

P-242-SSL-SUGAR-72018

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

FOR

**PROPOSED EXPANSION OF SUGAR FACTORY FROM 800 TCD TO
10000 TCD, ESTABLISHMENT OF 60 MW CO-GEN PLANT
& 200 KLPD MOLASSES BASED DISTILLERY**

BY

SHIVNERI SUGARS LTD.

**NHAVI (BK.), TAL.: KOREGAON, DIST.: SATARA
STATE : MAHARASHTRA**

PREPARED BY



EQUINOX ENVIRONMENTS (I) PVT. LTD.,

**ENVIRONMENTAL; CIVIL & CHEMICAL ENGINEERS, CONSULTANTS & ANALYSTS,
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AN ISO 9001 : 2015 & QCI - NABET ACCREDITED ORGANIZATION



2018 - 2019

SHIVNERI SUGARS LIMITED

Regd. Office : 2nd Floor, Shiv Pavilion Apartment, Near Ram Mandir,
Sangli -miraj Road, Sangli 416416, Maharashtra

Contact : 0233- 2373885, E-mail : sushant.shivneri@gmail.com

CIN : U15400PN2016PLC167162

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 expansion of Sugar factory from 800 TCD to 10000 TCD, establishment of 60 MW Co-gen plant & 200 KLPD molasses based distillery by – Shivneri Sugars Ltd., located at Nhavi (Bk.), Tal.: Koregaon, Dist.: Satara.

Dear Sir,

We – Shivneri Sugars Ltd., have planned for expansion of Sugar factory from 800 TCD to 10000 TCD, establishment of 60 MW Co-gen plant & 200 KLPD molasses based distillery located at Nhavi (Bk.), Tal.: Koregaon, Dist.: Satara, Maharashtra State.

Accordingly, an application of Form – 1 was submitted online on 07.09.2018 to the 'Ministry of Environment, Forest and Climate Change (MoEFCC); New Delhi' for grant of ToR's. Subsequently, the application was considered and standard TORs were issued vide letter no. IA-J-11011-/277/2018-IA-II(I) dated 12.10.2018. Therein, directions have been given to conduct Public Hearing w.r.t our 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 existing and proposed units.

'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. Also, a Demand Draft of Rs. 2, 00,000 /- (Rs. Two Lakhs only) bearing No. 029363 drawn on

Factory : Ganesh tekai Nhavi bk, 415511, Tal. Koregaon, Dist. Satara

SHIVNERI SUGARS LIMITED

Regd. Office : 2nd Floor, Shiv Pavilion Apartment, Near Ram Mandir,
Sangli -miraj Road, Sangli 416416, Maharashtra

Contact : 0233- 2373885, E-mail : sushant.shivneri@gmail.com

CIN : U15400PN2016PLC167162

HDFC Dated 14/01/2019 towards the Public Hearing a charges, as decided
by the govt., has been presented herewith.

Please do the needful and oblige.

Thanking you.



For Shivneri Sugars Limited

A handwritten signature in blue ink, appearing to be "S. Patil".

Shri Sushant S. Patil
(Director)
(DIN: 06842330)

- Encl.: 1. Executive Summary of Project
2. A Draft EIA Report
3. A D.D. bearing No. 029363 dated 14/01/19 for Rs. 2,00,000/- only
drawn on HDFC bank

14012019

SESH/MSM(C)/CTS-2010

ON DEMAND PAY

THE SUB REGIONAL OFFICER, MAHARASHTRA POLLUTION CONTROL

Or Order

अदा करे
Rupees

BOARD, SATARA, ***

या उनके आदेश पर

रुपये **TWO LAKH ONLY.**

₹ ***2,00,000.00**

FC FOR VALUE RECEIVED
SHIVNERI SUGARS LIMITED

For HDFC BANK LTD.

SANGLI - MAHARASHTRA
SANGLI - 416416

DRAWEE BRANCH
REF. No. 022213045412

ISSUING BRANCH

Attn: P25896

AUTHORISED SIGNATORIES

Please sign above

⑈029363⑈ 416240151⑈ 999990⑈ 16

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Summary of Draft EIA Report
for
Expansion of Sugar factory from 800 TCD to 10000 TCD and Establishment of 60 MW
Co-generation Plant (50 MW electricity generation from Co-gen & 10 MW from
Distillery) and 200 KLPD Molasses based Distillery
By
Shivneri Sugars Ltd. (SSL)
A/p. - Ganesh Tekadi, Nhavi (Bk.), Tal: Koregaon, Dist.: Satara, Maharashtra State

1) THE PROJECT

Shivneri Sugars Ltd. (SSL) is located at **Ganesh Tekadi, Nhavi (Bk.), Tal.: Koregaon, Dist.: Satara, Maharashtra State**. It is towards South-East of Satara, at a distance of about 24 Km from city. The existing cane crushing capacity of the sugar factory is about 800 TCD, establishment of Co-generation capacity of 60 MW (50 MW electricity generations from Co-gen & 10 MW from Distillery) and 200 KLPD Molasses based Distillery.

As per the Environmental Impact Assessment (EIA) Notification dated 14th September 2006 and amendments there at issued by the Ministry of Environment and Forests (MoEF) project comes under **Category A**, listed at item 5(j), 5(g) and 1(d).

The management of 'SSL' has decided to go for expansion of existing sugar factory from 800 to 10000 TCD (increased by 9200 TCD), establishment of co-gen plant of 60 MW (50 MW electricity generations from Co-gen & 10 MW from Distillery) distillery of 200 KLPD. The project would be formulated in such a fashion and manner so that the utmost care of Safety Norms and Environment Protection shall be taken. The total capital investment details are given in following table -

Table 1 - Project Investment Details

Sr. No.	Industrial unit	Capital Investment (Rs. Cr.)		
		Existing	Proposed	Total
1.	Sugar Factory, Co-gen Plant & Distillery	Rs. 10 Cr.	Rs. 610 Cr.	Rs. 620 Cr.

2) THE PLACE

The proposed expansion of sugar factory, establishment of co-gen plant & distillery by SSL should be set up at Survey. No. 164,166,173,174,175,176,177,178,180,181, Nhavi (Bk.), taluka Koregaon, district Satara, Maharashtra.

Total land acquired by the industry for an integrated project complex of sugar factory, co-generation plant and distillery is about **20.64 Ha**. No objection certificate for the proposed expansion project activities has been obtained from the Grampanchayat Nhavi (Bk.)

Following aspects have been taken into consideration while planning expansion project activities in the SSL complex -

1. Availability of excess cane for crushing in sugar factory from the operational area.
2. Availability of adequate equipments and allied infrastructure in sugar factory, co-gen and distillery unit.
3. Availability of adequate quantity of water and electricity for the proposed project.
4. Rahimatpur city is located at about 6 Km from the project site which is very well connected with other parts of the country by roads, rail.
5. No rehabilitation and resettlement are required to be done.

The area requirement for various amenities and buildings under existing as well as proposed expansion of sugar factory, co-gen plant and distillery is as follows -

Table 2 - Total Area Break up

A	Sugar Factory & Co-gen	Area (Sq.M.)
1	Sugar Plant	5184.00
2	Clarification House	1008.00
3	Gunny Bags	123.25
4	Sugar House	346.00
5	Limes Slaker	288.00
6	Injection Pump House	288.00
7	Sugar Cooling Tower	800.00
8	Sugar Boiler & Fan House	3900.00
9	Sugar Boiler Power House	1200.00
10	Work Shop	180.00
11	Store	315.00
12	Sugar Godown	1800.00
13	Molasses Tanks (3 No.s)	207.34
14	ETP	1200.00
15	Raw Water Tank	1250.00
16	CPU	1500.00
17	WTP	450.00
18	Store Yard	1100.00
19	Bagasse Yard	5250.00
20	Cane Yard	8820.00
21	Co-gen Boiler	2800.00
22	Co-gen Power House	2400.00
23	Co-gen Cooling Tower	800.00
Total		41209.59
B	Distillery	
1	Ware House	2800.00
2	Distillation	1875.00
3	Fermentation	1875.00
4	Incineration Boiler & Power House	3300.00
5	Coal Yard	3525.00
Total		13375.00
C	Colony	
1	Guest House	360.00
2	C Type Colony (2 No.s)	600.00
3	D Type Colony (4 No.s)	400.00
4	B Type Colony (2 No.s)	450.00
5	Admin Buildings	1000.00
6	Road	10590.9
Total		13400.9
D	Total Built-up Area (A+B+C)	67985.00
E	Green Belt	68796.6
F	Open Space	69682.00
Total Area		206464.00

From the above table, it could be seen that the land available is much more than actual requirement. In an area other than the project space requirement, infrastructure for green belt development and roads would be provided. Here a good network of internal as well as main approach roads would be prepared. Refer **Appendix - A** for plot layout plan of proposed project.

3) THE PROMOTERS

The proposed sugar factory expansion by 9200 TCD, establishment of distillery plant of 200 KLPD & Co-gen of 60 MW (50 MW electricity generations from Co-gen & 10 MW from Distillery) should be implemented by the management of SSL in the existing sugar factory premises. The SSL promoters are well experienced in the field of sugar, co-gen and distillery & have made a thorough study of entire project planning as well as implementation schedule.

The names and designations of the promoters are as under-

Table 3 - Promoters of SSL

Sr. No.	Name	Designation
1.	Mr. Shrimant B Patil	Chairman & Managing Director
2.	Mr. Shrinivas Patil	Director
3.	Mr. Yogesh Patil	Director
4.	Mr. Sushant Patil	Director

4) THE PRODUCTS

The details products and by- product manufactured / to be manufactured under existing and expansion projects activities have been presented in following table.

Table 4 - Products of the Sugar Factory, Co- Gen Plant & Distillery

a. Sugar Factory

Industrial unit	Product & By-product	Quantity		
		Existing (800 TCD)	Expansion (9200 TCD)	Total (10000 TCD)
Sugar Factory	Sugar	3120 (MT/ M)	35880 (MT/ M)	39000 (MT/ M)
	By-product			
	Molasses	960 (MT/ M)	11040 (MT/ M)	12000 (MT/ M)
	Bagasse	7200 (MT/ M)	82800 (MT/ M)	90000 (MT/ M)
	Press Mud	960 (MT/ M)	11040 (MT/ M)	12000 (MT/ M)

b. Co-gen Plant & Distillery

Industrial unit	Product & By-product	Proposed Quantities
Co-Gen	Electricity	50 (MW)
Distillery	Rectified Spirit (RS)	200 (KLPD)
	Extra Neural Alcohol (ENA)	200 (KLPD)
	Ethanol	200 (KLPD)
	Electricity (MW)	10 (MW)

Details of the manufacturing process and flow chart for sugar factory, co-gen plant & distillery are given in Chapter 2 of the EIA Report.

Table 5 - List of Raw Materials

a. Sugar Factory

Industrial Unit	Name of Raw Material	Quantity (MT/M)			Source
		Existing (800 TCD)	Expansion (9200 TCD)	Total (10000TCD)	
Sugar Factory	Sugarcane	2400	276000	300000	Near By Farms
	Lime	45	496	540	Local Vendor
	Sulphur	15	166	180	

b. Distillery & Co-gen

Distillery	Raw Materials	Total (200 KLPD)	Source
	Molasses	22230 MT/M	Own & Nearby Sugar Factories Local Vendors
	Oil & Grease	42 MT/M	
	DAP	8 MT/M	
	Urea	8 MT/M	
Co-gen	Raw Materials	Total (60 MW)	Source
	Bagasse	90000 MT/M	Own Sugar Factory

5) THE PURPOSE

- Sugar Industry is the second largest agro industry in the country.
- Maximum utilization of sugarcane in command area through sugar factory expansion.
- Bagasse based co-gen plant fulfills 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.
- Alcohol industry is the second largest source of revenue of the state.
- Distillery business is gaining more importance with regards to production, usage, easy availability of raw material.
- Cogeneration for the sugar industry has been a very attractive option in view of the potential for increasing the financial health of the sugar mill on one hand and reducing the ecological damage by promoting the use of renewable fuels like bagasse for power generation, on the other hand.

Considering the above facts as well as cane availability, management of SSL has decided to go for expansion of sugar factory, establishment of Co-gen & distillery.

6) ENVIRONMENTAL ASPECTS

Environmental degradation is the greatest concern world over and as a citizen of India, it is the responsibility of one and all to strive and bring about a balance between Environment, Industrial Growth and Development of Economy thereby.

Keeping in view the above fact, SSL has proposed to implement an effective 'Environmental Management Plan' & various aspects of the same are as follows,

A. Water Use, Effluent Generation and its Treatment

The details of water usage and effluent generation per day would be as follows

a. Water Use

Details of water usage for the distillery operations are as follows-

Table 6- Details of Water Consumption in Sugar & co-gen of SSL

Sr. No.	Description	Existing Water Requirement (m ³ /day)	Expansion Water Requirement (m ³ /day)	Total Water Requirement (m ³ /day)
1.	Domestic	4 (# 0.8+ \$ 3.2)	46 (#9.2 + \$36.8)	50 (#10 + \$40)
2.	Industrial			
	a. Process	*260	*2813	*3073
	b. Cooling Makeup	*104	*1196	*1300
	c. Boiler Makeup	40 (#18+*22)	440 (#210+*230)	480 (#228+*252)
	d. Lab& Wash	*4	*61	*65
	e. DM Backwash	*14	*186	*200
	f. Ash Quenching	*1	*9	*10
	Industrial Use (a+b+c+d+e+f)	423 (#18 +*405)	4705 (#210+*4495)	5128 (#228+*4900)
3.	Grand Total (1+2)	427 (#18.8+*405+ \$3.2)	4751(#219.2+*4495+\$33.6)	5178 (#238+*4900+\$40)

Note: # - Water taken from River, * - Cane Condensate water, \$ - Treated water in Proposed STP

Table 7 - Details of Water Consumption in Distillery of SSL

Sr. No.	Description	Total Water Requirement (M ³ /day)
1.	Domestic	27 (#7 + \$20)
2.	Industrial	
	a. Fermentation dilution	1587 (#1032 + *555)
	b. Cooling tower replenishment	*554
	c. Boiler Blow down	#180
	d. Lab & Wash	#5
	e. Scrubber	--
	Industrial Use (a+b+c+d+e)	2326 (#1217 + *1109)
3.	Grand Total	2353 (#1224 +*1109+\$20)

Note: # - Water taken from River, * - Condensate water from MEE, \$ - Treated water in Proposed STP

b. Effluent Treatment

i) Domestic Effluent-

Total domestic effluent generated from SSL project complex will be 67 M³/D (Domestic effluent from Sugar factory and Co-gen plant - 45 M³/D and from Distillery - of 27 M³/D) same shall be treated in proposed Sewage Treatment Plant (STP).

ii) Industrial Effluent-

Total industrial effluent generated from expansion of sugar factory & proposed co-gen plant shall be 997 M³/D. same shall be treated in proposed Effluent Treatment Plant (ETP). Treated water from ETP shall be used for gardening on own land as well as for irrigation in nearby farmlands. Details of wastewater generation under existing and proposed operations are as follows-

Table 8 - Effluent Generation in Sugar & Co-gen of SSL Complex

Description	Existing (M ³ /day) (800 TCD)	Expansion (M ³ /day) (9200 TCD & 50 MW)	Total (M ³ /day) (10000 TCD & 50MW)	Disposal
Domestic	3	42	45	Treated in proposed STP
Industrial				
a. Process	50	547	597	Treated in full fledged ETP
b. Cooling Blow down	6	69	75	

c. Boiler Blow down	4	56	60	
d. Lab& Wash	4	61	65	
e. DM Backwash	14	186	200	
f. Ash Quenching	--	---	--	
Industrial Use (a+b+c+d+e+f)	78	919	997	
Grand Total	81	961	1042	

Table 9 - Details of Effluent Generation in Distillery of SSL

Purpose	Quantity (CMD)	Disposal Method
Domestic	22	Treated in proposed Sewage Treatment Plant (STP)
Industrial		
Process Fermentation dilution	Raw Spent wash -1600 Conc. Spent wash - 640 (3.2 KL/KL) MEE Condensate-960	Raw spent wash shall be concentrated in Multi Effect Evaporator (MEE). Conc. Spent wash shall be incinerated in incineration boiler.
	Spent lees - 400	Other Effluents viz. spent lees, cooling blow down, boiler blow down, lab & washing, MEE condensate shall be forwarded to Distillery CPU.
Cooling Blow Down	110	
Boiler Blow Down	18	
Lab and Washing	34	
Total	Conc. Sp. wash - 1640 Other effluent - 562	

Figure 1 - Flow Chart of Sugar ETP

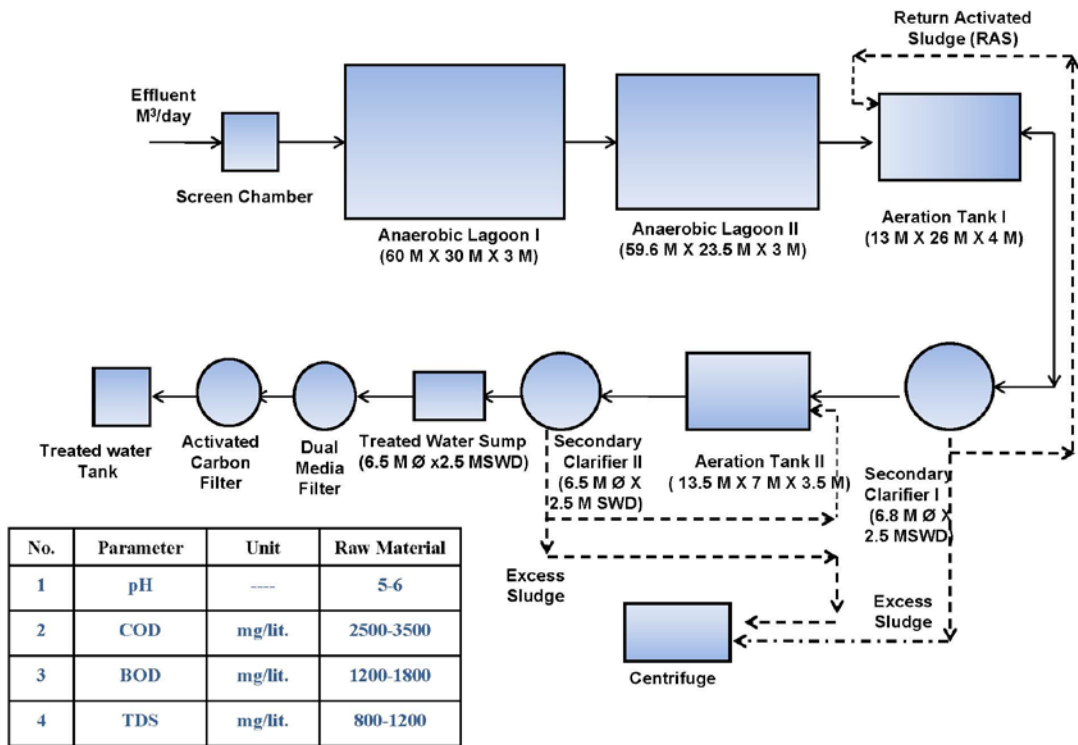
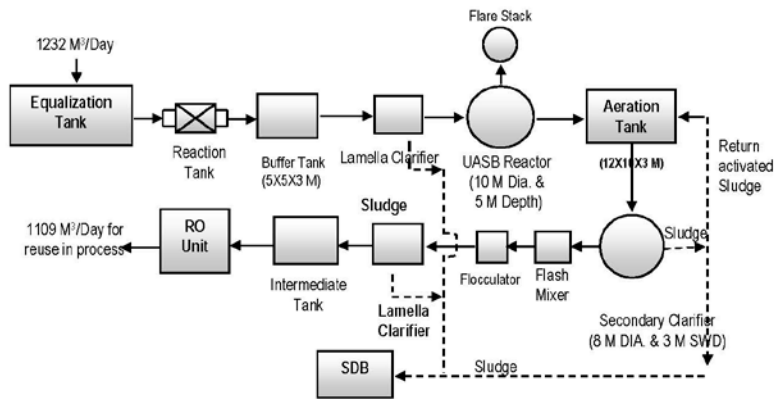


Figure 2 - Flow Chart of CPU in Distillery



Note:-
 UASB – Up flow anaerobic sludge blanket
 RO – Reverse Osmosis
 SDB – Sludge Drying Bed

No	Parameters	Unit	Raw Effluent	Treated Effluent
1.	pH	---	5-6	7-9
2.	COD	mg/lit	2,800-3,000	100-150
3.	BOD	mg/lit	1,500-1,800	30-70
4.	TDS	mg/lit	1,500-1,800	50-100

Table 10 - Spentwash Generation from Distillery

No.	Description	Quantity
1.	Quantity of raw spentwash generated from 200 KLPD molasses distillery	1600 m ³ /day
2.	Total quantity of spentwash generated after Conc. in MEE	640 m ³ /day
3.	Working days	330 Nos.
4.	Total quantity of Conc. spentwash generated	2, 1,200 m ³ /Season.

The treated effluent should be used for green belt to be developed in own premises as well as nearby farmers.

B. Air Emissions

Emissions will be generated from 200 TPH bagasse fired boiler as well as 75 TPH incineration boiler (fuel-coal + conc. spent wash). ESP will be installed for same as APC equipment. Details of air pollution aspect and the control measures are given in following Table.

Table 11 - Details of Boiler and Stack in SSL

Sr. No.	Description	Proposed	
1	Capacity	200 TPH	75 TPH
2	Fuel type	Bagasse	Spent Wash blended with coal
3	Fuel Quantity	2400 MT/D	Sp. wash- 906 MT/D
			Coal – 36 MT/D
4	Height of Stack, M (above ground level)	94 M	91 M
5	Material of construction	RCC	RCC
6	Shape (round/rectangular)	Round	Round

Sr. No.	Description	Proposed	
7	Diameter/ size, in meters	6 M	3.2 M
8	Flue Gas Temp	160 ⁰ C	160 ⁰ C
9	Gas flow rate in Nm ³ /Hr	3,56,460 NM ³ /Hr	2,22,222 NM ³ /Hr
10	Height of sampling Port	20 M	20 M
12	Control Equipment preceding the stack	ESP	ESP
13	Online monitoring system	To be Installed (Parameters – SPM)	To be Installed (Parameters – SPM)

C. Noise Pollution Aspect

1. Sources of Noise

- i. In proposed unit, very high noise generating sources would not exist. D.G. Set should be one of the sources of noise pollution. But the operation of D.G. Set would be only in the case of power failure. Expected noise levels in the section would be about 72 dB (A). Adequate noise abatement measures like silencer should be implemented in this section. Moreover, enclosures to the machinery should be provided wherever possible.
- ii. Fermentation section & distillation section should be the other minor noise generating sources. The expected noise levels in these sections should be in the range of 70 to 80 dB (A).
- iii. Pumps, compressors, boiler house, turbine, movement of trucks for material transportation etc.

2. Control Measures

Isolation, separation and insulation techniques to be followed, PPE in the form of earmuffs, earplugs etc. should be provided to workers. The D.G. Set shall be enclosed in a separate canopy to reduce the noise levels.

D. Hazardous Wastes

The different types of hazardous wastes being generated from existing operations as well as those to be generated from proposed activities and their disposal methods are presented in following table.

Table 12 - Hazardous Waste Details

Sr. No.	Description	Quantity	Mode of Disposal
1	Cat. No. 5.1 Spent Oil	0.5 MT/M	Burnt with bagasse in Co-gen boiler

No any hazardous waste shall be generated from the proposed 60 KLPD Distillery plant.

E. Solid Wastes

Solid wastes from the industries are categorized as hazardous and non-hazardous. Wastes that pose substantial dangers immediately or over a period of time to human, plant, or animal life are classified as hazardous wastes. Non- hazardous waste is defined as the waste that contributes no damage to human or animal life. However, it only adds to the quantity of waste.

Following table gives details of solid waste generated in the existing, proposed modernization cum expansion Sugar factory & establishment of Distillery unit as well as Co-gen plant.

Table 13 Solid Waste Generation, Storage and Disposal Details

Sr. No.	Type of Waste	Quantity	Disposal
1	Yeast Sludge	349.5 MT/M	Used as manure
2	CPU Sludge	0.5 MT/M	
3	ETP sludge	11 MT/M	
4	Boiler Ash- bagasse	720 MT/M	Sold to brick manufacturer
5	Boiler Ash- Coal	138 MT/M	
6	Boiler Ash- Spent wash	4892 MT/M	

F. Odour Pollution

Odour sources of proposed project are molasses handling and storage, bacterial growth in interconnecting pipes & unattended drains. Under proposed project, spentwash shall be carried through closed pipeline for incineration and concentration in MEE. Hence, odour nuisance due to spentwash storage and incineration activity shall be entirely eliminated.

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 Maharashtra Pollution Control Board (MPCB) or any other concerned authority are strictly followed in the existing set up. Same practice shall be continued after implementation of proposed expansion.

H. Environmental Management Cell

The SSL have planned an Environmental Management Cell (EMC) functioning under its proposed activity. Members of the EMC are well qualified and experienced in their concerned fields. This cell shall be further augmented suitably under expansion. The proposed EMC members are as under-

Table 14 - Environmental Management Cell

Sr. No.	Name of Member	Designation	Number of Working Person(s)
1.	Mr. Shrimant Patil	Chairman & Managing Director	1
2.	Dr. Sangram Ghugare	Env. Consultant Equinox Environments (I) Pvt. Ltd.	1
3.	Mr. Padamraj C. Pai	Environmental Officer (Unit 1)	1
4.	Mr. Tushar Karkare	Environmental Officer (Unit 2)	1
5.	Mr. Chandrashekhar D. Lihare	ETP Incharge (Unit 1)	1
6.	Mr. Sujitkumar Chougule	Safety Officer (Unit 1)	1
		Total	06

Members of the environmental cell should be well qualified and experienced in the concerned fields.

The capital as well as O & M cost towards environmental aspects under the proposed activities would be as follows –

Table 15 - Capital as well as O & M Costs

Sr. No.	Description	Cost Component (In Crores)	
		Capital	Annual O & M
1	Air Pollution Control (APC) equipment – ESP for	Rs. 20.00	Rs.4.00

Sr.	Description	Cost Component (In Crores)	
	Boiler – 1 Nos. in Co-gen (Stack height 94 M) & 1 Nos. In distillery (Stack height 91 M).		
2	Spentwash Treatment Facility – Spentwash Storage tanks, Bio-methanation Plant, MEE, CPUs, Proposed ETP	Rs. 25.00	Rs.8.50
3	Noise Pollution Control	Rs. 2.00	Rs. 0.25
4	Environmental Monitoring & management	Rs. 1.50	Rs. 0.35
5	Occupational Health & Safety	Rs. 0.35	Rs. 0.10
6	Green Belt Development & Rain Water Harvesting	Rs. 1.50	Rs. 0.25
7	Provision towards CER in Five Years after grant of EC	Rs. 11.00	Rs. 0.20
	Total	Rs. 61.35 Cr.	Rs. 23.55 Cr.

I. Rainwater Harvesting Aspect

- Total area of Plot - **206464 M²**
- Total Open space – **69682 M²**
- Average annual rainfall in the area = 783 mm.

➤ Rooftop Harvesting

- Roof Top harvesting area of 4,610M²
- Roof Top harvesting yield is – **3,088.7 M³**

➤ Surface Harvesting

- Surface Harvesting area of 69,682 M²
- Surface harvesting yield is – **21,824.40 M³**

Hence, the total water becoming available after rooftop and land harvesting would be-
3,088.7+ 21,824.40= 24,913.1M³ i.e. **24.19ML**

J. The Green Belt

Table 16 - Area Details

No.	Description	Area (Sq. M)
1.	Total Plot Area	206464.00
2.	Built up Area	67985.00
3.	Green Belt (Proposed – 33.3% of Total Plot Area)	68796.60
4.	Open Space	69682.00

The Criteria for Green Belt Development Plan

Emission of SPM, SO₂ is the main criteria for consideration of green belt development. The green belt development is provided to abate effects of the emissions of SPM & SO₂. 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 in proposed green belt.

K. Socio-Economic Development

The socio economic study was carried out in 36 villages out of the total 19 villages within 10 Km radius of the study area. The methodology adopted involved a structured close ended interview schedule (33 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 observations and conclusions after the socio-economic study are as follows-

- i. Most respondents from all villages are dependent on agriculture and allied activities for their livelihood.
- ii. Major crops grown in the area included sugarcane, ginger, turmeric and wheat.
- iii. Water conservation activities like “Pani Foundation” are implemented on mountain region areas like Borgaon, Ambheri, Velu & Nhavi Bk.

7) ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

A. Impact on Topography

There would be no change in topography, land use or change in water body due to manufacturing activities in sugar factory, distillery and co-gen plant unit.

B. Impact on Climate

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

C. Impact on Air Quality

A study area of 10 km radius is considered for determination of impacts.

i. Baseline Ambient Air Concentrations

The 24 hourly 98th percentile concentrations and averages of PM₁₀, PM_{2.5}, SO₂ and NO_x in Ambient Air, recorded during the field study conducted for the season October – November – December 2018 are considered as baseline values.

The existing baseline concentrations are summarized in following table

Table 17 - Baseline Concentrations

Parameter	Concentration (µg/m³)
PM ₁₀	62.02
PM _{2.5}	27.31
SO ₂	26.97
NO _x	31.47
CO	0.14

ii. Air Polluting Sources

Steam required for proposed activities of sugar factory and co-gen plant will be taken from proposed 200 TPH co-gen boiler. Bagasse will be used as fuel for the same. ESP will be installed as APC along with stack of 94 M height. Steam required for distillery operations will be taken from 75 TPH incineration boiler. Coal and conc. spent wash will be used as fuel for the incineration boiler. ESP will be used as APC along with a stack of 91 M will be provided to the same. 2 DG Sets of capacity 1 MW will be installed on site. HSD will be used as fuel for the same.

D. IMPACT ON WATER RESOURCES

i. Impact on Surface Water Resources

Fresh water requirement for the various units in SSL campus for expansion as well as establishment shall be met from the Krishna River. The Industry has been applied granted permission for lifting

1500 M³ water annually from the Irrigation Dept; Govt. of Maharashtra. For details w.r.t water consumption refer above Table 5 and 6. Further, copy of water lifting permission application is enclosed **Appendix – D**.

Raw spent wash (1600 M³/day) shall be concentrated in Multi Effect Evaporator (MEE).
Conc. Spent wash (640) shall be incinerated in incineration boiler.

ii. Impact on Ground Water Resources

Water required for the industry would be obtained from irrigation scheme on Krishna River. Further, copy of water lifting permission application is enclosed **Appendix – D**. As ground water shall not be a source of raw water for the proposed project, there shall not be any impact on ground water level.

E. IMPACT ON SOIL

Impact on the soil characteristics is usually attributed to air emissions, wastewater discharges and solid waste disposal. Deposition of particulate matter in ambient air without APC equipment can result in to alteration of properties of soil and its composition. Accidental discharge of spent wash, effluent or solid waste on land may change soil characteristics and soil fertility slowly; making it saline and non-suitable for agricultural or and any other vegetation to survive.

Solid waste generated from distillery and co-gen plant is yeast sludge and Boiler Ash respectively. Yeast sludge would be used as manure and Boiler Ash would be sold to brick manufacturer. The domestic effluent would be treated in sewage plant to be provided on site. Here, no impact is envisaged, as the quality of the effluent would be as per the norms stated by MPCB.

F. IMPACT ON NOISE LEVELS

The workers could get annoyance and can lose concentration during operation. It can cause disturbance during working. People working near the source need risk criteria for hearing damage while the people who stay near the industry need annoyance and psychological damage as the criteria for noise level impact analysis. The major noise emanating sources in SSL complex shall be plant & machinery in sugar factory like mill, compressors etc., boiler, turbine and DG set. SSL is not a major noise producing industry.

G. IMPACT ON LAND USE

The proposed expansion activity should be implemented in existing sugar factory, Co-gen plant & distillery premises on the same acquired land & hence no any change in the land use pattern is expected. Therefore the impact on land use is non-significant.

H. IMPACT ON FLORA AND FAUNA

The expansion of existing sugar, co-gen plant and distillery factory is carried out in the existing premises of SSL. Hence, there is no any terrestrial habitats loss. In study area of 10 Km radius of project site, there is no presence of any Ecological Sensitive Zones, Reserved /Protected Forest / National Parks/ Wildlife Sanctuary. The study area represents a semi-arid ecosystem with habitat types of agriculture, scrubs, and scattered trees, and human habitations.

Effect on Vegetation: In the case of proposed project, particulate emissions from boiler without APC / less efficient APC should be of concern. SPM forms coating on surface of leaves and retard photosynthetic activity of plants.

Habitat Loss/ Removal: In study area of 10 Km radius of Project Site there is no presence of any Ecological Sensitive Zones, Protected Forest / National Parks/ Wildlife Sanctuary.

I. IMPACT ON HISTORICAL PLACES

No any historical place is within the study area of 10 Km radius. There would be no any significant impact on historical place by the proposed modernization and expansion project.

8) ENVIRONMENTAL MONITORING PROGRAMME

Reconnaissance of the study area was undertaken in the month of October 2018. Field monitoring for measuring meteorological conditions, ambient air quality, water quality, soil quality and noise levels was initiated in December 2018. The report incorporates the data monitored during the period from October – November - December 2018 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 18 - Land Use/ Land Cover

Sr. No.	Classes	Area in Ha.	Percentage
1	Built Up Area	970	3.09
2	Crop Land	12380	39.41
3	Fallow Land	4150	13.21
4	Water Bodies	150	0.48
5	River	35	0.11
6	Forest Area	2070	6.59
7	Barren Land	1850	5.89
8	Open Scurb Land	9810	31.23
	Total	31415	100

C. Meteorology

The 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.

The meteorological parameters were monitored during the period October - November –December 2018. The details of parameters monitored, equipments used and the frequency of monitoring have been given in Chapter 3 of the EIA report.

D. Air Quality

This section describes the selection of sampling locations, includes the methodology of sampling and analytical techniques with frequency of sampling. Presentation of results for October 2018 – November – December 2018 survey is followed by observations. All the requisite monitoring

assignments, sampling and analysis was conducted through the laboratory of M/s. Green Envirosafe Engineers & Consultant Private Limited, Pune. Lab has received NABL accreditation and has been approved by MoEF; 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 19 - Ambient Air Quality Monitoring (AAQM) Locations

AAQM Station Code	Name of the Station	Station Location	Distance from the Site (Km)	Direction w.r.t. the Site
A1	Industrial Site	-	--	--
A2	Nhavi	Nearest Habitation	1.82	SSE
A3	Pimpri	Downwind	2.30	W
A4	Arvi	Downwind	5.78	S
A5	Velu	Up- Wind	2.21	NE
A6	Landewadi	Crosswind	5.22	SSE
A7	Sap	Crosswind	2.93	NW
A8	Pawarwadi	Crosswind	3.68	SE

Table 20 - Summary of the AAQ Monitoring Results for Season [October – November – December 2018]

		Location							
		Industrial Site	Nhavi	Pimpri	Arvi	Velu	Landewadi	Sap	Pawarwadi
PM ₁₀ µg/M ³	Max.	64.95	61.35	62.79	62.83	63.58	63.57	64.59	63.28
	Min.	53.76	51.81	53.34	51.06	53.62	51.93	51.91	51.72
	Avg.	58.84	56.04	57.32	56.00	57.81	57.20	58.18	57.29
	98%	62.02	60.22	61.49	60.17	61.98	60.81	61.45	60.70
PM _{2.5} µg/M ³	Max.	30.54	27.96	27.61	27.28	26.10	28.78	27.32	26.44
	Min.	20.04	18.39	20.05	20.10	20.61	21.28	20.52	21.11
	Avg.	21.84	23.82	23.50	23.00	23.91	24.49	24.08	23.75
	98%	27.31	26.80	26.31	26.11	25.81	27.31	26.54	26.18
SO ₂ µg/M ³	Max.	30.54	24.14	25.21	26.65	27.65	24.98	29.58	27.89
	Min.	20.34	18.39	19.83	18.68	18.56	18.71	18.57	20.53
	Avg.	25.64	21.38	22.19	22.19	22.63	21.35	23.14	23.80
	98%	26.97	23.02	23.60	24.61	25.46	23.29	25.54	25.45
NO _x µg/M ³	Max.	32.63	31.91	31.88	33.01	30.55	32.71	34.28	34.33
	Min.	29.30	28.06	29.01	27.59	25.57	27.96	29.15	27.79
	Avg.	30.69	29.97	30.41	29.84	28.05	30.19	31.42	30.58
	98%	31.47	30.72	31.20	30.66	29.20	31.21	32.85	32.22
CO mg/M ³	Max.	0.15	0.14	0.16	0.16	0.15	0.15	0.15	0.15
	Min.	0.07	0.06	0.07	0.05	0.06	0.09	0.08	0.08
	Avg.	0.11	0.10	0.12	0.11	0.11	0.12	0.11	0.11
	98%	0.14	0.13	0.15	0.13	0.13	0.14	0.13	0.13

Notes: PM₁₀, PM_{2.5}, SO₂ and NO_x are computed based on 24 hourly values, CO concentrations were observed to be well below detectable limits and hence the same are not mentioned in the above table.

Table 21 - National Ambient Air Quality Standards (NAAQS) Specified by CPCB Notification
(New Delhi, the 18th November, 2009)

		Zone Station	
		Industrial, Residential and Rural Area	Ecosensitive Area Notified by Govt.
PM ₁₀ µg/M ³	24 Hr	100	100
	A.A.	60	60
PM _{2.5} µg/M ³	24 Hr	60	60
	A.A.	40	40
SO ₂ µg/M ³	24 Hr	80	80
	A.A.	50	20
NO _x µg/M ³	24 Hr	80	80
	A.A.	40	30
CO mg/M ³	8 Hr	4	4
	1 Hr	2	2

Water Quality

Sampling and analysis of water samples for physical, chemical and heavy metals were also 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 22 - Monitoring Locations for Surface Water

Station Code	Name of the Station	Distance from the Site (Km)	Direction w.r.t. the Site
SW1	Nhavi	1.29	SSE
SW2	Pimpri	1.67	SW
SW3	Project Site	0.93	SW
SW4	Takale	9.76	WWS
SW5	Nigadi Vandan	9.86	W
SW6	Belewadi	2.99	NE
SW7	Sap	4.44	NW
SW8	Apshinge	8	NW

Table 23 - Monitoring Locations for Ground Water

Station Code	Geographical Location	Distance from the Centre of Site (M)	Direction w.r.t. Site
GW1	17°33'22.78"N, 74°14'39.21"E		
GW2	17°33'31.41"N, 74°14'31.41"E		
GW3	17°33'27.72"N, 74°14'38.75"E		
GW4	17°33'50.17"N, 74°14'55.99"E		
GW5	17°33'42.70"N, 74°14'50.49"E		
GW6	17°33'26.59"N, 74°14'49.98"E		
GW7	17°33'17.11"N, 74°15'2.09"E		
GW8	17°33'23.53"N, 74°15'6.61"E		

The results observed after monitoring for above locations are well within the limits as per IS10500:2012. Refer Chapter 3, section 3.9.2 table 3.14 & table 3.15 for analysis results of surface water and ground water.

F. Noise Level Survey

The study area of 10 Km radius with reference to the proposed expansion 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 24 - Noise Sampling Locations & Ambient Noise Levels

Station Code	Name of the Sampling Point	Direction	Distance (Km)	Average Noise Level in dB(A)					
				L ₁₀	L ₅₀	L ₉₀	L _{eq(day)}	L _{eq(night)}	L _{dn}
N1	Industrial Site	--	--	58.69	61.70	70.24	69.7	60.4	70.0
N2	Ambheri	N	4.71	42.89	44.85	47.15	51.0	39.6	50.5
N3	Rahimatpur	NW	6.89	42.24	44.45	47.06	50.8	38.9	50.2
N4	Wathar	SW	6.85	42.29	44.40	48.00	50.2	40.2	50.2
N5	Arvi	SW	5.98	41.82	44.10	46.22	50.1	39.0	49.7
N6	Nagjari	S	7.61	43.21	44.15	47.16	52.1	39.0	51.2
N7	Nhavi	SE	1.93	43.15	44.55	47.61	52.9	39.1	51.8
N8	Nandoshi	SE	6.68	43.21	43.15	47.16	52.1	39.0	51.2

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

Field survey for ecology and biodiversity studies were carried out on 15.11.2018 to 18.11.2018 for proposed expansion of SSL. Before selecting field study sites, a preliminary survey of the study area was done with help of toposheet, landuse maps, census data, satellite imagery as well as literature review. Total 47 villages out of which 9 villages fall in 5 km radius and 38 villages fall between 5 to 10 km radius.

In field study random sampling and opportunistic method was used for study of flora and fauna. In addition, a questionnaire survey, comprising of 21 ecology-biodiversity related questions in Marathi was carried out. Chapter 3 may be referred for details of this aspect.

Table 25 Villages visited for EB field study and questionnaire survey

In radius 0 to 5 Km		In radius 5 to 10 Km	
Sr. No.	Names of Study villages	Sr. No.	Names of Study villages
1	Pimpri	10	Boriv
2	Sap	11	Takle
3	Velu	12	Borgaon
4	Ambhari	13	Kombadwadi
5	Belwade	14	Nagjhari
6	Surli	15	Nandoshi
7	Nhavi Bk	16	Aundh

8	Powarwadi	17	Ambheri
9	Khabalwadi		

Observations

1. The study area is a mosaic of manmade ecosystems i.e. agriculture, horticulture and natural terrestrial ecosystems such as woodland, grassland, fallow land, scrub and wetlands such as percolation tanks, streams and river.
2. Due to availability of water through lift irrigation from River Krishna in the West and some seasonal village tanks, major part of cultivated area is under sugarcane along with turmeric and ginger.
3. Aquatic habitats studied include 16 water tanks near villages namely Velu, Belwade, Pawarwadi, Nandoshi, Nagzari, Kombadwadi, Ambheri, Boriv and Borgaon and marshy areas, streams and stretches of Krishna River.
4. Near villages and settlements washing of clothes and vehicles, dumping of solid wastes, and discharge of untreated domestic sewage, non point run off of agro-chemicals from the adjoining predominant sugarcane cultivation in the Krishna catchments is polluting the streams, village tanks and the river causing cumulative adverse environmental impact on ecology and biodiversity of the area.

8) 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. The 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. The 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 1000 men during their working period.

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

9) SALIENT FEATURES OF EMP

1. Management during Construction Phase

During construction phase, following recommendations are suggested-

- Suitable measures should be taken to protect workers against dust arising from leveling, drilling, crushing, excavation and transportation. Extensive tree plantation programme would be carried out along the boundaries of the proposed plant and internal roads.
- The construction site should be provided with sufficient and suitable sanitation facilities for workers to maintain proper standards of hygiene.
- Noise prone activities would be restricted during night particularly between the period 22 hrs to 06 hrs in order to have minimum adverse impact.

2. Management during Post Construction Phase

Measures to be taken during the post construction phase especially w.r.t. monitoring are presented below-

Table 26 - Plan for Monitoring of Environmental Attributes within Industrial Premises

No.	Description	Location	Parameters	Frequency	Person Responsible	Conducted by
1	Ambient Air Quality	Upwind-1, Downwind-2 (Near Cane Yard, Near Bagasse yard, Near Colony)	PM _{2.5} , PM ₁₀ , SO ₂ , NO _x &CO	Monthly	EHS Officer	MoEFCC and NABL Approved External Laboratory
2	Work Zone Air Quality	4 Locations (Mill section, Fermentation section, Sugar bagging section, Distillation section)	PM ₁₀ , PM _{2.5} , SO ₂ , NO _x , CO	Monthly or CPCB / SPCB requirement		
3	Stack Emissions	Boiler – 2 Nos. 2 Nos.(Distillery and Co-gen boiler) D.G – 2 Nos.	SPM, SO ₂ , NO _x	Monthly		
4	Ambient Noise	5 Locations - (Near Main Gate, Near ETP, Near Sugar Godown, Near fermentation Area, Near Cane Yard)	Spot Noise Level recording; Leq(n), Leq (d), Leq (dn)	Monthly	EHS Officer	
	Work zone Noise	Premises –5 Nos. (Mill section, Distillation section, Boiler, DG set, Turbine section)	Spot Noise Level recording; 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	Admin Office, Boiling Section & ETP Office	Parameters as per drinking water Std IS:10500	Monthly		
7	Fugitive Emissions	Bagasse Yard	VOC	Monthly		
8	Waste Management	Implement waste management plan that Identifies and	Records of Solid Waste	Twice in a year	EHS Officer	

No.	Description	Location	Parameters	Frequency	Person Responsible	Conducted by
		characterizes every waste associated with proposed & expansion activities and which identifies the procedures for collection, handling & disposal of each waste arising.	Generation, Treatment and Disposal shall be maintained			By SSL
9	Emergency Preparedness as Fire Fighting	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	