

Executive summary

of Draft EIA report

Proposed Expansion of Sugar Unit from 2500 TCD to 7500 TCD and new 110 KLPD Sugarcane Syrup/ Molasses based Distillery plant

Village Devidahegaon, Tal. Ghansawnagi, Dist. Jalna, Maharashtra

Proposed by

M/s. Samrudhi Sugars Limited

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QCI-NABET, Lab NABL, MOEF & CC, OHSAS 18001:2007 approved

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Executive Summary

1 Introduction

Samrudhi Sugars Limited (SSL) is a private company incorporated on 24th August 2006. It is classified as Non-govt company and is registered at Registrar of Companies, Mumbai on 24th August 2006 having CIN No. U15424MH2006PLC164023 and registration number 164023.

SSL proposes for expansion of Sugar unit from 2500 TCD to 7500 TCD & new 110 KLPD Sugarcane Syrup/Molasses Based Distillery Plant. The industry shall be situated in total area of 22.95 Ha. Industry will be using Sugarcane, Molasses and Sugarcane Syrup for manufacturing the product. The industry is fully geared up to implement and commission the proposed project. Latest technologies for sugar & ethanol will be employed in this project, to ensure efficiency and optimum operating performance for all the products, with ZLD.

2 Project Location

Samrudhi Sugars Limited (SSL) is located at Gut No. 111,119,120,122,123,124,125,146,173 village Devi Dahegaon, Tal Ghansawnagi, Dist Jalna, Maharashtra. Unit is geographically located at Latitude 19°26'51.58"N & Longitude 76°4'32.28"E situated around 471m above MSL.

3 Salient features of integrated project

Table 1 Brief information of the project and environmental settings

Particulars	Details
Project	Expansion of sugar unit from 2500 TCD to 7500 TCD and New 110 KLPD sugarcane syrup/molasses based distillery plant
Location	Gut No. 111,119,120,122,123,124,125,146&173 Village Devi Dahegaon, Tal: Ghansawnagi, Dist: Jalna, Maharashtra.
Screening category (as per SO 1533 as timely amended)	5 (g) – “Distilleries” Category: “A” (>100 KLPD molasses based distillery) 5 (j) – “Sugar” Category “B”
Land Type of Project Site	Private land
Product	Existing: Sugarcane Crushing: 2500 TCD Proposed: Sugarcane Crushing: 7500 TCD RS/ENA/AA/ Ethanol: 110 KLPD
By-product	CO ₂ : 62 TPD (<i>For industrial beverage grade/ dry ice</i>)
Basic Raw Material	Sugarcane

	Own sugarcane syrup B-Heavy Molasses C-Molasses
Operation days	Sugar: 180 days (Season) Distillery: 330 days
Total Plot Area	22.95 Ha.
Green belt Area	Total: 7.6 Ha. (33% of total plot area) Existing: 3.4 Ha. Proposed: 4.2 Ha.
Water requirement	Sugar & Co-gen: 42 CMD (Dom. 36.4 CMD + Ind. 6 CMD) Distillery: 212 CMD
Source of water	Source of water: Minor Irrigation Tank, Devi Dahegaon (Permission available)
Boiler	Sugar: Existing: 60 TPH Proposed: 35 TPH Distillery: Proposed: 40 TPH
T.G Set	Existing: 14 MW [10 MW (operational) + 4 MW (stand by)] Proposed: 8 MW [To both Sugar & Distillery Boilers]
APCD	Existing Sugar boiler (60 TPH) – Wet scrubber with 65m stack height Proposed Sugar boiler (35 TPH) – Wet scrubber Proposed Distillery (40 TPH) – ESP/ Rotary Scrubber with 45m of stack height.
Steam requirement	Sugar: Existing: 42 TPH Proposed: 113.12 TPH Distillery: Proposed: 19.18 TPH
DG Set	Existing: 320 kVA*1
Fuel for Boiler	Sugar: Bagasse: 27.12 TPH Biogas: 0.43 TPH Distillery: Bagasse: 10.15 TPH Biogas: 0.49 TPH
Power requirement	Sugar: 7.5 MW Distillery & allied m/c.: 2.0 MW
Man-power requirement	Existing: 200 Nos. Proposed: Construction Phase: 180 Operation Phase: 360

Total project cost	200 Crore	
EMP capital cost	50.09 Crore (25% of total project cost)	
CER Cost	1.5 Crore (0.75% of total project cost-brownfield project)	
Total effluent generation	Sugar & Co-gen: 744.5 CMD Sugar Condensate: 1487 CMD Domestic: 29 CMD Distillery: 802 CMD	
ETP Capacity	Existing: 350 CMD Proposed ETP capacity : 850 CMD	
CPU capacity for Sugar Condensate	1500 CMD	
CPU capacity for distillery	850 CMD	
STP capacity	30 CMD	
Solid and Hazardous waste management	Existing Sugar: Press Mud: 100 TPD Bagasse Ash: 6.43 TPD ETP Sludge: 0.12 TPD After Proposed Sugar: Press Mud: 300 TPD Bagasse Ash: 10.2 TPD ETP Sludge: 0.76 TPD STP Sludge: 2.6 TPD Distillery: Bagasse Ash: 4.3 TPD CPU Sludge: 1.3 TPD Spent wash powder: 30.6 TPD Spent oil: 1.5 T/ Annum	<ul style="list-style-type: none"> ● Bagasse ash will be mixed with press mud and utilized as a manure or sold directly to farmers. ● ETP, STP and CPU sludge can be utilized for as manure. ● Spent wash powder will be sold to farmers ● Spent oil will be sent to authorized recycler.

4 Process description

Distillery Process based on Molasses/ Cane Syrup

- Molasses preparation
- Yeast propagation
- Fermentation
- Distillation

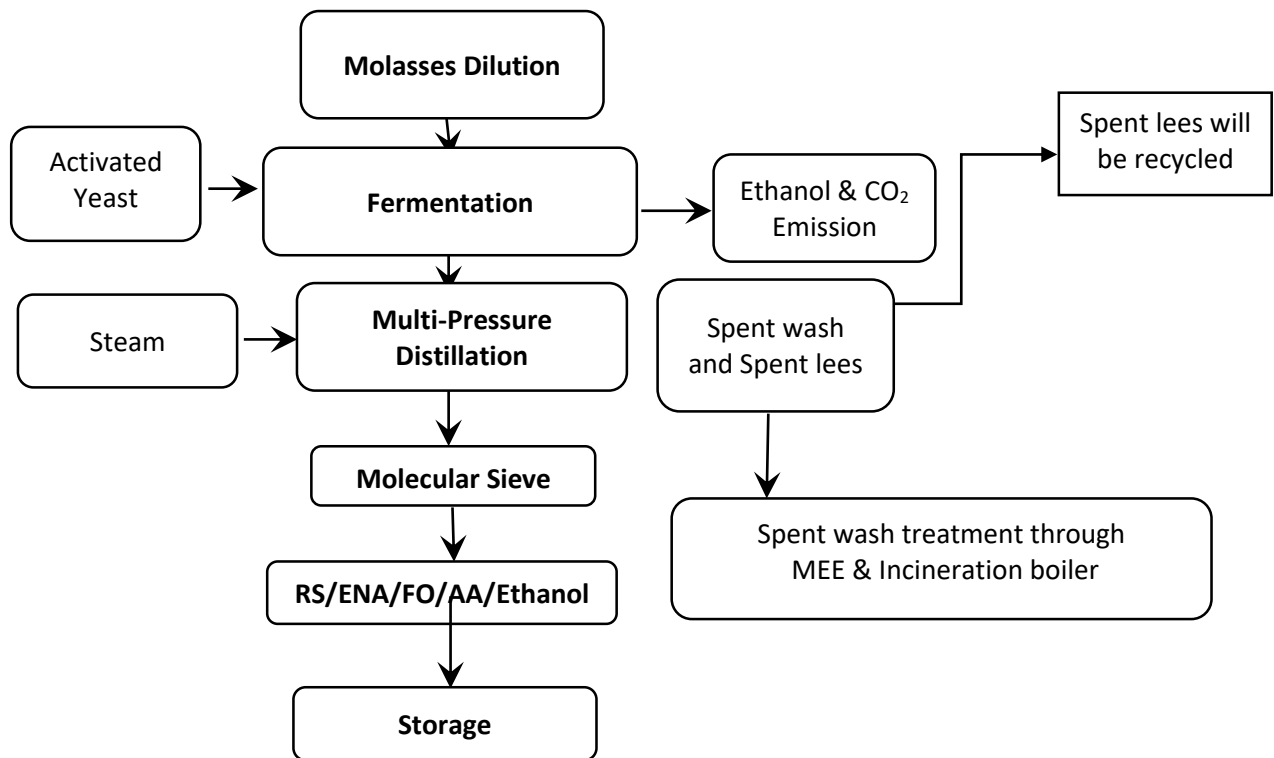


Figure 1 Distillery process flow chart (Molasses based)

Sugar manufacturing process description

Technology- Most of the sugar factories in India follow Double Sulphitation Process and produce plantation white sugar.

The major unit operations are given below. These are

1. Extraction of Juice
2. Clarification
3. Evaporation
4. Crystallization
5. Centrifugation

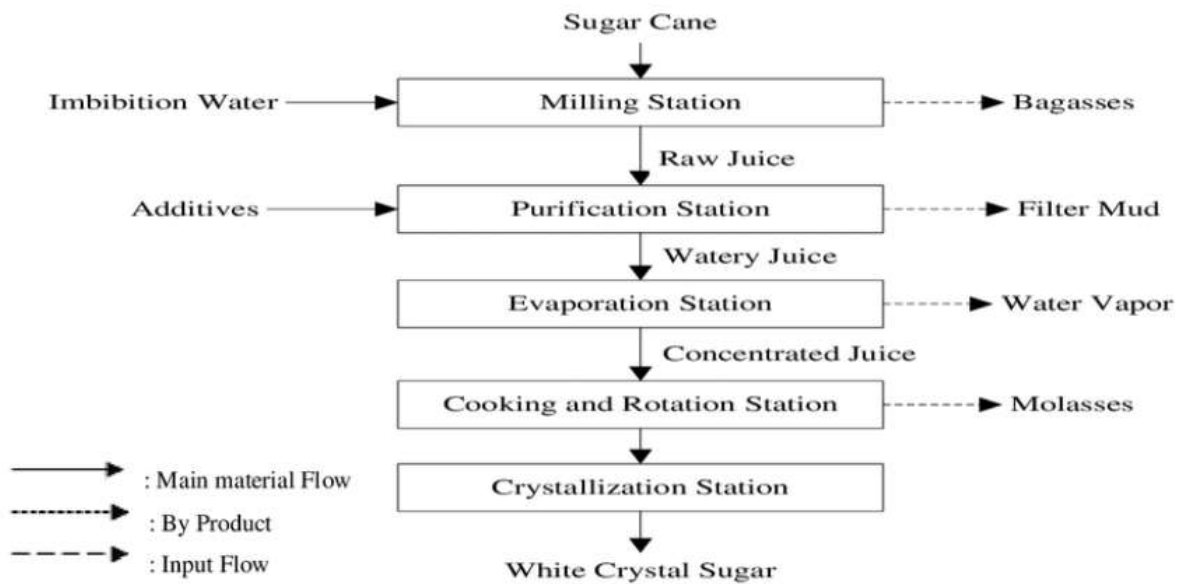


Figure 3 Sugar process flow chart

5 Description of the Environment

Standard ToR was approved by MOEF&CC; New Delhi vide letter No. IA-J-11011/397/2022-IA-II(I) dated 04.10.2022. The study period conducted was from 1st March 2022 to 31st May 2022. The guiding factors for the present baseline study are the requirements prescribed by the guidelines given in the EIA Manual of the MoEF&CC and methodologies mentioned in Technical EIA Guidelines Manual for Distilleries by IL&FS Ecosmart Ltd., approved by MoEF&CC.

Table 2 Observation of Environmental monitoring

Environmental Attributes	Frequency of monitoring	Parameters	Observed Results
Meteorology	Microprocessor based Weather Monitoring Station Continuous hourly recording	Wind direction	West followed by West North West
		Max. Temp.	43.6 °C
		Mini. Temp.	1.2 °C
		Relative Humidity	45-64 %
		Precipitation	Annual avg. 789.7 mm
Ambient Air Quality	10 Locations 24 hourly samples Twice a week for 3 months (in µg/m ³)	PM ₁₀	All parameters are within limit of NAAQ 2009
		PM _{2.5}	
		SO ₂	
		NO _x	
Water Quality (Ground & Surface*)	9 no. of locations – Ground water 4 no. of locations – Surface water (Physical, chemical and biological parameters)	Parameter	Maximum the constituents are within the permissible limits prescribed standards promulgated by Indian Standards
		pH	
		TDS	
		COD	
Soil Quality	Once in season at 9 locations	Soil type and texture, Physio-chemical properties, NPK	Red sandy soil. Soil is medium in fertility, good water holding capacity, heavy metal contamination signs not seen.
Noise Level	Once in season at 10 Locations (Noise levels in dB(A))	Day	47.2 – 63.6
		Night	39.9 – 60.5
Land use Pattern	One time visit of the study area	Identification & classification of land use	Most of the land is Agricultural land followed by Barren land
Geology and hydrogeology	Based on secondary data	Geology and hydrogeology of the study area	Basaltic lava flows, the ground water in Deccan trap basalt occurs mostly in the upper weathered and fractured parts down to 20-25 m depth, alluvium occurs in small areas.

Environmental Attributes	Frequency of monitoring	Parameters	Observed Results
Ecology	General in 10 km radial study area and data collected around the project site through field visits	Flora	The most abundant species in the study areas are, Abrus precatorius L., Abutilon indicum (L.) Sweet, Acacia concinna (Willd.) DC., etc.
Socioeconomic Data	General in 10 km radial study area and data collected around the project site through field visits	Socio-economic characteristics of the affected area	Sanitation facilities are satisfactory, Power supply facility is available in almost villages and town, Drinking water sources is mostly from ground water. Medical facilities in terms of primary health centre and primary health sub centres in the rural areas are good.

6 Anticipated Environmental Impacts

Table 3 Anticipated Impacts

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

7 Environmental Monitoring Program

Table 4 Environmental monitoring schedule

Particulate	Parameters	Number of location	Frequency
Ambient air quality	PM ₁₀ , PM _{2.5} , SO ₂ , NO _x etc.	Ambient air quality at minimum 3 locations. Two samples downwind direction at 500 m and 1000 m respectively. One sample upwind direction at 500m.	Monthly
Stack emission	PM, SO ₂ and NO _x	All stacks	Monthly
		Online stack monitoring will be installed	-
Work place	PM _{2.5} , SO ₂ , NO _x , CO, O ₃	Process emission in workplace area/plants (for each area/plant minimum 2 locations and 1 location outside plant area near vent)	Monthly
Waste water	pH, EC, SS, TDS, O&G, Ammonical Nitrogen, COD, BOD, Chloride, Sulphides etc.	Wastewater from all sources. Inlet & outlet of ETP, spent wash, Condensate treatment plant	Monthly
		Online Monitoring machine is already installed at existing ETP. Camera at spent wash tank will be installed.	
Surface water and ground water	pH, Salinity, Conductivity, TDS, Turbidity, DO, BOD, Phosphate, Nitrates, Sulphates, Chlorides, Total Coliforms (TC) & <i>E.Coli</i>	3-5 location Within 1 km radius from spent wash tank and compost yard. 2 locations downward 1 location upward additional three locations within 10 km radius from the site.	Half yearly
Solid waste	Ash	<ul style="list-style-type: none"> Process dust generated sludge and ash. Before used as manure if used manure 	Monthly
Soil Organic and Inorganic matter	N, P, K, moisture, EC, heavy metals etc.	At lands utilizing compost manure and treated effluent, 3 locations	Pre monsoon and Post monsoon
Noise	Equivalent noise level - dB (A) at min. Noise Levels measurement at high noise	5 location At all source and outside the Plant area.	Monthly

Particulate	Parameters	Number of location	Frequency
	generating places as well as sensitive receptors in the vicinity		
Green belt	Number of plantation (units), number of survived plants/ trees, number of poor plant/ trees.	In and around the plant site	Monthly
Soil	Texture, pH, electrical conductivity, cation exchange capacity, alkali metals, Sodium Absorption Ratio (SAR), permeability, porosity.	2-3 near Solid/ hazardous waste storage. At least five locations from Greenbelt and area where manure of biological waste is applied. Near spent wash storage lagoon	Quarterly
Occupational health	Health and fitness check-up of employees getting exposed to various hazards and all other staff	All worker	Yearly/ twice a year
Emergency preparedness, such as fire fighting	Fire protection and safety measures to take care of fire and explosion hazards, to be assessed and steps taken for their prevention.	Mock drill records, on site emergency plan, evacuation plan	Monthly during operation phase

8 Additional Studies

The following additional such as risk assessment for storage and handling of alcohol and mitigation measure due to fire and explosion and handling area has been carried out.

9 Environmental Management Plan

Following mitigation measures shall be adopted by factory to minimize the impact of project on the surrounding environment.

Table 5: EMP for various environmental attributes

Environmental Attributes	Mitigation Measures
Air Quality Management	<p>Process Emission</p> <ul style="list-style-type: none"> Wet scrubber & ESPs shall be provided for PM emissions. The whole process will be carried out in closed condition so as to avoid any chances of VOC emissions. <p>Utility Emission</p>

	<ul style="list-style-type: none"> • All the D.G. sets shall be standby arrangement and will only be used during power failure. • Adequate stack height shall be provided to Boiler and D.G. sets. • Electrostatic Precipitator shall be provided as an air pollution control device to the boiler with approximately 99.99 % efficiency to capture maximum boiler fly ash. <p>Fugitive Emission</p> <ul style="list-style-type: none"> • The main raw material and product shall be brought in and dispatched by road in covered enclosures. • Dust suppression on haul roads shall be done at regular intervals.
<p>Water & Wastewater Management</p>	<ul style="list-style-type: none"> • The distillery would be based on 'Zero Liquid Discharge' technology. • Raw spent wash will be concentrated in MEE and sent to dryer to form spent wash powder which will further be sold. • Spent lees, blow down and condensate will be treated in CPU of capacity 850 CMD and treated water will be recycled. Treated water will be recycled in process. • Effluent from sugar unit will be treated in 350 CMD ETP and after proposed expansion it will be treated in augmented 850 CMD ETP. ETP Treated effluent from sugar will be reused in greenbelt development and cooling tower. • Excess condensate of 1487 CMD form sugar will be treated in 1500 CMD CPU of sugar and treated water shall be recycled in equipment cleaning, boiler makeup water and stored for distillery for off-season. • Domestic sewage will be treated in 30 CMD STP and treated water will be recycled into gardening • Proper storm water drainage will be provided during rainy season to avoid mixing of storm water with effluent.
<p>Noise Management</p>	<ul style="list-style-type: none"> • Closed room shall be provided for all the utilities so as to attenuate the noise pollution. • Acoustic enclosure shall be provided to D.G sets. • Free flow of traffic movement shall be maintained. Earmuffs shall be used while running equipment's of the plant. • Proper maintenance, oiling and greasing of machines at regular intervals shall be done to reduce generation of noise. • Greenbelt shall be developed around the periphery of the plant to reduce noise levels.

Odour Management	<ul style="list-style-type: none"> • Odour shall be primarily controlled at source by good operational practices, including physical and management control measures. • Better housekeeping will maintain good hygiene condition by regular steaming of all fermentation equipment. • Use of efficient biocides to control bacterial contamination. • Control of temperature during fermentation to avoid in-activation/ killing of yeast. • Avoid staling of fermented wash.
Solid & Hazardous Waste Management	<ul style="list-style-type: none"> • The hazardous waste i.e. spent oil generated shall be very minor and shall be burnt in boiler along with fuel. • Bagasse ash will be mixed with press mud and utilized as a manure or sold directly to farmers. • Spent wash powder will be sold to farmers • ETP, CPU & STP sludge can be used in greenbelt development
Traffic Management	<ul style="list-style-type: none"> • Culverts shall be maintained. • The trucks carrying raw material & fuel shall be covered to reduce any fugitive dust generation. • Good traffic management system shall be developed and implemented for the incoming and outgoing vehicles so as to avoid congestion on the public road.
Green Belt Development / Plantation	<ul style="list-style-type: none"> • Plantation shall be done as per Central Pollution Control Board (CPCB) Norms. • The plantation in and around the plant site helps/will help to attenuate the pollution level. • Native species shall be given priority for Avenue plantation.
Corporate Social Responsibility	<ul style="list-style-type: none"> • An amount of INR 1.5 Cr. (As CER OM dated 1.05.2018 brownfield project 0.75% of total project cost) will be allocated for CSR activities in the coming 2 years which will be utilized on the basis of requirement for weaker sections of the society for next 2 years.
Occupational Health & Safety	<ul style="list-style-type: none"> • Factory shall monitor the health of its worker before placement and periodically examine during the employment • Health effects of various activities and health hazard if any observed shall be recorded and discussed with the health experts for corrective and preventive actions need to be taken by the industry • All safety gear shall be provided to workers and care shall be taken by EMC that these are used properly by them. All safety norms shall be followed

10 Environment Management Cost

Table 6 Environment Management Cost

S. No	Construction phase (with Break-up)	Capital Cost	O & M
		(Amount in lakhs)	
1.	Environmental monitoring	0	1.5
2.	During site preparation	2	1
3.	Noise and solid waste management	2.5	1.5
4.	Water and waste water	10	4
5.	Occupational health	5	1.5
6.	Greenbelt development	10	5
	Total (A)	29.5	14.5
Sr. No	Operation Phase (with Break-up)	Capital Cost	O & M
		(Amount in lakhs)	
1	Air pollution	1980	28
a	Wet Scrubber	800	10
b	ESP	1000	15
c	Online Continuous Emission Monitoring System (OCEMS)	40	3
d	ID fan and other auxiliaries	140	
2	Water pollution	2475	26.5
a	ETP	400	5
b	CPU * 2	1000	10
c	STP	75	1.5
	Air Cooled Condenser	1300	5
e	Dryer	1000	5
3	Noise pollution	90	10
4	Environmental Monitoring (Air, water, waste water, Soil, Solid waste, Noise)	50	12
5	Occupation health	80	30
6	Green belt	60	25
7	Solid waste	45	10
8	Rain water harvesting	50	10
9	CER Cost	150	0
	Total (A)	4980	151.5
	Total A+B	5009.5	166

11 Project Benefits

1. Provides an initiative to sugar mill to concentrate more on conservation of energy & reduction of operating cost, thereby improving their profitability of operation.
2. Saves the expenditure on safe storage and disposal of bagasse.
3. Benefits of quick return on biomass power capital investment and generation of additional revenue.
4. The economic benefits available to the sugar factories from sale of exportable surplus and improvement in the operations

5. Entire integrated project is proposed to be set up based on the stand-alone commercial viability of each component of the project.

12 Conclusion

- Zero liquid discharged is proposed with efficient mitigation measures implemented.
- Air emissions through stack will be controlled by ESP.
- Loss of vegetation and habitat will not be attributed.
- Personal protective equipment's, safety precautions, emergency plan & disaster management plan shall be in place to avoid the environment hazards.