

:: Executive Summary ::

Chapter 1: Introduction

- M/s Shri Gurudatt Sugars Ltd, [SGSL], is a presently became one of the major industry in the area. This industry was established by Shri. Bhagvanrao G. Ghatge & his son Shri. Madhavrao B. Ghatge. SGSL is contributing to change the Social & Economic environment of the area.
- M/s Shri Gurudatt Sugars Ltd. is established in the year of 2004 by late Shri. Bhagvanrao G. Ghatge. The proposed Expansion of Sugar 6000 TCD to 13000 TCD, Co-gen 21 MW To 90 MW, new Molasses based Distillery of 150 KLPD and Raw Sugar to Refined Sugar 1755 TPD at Gat No. 61/A, Akiwat- Takaliwadi Road, Takaliwadi, Tal- Shirol, Dist- Kolhapur, State-Maharashtra. The plot admeasures of proposed area is about 222577 sqm (55 Acres). And there is no change in land use pattern. The expansion project will be done within the existing premises.
- The Factory has been performable extremely well. It has excellent communication facilities & is connected by rail & road ways. This place is easily accessible for transportation of raw material. The notification no. S.O. 1533 promulgated on 14th September 2006 have covered these type of industries under its entry 1(d), 5(g) & 5(j). It is stated that captive power plant, Distillery & Sugar processing industry respectively. Standard TOR issued by the MoEF&CC wide letter no. IA-J-11011/304/2017-IA-II(I) and Minutes of 38th Expert Appraisal Committee (Industry-2) dated 26th June 2018. As the project fall under interstate boundary by 4.27 km. It is treated as 'A' category

Chapter 2: Project Description

▪ Location of Project

The geographical location of the project is 16°37'15.50"N Latitude & 74°35'39.5"E Longitude with an elevation of 540 m above mean sea level. Local authority has assured to provide all infrastructures like assures Electrical power, continuous water supply with purification from water works having rapid sand filtration [RSF], internal road network, external approach road etc.

▪ Manufacturing Process

❖ Sugar

- a. Harvested cane transport to the factory & where cane weighing is done on Weigh Bridge
- b. Cane carrier & Cane kicker can help for upcoming process.
- c. In fibrizor the cane is cut in fine pieces to make possible juice.
- d. Then in four mill tandem, cane is crushed in three rollers to get maximum juice.
- e. After crushing Raw juice is heated at 35°C & up to 70°C.

- f. Then sulphitation process done with adding the milk of lime as well as SO₂ is passed through juice. Sulphited juice again heated up to 102° C to 103° C.
- g. After that the scum settled through the Rapi Dorr & then Clear juice from rapi dorr is heated again in tubular juice heaters up to 100- 111° C.
- h. Clear juice contains around 70% of water. The clear juice is boiled / heated in a series of 4 to 6 evaporator vessels to evaporate water from clear juice.
- i. Thick clear juice obtained from evaporator vessels called syrup is taken on pan floor and boiled in the pan bodied.
- j. Pan is also a vessel in which syrup is boiled. The pan is boiled up to proper size of crystals are formed.
- k. After the crystallization process in pan a ready material containing sugar crystals called massecuite. A ready massecuite is rotated in centrifugal machine having high RPM to separate sugar and mother liquor from massecuite.
- l. In Hooper, Separated Sugar from centrifugal machines dropped in to the hoppers where sugar is dried and cooled down.

❖ Co-Generation

The cogeneration plant is selected to utilize bagasse as non conventional fuel. The plant will consume 5,82,400 MT/year of bagasse for 160 days of co-generation plant operation. The boiler capacity is designed for 120 × 2 TPH at 110 Kg/cm², 540° C. The high pressure Turbo Generator is selected as 2.5 extraction back pressure type with oil cooler. The generator will be 2/4 poles, 3 phase, to suit 90 MW as suitable capacity. This will also meet the process steam requirement of the Sugar Plant. It is expected that Co-generation Plant will fulfill the energy requirement of the Sugar Plant and remaining power can be exported to the Maharashtra State Power Grid.

The steam generating system for the proposed Cogeneration project consist of two multi fuels fired boiler with a maximum continuous rating of 110 TPH (70 TPH + 40 TPH), with the outlet steam parameters at 45 Kg/cm² and 500° C. The tolerance on the super heater outlet temperature shall be +5 to -5 °C

❖ Distillery

- a. Molasses is used for production of alcohol. Molasses contains about 50% total sugars, of which 30 to 33% are cane sugar & rest are reducing sugar. During Fermentation, yeast a living micro-organism belonging to class fungi converts sugar present in the molasses such as sucrose or glucose in the alcohol.
- b. Continuous Fermentation: Molasses, diluted with the water to the desired concentration is metered continuously into fermented.
- c. Yeast Cycling: The yeast in the fermented wash is removed as 45 to 55 % v/v slurry & is returned to the fermenter.
- d. Fermented Wash to Distillation: Clarified or de-yeasted wash flow by gravity to the propagation vessels no. III which during continuous production, operates as an

- intermediate wash tank from here fermented wash is pumped to the wash preheated, which uses vapors from the distillation column to preheat wash.
- e. **Wash Weak Recycling:** Weak wash is cooled, first against the deyeasted wash entering the column & then against water in the trim cooler & recycled back to the fermenter.
 - f. **Propagation:** During propagation it serves the in volume builds up. When the fermenter enters the continuous production mode, propagation vessel III is used as an intermediates wash tank. Propagation is carried out only to start up the process initially or after very long shutdown during which the fermenter is emptied.
 - g. **Distillation:** Pre heated wash at around 72-74⁰ C enters the top of degasifying column, which is attached the analyzer column. Analyzer column bottom temp has to be maintained around 80-80°C with the help of reboiler, where in heat is exchanged through the vapors from rectifying column top. From degasifying column part of the vapors will go to the aldehyde column to remove low volatile compounds which has been formed during fermentation like acetaldehyde and methanol.

❖ **Refined Sugar**

- **Milling Process:** The first mill extracts 50-70% of the total juice contained in the prepared cane, the remaining offering resistance to removal from fibre by simple compression in rollers. Imbibition water temperature is in the range of 75° C to 80° C.
- **Juice Clarification:** Juice received from the milling process is contains suspended impurities of cane origin like fine bagacillo. The impurities in dispersed and suspended state include soil and fine particles of bagasse extracted during milling. Suspended impurities, colloids and non sugar components making it clear and transparent juice.
- **Defecation:** Defecation of juice employing mainly lime and heat as agents. It is more or less established that for optimum results the juice must contain 240-300 mgms of P₂O₅ per liter. The added lime forms insoluble Tricalcium Phosphate Ca₃(PO₄)₂ precipitate which occludes colloids and suspended impurities.
- Then juice is heated in juice heater up to 70° C-72° C. The heated juice is treated with milk of lime in continuous treatment tank (reaction tank) for achieving juice pH 7.1 – 7.4 and limed juice heated at temperature 100° C -103°C, and sent to continuous clarifier for mud settling.
- **Clarification:** A dilute solution of the settling aid is fed continuously to the treated juice on its way to the settler after the juice has been heated. It is desirable to feed the solution near the point of entry into subside/clarifier and particles of precipitate with resultant formation of large aggregates which settle rapidly. Magnofloc LT- 27 is the flocculent used.
- **Evaporation:** The dry substance content of the clarified juice from approx. 14 - 16 % to a dry substance content of approx. 60 - 66 % in the syrup by water evaporation.

- **Pan Boiling:** It is done to convert the thick juice (syrup) into crystal form. This is done in vacuum pan which is either batch or continuous type pan. The number and size of grains maximum crystal surface for sugar adsorption from the mother liquor.
- **Centrifugation:** Centrifugal force is used to separating mother liquor from sugar crystal by applying much, greater force than gravity. This operation is called as purging or curing.
- **Raw Melt Treatment:** The heated melt is taken in melt reaction tank. In this melt Phosphoric acid (250-350 ppm), Lime-secrete & Decolourant (60-150 ppm) is added. After that flocculent (8-18 ppm) is added. The main reaction takes place in process as follows.



- **Continuous Floatation Carrier:** Scum is removed from the melt surface by the scraper. The obtained melt is known as clear melt which is send to DBF & the obtained residue is known as scum this is send to scum de-sweetening unit.
- **Scum De-sweetening Unit:** In the phospho-flotation process of sugar refining, dissolved sugar is recovered from the scum clarifier by a multi-stage re-flotation process involving three consecutive stages of counter-current aqueous extraction, using an organic polymeric flocculating agent. the dilute sugar solution recovered from of the first extraction stage typically has a concentration of from 10° to 20° Brix. The sugar concentration in the dilute sugar solution removed from of the last extraction stage is typically from 0.2° to 2° Brix. The residual sugar content in the de-sweetened scum removed from of the last extraction stage and the de-sweetened scum send to rotary vaccum filter mud tank.
- **Deep Bed Filter (DBF):** It contains 5 layers of sand stones and 1 layer of activated carbon to filter out or separate insoluble suspended particle adhering on the stone and clear melt is out and is sent to melt concentrator.
- **Melt concentrator:** This is to increase the dry substance content of the filtered liquor from approx. 62%-65 % to a dry substance content of approx. 70%-72 % in the concentration filtered liquor by water evaporation.
- **Pan Boiling:** At pan station R1, R2, R3 and R4 Masecuite boiling is done in a Batch pan and recovery house Masecuite are boiled in both pan (Batch and Continuous). Dry seed is used for R1, R2, and R3 pan seeding. R2 Masecuite boiling is done by R1 molasses. . R3 Masecuite boiling is done by R2 molasses. R4 Masecuite boiling is done by R3 molasses and R4 molasses send to pan boiling and R4 sugar send to Raw sugar melter.
- **Centrifugation:** The R1, R2, R3, & R4 Masecuite is take in batch type fully automatic flat bottom centrifugal machines and recovery house Masecuite is cured in a continuous type centrifugal machines.

- **Drying & Grading:** The R1,R2 & R3 sugar is conveyed to FBD (Fluidized Bed Dryer) where most of the moisture is removed, then passes over the magnets to remove ferrous particles and the sugar send through elevator in the grader. Then conveying the different grade sugar on different belt then pass through magnet and entered in silo.
- **Packaging:** After grading this sugar is storing in sugar silo, which is weighted and packed in HDPE –PPE bags in 50 Kg.
- **Project Cost**
 - Total Project Cost 350 Cr.
 - CER Cost 3.5 Cr
 - EMP Cost 35Cr
- **Raw Material**
 - The main raw material for sugar is Sugar cane, Lime & sulphur.
 - Raw material for Co-generation is Bagasse.
 - For distillery, the important raw material is Molasses.
- **Water Management**

The total water requirement after expansion is 892 m³/day. [Sugar + Co-gen + Distillery]
- **Utilities**
 - Power Requirement: the total power generation here will be 90 MW/day. The power for the factory will be consumed from the in-house production & excess will be sold to the MSEB.
 - Boiler: 2 nos. of existing 40 TPH, 70 TPH and proposed 2 nos. of 120 TPH and 1 no. of 60 TPH capacity boilers with the fuel Bagasse.
 - DG Set: There are 2 nos. of existing DG sets of capacities 500 KVA and 125 KVA. Proposed DG set capacity shall be 1250 KVA
 - Fuel for DG set: Fuel used will be HSD.
- **Waste Water :**
 - The effluent from Sugar unit will be treated in ETP consists of Primary treatment, two-staged Secondary treatment followed by tertiary treatment of dual media filtration which will remove turbidity organic matter and traces of color from the treated effluent. The treated water will be used for maintaining the Green Belt.
 - The condensate polishing unit will be provided for condensate generate from sugar unit. The technology comprises multi membrane filter followed by active carbon filter and softener.
 - The spent wash (effluent) from distillery will be sent to MEE + Incineration Boiler.

- By adopting the above technology, it is possible to achieve not only zero pollution but also will utilize fully the nutrient values and organic matter of Spent wash for the resource generation.
- **Air Emissions:**
 - The air pollution caused by this industry is mainly from boiler. The boiler will be provided with ESP to combat ash pollution.
- **Solid Waste Management:**
 - The main solid waste from factory will be of non-hazardous from office, garden and boiler ash. Non hazardous waste will be segregated as compostable and saleable. Solid waste such as yeast sludge and Boiler Ash are mixed with press mud and converted to bio compost will be made available to nearby farmers.
 - The hazardous waste from ETP and process will be generated. Spent oil will be burnt along with bagasses in co-gen boiler. ETP sludge, distillation residue will be used as manure.

Chapter 3: Description of Environment

Base line environmental studies were carried out, as per TOR received from MoEF&CC, New Delhi.

Study area: The study area is defined as area within 10 km radius from proposed expansion site of boundary.

- **Baseline Environment:** Kolhapur has a semi-arid climate with three seasons, a hot, dry summer from the middle of February to the middle of June, a monsoon from the middle of June to late October and a mild cool season from early November to early February. The total rainfall is about 700 mm.

Table No.11.1 Average meteorological condition at Kolhapur

Sr. No	Month	Average Temperature [°C]	Wind Speed [Km/hr]	Wind Direction [From north]	Rainfall [mm]	Relative Humidity[%]
1	October	24.5	5.3	163.9	0.2	74.3
2	November	23.1	5.7	129.2	0.0	66.7
3	December	22.5	5.0	131.8	0.0	58.0

- **Ambient Air Quality:**

Ambient Air Quality monitoring stations were set up at 9 different locations. Parameters recorded are as follows:

- PM_{2.5}
- PM₁₀
- SO₂

- NO_x
- CO
- HC

The observations are as follows:

- Maximum concentration of SO₂ was 9.2 µg/m³ at Project Site & minimum concentration was 7.1 µg/m³ at Shahapur and Manjari.
- Maximum concentration of NO_x was 11.1µg/m³ at Project Site & minimum concentration was 8.6µg/m³ at Akiwat.
- Maximum concentration of PM₁₀ was 47.8 µg/m³ at Project Site & minimum concentration was 25µg/m³ at Shahapur.
- Maximum concentration of PM_{2.5} was 18.5µg/m³ at Project Site & minimum concentration was 7.5 µg/m³ at Shahapur.
- Maximum concentration of CO was 0.16µg/m³ at Project site & minimum concentration was 0.09µg/m³ at Takali.
- The levels of HC were found below detectable limit.

▪ **Noise:**

Noise levels were recorded at 10 different locations within the study area. Observation as follows.

- Average Noise level at all location in study area is 47 dB & 40 dB in day time & night time respectively. This is within the permissible limit given by CPCB i.e. day time 55 dB & night time 45 dB.
 - Maximum Noise level observed in day time & night time is at Project Site.
 - Minimum Noise level observed in day time at Abddul Lat Village.
 - Minimum noise level observed in night time at. Mangawati.
- **Hydrogeology:**
- Hill ranges in Kolhapur dist runs roughly North-South, along the main range of western ghat presenting wild and picture square hill slopes and valleys.
 - A geological map is showing basalt, laterite, quartzite and granite presence in the district. Bauxite is chief mineral of economic value. Water, sheds 405 are in safe zone except one which is in semi critical category.
 - Total annual ground water recharge is 82343 ha m, natural discharge is 4117 ha gross draft is 45866 ha m and net annual availability is 78226 ham.
 - The entire Solapur district is occupied by lava flows of the Deccan Basalt formation, which constitute the main rock formation of the district.
 - **Well Inventory:** Well inventory survey for hydrogeological study around Village Akiwat-Takaliwadi Road, Taluka Shirol, District Kolhapur, (10 Km. radius) have been carried out for accurate identification of the aquifer(s), nature of the water bearing

formation, depth to water, identification of formation fracture characteristics, tectonic structure.

- **Dug wells:** The study area hosts most of the dug wells. The river network is completely covered most of the part of study area. Thus dug wells in the study area was mostly with full of water during visited schedule.
- **Aquifer:** Upper zone is covering with shallow depth soil and moderately weathered rock materials thus mostly all the dug wells in the study area are covered with cement lining of either concrete or rock blocks.

▪ **Surface and Ground Water:**

- There 2 rivers within the 10 km radius of the project site. Krishna and Dudhaganga. Ground water samples were collected from 9 locations. Surface water samples were collected from 6 locations.
- pH of the all ground water sample ranges from 7.07 to 8.09 while pH of surface water samples are 7.59 to 7.9.
- The values of DO were found in range of 5.2 mg/lit to 6.20 mg/lit in surface water. While Total Hardness were found in 19 mg/lit to 311.8 mg/lit in surface water and 34.6 mg/lit to 445.5 mg/lit in ground water.
- Total Suspended solids were found in range between 1 mg/lit to 20 mg/lit in ground water and 4 mg/lit to 28 mg/lit in surface water. Total Dissolved Solids were found in the range between 284 mg/lit to 1236 mg/lit in ground water and 92 mg/lit to 965 mg/lit in surface water.
- BOD values were found in the range of BDL mg/lit to 2 mg/lit in ground water samples. This indicates that the ground water is not contaminated. Similarly BOD values were found in BDL in surface water samples, this indicates water quality of surface water is good.
- COD values was found BDL to 12 mg/lit in ground water and in surface water 2.4 mg/lit to 7.2 mg/lit.
- Other parameters like Cadmium, Chromium, Lead, Zinc, Copper Manganese, Mercury, Selenium, Arsenic, etc. were not detected in all ground and surface water samples. This concludes that the surface and ground water in the study area is not polluted by any source during the study period.

▪ **Geology**

- Two distinct trends are seen in the hill ranges of Kolhapur district. One runs roughly North-South, along the main range of the Western Ghats presenting wild and picturesque hill slopes and valleys.
- The other one comprises the narrow broken-crested ridges and flat topped masses stretching eastwards and merging gradually into the plains in the East.
- The rivers Hiranyakeshi, Vedganga, Dudhaganga, Bhogvati and Panchganga drain the area towards East.

- The Dharwar phyllites and amphibolities intruded by granite-gneiss are the oldest rocks found as small inlays in this district. Phyllites and amphibolities are noticed near Ajra.
- The phyllites are completely weathered and have formed variegated clays. The amphibolities are dark, markedly schistose and break into thin slabs.

▪ **Soil:**

Soil samplings were carried out at 9 locations in the study area.

- Soil around site area is dark brown to black colored cotton soil most commonly associated with Deccan plateau. As per Soil Classification, the soil within study area is mostly clay soil. The average soil texture of study area was Clay. The maximum moisture content was observed at the Ghosarwad (23.2%). The minimum moisture content was observed in the Village Akiwat (7.2%).
- The porosity of soil in the study area were found in the range of 13-44 %. Maximum water holding capacity of soil was at Village Takali (76%). The minimum Water holding capacity was at Project Site (41%).
- Analysis of soil samples collected from the study area shows that soil has neither been affected by liquid effluent nor by disposal of solid/hazardous waste.
- Porosity shows that soil has good percolation capacity during rainy season. Soil is also observed good fertility for crop production.

▪ **Land Use:**

- A recent satellite image for study area was collected from NRSC. The image was interpreted for identification of various land use / land cover classes.
- Ground truthing was done to confirm and edit the interpreted land use / land cover classes.
- Land use of the study area has been classified into 1) Built up area (2.56%) 2) Crop land (48.120%) 3) Fallow land (45.14%) 4) Water Bodies (0.129%) 5) Scrub Land (0.46%) and 6) Barren Land (2.01%) and River (1.58%).

▪ **Ecology & Biodiversity:**

- **Floral Investigation:** Core zone (proposed Project site): Tree species viz *Albizia lebbeck*, *Albizia procera*, *Azadirachta indica*, *Alstonia scholaris* were observed on the site. Some herbs and shrubs species viz. *Lantana camara*, *Alternanthera sessalis*, *Parthenium sp.*, *Tridax procumbens*, *Cassia sp.*, were also observed on the proposed project site.

Buffer zone (10 km from project boundary): The structure and composition of vegetation in the buffer zone was studied by visual observations during the site visit. The study area is dominated by agricultural fields. Most of the area is covered by active cropping accompanying patches of barren land and grassland in between. The dominant species observed in the study area were *Albizia lebbeck*, *Albizia procera*, *Azadirachta indica*, *Artocarpus integrifolia*, *Embllica officinalis*, *Saraca asoca*, *Ficus racemosa*.

- **Faunal Investigation:** During the field studies some tracks and signs of Indian Wild Boar (*Sus scrofa*), Indian Hare (*Lepus nigricollis*) and domesticated animals were observed in the study area.
 - During the public consultation and information collected from forest/wildlife department Jackal (*Canis aureus*), Tadas (*Hyaena hyaena*), Common Mongoose (*Herpestes edwardsii*), Smooth Indian Otter (*Lutragale perspicillata*).
 - Some reptiles i.e. Krait (*Bungarus caeruleus*), Russel viper (*Vipera russelli*), Common Rat Snake (*Ptyas mucosus*) are generally observed in the study area.
 - The total 9 nos. of mammal species and 4 nos. of reptile species were recorded in the study area.
 - **Avifauna:** During overall survey in the study area, a total of 28 nos. of bird species were recorded in the study area. The species which observed in and around the human settlements are Robin, Bharadwaj, Purple sunbird, Shrike, Common Kingfisher, Common myna, Green bee eater.
- **Socio-Economic Study:**
- Social survey is conducted on 17th September, 2015 to 21th September 2015 in the study area to collect factual information by involving community. For secondary data primary census abstract of 2011, Government of India has been used.

Table No. 11.2 Kolhapur District Profile at Glance

Sr. No.	Socio Economic Indicators	Kolhapur district	Shirol Taluka	Project Area (28 villages)
1	Population- Total :(Census 2011)	38,76,001	3,91,015	2,05,602
2	Male	1,980,658	2,00,508	1,05,873
3	Female	1,895,343	1,90,507	1,00,729
4	Total SC population	5,04,461	59,931	22,846
5	Total ST population	30,206	10,511	3,803
6	Total Child Population (0-6 Age)	4,08,942	41,177	22,985
7	Total No. of Households	8,40,240	83,953	42,799
8	No. of Villages	1622	56	28
9	Total Literate Population:	28,25,845 (81.51%)	291910 (74.65%)	1,42,173
10	Male	15,59,760	1,66,610	80,091
11	Female	12,66,085	1,25,300	62,091
12	Administrative set up	District Collector, Zilla Parishad, District headquarters	Mini Cooperation (Nagar Palika) and Grampanchayat Offices	Grampanchayat Office

13	Community Hall	Yes	Yes	Yes
14	Banks	Yes	Yes	Yes
15	Post Office	Yes	Yes	Yes
16	Bus Stand/ Bus stop	Yes	Yes	Yes
17	Weekly Market	Yes	Yes	Yes
18	Connecting road to villages	Yes	Yes	Yes
19	Existing Social Groups	Yes	Yes	Yes
20	Total Worker population	17,04,054	1,75,326	83,028
21	Total Main worker Population	15,08,563	1,43,107	71,679
22	Total Main Cultivator Population	5,94,056	43,280	21,443
23	Total Main Agricultural Labourers	2,07,790	42,647	20,937
24	Total Marginal Workers Population	1,95,491	32,219	14,580
25	Total Marginal Cultivator Population	66,816	11,940	4,814
26	Total Marginal Agricultural Labourers	58,238	11,087	7,075
27	Total Non worker Population	21,71,947	1,83,853	94,006

Conclusion: The above table shows that there is a 51.49% population of males and 48.89 % population of females, total working population is about 40.38 % out of that 25.82% are main cultivators and 24.82 % are the agricultural labors. Out of total population there are about 69.14% population is literate.

The project has strong positive effects on average consumption in the project area, which is likely to lead to increase average income through multiplier effects and increased farm income and livelihood support activity for the villagers.

Chapter 4: Anticipated Environmental Impact Identification and Mitigation Measures

1. Air Environment:

Impacts

Various identified sources, in production of Sugar, Power and Alcohol that can cause potential impacts on air quality are emissions from:

- Emission during construction phase.
- Emissions during operation phase from boiler one no. of each 40 TPH, 70 TPH, 2 nos. of 120 TPH and one no. of 60 TPH.
- Emission from DG sets during power failure/ emergency purpose.

- Emission form vehicular movement.

Mitigation measures for air quality impacts will include:

- Air pollution control will be through the electrostatics precipitator and adequate stack height of 65 m for 40 & 70 TPH boiler, 70 m for 120 TPH and 55 m for 60 TPH boiler.
- DG Set has the stack height of 30 m with acoustic enclosure provided and it will be used in case power failure.
- Effective water spraying will be carried out on the access roads to control re-entrained dust during dry season (if required).
- Plantation within project premises and around the boundary will be done.
- Ensuring the availability of valid Pollution under Control Certificates (PUCC) for all vehicles used on site.
- Proper periodic maintenance will be all air pollution control equipments will be carried out to ensure its efficient operation.

Fugitive Emissions

A number of mitigation measures are taken to control fugitive emissions, the presence of which will be taken to Noticeable by plain vision if not controlled. Following are the measures:

- Rubber wheel carts/trucks to bring in raw materials, not filled high, sides cladded, slow speed travel, avoiding vibrations.
- Engineering the plant layout in such a way so as to virtually eliminate need of using heavy equipment for material handling in the main plant.
- Concrete flooring & wind barrier for bagasses storage yard.

2. Noise Environment:

The proposed plant operations and related activities will lead to emission of noise that may have significant impact on the surrounding communities in terms of increase in noise levels and associated disturbances.

Impacts

Following activities would result in increase in noise level:

- Operation of plant
- Construction activity
- Vehicle/traffic movement

Mitigation measures for noise related impacts will include:

- Ensure hand-held concrete breakers are muffled
- Maintain machines regularly - they will be quieter
- Locate noisy machines away from main areas of activity.

- Fit silencers to combustion engines. Ensure they are in good condition and work effectively.
- Keep machinery covers and panels closed and well fitted. Bolts/fasteners done up tightly avoid rattles
- Selection of quieter tools/ machines.
- Enclose the noise sources
- Hearing protection by ear mufflers
- Reduction of noise by placing temporary noise barriers

3. Water Environment:

The proposed project will utilize 892 m³/day water during operation phase. The source of water will be from Krishna River. The treated waste water shall be used for green belt development.

Impacts

- Effluent is generated from mainly from Sugar and distillery unit. Effluent will be generated from sugar plant units like, mill house, boiling house pumps, centrifuges and discharges from laboratory.
- This wastewater contains organic matter, oil and grease with BOD around 2000 mg/lit and COD of 5000 mg/lit.
- If this wastewater is not treated properly may affect surface as well as ground water quality.

Mitigation measures to reduce ground water related impacts are:

- Effluent treatment plant (ETP) is being installed to treat the wastewater.
- The treated waste water will be used for gardening.
- The spent wash from Distillery will be used for fired in boiler.
- The steam generated by the incineration boiler and power generated in the turbine will be used for distillery plant, IMEE, standalone MEE and incineration boiler.
- Thus the zero liquid discharge will be achieved.
- Efforts will be made to reduce water requirement by recycle and reuse of process waste water etc.
- Domestic waste water shall be reused for Green belt.

4. Land:

The study area covers 314 km². In that context the likely change in land use and land cover due to the project is likely to be in the order of 0.01-0.02% of the entire area, a relatively modest figure. Also as per the environmental risk categorization it comes under moderate risk level where the activity can operate subject to management and or modification.

Impacts

Potential Impacts on the Land Use and land cover shall be due to the project are given below:

- With reference to Drainage map of land, there are many small streams and natural drains near the plant. There is a chance of that water bodies gets polluted if the effluent from the plant is discharged into the drains.
- The surrounding land use may get affected due to solid waste, if it is not disposed properly. The soil and the ground water can get polluted.
- Site preparation.
- Green belt development (Positive Impact).

Mitigation measures to reduce Land Use and land cover related impacts are:

- Optimization of land requirement through proper site lay out design will be a basic criteria at the design phase.
- As the Site is surrounded by Agriculture land as LU map suggest so care should be taken for the waste disposal.
- The management of the proposed plant should implement the proper disposal method for solid and hazardous waste. The waste should not be dumped on open ground without liners.
- Development and maintenance of green belt within project premises, a positive impact is envisaged.

5. Soil

Impacts

Potential impacts on soil due to production of sugar and co-generation activities are given below:

- Impacts during construction phase
- Impacts during operation phase.

Mitigation measures to reduce soil related impacts are:

- Construction activity is limited. Effect is limited to factory area only.
- Fertile soil will be stacked and used in landscaping.
- The drainage plan will be implemented.
- Fly ash, press mud and spent wash will be sale to authorized vendor for disposal.
- Waste water will be treated in ETP.
- Waste water will be channelized.
- Reduce erosion.
- Silt trap will be installed to prevent siltation.
- The lagoons have been made by concrete with adequate size to prevent over flow. Thin layer lining will be done over concrete walls of lagoons to prevent percolation.

6. Socio-Economic

Critical analysis of socio-economic profile of the area vis-à-vis its scenario with proposed project activities indicate that the impacts of the project are expected to be of varying nature.

Impacts

The impacts predicted will be on following Environmental components:

- Population.
- Education.
- Employment Generation.
- Infrastructure.
- Sanitation/Public Health.
- Agriculture.

Mitigation measures for Socio Economic:

- Construction and maintenance of the approach road at regular interval will be carried out by the project proponent.
- Developed water management and adoption of Soil and Water conservation methods with recharge the groundwater. Improving organic farming practices by providing agriculture technology in some of the villages in 10 km radius area. To solve the sanitation problems by sock pits, covered drains and construction of toilets and solid west management.
- To stop the migration by start the income generation activities and employment opportunity, job opportunities will be created in the project area from industrial sector, Creation of employment opportunity in the areas.
- The sugar factory should have strict vigilance on pollution control systems to ensure strict compliance with laws.
- Full proof arrangements to be made by the factory to keep pollution under check.
- People will not migrate to city or urban area in search of employment / livelihood. 998 village youth (Skilled and unskilled worker) will get the employment opportunities.
- Industry to ensure immediate action to stop contamination so that ground water is not polluted.

7. Occupational Health & Safety

Impacts on Occupational Health, Community Health and Safety listed below:

- Impact during preparation of site development which is Risk of occupational injuries.
- Impact on community health due to various transportation activities, like Noise pollution, Dust pollution, potential damages to village road. Due to this lot of inconvenience may happen to local community.
- Occupational risk during working at heights, during welding etc for Construction activity.
- During storage, handling and disposal of waste water, Risk to community health due to spillage in surrounding area if not stored properly.
- Risk during manufacturing process.
- Risk due to Fire for all type of storages.

Mitigation Measures:

- By using PPEs during process impacts on occupational health and safety shall be overcome.
- Occupational health and Safety surveillance program will be carried out
- Continuous CSR activities shall be there by proponent such as construction of approach roads, various awareness programs
- By proper Risk Assessment and risk management of process.

Chapter No. 5: Analysis of Alternatives

Site selection

The proposed project is within the existing premises; site is already in possession of proponent at Gut No. 61/ A Akiwat, Takaliwadi. The site has been selected and finalized with the following considerations. Hence alternative site was not studied.

Availability of Required Land: The raw material like Lime, Sulphur, lubricants phosphoric acid etc is required for production of sugar will be procured from Local Market with road transportation. The Molasses will be available from own source and short fall will be purchased from local market. The bagasse a key raw material required for power generation is available from own source. The cane shall be transported through bullock carts, tractors, trolleys and trucks as per the distance.

Site Approach: The site is approachable by the nearest railway station namely Jaysingpur 15 km away from project site towards North-West direction. The nearest airport located at Kolhapur which is 40 km away from the project site towards West direction. The National highway NH-4 (Pune –Bangalore) is 40 km away from the project site towards North West direction. Nearest habitat is Takaliwadi which is 0.5 km away from the project site towards North-East direction.

Topography / Nature of Terrain: The existing site has plane topography with flat terrain and doesn't require cutting or filling and subsequently doesn't require much manpower and machinery.

Availability of Water: Total fresh water requirement for sugar, distillery & cogeneration unit is 892 CMD, apart from that 4620 CMD water shall be met through recycle of condensate water {Sugar & Distillery}. The water source is from Krishna River and adequate quantity will be supplied by the irrigation department.

Environmental Considerations: The site selected is feasible with respect to following listed points.

- No forest land is involved.
- No cultivable land is involved.
- No requirement of cutting of trees.
- No displacement of people.

Technology Process:

The existing technology used by **M/s Shri Gurudatt Sugars Ltd.** for Manufacturing of sugar, co-gen & alcohol is one of the best and proven technologies. Treatment point of view for existing as well as expansion project. MEE-incineration boiler for distillery will play important role where it can achieve Zero Liquid Discharge as per CPCB norms. Condensate polishing unit for sugar and distillery will save on fresh water requirement.

1. Improvement in crushing capacity & its utilization with updating of Technologies.
2. Improvement with milling performance by maintaining the machineries & its components.
3. Reduction in energy consumption by adopting modern energy saving techniques.
4. Optimum use of steam.
5. Reduction in final molasses purity.

Co gen Process:

The high pressure co-generation plant is selected to utilize bagasse as non-conventional fuel. The new co-generation power plant with existing low pressure boiler and turbo generator. It is an efficient and cost effective to save energy and reduce pollution. There is no addition of equipment at 85 MW capacities of cogeneration project. This will be run at full capacity.

Distillery:

The proponent has decided to install the new 150 KLPD distillery with;

1. Continuous fermentation/ Fed Batch System.
2. Multi-pressure distillation system to produce RS, ENA & for fuel ethanol.
3. Molecular sieve dehydration technology shall be adopted.
4. Stand alone evaporation system has been incorporated as primary & secondary treatment system.

Chapter 6: Environmental Monitoring Program

An environmental monitoring plan provides a delivery mechanism to address the adverse environmental impacts of a project during its execution, to enhance project benefits, and to introduce standards of good practice to be adopted for the project works. An environmental monitoring program is important as it provides useful information of the project.

Objective of monitoring:

1. To measure effectiveness of operating procedure.
2. To confirm statutory & mandatory compliance.
3. Identify unexpected change.

Environmental Monitoring:

The following will be monitored on a regular basis during operation phase and also throughout the life of the project to ensure that a high level of environmental performance is maintained:

- Periodic monitoring of PM₁₀, PM_{2.5}, SO₂ and NO_x will be carried out during the operational phase.
- Post project sampling and effect on baseline data generated during preparation of EIA report
- The general effectiveness of pollution control measures shall also be monitored.
- Online monitoring is also working in the factory. As per CPCB guidelines.

Chapter 7: Additional Studies

Hazard Identification and Consequence Assessment

Identification of hazards in the proposed plant is of primary significance in the analysis, Quantification and cost effective control of accidents involving chemicals and process. A classical definition of hazard states that hazard is in fact the characteristic of system/plant/process that presents potential for an accident.

Planning:

On-site and Offsite emergency plan will be prepared as per the factory act and will be prepared as per Rule no. 12 of factory act (control of Industrial Major Accident Hazard Rules, 2003) as per the guidelines given in Schedule 6. It is absolutely necessary to train carryout mock drills for success of emergency plan during actual emergency. Emergency procedures should be laid down clearly and convincingly to everyone on site.

Public consultation:

Details of Public consultation will be incorporated after conducting Public hearing for the project as guided by MPCB and their suggestions will be incorporated in operation of the plant and CSR activities.

Chapter 8: Project benefit

The proposed project on implementation will generate potential jobs directly, and will also generate many indirect job opportunities.

1. Indirect and direct employment opportunities to local people in contractual works like housing Construction, transportations, sanitation, for supply of goods and services to the project and other community services.
2. The production of sugar, alcohol which lead the state higher level.
3. Market and business establishment facilities will be also increase also Cultural, recreation and aesthetic facilities will be improved.
4. Improvement in communication, transport, education, community development and medical facility.

5. The activities would result in an increase in local skill levels through exposure to proposed technology.

Chapter No. 9: Environment Management Plan

The EMP provides a delivery mechanism to address potential adverse impacts, to instruct contractors and to introduce standards of good practice to be adopted for all project works. For each stage of the program, the EMP lists all the requirements to ensure effective mitigation of significant biophysical and socio-economic impacts identified in the EIA.

- Energy and water conservation practices will be adopted.
- Green belt development plan is designed for project over 18.15 Acre with variety of plants.
- Total rainwater generated and harvested through built-up and open area, and green belts from the project area is about **78023 m³**. The rainwater recharge through recharge structures like settling ponds pits etc.

CER Activity: The SGSL has already adopted a policy for Environment protection and comprises following aspects:

- Accidental Insurance: providing to farmers and Harvesting contractors labors.
- Medical Camp: This is regularly organize for harvesting Labours & factory employees
- Help & Support to Handicapped People [Divyang People]
- Ambulance: Donated an Ambulance to National Development Academy headed by Shri. Dnyaneshwar Mulay, Consul General of India, NewYork
- Firefighter Vehicle Facility: SGSL has provided safe & high quality fire protection services to the surrounding local residential area.
- Religious Activity: Giving donation & a bag of sugar to the many Mandals, Sansthas, Trust for their religious programs & activity.
- Educational Development Activity: SGSL helping financial as well as material support to the educational institute.
- Water Conservation with Water Benchmarks: SGSL has established a unique water treatment system where in naturally available water in cane is reused for running of plant in season without depending on external water.
- Activity Relating to farmer: Cane Development Program:

Chapter 10: Conclusion

M/s. Shri Gurudatt SugarsL proposed project is not going to affect the surrounding environment as this project will adopt the latest technology. Further, it will generate a fair amount of direct, indirect and induced employment in the region. The local economy will receive a boost due to employee spending and services generated by the company. All the possible environmental aspects are adequately assessed and necessary control measures are formulated to meet with statutory requirements. Due to the implementation of the project activity there shall be improvement in the standard of living viz. better education, improved health, sanitation facilities

etc. This is envisaged as a major positive benefit. The company's management shall recruit semi skilled and unskilled workers from the nearby villages due to availability of local labors. The employment provided due to the proposed project would rapidly increase the social status of the villagers. Thus implementing this project will minimize adverse impacts on surrounding environment. Hence proposed project will be a welcome development.

Chapter 11: Executive Summary

Executive Summary is incorporated in this Chapter.

Chapter 12: Disclosure of Consultant

The project proponents retained sd engineering services pvt. ltd. as consultant to prepare EIA report for SGSL. The consultant has more than 23 years of varied experience in the field of environment. The mission of company is to provide sustainable solutions on "Environment for Development". The company is an accredited EIA Consultant Organization by NABET, Quality Council of India under EIA accreditation scheme as per mandatory requirement of the MOEF&CC, Govt. of India for carrying out Environmental Clearance studies.