P-26-VNSSK-SUGAR-32018

SUMMARY ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

(IN ENGLISH AND MARATHI)

FOR

EXPANSION OF 30 KLPD MOLASSES BASED DISTILLERY UPTO 60 KLPD

BY

VISHWASRAO NAIK S.S.K. LTD.

YASHWANTNAGAR, A/P CHIKHALI,
TAL.: SHIRALA, DIST.: SANGLI

PREPARED BY

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AN ISO 9001 : 2015 & QCI - NABET ACCREDITED ORGANIZATION

2019 - 2020

☎ शिराळा(०२३४५)२७२१३८,२३१००२/३
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जय सहकार

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ता. शिराळा, जि. सांगली
Vishwasrao Naik Saha. Sakhar Karkhana Ltd., Yashwantnagar
Tal.- Shirala, Dist.- Sangli

REF NO.: 22 **DATE: 14.01.2020**

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

Sub.: Application for reconducting **'Public Hearing'** for proposed expansion of **molasses based distillery** from **30 KLPD to 60 KLPD** (increased by 30 KLPD) by – **Shri Vishwasrao Naik Sahakari Sakhar Karkhana Ltd.,** located at Yashwantnagar, A/p: Chikhali, Tal.: Shirala, Dist.: Sangli.

Ref.: Public hearing conducted on 30.11.2018 w.r.t. proposed expansion of distillery from 30 KLPD to 60 KLPD by – **Shri Vishwasrao Naik Sahakari Sakhar Karkhana Ltd.**

Dear Sir,

We – **Shri Vishwasrao Naik Sahakari Sakhar Karkhana Ltd.,** have planned for expansion of molasses based distillery from 30 KLPD to 60 KLPD, located at Yashwantnagar, Tal.: Shirala, Dist.: Sangli, Maharashtra State.

Accordingly, an application of Form – 1 was submitted online on 01.08.2017 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. Therein, directions have been given to conduct Public Hearing w.r.t. our proposed distillery project. Subsequently, the Public hearing was conducted on 30.11.2018. During the day of Public Hearing due to unavoidable reason, Public Hearing was conducted by Sub Divisional Officer (SDO), Walwa. Now, as per EIA notification No. S.O. 1533 (E) dated 14.09.2006; *Appendix IV* [Procedure for Conduct of Public Hearing] under Para 4.0, it has been stated that – *The District Magistrate or his or her representative not below the rank of an Additional District Magistrate assisted by a representative of SPCB or UTPCC, shall supervise and preside over the entire public hearing process.*

In due course, the Convener (SRO; MPCB, Sangli) prepared MoM of the Public Hearing which were signed by himself and the SDO. Copy of the MoM is attached at **Appendix - I**. Sir, as the actual procedure of conducting Public Hearing at our

☎ शिराळा(०२३४५)२७२१३८,२३१००२/३
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जय सहकार

Industrial Site under Chairmanship of the SDO; Walwa is not "Valid as well as Legal" process in light of stipulations in the EIA Notification dt. 14.09.2006. We hereby request you to issue a fresh order towards re-conducting of Public Hearing at your earliest.

Now, in order to reconduct public Hearing, we are again submitting all the relevant documents and information to your office.

Alongwith 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 expansion 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. Also, a Demand Draft of Rs. 25,000/- (Rs. Twenty Five Thousand only) bearing No. drawn on dated towards the Public Hearing charges, as decided by the government, has been presented herewith.

Please do the needful and oblige.

Thanking you.

Yours faithfully

Shri Ramchandra Shivajirao Patil
(Managing Director)

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

NOT NEGOTIABLE A/C PAYEE ONLY

सांगली जिल्हा मध्यवर्ती सहकारी बँक लि., सांगली. अदाकर्ता शाखा: H.O.SANGLI
THE SANGLI DISTRICT CENTRAL CO-OP. BANK LTD., SANGLI. DRAWEE BRANCH:

Valid for three months from the date of instrument

दिनांक Date 24 DEC 2019
D D M M Y Y Y Y

Dnyaneshwar Security Printing Industries Satara. CTS/2010

मांगे जाने पर On Demand Pay The Sub-Regional Officer, Maharashtra Pollution Control Board, Sangli. को या उनके आदेश पर Or Order

रुपये Rupees Twenty five thousand Only. ——— अदा करें। ₹ 25000/-

दक TC	एक OC	दला TL	~~पला~~ OL	दह TT

Vishwasrao Naik Saha. Sakhar karkhana Ltd.

मुल्यप्राप्त हुआ / For Value Received
For THE SANGLI DISTRICT CENTRAL CO-OP. BANK LTD., SANGLI.
For The Sangli Dist. Cen. Co-op. Bank Ltd., Sangli
Branch Chikhali Code No. 91

9 8 7 6 5 4 3 ~~2~~ 1

जारी करने वाली शाखा ISSUING BRANCH BR. CHIKHALI
Code No. 91
☎ (02345) 231000

Authorised Signatory
Code No. U-1101
URANKAR B. M.

Authorised Signatory
Branch Manager

Please sign above this line

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Summary of Draft EIA Report
for
Expansion of Molasses Based Distillery from 30 KLPD to 60 KLPD in the Existing 4500 TCD Sugar Factory, 15 MW Cogeneration & 30 KLPD Molasses Distillery
By
Shri Vishwasrao Naik Sahakari Sakhar Karkhana Ltd.,(VNSSKL)

A/p: Yashwantnagar, Chikhali, Tal.: Shirala, Dist.: Sangli, Maharashtra State

1. THE PROJECT

The promoters of **Shri Vishwasrao Naik Sahakari Sakhar Karakhana Ltd., (VNSSKL)** have planned to go for expansion of molasses based Distillery unit from 30 KLPD to 60 KLPD (increase by 30 KLPD). The same shall be implemented in the existing 4500 TCD Sugar Factory, 15 MW Cogen Plant & 30 KLPD Molasses Distillery located at G. No. 162, 175,182, 183, 189, 223 and 224, A/p: Yashwantnagar, Chikhali, Tal: Shirala, Dist.: Sangli, Maharashtra.

This report is made in the overall context of Environmental Impact Assessment (EIA) Notification No. S. O. 1533 (E) dated 14.09.2006 and amendments thereto issued by the Ministry of Environment, Forest and Climate Change (MoEFCC); New Delhi Project type 5 (g). Accordingly, Form 1 application is submitted to MoEFCC; New Delhi and Standard ToRs granted on 16.10.2017. The amendment was done in EIA Notification of 2006 on 13.06.2019 [Notification No. S.O. 1960 (E)]. As per the amendment project comes under **Category B.**

Capital investment of existing distillery is Rs. 15.05 Cr. and that for proposed expansion will be Rs. 42.88 Cr.

2. THE PLACE

The expansion of distillery project would be implemented in the existing integrated sugar, co-gen and distillery premises of VNSSKL. Total land acquired by the industry is 5,25,280 Sq. M. (52.52 Ha.). Total built up area of sugar factory, co-gen & distillery project (after expansion) would be 64,383.15 Sq. M. No Objection Certificate for the proposed expansion project has been obtained from Grampanchayat Chikali. Refer table-1 for detailed area break up.

Table 1 - Area Statement of VNSSKL

No.	Description	Area (Sq. M.)
A	Built-up Area	
i	Sugar Factory & Co-gen– Existing	25,207.8
ii	Distillery Unit – Existing	37,294.11
iii	Distillery Unit – Expansion	1,881.24
	Total (i+ii+iii)	**64,383.15**
B	**Green Belt- Existing**	**2,24,000**
C	Open Area	**2,36,896.8**
	Total Plot (A+B+C)	**5,25,280**

Refer **Appendix - A** of Draft EIA report for plot layout plan of VNSSKL.

3. THE PROMOTERS

Promoters are well experienced in the field of distillery & have made thorough study of entire project planning as well as implementation schedule. The names and designations of the promoters are as under-

Table 2 - List of Promoters

No.	Name	Designation
1.	Shri Mansingrao Naik	Chairman
2.	Shri Babasaheb Patil	Vice Chairman
3.	Shri Mansingrao Patil	Director
4.	Shri Dinkarrao Patil	Director
5.	Shri Suresh Patil	Director
6.	Shri Babasaheb Pawar	Managing Director

4. THE PRODUCTS

Details of products as well as by-products in existing and expansion of molasses based distillery activities have been presented in table 3.

Table 3 - List of Products for Integrated complex

Industrial unit	Product & By-product	Quantity	
		Existing	Total- After Expansion
Distillery (60 KLPD)	Rectified Spirit /Extra Neutral Alcohol (KL/D)	30	60
	Pharmaceutical Grade Alcohol$ (KL/D)/	--	60$
	Ethanol $ (KL/D)	20	60$
	By-Product		
	Fusel Oil (KL/D)	0.05	0.1
	CO_2 (MT/D)	23	46
Sugar Factory (4500 TCD)	Sugar(12-13%)* (MT/M)	16,872	16,872
	Bagasse (30%)* (MT/M)	40,500	40,500
	Press Mud (4%)* (MT/M)	5400	5400
	Molasses (4%)*(MT/M)	5400	5400
Co-gen (15 MW)	Electricity (MW/Hr)	15	15

Note:$- Ethanol &Pharmaceutical Grade Alcoholwill be manufactured from RS produced from in-house distillery as well as RS bought from outside distilleries. Separate consents will be procured from MPCB for the same.

* - Percent of Cane Crushed.

Details of the manufacturing process and flow chart are given in Chapter 2 of EIA report.

5. THE PURPOSE

- Sugar factory is the 2nd largest agro-based industry in the Country.
- Maximum utilization of sugarcane in command area.
- 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.
- Alcohol has assumed very important place in the Country's economy. It is a vital raw material for a number of chemicals and also a renewable source of energy. It has been a source of a large amount of revenue by way of excise duty levied by the Govt. on alcoholic liquors. It has

a potential as fuel in the form of power alcohol for blending with petrol. Also, the fermentation alcohol has great demand in countries like Japan, U.S.A., Canada, Sri Lanka etc., as the synthetic alcohol produced by these countries, from naphtha of petroleum crude, is not useful for beverages.

6. ENVIRONMENTAL ASPECTS

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

A. Water Use, Effluent Generation and its Treatment

i. Water Use :

(a) Distillery: Existing & Expansion Unit:

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

Table 4 - Water Consumption for Existing & Expansion Distillery Unit

No.	Purpose	Quantity (M^3/D)		
		Existing	Total After Expansion	As per Consent for 30 KLPD Distillery
1	**Domestic**	3#	5 (3$+2#)	10#
2	**Industrial**			
	a. Process	237#	474♣	225#
	b. Boiler Make-up	--	52#(Incineration)	100#
	c. Cooling Make-up	75#	84#	
	d. Lab & Washing	6#	3#	
	e. DM Plant	--	10♣	
	f. Ash Quenching	1#	1#	
	Industrial Total (a+b+c+d+e+f)	**319#**	**624 (484♣+140#)**	**325#**
3	**Gardening**	--	6#	--
	Grand Total (1+2+3)	**322#**	**635 (484♣+148#+3$)**	**335#**
	Fresh Water Consumption (Norm : 10 KL/KL of Alcohol)	10.6	2.3	10.8

Note: # - Actual quantity of water taken from Mangale Savarde Bandhara of river Warana.
♣ -Treated water from Distillery after CPU, $ - Treated water from STP

(b) Existing Sugar (4500 TCD) & Co-generation Unit (15 MW):

Table 5 - Details of Water Consumption in Existing Sugar Factory & Co-gen Plant

No.	Purpose	Quantity (M^3/ Day)	As per Consent 4,500 TCD Sugar & 15 MW Cogen (M^3/D)
1	**Domestic**	25#	25#
2	**Industrial**		
	a. Process	1380*	500#
	b. Boiler	195#	720#
	c. Cooling Tower Make-up	855*	
	d. DM Plant	45#	
	e. Lab & Washing	9*	
	f. Ash Quenching	2*	
	Industrial Total (a+b+c+d+e+f)	**2486 (2246*+240#)** (90% Recycle)	**1220#**
3	**Gardening & Green Belt**	50*	--
	Grand Total (1+2+3)	**2561 (2296*+265#)**	**1245#**
	Fresh Water Consumption (100 Lit/MT of Cane Crushed)	**53.3**	**271**

Note: # - Actual quantity of fresh water taken from Mangale Savarde Bandhara of river Warana,
* - Cane Condensate from Sugar factory, $ - Treated water from STP

For more details about water budget refer Chapter 2 Section 2.7.1 of EIA report.

ii. Effluent Generation :

(a) Distillery: Existing & Expansion Unit:

Table 6 - Effluent Generation from Existing & Expansion Distillery Unit

Purpose	Effluent Generation (M^3/Day)			Disposal
	Existing	After Expansion	As per Consent for 30 KLPD Distillery	After Expansion
Domestic	2	4	8	To be treated in proposed STP – used for irrigation
Industrial				
Process			240	Sp. wash will be forwarded to re-boiler followed by concentration in MEE & then incinerated in incineration boiler
i. Raw Spentwash	240	480		
ii. Conc. Sp. wash	--	98		Other effluent will be treated in proposed distillery CPU. Treated effluent will be fully recycled in process to achieve ZLD.
iii. MEE Condensate	--	380		
iv. Spent lees	41	82		
Boiler Blow down	--	11		
Cooling Blow down	8	8		
Lab & Washing	3	3		
DM Plant	--	10		
Industrial Total	**Sp wash – 210 Other - 52**	**Sp wash - 98 Other - 494**	--	

Table 7 Effluent Generation from Existing Sugar & Co-generation Unit

No.	Purpose	Effluent Generation (M^3/ Day)
A	**Industrial**	
1	Process	180
2	Boiler Blowdown	35
3	Cooling Blowdown	55
4	DM Backwash	19
5	Lab & Washing Effluent	9
	Industrial Total (1+2+3+4+5)	**298**
B	Domestic	20
	Grand Total	**318**

i) Domestic Effluent

Domestic effluent from existing activities of sugar factory, co-gen plant and distillery is 22M^3/D, same is being treated separately in septic tanks followed by soak pits provided in a decentralized manner. After implementation of distillery unit, total domestic effluent from VNSSKL campus will be 24 M^3/D. Same will be treated in proposed Sewage Treatment Plant (STP) of capacity 40 M^3/ D and treated effluent will be reused for flushing and also used for gardening.

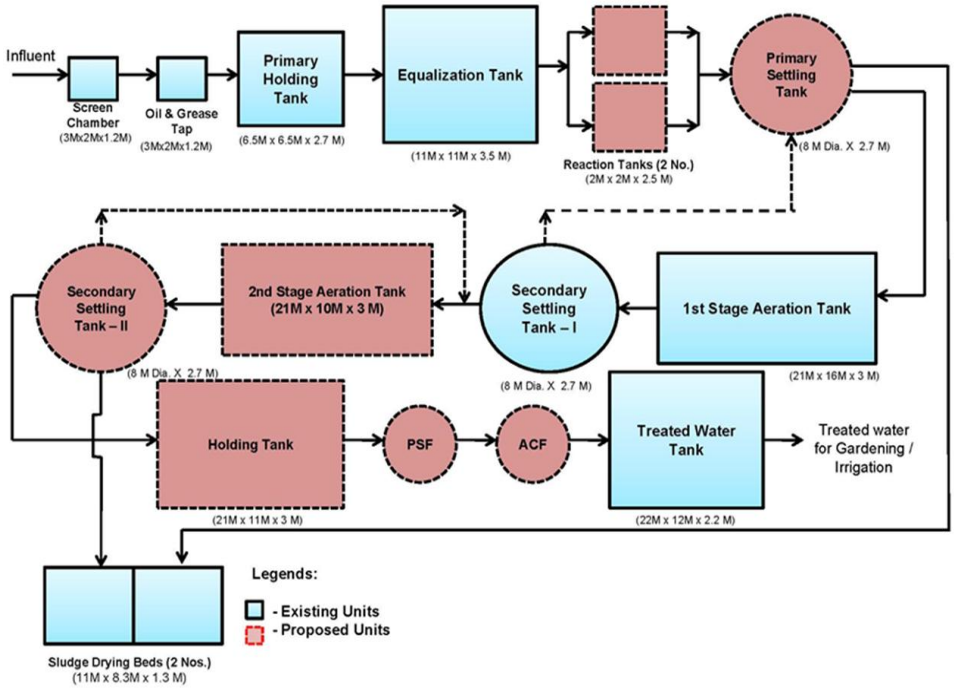
ii) Industrial Effluent

Total industrial effluent generated from existing sugar and co-generation unit is 298 M^3/D. Same is treated in a full-fledged Effluent Treatment Plant (ETP) provided in own factory premises comprising of primary, secondary & tertiary unit operations. Treated effluent is supplied for watering of plantation under the green belt in own factory premises as well as on 15 Acre land owned by factory for irrigation.

After expansion of distillery, raw spentwash about 480M^3/D will be generated & forwarded to re-boiler followed by concentration in Multi Effect Evaporator (Five Effect). Further, concentrated spentwash of 98 M^3/D will be incinerated in proposed 22 TPH incineration boiler.
Other effluents viz. Spent Lees 82 M^3/D, Condensate from MEE 380 M^3/D, cooling & boiler blow down 19 M^3/D, Lab & washing effluent 3M^3/D and DM plant backwash 10 M^3/D will be treated in proposed Condensate Polishing Unit (CPU) having 600 M^3/D capacity. Treated effluent will be fully reused for industrial operations, thereby achieving Zero Liquid Discharge (ZLD) for process effluent

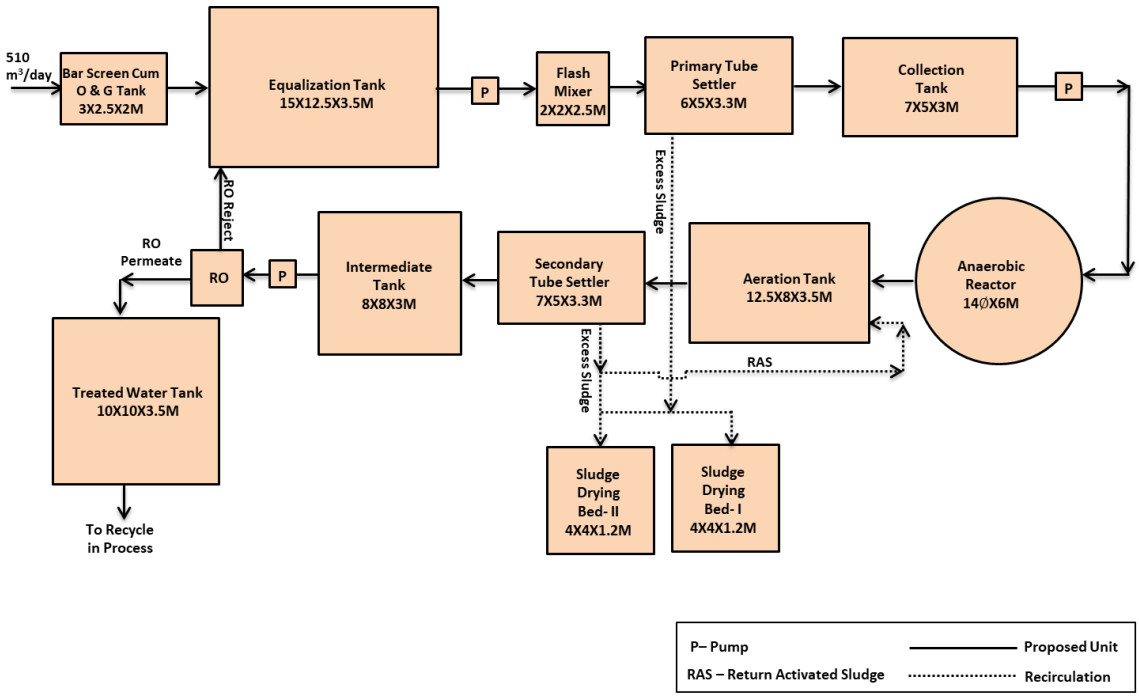
The flow chart of existing ETP is presented in Figure 1.0

Figure 1.0 Flow Chart of Sugar Factory ETP



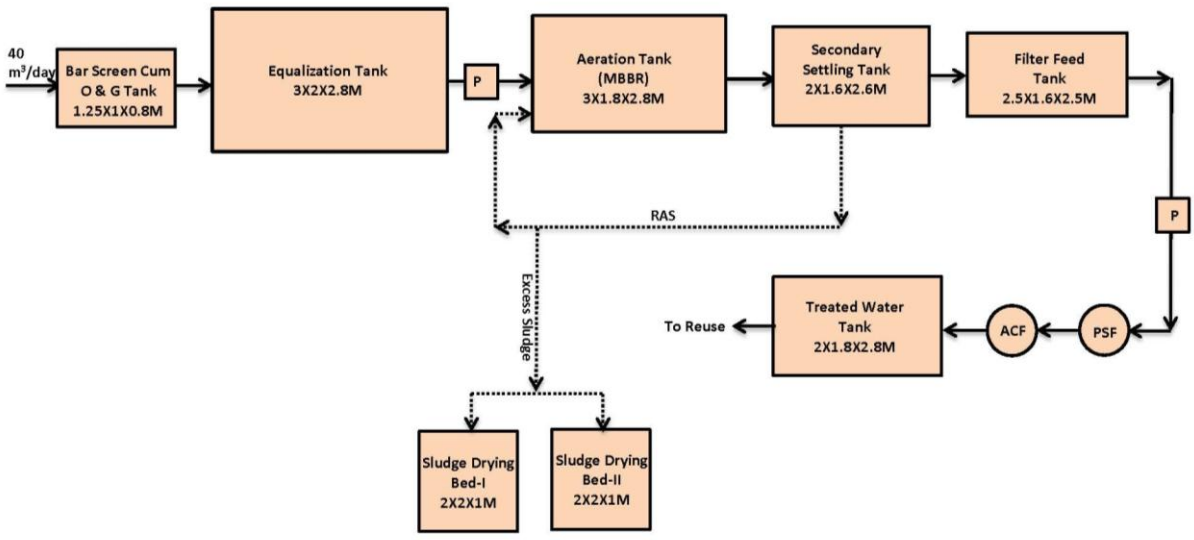
No.	Parameter	Unit	Raw Effluent	Treated Effluent	Limit
1	pH	---	4-6	7.2 - 8.2	7.5-8.5
2	COD	mg/lit	2500-3000	165 – 235	250
3	BOD	mg/lit	1250-1500	44 – 90	100
4	TDS	mg/lit	1600-2100	1000-1500	2100
5	SS	mg/lit	500-600	62 – 82	100

Figure 2.0 Flow Chart of Proposed Distillery CPU



No	Parameters	Unit	Inlet	Outlet
1.	pH	---	5 - 6	7 – 8
2.	COD	mg/lit	3500 - 4000	< 100
3.	BOD	mg/lit	1500 - 2000	< 50
4.	TDS	mg/lit	2000 - 2500	< 100
5.	SS	mg/lit	400 - 500	< 50

Figure 3.0 Process Flow Diagram of STP (Proposed)



No	Parameters	Unit	Inlet	Outlet
1.	pH	---	6.5 – 7.5	7.2 – 7.5
2.	COD	mg/lit	500 - 600	< 30
3.	BOD	mg/lit	250 - 300	< 10
4.	TSS	mg/lit	250 - 400	< 5
5.	O & G	mg/lit	25 - 50	< 10

iii. Air Emissions

Steam required for proposed distillery expansion activities would be taken from proposed incineration boiler of 22TPH and existing co-gen boiler of 80 TPH. For proposed boiler, Coal - 38MT/D along with concentrated Spent Wash – 132 MT/D and for existing boiler, Bagasse – 810 MT/D is used as fuel. Existing boiler is provided with stack of 76 M with ESP as APC. Proposed incineration boiler would be provided with stack of 60 M with ESP.

Details of air pollution aspect and the control measures are given in following Table.

Table 8 - Details of Existing & Proposed Boilers and Stacks

No.	Description	Existing		Under Expansion
		Sugar, Co-generation & Distillery Unit		Distillery Unit
1	Stack attached to	**Boiler 1**	**D.G. Set (2)**	**Boiler 2**
2	Capacity	80 TPH (Co-gen)	700 & 300KVA	22 TPH
3	Fuel type	Bagasse	Diesel	Coal & Spentwash Wash
4	Fuel quantity	810 MT/D	145 Lit/hr	38 MT/D & 132 MT/D
5	Material of construction	RCC	M.S.	RCC
6	Stack Height	76 M	2 M (ARL)	60 M
7	Diameter	1.8 M	--	1.2 M
8	APC Equipment	ESP	--	ESP

There will be process emissions in the form CO_2 from Fermenters in distillery unit. After expansion, CO_2 to the tune of 46 MT/D will be generated. Currently, from distillery activities 23MT/D CO_2 is generated & same is collected, purified, compressed and filled in cylinders & sold for production of beverages. Same practice shall be continued after distillery expansion.

iv. Noise Pollution Aspect

1. **Sources of Noise**

   i. Probable sources of noise are boiler, fermentation section, distillation assembly, D.G. Sets etc. D. G. Set would be operated only in the case of power failure. Expected noise levels in the section would 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. shall be provided to workers. D.G. Set is enclosed in a separate canopy to reduce the noise levels.

v. Solid Wastes

Table 9 - Solid Waste Generation & Disposal

No.	Unit	Type	Quantity (MT/M)		Disposal
			Existing	After Expansion	
1	Distillery	Yeast Sludge	150	300	Burnt in Incineration boiler
		Boiler Ash	--	870	Supplied to Brick / Cement Industry
		CPU Sludge	--	16	Burnt in Incineration boiler
2	Sugar Factory & Co-gen Plant (Existing)	ETP Sludge	11	--	Used as manure
		Boiler Ash (Bagasse)	600	--	Sale to brick/cement manufacturers

vi. Hazardous Wastes

Table 10 - Hazardous Waste Generation & Disposal

No.	Industrial Unit	Category	Quantity (MT/Yr.)		Disposal
			Existing	After Expansion	
1	Distillery	Distillation residue (Cat. No. 20.3)	60	100	Burnt in boiler
2	Sugar & Co-gen	Used Oil (Cat. No. 5.1)	1.0	--	Authorized re-processor

vii. Odour Pollution

ETP Sludge and Press mud would be the source of odour nuisance from distillery 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.

viii. 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 expansion activities.

ix. Environmental Management Cell

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

Table 11 - Environmental Management Cell of VNSSKL

No.	Designation	Number (s)
1	Chairman	1
2	Distillery Incharge	1
3	Production Manager	1
4	Environmental Officer	1
5	Chief Chemist	1
6	Co-gen Manager	1
8	Representative of Environment Consultant	1
9	Lab Chemist	5
10	ETP Operators & Supporting Staff	12
11	Compost Labours	14

Details of capital as well as O & M costs towards environmental aspects under the proposed expansion setup are as follows –

Table 12 - Capital & O & M Cost

No.	Description	Cost Component (Rs. Lacs)	
		Capital	Annual O & M
A	**Existing Project**		
1	Air Pollution Control: ESP (1 boiler- 80 TPH, Stack height - 76M)	400	40
2	Water Pollution Control (ETP)	150	50
3	Noise Pollution Control	15	1
4	Occupational Health and Safety	25	3
5	Environmental Monitoring & Management	30	3
6	Green Belt Development	200	50
	Total (3.5% of Existing Investment of Rs. 231.12Cr)	**820**	**147**
B	**Expansion Project**		
1	APC - Stack of 60 M along with ESP (22 TPH incineration boiler)	2000	20
2	Installation of MEE, CPU	300	3
3	Installation of STP	10	3
4	Noise Pollution Control	5	1
5	Occupational Health & Safety	20	2
6	Env. Monitoring & Online Systems for Stack	10	1
7	Rain Water Harvesting Plan	20	2
8	CER amount (for 5 years after expansion)	0.45	--
	Total (55% of Expansion Investment of Rs. 42.88 Cr)	**2365.45**	**32**
	Grand Total	**3185.45**	**179**

x. Rainwater Harvesting Aspect Under Distillery Unit:

Total area of Plot – 5,25,280 M^2
Total Open space – 2,36,896.8 M^2
Average annual rainfall in the area = 600 mm

- Rooftop Harvesting

Roof Top harvesting area of 6029 M^2
Roof Top harvesting yield is – 2894 M^3

- Surface Harvesting

Total Open space – 2,36,896.8 M^2
Surface harvesting yield is – 84,095 M^3

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

2894 M^3+ 84,095 M^3= 86,989 M^3M^3

Rain water harvesting through Roof Top is already done in existing sugar factory premises.

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

xi. The Green Belt

Table 13 - Area Details

No.	Description	Area (Sq. M.)
1	Total Built – up area	**64,383.15**
2	Open Space	**2,36,896.8**
3	Existing Green Belt Area (42% of Total plot Area)	**2,24,000**
	Total Plot Area (1+2+3)	**5,25,280**

Under existing setup of VNSSKL an area of 2,24,000 Sq. M. is developed under green belt, this accounts 42% of total plot area. There under, about 7472 no. of different plant species of ecologically as well as economically important have already been planted.

The Criteria for Green Belt Development Plan

To abate pollution through emissions in the form of SPM, SO_2 as well as to mitigate noise is the main criteria for consideration of green belt development. 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 green belt.

xii. Socio-Economic Development

Socio economic study was carried out in sixteen villages within 10 Km radius of the study area. Methodology adopted involved a structured close ended interview schedule (21 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. Company has to give employment opportunity to local people by considering their education and ability recruiting instead of outsider.
ii. It is necessary to inform about forthcoming new project to community by conducting common meeting or through village panchayat, newspaper, electrical media because majority of respondents are not aware about new project.
iii. Village people are expecting of good roads, educational facility, waste disposal, pollutions control, sufficient employment opportunity, and health services. Therefore, company has to make proper plan and budget and implement for community development.

7) ENVIRONMENTAL MONITORING PROGRAMME

Reconnaissance of the study area was undertaken in the month of September 2017. Field monitoring for measuring meteorological conditions, ambient air quality, water quality, soil quality and noise levels was initiated in October 2017. The report incorporates the data monitored during the period from October 2017 to December 2017 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 14 - Land Use/ Land Cover

No.	Class	Area (Ha)	Percentage (%)
1.	Crop Land/ Irrigated Land	11933.6	37.98
2.	Fallow Land	3353.93	10.67
3.	Settlement	2124.08	6.76
4.	River	321.81	1.02
5.	Forest Land	4204.0	13.38
6.	Barren Land	2516.96	8.01
7.	Water Body	259.12	0.82
8.	Scrub Land	6702.0	21.33
	Total	**31415.981**	**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, Kolhapur.

The meteorological parameters were monitored during the period October 2017 to December 2017. 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 the October 2017 to December 2017 survey is followed by observations. All the requisite monitoring assignments, sampling and analysis was conducted through the laboratory of M/s. Horizon Services, Pune. Lab has received NABL accreditation and has been approved by MoEF; New Delhi. Further it has also received OHSAS 18001–2007 certifications by DNV.

Ambient air monitoring was conducted in the study area to assess the quality of air for PM_{10}, $PM_{2.5}$, SO_2, NO_x and CO. The various monitoring stations selected are shown in following table.

Table 15 - 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	Bhatshirgaon	NE	2.17
A3	Ladewadi	SE	7.09
A4	Upawale	N	4.66
A5	Thergaon	SE	3.82
A6	Wadi Baghai	NW	2.41
A7	Kandoor	SW	4.5
A8	Chikhali	SW	0.56

Table 16 - Summary of the AAQ Levels for Monitoring Season [October 2017 to December 2017]

Parameter		Location							
		Industrial Site	Bhtashirgaon	Ladewadi	Upavale	Thergaon	Wadi Baghai	Kandoor	Chikhali
PM_{10} ($\mu g/M^3$)	Max.	76.8	72.2	72.6	71.5	71.5	67.5	70.4	68.4
	Min.	63.7	57.5	59.4	60.4	60.4	60.6	60.9	60.3
	Avg.	71.5	65.6	67.5	66.6	66.6	63.3	65.3	65.5
	98%	75.3	68.7	71.8	70.0	70.0	65.5	67.8	68.2
$PM_{2.5}$ ($\mu g/M^3$)	Max.	27.1	26.4	23.4	54.8	26.5	28.5	24.1	23.4
	Min.	21.3	18.5	18.5	18.6	18.6	15.9	14.3	16.8
	Avg.	24.2	21.3	20.9	22.8	22.2	22.0	20.1	22.7
	98%	26.2	24.4	22.7	32.1	24.0	23.7	35.4	36.3
SO_2 ($\mu g/M^3$)	Max.	25.9	18.9	17.8	17.6	20.9	25.4	24.9	26.8
	Min.	18.2	11.6	10.7	10.4	12.5	13.3	10.5	10.4
	Avg.	21.8	15.2	14.5	13.8	16.8	19.7	16.8	16.6
	98%	25.8	18.2	17.4	17.1	20.4	23.2	23.9	23.6
NOx ($\mu g/M^3$)	Max.	32.7	23.6	26.8	25.8	24.9	29.4	27.9	29.4
	Min.	25.2	15.2	19.1	18.6	17.0	20.1	11.4	10.4
	Avg.	28.9	19.9	22.5	22.0	21.0	24.1	21.4	20.1
	98%	32.3	23.0	26.5	25.1	24.1	28.3	27.5	26.9
CO (ppm)	Max.	0.1	0.01	0.06	0.06	0.06	0.08	0.08	0.07
	Min.	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	Avg.	0.05	0.03	0.03	0.03	0.03	0.05	0.04	0.04
	98%	0.09	0.1	0.05	0.05	0.05	0.07	0.07	0.06

Note: 1. PM_{10}, $PM_{2.5}$, SO_2 and NO_x are computed based on 24 hourly values.

2. CO is computed based on 8 hourly values.

Table 17 - National Ambient Air Quality Standards (NAAQS) Specified By Central Pollution Control Board Notification (New Delhi, The 18th November, 2009)

Parameter ($\mu g/M^3$)		Standards	
		Industrial and mixed use zone	Residential and rural zone
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
NOx	24 Hr	80	80
	A.A.	40	40
CO (ppm)	24 Hr	4	4
	A.A.	2	2

Note: A.A. represents "Annual Average

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. Horizon Services, Pune, (MS). 8 locations for surface water and 8 locations for ground water were selected. The locations are mentioned below-

Table 18 - Monitoring Locations for Surface Water

Station Code	Location	
SW1	Nalla On Western side of compost yard	Upstream
SW2	Nalla On Western side of compost yard	Downstream
SW3	River Nalla confluence	Upstream
SW4	River Nalla confluence	Downstream
SW5	Lake of Chikhali	--
SW6	Pawlewadi	--
SW7	Sagaon	--
SW8	Bhatshirgaon	--

Table 19 - Monitoring Locations for Ground Water

Station Code	Co-ordinates	
	Latitude	Longitude
GW1	16°56'19.52"N	74° 4'49.22"E
GW2	16°55'38.91"N	74° 5'9.23"E
GW3	16°55'45.70"N	74° 5'6.62"E
GW4	16°55'53.66"N	74° 5'5.30"E
GW5	16°55'59.34"N	74° 5'59.50"E
GW6	16°55'45.71"N	74° 6'1.59"E
GW7	16°55'47.42"N	74° 5'50.70"E
GW8	16°55'36.53"N	74° 5'23.30"E

The results observed after monitoring for above locations are well within the limits as per IS10500:2012. Refer Chapter 3, section 3.7.4 of EIA report for monitoring results.

F. Noise Level Survey

The study area of 10 Km radius with reference to the distillery 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 20- Noise Sampling Locations & Ambient Noise Levels

Station Code	Name of the Sampling Point	Direction & Distance (Km) from Industrial Site		Average Noise Level in dB(A)					
				L_{10}	L_{50}	L_{90}	$L_{eq(day)}$	$L_{eq(night)}$	L_{dn}
N1	Industrial Site	--	--	67.55	68.45	69.13	73.4	63.7	73.5
N2	Chikhali	SW	0.56	40.47	44.9	46.45	53.9	37.2	52.3
N3	Bhatshirgaon	NE	2.17	41.91	45.4	47.69	50.2	41.8	50.8
N4	Sarud	SW	5.51	41.52	47.4	48.29	51.5	33.6	49.5
N5	Biour	NE	3.92	40.52	42.25	42.77	51.5	33.6	49.5
N6	Sawarde Bacche	SE	4.57	39.94	43.25	43.59	47.2	39.8	48.3
N7	Sagaon	SW	3.26	33.15	36.7	37.59	42.5	31.8	42.3
N8	Kande	SE	2.30	39.73	42.6	43.2	46.6	39.0	47.7

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 distillery expansion project was conducted during post monsoon season. Out of the total 53 villages within 10 km radius, 19 villages were found suitable for Ecology and Biodiversity (EB) studies being representative of the major habitats in the study area i.e. 11 villages within 5 km radius and 8 villages between 5 and 10 km radius.

Table 21 - Names and Distance of study villages from project site for EB survey

No. / Radius	Name of Study Village	No. / Radius	Name of Study Village
0 to 5 Km		**5 to 10 Km**	
1	Kandoor	12	Punavat
2	Savarde	13	Mangle
3	Kande	14	Rile
4	Vadibaghai	15	Kapshi
5	Dholewadi	16	Kapri
6	Biur	17	Sarud
7	Bhatshrigaon	18	Karave
8	Chikhali	19	Ingrul
9	Natoli		
10	Sagoan		
11	Pavlewadi		

General Observations and Recommendations:

1. The wetlands in the study area like Morna dam, village tanks and stretch of River Warana, Morna and Kadvi provides suitable habitat to significantly rich aquatic biota and avifauna including migratory birds and therefore it needs to be protected and conserved.
2. Washing of clothes and vehicles, dumping of solid wastes, and discharge of untreated domestic sewage from town and villages and mainly effluents from local industries, run off of the agro chemicals used in the adjoining predominant sugarcane agriculture belt in the catchment of River Warana is polluting the water bodies in the area and resulting cumulative adverse environmental impact on ecology and aquatic biodiversity of the area.
3. The 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, stressing on mass block tree plantation, rainwater harvesting, solar lighting, organic farming, etc.
4. The pollution control measures as per EMP should strictly be implemented by the industry.

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 1,000 men during their working period.

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

9) ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

A. Impact on Topography

No major topographical changes are envisaged in the acquired area as it is expansion of existing distillery. Only few machines and equipments required for expansion shall be installed on site.

B. Impact on Climate

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

C. Impact on Air Quality

An area of 10 Km radius considering the expansion project at its center is considered to determine the impacts.

i. Baseline Ambient Air Concentrations

The 24 hourly averages concentrations of PM_{10}, $PM_{2.5}$, SO_2 and NOx in Ambient Air, recorded during the field study conducted for the season October, November & December 2017 is considered as baseline values. They represent impact due to operations of existing nearby industries on this region. The 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. The existing baseline concentrations are summarized in following table-

Table 22 - Baseline Concentrations

Parameter	Concentration (μg/m^3)
PM_{10}	75.3
$PM_{2.5}$	26.2
SO_2	25.8
NO_X	32.3
CO	0.09 ppm

ii. Air Polluting Sources

Steam required for proposed distillery expansion activities would be taken from proposed incineration boiler of 22TPH and existing co-gen boiler of 80 TPH. For proposed boiler, Coal - 38 MT/D along with concentrated Spent Wash – 132 MT/D and for existing boiler, Bagasse – 810 MT/D is used as fuel. Existing boiler is provided with stack of 76 M with ESP as APC. Proposed incineration boiler would be provided with stack of 60 M with ESP.

D. IMPACT ON WATER RESOURCES

i. Impact on Surface Water Resources

Fresh water required for existing as well as expansion activities shall be met from Mangale Savarde Bandhara of river Warana. The permission granted to VNSSKL by Irrigation Department; for lifting fresh water from Warana River is 0.136 Million M^3(1,36,000 M^3/Year). 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 surface water resource.

Raw Spentwash to the tune of 480 M^3/D shall be primarily forwarded to re-boiler followed by concentration in Multi Effect Evaporator (Five Effect) and condensate would be forwarded to distillery CPU. Further, concentrated spentwash of 98 M^3/D shall be subjected to incineration.

Other effluent shall be treated in Distillery Condensate Polishing Unit (CPU) and recycled in to process for dilution of molasses and cooling tower make-up. No process effluent will be discharged in nearby river or nalla. Hence, there will not be any impact on surface water resource.

ii. Impact on Ground Water Resources

Water required for the industry would be obtained from Mangale Savarde Bandhara of river Warana. Permission for water lifting has been obtained from competent authority. No ground water would be extracted for proposed distillery expansion project. Moreover, there will not be any discharge of untreated effluent so there will not be any impact on ground water level and quality.

E. IMPACT ON SOIL

Impact on the 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 would be 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.

Yeast Sludge about 300MT/M & CPU Sludge 16 MT/M would be generated as solid waste after distillery expansion activities. The same shall be burnt with bagasse in incineration boiler. Boiler ash generated about 870 MT/M and it shall be disposed off by sold to brick manufacturers / cement industry.

Hazardous waste generated after expansion of distillery would be in the form of Distillation Residue (Cat. No. 20.3) – 100 MT/Yr, shall be burnt with bagasse in incineration boiler. Used Oil 1 MT/Yr shall be given to authorized re-processor.

F. IMPACT ON NOISE LEVELS

Probable sources of noise are boiler, distillation assembly, D.G. Sets etc. The workers could get annoyance and can lose concentration during operation. Workers working near the source need risk criteria for hearing damage while people who stay near the industry lead annoyance and psychological damage. It is obvious that the acceptable noise level for the latter 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.

G. IMPACT ON LAND USE

The total land acquired by project proponent for industrial purpose is 5,25,280 Sq. M. (52.52 Ha). This entire land is a flat terrain. There would be no change in land use pattern since it is a proposed expansion project that would be undertaken in existing factory area. Hence, no change in the land use pattern is expected. Therefore, the impact on land use is insignificant.

H. IMPACT ON FLORA AND FAUNA

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

Contamination of Habitats:

The study area is comprised of natural terrestrial ecosystems such as woodland, grassland, fallow land, scrubs and manmade ecosystems like agriculture and horticulture with human habitations. Most of the wetlands, specially Morna dam and stretch of Warna river provides good habitat for aquatic biodiversity.

Further, raw Spentwash shall be primarily forwarded to re-boiler followed by concentration in Multi Effect Evaporator (Five Effect) and condensate would be forwarded to distillery CPU. Further, concentrated spentwash shall be subjected to incineration.

Moreover, industrial effluent generated after distillery expansion activities shall be treated in Distillery Condensate Polishing Unit (CPU) and recycled in to process for dilution of molasses and cooling tower make-up. No process effluent will be discharged in nearby river or nalla. Hence, there shall not be contamination of terrestrial as well as aquatic habitats.

I. IMPACT ON HISTORICAL PLACES

No historical places found within the study area and the impact is nil.

J. SALIENT FEATURES OF EMP

1. Management during Construction Phase

During construction phase, following recommendations are suggested-

- No major construction would be done since most of infrastructure would be used from existing unit like Admin Building, Common Utility, Canteen, Mill House, Evaporator House etc.
- The construction site would 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

The following routine monitoring programme as detailed in Table 23 shall be implemented at site. Besides, monitoring, compliance to Environmental Clearance conditions and regular permissions from CPCB /MoEFCC/ MPCB shall be monitored and reports are maintained for further reference.

Table 23 - 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 ETP, Near Colony.)	PM_{10}, $PM_{2.5}$, SO_2, NOx & CO	Monthly	EHS Officer	MoEFCC and NABL Approved External Laboratory
2	Work Zone Air Quality	4 Locations (Mill section, Boiling House, Sugar Bagging Section, Sugar Godown)		Monthly		
3	Stack Emissions	Boiler – 1 No. (Co-gen boiler), D.G – 2 Nos.	SPM, SO_2, NOx	Monthly		
4	Ambient Noise	5 Locations - (Near Main Gate, Near ETP, Near Sugar Godown, Near compost Area, Near Cane Yard)	Spot Noise Level; Leq(n), Leq (d), Leq (dn)	Monthly	EHS Officer	
	Work zone Noise	Within Premises – 5 Nos. (Admin Office, Mill Section, Boiler, DG set, Turbine Section)	Spot Noise Level; Leq(n), Leq(d), Leq (dn)	Monthly		
5	Effluent	• 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 characterizes every waste associated with proposed & expansion 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 VNSSKL
9	Emergency Preparedness (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	

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 Bhatshirgaon, Ladevadi, Upawale, Thergaon, Wadi Baghai, Kandoor, Chikhali	$PM_{10,}$ $PM_{2.5,}$ $SO_{2,}$ NO_x & CO.	Quarterly	MoEFCC and NABL approved external Laboratory
2	Noise	10 villages within 10 Km study area - Chikhali, Bhatshirgaon, Sarud, Biour, Sawarde Bacche, Sagaon and Kande	Spot Noise Level recording; Leq(n), Leq(d), Leq(dn)	Quarterly	MoEFCC and NABL approved external Laboratory
3	Soil	4 locations within 10 Km study area - Chikhali, Bhatshirgaon, Natoli & Wadi Baghai	1. pH 2. Salinity 3. Organic Carbon 4. Nitrogen 5. Phosphorous as Potash	Quarterly	MoEFCC and NABL approved external Laboratory
4	Ground Water and Surface water	Surface water locations around industrial premises – Nalla On Western side of compost yard – Upstream & Downstream, River Nalla confluence – Upstream & Downstream, and Lake of Chikhali 8 locations for Ground water	Parameters as per CPCB guideline for water quality monitoring – MINARS/27/2007-08	Quarterly	MoEFCC and NABL approved external Laboratory
5	CSR / CER	As per Standard ToRs granted	--	--	By VNSSKL
6	Green Belt Development	As per Standard ToRs granted	--	--	By VNSSKL
7	Rain Water Harvesting	As per Standard ToRs granted	--	Once in year	By VNSSKL