

CHAPTER 11

EXECUTIVE SUMMARY

CHAPTER 1: INTRODUCTION

1) Shri. Gurudatt Sugars Ltd. (SGSL) has proposed expansion of sugar manufacture from 4900 TCD to 6000 TCD and Cogeneration power from 15 MW to 21 MW. Shri. Madhavrao B. Ghatage is the chairman and managing director of the SGSL company, Kolhapur. The site is located at Gut No. 61/A Akiwat Takaliwadi Road, Taluka Shirol, District Kolhapur (MS). The geographical location of the industry is 16°37'15.5" N latitude and 74°35'39.5" E longitude with an elevation of 540 m above Mean Sea Level (MSL). The total plot area is 55 acres. The Notification No S. O. 1533 promulgated on 14th September 2006 have covered these types of industries under its entry 5(j) Sugar Industry & 1(d) Thermal Power Plant. TOR letter issued by the MoEFCC 36th Reconstituted Expert Appraisal Committee (Industry 2) meeting held during 16th & 17th March, 2015.

CHAPTER 2: PROJECT DESCRIPTION

2) Sugar cane

The manufacturing process for sugar comprises following steps at SGSL

- Cane weighing and unloading from trucks, bullock carts, trolley etc
- Cane handling and preparatory system
- Milling tandem
- Juice clarification system
- Evaporation
- Vacuum pan boiling and crystallization
- Storage packing and warehousing of sugar bags
- Final molasses storage
- Effluent treatment
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3) Cogeneration Process:

Co-generation will be done through steam turbines of double extraction condensing route by 110 TPH boilers (70 TPH & 40 TPH) at 520^oC steam temperature. Turbo generating set is based on Double Extraction cum condensing mode and with generation capacity of total 21MW. Steam requirement shall be 45 kg/cm² for power generation unit. This can be met by using exhaust steam coming after turbines. Power requirement (21 KW/hr) for unit connected load is available through Govt. Electricity. However the same will be generated in house from turbine. There are

two DG set used only in emergency backup of capacity (250 KVA & 500 KVA) for proposed plant. Quantity of fuel for DG set shall be 70 Liters/hr of HSD.

4) The main raw material for this industry is sugarcane. The procurement of sugarcane will be 9.60 Lakh MT/Annum and balance from nearer sugar factory. The total water requirement for sugar & cogeneration process is about 1405.25m³/day. Water is supplied from Krishna River by Irrigation Department Sangli. The total project cost is 44 Cr, EMP cost-11.23 Cr & CSR Cost- 1 Cr. EMP cost is allocated to existing project as well as proposed.

5) **Cooling Tower-** The cooling tower is designed as Induced Draft Counter current flow RCC structure. The capacity of cooling tower shall be 700 m³ and water circulation pumps for various sections shall be as 1350 m³/hr each, 35 m Head, Quantity of water cooled is 1350 m³/hr each. Temp from drop 40-42⁰C to 30-32⁰C is expected from the cooling tower.

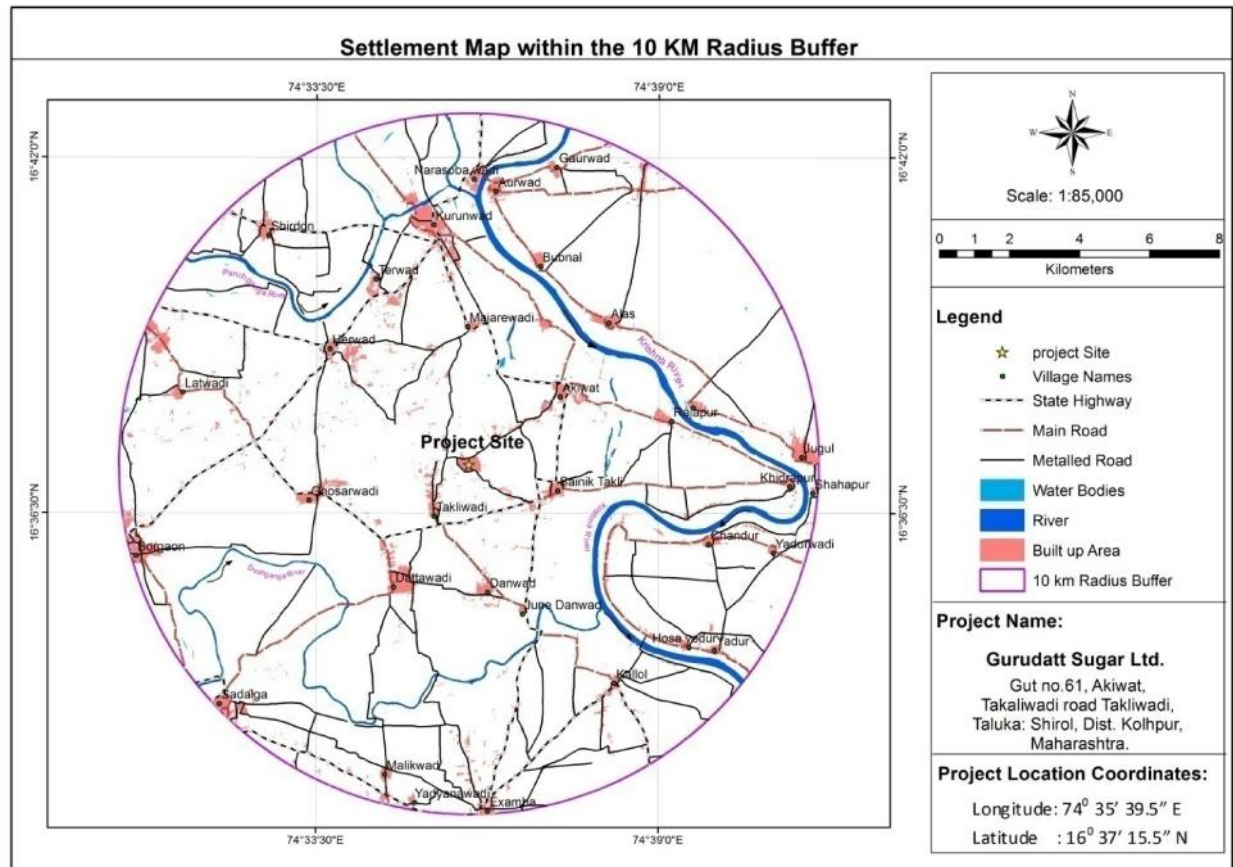
6) **Waste water generation** from different sources is 504.72m³/day. The sources of wastewater generation from sugar plant are mainly from the mill house, boiling house pumps, centrifugal pumps and discharges from laboratory. All lean streams from various sources like boiler blow down; cooling tower blow down, domestic will be collected together and subjected to primary, secondary treatments followed by UF and RO to recycle treated effluent.

7) **Air emissions:** Boiler capacity is designed at 110 TPH. The air pollution caused by this industry is mainly from boiler. The boiler will be provided with cyclone followed by ESP to control air pollutants followed by chimney of 65m height.

8) **Solid waste management:** Bagasse from cane sugar crushing is about 47410 kg/hour which will be used in cogeneration power production. The main solid waste from factory will be of non-hazardous from office, garden, effluent treatment plant. Non hazardous waste will be segregated as compostable and saleable. Hazardous solid waste such as spent oil and wastes/residues containing oil will be disposed scientifically as per the norms.

CHAPTER 3: DESCRIPTION OF THE ENVIRONMENT

9) **Study area:** The study area for EIA is defined as area within 10 km radius from proposed project. Kolhapur District 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. In winter seasons temperature varies between 28⁰c & 32⁰c with wind speeds of about 8 km/hours. Rainfall is negligible and relative humidity is around 40%. Base line environmental studies were carried out, as per TOR received from MoEFCC, New Delhi. Satellite imagery of the site location and study area is depicted in the Figure.



10) Ambient Air Quality (AAQ):

Ambient Air Quality monitoring stations were set up at 9 different locations. AAQ parameters recorded during winter season for 13 weeks for $PM_{2.5}$, PM_{10} , SO_2 , NO_x , CO and HC. The sampling locations were selected on the basis of wind rose diagram of one year meteorological data of Kolhapur District. Maximum concentration of SO_2 was $9.2\mu g/m^3$ at Project Site & minimum concentration was $7.1\mu g/m^3$ at village Shahapur as well as village Manjari. Maximum concentration of NO_x was $11.1\mu g/m^3$ at project site & minimum concentration was $8.6\mu g/m^3$ at village Akiwat. Maximum concentration of PM_{10} was $47.8\mu g/m^3$ at Project Site & minimum concentration was $25\mu g/m^3$ at village Shahapur. Maximum concentration of $PM_{2.5}$ was $18.5\mu g/m^3$ at Project Site & minimum concentration was $7.5\mu g/m^3$ at village Akiwat. Maximum concentration of CO was $0.16\mu g/m^3$ at Project site & minimum concentration was $0.09\mu g/m^3$ at village Takali.

11) **Noise:** Noise levels were recorded at 13 different locations within the study area. Average Noise level at all location in study area is 47 dB & 40 dB in day time & night time respectively. Maximum Noise level observed in day time & night time is at Project Site.

Minimum Noise level observed in day time at village Abddul Lat. Minimum noise level observed in night time at village Mangawati.

12) **Land Use:** A recent satellite image for study area was collected from NRSC Hyderabad. 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. Satellite data of IRS Resourcesat2 sensor is geometrically corrected and enhanced using principal component method and Nearest Neighborhood re-sampling technique. Essential maps (related to natural resources) like Land use / Land cover map are prepared by visual interpretation of the satellite imagery. Visual interpretation is carried out based on the image characteristics like tone, size, shape, pattern, texture, location, association, background etc. in conjunction with existing maps/ literature. All the maps prepared are converted into soft copy by digitization of contours and drainages. In that process editing, labeling, mosaicing, quality checking, data integration etc are done, finally Land use areas are measured in Square Kilometers. Preliminary quality check and necessary corrections are carried out for all the maps prepared.

13) **Land use** of the study area has been classified into various categories. The major portion of land is covered by Agriculture land (48.12%) followed by fallow land (45.14%). Built up area is only 2.56 %. Water bodies are rivers constitute 1.7 % land where as scrub land is only 0.46 %.

14) **Geology and 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. The other hill range comprises the narrow broken crested ridges merging gradually into planes in the east direction. A geological map is presented in the report 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 m, gross draft is 45866 ha m and net annual availability is 78226 ham.

15) Well inventory survey was carried out in the study are. Aquifer material is mainly of weather and highly fractured rock, inferred unconfined and semi confined type aquifers. Dug wells are used for drinking as well as irrigation purpose. Seasonal variation in ground water levels from monsoon (September) of summer (May) is observed between 0.5 m and 7m.

16) **Drainage Pattern:** Drainage map of study area was prepared using the field data and topo-sheets. The drainage map shows very clear pattern of rivers and drainage along with is direction of flow. The three major rivers 1. Krishna 2. Panchganga and Dudhaganga are major sources for irrigation and industries. There are no major reservoirs / ponds in the study area.

17) **Soil:** Soil samples were collected at 9 locations in the study area and analysed for the physical parameters. Soil at and 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 Silty Clay Loam and Silty Loam.

18) **Ground Water Quality:** Ground water samples were collected at 7 locations of the study area and analyzed for parameters mentioned in the Indian Standard BIS 10500:2012. All parameters are within permissible limit with BIS standard for drinking water. Maximum concentration of Total dissolved solids found high 1236 mg/L at village Jugul and Minimum 284 mg/L. at Boargaon village. Maximum concentration of Hardness found 445 mg/L at village Jugul and minimum concentration of hardness found 70 mg/L at Project site. Maximum concentration of Total Suspended Solids found 1237 mg/L at Village Jugul and Minimum 440 mg/L at Project Site. All heavy metals are below the permissible limit.

Surface Water Quality: The Study area has 3 rivers that is Panchganga, Dudhganaga & Krishna River. Physic chemical analysis was conducted for 36 parameters including heavy metals. Heavy metals are within permissible limits in all samples collected from these three rivers. Other Parameters are within a permissible limit in surface water. Total Dissolved Solids found 578 mg/L in Krishna River at village Jugul and minimum 372mg/L in Panchganaga River at village Herwad. The Total Suspended Solid is maximum i.e 28mg/L high amount in Krushna River near village June Dhanwad village & minimum 4.0mg/L in Krishna River near Takali village. The total Kjeldhal Nitrogen is maximum i.e. 3.1 mg/L at both village Dudhaganaga river at June Danwad & Krishna river at Kavtheguland. Other Parameters are within a permissible limit in surface water.

19) **Ecology & Biodiversity:** The list of floral species is prepared based on visual observation during site visits and thorough review of literatures. Secondary data available with various government offices are referred for identifying rare or endangered species in the region. There are no endangered species of flora and fauna in the study area. There are no reports with the forest department about endangered species or notified protected species. Vernacular species are present in study area. Indian species such as *Hyena*, *Jackals*, *Wild Pigs*, *Red fox* and *Panther* are recorded in the literature. Typically vegetation is composed of natural and cultivated type like *Babhul*, *Neem*. *Beshrami* is common weed in wet areas. There are about sixty species of fish available in rivers, tanks, ponds. No threaten on flora and fauna in study area. Phytoplankton and zooplankton species were also recorded from the three river waters and listed in the project report.

20) **Socio-Economic Study:** Social survey is conducted 19th September 2015 to 20th September 2015 in 28 villages to collect factual information by involving community. For secondary data primary census abstract of 2011, Government of India has been used. Social survey and Rapid Rural Appraisal (RRA) was carried out to know the factual information and opinion of the community.

CHAPTER 4:

ANTICIPATED ENVIRONMENTAL IMPACT IDENTIFICATION AND MITIGATION MEASURES

21) Anticipated environmental impacts are quantified using scores for impact severity in range from 1 to 5 depending on probability of occurrence. Significance criteria based on consequence from insignificant to catastrophic is designed to know the impact risk levels. Accordingly, an environmental risk is categorized into low risk to extremely high risk. Mitigation measures are suggested and actions required are delineated to minimize the adverse impacts and enhance the positive impacts. Anticipated environmental impacts and associated mitigation measures are described briefly for the environmental component.

1. Air Environment:

Impacts

22) The potential impacts on air quality are emissions from construction and operation phases. Emission from DG sets during power failure/ emergency purpose and vehicular movement may impact temporarily air quality. Mitigation measures for air quality impacts will include: Air pollution control equipment like ESP attached to boiler will reduce pollutants drastically as indicated by the air quality modeling studies. 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. Availability of valid Pollution under Control Certificates (PUCC) for all vehicles used on site will ensure low emission of air pollutants. Proper periodic maintenance of all equipment to ensure its efficient operation.

23) **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. Rubber wheel carts /trucks to bring in Raw materials, not filled high, 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 bagasse storage yard will minimize dust.

2. Noise Environment

24) The proposed plant operations and related activities will lead to emission of noise that may have significant impact on the surrounding communities and fauna in terms of increase in noise levels and associated disturbances. Mitigation Measures include selection of quieter tools/machines. Equipment etc Enclose the noise sources; Hearing protection by ear mufflers to the workers; Maintain machines regularly; ensuring silencers to combustion engines are in good condition and work effectively. Keep machinery covers and panels closed and well fitted. Bolts/fasteners done up tightly avoid rattles.

3. Water Environment:

25) The source of water will be from Krishna River through Irrigation Department Sangli. The total water requirement for industry is 1405.25m³/day. Waste water generation will be 504.72 m³/day. Waste water after the treatment is used for green belt development. Effects are made to have zero waste water discharge.

Efforts will be made to reduce water requirement by recycle and reuse of process waste water etc; Treated wastewater will be used for irrigation and greenbelt development. Recharge pits for rainwater harvesting will be made to improve groundwater levels;

4. Land

28) 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.

Potential Impacts on the Land Use and land cover shall be due to site preparation which as within the premises and are insignificant. Acquisition of land is not required and hence there will not be any social disturbances. Optimization of land requirement through proper site lay out design will be basic criteria at the design phase. Development and maintenance of green belt within project premises, a positive impact is envisaged.

5. Soil

29) Potential impacts on soil are attributed to waste water discharges dumping of solid waste and fly ash. 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 will be sale to authorized vendor.

6. Biodiversity

30) Ecology and Biodiversity Impact analysis shows that there is moderate risk during clearance of vegetation and preparation of approach road. Vibration and noise may cause low impact on surrounding fauna. Green belt development will have positive impact on flora and fauna. No impacts are anticipated on aquatic flora and fauna of the rivers.

7. Socio-Economic

31) 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. The impacts predicted will be on population, education, employment generation, infrastructure, sanitation/public health, agriculture. Mitigation Measures: Construction and maintenance of the approach road at regular interval will be carried out by the project proponent. The proper sign board will be placed for smooth flow of traffic. The parking space/facilities will be provided within the premises of the factory by the project proponent to minimize the accidents and traffic. The Continuous Monitoring of Air and Water will be carried out as agricultural fields are just found adjacent to the site. Alternate employment is likely to become important in the area due to various project based activities.

8. Occupational Health & Safety

32) Occupation injuries may occur during site development. Noise and dust pollution is expected due to transportation and handling of construction material. Roads may damage because of heavy traffic and cause inconvenience to the local people. Occupational risk during working at height, manual lifting of heavy material and welding operations need safe operations. Disasters may happen due to boiler first, fire and accidents in manufacturing equipments.

33) Risk assessment and risk management in the SGSL has been carried out. Strict compliance to the SOPS and instructions must be followed by the operating staff. Occupation health and surveillance program must be carried out periodically. Use of personal protective equipment is made compulsory for operators and workers. CSR activities are conducted by the industry to minimize public grievances.

CHAPTER 5: ANALYSIS OF ALTERNATIVES

34) There is no need for site selection since proposed expansion project is within the existing premises. The process used is based on Raw materials that are available, without any bottle neck. The existing two W/L milling tandems shall be replaced with new two mills of appropriate size. The mills will be high set to help ease to operation, maintenance and housekeeping. The high pressure co-generation plant is selected to utilize bagasse as non-conventional fuel. The new co-generation power plant will replace the existing low pressure boiler and turbo generator. It is an efficient and cost effective to save energy and reduce pollution.

CHAPTER 6: ENVIRONMENTAL MONITORING PROGRAMME:

36) Environmental Monitoring will be carried out 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 for environmental aspects environmental will be assessed regularly. The general effectiveness of pollution control measures shall also be monitored in operation phase. After state government guideline, Online Monitoring system is already installed at the plant. The data is submitted to CPCB as per the guidelines. The industry has installed on line monitoring system for sugar and cogeneration effluent and boiler and stack as depicted.

CHAPTER 7: ADDITIONAL STUDIES

37) Hazard identification and consequence assessment has been done for in the proposed expansion plant. Quantification and cost effective control techniques of accidents involving chemicals and process are analyzed in depth. Proper handling and storage procedure of alcohol will be followed to avoid any kind of accidents.

On-site and offsite emergency plan is prepared as per the factory act and will be observed as per Rule No. 12 of factory act (control of Industrial Major Accident Hazard Rules, 2003as 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 are laid down clearly and convincingly to everyone on site, particularly the KEY personnel & essential workers.

Public consultation

38) 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 BENEFITS

39) The proposed project on implementation will generate potential jobs directly, and will also generate many indirect job opportunities. There will be a beneficial effect of a flourishing production it that will directly and indirectly boost the living standards of the people and with increase in industrial activities, create more jobs in the local economy. The activities would result in an increase in local skill levels through exposure to proposed technology. Development of ancillary activities resulting into indirect jobs and skills of local manpower.

CHAPTER 9: ENVIRONMENTAL MANAGEMENT PLAN

40) 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 has listed 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 by the management. Green belt development plan is designed for project over 3.4 Acres 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. To conserve this water one recharge pit of adequate size 4 X 4 X 2 Meters is proposed. The proposed recharge pit can shifted as per the availability of open land, direction & slope of harvested water channel.

41) **CSR Activities:** The Company is already having a various program for community development like, accidental insurance, medical camp, help & support to handicapped people [Divyange People], Ambulance, fire fighting vehicle facility, religious activities like Ganpati Utsav & other social religious activity, to help the educational development activity etc. The most famous activity done by M/s Gurudatta Sugars Ltd. is Water conservation with water benchmark, which can save the 7.2 Cr. liter of water. This module has become pioneer project to overcome on natural calamity & drought. For proposed Corporate Social Responsibility cost will be 1 Cr & it will be more than 1 Cr whenever necessary.

CHAPTER 10: CONCLUSION

42) All the possible environmental aspects have been adequately assessed and necessary control measures have been formulated to meet with statutory requirements. Thus implementing this project will have minimum adverse impacts on surrounding environment. At the same time, income generation capacity will also improve in the area by direct and indirect employment leading to socio-economic development in the area. Hence proposed expansion project will be a welcome development.

43) Consultants

The project Proponent retained sd engineering services pvt. ltd” as consultant to prepare EIA report of M/s Shri Gurudatt Sugars Ltd. The consultant has more than 15 year of varied experience in the field of Environment. The mission of company is providing sustainable solution 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 MoEF-CC, Govt. of India for carrying out Environmental Clearance.