EXECUTIVE SUMMARY
OF EIA REPORT

For Expansion of sugar unit from 4,000 to 8,250 TCD and
Co-generation unit from 21 to 35 MW

M/S. THE MALEGAON SAHAKARI SAKHAR KARKHANA LIMITED

Post: Shivnagar, Malegaon Bk, Taluka: Baramati, District: Pune, Maharashtra

Prepared by

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Recognized R & D Center by Department of Scientific and Industrial Research (DSIR), Ministry of Science and Technology, Government of India

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September 2018

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EXECUTIVE SUMMARY OF EIA REPORT

1.0 INTRODUCTION

This project is proposed by M/s. The Malegaon Sahakari Sakhar Karkhana Limited (TMSSKL). The sugar factory is located at Shivnagar, village Malegaon Bk, Tal- Baramati, Dist-Pune, Maharashtra. It is one of the progressive co-operative sugar factory in Maharashtra; set up in the year 1955. It is registered under Bombay Co-operative Societies Act vide No G266, on 24th February 1955. During 1950's, cooperative movement in sugar industry was just getting established and sugar cane gained popularity amongst farmer for assured returns to their crop cultivation efforts. This mill was established to provide support to the cane growers and farmers of this area. Thus, the sugar factory was started under the leadership of late veteran leader Shri G. G. Shembekar. Initial installed capacity of TMSSKL was 1,000 TCD and had taken first crushing season in 1957-58. Now, the Management has decided to increase the capacity of existing sugar unit from 4000 to 8250 TCD. By this expansion, the mill could able to fulfill the crushing demand of local farmers. This expansion will generate bagasse at increased rate and hence expansion of bagasse based cogeneration unit from 21 to 35 MW is also integrated in this expansion.

1.1 PURPOSE OF THE REPORT

The purpose of this report is to get an Environmental Clearance for expansion of sugar unit from 4,000 to 8,250 TCD and cogeneration unit from 21 to 35 MW of M/s. The Malegaon Sahakari Sakhar Karkhana Ltd., Shivnagar, Malegaon, Taluka Baramati, District Pune by carrying out EIA studies. The notification no. S.O. 1533 promulgated on 14thSeptember 2006 has covered sugar and cogeneration (thermal power) projects under Section 5(j) and 1(d) respectively. Both the projects are placed under category 'B' and will be processed together in an integrated manner. This is a summary of an EIA report of proposed sugar and cogeneration expansion project.

2.0 FEATURES OF THE SITE

The proposed sugar and cogeneration unit will be installed within the existing sugar factory premises. TMSSKL has 35 acres of industrial plot. The proposed capacity enhancement will be achieved mainly due to modernization of existing unit. Land requirement is only for installation of a new boiler and its allied units. It will be approx 1 to 1.5 acres, which is available in existing 35 acres of industrial plot. The existing site meets the industrial siting guidelines of the Ministry of Environment Forest and Climate Change (MoEFCC). Therefore, the project proponent has not explored any alternative site. This site location map is enclosed as annexure I to the main EIA report. The other important aspects are highlighted in the following table.

Geographical Location	$18^0$06'43.62"N, $74^0$30'42.89" E.
Road Connectivity	3.5 km from Pune-Jejuri- Baramati road
Nearest village/s	Malegaon is approx 2.0 km away from the site

Nearest City/Town	Baramati is approx. 8.0 km from the project site.
Railway Station	Baramati railway station is approx.8 km from the project site
Air Port	Pune airport is the nearest airport approx. 82 km from the site.
River	Nira river is 7 km from project site (towards south)

3.0 HIGHLIGHTS OF THE PROJECT

Project Proponent	M/s. The Malegaon Sahakari Sakhar Karkhana Ltd.
Project location	Existing factory premises
Land	Total plot area is 179 acre in which, 35 acres of land is built-up area of existing industrial activity which includes sugar factory, cogeneration, distillery and allied units. Approx 1 to 1.5 acre is for the proposed expansion. The existing greenbelt area is 12 acre which is 33% of the industrial plot, hence only tree plantation is proposed to increase the density in the existing greenbelt.
Product	Power 35 MW electricity (Existing 14+7 = 21 MW + Proposed 14 MW capacity)
Operational Days	Sugar: Maximum 180 days (Average 160 days) Cogeneration: Average 275 days (Season 160 days + 115 off-season days)
Main Raw Material	**Sugar Unit** (based on operational capacity) Sugar Cane: 8,250 TPD; Lime: 12.37 TPD (0.15% Cane); Sulfur: 4.95 TPD (0.06% Cane) **Cogeneration Unit:** Bagasse as a fuel: 1827 TPD During season and 352 TPD During Off-season
Water Requirement	During seasonal operation : 182 m^3/day for sugar and cogeneration; During off seasonal operation: 536 m^3/day
Source of water	Nira Left Bank Canal
Power	**Power requirement will be met through own cogeneration unit**

Particulars	**During season**	**Off seasonal**
Power generation	25.733 (Existing 14 MW + New 14 MW BP type TG set)	6.401 (from Existing 7 MW DECC type TG set)
captive power consumption	11.850 MW	1.971 MW
Power to grid	13.883 MW	4.430 MW

Boiler	Existing two boilers of 80 TPH and 40 TPH capacity with 67 Kg/cm^2 will be used as it is and additional one numbers of 60 TPH capacity boiler with 67 Kg/cm^2 pressure will be installed having temp of 510^{o}C. It will have separate ESP and connected to new stack of 76 m height
Steam turbine generator (STG)	• Existing 14 MW back pressure + New 14 MW Back pressure STG set to produce the 25.733 MW of power in seasonal operation • Existing 7 MW STG set of DECC type will be used to produce power of 6.401 MW in Off-seasonal operation
Air pollution control device	Separate ESP is in place as pollution control equipment for existing two boilers. Additional new ESP system will be installed for proposed 60 TPH boiler.
Stack height and inner diameter	Existing 76 m height and 4.1 m inner diameter Proposed 76 m height and 4.1 m inner diameter
Manpower	Sugar/cogeneration unit: 40 persons (approx)
Project Cost	Rs. 95.55 Cr. (Sugar and cogen project)
EMP Cost	Rs.5.52 Cr. for sugar- cogen unit

4.0 THE PROCESS

In India, double sulphitation process is used to manufacture plantation white sugar. The manufacturing process consists of following steps.

- **Extraction of Juice**

The sugarcane is passed through preparatory devices like knives for cutting the stalks into fine chips before being subjected to crushing in a milling tandem comprising 4 to 6 roller mills. In the best milling practice, more than 95% of the sugar of cane gets extracted into the juice.

- **Clarification**

The treated juice on boiling fed to continuous clarifier from which the clear juice is decanted while the settled impurities known as mud is sent to rotary drum vacuum filter for removal of unwanted stuff called filter cake. It is returned to the field as fertilizer.

- **Evaporation**

The syrup is again treated with sulphur dioxide before being sent to the pan station for crystallization of sugar. Crystallization takes place in single-effect vacuum pans, where the syrup is evaporated until saturated with sugar. At this point 'seed grain' is added to serve as a nucleus for the sugar crystals, and more syrup is added as water evaporates.

- **Centrifugation**

The massecuite from crystallizer is drawn into revolving machines called centrifuges. The perforated lining retains the sugar crystals, which may be washed with water, if desired. The mother liquor 'molasses' passes through the lining because of the centrifugal force exerted and after the sugar is 'purged' it is cut down leaving the centrifuge ready for another charge of massecuite.

- **Gradation & Packing**

The final product in the form of sugar crystal is dropped through pan section and this sugar is graded and picked in 50 kg bags. The grade of the sugar depends on the size of the crystal viz. Small (S) and Medium (M).

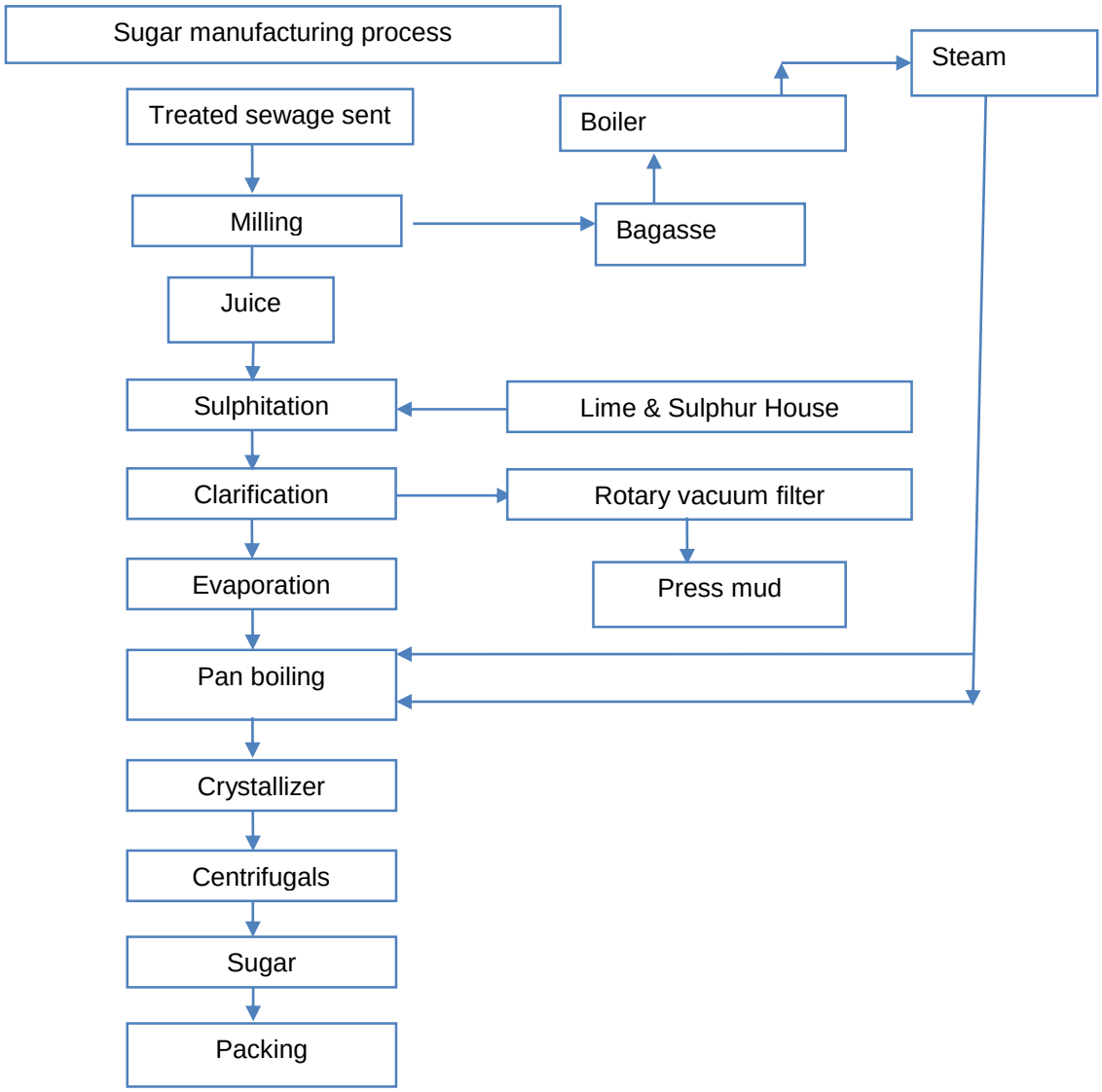

Figure 1: Flowchart of sugar manufacturing process

Process: Cogeneration

In simple terms, cogeneration is on-site generation and utilization of steam and power. Here, the steam is produced in high pressure boilers and used twice. First, it is fed to the steam turbine generator to produce power and then exhaust steam from turbine is used for the process in sugar unit (during crushing season). A schematic of power generation from the cogeneration is shown in following figure.

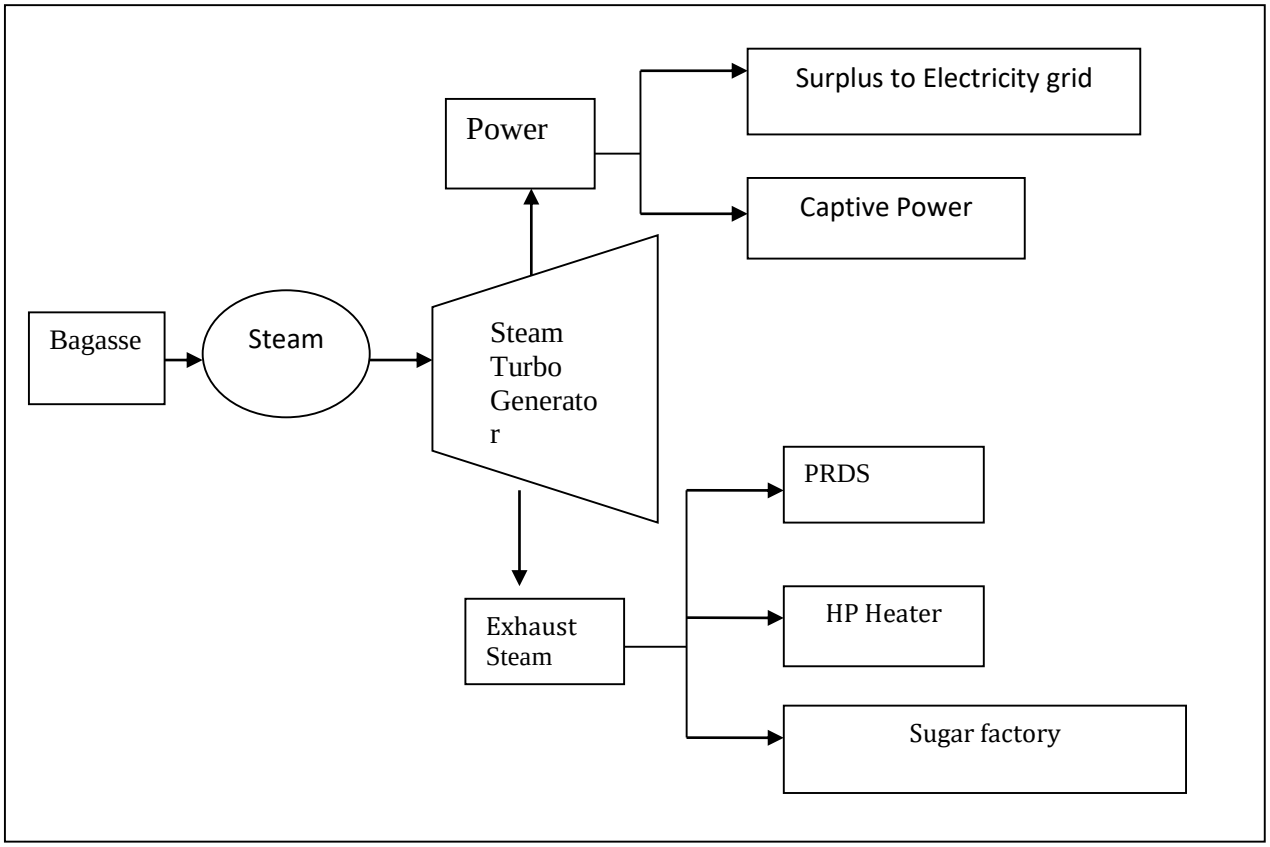

Figure 2: Process flow diagram of cogeneration power plant

4.1 Cogeneration scheme for crushing season (160 days)

In the proposed project, the mill will operate two 14 MW turbine and generate power of 25.733 MW. From this, 11.883 MW will be consumed for captive purpose and remaining 13.883 MW will be connected to grid. During off-season, 7 MW DECC type turbine will be used. It will produce 6.401 MW power. Captive power requirement in off-season will be 1.971 MW and remaining 4.430 MW will be exported.

Table 1: Power balance for crushing season

Particular	Season (in MW)		Off-season (in MW)
35 MW TG (Cogeneration) (14+7) MW + 14 MW = 35 MW	28	(14 +14)	7 MW

Power Generation from of TG set		25.733	6.401
Captive consumption			
Cogen auxiliary		2.100	0.405
Sugar Factory		8.184	Nil
Distillery		1.336	1.336
W/S + Colony + ETP + other		0.230	0.230
	Total	**11.850**	**1.971**
Surplus power to be exported to State grid		**13.883**	**4.430**

5.0 RESOURCES

5.1 Sugar cane: The sugar mill is having more than 14,300 cane grower members, who supplies cane to the mill. Cane crushing data for last three years and expected cane availability, given in the following tables.

Table 2: Cane availability for last three seasons

#	Season	Area (in Ha.) Under Sugarcane (Member)	Average cane yield (T/Ha.)	cane available from Members (T)	Cane crushed (Tons)	Bagasse generation on cane (%)	Sugar Recovery (%)
1	2014-15	8242.95	93.09	7,67,340	9,08,252	27.77 (252,221 T)	11.84
2	2015-16	8512.55	79.85	6,89,713	841,816	27.67 (232,930 T)	12.00
3	2016-17	6929.05	72.07	6,87,996	6,87,996	27.58 (189,749 T)	11.62

Table 3: Expected cane availability for next four seasons

#	Season	Sugarcane Area (Ha)	Yield (MT/Ha)	Sugarcane Available MT	Expected Crushing* (MT)	Expected Sugar Recovery (%)
1.	2018-19	8,000	95.0	7,60,000	8,00,000	12.0

2.	2019-20	8,000	100	8,00,000	8,50,000	12.5
3.	2020-21	8,000	102	8,16,000	9,00,000	12.5
4.	2021-22	8,000	107	8,56,000	9,50,000	12.5

5.2 Bagasse: The bagasse balance indicates that the sugar factory is having adequate source of fuel i.e. bagasse to operate the proposed cogeneration unit during season as well as off-season.

Table 4: Bagasse Balance

Description	Quantity (in Tons per day)
Cane crushing rate @ 343.75 TCH	8250
Bagasse production @ 28.6% = 98.3 TPH	2359.5
Bagasse utilization during seasonal operation = 76.10	1827.00
Bagasse saving due to use of biogas 1.5 TPH x 24 hr	36.00
Less Bagacilo	11.80
Bagasse saving per day during season	**556.70**
Bagasse saving per season (160 days average)	**89,072**
During off season -Bagasse utilization @14.7 TPH (x 115 days)	40,480

5.3 Water: At present sugar factory draws water from Nira Left Bank Canal. The water requirement for sugar & cogeneration project during seasonal operation will be 182 m^3/day and 536 m^3/day during off seasonal operation. Water conservation will be achieved by recycling of water.

Table 5: Water balance/budget – Sugar and cogeneration unit during Season

#	Particulars	Quantity
I.	**Boiler section**	
	i. Water Input	
1	Boiler (40TPH + 80TPH + 60TPH) 180TPH	
2	Water input in boiler (Steam Generation + Blow Down against steam generation) (172 + 3.44 rounded to 4 TPH (2%))= 176TPH x 24 h	4224
3	Steam generation 172 TPH	
	ii. Water and waste water output	
1	Condensate recycled to boiler (172 TPH)	4128
2	Boiler blow down @2 % on steam generation = 3.44 say 4	96
Total		4224
	iii. Net water requirement for boiler	
1	Net water requirement (taken from process condensate)	96
II.	**Sugar process**	
A.	**Water input sugar process**	

1	Mill imbibition @ 30 % on cane crushing	2475
2	Water For condenser/boiler parts cooling, Vacuum Pump & Others @ 10 %	825
Total		**3,300**
B. Output from process		
1	Water from cane @ 70.0 % on cane crush	5775
2	condenser/boiler parts cooling, Vacuum Pump & Others @ 8 %	660
Total		**6,435**
C. Water loss product and by product		
1	Water losses in bagasse @ 50% Moisture (Production of bagasse 28.5% on cane crush i.e. 1140 TPD)	1175.6
2	Water loss in Pressmud @ 70% on pressmud (Production 4% on cane crush)	231.0
3	Water loss in molasses @13% water (Production 4% on cane crush)	42.9
	Total **Rounded to**	**1448.9** **1449**
D. Water loss in process		
1	Water loss in steam condensate	96
2	Over all water loss in process in term of evaporation @ 3% on cane crush	247.5
	Total **rounded to**	**343.5** **344**
E. Water loss as effluent and other waste water		
1	Effluent from process@100 lit/T of cane crush	825
2	Spray pond over flow @100 lit/T of cane crush	825
	Total	**1650**
F. Hot water generation from process		
1	Steam condensate	4128
2	Process condensate	5775
	Total	**9903**
G. Hot water (Condensate) consumption		
1	Condensate required at boiler @ 172 TPH of steam generation	4128
2	Condensate required for imbibition at mill @ 30 % on cane	2475
3	Condensate required for MOL Preparation@ 2 .5% on cane	206.2
4	Condensate recycled at vacuum filters @ 4.5 % on cane	371.2
5	Condensate recycled at Pan @ 3 % on cane	247.5

6	Condensate recycle for mol. Conditioners @ 0.5 % on cane	41.2
7	Condensate recycle for sugar melting & magma mixers @ 4.5 % on cane	371.2
8	Condensate recycle at A C/F M/c- @ 2.0 % on cane	165
9	Condensate recycle for Cont. M/c- @2.5 % on cane	206.2
10	Hot condensate utilize for mill washing @1.0 % on cane	82.5
	Total	**8294.0**
H. Excess condensate generation		
Hot water generation – hot water consumption/recycle (9903 – 8294 = 1609)		**1609**
Excess condensate will be treated through Condensing Policing Unit. CPU will have equalizing tank, anoxic tank, aeration tank, clarifier, duel media filter and activated carbon filter are used. CPU will deliver industrial utilizable water such as sugar factory cleaning washing, cooling water make up and distillery process etc. Total excess condensate will be utilized by the industry		
I. Fresh water requirement for seasonal operation is 96 m^3/day		
J. Domestic water requirement		
1	Total manpower (existing 911 + Proposed 160 = 1071) @80 liter per person per day **-** rounded to	**85.7** **86**
K. Net fresh water requirement during seasonal operation is 96 + 86 = 182 m^3/day		
L. Total water requirement in operational season @ 160 days = 29,120 m^3		

A. Water balance during off seasonal operation

Table 6: Water balance during off season

I. WATER INPUT (requirement at start-up)	**m^3/day**
Boiler Capacity @ 40 TPH	960
DM Water For Boiler feed (@35.69 TPH steam generation + Boiler blow down @3.6% i.e.1.31 TPH = 37 TPH say)	888
Other Domestic Usage 438 people @110 lit/day/person Rounded to	48.18 49
Water for cooling of cogeneration auxiliary (Air cool condenser will be used)	450
Total Water Input	2347.00
II. WATER OUTPUT	**m^3/day**
Steam Condensate	911
Total Water Output	911
III. WATER OUTPUTS AS A WASTEWATER	**m^3/day**

Waste water output from boiler as blow down 3.6%	37
Domestic wastewater (Loss + effluent)	49
Total water output from sugar process	86
Net water requirement (Boiler Blow down + Cooling water + domestic requirement) i.e. 37+49+450 = 536 m^3/day	536
Total water requirement for off season @115 days = 61,640 m^3	

Water requirement for proposed project

- During seasonal operation = 160 days x 182 m^3/day = 29,120 m^3
- During off seasonal operation = 115 days x 536 m^3/day = 61,640 m^3

Total water requirement per annum = 90,760 m^3

From the above water budget it is observed that the mill is having sufficient supply of water from irrigation department to meet its requirement even after proposed expansion. Thus, there is no need to take permission of additional water drawl.

5.4 Boiler and Steam: Steam balance in detail is available in the following table

Table 7: Steam Balance

Particulate	During season (TPH)	During off season (TPH)
Steam generation	**172**	**35.69**
Steam consumption (after extraction from STG)		
Sugar process LP steam	126.63	--
Sugar Factory MP steam	03.37	--
For HP heater	24.00	09.55
For De-aerator	2.00	02.00
Condensate	-	08.14
Distillery and allied	16.00	16.00
Total consumption	**172**	**35.69**

Turbine and Power

Table 8: Steam Turbine Generator (STG) set

Sr. No.	Steam Turbine Generator	Power generation (MW)

1.	Season	Existing 14 MW + New 14 MW Back pressure type	25.733
2.	Off-season	Existing 7 MW DECC type	6.401

5.5 Land: The proposed expansion will take place by means of modernization of existing unit, thus 1 to 1.5 acre of land required for installation of new boiler and ancillary activities, which is very minor.

Table 9: Land breakup

Unit	Existing	Proposed	Total land allocation
Sugar & Cogeneration unit			
Finished product storage, office, existing distillery and ancillary units	25	1.00	26
Parking & Cane Yard	6.80	-	6.80
Roads	3.20	-	3.20
Greenbelt	12.00	-	12.00
Reservoir	0.60	-	0.60
Colony, agricultural plot and for future expansion	131.4	-	130.4
	Total		**179**

There will be a provision of mechanized handling of bagasse and ash. The proposed project will create 30 direct employment opportunities.

Table 10: Project Cost

Sr. No.	Particulars	Amount(Rs. in Lakhs)
1.	Civil work and building	604.00
2.	Plant and machinery including taxes and duties	8319.00
3.	Preliminary, pre-operative and other expenses	335.00
4.	Miscellaneous fixed assets	105.66
5.	Contingencies and Margin money	191.34
Total		**9,555.00**
Above cost includes Environment management cost		**552.00**

Table 11: Budgetary allocations for environment management

Sr. No.	Particular	Capital Cost (Rs. in lakhs)	Recurring Cost (Rs. in lakhs)
1.	Air pollution control equipment (ESP) with RCC Chimney	195	25
2.	Ash & Bagasse handling / Solid waste management	20	10
3.	Fire protection and additional safety gears	15	07

4.	Greenbelt	15	10
5.	Water pollution control and ETP modification with new STP, CPU	272	30
6.	Occupational Health (Check-up)	-	10
7.	Rain water harvesting	05	02
8.	Environment monitoring and management	30	10
	Total	**552**	**104**

6.0 BASELINE ENVIRONMENT

Table 12: Summary of Environmental features of study area

#	Facet	In brief
1	General characteristics	Hot summer and general dryness throughout the year
2	Rainfall	Average (for last ten years) 477mm/annum Rains above 100 mm are received mainly in July and September months
3	Temperature	In summer, average maximum 33^0C in May In winter, average minimum20^0C in December
4	Humidity	The relative humidity ranges between 30-60%
5	Wind	Predominantly from north-west, north, northeast and west during study period
6	Land use	Major: agricultural 83.4%, settlement (Buil-up) 5.8% and Fallow land 5.1%,
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 2014 - Slightly alkaline, good for irrigation purposes throughout the district. However, potability is affected at some places in the district due to high nitrate and total hardness
10	Soil	Very shallow (soil depth less than 10 cm) to deep black alluvial soils
11	Nearest sanctuary	Mayureshwar Wildlife Sanctuary at approx 36 km

(Baseline data - enclosed as Annexure XVII to the main EIA report)

7.0 IMPACT ASSESSMENT AND ENVIRONMENT MANAGEMENT PLAN

7.1 Air Environment: Impact causing factors

1) **Emissions from process:** It will be due to burning of bagasse as a main fuel. Bagasse contain 2% of ash and <0% sulfur and Nitrogen

2) Transportation: Vehicles of employees and visitors are anticipated as the only source. Hence, this could cause negligible increase mainly in NOx, particulate matter and HC.

3) Fugitive and Other sources of air pollution: Fugitive Emissions: This will be mainly from Bagasse and dust particles. Since, fly ash will be collected through ESP and transported in covered vehicles/conveyers to the compost site, thus, ash is assumed to be negligible source of fugitive emissions.

7.1.1 Environmental management plan

- Use of Bagasse as a fuel, transported to boiler through closed conveyer
- Remaining Bagasse will be belled and stored in yard; no loose Bagasse will be stored or handled
- ESP to control fly ash (PM); Existing Round RCC stack with 76 m height same configuration is proposed for the new; fly as well as bottom ash will be used to mix in compost of distillery unit, since it is rich in potash
- Provision of separate parking for goods and general vehicles, wide asphalted internal roads, approach road to state highway is also asphalted
- The existing greenbelt area is 12 acre which is 33% of the industrial plot, hence only tree plantation is proposed to increase the density in the existing greenbelt.
- Strict prohibition on washing and maintenance of vehicles on site or in parking area

7.1.2 Air Pollutant Dispersion Modeling

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

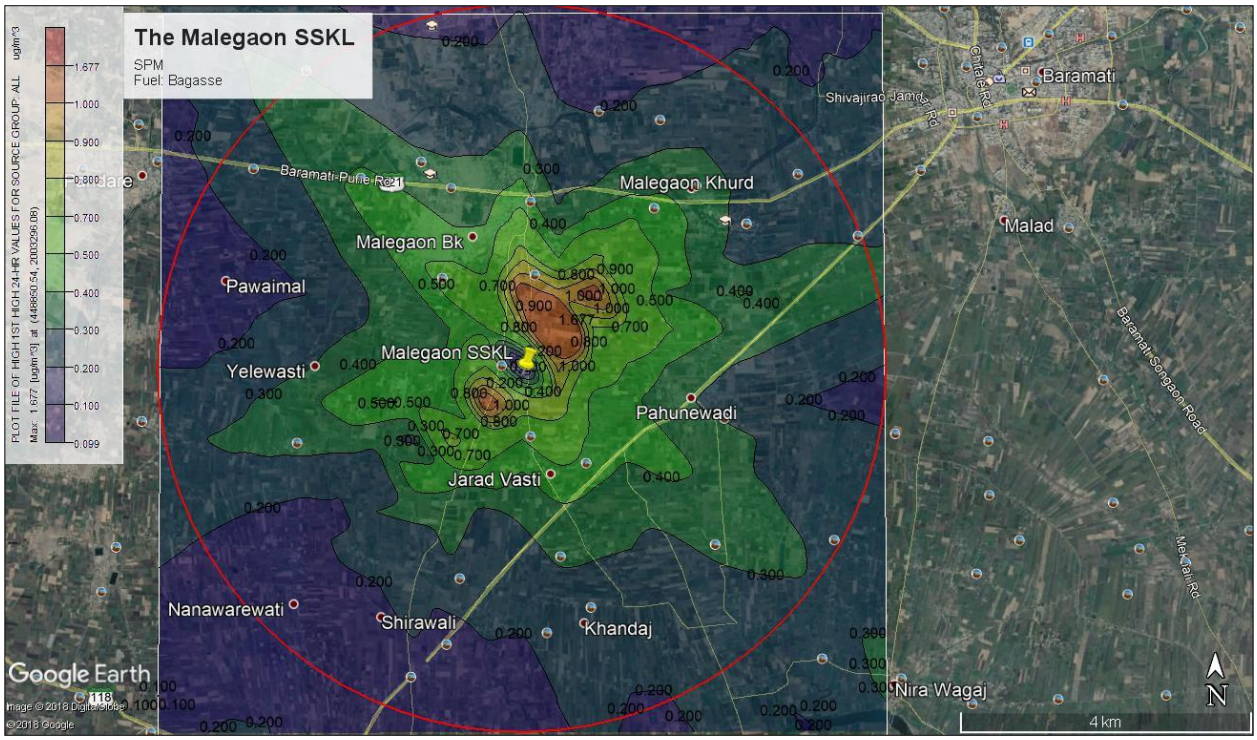

Figure 3: Short term 24 hourly GLCs of PM

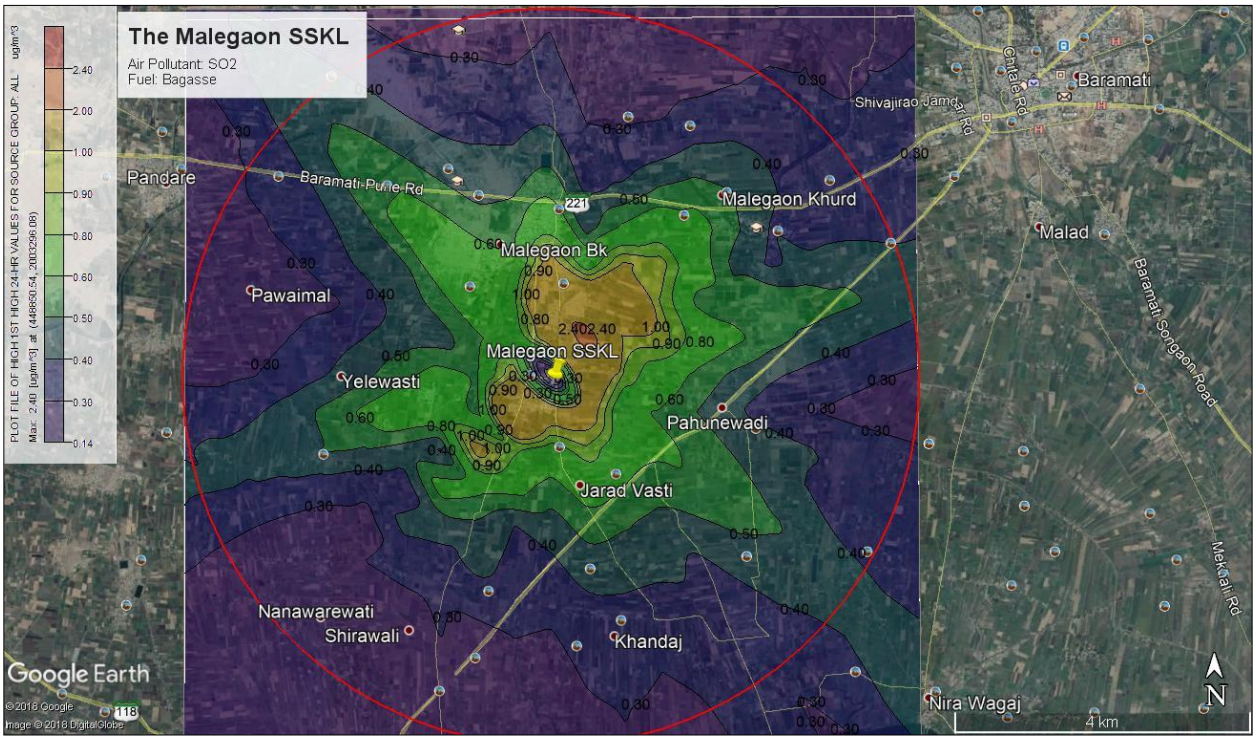

Figure 4: Short term 24 hourly GLCs of SO_2

a. Observation

From the results obtained from the software based simulation study of air pollutant dispersion, the following inferences are drawn

- There will be an increase in the concentration of PM and SOx mainly towards SE, NE and SSE
- The maximum incremental load of all these pollutants will be at a distance of 700 m i.e. 0.7 km towards northeast and, where increase of 1.68 μg/m^3 for PM and 2.40 μg/m^3 for SOx is anticipated. The area where maximum GLC anticipated is predominantly occupied by agricultural vegetation.

Table 13: Summary of Maximum 24-hour GLC due to proposed project

Description	Concentration μg/m^3	
	PM	**SO_2**
Maximum rise in GLC	1.677	2.40
Direction of Occurrence and distance	NE (0.73 Km)*	NE (0.73 Km)*
Coordinates of maximum GLC	N- 18^{0}07'05"	N- 18^{0}07'05"
	E- 74^{0}30'59"	E- 74^{0}30'59"
Baseline Concentration reported nearby GLC (at 0.73 km NE)	74.85 (Shivnagar/ Project site)	20.83 (Shivnagar/ Project site)
Total Concentration (Post project scenario)	76.527	23.23
NAAQS	**PM_{10}** 100	80
*The distance is measured from stack to the receptor of maximum GLC		

7.1.3 Impact Assessment: Estimated incremental concentrations of PM and SOx in the downwind direction of the site are very nominal. Therefore, it is anticipated that, the increase in the concentration of these air pollutants due to the proposed activity, likely to cause minor negative impact on air environment and negligible impact on surrounding ecology.

7.2 Water environment

7.2.1 Impact causing factors: Some of the common causes are drawl of fresh water in large quantity and its usage, water pollution, disposal of polluted water into nearby water bodies. Taking these points into consideration, following EMP is proposed.

7.2.2 Environment management plan:

- Steam will be used twice, first for power generation and exhaust steam of turbines will be used in sugar unit; Steam condensate will be re-circulated

- Existing sugar ETP will be upgraded so as to treat an effluent of 825m^3/day from proposed units (after expansion)
- In existing unit, spray pond overflow is separately collected and sent to irrigation. Same will be followed after expansion (quantity 825 m^3/day)
- CPU is proposed to treat excess condensate (available from cane)
- Treated water will be reused partially in the process and remaining for greenbelt/irrigation (within the premises); approx 50 acres of farms are available to use the treated water
- STP will be installed to treat sewage
- Daily, >10,600 m^3 of water will be recycled, due to which the fresh water drawl will get reduced considerably
- Provision of sump for storage of effluent in emergency situation
- Rain water harvesting

7.2.3 Impact Assessment: No negative impact on water environment and aquatic ecosystem is envisaged, due to the proposed project. Minor negative impact is envisaged on soil. No additional Water drawl is required other than the allocated quota. This water is reserved by the Irrigation Department for industrial activities. Therefore, impact on water availability for other users is envisaged to be minimal.

7.3 Land environment

7.3.1 Impact causing factors: Effluents, if discharged directly (untreated) on land, can cause damage to soil fertility and micro-flora, mainly due to its alkaline pH. As a control measure, the factory has made a provision of expansion of effluent treatment plant. Treated water will be reused for activities like cooling, gardening etc.

7.3.2 Environmental management plan: The solid waste expected would be ash due to burning of bagasse and sludge from ETP, CPU and STP. Ash is estimated to be about 36.54 TPD. Sludge from ETP, CPU and STP is another solid waste which will be organic in nature. The boiler ash from bagasse is generally rich in potash; hence, ash as well as sludge will be mixed with biocompost of distillery unit and added to soil for disposal. Spent oil will be up to 1-2 KL per annum. It will be mixed with bagasse and burnt into boiler.

7.3.3 Impact Assessment: The project is not going to generate any hazardous waste, except spent oil. Since, the solid waste is non-toxic and non-hazardous, it is anticipated that the solid waste will have no negative impact on land. Minor negative impact is also envisaged on the land environment of the site due to construction of the proposed unit. Positive impact envisaged in the form of recycling of nutrients and organic carbon from ash and sludge.

7.4 Ecology

7.4.1 Impact Causing factors: In case of any industrial project, impact on ecology is observed mainly in the form of change in habitat or alteration/fragmentation of habitat, disturbance to wildlife or ecosystem, etc. In case of the proposed project, when such possibilities examined, impact causing activities were not observed, except transportation activity required for the raw material.

7.4.2 Environmental management plan

Greenbelt enhancement by adding 5000 trees; developing three raw curtain in the peripheral area - for mitigation of air and noise pollution.

7.4.3 Impact assessment:

Transportation of raw material is anticipated to cause minor negative impact on surrounding natural as well as manmade ecosystem. The project is going to implement utilization of all treated water and its safe disposal, thus no negative impact is envisaged due to wastewater on surrounding ecosystem. Recycling of minerals and organic matter from solid waste to soil is anticipated as positive impact in addition to greenbelt enhancement.

7.5 Socio-economic environment

7.5.1 Impact Causing Factors: issues of rehabilitation; restoration; population flux; pressure on available resources and infrastructure

7.5.2 Environment Management Plan: Project is agro-based – therefore, indirectly beneficial to local farmers; no issues of rehabilitation or restoration; local candidates will be employed – thus, migration of population to the site surrounding area and pressure on infrastructure and resources is anticipated to be negligible

7.5.3 Impact Assessment: Considering the long term benefits to the locals, the project will have positive impact on socio-economic environment.

7.6 Other impact: Traffic

In the project, the transportation activity will take place mainly during the crushing season. Considering the availability of Pune-Baramati state highway and other district level asphalted roads in the vicinity, the increase in vehicles will get accommodated. It is envisaged that it will not cause any traffic congestion.

8.0 PROBABLE RISK FACTORS

Following scenarios feel under maximum credible accident scenario

- Fire in fuel yard (bagasse yard) and/or Fire due to short circuits
- Injury to body and body parts (mechanical)

8.1 Fire in fuel (bagasse) yard: An elaborate fire hydrant network and fire fighting system comprising of trained crew and facilities will mitigate the risk of such incidents. In addition, as per requirement fire extinguishers, fire alarm system and smoke detectors are also installed. There are four assembly points exist in the premises. There are 11 emergency exits available in the existing unit.

8.2 Mechanical injury to body parts: In sugar and power plant, there are several places where workers are likely to be involved with accidents resulting in injury to body parts. The places are workshop, during mechanical repair work in different units, during construction work, road accidents due to vehicular

movement, etc. Workers exposed to mechanical accident-prone areas will be given personal protective equipment. All safety and health codes prescribed by the BIS will be implemented.

9.0 DISASTER MANAGEMENT PLAN (ON-SITE)

9.1 Emergency Preparedness and Response Team Structure

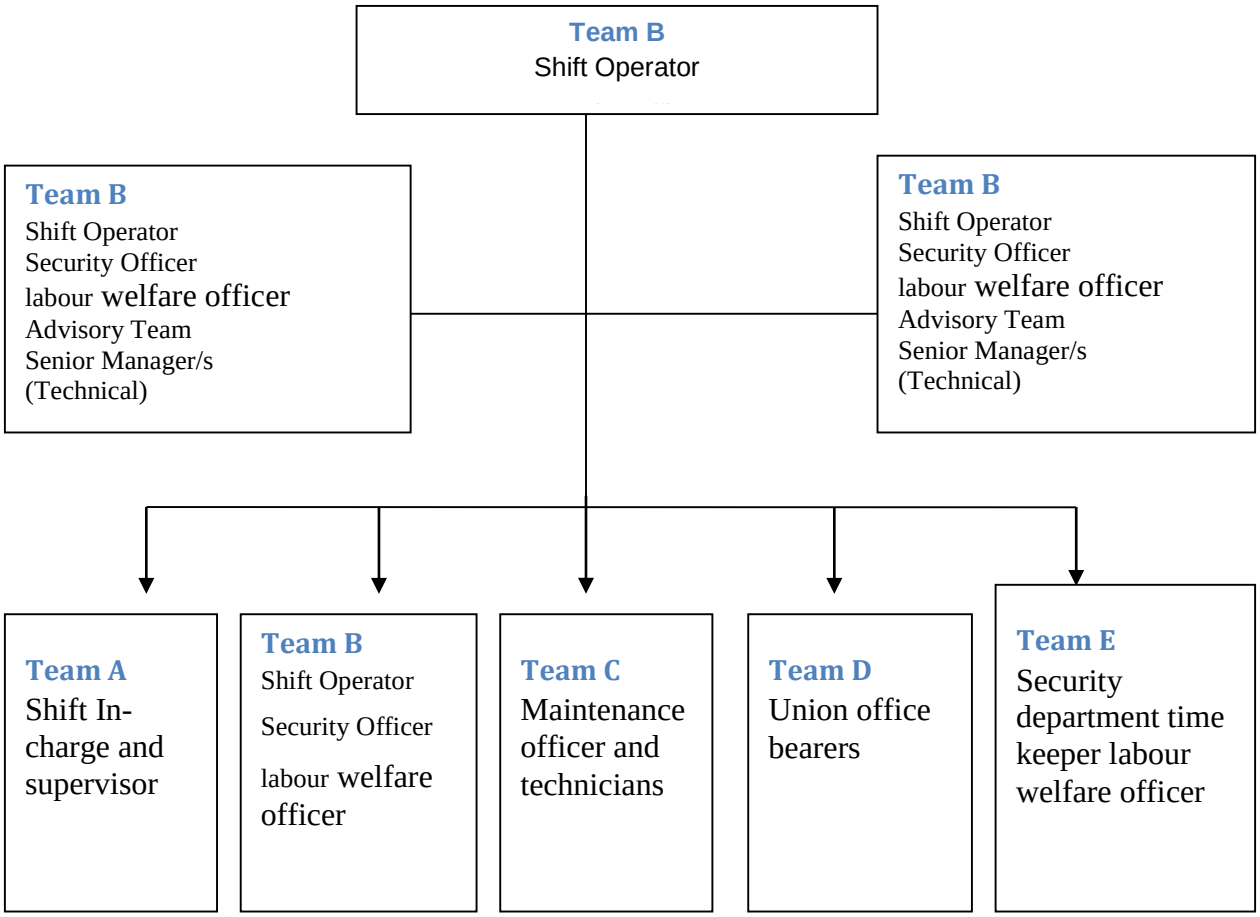

Figure 5: Emergency Preparedness and Response Team Structure

10.0 ENVIRONMENTAL MONITORING PROGRAMME

Table 14: Summarized environmental monitoring programme

#	Particulars	Parameter	Frequency[#]
1	Stack Emissions	Particulate matter, SO_2, NO_x	Monthly
2	Ambient Air Quality	PM_{10}, $PM_{2.5}$, SO_2, NO_x	Monthly within premises and twice a season at

#	Particulars	Parameter	Frequency[#]
			village in upwind, downwind directions
3	inlet and outlet of ETP	pH, EC, BOD, COD, SS, TDS, Oil & Grease etc.	Monthly
4	Bore well /ground water sample nearer to site/ETP	pH, EC, COD, BOD, Total solids, dissolved solids, hardness, alkalinity, Chlorides, Sulphate, Phosphates, and heavy metals such as Chromium, Cadmium, Iron, etc.	Monthly
5	Noise monitoring	Noise Levels measurement at high noise generating places as well as sensitive receptors in the vicinity	Monthly
6.	Occupational health	health and fitness checkup of employees get exposed to various hazards All other staff (except above)	Once a year

11.0 PROJECT BENEFITS

- Demand of local farmers for crushing of available cane will get fulfilled by the project
- Efficient use of available resources such as bagasse and water, to produce surplus power
- The proposed project on implementation will generate ~40 direct employment opportunities
- The project is agro based, hence there will be plenty of indirect employments to locals;
- Approx 25,000 families likely to get benefitted by the project
- No rehabilitation/resettlement issues are involved
- Factory is already implementing several schemes/activities for the benefit of locals which includes farmers, employees and those schemes/activities will be continued
- Technology for the project and pollution control are available indigenously

12.0 CONCLUSION

Proper implementation of EMP, risk and disaster management plan will help to prevent, control and mitigate the negative impact of the project and allied activities. At the same time, it will help to enhance positive impact. Overall, social and economic benefits of the project envisaged being profound and therefore, the project will be beneficial to the society and overall development of the region.