EXECUTIVE SUMMARY

of

Environmental Impact Assessment Report

New 16 MW Co-generation Unit

M/s. Karmaveer Shankarrao Kale Sahakari Sakhar Karkhana Limited,

Gautamnagar, Post: Kolpewadi, Tal.: Kopargaon, Dist.: Ahmednagar, Maharashtra 423602

Prepared by

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EXECUTIVE SUMMARY OF EIA REPORT

1.0 INTRODUCTION

M/s. Karmaveer Shankarrao Kale Sahakari Sakhar Karkhana Limited (KSKSSKL) is located at Gautamnagar, Post Kolpewadi, Taluka Kopargaon in Ahmednagar district of Maharashtra. It is a cooperative sugar mill, registered under the Bombay Co-operative Society Act, 1925 on 04.06.1953 vide Registration No. G 260. The sugar factory is operational since1965.The factory has improved the crushing capacity gradually from 800 to 2500 TCD (licensed) and its overall performance is very good. The mill management has undertaken extensive cane development activities and there has also been an increase in sugarcane plantation in its area of operation. Therefore, the management has decided to modernize the existing plant and machinery so as to achieve installed capacity of 4,000 TCD (not under the purview of environmental clearance) and also installation of new bagasse based co-generation (power generation) project of 16 MW capacity.

As per the EIA notification SO-1533, issued in September 2006 and its amendment till the date, specifies that, the biomass based power projects upto 50 MW are placed under category 'B'. Therefore, this project requires 'Environmental Clearance' (EC) from the State EIA authority. Hence, the management of the factory has entrusted the work of preparation of EIA/EMP to Vasantdada Sugar Institute (VSI), Manjari (Bk.), Pune. VSI is arenowned institute, providing research, technical and consultancy services to the sugar and distillery industries, since 1975. Also, it is a NABET accrediated EIA consultant.

2.0 FEATURES OF THE SITE

The proposed cogeneration unit will be installed within the existing sugar factory premises. **KSKSSKL** has alloted 4.6 acres of land for proposed project, which is adequate for the modernization of sugar, installation of cogeneration unit as well as ancillary units such as switch yard, etc. The existing site meets the industrial siting guidelines of the Ministry of Environment Forest and Climate Change (MoEF&CC). Therefore, the project proponent has not explore 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.

Location of the project	Existing Sugar mill At. Gautamnagar, Post- Kolpewadi, Tal-Kopargaon ,Dist-Ahmednagar, Maharashtra.
Site Geographical coordinates	$19^0$53'23.27" N $74^0$21'06.22"E; $19^0$54'04.99" N $74^0$21'12.22"E $19^0$53'26.96" N $74^0$21'27.77"E; $19^0$54'06.39" N $74^0$21'32.38"E Elevation 530 MSL
Nearest City/Town	Kolpewadi towards east of the factory, Kopargaon (taluka place) approx 13 km
Nearest Railway station	Kopargaon - approx. 13 km
Nearest National/ State Highway	Nashik-Shirdi SH- 39 at 8 km towards south; Ahmednagar-Shirdi-Kopargaon SH-10 – at 15km towards south-east
Nearest Airport	Nashik: 55 km, Shirdi: 23 km and Aurangabad: 110km
Nearest River	Godavari - approx. 4 km towards north/north east

Note: mentioned are aerial distances from site

3.0 HIGHLIGHTS OF THE PROJECT

1	**Name of the Proponent**	Karmaveer Shankarrao Kale Sahakari Sakhar Karkhana Limited (KSKSSKL)
2	**Project**	New 16 MW cogeneration unit
3	**Operational Days**	Maximum 200 days (Average 160 days)
4	**Land**	Total plot area: 105 acre Existing Built up area: 48 acres **proposed project: 4.6 acre** Green belt: 25.5 acres provided for green belt development
5.	**Main Raw Material and its Source**	Water: 676 m^3/day Source: Godavari River Canal (Permission available for 8,93,000.7 m^3/year) Bagasse (as fuel): 928.4 TPD (Source: Own sugar unit)
5.	**Steam requirement**	94 TPH (Source: New 120 TPH capacity boiler)

6.	**TG set (Installed capacity)**	16 MW	
7.	**Production equipment, machinery and ancillary units**	Steam generating Unit (Boiler), Condensate system, Steam Turbine Generator, Fire protection system, Bagasse and Ash handling system, Cooling towers, etc.	
8.	**Product: Total Generation of power from T.G set of 16 MW = 15.4 MW**	Surplus power for export to state grid Total Captive Power Consumption (for Sugar, distillery. Cogen unit and Misc. use) Connected to grid at Kolpewadi, approx 1.75 km from site towards west	9.100 MW 6.300 MW
9.	**Boiler**	New boiler of 120 TPH with working pressure of 87 Kg/cm^2(Existing Four low pressure boilers of capacity 10, 20, 30, 35 TPH will be discarded)	
10.	**Air pollution control system**	New Electrostatic precipitator (ESP) will be installed Existing stack will be used having height of 72 m and diameter of 3.5 m	
11.	**Wastewater treatment**	Activated sludge process based having Primary, Secondary and tertiary treatment units	
12.	**Manpower**	Approx 36	
13.	**Project Cost**	Rs. 112.73 Crores	
14.	**EMP Cost**	Rs. 3.33 Crores	

4.0 THE PROCESS

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 fed to the steam turbine generator to produce power and then exhaust steam from turbine used for the process in sugar unit. A schematic of power generation from the cogeneration shown in following figure.

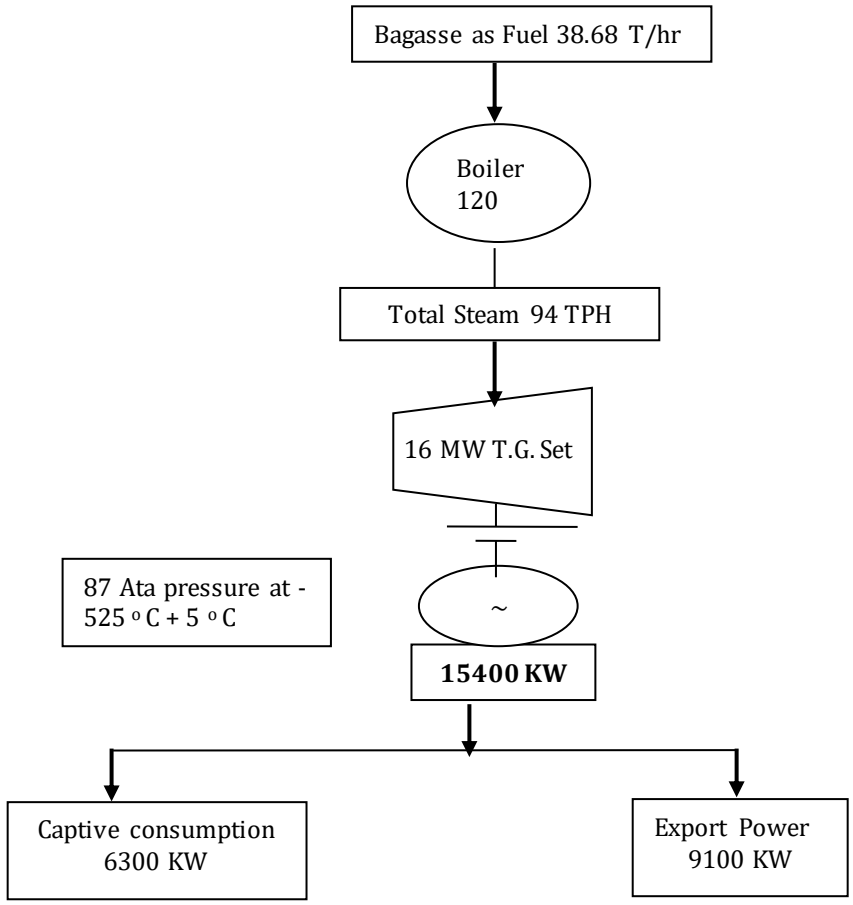

Figure 1: Process flow diagram of cogeneration power plant

4.1 Cogeneration scheme for crushing season (average 160 days)

Table 1: Power balance for crushing season

Total Generation of power from T.G set of 16 MW	**15.40 MW**
Sugar Factory power consumption	4.900 MW
Distillery Unit	1.400 MW
Total Captive consumption	**6.300 MW**
Surplus power to be exported to state grid	**9.100 MW**

5.0 RESOURCES

5.1 Sugar Cane and bagasse

Viability of the proposed expansion of sugar and cogeneration unit depends on the availability of sugarcane. Keeping this in view, the mill management is keenly engaged in cane development activities for enhanced sugarcane yield. The cane availability and expected performance of sugar mill is given in Table 2.

Table 2: Expected performance of sugar mill

#	Particulars	Season	
		2018-19	2019-23
1.	Sugarcane production (MT)	6,50,000	6,60,000
2.	Cane crushing (MT)	6,40,000	6,50,000
3.	Bagasse generation (MT @28% on cane crushed)	1,79,200	1,82,000
4.	Molasses (MT)	33,280	33,800
5.	Press mud (MT)	25,600	26,000

Bagasse requirement for season is of 928.4 TPD (38.68 TPH). The bagasse balance given in table 3, indicates that the sugar factory is having adequate source of fuel i.e. bagasse to operate the proposed cogeneration unit.

Table 3: Bagasse balance i.e. generation and net consumption estimates for the proposed cogeneration

Description	Tonne Per day	Seasonal operation (avg. 160 days)
Cane crushing rate @ 4000 TCD	4,000	6,40,000
Bagasse production @ 28% = 46.66 TPH	1120	1,79,200
Bagasse utilization (Season) = 38.68 TPH	928.40	1,48,543
Boiler :120 TPH		
Bagasse saving @ 7.98 TPH	191.52	30,656

5.2 Water: At present, sugar factory draws water from Godavari River Canal (Permission available from Irrigation Department). The water requirement for proposed cogeneration project will be 676 m^3/day. Water conservation will achieved by recycling of water.

Table 4: Water budget for 16 MW proposed cogeneration unit

A. WATER INPUT (requirement at start-up)	m^3/day
DM Water For Boiler feed @94 TPH generation	2256
Water for cooling of cogeneration auxiliary@ 480 m3/h	11,520
Other Domestic Usage 36 people @110 lit/day/person	4
Total Water Input	**13,780**
B. WATER OUTPUT	m^3/day
Steam Condensate	2,164
Water for cooling of cogeneration auxiliary	10,940

Domestic	0
Total	**13,104**
C. WATER OUTPUTS AS A WASTEWATER	m^3/day
Wastewater output from boiler	45
Wastewater from cooling tower	150
Domestic wastewater (Loss + effluent)	4
Total water output from process	**199**

Fresh water requirement: Input water – Recycle water = 13780 – 13104= 676

Water requirement per year for propose cogeneration unit = 676 m3/day X 160 days

= 1, 08, 160 m^3 /year

5.3 Steam: During cane crushing season, the steam will be generated from one boiler of 120 TPH capacity, 87 Ata pressure and 525^{0}C ± 5^0 C temperature. Produced steam will be supplied to a new TG set of 16 MW. The exhaust steam from cogeneration unit will be utilized in sugar factory and distillery. Steam balance in detail has been provided in table.

Table 5: Steam Balance

#	Description	For season
	Total steam generation	**94.00 TPH**
1	Steam required for Sugar process @ 42%	76.00 TPH
2	Steam for distillery unit @ 2.5 ata	8.00 TPH
3	Steam to De-aerator	3.00 TPH
4	Steam to H.P .Heater @8ata	7.00 TPH
	Total steam consumption	**94.00TPH**

Table 6: Boiler & turbine generator details

#	Boiler	Pollution Control Equipment	Steam generation
1	One - New 120 TPH @ 87 ATA Pressure and temperature 525± 5^{0}C	Electrostatic precipitator	94 TPH
#	**Steam Turbine Generator**	**Power generation (MW)**	
1.	16 MW (New)	15.4	

5.4 Land: The sugar factory have total 105 acre of land, which includes existing sugar unit, distillery and auxiliary unit, of ~ 48 acres of built-up area. The proposed project will be requiring

4.6 acres of land, which will be available from existing factory land. Factory has already made provision of ~25 acre of land for greenbelt development.

5.5 FINANCIAL ASPECTS

Table 7: Project Cost Details

Sr. No.	Particulars	Amount (Rs. in Cr.)
1.	Civil work and building	07.00
2.	Plant and machinery (including taxes and duties)	100.90
3.	Preliminary, pre-operative and other expenses	2.60
4.	Miscellaneous fixed assets	0.95
5.	Contingencies	0.75
6.	Margin Money	0.53
	Total	**112.73**
	Environment Management Cost (Lakhs)	**333.00**

Table 8: Environment Management Cost Details

Sr. No.	Particular	Capital Cost (Rs. in lakhs)	Recurring cost (Rs. In Lakhs)
1	Air pollution control equipment (ESP)	120.00	20.00
2.	Ash & bagasse handling/Solid waste management	153.00	25.00
	Fire protection	25.00	10.00
4.	Greenbelt	15.00	05.00
5.	Occupational Health	-	06.00
6.	Rain water harvesting	20.00	02.00
7.	Environment monitoring and management	-	10.00
	Total	**333.00**	**78.00**

Table 9: Project Implementation Schedule

Sr. No.	Project Activity	Proposed time
1.	Application to MoEFCC New Delhi for TOR	June 2016
2.	SEAC meeting for award of TOR for undertaking detailed EIA studies	July 2017
3.	Draft EIA report submission for public hearing	Aug 2018
4.	Conducting public hearing	September 2018
5.	Preparation of final EIA report	Oct 2018

6.	EC presentation at SEAC and SEIAA	December 2018 to January 2019
7.	Environmental clearance for project (Anticipated)	February 2019
8.	Start date for commission of the project	After receipt of EC
9.	Completion of the project	Max 3-4 months from start date

6.0 BASELINE ENVIRONMENT

Table 10: 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) 344 mm/annum (Kopargaon) Rains above 100 mm are received mainly in July and September months
3	Temperature	In summer, average maximum 39^0C in May In winter, average minimum12^0C in December
4	Humidity	The air is generally dry during December to May and particularly so in the afternoons when the humidity is 20 per cent or less on an average. The relative humidity during south-west monsoon period increases up to 80 per cent and above.
5	Wind	Predominantly from north-west, west, north, and southwest during study period
6	Land use	Major - agricultural 34.6%,Fallow land (current + long) 38.4 %, open scrub 7%
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	Nandur-Madhyameshwar Bird Sanctuary ~29 km (Northwest) Kalsubai wildlife sanctuary at approx 80km (Southwest)

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 ~0.02% sulfur and nitrogen.

2) Transportation: Vehicles used for material transport, vehicles of employees and visitors are anticipated as the only source. This could cause minor increase mainly in CO, NOx, particulate matter and HC.

3) Fugitive and Other sources of air pollution: Fugitive Emissions: This will be mainly from handling of Bagasse, ash and dust particles.

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); Round RCC stack with 72m height; fly as well as bottom ash will be used to mix with 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
- Green belt enhancement by ~1000 trees around the project boundary area

Air Pollutant Dispersion Modeling

Prediction of impacts on air environment has been carried out employing mathematical model - AERMOD view dispersion model 9.5 software developed by Lakes Environment Software, Canada.

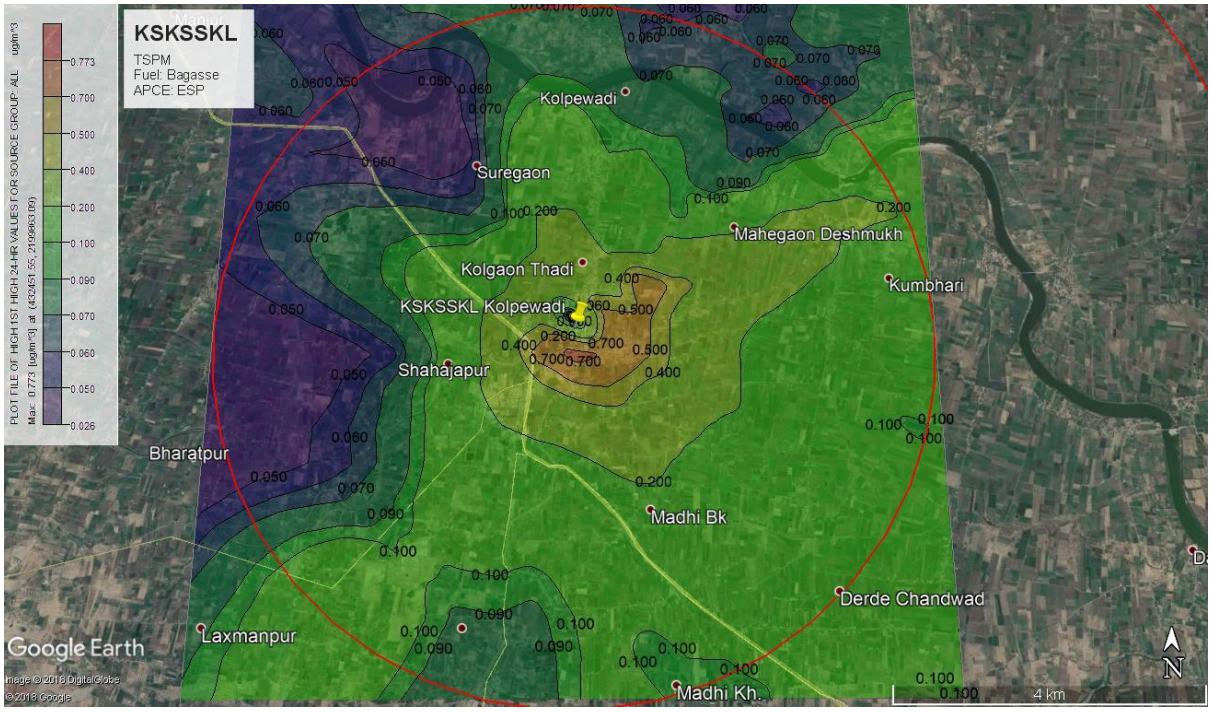

Figure 2: Short term 24 hourly GLCs of PM

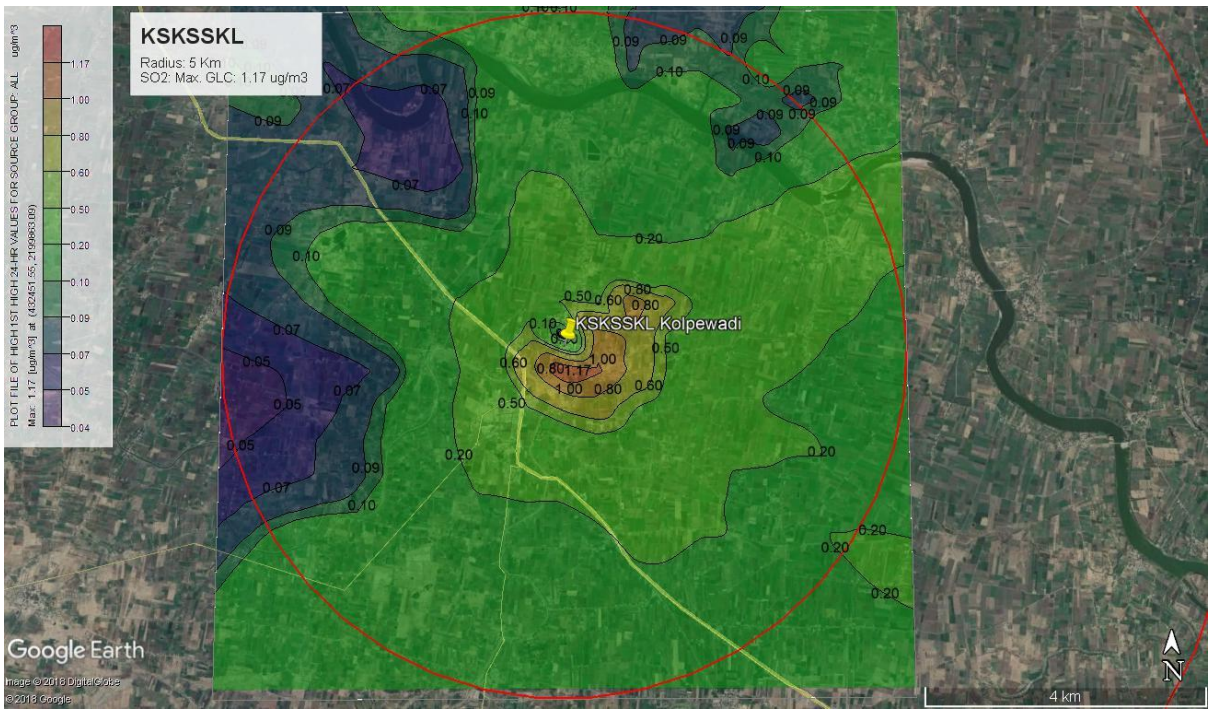

Figure 3: Short term 24 hourly GLCs of SO_2

a. Observation

The resultant GLC values indicate that, after operation of boilers at above stated capacity and fuel consumption, will be within the prescribed National Ambient Air Quality Standards (NAAQS) for residential & rural areas.

Inference of dispersion modeling study suggest that -

- The maximum incremental load of these pollutants will be at a distance of 0.47km (i.e. 470m) towards south, where increase of 0.77 μg/m^3 for PM and 1.17 μg/m^3 for Sox could be observed. This area is open and partially occupied by agricultural vegetation and industry own premises
- Nearest residential area towards SE is village Kolpewadi which is at 0.6 km from the site and 0.2 km from maximum GLC location determined by dispersion model.
- From the results derived from the mathematical modeling study, it is anticipated that resultant concentration of these air pollutant in downwind direction will be well within the national ambient air quality standards prescribed by CPCB in Nov. 2009.

Table 11: Summary of Maximum 24-hour GLC due to proposed project

Description	**Concentration μg/m^3**	
	PM	**SO_2**
Maximum rise in GLC	0.77	1.17
Direction of Occurrence and distance	0.47 mtr (south)	0.47 mtr (south)
Coordinates of maximum GLC	19.893515N, 74.355502E	19.893515N, 74.355502E
Baseline Concentration reported nearby GLC (Village Kolpewadi)	57.78	13.76
Total Concentration (Post project scenario)	58.55	14.93
NAAQS	**PM_{10}100**	**80**

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

7.1.2 Impact Assessment: Estimated incremental concentrations of PM and SOx in the downwind direction of the site are very marginal, considering the baseline value. 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: Drawl of fresh water in large quantity and its usage, thermal water pollution and its disposal into nearby water bodies(if not properly cooled).

7.2.2 Environment management plan: In order to reduce the fresh water intake the management has planned to recycle the hot water streams after proper cooling treatment. Steam will be used twice, first for power generation and exhaust steam of turbines will be used in sugar, distillery and axillary unit. Steam condensate will be re-circulated. Rainwater harvesting is planned to fulfill partial startup requirement of water. The sources of the wastewater will be blow down of cooling tower and boiler. Hence, it won't be significant on COD or BOD or any polluting content, except high temperature. Therefore, all collected effluent will be cooled and directly used for the irrigation purpose.

The sanitary wastewater shall be disposed by using septic tank and soak pit system.

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 within the premises. Water allocated to the sugar factory will be from the quota reserved 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: A major source of land pollution is envisaged to be wastewater and solid waste generated in the proposed project.

7.3.2 Environmental management plan: In the proposed project, wastewater having high temperature is the only cause of concern. Provision of proper cooling is made in the project. Thus, no negative impact envisaged on land environment due to the wastewater generated in the project. The solid waste expected would be ash from boiler. It estimated to be about 18.57 TPD. The boiler ash from bagasse is generally rich in potash; hence, ash will be given to the distillery unit to mix with biocompost and disposed in soil as enriching material.

7.3.3 Impact Assessment: The project is not going to generate any hazardous waste except spent oil, which is very less in quantity. Since, the solid waste is non-toxic and non-hazardous; it anticipated that the solid waste would 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.

7.4 Ecology

7.4.1 Impact causing factors: Considering the overall activities involved with the project, minor negative impact is envisaged due to tree felling for transmission line. It may result into loss of shelter or resting place for many of the birds, reptiles and insects. It will partially affect the food chain at localized level. The tree species are not rare or keystone species, therefore minor impact is envisaged.

7.4.2 Environmental management plan: Greenbelt development - for mitigation of air and noise pollution. Also, compensatory plantation need to be undertaken, as per the norms of

concerned authority. Technologies for the conservation of water will be implemented. Solid waste is organic and gets safely disposed-off by applying into soil.

7.4.3 Impact assessment: In case of proposed project, the air dispersion modeling study reveals that the ground level concentration of PM (during operation phase) in ambient air will remain within the NAAQ standard limits; whereas, no wastewater will be released into any surface water bodies. Hence, it is envisage that, air and water pollutants from the proposed project will have no negative impact on surrounding ecosystem. The negative impact is anticipated due to following.

1. Due to construction on the present open areas, (mainly for switch yard) - foraging ground may get lost permanently for some of the birds, insects and reptiles; also this activity may cause negative impact on soil micro-fauna
2. Installation of transmission line constructed up to the nearest substation (MSEDCL) located at ~1.7km, will require tree felling (about 15-20 trees), it will also cause minor negative impact on surrounding ecosystem.

Mitigation measures

- The wastewater generated will be cooled and recycled as well as reused for greenbelt, which is anticipated as positive impact for the conservation of resource as well as efficient utilization of it.
- Solid waste generated in the project (bagasse ash) will be organic in nature and rich in potash. It will be mixed with compost of distillery unit and added to soils. Thus, nutrient will get recycled and soil enrichment will take place. This is anticipated as second positive impact on the land and the surrounding eco-system.
- Greenbelt development will help in enhancing the biodiversity of the area. It will also help in improving the aesthetics. This is another positive impact anticipated due to the project.

7.5 Socio-economic environment

7.5.1 Impact Causing Factors: issues of rehabilitation; restoration; population flux are not associated with the proposed project; considering the volume of the project, probability of pressure on available resources and infrastructure is also very low.

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.

Table 12: Financial provision for ESC (CSR) and Corporate environmental responsibility (CER) activities planned for next five years

CSR activity head	Year					TOTAL
	1st	2nd	3rd	4th	5th	
	Budgetary provision (Rs. in lakhs)					
A. Drinking Water						
Watershed management work	20	20	25	25	30	**120**
Construction of water storage tanks/repair or maintenance, supply of drinking water	05	05	07	07	10	**34**
Sub-Total for A	**25**	**25**	**32**	**32**	**40**	**154**
B. Health facilities						
Health check-up of workers and their family members	03	03	04	04	05	**19**
Organizing medical camps	02	02	03	03	04	**14**
Medical aid to needy people, etc.	01	01	02	02	03	**09**
Sub-Total for B	06	06	09	09	12	**42**
C. Education						
Training to local farmers	05	05	07	07	08	**32**
Educational aid to local schools, colleges, etc	05	05	08	08	10	**36**
Sub-Total for C	**10**	**10**	**16**	**16**	**20**	**68**
D. Agriculture and Livestock care						
Providing good quality seed, chemical fertilizers and green manure, compost, etc.	25	25	30	30	32	**142**
Aid for improving irrigation system	20	20	25	25	28	**118**
Providing water, fodder and veterinary facilities for local domestic animals	05	05	07	07	08	**32**
Other activities for maintaining social, cultural and religious harmony	02	02	03	03	04	**14**
TOTAL BUDGETARY ALLOCATION FOR NEXT FIVE YEARS						**570**

7.6 Other impact: Traffic

In the project, the transportation activity will take place mainly during the construction phase. Considering the availability of four lane state highway -SH 10, other district level asphalted roads

in the vicinity, the nominal increase in vehicles during construction phase may not cause any traffic congestion.

During operation phase, the transportation activity will be very negligible (for cogeneration project); hence, the probability of traffic congestion is insignificant.

8.0 EMP: OPERATION PHASE

Table 13: Environment management plan: operation phase

Aspect	Impact causing factor	Control/Mitigation Measures
AIR ENVIRONMENT		
Air Environment	Particulate Matter (PM)	• Existing Stack 72 m height is adequate • ESP to control ash emission through stack • Existing Greenbelt 25.5 acre • Bagasse contains traces of S & N, hence generation of SO_2 and NO_X anticipated to be limited • Proper ash and bagasse handling system
	Fugitive dust from handling and transport of bagasse and ash; dust generation from roads, etc.	Mechanized system for handling of bagasse as well as ash Asphalted internal roads, Adequate parking places for goods and private vehicles
WATER ENVIRONMENT		
Water Environment	Major source – effluent will be in the form of hot water	• Hot wastewater will be cooled and it will be recycled (partially); as well as used for water greenbelt; it will reduce fresh water requirement considerably • Rain water harvesting
SOLID WASTE		
Boiler	Ash	• Bagasse ash is rich in potash, thus it will be sent to distillery unit to mix with biocompost or sold for brick manufacturing

Aspect	Impact causing factor	Control/Mitigation Measures
		• Provision of greenbelt for natural control of fugutive dust
NOISE		
Process machineries	Mainly Boiler, STG, pumps and motors	• Noise sources/ noise generating activities will be under roof/in covered area • Regular maintenance of machinery • Provisions of personal protective equipment; Job rotation at high noise work places; Regular health check up • Walls and trees will help to attenuate noise; Greenbelt development
	Transportation	• Regular maintenance of vehicles • Well maintained internal roads and adequate parking will reduce traffic congestion and noise due to it
Ecology and Biodiversity	Tree cutting felling, disturbance to wildlife due to project	• Compansatory plantation as per the norms of local authority for tree felling for transmission line • Adequate preventive, control and mitigation measures for air, water and soil pollutants • No tree cutting required for actual installation of the project, land is flat and barren • No wildlife sanctuary, national park or biosphere reserve within 10km radius, site/study area is not in migratory route of any wildlife, no rare and endangered species of plants/animals reported from the region • Addition of 1,000 trees to greenbelt will help to enhance the biodiversity and may provide habitat to many species

Aspect	Impact causing factor	Control/Mitigation Measures
Socio-economic Environment	Rehabilitation and Restoration (RR), pressure on available manmade infrastructure/resource due to population flux	• No rehabilitation and restoration issue involved • Local candidates will be preferred for employment. • Skilled work force is easily available in the vicinity
Safety and Occupational health	Accidents, improper work practices	• Safety officer and safety committee will be formulated • Provision of adequate safety gears • Other safety measures as per the norms • Insurance policy for workers as per norms • Regular health check-up
Risk and disaster management	Fire, accidents, earthquake, etc.	• The entire premises is no smoking zone • Lightening arresting system will be provided • Earthquake resistant construction

9.0 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)

9.1 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 alarm system and smoke detectors will be installed.

9.2 Mechanical injury to body parts: In a 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. The non-respiratory PPE includes tight rubber goggles, safety helmets, welders hand

shields and welding helmets, plastic face shields, ear plugs, ear muffs, rubber aprons, rubber gloves, shoes with non-skid soles, gum boots, safety shoe with toe protection. All safety and health codes prescribed by the BIS will be implemented.

10.0 DISASTER MANAGEMENT PLAN (ON-SITE)

10.1 Emergency Preparedness and Response Team Structure

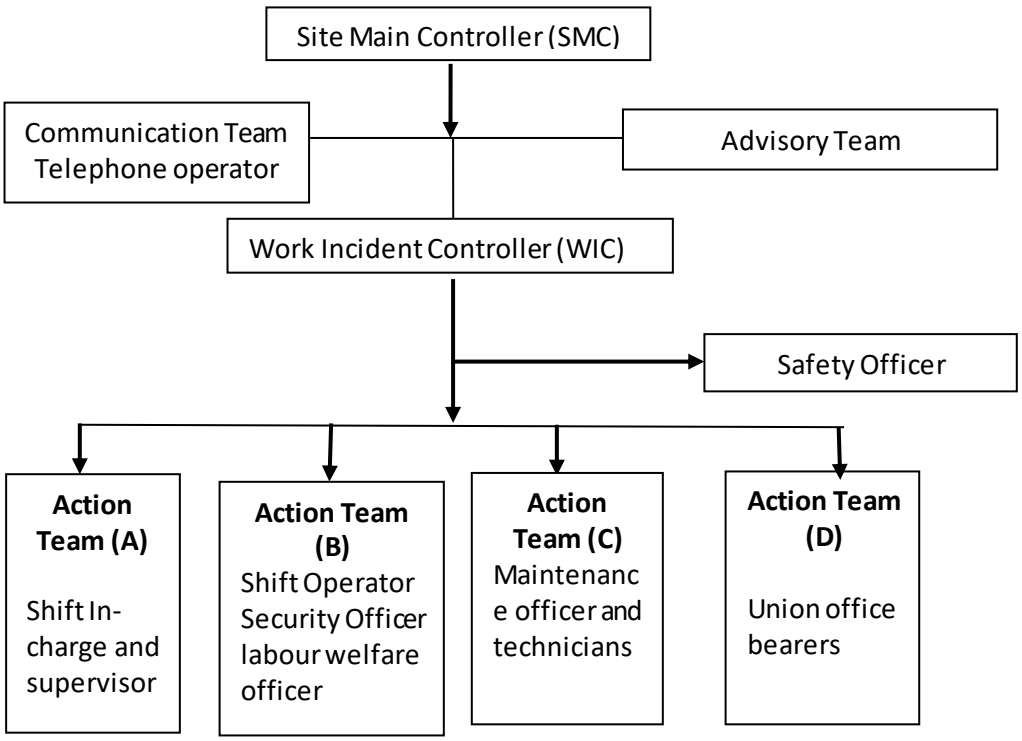

Figure 4: Emergency Preparedness and Response Team Structure

11.0 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 village in downwind direction
3	Inlet and outlet of ETP	pH, EC, BOD, COD, SS, TDS, Oil & Grease etc.	Monthly
4	Bore well /ground water sample	pH, EC, COD, BOD, Total solids, dissolved solids, hardness, alkalinity, Chlorides, Sulphate,	Quarterly /monthly

#	Particulars	Parameter	Frequency#
	nearer to site/ETP	Phosphates, and heavy metals such as Chromium, Cadmium, Iron, etc.	
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)	Quarterly Once a year

12.0 PROJECT BENEFITS

- Efficient use of available resources such as bagasse, steam to produce surplus power
- Recycling/reuse of water will save fresh water intake
- The proposed project on implementation will generate 36 direct employment opportunities
- The project is agro based, hence there will be plenty of indirect employments to locals
- No rehabilitation/resettlement issues are involved
- Factory is already implementing several schemes/activities for the benefit of local farmers, employees and those schemes/activities will be continued
- Technology for the project and pollution control are available indigenously
- Produced electricity will fulfill captive requirement
- Overall, pollution aspect is minor and it will be controlled at all possible extent

13.0 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.