

P-390-JSMPL-DISTILLERY-12019
(Revision - 01)

**SUMMARY ENVIRONMENTAL IMPACT ASSESSMENT
(EIA) REPORT
(IN ENGLISH AND GUJARATI)**

FOR

**ESTABLISHMENT OF 80 KLPD
MOLASSES BASED DISTILLERY**

BY

JARANDESHWAR SUGAR MILLS PVT. LTD.

**CHIMANGAON, TAL.: KOREGAON, DIST.: SATARA,
MAHARASHTRA STATE**

PREPARED BY



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An ISO 9001 : 2015 & QCI - NABET Accredited Organization



September - 2019

JARANDESHWAR SUGAR MILLS PVT. LTD

REF NO.:

DATE:

To,
The Member Secretary
Maharashtra Pollution Control Board (MPCB);
3rd & 4th Floor, Kalpataru Point,
Sion Circle, Sion (E),
Mumbai - 400 022

Sub.: Application for 'Public Hearing' to be conducted for proposed 80 KLPD molasses based distillery by – Jarandeshwar Sugar Mills Pvt. Ltd. (JSMPL), located at Gat No. 803, Chimangaon, Tal.: Koregaon, Dist: Satara, Maharashtra.

Dear Sir,

We – "Jarandeshwar Sugar Mills Pvt. Ltd." have planned to establish 80 KLPD molasses based distillery in our existing Sugar Factory premises located at Gat No. 803, Chimangaon, Tal.: Koregaon, Dist: Satara, Maharashtra.

Accordingly, an application in Form – 1 format was submitted to the 'Ministry of Environment and Forests (MoEF); New Delhi' for grant of ToR's on 23.02.2019. Subsequently, standard ToR's were granted on 12.03.2019. Refer **Enclosure – I** for copy of ToR letter. In the ToR letter, directions were given to conduct Public Hearing w.r.t. our proposed distillery project. Now, in order to conduct Public Hearing, we hereby are submitting all the relevant documents and information to your office.

Along with the Public Hearing application, a draft EIA Report as per the generic structure stipulated in MoEF Notification No. S.O.1533 (E) dated 14.09.2006 as amended vide Notification No. 3067 (E) dated December 01, 2009 and Executive Summary Report in two languages (English and Marathi) are enclosed separately. The same provide details of Pollution Control Facilities, Production Processes and Raw Materials as well as Finished Products and Environmental Management Plan (EMP) etc. regarding the unit.

'Twenty Sets' of various documents, as mentioned above and equivalent number of soft copies of same have been submitted for your information and necessary further action.

JARANDESHWAR SUGAR MILLS PVT. LTD.

Also, a Demand Draft of Rs. 1,00,000/- (Rs. One Lakh only) Bearing No. 598977 drawn on dated 11/9/2019 towards the Public Hearing charges, as decided by the govt., has been presented herewith.

Please do the needful and oblige.

Thanking you.

Yours faithfully,


Mr. Vijay R. Jagdale
(Director)

Encl.: 1. Executive Summary of project
2. A Draft EIA Report
3. A D.D. bearing No. dated drawn on



सातारा जिल्हा मध्यवर्ती सहकारी बँक. लि., सातारा.
 THE SATARA DISTRICT CENTRAL CO-OPERATIVE BANK LTD. SATARA
 मुख्य कार्यालय: 'विज्ञान भवन' सातारा नगर कार्यालय: ३, प्लॉट ६, जिल्हा परिषदेसमोर, सादरबझार कॅम्प, सातारा-४११००१

IFS CODE: IBKL0485SDC

Valid for 3 months from the date of issue

दिनांक / Date: 11 SEP 2024
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साईट चंभजगांव २३८

Sub Regional officer M.P.O.C. Bank Satara Or Order

one lakh only

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अदा करें: ₹ 100000/-

प्राप्त मूल्य के लिए अदा करें / For Value Received

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01	11	01	11

For SATARA DISTRICT CENTRAL CO-OP. BANK LTD., SATARA

Authorised Signatory
 Code No. _____

Authorised Signatory
 Code No. S.S.
 Jadhav S.S.
 1-646
 Please sign above

अदाकर्ता शाखा / DRAWEE BRANCH: जिवाजी झरला ७

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**Summary of EIA Report For
Establishment of 80 KLPD Molasses Based Distillery
By
Jarandeshwar Sugar Mills Pvt. Ltd., (JSMPL)**

Gat No. 803, A/p: Chimangaon, Tal.: Koregaon, Dist.: Satara – 415501, Maharashtra

1) The Project

Jarandeshwar Sugar Mills Pvt. Ltd. (JSMPL) is located at Gat No. 803, A/p: Chimangaon, Tal.: Koregaon, Dist.: Satara – 415501, Maharashtra. They have planned to establish 80 KLPD molasses based Distillery unit in the existing 10,000 TCD Sugar Factory & 32 MW Co-gen Plant.

As per the provisions of “EIA Notification No. S.O. 1533 (E)” dated 14.09.2006; as amended vide Notification No S.O. 3067 (E); dated 01.12.2009; the project comes under activity **5(g)– Distillery**; comes under **Category ‘A’**. Accordingly, Form I application submitted online to MoEFCC; New Delhi & granted standard ToRs vide letter no. IA-I-11011/58/2019-IA-II(I) dated 12.03.2019

In due course, revised “EIA Notification No. S.O. 1960 (E)” dated 13.06.2019, published by MoEFCC, New Delhi; & the project comes under activity 5(g)– **Distillery**; comes under **Category ‘B’**.

Total capital investment of existing Sugar and Co-generation project is Rs. 246 Crores & that for establishment of molasses based distillery would be Rs. 130 Crores.

2) The Place

Proposed project would be implemented in the existing sugar and co-gen premises of JSMPL. Total land acquired by the industry is 8,34,970.0 Sq. M. (206 Acre). Total built up area under existing sugar factory, co-gen unit & proposed distillery unit would be 95,119.27 Sq. M. An another distillery - Laxmi Organics Ltd., located in the existing premises. The same was given on lease to earlier by management from whom land of JSMPL distillery was taken.

A distillery – Laxmi Organics Ltd., located in the existing premises. The same was given on lease by third party management for operation upto year 2021.

3) The Promoters

JSMPL promoters are well experienced in the field of Sugar, Co-gen & distillery & have made thorough study of entire project planning as well as implementation schedule. Name and designation of the promoters are as under-

Table 2 -List of Promoters

No.	Name	Designation
1.	Rajendra S. Ghadge	Director
2.	Vijay R. Jagdale	Director

4) The Products

The details of products as well as by-products in existing Sugar, Cogen & proposed molasses based Distillery activities has been presented in table below.

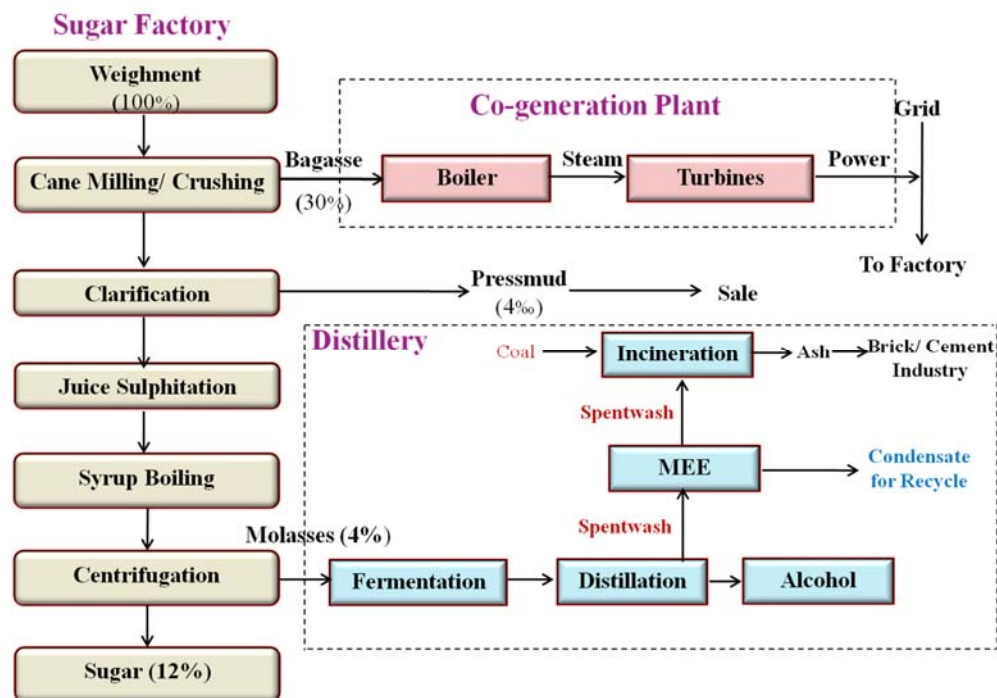
Table 3-Product & By-product for Integrated Complex

Industrial Unit	Product & By-product	Quantity
Existing Sugar Factory (10,000 TCD)	Sugar (11-12%) (MT/M)	34,850
	By-Product	
	Bagasse (28%)* (MT/M)	84,000
	Press Mud (4%)* (MT/M)	12,000
	Molasses (4%)* (MT/M)	12,000
*Existing Co-gen Unit (32	Electricity (MW/Hr)	32
Proposed Distillery Unit (80 KLPD)	Products	Proposed Quantity
	Rectified Spirit (RS)/ Extra Neutral Alcohol (ENA)/ Absolute Alcohol (AA) /Ethanol (KL / M)	2,400
	By-Products	
	Fusel Oil (KL/M)	4.5
	CO ₂ (MT/M)	1800

NOTE- *: Values as per valid CFO.

5) Manufacturing Process

Figure 1 Integrated Manufacturing Process Operations



For more Details of manufacturing process and flow chart for sugar factory and Co-gen plant are given in Chapter 2 and at alternative technology in Chapter 5th of the Draft EIA Report.

6) The Purpose

- Sugar factory is the 2nd largest agro-based industry in the Country.
- Maximum utilization of sugarcane in command area tho' sugar factory expansion.
- Bagasse based co-gen plant fulfils captive power need. Surplus exported in grid.
- Sugar industry is instrumental in resource mobilization, employment generation, income generation and in creating social infrastructure in command area
- Distillery industry uses sugarcane molasses, cereals and other agro products for producing alcoholic beverages. The production of fermented and distilled drinks throughout the world is based on materials that can be grown locally and is best suited to prevailing climatic conditions. Ethyl Alcohol is manufactured by fermenting molasses. Molasses come from sugar manufacturing units.

Considering the above facts, management of JSMPL had decided to establish molasses based distillery.

7) Environmental Aspects

JSMPL have an effective 'Environmental Management Plan' and various aspects of the same are as follows:-

A) Water Use and Effluent Generation

a. Water Use

Details of water usage in existing as well as proposed activities are as follows-

Table 4 - Details of Water Consumption in Sugar, Cogen & Distillery Unit

No.	Description	Existing Sugar & Co-gen Unit (M ³ /Day)		Proposed Distillery (M ³ /Day)
		Total Water Consumption	Fresh Water Consumption – As per MPCB Consent	
1.	Industrial			
a)	Process	2770*	500 [#]	624 (616 [♣] +8 [#]) (Fermentation Dilution)
b)	Cooling Make up	1000 [€]	500 [#]	120 [€]
c)	Boiler Make up	420 [€]		70 [#]
d)	DM Plant	225 [#]		--
e)	Lab & Washing	20(18 [€] +2 [#])	--	6 [#]
f)	Fusel Oil Decanter & Alcohol Scrubber	--	--	6 [€]
2.	Industrial Total	4435 (2770*+1438[€]+227[#])	1000[#]	826 (616[♣]+126[€]+ 84[#])
	Recycle	95%	--	90%
3.	Domestic	35(30 ^Ω +5 [#])	80 [#]	3(2 [§] +1 [#])
4.	Gardening	40 ^Ω	--	--
5.	Grand Total	4510 (2770*+1438[€]+232[#]+70^Ω)	1080[#]	829(616[♣]+126[€]+85[#]+2[§])
	Fresh Water Consumption (Norm 200 Lit / MT of Cane Crushed& 10 KL/KL of Alcohol))	22.7 Lit. / MT	100Lit. / MT	1.0 KL/KL

Note : * Natural water available from sugarcane crushing € Cane Condensate after Sugar Factory CPU
 # Fresh water from River Tilganga, ♣ Treated Water from Distillery CPU,
 Ω Treated water from ETP § Treated water from STP

Total water requirement for existing Sugar factory & Co-gen is 4510 M³/D. From this, about 4435M³/D is required for industrial activities. About 4208 M³/D is utilized from sugarcane condensate & 227 M³/D is the fresh water taken from river.

Total water required for proposed distillery unit would be 829M³/D. From this, about 826 M³/D for industrial purpose, from which 616M³/D would be treated water from CPU & 210 M³/D would be the fresh water met from river for worst case i.e. non- crushing season.

Fresh water consumption for industrial purpose in distillery is 1.0 KL/KL of fresh water against norm of 10KL/KL of alcohol produced.

Total water required for domestic purpose would be 38 M³/D. From this, 35 M³/D is used in existing sugar & cogen & 3 M³/D would be required for distillery unit. Presently, water required for domestic purpose is met from river. After establishment of distillery unit, STP would be provided. From total domestic water requirement, about 32M³/D would be the treated water from STP & 6M³/D would be the fresh water taken from river.

b. Effluent Treatment-

Effluent generated from existing Sugar, Cogen & proposed Distillery unit is given in following table-

Table 5 - Effluent Generation from Sugar, Cogeneration& Distillery Operations

No.	Description	Existing Sugar & Cogen Unit (M ³ /Day)		Proposed Distillery (M ³ /Day)
		Total Effluent	Effluent - As per MPCB Consent	
1	Domestic	32	50	2
2	Industrial			
a)	Process	570	475 (310 Sugar + 165 Cogen)	Raw Spent wash - 635 Conc. Sp. Wash - 130
				Spent lees - 103 MEE Condensate - 505
b)	Cooling Blowdown	285		15
c)	Boiler Blowdown	50		13
d)	DM Backwash	225		--
e)	Lab & Washing	18		5
f)	Fusel Oil Decanter and Alcohol Scrubber	--	--	5
	Industrial Total	1148	475	Conc. Spentwash – 130 Other Effluents – 646 (Sp. wash generation @ 1.6 KL/ KL of Alcohol)

i) Domestic Effluent

Total domestic effluent generated from sugar, cogen & distillery unit will be 34 M³/D. Same will be treated in proposed STP and treated water will be used for gardening/ green belt development.

ii) Industrial Effluent

Total trade effluent generated from existing sugar and co-generation activities is 1148M³/D. Same is treated in existing Effluent Treatment Plant (ETP) provided in own factory premises

comprising of primary, secondary & tertiary unit operations. Treated effluent alongwith excess condensate is supplied for watering plantation under the green belt in own factory premises as well as on land of shareholders of factory for irrigation.

Industrial effluent generated from proposed distillery activities would be in the form of Spent Lees 103 M³/D, Condensate from MEE 505 M³/D, Boiler Blow down 13 M³/D, cooling blow down 15 M³/D and effluent from lab & washing & scrubber 10 M³/D. This entire effluent would be treated in proposed Condensate Polishing Unit (CPU). Treated effluent would be recycled in to process for dilution of molasses and cooling tower make-up.

The flow chart of existing ETP & proposed CPU is presented in chapter 2.

Raw Spentwash to the tune of 635 M³/D will be forwarded to evaporation and concentration in Multiple (Five) Effect Evaporator (MEE). Further, concentrated spentwash of 130 M³/D will be incinerated in proposed 28 TPH boiler.

B) Air Emissions

Presently, steam required for sugar & cogen activities is taken from boiler of 160TPH capacity. Bagasse to the tune of 1728 MT/D is used as fuel. Electrostatic Precipitator (ESP) is provided as APC with 82M stack.

Steam required for distillery activities will be taken from proposed 28 TPH boiler. Coal about 48 MT/D alongwith conc. spentwash about 130 MT/D will be used as fuel. Boiler will be provided with ESP as APC with stack of 50M height. Ambient & stack emissions are monitored regularly by industry & are well within the limit.

Details of air pollution aspect and the control measures are given in Chapter 2, Section 2.7.2.

There will be process emissions in the form CO₂ from Fermenters in distillery unit to the tune of 1800 MT/M. Same will be collected, purified, compressed and filled in cylinders and sold for production of beverages.

C) Noise Pollution Aspect

1. Sources of Noise

- i. In the Sugar factory and co-gen; noise generating sources are the boiler house, turbine rooms, cane crushing section and mill house, D.G. Sets etc. Probable sources of noise from distillery are boiler, fermentation section, distillation assembly, etc. D. G. Set will be operated only in case of power failure. Expected noise levels in the section will be about 70 dB(A) to 80 dB (A).
- ii. Pumps, compressors, movement of trucks for material transportation etc. may cause noise.

2. Control Measures

Control through isolation, separation and insulation techniques. PPEs like earmuffs, earplugs etc. will be provided to workers. D.G. Sets are enclosed in a separate canopy to reduce the noise levels.

D) Hazardous Wastes

(a) Sugar and Co-gen Unit:

Table 8 - Details of Hazardous Waste From Sugar & Co-gen Unit

No.	Type of Waste	Quantity	Disposal
1.	5.1 & 5.2- Used Oil/ Spent Oil	6.0 KL/Yr	Burnt in Boiler
2.	33.1 – Empty Containers	25 Nos./ Yr	Authorized re-seller

(b) **Distillery Unit:** No any hazardous waste will be generated from proposed distillery unit.

E) Solid Wastes

Table 7- Details of Solid Waste

No.	Unit	Type	Quantity (MT/M)	Disposal
1	Sugar Factory & Co-gen Plant (Existing)	ETP Sludge	25	Used as Manure
		Boiler Ash (Bagasse)	2900	
2	Distillery (Proposed)	Boiler Ash (Coal+ Sp.wash)	960	Sale to Brick manufacturers
		Yeast Sludge	420	Used as Manure
		CPU Sludge	2.0	

Agreement with brick manufacturers will be done after commissioning of distillery unit.

F) Odour Pollution

ETP Sludge, Yeast Sludge and Press mud will be the source of odour nuisance from industrial operations. For the same, separate impervious storage yard with thick stone soiling would be provided. Further, fermentation section may cause odour. Proper operations at the fermenters including closing it appropriately shall curb odour generation.

G) Compliance with the Norms

All the relevant acts, rules and guidelines with respect to effluent treatment and disposal, solid& hazardous wastes handling and disposal as well as in respect of emission handling and disposal, wherever applicable, as specified by the CPCB/ MPCB or any other concerned authority are strictly followed in the existing set up. Same practice shall be continued after implementation of proposed project activities.

H) Environmental Management Cell

Industry is already having an environmental management cell (EMC) functioning under its existing sugar & cogen unit. Members of the EMC are well qualified and experienced in their concerned fields. This cell shall be further augmented suitably after establishment of distillery unit. The existing and proposed EMC members are as under.

Table 9 Environmental Management Cell of JSMPL –

No.	Designation	Number (s)
1	Chairman	1
2	Environmental Officer	1
3	Safety Officer	1
4	Chief Chemist	1
5	Environmental Officer	1
6	Representative of Consultant	1
7	Lab Chemist	3
8	ETP Operators & Supporting Staff	4

Details of capital as well as O & M costs towards environmental aspects under the existing sugar & cogeneration setup & proposed distillery are as follows –

Table 10 Capital as well as O & M Cost

No.	Description	Cost Component (Rs. Lakhs)	
		Capital	O & M / Year
A	Existing		
1	APC Equipments – ESP & Stack for boiler	525.0	50.0
2	Ash Collection System	50.0	5.0
3	Water Pollution Control - ETP & CPU	230.0	10.0
4	Noise Pollution Control	6.5	2.0
5	Solid Waste Management	10.0	1.0
6	Occupational Health and Safety	30.0	3.0
7	Green Belt Development	30.0	2.0
8	Environmental Monitoring & Management	12.0	1.5
9	Laboratory & Chemicals	1.0	0.1
	Total	894.5	74.6
B	Proposed		
1	Incineration Boiler, APC Equipment – ESP, Stack & Ash handling system	2800.0	35.0
2	Water Pollution Control – CPU & STP	150.0	15.0
3	Occupational Health & Safety	10.0	2.0
4	Green Belt Augmentation Plan & Rain Water Harvesting implementation	30.0	3.0
5	Noise Pollution Control	4.0	1.0
6	Environmental Monitoring & Management	9.0	1.5
7	CER amount (2.5% of total cost of Distillery unit for 5 years after establishment of Distillery)	325.0	--
	Total	3328	57.5

D) Rainwater Harvesting Aspect Under Integrated Complex:

Total area of Plot – 8,34,970.0 M²

Total Open space – 4,05,862.6 M²

Average annual rainfall in the area = 780 mm

➤ Rooftop Harvesting

Roof Top harvesting area of 18,370.65 M²

Roof Top harvesting yield is – 12,124.6M³

Thus, about **12,124.6 M³** of rainwater could become available during every season from the ‘Roof Top Harvesting’ operations. This when charged to open / bore wells would definitely have a positive impact on the ground water quantity.

➤ Surface Harvesting

Total Open space – 7,39,850.7M²

Surface harvesting yield is – 2,30,833.4M³

Hence, the total water becoming available after rooftop and surface harvesting would be –

$$12,124.6 \text{ M}^3 + 2,30,833.4\text{M}^3 = 2,32,058\text{M}^3$$

Total water from harvesting when charged to open / bore wells would definitely have a positive impact on the ground water quantity.

J) The Green Belt

Table 12 Area Details

No.	Description	Area (Sq. M.)
1.	Total Plot Area	8,34,970.0
2.	Total Built – up area under Sugar, Co-gen & Distillery	95,119.27
3.	Open Space	4,05,862.6
4.	Existing Green Belt Area (33% of Total plot Area)	2,75,540.1
5.	Proposed Green Belt area	58,448

The Criteria for Proposed Greenbelt Development Plan

Emission of SPM, SO₂ is the main criteria for consideration of green belt development. Plantation under green belt is provided to abate effects of the above emissions. Moreover, there would also be control on noise from the industry to surrounding localities as considerable attenuation would occur due to the barrier of trees provided in the green belt.

K) Socio-Economic Development

Socio economic study was carried out in 8 villages within 10 Km radius of the study area. Methodology adopted involved a structured close ended interview schedule (30 questions) in Marathi, which was drafted prior to and employed during the survey. Refer Socio – economic profile in Chapter 3 of EIA report for detailed information of socio economic aspect. The suggestions after the socio-economic study are as follows-

- i. Industry should contribute towards providing health facility under CER for locals at least through a mobile health van.
- ii. Employment should be given to the people from nearby villages considering the JSMPL's environmental impacts on their traditional livelihood and agricultural land.
- iii. Good rate to farmers for sugarcane.
- iv. ZP / Gram panchayat should make provision for infrastructure like roads, toilets in public places with the help of the factory.
- v. To provide radium strips/ flags to sugarcane transportation vehicles by industry to reduce accidents on road.

Company has to make proper plan and budget and implement for community development.

8) ENVIRONMENTAL MONITORING PROGRAMME

Reconnaissance survey of the study area was undertaken in the month of December 2018. Field monitoring for measuring meteorological conditions, ambient air quality, water quality, soil quality and noise levels was initiated in January 2019. Report incorporates data monitored during the period from January 2019 to March 2019 and secondary data collected from various sources which include Government Departments related to ground water, soil, agriculture, forest etc.

a. Land Use

Land use study requires data regarding topography, zoning, settlement, industry, forest, roads and traffic etc. The collection of this data was done from various secondary sources viz,

Census books, Revenue records, State and Central Government Offices, Survey of India toposheets as well as high resolution satellite image and through primary field surveys.

b. Land Use/ Land Cover Categories of Study Area

Table 13 Land Use/ Land Cover

No.	Class	Area (Ha)	Percentage (%)
1	Built Up Area	1280	4.07
2	Crop Land	11534	36.71
3	Fallow Land	12432	39.57
4	Water Bodies	250	0.79
5	Nadi/ Canal	209	0.66
6	Forest Area	2928	9.32
7	Open Scurb Land	2782	8.86
	Total	31415	100

c. Meteorology

Methodology adopted for monitoring surface observations is as per the norms laid down by Bureau of Indian Standards (BIS) and the India Meteorology Department (IMD). On-site monitoring was undertaken for various meteorological variables in order to generate the data. Further, certain secondary meteorological data like temperatures, relative humidity, rainfall intensity etc. have been taken from IMD, Satara.

Meteorological parameters were monitored during the period January 2019 to March 2019. Details of parameters monitored, equipments used and the frequency of monitoring have been given in Chapter 3 of the Draft EIA report.

d. Air Quality

This section describes selection of sampling locations, includes methodology of sampling and analytical techniques with frequency of sampling. Presentation of results for January 2019 to March 2019 survey is followed by observations. All the requisite monitoring assignments, sampling and analysis was conducted through the laboratory - M/s. Green EnviroSAFE Engineers & Consultant Private Limited, Pune. Lab has received NABL accreditation and has been approved by MoEFCC; New Delhi. Further it has also received ISO 9001:2008, ISO 14001:2004 OHSAS 18001–2007 certifications by DNV.

Ambient air monitoring was conducted in the study area to assess the quality of air for PM₁₀, PM_{2.5}, SO₂, NO_x and CO. The various monitoring stations selected are shown in following table.

Table 14 Ambient Air Quality Monitoring (AAQM) Locations

AAQM Station Code	Name of the Station	Distance from Site (km)	Direction w.r.t. Site
A1	Industrial Site	--	--
A2	Koregaon	7.0	W
A3	Khirkhandi	1.49	SEE
A4	Bhatamwadi	1.77	NE
A5	Saigaon	2.85	SSW
A6	Chimangaon	3.0	NNW
A7	Wadachivadi	2.11	WWS
A8	Asare	5.77	W

**Table 15 Summary of the AAQ Levels for Monitoring Season
[January 2019 to March 2019]**

Parameter		Location							
		Industrial Site	Koregaon	Khirkhandi	Bhatamwadi	Saigaon	Chimangaon	Wadachivadi	Asare
PM ₁₀ (µg/M ³)	Max.	67.10	59.60	59.50	59.70	58.90	59.90	59.20	59.80
	Min.	58.20	50.30	50.10	50.20	50.10	50.20	50.60	50.00
	Avg.	63.10	55.70	55.79	56.35	55.83	56.65	56.49	56.15
	98%	67.01	59.42	59.50	59.65	58.90	59.76	59.16	59.63
PM _{2.5} (µg/M ³)	Max.	29.70	20.40	20.10	19.90	20.50	19.70	19.80	19.90
	Min.	15.10	15.10	15.10	15.10	15.10	15.10	15.10	14.80
	Avg.	17.24	18.34	18.23	18.25	18.63	17.93	18.25	18.48
	98%	19.02	20.17	20.01	19.85	20.27	19.61	19.80	19.80
SO ₂ (µg/M ³)	Max.	29.70	19.50	19.90	19.80	19.70	19.70	19.80	19.90
	Min.	25.80	15.10	15.10	15.20	15.10	15.90	14.80	15.10
	Avg.	28.07	17.77	17.58	17.76	17.82	18.21	17.33	17.87
	98%	29.56	19.45	19.76	19.80	19.65	19.70	19.67	19.90
NO _x (µg/M ³)	Max.	35.40	25.60	26.20	25.80	24.80	24.90	24.90	25.40
	Min.	31.00	21.70	21.00	21.00	20.20	21.00	21.10	21.00
	Avg.	33.47	24.07	23.70	23.28	22.53	22.70	23.26	23.14
	98%	35.31	25.42	25.92	25.39	24.75	24.58	24.90	25.36
CO (mg/m ³)	Max.	0.90	0.09	0.09	0.09	0.09	0.09	0.09	0.09
	Min.	0.20	0.01	0.02	0.01	0.02	0.01	0.02	0.02
	Avg.	0.57	0.06	0.06	0.07	0.07	0.05	0.06	0.06
	98%	0.90	0.09	0.09	0.09	0.09	0.09	0.09	0.09

Note:1. PM₁₀, PM_{2.5}, SO₂ and NO_x are computed based on 24 hourly values.

2.CO is computed based on 8 hourly values.

**Table 16 National Ambient Air Quality Standards (NAAQS) Specified By Central
Pollution Control Board Notification (New Delhi, The 18th November, 2009)**

Parameter (µg/M ³)		Standards	
		Industrial and mixed use zone	Ecologically Sensitive Area
PM ₁₀	24 Hr	100	100
	A.A.	60	60
PM _{2.5}	24 Hr	60	60
	A.A.	40	40
SO ₂	24 Hr	80	80
	A.A.	50	20
NO _x	24 Hr	80	80
	A.A.	40	40
CO (ppm)	24 Hr	4	4
	1 Hr.	2	2

Note: A.A. represents “Annual Average”

The results observed after monitoring for above locations are well within the limits as per NAAQS. Refer Chapter 3 of EIA report for monitoring results.

e. Water Quality

Sampling and analysis of ground water and surface water samples for physical, chemical and heavy metals were undertaken through the laboratory of M/s. Green Envirosafe Engineers & Consultant Private Limited, Pune.

As per standard ToRs 8 locations for surface water and 8 locations for ground water were selected. The locations are mentioned below-

Table 17 Monitoring Location for Surface Water

Location	Station Location	Justification	Distance from Site (km)	Direction
SW1	Near Chimangaon	Upstream	4.0	NW
SW2	Shirdhon	Downstream	10.0	SW
SW3	Site	Nalla	1.0	NW
SW4	Kumthe	River Nalla Confluence	4.4	NW
SW5	Site	Tank	1.6	E
SW6	Sangavi -1	Nalla	2.5	NW
SW7	Sangavi – 2	Nalla	1.9	W
SW8	Near Saigaon	Nalla	4.0	SSW

Results observed after monitoring ground water locations and surface water locations are mentioned in Chapter 3 of the EIA report.

Table 18 Monitoring Locations for Ground Water

Station Code	Location Name	Co-ordinates	
		Latitude	Longitude
GW1	Industrial Site	17°42' 18.10" N	74°13' 46.99" E
GW2	W side of Chavhanwadi	17°42' 15.36" N	74°14' 33.18" E
GW3	N side of Site	17°42' 55.31" N	74°13' 44.40" E
GW4	SSE side of Site	17°42' 40.88" N	74°13' 38.92" E
GW5	W side of Bhatamwadi	17°42' 51.93" N	74°13' 22.67" E
GW6	WWS side of Bhatamwadi	17°42' 43.41" N	74°13' 25.14" E
GW7	WWS side of Bhatamwadi	17°42' 48.40" N	74°13' 27.03" E
GW8	E side of Vadachivadi	17°42' 44.95" N	74°13' 11.31" E

Refer Chapter 3, section 3.7.4 of EIA report for monitoring results.

f. Noise Level Survey

Study area of 10 Km radius with reference to the proposed project site has been covered for noise environment. The four zones viz. Residential, Commercial, Industrial and Silence Zones have been considered for noise monitoring. Some of the major arterial roads were covered to assess the noise due to traffic. Noise monitoring was undertaken for 24 hours at each location. The details of noise monitoring stations are given in following table

Table 19 Noise Sampling Locations & Ambient Noise Levels

Station Code	Name of the Sampling Point	Distance from Site (km)	Direction	Average Noise Level in dB(A)					
				L ₁₀	L ₅₀	L ₉₀	L _{eq(day)}	L _{eq(night)}	L _{dn}
N1	Project Site	--	--	63.3	65.1	67.2	70.8	60.0	70.5
N2	Khirkhandi	1.49	SEE	45.7	47.3	48.6	53.4	41.5	52.8
N3	Ramoshiwadi	2.7	NE	47.4	48.1	49.6	53.0	43.3	53.1

N4	Vardhangad	4.29	NE	45.4	47.0	47.9	52.6	41.6	52.3
N5	Chimangaon	3.0	NNW	45.1	47.2	48.4	51.9	42.7	52.2
N6	Borjaiwadi	5.0	N	43.6	45.3	46.2	49.7	41.0	50.2
N7	Vadachivadi	2.11	WWS	45.6	47.1	47.8	52.7	41.6	52.3
N8	Golewadi	4.08	WWS	47.4	48.6	49.4	54.0	43.3	53.7
N9	Ekambe	2.91	S	47.1	48.1	49.6	52.8	43.6	53.1

g. Socio-Economic Profile

Socio-economic status of the population is an indicator for the development of the region. Any developmental project of any magnitude will have a bearing on the living conditions and on the economic base of population in particular and the region as a whole. Chapter 3 may be referred for details of this aspect.

h. Ecology

Ecological survey for proposed project was conducted during pre- monsoon season. Out of the total 59 villages within 10 km radius, 13 villages were found for Ecology and Biodiversity (EB) studies being representative of the major habitats in the study area i.e. 9 villages within 5 km radius and 4 villages between 5 and 10 km radius.

Table 20 Villages visited for EB field study and questionnaire survey within 5 and 10 km radius of the project site

In radius 0 to 5 Km				In radius 5 to 10 Km			
No.	Names of Study villages	EB Study	Q. Survey	No.	Names of Study villages	EB Study	Q. Survey
1	Sangvi	*	*	10	Kumathe	*	*
2	Chimangaon	*	*	11	Ner	*	-
3	Bodhewadi	*	*	12	Borjaiwadi	*	*
4	Vadachiwadi	*	*	13	Kanherkhed	*	*
5	Golewadi	*	*				
6	Bhatamwadi	*	*				
7	Vardhangad	*	*				
8	Khirkhandi	*	*				
9	Ekambe	*	*				

General Observations and Recommendations:

1. Protection and conservation of the fragmented local natural habitats, with joint participation of locals by industry, are to be undertaken on priority. Three villages in the study area namely 1) Khirkhandi, 2) Vardhangad and 3) Shelti are recommended for CER activity for conservation of the existing ecology and biodiversity in their area, as it is still in better state.
2. Industry, by involving workers and locals, should demonstrate, encourage and promote suitable eco-friendly alternatives and green technologies in the villages in the 5 km and 10 km vicinity, Block plantation of local tree species, Water and soil conservation activities like Rain water harvesting, drip irrigation, Solid waste and sewage management, Organic farming and Environmental awareness campaign should be undertaken involving locals, particularly youth clubs and women self-help groups.
3. In addition to proactively controlling negative impacts of industrial pollution on the ecology, above initiatives would help improve health of the villagers, most of who are employed in the industry.

9) Additional Studies & Information

Risks Assessment –

Risk to human health is inherent. It is safe only when the installation is dismantled at the end of its useful life. The following principles should be used as guidelines for the selection of risk criteria -

1. Increase in risk, caused by the presence of the plant to local community (i.e. neighboring public) should be negligible in comparison to the risk they already have in their daily life.
2. Work force on the plant should be expected to accept a potentially greater risk than the members of the local community since the work force have been trained to protect themselves from the possible hazards and thus reducing the actual risk to themselves.

The risk criteria considered by Green A.G. (1982) are given as below:

1. Risk to Plant: This risk is to be given priority only when it is proved beyond doubt that the risk to life is so low that reducing this risk may not be justified. Under this consideration, the risk to economic damage may be considered.
2. Risk to Public and Employees: The scale used for risk to employee and public is Fatal Accident Rate (F.A.R.) or more commonly Fatal Accident Frequency Rate. (F.A.F.R.). The F.A.R. and F.A.F.R. is defined as number of deaths from industrial injury expected in a group of 1,000 men during their working period.

Risk & Hazard will deal with –

- Identification of Hazards in the Production processes, like sulphur dioxide generation unit for sugar factory
- Identification of hazards in the storage and handling of Bagasse, Molasses in existing sugar factory.
- Possible hazards in distillery, like storage and handling of alcohol.
- Occupational Health Center, staff required, adequate medical facilities as per the requirement of Factory act.

For more details w.r.t. this aspect, Chapter 7 of EIA report may be referred.

10) ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

a. Impact on Topography

No major topographical changes are envisaged in the acquired area as land was kept vacant for establishment of distillery unit in existing sugar factory premises.

c. Impact on Climate

Impact on the climate conditions due to the proposed project activities is not envisaged, as emissions to the atmosphere of flue gases with very high temperatures are not expected.

d. Impact on Air Quality

An area of 10 Km radius with project site at its center was considered to determine the impacts.

i. Baseline Ambient Air Concentrations

The 24 hourly average concentrations of PM₁₀, PM_{2.5}, SO₂ and NO_x in Ambient Air, recorded during the field study conducted for the season January, February & March 2019 is considered as baseline values. They represent impact due to operations of existing nearby

industries on this region. Average concentrations of above mentioned parameters, at this location, are considered to be the ‘Baseline Concentrations’ to determine the impact of industrial operations on ambient air quality. Existing baseline concentrations are summarized in following table-

Table 21- Baseline Concentrations

Parameter	Concentration ($\mu\text{g}/\text{m}^3$)
PM ₁₀	67.01
PM _{2.5}	19.02
SO ₂	29.56
NO _x	35.31
CO	0.90 mg/m ³

ii. Air Polluting Sources

Steam required for existing sugar & cogen activities is taken from boiler of 160TPH capacity. Bagasse to the tune of 1728 MT/D is used as fuel. Electrostatic Precipitator (ESP) is provided as APC with 82 M stack.

Steam required for proposed distillery activities will be met from proposed 28TPH incineration boiler. Spentwash @ 130 MT/D will be blended with coal @ 48 MT/D. Boiler will be provided with ESP as APC with stack of 50M height.

E. Impact On Water Resources

i. Impact on Surface Water Resources

Fresh water required for existing as well as proposed project activities will be met from river. The permission granted to the industry to lift water from river is 0.1637M. Cum (1,63,700 M³/Day) 0.1637M. Cum. .For details w.r.t. water consumption refer Chapter 2, Section 2.7.1.1 of EIA report. Hence, there will not be any significant impact on ground water resource.

Raw Spentwash will be forwarded to evaporation and concentration in Multiple (Five) Effect Evaporator (MEE). Further, concentrated spentwash will be incinerated in proposed 28 TPH boiler.

Industrial effluent generated from proposed distillery activities will be treated in proposed Condensate Polishing Unit (CPU). Treated effluent will be recycled in to process for dilution of molasses and cooling tower make-up.

Total domestic effluent generated from sugar, cogen & distillery unit will be treated in proposed STP and treated water will be used for flushing and also used for gardening.

No process effluent will be discharged in nearby river or nalla. Hence, there will not be any impact on surface water quality.

ii. Impact on Ground Water Resources

Water required for the industry will be obtained from river. Permission for water lifting has been obtained from competent authority. No ground water will be extracted for existing as well as proposed project. Moreover, there will not be any discharge of untreated effluent so there will not be any impact on ground water level and quality.

F. IMPACT ON SOIL

Impact on soil characteristics is usually attributed to air emissions, wastewater discharges and solid waste disposal. As mentioned above, there will not be discharge of any untreated effluent on land. Increase in chemical constituents of soil is not likely through deposition of air pollutants. ESP is provided as APC equipment to control the air emissions. There will not be any process emissions worth mentioning, the impact on the soil characteristics will be nil.

Solid waste will be generated from distillery activities in the form of Yeast Sludge about 420 MT/M, CPU Sludge 2.0 MT/M and Boiler Ash about 1050 MT/M. Sludge will be used as manure & ash will be sold to brick manufacturers.

No any hazardous waste will be generated from distillery unit.

G. IMPACT ON NOISE LEVELS

Probable sources of noise are mill, compressors, boiler, distillation assembly, turbine & D.G. Sets etc. Workers could get annoyance and can lose concentration during operation. Workers working near the source need risk criteria for hearing damage while people residing near industry lead annoyance and psychological damage. It is obvious that the acceptable noise level for the later case is less than the former case. Noise can affect health of workers, can cause loss of hearing and can disturb during working which may lead to accidents.

H. IMPACT ON LAND USE

Total land acquired by project proponent for industrial purpose is 8,34,970.0 Sq. M. (83.4 Ha). Land is slightly slopy. There would be no change in land use pattern since it is a proposed project that would be undertaken in existing sugar factory premises. Hence, no change in the land use pattern is expected. Therefore, impact on land use is insignificant.

I. IMPACT ON FLORA AND FAUNA

There will be no loss in native flora/fauna due to execution of proposed project since proposed project will be implemented in existing factory premises. Hence, there is no any loss of terrestrial habitat.

Contamination of Habitats:

Major terrestrial habitats such as grassland, scrub, fallow land, and cropland and in wetland habitats streams, canal and tank were identified in the vicinity of the study villages.

Most of the area is comprised of manmade terrestrial ecosystems dominated by cropland, fallow land and human habitations with few small pockets of barren scrub, patchy grasslands and scanty woodland.

The major aquatic habitats in the region are two major rivers; Tilganga (4.5 km) and Vasana (8.7 km), and 9 village tanks in 5 km buffer area while 12 tanks in 5 to 10 km buffer.

Raw Spentwash from distillery will be forwarded to evaporation and concentration in MEE & concentrated spentwash will be incinerated.

Other industrial effluent generated from proposed distillery activities will be treated in proposed CPU. Treated effluent will be recycled in process for dilution of molasses and cooling tower make-up.

Total domestic effluent generated from sugar, cogen & distillery activities will be treated in proposed STP and treated water will be used for gardening/ green belt development.

No process effluent will be discharged in nearby river or nalla. Hence, there will not be contamination of terrestrial as well as aquatic habitats.

J. IMPACT ON HISTORICAL PLACES

Vardhangad Fort & Mahadev Temple at 4.38 Km & Kedareshwar Temple at 7.6 Km are the historical places present in the study area. But, the places are not notified and the impact is nil.

11) SALIENT FEATURES OF EMP

Following routine monitoring programme as detailed in Table N0. 22 shall be implemented at site. Besides to this monitoring, the compliances to all Environmental Clearance (EC) conditions and regular permissions from CPCB /MoEFCC shall be monitored and reported periodically.

Table 22 Plan for Monitoring of Environmental Attributes within Industrial Premises (Onsite)

No.	Description	Location	Parameters	Frequency	Person Responsible	Conducted by
1	Ambient Air Quality	Upwind-1, Downwind-2 (Near Cane Yard, Near Main ETP, Near Alcohol Plant)	PM ₁₀ , PM _{2.5} , SO ₂ , NO _x & CO	Monthly	EHS Officer	MoEFCC and NABL Approved External Laboratory
2	Work Zone Air Quality	4 Locations (Mill section, Boiler area, Fermentation section, Sugar bagging section)		Monthly or CPCB / SPCB requirement		
3	Stack Emissions	Boiler – 2 Nos., D.G – 2 Nos.	SPM, SO ₂ , NO _x	Monthly		
4	Ambient Noise	5 Locations - (Near Main Gate, Near ETP, Near Sugar Godown, Near Cane Yard, Admin Office)	Spot Noise Level; Leq(n), Leq (d), Leq (dn)	Monthly	EHS Officer	
	Work zone Noise	Within Premises – 5 Nos. (Mill section, D.G. Sets, Co-gen Area, Distillation Section, Boiler Section, ETP)	Spot Noise Level; Leq(n), Leq(d), Leq (dn)	Monthly		
5	Effluent	<ul style="list-style-type: none"> • Treated • Untreated 	pH, SS, TDS, COD, BOD, Chlorides, Sulphates, Oil & Grease	Monthly	EHS Officer	MoEFCC and NABL Approved External Laboratory
6	Drinking Water	Factory canteen/ Residential Colony	Parameters as per drinking water Std IS:10500	Monthly		
7	Fugitive Emissions	Ethanol storage area & Distillation column , Bagasse yard	VOC	Monthly		
8	Waste Management	Implement waste management plan that identifies and characterizes every waste associated with proposed activities and which identifies the procedures for collection, handling & disposal of each waste arising.	Records of Solid Waste Generation, Treatment and Disposal shall be maintained	Twice in a year	EHS Officer	By JSMPL
9	Emergency Preparedness such as fire fighting	For Industrial Site - Fire protection and safety measures to take care of fire and explosion hazards, to be assessed and steps taken for their prevention.	On site Emergency Plan, Evacuation Plan, fire fighting mock drills	Twice a year	Safety Officer	
10	Health Check up	Employees and migrant labour health check ups	All relevant health check-up parameters as per factories act.	Once in a Year	Safety Officer	
11	Green Belt	Within industry premises as well as nearby villages	Survival rate of planted sapling	In consultation with DFO	Environmental Engineer/ Safety Officer	
12	CER	Study Area - As per requirement	--	--	Industry	By JSMPL

**Table 24 Plan for Monitoring of Environmental Attributes within Industrial Premises
(Offsite)**

No.	Description	Location	Parameters	Frequency	Conducted by
1	Ambient Air Quality	Upwind, Downwind & Near Habitat - 8 Locations Industrial Site, Koregaon, Khirkhandi, Bhatamwadi, Saigaon, Chimangaon, Wadachivadi & Asare	PM ₁₀ , PM _{2.5} , SO ₂ , NO _x & CO.	Quarterly	MoEFCC and NABL approved external Laboratory
2	Noise	8 villages within 10 Km study area- Industrial Site, Khirkhandi, Ramoshiwadi, Vardhangad, Chimangaon, Borjaiwadi, Vadachivadi, Golewadi & Ekambe	Spot Noise Level recording; Leq(n), Leq(d), Leq(dn)	Quarterly	MoEFCC and NABL approved external Laboratory
3	Soil	8 locations within 10 Km study area	pH, Salinity, Organic Carbon, Nitrogen, & Phosphorous as Potash	Quarterly	MoEFCC and NABL approved external Laboratory
4	Surface Water and Ground Water	8 Surface water locations around industrial premises – Near Chimangaon, Shirdhon, Site (Nalla), Kumthe, Site (Tank), Sangavi -1, Sangavi – 2 & Near Saigaon 8 Ground water locations – Industrial Site, W side of Chavhanwadi, N side of Site, SSE side of Site, W side of Bhatamwadi, WWS side of Bhatamwadi (1), WWS side of Bhatamwadi (2) & E side of Vadachivadi	Parameters as per CPCB guideline for water quality monitoring – MINARS/27/2007-08	Quarterly	MoEFCC and NABL approved external Laboratory
5	CER	As per activities	--	--	By JSMPL
6	Green Belt Development	Within Industry premises as well as nearby villages	--	--	By JSMPL
7	Rain Water Harvesting	Within Industry premises as well as nearby villages	--	Once in year	By JSMPL