AND INFRASTRUCTURE

2.1 Molasses

Molasses is the main raw material for the proposed project. The molasses requirement after the expansion will be 333 TPD for C type or 300 TPD for B heavy type. In this case, considered 330 days' operation per annum. Hence, molasses requirement would be 109,890 TPA for C-type OR 99,000 TPA for B-heavy type. Whereas its availability from own mill will be up to 48,000 TPA for C-type and 72,000 TPA for B-heavy. In case of B-heavy, the project will need to purchase 27,000 TPA of molasses from external sources. Whereas in case of C-type, project will need to purchase 61,890 TPA of molasses. Separate mild steel (MS) tanks available in sugar as well as distillery unit to store molasses.

2.2 Water

The distillery unit will require 861 m^3/day fresh water after recycling of process condensate and spent lees. Daily fresh water requirement for the after proposed expansion activity is discussed in Table 2.

Table 2: Summary of water balance

Particulars	Intake	Consumption And Losses	Generated Effluent	Recycle and Reuse	Daily Net Requirement
Industrial Process	1085	5	180.0	900*	185
Boiler feed	636	30	12	594	42
Cooling Purpose	624	624	00	00	624
Pump and gland cooling	100	00	00	100	00
Domestic	10	3.00	7	00	10
Other	-----	-----	-----	----	----
Total	**2455.0**	**662.0**	**199.0**	**1594.0**	**861**
The fresh water requirement per lit of Alcohol including domestic water					9.56 lit/lit of RS

Note: Water balance in detail provided in chapter II – page 2-10 of main EIA report.

2.3 Fuel

Concentrated spent wash of >55° brix up to 60° brix will be incinerated along with coal. Spent wash available for incineration will be 144 m^3/day or 178.5 TPD. This quantity of spent wash will produce 15

TPH steam (GCV 1750K.cal). Concentrated spent wash to coal will be used in 70:30 ratio.

2.4 Steam

Maximum steam requirement will be 23.25 TPH including, steam required for re-boiler, integrated evaporation and standalone spent wash multi-effect evaporation plant. It will be produced from existing 22 TPH boiler after augmenting its capacity appropriately.

2.5 Power

The estimated power requirement for proposed expansion is 2 MW. It will be fulfilled from the captive incineration boiler. In case of shut down, it will be purchased from state electricity grid.

2.6 Boiler

Existing distillery having an incineration boiler of 22 TPH having 46.5 kg/cm2 (g) pressure & 400 ± 5°C temperature. The capacity of this boiler shall be augmented to fulfill the steam requirements of the distillery after proposed expansion.

2.7 Fuel Handling System

Entire coal storage area/ yard is covered with permanent weather shed roofing and walls on four sides. Mechanized fuel handling system as well as dust suppression system is installed for this area. Coal handling conveyor will have a capacity of max. 5 TPH. The conveyors are suitably covered with hood or enclosures.

2.8 Ash Handling System

Mechanical ash handling system will be used. Control techniques for fugitive dust emission from ash storage pond, involves watering, chemical stabilization (if required), reduction of surface wind speed with windbreaks or source enclosures.

2.9 Land

The sugar factory is holding more than 126.4 acres of land. The land is flat and already under the industrial use (i.e. sugar factory and allied units). The existing distillery unit has occupied land of 14.23 acres. Proposed expansion will be carried out mainly through minor modifications in the existing setup. Hence, it will not require any additional land. The proposed expansion will easily get accommodated in the existing land of 14.23 acres (for distillery unit).

2.10 Manpower

The project will use the existing manpower at present 137. However, anticipated indirect employment opportunities will be from transportation, local service providers, etc.

3.0 PROCESS DESCRIPTION

For the proposed project, the Management has planned to adopt the latest technology for process as well as for effluent disposal. Overall objective of this is to achieve high efficiency of operations, save energy and water and achieve Zero Liquid Discharge (ZLD). The characteristic of manufacturing process is given below and a schematic is shown in Fig. 2.

3.1 Manufacturing Process

The production process mainly involves fermentation and distillation process.

3.1.1 Fermentation

Molasses is the chief raw material used for production of alcohol. Molasses contains around 50% total sugars, of which 30 to 33 % are cane sugar and the rest are reducing sugar. *Saccharomyces cerevisieae*, converts sugars such as sucrose or glucose present in the molasses in to alcohol. The continuous fermentation process involves addition of fresh nutrients medium either continuously or intermittent withdrawal of portion of nutrient for recovery of fermentation products. In continuous process, fermenter is in constant usage with little shut down and after initial inoculation of yeast culture, further inoculation is not necessary. It has many advantages like continuity of operation, higher efficiency and ease of operation. Most modern ethanol production plants adopt this continuous fermentation technology. The yield of alcohol is ~270 litres/ ton of C type molasses and 300 to 330 litres for B-heavy type.

3.1.2 Distillation

After fermentation, the next stage in the manufacturing process is to separate alcohol from fermented wash and to concentrate it to 95%. This called Rectified Spirit (RS). For this purpose, method of multi-pressure distillation will be adopted. After separation of alcohol, the remaining part is the effluent of the process i.e. spent wash and spent lees.

3.1.2.1 Multipressure Distillation

Multi-pressure distillation system for production of Rectified spirit consists of distillation columns.
Advantages of MPR Distillation:

a. Maximum heat integration is possible.
b. Few columns operate under vacuum, few under pressure, few under atmospheric pressure.
c. Low steam consumption with reboiler (2.2 Kg/lit. of Rectified Spirit)
d. Spent wash generation is less.

3.1.2.2 Re-distillation to manufacture Extra Neutral Alcohol (ENA)

ENA is prepared by re-distillation of the rectified spirit (RS) for the removal of impurities like higher alcohols, aldehydes and methyl alcohol. This is done by, remixing rectified spirit with soft water and distilling it in the ENA column.

3.1.2.3 Anhydrous Alcohol (AA)

Anhydrous alcohol is an important product required by industry. As per IS specification it is nearly 100% pure or water free alcohol. Alcohol as manufactured by Indian distilleries is rectified spirit, which is 94.68% alcohol. It is not possible to remove remaining water from rectified spirit by straight distillation as ethyl alcohol forms a constant boiling mixture with water at this concentration and is known as azeotrope. Therefore, special process for removal of water is required for manufacture of anhydrous alcohol. The various processes used for dehydration of alcohol are Azeotropic Distillation, Molecular Sieves and Evaporation / Vapor permeation system

Details of molasses and product storage tanks are given in Table 3.

Table 3: Details of Storage Tanks

SPECIFICATIONS FOR RECEIVERS & STORAGE TANKS – THICKNESS AS PER IS-803- 1976:			
#	Particulars	Quantity	Capacity (inm^3)
1.	Rectified spirit receivers	3	244.22
2.	Impure spirit receivers	3	42.16
3.	* Rectified spirit storage tanks	3	2041.93
4.	* Impure spirit storage tank	1	281.61
5.	Fusel oil storage tank	1	14.06
6.	Molasses storage at distillery (Tons)	2	21952 MT
7.	Molasses storage at sugar mill (Tons)	2	15072 MT

***** These will be provided with flame arrester & cooling vent condenser. The level indicators provided on all tanks. Receivers are also provided with flame arrester (SS-304).

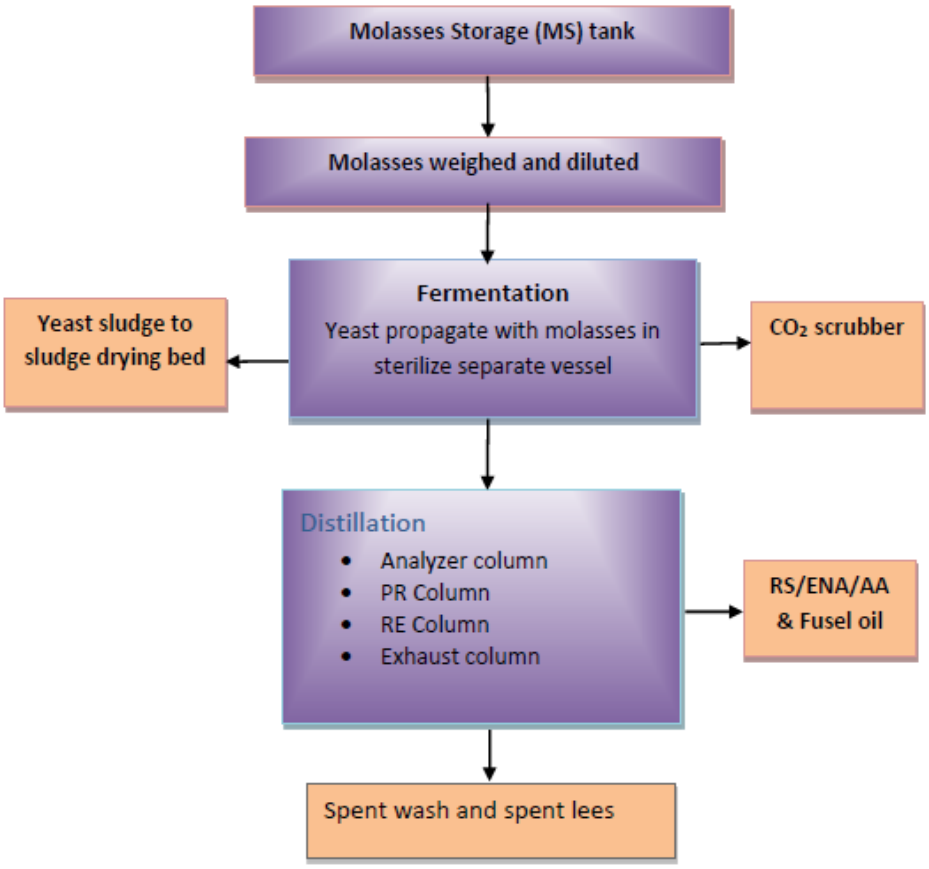

Figure 1: Schematic of RS/ENA/AA manufacturing process

4 .0 BASELINE ENVIRONMENTALCONDITIONS

The guiding factors for the present baseline study are the requirements prescribed by the Ministry of Environment, Forestry and Climate Change (MoEFCC) for conducting Environmental Impact Assessment study published in the EIA notification 2006 and its subsequent amendments. Apart from this, the terms of reference for the EIA were also considered while planning and executing the monitoring. For baseline data collection sampling of air, water and soil was carried out from October 2019 to January 2020.

The baseline study begins with site visits and reconnaissance survey in the study area. During these visit the locations were fixed for the monitoring and collection of primary data.

Table 4: Summary of Environmental features of study area

#	Facet	In brief
1	General characteristics	Hot and dry
2	Rainfall	An average annual rainfall of 550 mm Rains are received mainly during June-September months
3	Temperature	The maximum temperature in summer is around 38°C and minimum temperature in winter is around 12°C.
4	Humidity	The maximum relative humidity was 55 percent. The mean relative humidity ranges between 26-28 percent
5	Wind	Predominant wind direction was West followed by North West and the average wind speed was 11.3 km/hr during the study period
6	Land use	Crop land area 76.7 %, scrub land 16.12 %, forest 4.22%, settlement area 1.71 %, river/water bodies 1.28%
7	Air Quality	Complies NAAQ standards of Nov. 2009 at all monitored locations
8	Noise	Complies the standard
9	Ground water	As per Central Ground Water Board report 2013, the groundwater quality in the district is affected because of high NO3 concentrations
10	Soil	Medium and deep black
11	Nearest sanctuary	Yashwantrao Chavan Sagreshwar Wildlife Sanctuary at 1.7 km from the site

5.0 IMPACT ASSESSMENT AND ENVIRONMENT MANAGEMENT PLAN

5.1 Air Environment

Ambient air quality of the study area was assessed through a network of eight air monitoring stations, considering the wind pattern for the study area. Methods used for AAQ analysis:$PM_{2.5}$ & PM_{10}: USEPA, NOx: IS- 5182 (Part vi) 2006, SO_2: IS- 5182 (Part ii) 2001.

The values for PM_{10}, $PM_{2.5}$, SO_2, and NOx for all monitored locations were well within National Ambient Air Quality (NAAQ) Standard limits.

5.1.1 Impact causing factors

1) **Emissions from process:** It will be due to incineration of spent wash alongwith coal. Carbon dioxide will get generated from fermentation process.

2) **Transportation:** Vehicular pollution due to transportation activity, dust from roads, loading unloading

of material and transportation of material will involve mainly transportation of coal, molasses to some extent and ethanol/spirit. For transportation of the coal approx. 2974 dumpers will get involved annually and transportation of finished product i.e. RS/ENA or AA will require about 1485 tankers (considering each tanker of 20 KL capacities) annually. Hence, this is anticipated to cause increase in particulate matter and NOx, particularly during the period/days of transportation. Hence, transportation activity anticipated as a major impact causing factor.

3) **Fugitive Emissions and Other sources of air pollution:** Fugitive emissions from handling and storage of coal and ash; transportation activities anticipated to cause significant negative impact.

4) In addition, odour anticipated as a major factor causing negative impact.

5.1.2 Impact Assessment: Transportation activities as described above are anticipated to cause increase in vehicular emissions. Increase in the particulate matter, CO, CO2, NOx and hydro-carbon in ambient air is anticipated due to increase in vehicular emissions. This increase is likely at site and along the transportation route. Since, the transportation will take place in bulk at periodic interval, increase in vehicular emissions will be fluctuating throughout the year.

The expected generation of CO_2 from a 90 KLPD distillery is 66.6 TPD. This will contribute to greenhouse effect.

5.1.3 Preventive, control and mitigation measures

System for suppression of dust from handling of coal and ash will be installed. It includes mainly, use of pulse jet bag filters for coal loading-unloading on conveyors, foggers/dust suppressors in coal and ash storage yard, wind breakers for ash storage area.

KAGDBLSSKL is using a CO_2 scrubber for removal of the gas from alcohol stream. Existing greenbelt of the industry will help to absorb some of the generated CO_2. The project proponent is exploring ways to mitigate this in a, environmentally and economically feasible way.

- ESP to control ash emission through stack with height 75 m
- Mechanized handling of coal and ash
- Plantation of 2500 trees proposed for greenbelt/tree density enhancement
- Provision of asphalted or RCC roads inside the premises
- Wind breaks to control PM from ash storage yard
- In addition, as per the situation - use of economically affordable techniques for suppression of dust from handling and storage area

- Ash will be transported in closed/covered vehicles to the brick manufacturing unit

5.1.3.1 Air Pollutant Dispersion Modeling

Prediction of impacts on air environment has been carried out by employing mathematical model - AERMOD view dispersion model 9.2 software developed by Lakes Environment Software, Canada.

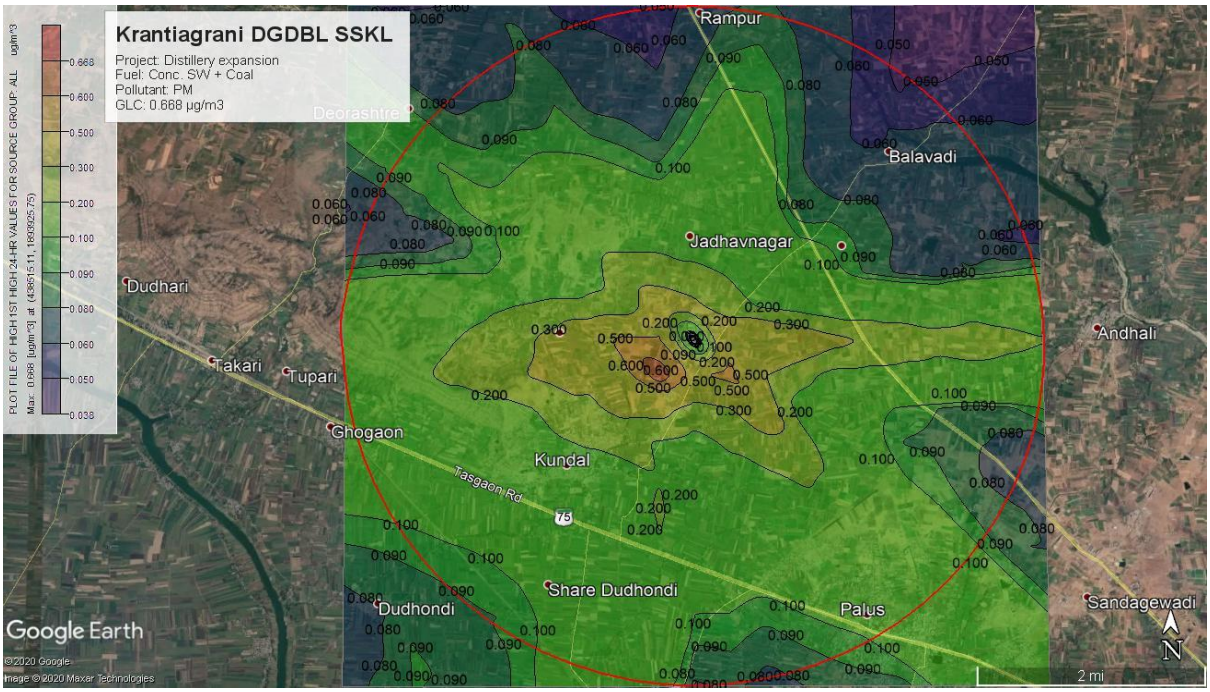

Figure 2 Shortterm 24 hourly GLC sof PM

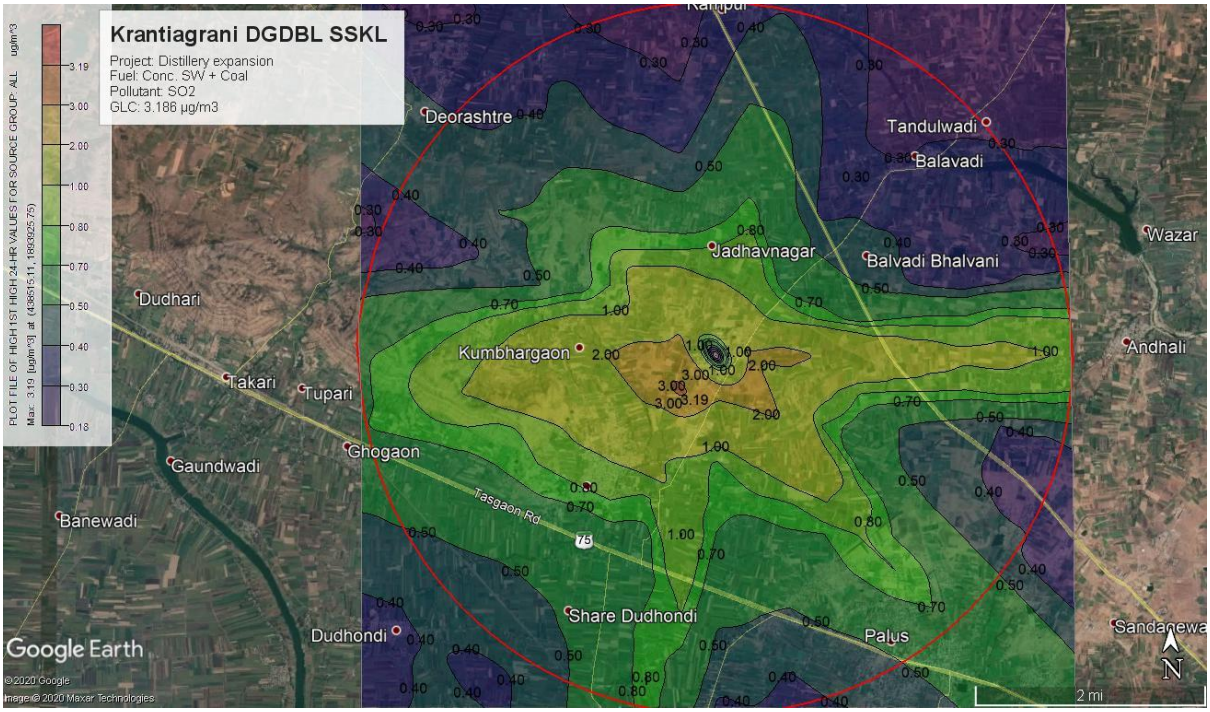

Figure3: Shortterm 24 hourly GLC of SO_2

a. Observation

- An increase in the concentration of PM and SOx anticipated maximum towards south-west
- The maximum incremental load of PM and SOx will be at a distance of ~0.7 km towards south-west; where increase of 0.668 μg/m3 for PM and 3.19 μg/m3 for SOx anticipated. This area is partially open (occupied by seasonal grasses/vegetation) and partially under agricultural use.
- Nearest residential area towards south-west is village Kundal which is ~1.7 km.
- From the results derived from the mathematical modeling study, concentration of these air pollutant in downwind direction will be well within the national ambient air quality standards prescribed by CPCB in Nov. 2009.

Table 5: Summary of Maximum 24-hour GLC due to proposed project

Description	Concentration in μg/m³	
	PM	SO_2
Maximum rise in GLC	0.67	3.19
Direction of Occurrence and distance	SW @ 0.7 km	SW @ 0.7 km
Coordinates of maximum GLC	17⁰ 7' 45" N 74⁰ 25' 19" E	17⁰ 7' 45" N 74⁰ 25' 19" E
Baseline Concentration(average) reported nearby GLC (at Village Kundal ~1km SW)	67.88	25.49
Total Concentration (Post project scenario) at village Kundal	68.18	27.49
NAAQS	PM_{10} 100	80

* The distance is measured from stack to the receptor of maximum GLC

5.2 Water Environment

5.2.1 Impact causing factors: The impact of a distillery project on water environment is crucial from two aspects viz. the consumption of water in process and the generation of wastewater.

5.2.2 Impact Assessment: The project proponent is having a permission to draw water from Krishna river through canal. State Irrigation Department has given this permission. Thus, water used in the project will be exclusively allocated for industrial activities. In case of drought or less rainfall situation, other users from the area likely to get affected due to water demand by the distillery.

For wastewater/effluent, the management planned to achieve ZLD. Therefore, in normal operations (when all measures proposed are implemented and works effectively), no negative impact on water environment and aquatic ecosystem envisaged due to the proposed project.

5.2.3 Environment management plan: Wastewater from various sources will be properly treated in CPU so as to reutilize it. Approx. 750 to 800 m^3 per day of fresh water expected to get conserved due to reuse of treated water. In addition, ~700 m^3 of water will be recycled. Thus project is expected to save about 1450 m^3 of water every day. Concentrated spent wash will be sent to incineration boiler with supplementary fuel coal. 'Zero liquid discharge' for spent wash will be achieved by this method The treated water will be mainly reused in the distillery unit itself -for molasses dilution, cooling tower make-up and/or for gardening activity. The sanitary wastewater will be disposed by using existing Sugar ETP. Thus, zero liquid discharge will be achieved.

The industry has implemented the rainwater-harvesting project. Presently, it is harvesting water mainly from roof top areas of mill shed and building. The rooftop area available for rain water harvesting is 25,066 m^3. All water is collected and channelized to sump wells.

5.3 Land Environment

5.3.1 Impact causing factors: Mainly two factors have been identified in case of the proposed project a) handling and disposal of effluent and b) solid and hazardous waste,

Impact of effluent

Impact on soil/land environment anticipated in case of accidental release/discharge of spent wash on land or percolation of spent wash from holding tanks.

a) Solid waste

Table 6: Solid Waste and its Management

Waste Material	Quantity	Upshot
Ash	58.90 TPD	Given to brick manufacturing unit
Yeast Sludge	27-30 TPA	It will be sent to sludge drying beds. Dried sludge will be mixed into soil
CPU sludge(wet basis)	40-45 TPA	

5.3.2 Impact Assessment: The project is not going to generate any hazardous waste except spent oil. Measures proposed for handling and/or disposal of solid waste observed adequate. Hence, it is no negative impact anticipated from the solid waste of the project, on land environment. Organic matter of sludge will help in improving soil organic content, which anticipated as a positive impact. Negative impact anticipated due to storage and handling of ash.

5.3.3 Environmental management plan: As discussed earlier, highly polluted wastewater i.e. spent wash will be disposed by incineration process. Impervious tanks will be constructed for the storage of raw and concentrated spent wash, as per CPCB guidelines. For ash handling and storage, plan is already explained. Ash will be disposed by giving it to the local bricks manufacturer.

Sludge from CPU this sludge is usually bio-degradable, organic and nearly neutral in nature. It doesn't contain any toxic or hazardous elements. Therefore, this will be safely disposed by mixing into soil.

5.4 Noise:

5.4.1 Impact causing factors: The principle sources of noise are boiler, STG and machinery (mainly motors and pumps). Additionally, handling of coal is also considered as a noise source. Increase in traffic due to project activity can also lead to increase in noise levels.

5.4.2 Impact assessment: The noise levels in the industry and vicinity are expected to increase due to the industrial sources mentioned above and also due to increase in traffic due to transportation of raw material and finished product. Increase in noise levels impacts people working in the industry as well as those staying in the surrounding areas.

5.4.3 Environmental management plan Noise generated in the boiler and STG section will be localized & confined because it will be under shed/covered area. Thus, generated noise will be localized. The rotating equipment to be maintained by periodical oiling and/or greasing, providing noise proof cabins to operators where remote control for operating noise generating equipment is feasible, Developing greenbelt or barriers to reduce noise levels will help to maintain noise level as per standard.

5.5 Ecology

5.5.1 Impact causing factors: Habitat destruction, alteration and fragmentation; Disturbance to wild life or habitat disturbance; Pollution (from the project processes and activities); Impact due to project linked activities such as lighting; Threat to rare, endangered flora and fauna

5.5.2 Impact assessment: Threat anticipated to traditional land races of sorghum, due to increase in cane cultivation area. Minor negative impact anticipated on avi-fauna due to stack gas temperature (approx. 80-90^{o}C). Dispersion modeling study indicates settling of fly ash mainly in 0.5-1 km distance from stack. Thus, agricultural vegetation and flora/plants in this area likely to get affected due to dust/fly ash (particulate matter). Disturbance to fauna (along the transportation route) anticipated due to the project. In normal operational conditions, no change in the aquatic or terrestrial flora/fauna anticipated due to the wastewater from the proposed project. But in case of accidental release of spent wash negative impact anticipated on ecology and biodiversity of the surrounding area. Activities involved for solid waste handling/storage/treatment and transportation will be confined to site and transportation route. Ash from the pit and during transportation likely to get air borne and settle on leaves of surrounding plants. It is likely to affect the photosynthesis. In case of fauna, negative impact envisaged from the activity presumed low. Enhancement in soil micro-flora due to sludge is anticipated as positive impact. Greenbelt enhancement will support the biodiversity of the area. It will also help in improving the aesthetics. This

is another positive impact anticipated due to the project.

Core area of Sagareshwar sanctuary is totally fenced by permanent grilled fencing. Therefore, the activities outside the boundary of the sanctuary have practically no influence on the wildlife of the sanctuary. In addition, eco-sensitive area of the wildlife sanctuary is demarcated upto 100 m from its existing boundary. Thus, even though the existing sugar, cogeneration and distillery unit is just 1.7 km from the sanctuary boundaries, negative impact due to the industrial activities (within the premises) on the wildlife of sanctuary anticipated negligible.

5.5.3 Environmental management plan: Greenbelt enhancement, watering arrangement for domestic and wild animals (in drought period), plan to protect local landraces.

5.6 Socio-economic environment

5.6.1 Impact Causing Factors: Issues of rehabilitation & restoration; population flux; pressure on available resources and infrastructure.

5.6.2 Impact Assessment: No rehabilitation, restoration required hence no impact with respect to the same. Similarly, no population flux anticipated due to proposed expansion. Considering the long term benefits to the locals, the project will have positive impact on socio-economic environment.

5.6.3 Environment Management Plan: Project is agro-based – therefore, indirectly beneficial to local farmers; no issues of rehabilitation or restoration; Available infrastructure and resources will be used.

5.7 Other impact: Traffic

During operation phase, the transportation activity will get increased considerably. However, availability of adequate and proper road infrastructure in the area and provision of adequate parking in the project premises, probability of traffic congestion envisaged very low. In the study area as well as in the surrounding region, road infrastructure is good. It comprises of state as well as national highway (Pune-Bengaluru). Thus, additional vehicle load will get distributed and accommodated within existing infrastructure.

6.0 FIRE PROTECTION SYSTEM

Fire protection system in the existing unit has been provided in accordance to PESO, OISD-117 and LPA regulations. The firefighting system consists of a hydrant network, piping etc, (alongwith water storage of 75 lac litres). Fire protection system also include one electric driven pump, one diesel engine driven pump, one jockey pump, piping, basin etc. Water hydrants are provided at all strategic points. A suitable Fire ring system as per the guidelines of TAC will be incorporated. Non-flame proof and flame proof area is separated by minimum distance of 15 meters. Portable fire extinguishers will also be provided in

strategic locations viz., power house, control rooms, switch yard.

Fire Protective System – Fixed supply of Carbon dioxide from the Tank, normally connected to fixed piping system with nozzles arranged to discharge CO_2 directly on the burning material, equipped with Fire Alarm, Fire hydrant fm 200/70 and extinguishing system H.V.W / M.V.W Spray system (LOCAL APPLICATION ONLY). System consists of Alarm Bell, Control panel, remote station, electric control needed for operating system, Pressure switch Heat detector, Heat collector, and conveyor rail, Drain Board with dip tank and discharge nozzles.

Automatic fire Sprinkler System (Water Hydrant) – Electro-magnetic dehydration system uses an electric fire detection system installed in the area as open sprinklers /spray nozzles. Upon sensing a hazard, the Electromagnetic valve opens.

6.1 Safety Aspects through Design and Engineering

- All design will be as per ISI standard specification and drawings to be approved by factory /electrical inspectorate /safety inspectorate weights & measurement inspectorate etc.
- The plinth level of distillery building will be at min 0.75 m height from developed ground level and it is to be built by brick masonry. For ground floor flooring of M10 grade (CC1:3:6) as a base concrete is to be made and its IPS shall be 50 mm of M15 grade (CC1:2:4). Plinth foundation should carry the load of 4 m height wall safely.
- All distillation columns accessed from flooring (grating)
- The roof of the structures (fermentation, distillation, receivers) must be covered totally by pre-coated sheets (Pre-painted galvano loom sheet i.e. PPGL sheets) of 0.5 mm thickness.
- For anhydrous ethanol receivers & storage tanks – as per PESO (Petroleum and Explosive Safety Organizations) guidelines
- Distance between flameproof and non-flame proof area min. 15 m
- The layout will take into account the working space & safety requirement of Factory Inspectorate, Govt. of Maharashtra State.

6.2 Plant Lighting

a. The normal process area lighting will generally compromise of Fluorescent fittings & Mercury vapor fittings.

b. Flameproof light fittings conforming to IS 2148 shall be provided for hazardous areas, particularly in distillation & storage section, while non-flame proof fittings in other areas.

c. Plant building lighting will be as per norms & as per Electrical inspectorate / factory inspectorate norms.

6.3 Energy and Water Saving Measures

- High alcohol percentage in fermented wash can result in substantial reduction in steam consumption.
- It is possible to recycle low strength waste i.e. process condensate, spent lees etc. in distillery after treatment. This will reduce fresh water consumption for process/non-process applications.

7.0 SAFETY, OCCUPATIONAL HEALTH MANAGEMENT

Important measures proposed for safety and occupational health are as follows.

- Use of flameproof electrics
- Standard operating procedures (SOP) will be strictly implemented to ensure safety, health and environment throughout the premises
- Smoking and igniting activities will be strictly prohibited in the entire unit
- Existing Firefighting system will be modified suitably so as to make it suitable for the proposed project (as per the statutory guidelines)
- Regular medical checkup of workers, contractual workers and employees
- Group insurance and medical insurance facilities provided in the existing setup will be extended after proposed project.

Facilities such as drinking water facility, canteen, toilet and bathrooms, petrol pump, first aid facility, safety gears and PPE will be made available to workers, as well as to the visitors and transporters.

7.1 Plan of evaluation of health of workers & Schedule of medical check-up during operational phase

- KAGDBLSSKL is monitoring the health of its worker before placement and periodically examines during the employment
- Proper schedule is in place which will be modified suitably if required and followed with help of occupational health experts and doctor
- Health effects of various activities and health hazard, if any observed will be recorded and discussed with the health experts for corrective and preventive actions need to be taken by the industry.

Table 7: Financial provision for CER activities planned for next five years

CSR activity head	1st year	2nd year	TOTAL
	Budgetary provision (Rs. in lakhs)		
Education and awareness: Financial aid to schools for development of laboratory facilities and educational aids	3.50	3.00	6.50
Other activities for maintaining social and cultural harmony	1.00	1.00	2.00
TOTAL BUDGETARY ALLOCATION FOR NEXT FIVE YEARS (2% of the capital budget)			8.50

Table 8: Estimated Capital & Recurring Expenses for Environment Management

#	Particulars	Amount (Rs. in Lakhs)
	Capital Expenses	
1	Upgradation/modification of MEE	65.00
2	Upgradation of Condensate polishing unit	21.25
3	Environmental monitoring and management	30.00
4	Greenbelt enhancement/development	10.00
5	Rainwater harvesting (improving the set-up)	10.00
	TOTAL	136.25
	Additional provision towards CSR/CER (2 % of capital investment)	8.50
	Recurring Expenses/Annum	
1	Salaries and wages	75.00
2	Maintenance of pollution control devices e.g. MEE, Incineration boiler ESP, CPU, etc.	230.00
3	Fuel (incineration activity) & Electricity (in case of diesel generator operation)	113.60
4	Miscellaneous	15.00
	TOTAL	433.60

8.0 CONCLUSION

The potential environmental, social and economic impacts of the distillery expansion project of KAGDBLSSKL have been assessed during the environmental impact assessment study and are given in detail in this EIA report. The project is expansion of existing molasses based distillery unit from 60 to 90 KLPD. The management has tried to comply conditions of existing 60 KLPD environmental clearance. Therefore, it is aware of its environmental responsibility. It will abide EC conditions of expansion project and fulfill its environmental and social responsibilities.

The project will have certain levels of marginal impacts on the local environment. It has been endeavored to minimize the negative impacts by addressing them through mitigation measures detailed in the environmental management plan. Necessary control measures have been suggested to meet with the norms and safeguard the environment. The implementation of this project will definitely improve the physical and social infrastructure of the surrounding area. Adequate financial provision is made by management of KAGDBLSSKL for EMP and CSR activities (i.e. for upliftment of the local people). The proposed project will contribute to the ethanol blending program of the country and thus to economic growth. It will also help in generating revenue for the Government.