



P-335-NBSSKL-DISTILLERY-52019
(Revision - 01)

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

FOR

**EXPANSION OF MOLASSES BASED DISTILLERY FROM 30 KLPD TO
105 KLPD IN EXISTING PROJECT COMPLEX OF 3,500 TCD SUGAR
FACTORY, 18 MW CO-GEN PLANT AND 30 KLPD DISTILLERY.**

BY

NIRA BHIMA SAHAKARI SAKHAR KARKHANA LTD.

**AT: SHAHAJINAGAR, PO: REDNI, TAL.: INDAPUR,
DIST.: PUNE, MAHARASHTRA**

PREPARED BY



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AUGUST - 2020

Nira Bhima Sahakari Sakhar Karkhana Ltd.

Shahajinagar, Tal. Indapur, Dist. Pune.

Founder:

Hon. Shri. Harshwardhan Shahajirao Patil

Ex. Minister: Co-Operation & Parliamentary Affairs

Bawada: Tel: 02111-275701, 275100

Ref No.: NIRA-BHIMA/ ENVIR / 510 / 2020-21

Date 22/7/2020

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

Sub.: Application for Public Hearing to be conducted for proposed expansion of 30 KLPD to 105 KLPD Molasses based Distillery by – **Nira Bhima Sahakari Sakhar Karkhana Ltd.** is located at: Shahajinagar, Po.: Redni, Tal.: Indapur, Dist.: Pune, Maharashtra State.

Dear Sir,

We — **Nira Bhima Sahakari Sakhar Karkhana Ltd. (NBSSKL)** - have established 3,500 TCD Sugar Factory, 18 MW Co-generation Plant and 30 KLPD Molasses Based Distillery. Now, the management of NBSSKL has decided to go for an Expansion of 30 KLPD Molasses Based Distillery up to 105 KLPD Molasses based Distillery.

Accordingly, an online application of Form – 1 was submitted to the 'Ministry of Environment, Forest and Climate Change (MoEFCC); New Delhi' on 18.10.2019 for grant of ToR. Subsequently, our ToRs were granted by MoEFCC on 30.10.2019. Refer **Enclosure – I** for the same and standard ToR by MoEFCC. In the standard ToR the directions were given to conduct Public Hearing w.r.t. our proposed project. Now, in order to conduct Public Hearing, we hereby are 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 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. 50,000/- (Rs. Fifty thousand Only) bearing No. 006570 drawn on Bank of India dated 29.07.2020 towards the Public Hearing charges, as decided by the govt., has been presented herewith.

Nira Bhima Sahakari Sakhar Karkhana Ltd.

Shahajinagar, Tal. Indapur, Dist. Pune.

Founder:

Hon. Shri. Harshwardhan Shahajirao Patil

Ex. Minister: Co-Operation & Parliamentary Affairs

Bawada: Tel: 02111-275701, 275100

Ref No.: NIRA-BHIMA/

Date: / / 201

Please do the needful and oblige.

Thanking you.

Yours faithfully,


Sudhir Genge Patil
(I/C Managing Director)

Nira Bhima Sahakari Sakhar Karkhana Ltd. (NBSSKL)

Encl.: 1. A Draft EIA Report & Summary EIA Report

2. A D.D. bearing No. 006570 dated 29.07.2020 drawn on Bank of India





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**Summary of Draft EIA Report For
The Expansion of From 30 KLPD to 105 KLPD Molasses based Distillery in
the Existing Premises of
Nira Bhīma Sahakari Sakhar Karkhana Ltd.
At: Shahajinagar, Po: Redni, Tal: Indapur, Dist.: Pune.**

1) THE PROJECT

Nira Bhīma Sahakari Sakhar Karkhana Ltd (NBSSKL) is located At: Shahajinagar, Po: Redni, Tal: Indapur, Dist.: Pune, Maharashtra State.

Existing integrated project complex comprising of 3,500 TCD Sugar Factory, 18 MW Co-gen Plant and 30 KLPD Distillery. Industrial site is towards North –East of Pune, at a distance of about 129 Km from site. Existing cane crushing capacity of the sugar factory is about 3500 TCD and Co-generation plant capacity is 18 MW and Distillery is 30 KLPD. Environmental Clearance (EC) granted to existing 30 KLPD molasses based distillery was on 17th March 2009 and 18 MW Co-gen plant in the year 24th January, 2014. Now the management of NBSSKL have plan to go for expansion of molasses based distillery from 30 KLPD to 105 KLPD (expansion by 75 KLPD).

This report is made in the overall context of EIA Notification No. S. O. 1533 (E) dated 14.09.2006 as amended vide Notification No S.O. 3067 (E); dated 13.06.2019, project comes under Category ‘A’ at Center Level under Item No. 5 (g)(i).

Refer table 1 for details of capital investment.

Table 1 Project Investment Details

Sr. No.	Industrial unit	Capital Investment (Rs. Cr.)		
		Existing	Expansion	Total
1	Sugar Factory, Co-gen Plant	221.35	-	221.35
2	Distillery	32.69	79.75	107.35
	Total	254.04	79.75	333.79

2) THE PLACE

Total land area acquired by the NBSSKL is 53.41 Ha. Proposed expansion of distillery shall be carried out at existing premises of NBSSKL. Existing built-up area under sugar factory, co-gen plant, and distillery along with other amenities is 2.33 Ha. Proposed built-up area for expansion of distillery is 2 Ha. A no objection certificate for the expansion project has been obtained from the Bhodni Grampanchayat. Refer Appendix – A of EIA report for plot layout plan of NBSSKL. Detailed area break-up is presented at table 2.

Table 2 Area Break up

No.	List of area	Area (Sq. M.)		
		Existing	Expansion	Total After Expansion
1	Plot Area	5,34,060	---	5,34,060
2	Built-up Area			
	Sugar & Co-gen	13,136.23	---	13,136.23
	Distillery	1,910.75	20,000.00	21,910.75
	Other Amenities	8,270.00	---	8,270
	Area under Road	37,938.65	---	37,938.65

	Total Built-up	61,255.63	20,000.00	81,255.63
3	Green Belt Area	1,22,502.00	58,746.60	1,81,248.6
4	Total Open Area	3,50,302.37		2,71,555.77

3) THE PROMOTERS

NBSSKL promoters are well experienced in the field of Sugar, Co-gen & Distillery and 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 List of Promoters

No.	Name	Designation
1	Mr. Lalasaheb Devidas Pawar	Chairman
2	Mr. Kantilal Shivaji Zagade	Vice-Chairman
3	Mr. Dhirajkumar Vasantrao Mane	Managing Director

4) THE PRODUCTS

Details of products that are manufactured under existing as well as expansion project are presented in Table 4.

Table 4.Product & By-product of for integrated Complex

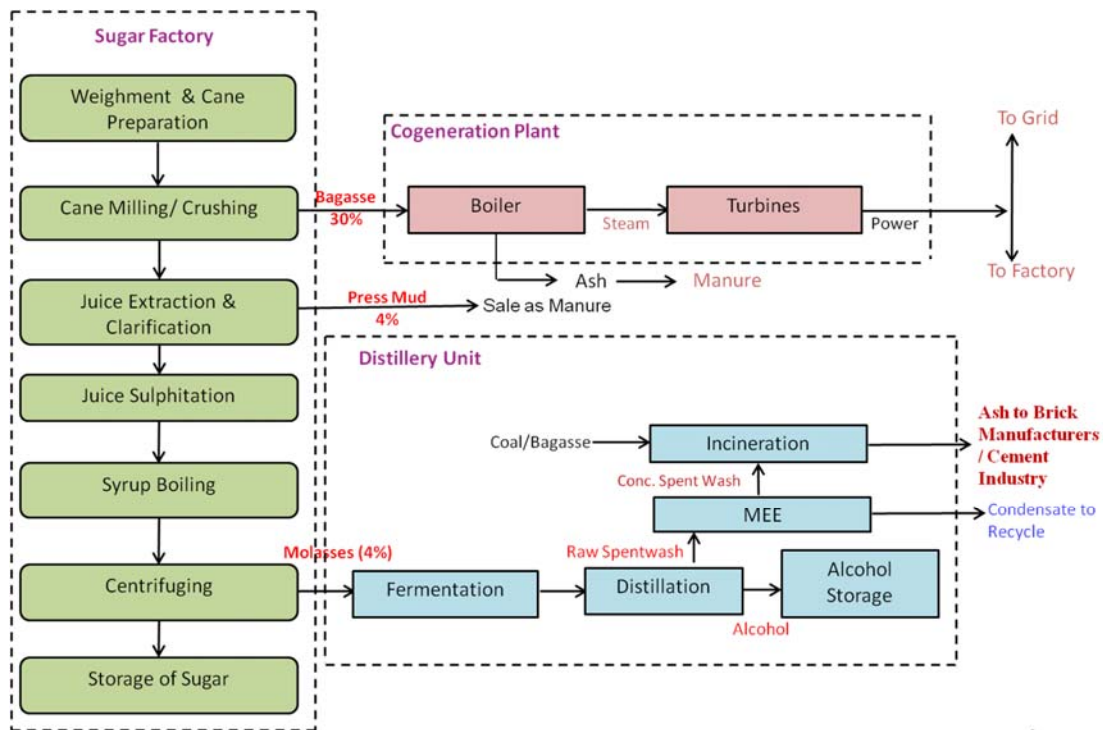
Industrial Unit	Product	Unit	Quantity		
			Existing	Expansion	Total
Distillery	Rectified Spirit (RS)/ Extra Neutral Alcohol (ENA) / Ethanol	KLPD	30	75	105
	By-products				
	CO ₂	MT/ D	23	56	79
	Fusel Oil	MT/ D	0.06	0.1	0.2
Sugar Factory	Sugar (12 %)*	MT/M	12600	--	12600
	By-products				
	Molasses (4 %)*	MT/M	4200	--	4200
	Bagasse (28.5%)*	MT/M	29,940	--	29,940
	Pressmud (4%)*	MT/M	4200	--	4200
Co-gen -	Electricity	MW	18	--	18

5) THE PURPOSE

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. Considering the above facts as well as availability of raw material, management of NBSSKL decided for expansion of distillery.

6) MANUFACTURING PROCESS

Figure 1 Integrated Manufacturing Process Operations



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7) ENVIRONMENTAL ASPECTS

NBSSKL has implemented an effective 'Environmental Management Plan' and various aspects of the same are as follows: -

A. Water Use, Effluent Generation and its Treatment

a. Water Use

Water required for distillery after expansion will be 1118 CMD. Out of this 277 CMD will be Fresh water taken from Bhīma river, 834 CMD will be recycled water CPU condensate and 7CMD will be Treated water from proposed STP. Total 76% recycle water will be used in distillery.

For existing sugar factory total 1780 CMD water is required. Out of this 341 CMD will be fresh water taken from Bhīma river and 1439 CMD is recycled water from sugarcane condensate. More details about water budget are presented in EIA report at Chapter 2

Table.5 Details of Water Consumption in Distillery of NBSSKL

No.	Description	Existing (M ³ /D)	After Expansion (M ³ /D)
1	Domestic	#4	#10
2	Industrial		
i	Process	#240	*834
ii	Cooling Makeup	#35	#180
iii	Boiler Makeup	#45	#72
iv	Lab & Washing	#2	#5

No.	Description	Existing (M ³ /D)	After Expansion (M ³ /D)
v	DM backwash	#5	# 10
	Total	#327	1101 (#267+*834) 76% Recycle
3	Gardening & Green Belt	#5	^s 7
4	Grand Total (1+2+3)	#336	1118 (#277+*834+^s7)
	Fresh Water Consumption (Norm: 10 KL/KL of Alcohol)	10.9	2.54

Note: - # - Fresh water taken from Bhīma river, ♠ - Recycled water CPU condensate & \$ - Treated water from proposed STP.

Table 6. Water Consumption & Effluent Generation Sugar Factory & Co-gen Plant

No.	Description	Water Consumption (M ³ /D)	Effluent Generation (M ³ /D)	Treatment
1	Domestic	#30	24	Proposed STP under distillery
2	Industrial			
	a. Process	*968	116	Treated in ETP; used for land irrigation
	b. Cooling Makeup	*461	46	
	c. Boiler Makeup	#254	5	
	d. DM Backwash	#50	50	
	e. Lab & Washing	#5	5	
	f. Ash Quenching	#2	0	
	Industrial Use	1740 (#311+*1429)	222	
3	Gardening & Green belt	*10		
	Grand Total (1+2+3)	1780 (#341+*1439)		
	Fresh Water Consumption (100 Lit/ MT of Cane Crushed)	88 Lit./ MT		
	Effluent Generation (200 Lit/ MT of Cane Crushed)		63 Lit. / MT	

Note: - # - Fresh water taken from Bhīma river, - * - Sugar cane condensate &

b. Effluent Treatment

i) Domestic Effluent

Domestic effluent generated from distillery after its expansion will be 2 M³/D. From existing sugar factory and co-gen plant is 24 M³/D. Previously, the domestic effluent was treating in septic tank followed by soak pit. After expansion of distillery, total domestic effluent will be treated in proposed Sewage Treated Plant (STP).

ii) Industrial Effluent

After distillery expansion existing practices for spentwash disposal (biomethanation followed by composting) shall be stopped & existing biomethanation plant will be scrapped. After distillery expansion industrial effluent generated would be in the form of raw spentwash, spentlees and other effluent from lab & washing, boiler blow downs, cooling blow downs etc. After expansion of distillery, total raw spentwash to be generated @ 840 M³/D, would be concentrate in Multiple effect evaporator (MEE) and the conc. spentwash @ 227 MY/D (1.6 KL/KL of alcohol) would be blended with bagasse or coal and burnt in incineration boiler. Other effluents viz. spent lees @ 148 M³/D, MEE condensate @ 672 M³/D and other

effluents @ 867 M³/D will be treated in proposed CPU. Treated water from CPU will be reused for industrial operations, thereby achieving Zero Liquid Discharge (ZLD). Flow chart of CPU is presented at figure 2.

Total trade effluent generated from existing sugar and co-generation activities is 222 M³/D. same is treated in existing ETP. Treated effluent will be given to farmers for irrigation as per their demand. Flow chart of sugar factory ETP is presented at figure 4.

Table 7 Details of Effluent Generation in Distillery of NBSSKL

Description	Existing 30 KLPD (M ³ /D)	After Expansion 105 KLPD (M ³ /D)	Disposal	
			Existing	After Expansion
Domestic	3	2	Soak pit followed by septic tank	Proposed STP
Process	Raw Spent wash – 240	a. Raw Spent wash – 840 1. Conc. Spent wash – 168 2. MEE Condensate - 672	Raw Spent wash is Treated in Bio-methanation Plant & Bio-methanated Spent wash is sent for Bio-Composting	Raw Spent wash shall be concentrated in Multi effect Evaporator (MEE). Conc. Spent wash shall be incinerated in incineration Boiler (1.6 KL/ KL)
	Spent lees – 45	Spent lees – 148		
Cooling B/d	3	18	Other Effluents viz. spent lees, Boiler blow down, cooling tower, and lab; washing, DM backwash is forwarded to Sugar ETP. Treated effluent is used for gardening and irrigation purpose.	Other effluent (867) viz. MEE Condensate, spent lees, cooling blow down, boiler blow down, lab & washing & DM backwash shall be forwarded to distillery CPU. Treated effluent shall be fully recycled in process to achieve ZLD.
Boiler B/d	4	14		
Lab; Washing	2	5		
DM backwash	5	10		
Total	Spent wash – 240	Spent wash – 168		
	Other Effluent - 59	Other Effluent – 867		

Figure 2 Flow Chart of Existing Distillery CPU

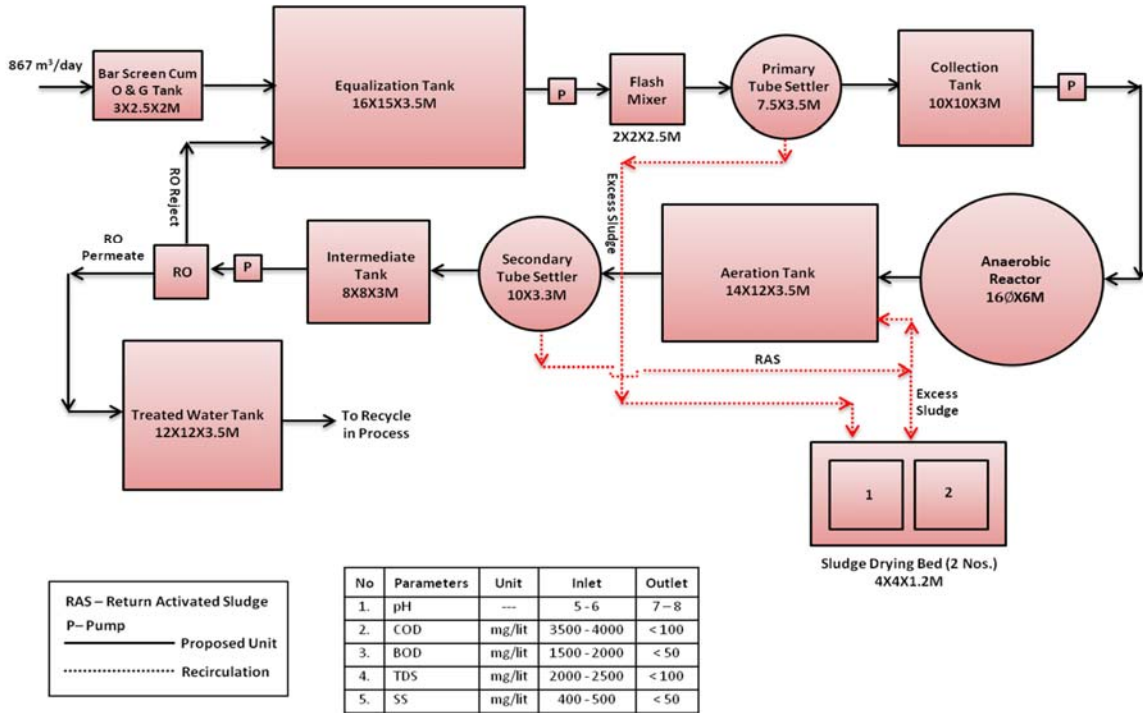


Figure 3 Flow Chart of Proposed STP

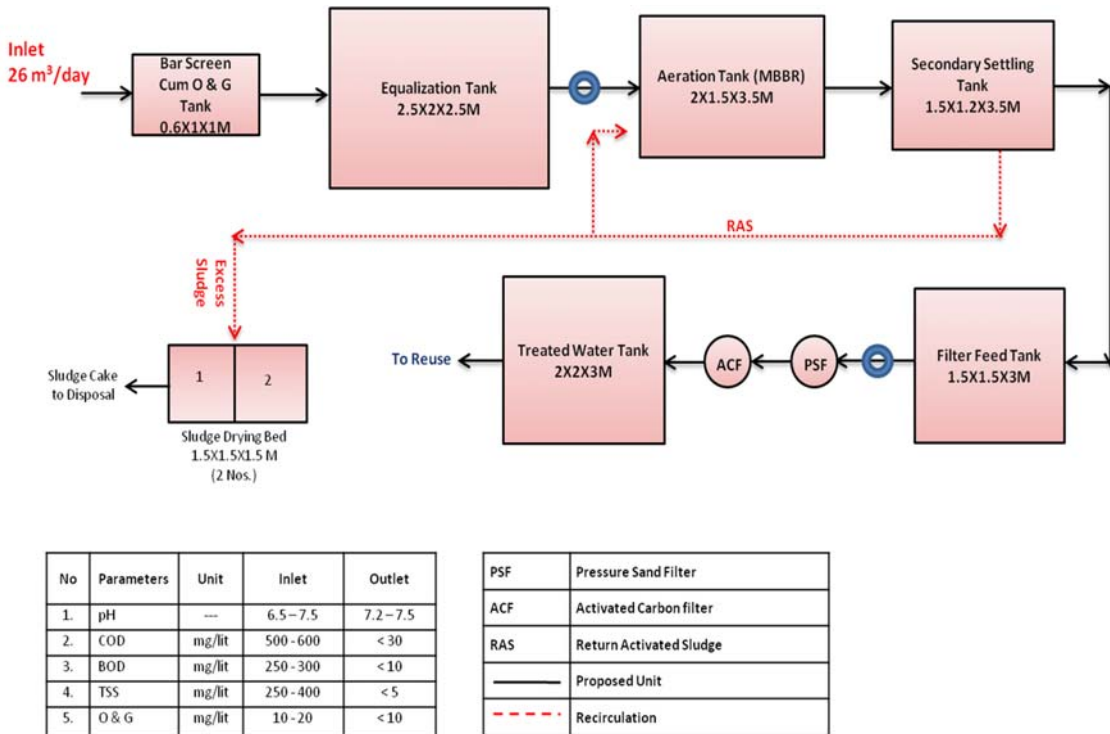
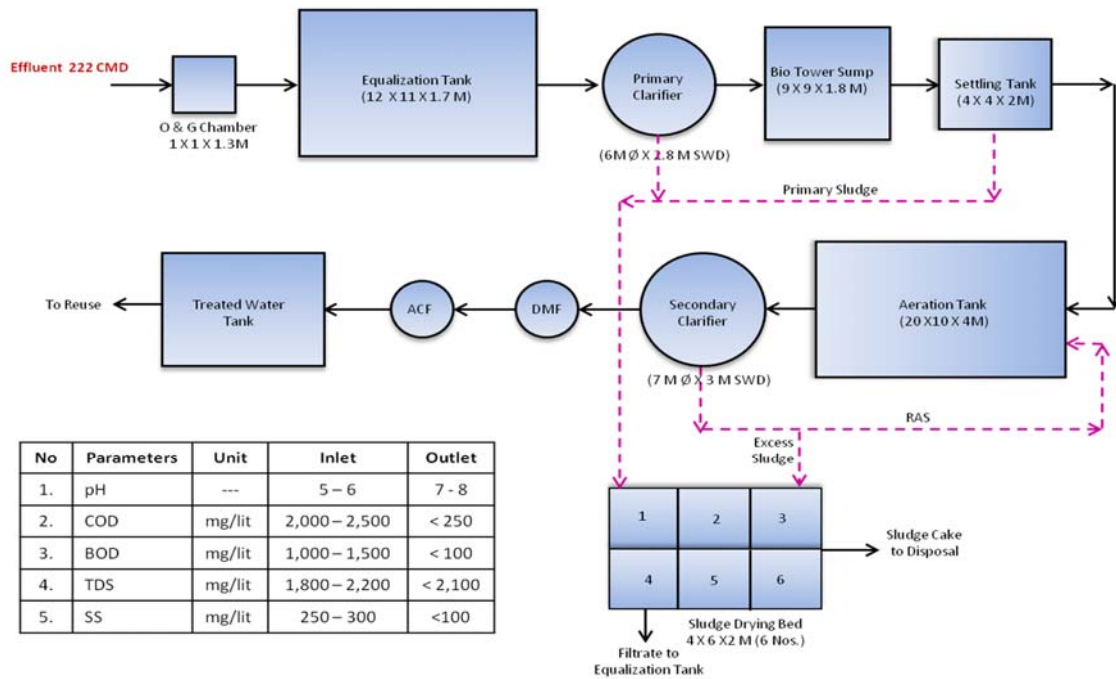


Figure 4. Flow Chart of Existing Sugar Factory ETP



B. Air Emissions

Under existing Sugar, Co-gen & Distillery, two boilers of capacity 66 TPH and 40 TPH is already installed. For 66 TPH boiler baggasse (566 MT/D) is used as fuel & for 40 TPH boiler Bagasse / Biogas (432MT/D/ 12000 M³/D) is used as fuel but after expansion of distillery biogas plant will be scrapped & hence biogas will be replaced by additional 30 MT/D bagasse. Hence total bagasse requirement for existing 40 TPH boiler will be 462 MT/D. ESP & Wet scrubber along with 75 M & 60 M stack height for 66 TPH & 40 TPH boiler respectively. Also there are 2 DG sets of 500 KVA are installed. Steam required for existing sugar factory, co-gen plant & distillery is taken from existing Co-gen boiler.

After distillery expansion a 30 TPH incineration boiler will be installed. Conc. Spwash (slope) + Bagassel (227 MT/D + 124MT/D) used as fuel for the same. ESP as APC equipment attached to the 62 M adequate stack height.

Table 8.Details of Boiler and Stack in NBSSKL

No	Description	Existing			Expansion
		Boiler 1	Boiler 2	DG Set 2	Boiler 1
1	Stack attached to-	Boiler 1	Boiler 2	DG Set 2	Boiler 1
2	Capacity	66 TPH	40 TPH	500 KVA each	30 TPH
3	Fuel type	Bagasse	Bagasse/ Biogas	HSD	Conc. Spwash (slope) + Bagasse
4	Fuel quantity (MT/D)	566	432/ 12000 M ³ /D *(30 MT/D)	20 Lit/Hr - Each	227 + 124
5	MOC	RCC	RCC	MS	RCC
6	Shape	Round	Round	Round	Round
7	Height, AGL	75 M	60 M	14 M ARL	62 M
8	Diameter	3.6 M	3.5 M	150 mm	2.9 M
9	APC equipment	ESP	Wet Scrubber	-	ESP

C. Noise Pollution Aspect

1. Sources of Noise

- i. In the distillery, very high noise generating sources would not exist. Expected noise levels in the section would be about 70 -80 dB (A) or so. Adequate noise abatement measures like silencer & maintenance of pumps, motors, and compressors would be carried out and enclosures would be provided to abate noise levels at source. Moreover, enclosures to the machinery would be provided wherever possible.
- ii. Existing sugar factory and co-gen; noise generating sources are the boiler house, turbine rooms, cane crushing section and mill house, etc.
- iii. Fermentation section & distillation section would be the other minor noise generating sources. The expected noise levels in these sections would be in the range of 70 to 80 dB (A).
- iv. Adequate green belt would be augmented in phase wise manner in and around the industry. So that it would further attenuate the noise levels.

2. Control Measure

Isolation, separation and insulation techniques to be followed, PPEs in the form of earmuffs, earplugs etc. would be provided to workers. D.G. Sets are enclosed in a separate canopy to reduce the noise levels.

D. Hazardous Wastes

No any hazardous waste would be generated from distillery project. Hazardous waste generated from existing sugar factory and co-gen plant activities and their disposal methods is presented in table 9.

Table 9.Details of Hazardous Waste

No.	Industrial Unit	Category	Quantity (Kg/M)	Disposal
1	Sugar factory	Spent Oil – Cat.5.1	200	Burnt in boiler

E. Solid Wastes

Table 10 Solid Waste Generation & Disposal

No.	Industrial Unit	Type	Quantity (MT/M)		Disposal
			Existing	After Expansion	
1	Distillery	Yeast Sludge	45	540	Burnt in Incineration Boiler
		CPU Sludge	--	30	
		Boiler Ash	360	1350	Brick/cement manufacturing / Palatalization
2	Sugar Factory & Co-gen Plant	Boiler Ash (Bagasse)	451	-	Brick/cement manufacturing
		ETP Sludge	150	-	Used as Manure

F. Odor Pollution

There are number of odour sources such as molasses handling and storage, fermentation and distillation, secondary effluent treatment, and storage of effluents, stale cane, bad mill sanitation, bacterial growth in interconnecting pipes & unattended drains. Measures adopted under existing unit for controlling same are proper housekeeping, sludge management in biological ETP units, steaming of major pipe lines, regular use of bleaching powder in the

drains, efficient handling, prompt & proper disposal of press mud. Under proposed expansion project of distillery, spent wash shall be carried through closed pipeline for spent wash storage and handling 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 MPCB or any other concerned authority are strictly followed in the existing set up. Same practice shall be continued after expansion as well as implementation of proposed expansion project.

H. Environmental Management Cell (EMC)

NBSSKL is already having an EMC functioning under its sugar factory and co-gen projects. Members of the EMC are well qualified and experienced in their concerned fields. This cell shall be further augmented suitably under expansion. EMC members are as under.

Table 11.Environmental Management Cell of NBSSKL

No.	Name of Member	Designation	No. of Working Person(s)
1	Mr. Lalasaheb Pawar	Chairman	1
2	Mr. Dhirajkumar Mane	Managing Director	1
3	Representative of Environmental Consultant	Env. Consultant	2
4	Mr. Gajedra Girame	Chief Engineer	1
5	Mr. Sudheer Genge	Distillery Incharge	1
6	Mr. Bharat Patil	Labor Welfare Officer	1
7	Mr. Kalyan Gaikwad	Environmental Engineer	1
8	Mr. Kalyanrao Patale	Chief Agree Officer Incharge	1
9	Mr. Dhananjay Limbore	Cane Supply Officer	1

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

Table 12.Capital as well as O & M Cost (Existing &Expansion)

No.	Description	Cost Component (Rs. Cr)	
		Capital	Annual O & M
	Existing Project		
1	APC Equipments: ESP (66 TPH), Wet scrubber (40 TPH), Stack heights 75 M & 60 M.	7.25	0.7
2	Water Pollution Control & OCMS (Bio-compost Yard & Machine, Sp. wash Tank, Maintenance of ETP, OCMS)	12.50	1
3	Noise Pollution: Insulation, Isolation, Attenuation Infrastructure of Plant & Machinery, PPEs	1.00	0.05
4	Occupational Health and Safety (Medical Check-up of employees, PPEs)	0.50	0.08
5	Environmental Monitoring & Management	0.25	0.02
6	Green Belt Development	0.50	0.15
7	Provision towards CER	0.44	-
	Total	22.44	2
	(8.8 % of Capital Investment of Rs. 254.04 Cr)		
	Expansion Project		

No.	Description	Cost Component (Rs. Cr)	
		Capital	Annual O & M
1	APC Equipments [ESP for incineration boiler – 1 Nos. (Stack height 62 M) & OCMS	30	0.30
2	Spentwash Storage Tank, Installation of STP, MEE CPU & OCMS	0.85	0.3
3	Noise Pollution Control	0.5	0.07
4	Occupational Health & Safety	0.10	0.002
5	Environmental. Monitoring	0.25	0.004
6	Green Belt Augmentation & Rain Water Harvesting Plan	0.25	0.10
7	Provision towards CER amount (for 5 years after expansion)	0.188	-
	Total (40.29 % of Capital Investment of Rs. 79.75 Cr)	32.138	0.776
	Grand Total (16.35 % of Capital Investment of Rs. 333.79 Cr)	54.578	2.776

I. Rainwater Harvesting Aspect

Table .13 Area Taken for RWH

Sr. No.	Description	Area (Sq. M.)
1	Rooftop Area	23,716.98
2	Green Belt Area	1,81,248.60
3	Area under Roads	37,938.65
4	Open Space	2,71,555.77

- Average annual rainfall in the area = 544 mm

No.	Description	Area (M ²)	RWH Yield (M ³)
A	<u>Rooftop Harvesting</u>		
	Roof Top	23,716.98	10,245.74
B	<u>Surface Harvesting</u>		
1	Green Belt	1,81,248.60	29,362.27
2	Roads	37,938.65	10,243.4
3	Open Space	2,71,555.77	43,992.03
	Total		83,597.74
	Grand Total (A+B)		93,843.48 M ³
			93.84 ML

J. Green Belt

Table .14 Area Details

No.	Description	Area (Sq. M)
1	Total Built up Area after expansion	81,255.63
2	Total Open Area after expansion	2,71,555.77
	Existing Green Belt Area (23% of Total Plot Area)	1,22,502.00
	Proposed Green Belt Area under Expansion (11% of Total Plot Area)	58,746.60
3	Total Green Belt - 34 % of Total Plot Area	1,81,248.60
	Total Plot Area	5,34,060.00

Criteria for Green Belt 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

Socio-Economic Development

Socio economic study was carried in 12 villages within 10 Km radius of the NBSSKL was carried out with the help of an interview schedule. Questions in Marathi language, 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.

7) ENVIRONMENTAL MONITORING PROGRAMME

Reconnaissance of the study area was undertaken in the month of October 2019. Field monitoring for measuring meteorological conditions, ambient air quality, water quality, and soil quality and noise levels was initiated in October 2019. Report incorporates the data monitored during the period from October 2019 to December 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. Collection of this data was done from various secondary sources viz., Census books, Revenue records, State and Central Government Offices, Survey of India topo sheets as well as high resolution satellite image and through primary field surveys.

B. Land Use/ Land Cover Categories of Study Area

Table 15 Land Use/ Land Cover

No.	Classes	Area (Ha.)	Percentage
1	Built Up Area	1162	3.70
2	Crop Land	18284	58.20
3	Fallow Land	4883	15.54
4	Barren Land	5654	18.00
5	Water Bodies	291	0.93
6	Grass Land with open Scrub	745	2.37
7	River	396	1.26
	Total	31,415	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, Pune.

Meteorological parameters were monitored during the period October 2019 to December 2019. Details of parameters monitored, equipment's used and the frequency of monitoring have been given in Chapter 3 of the EIA report. Hereunder, details of predominant wind directions and wind categories are given.

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 2019 to December 2019 survey is followed by observations. All the requisite monitoring assignments, sampling and analysis was conducted through the laboratory of Green Envirosafe Engineers & Consultant Pvt. Ltd., Pune which is NABL accredited and MOEFCC; New Delhi approved organization. Further, same has received certifications namely ISO 9001– 2015 and OHSAS 18001–2007 from 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. Various monitoring stations selected are shown in table 16.

Table 16 Ambient Air Quality Monitoring (AAQM) Locations

No.	Location	Direction From Site	Distance (Km)	Direction
A1	Industrial Site	--	--	--
A2	Bhodani	Up- Wind	2.53	NE
A3	Vakilwasti		5.36	E
A4	Reda	Downwind	3.04	NW
A5	Redani		3.51	W
A6	Kati	Cross - Wind	4.09	N
A7	Lakhewadi		1.95	S
A8	Shahajinagar	Near Habitat	0.73	N

**Table 17 Summary of the AAQ Monitoring Results for Season
[October – November – December 2019]**

		Location							
		Industrial Site	Bhodani	Vakilwasti	Reda	Redani	Kati	Lakhewadi	Shahajinagar
PM ₁₀ µg/M ³	Max	61.10	56.30	56.40	57.90	56.50	55.70	56.10	56.20
	Min	54.10	48.30	46.30	47.90	47.60	47.90	47.90	47.20
	Avg	57.89	52.82	52.21	54.60	53.26	52.85	52.39	52.74
	98% Percentile	60.78	55.98	56.17	57.72	56.41	55.52	55.50	56.20
PM _{2.5} µg/M ³	Max	21.20	18.80	18.60	16.50	18.30	18.50	18.50	22.50
	Min	16.10	13.50	13.10	12.10	13.10	13.10	13.20	11.70
	Avg	18.63	16.49	16.20	14.45	16.05	16.47	16.33	16.13
	98% Percentile	20.88	18.75	18.51	16.45	18.25	18.41	18.36	22.41
SO ₂ µg/M ³	Max	20.30	17.60	16.90	21.60	16.10	16.20	16.50	18.20
	Min	16.00	12.30	12.10	18.20	12.10	12.10	12.20	12.20
	Avg	18.28	15.02	14.32	19.65	14.25	14.29	14.03	14.59
	98% Percentile	20.21	17.60	16.62	21.55	16.10	16.20	16.41	18.02
NO _x µg/M ³	Max	30.40	23.30	22.70	19.40	21.40	23.50	21.70	23.40
	Min	25.20	18.10	17.10	13.40	17.20	16.80	17.30	15.50
	Avg	27.67	20.27	19.34	15.87	19.23	20.45	19.60	20.37
	98% Percentile	30.31	22.75	22.01	18.85	21.31	23.45	21.65	23.03
CO mg/M ³	Max	0.900	0.070	0.070	0.070	0.080	0.060	0.060	0.060
	Min	0.200	0.010	0.010	0.010	0.010	0.020	0.010	0.010
	Avg	0.508	0.042	0.041	0.042	0.035	0.036	0.032	0.027
	98% Percentile	0.854	0.070	0.070	0.070	0.073	0.057	0.057	0.057

Notes: PM₁₀, PM_{2.5}, SO₂ and NO_x are computed based on 24 hourly values. CO is computed based on 8 hourly values.

Table 18 National Ambient Air Quality Standards (NAAQS) by CPCB

(Notification No. S.O.B-29016/20/90/PCI-L by MOEFCC; New Delhi dated 18.11.2009)

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

Note: A.A. represents Annual Average

E. Water Quality

Sampling and analysis of water samples for physical, chemical and heavy metals were also undertaken through the laboratory of Green Enviro Safe Engineers & Consultant Pvt. Ltd Pune. Eight locations for surface water and eight locations for ground water were selected. Same are listed below-

Table 19 Monitoring Locations for Surface Water

Station Code	Name of the Station	Distance (Km)	Direction
SW – 1	Pond near the project site	0.70	NW
SW – 2	Pond near the project site	0.94	NNW
SW – 3	Pond near the project site	0.62	SE
SW – 4	Nala of the project site	3.28	W
SW – 5	Pond near the project site	2.57	SSW
SW – 6	Upstream of the Nira River	5.88	SSW
SW – 7	Midstream of Nira River	9.05	SE
SW – 8	Downstream of Nira River	3.54	NNE

Table 20 Monitoring Locations for Ground Water

Station Code	Name of the Station	Geographical Location		Distance (Km)	Direction
		Longitude	Latitude		
GW1	Shahajinagar	17° 59' 26.49" N	74° 57' 07.13" E	0.82	E
GW2	shahajinagar	17° 59' 30.85" N	74° 57' 1.31" E	0.64	NE
GW3	shahajinagar	17° 59' 20.30" N	74° 56' 40.27" E	0.27	S
GW4	Bodani	17° 59' 8.71" N	74° 57' 5.42" E	0.99	SE
GW5	Reda	17° 59' 38.5" N	74° 56' 18.04" E	0.69	NW
GW6	Reda	17° 59' 56.64" N	74° 56' 31.19" E	0.87	NNW
GW7	Shahajinagar	17° 59' 39.48" N	74° 57' 7.52" E	0.89	NE
GW8	Bodane	17° 59' 52.24" N	74° 57' 13.06" E	1.22	NE

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

F. Noise Level Survey

Study area of 10 Km radius with reference to the proposed project site has been covered for noise environment. Four zones viz. Residential, Commercial, Industrial and Silence Zones have been considered for noise monitoring. Some of the major material roads were covered to

assess the noise due to traffic. Noise monitoring was undertaken for 24 hours at each location. Details of noise monitoring stations are given in following table-

Table 21 Noise Sampling Locations

Station Code	Name of Sampling	Distance (Km)	Direction
N1	Project Site	-	-
N2	Lakhewadi	2	S
N3	Manemala	2.8	SE
N4	Bhodhi	2.4	NE
N5	Shetphal	3.7	NE
N6	Kati	3.8	N
N7	Reda	3	NW
N8	Redni	3.8	SW

Table 22 Ambient Noise Levels

Sr. No.	Location	Average Noise Level in dB(A)					
		L ₁₀	L ₅₀	L ₉₀	L _{eq(day)}	L _{eq(night)}	L _{dn}
1	N1	52.6	59.8	62.4	72.1	51.7	70.3
2	N2	43.9	47.2	48.6	53.3	41.9	52.8
3	N3	41.4	45.6	47.7	52.2	40.9	51.8
4	N4	43.0	46.9	48.8	53.8	41.4	53.0
5	N5	43.5	46.0	47.7	51.9	40.9	51.5
6	N6	41.8	47.0	48.2	55.0	41.1	53.9
7	N7	41.1	46.7	48.3	54.8	41.2	53.8
8	N8	41.1	46.5	48.1	54.2	41.3	53.3

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 aspects.

H. Ecology

Ecological survey for expansion of distillery by NBSSKL was carried by questionnaire study in 10 representative villages from 10 KM radius study area. 5 villages within 5 km radius and 5 villages between 5 to 10 km radius. Chapter 3,Section 3.12 may be referred for details of this aspects.

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. 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 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.

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 of EIA 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 distillery project. In acquired area, the changes would be due to the manmade structures, like distillery structure and ancillary units. Industrial activity would invite positive benefits in the form of land leveling and tree plantation in the plant vicinity and other premises.

B. Impact on Climate

Impact on the climate conditions due to the 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

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

i. Baseline Ambient Air Concentrations

24 hourly 98th percentile concentrations of PM₁₀, PM_{2.5}, SO₂ and NO_x in Ambient Air, recorded during the field study conducted for the season Oct-Nov-Dec- 2019 are considered as baseline values. They represent impact due to operations of existing nearby industries on this region. Existing baseline concentrations are summarized in following table and the GLC of the same is included in 4th chapter of EIA report.

Table .23 Baseline Concentrations (98 Percentile)

Parameter	PM ₁₀	PM _{2.5}	SO ₂	NO _x	CO
98 Percentile Conc.	62.78µg/m ³	20.88 µg/m ³	20.21 µg/m ³	30.31µg/m ³	2.854 mg/m ³
NAAQS	100 µg/m ³	60 µg/m ³	80 µg/m ³	80 µg/m ³	4 mg/m ³

ii. Air Polluting Sources

As discussed above under existing activity of sugar factory, co-gen and distillery operations, 2 boilers of 66 TPH & 40 TPH is installed on site. Steam required for expansion of distillery will be taken from existing boiler. For expansion of distillery boiler of 30 TPH will be installed.

D. IMPACT ON WATER RESOURCES

i. Impact on Surface Water Resources & Quality

Surface water along with recycled water will be used to meet water requirement of NBSSKL project complex. Effluent from distillery; Raw spent wash will be concentrate in Multiple effect evaporator (MEE) and the conc. spent wash would be blended with bagasse and burnt in incineration boiler. Other Effluents viz. spent lees, Boiler blow down, cooling tower, and lab; washing, DM backwash is forwarded to CPU. Treated effluent shall be used for gardening and irrigation purpose.

Total domestic effluent would be treated in proposed STP. Hence there will not be any impact on surface water resource. More details about water budget are presented at Chapter 2.

ii. Impact on Ground Water Resources & Quality

Ground water will not be a source of raw water for the 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. Under existing sugar factory as mentioned above, there will not be discharge of any untreated effluent on land. ESP and wet scrubbers are installed to existing boilers. Boiler ash from existing boiler is used as manure. Hence, there will not be any major increase in chemical constituents of soil through deposition of air pollutants/ discharge of waste water. Moreover, there will not be any process emissions worth mentioning, the impact on the soil characteristics will be nil.

F. IMPACT ON NOISE LEVELS

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. NBSSKL is not major noise producing industry. There shall be no any prominent effect due to vibration at the project site.

G. IMPACT ON LAND USE

Present use of the project land is Industrial wherein the sugar factory, cogeneration plant & distillery have already been established. Proposed expansion activity would be implemented in existing premises of sugar factory, co-gen plant & distillery. Also, an area was kept vacant for expansion of distillery. Hence no change in the land use pattern is expected. Therefore, the impact on land use is non-significant.

H. IMPACT ON FLORA AND FAUNA

Discharge of untreated wastewater from the industry in surrounding area can also cause significant environmental impact on the aquatic habitats and affect dependent biodiversity. In case of air pollution, industry is going to contribute in SPM pollution load in nearby area. This may have negative impact particularly on avifauna, surrounding crop yields & local population. Details in respect of impacts on ecology and biodiversity are described in Chapter 3.

I. IMPACT ON HISTORICAL PLACES

No historical places in study area. No major impact was observed during site visit.

10) SALIENT FEATURES OF EMP

Following routine monitoring program as detailed in Table 24 shall be implemented at site. Besides to this monitoring, the compliances to all Environmental Clearance conditions and regular permissions from CPCB /MoEFCC shall be monitored and reported periodically.

Table 24 Plan for Monitoring of Environmental Attributes in and around NBSSKL

No.	Description	Location	Parameters	Frequency	Conducted by
1	Air Emissions	Upwind – 1, Downwind - 2 (Near main gate, Fermentation section, Distillation section)	PM ₁₀ , PM _{2.5} , SO ₂ , NO _x , CO	Monthly	MoEFCC & NABL Approved External Lab
		Study area - (Bhodani, Vakilwasti, Reda, Redani, Kati, Lakhewadi, Shahajinagar)		Quarterly	
2	Work Zone Air	4 locations (Mill section, Fermentation section, sugar Bagging & Distillation section)	PM ₁₀ , PM _{2.5} , SO ₂ , NO _x , CO	Monthly	
3	Fugitive Emissions	Ethanol storage area & Distillation column	VOC	Monthly	
4	Stack Emissions	Boiler –3 Nos.	SO ₂ , SPM, NO _x	Monthly	
5	Ambient Noise	5 Locations (Near Distillation section, Near fermentation section, Near main gate, Near ETP, CPU, Near Sugar godown)	Spot Noise Level recording; Leq(n), Leq(d), Leq (dn)	Monthly	
	Work Zone Noise	5 Locations - (Near mill section, Distillation section, Boiler, DG set, Turbine section)			
6	Effluent	Treated, Untreated	pH, SS, TDS, COD, BOD, Cl, Sulphates, Oil & Grease.	Monthly	
7	Drinking water	Factory canteen / Residential Colony	Parameters as per drinking water Std IS10500	Monthly	
8	Soil	8 locations (Pitewadi, Redani, Bhodani, Patilwasti, Jadhavwadi, Lakhewadi, Pitkeshwadi, khorochi)	pH, Salinity, Organic Carbon, N, P, K	Quarterly	
9	Water Quality (Ground Water & Surface Water)	Locations in study area – (Ground Water& Surface Water available in study area)	Parameters as per CPCB guideline for water quality monitoring – MINARS/27/2007-08	Quarterly	
10	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	Records of Solid Waste Generation, Treatment and Disposal shall be maintained	Twice in a year	By NBSSKL

No.	Description	Location	Parameters	Frequency	Conducted by
		waste arising			
11	Emergency Preparedness such as fire fighting	Fire protection & safety measures to take care of fire & explosion hazards, to be assessed & steps taken for their prevention.	On site Emergency Plan, Evacuation Plan, fire fighting mock drills	Twice a year	By NBSSKL
12	Health Check up	Employees and migrant Labour health check ups	All relevant health check-up parameters as per factories act	Twice a Year	By NBSSKL
13	Green Belt	Within Industry premises as well as nearby villages	Survival rate of planted sapling	In consultation with DFO	By NBSSKL
14	CER	As per activities mentioned	--	Six Monthly	By NBSSKL