

EXECUTIVE SUMMARY



EXPANSION OF SUGARCANE CRUSHING CAPACITY FROM 4500 TCD TO 7500 TCD, COGENERATION POWER PLANT CAPACITY FROM 14.75 MW TO 29.5 MW, AND ESTABLISHMENT OF 150 KLPD DISTILLERY TO PRODUCE RECTIFIED SPIRIT/EXTRA NEUTRAL ALCOHOL/ETHANOL BASED ON B"/C" HEAVY MOLASSES/ SUGARCANE JUICE/SYRUP/GRAINS

AT

MAHATMA PHULE NAGAR, TALUKA KANNAD, DISTRICT AURAGNABAD, MAHARASHTRA -

BY

BARAMATI AGRO LIMITED (UNIT 2)

AREA:63.17 HECTARES

COST OF THE EXPANSION: Rs. 150 CR.

STANDARD TORS GRANTED: NO.IA-J-11011/81/2021-IA-II(I) DATED 17.04.2021

EXECUTIVE SUMMARY

1.0 INTRODUCTION

Baramati Agro Limited (Unit 2) is a private limited company and is located at post Mahatma Phule Nagar, Taluka Kannad, District Aurangabad. The industry is registered under the in the state of Maharashtra under the Companies Act, 1956 Vide Registration Number 11-045873 dated 2nd March 2006. The industry started its first crushing operation in the year 2013 with the installed capacity of 2500 TCD. The industry expanded its sugarcane crushing capacity from 2500 TCD to 4500 TCD and established 14.75 MW Cogeneration power plant to fulfill he power requirement of the sugar unit.

The command area is rich in sugarcane cultivation and has excellent irrigation facilities. Considering the Sugarcane cultivation potential and the availability of sugarcane in the command area the industry proposes to expand its sugarcane crushing capacity from 4500 TCD to 7500 TCD and Co-generation power plant capacity from 14.75 MW to 29.5 MW in order to utilized additional bagasse generated after the proposed expansion of sugar unit. The industry also proposes to establish 150 KLPD distillery to consume the available molasses from its own sugar unit and utilize sugarcane juice/syrup/grains for the production of RS/ENA/Ethanol. In the command area, the availability of Grains is also abundant and as such Grains based distillery unit is also proposed of the same capacity of 150 KLPD for production of RS/ENA/Ethanol as per demand.

1.1 PROJECT LOCATION

The salient features of the project site are

Table 1 Salient features of the project site

Sr. No.	Features	Description	Direction wrt site
1.	latitude	20°14'40.11"N	
2.	Longitude	75° 7'44.38"E	
3.	Elevation above MSL	639 meters	
4.	Nearest City/Town	Kannad ~ 2 Km	NE
		Chalisingaon ~ 30 Km	NNE
		Aurangabad ~ 70 Km	SSE
5.	Nearest Village	Rail ~ 1.8 Km	NWW
		Narsingpur ~ 4 Km	NE
		Malpur ~ 4.5 Km	SEE
		Bahirgaon ~ 3.8 Km	SE
6.	Road	NH-211 (Dhule-Solapur) adjacent to plot boundary	E
		SH-22 (Chalisingaon Road)Adjacent to plot boundary	E
7.	Nearest water body	Shivna Nadi ~1.5 Km	SE
		Ambadi Dam 7 Km	NW
8.	Railway Station	Chalisingaon – 30 Km	NNE
9.	Airport	Aurangabad airport ~70 Km	SE
10.	Protected Area	Gautala Autramghat Sanctuary – 5.3 Km	N
11.	Reserved Forests	Near Vithalpur- 0.7 Km	SW
		Near rail Nawadi – Surphalnath Hill 3 Km	W
12.	Wildlife Sanctuary	Gautala Autramghat Sanctuary – 5.3 Km	N
13.	Archeological site	None within 10 km	
14.	State boundary	None within 10 km	

Sr. No.	Features	Description	Direction wrt site
15.	Defense installations	None within 10 km	
16.	Average Rainfall	502 mm	
17.	Seismicity	II	

2.0 PROJECT DESCRIPTION

The details about the manufacturing capacity of existing unit as well as after the proposed expansion are given in table below

Table 2 Existing and Proposed Products manufacturing quantities

Sr. no.	Description	Unit	Existing Capacity	Proposed Capacity	Total	Remark
1.	Sugar Unit	TCD	4500	3000	7500	
2	Co-generation Power	MW	14.75	14.75	29.5	
3.	Distillery Unit	KLPD	0	150	150	
	Rectified Spirit or	KLPD		150	150	Only one product at a time
	Extra Neutral Alcohol or			150	150	
	Ethanol			150	150	

2.1 RESOURCE REQUIREMENT AND INFRASTRUCTURE FACILITIES

A) Raw material requirement

The details of the raw material requirement for sugar and distillery unit and its source are given in table below. The sugarcane is transported in bullock cart, Tractors etc and other chemicals are transported to the site through designated vehicles by Pakka Roads. The other raw materials like bagasse and Molasses are produced from its own sugar unit. In case shortage of molasses, if any shall be purchased from nearby sugar industries. Grains shall be purchased from farmers and transported to the site in designated vehicles

Sugar and Cogeneration power plant division

Table 3 Raw material requirement and its source for sugar unit

Sr. No.	Item	Quantity			Unit	Source
		Existing as per CTO	Proposed	Total		
1	Sugar Cane	4500	3000	7500	MT/day	Farmers
Consumable Chemicals						
1	Sulfur	2500	1666.7	4116.7	Kg/Day	Open Market
2	Lime	6750	4500	11250	Kg/Day	
3	Ortho phosphoric Acid	315	210	525	Kg/Day	
Utilities						
1	Total Steam Requirement	110	60	170	TPH	Own 110 TPH existing Boiler = Additional 60 TPH Boiler

Sr. No.	Item	Quantity			Unit	Source
		Existing as per CTO	Proposed	Total		
2	Fuel Bagasse	1175	640	1815	MT/Day	Sugar unit
3	Water	0	0	0	CMD	
4	Power	7	3	10	MW	Own Co-generation power plant
5	Manpower	480	440	920	Nos	Local

Table 4 Raw material requirement and its source for distillery unit

Sr. No	Item	Quantity	Unit	Remarks/Source
		150 KLPD Distillery		
1 a	B Heavy molasses OR	470	MT/day	Distillery unit will run for 150 days(During off season) on B heavy molasses available from our existing unit
1 b	C Molasses	580	MT/day	
2	Sugar cane	2000	MT/day	Distillery unit will be run for 180 days(During crushing season) on sugar cane
3	Grain (Broken rice, Maize)	375	MT/day	Grain based Distillery unit will run only during shortage of sugar cane
Consumable Chemicals				
1	Sodium Meta bi-sulphate	75	Kg/Day	Stored in Fermentation house Source: Market Mumbai, Pune Aurangabad
2	De-foam agent	150	Kg/Day	
3	Nutrients (Fertilizers DAP)	130	Kg/Day	
4	Enzymes	40	Kg/Day	
Utilities				
1	Total requirement of Steam	28.125	TPH	Proposed 30 TPH Incinerator boiler
2	Fuel Concentrated Spent wash	372	MT/Day	
3	Baggase	150	MT/Day	
4	Fuel Coal	100	MT/day	When bagasse will not available
5	Water	471	CMD	Source:- 1) Ambadi Dam (471 CMD)
6	Power	2	MW	Proposed 3 MW TG Set connected to Incinerator boiler
7	Man power	60	No.	Local

B) Land use Details

Details of existing and proposed land utilization pattern within the project site is given in table below

Table 5 Landuse breakup

Description	Area in ectares	Percentage
Existing built-up area	1.67	2.64
Proposed builtup area	2.54	4.02
Area Under utilities	3.15	4.99
Area under internal roads	5.42	8.58
Area under Parking	9.85	15.59
Greenbelt	22.30	35.30
Vacant Land	18.24	28.87
Total	63.17	

C) Power requirement

At present, the power requirement is 7 MW. Additional 5 MW of power will be required after the proposed expansion. Thus the total power requirement after the proposed expansion will be 12 MW. The details of which are given in table below

Table 6 Details of the power requirement

Sr. No	Unit	Existing (MW)	Proposed (MW)	Total (MW)	Source
1.	Sugar Unit and cogeneration power plant	7	3	10	Own 14.75 MW existing and proposed 14.75 MW Co-generation Power Plant
2.	Distillery Unit	0	2	2	Proposed 3 MW TG Set connected to 30 TPH Incinerator boiler
	Total	7	5	12	

D) Water Consumption details

Source of water is Ambadi Dam, which is 7 Km away from the project site. The necessary permissions for lifting the water for industrial use are available with the industry

Table 7 Water Consumption details

Description	Quantity	Remarks
Domestic use	75 CMD	
Sugar and Co-generation Power Plant	0 CMD	
Distillery Unit	471 CMD	

Sugar and Cogeneration power plant Division

The detailed water budget is for sugar and cogeneration unit is as under.

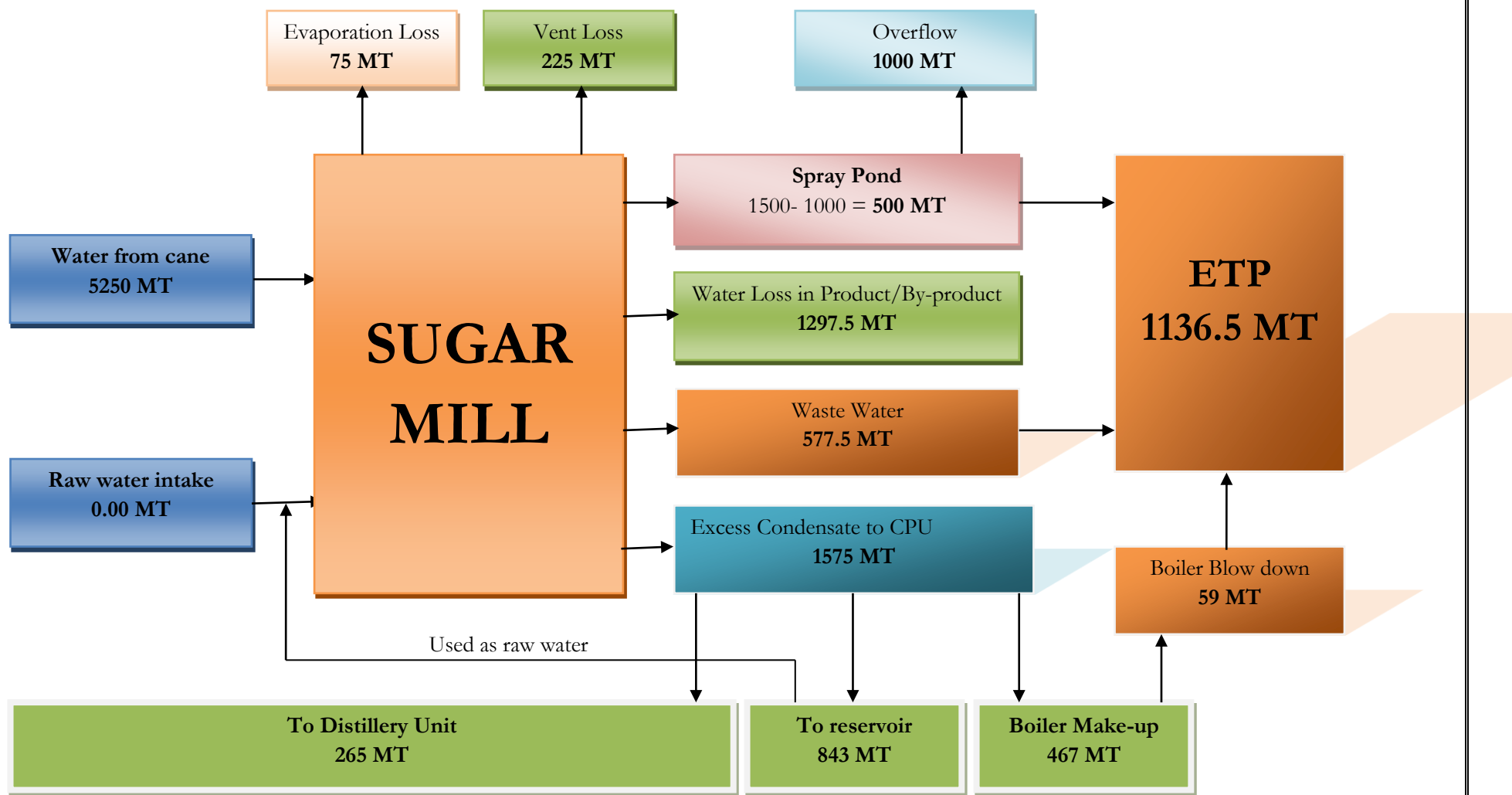


Figure-1 Water balance flow diagram for 7500 TCD Sugar unit

Table 8 Water Budget -Sugar and Co-generation Power Plant

Sr. No.	Station	Water consumption (CMD)			Losses (CMD)			Recycled water (CMD)			Effluent quantity (CMD)			Net water requirement (CMD)		
		Existing 4500 TCD +14.75 MW	Proposed 3000 TCD +14.75 MW	Total 7500 TCD+ 29.5 MW	E 4500 TCD+ +14.75 MW	P 3000 TCD+ +14.75 MW	T 7500 TCD + 29.5 MW	E 4500 TCD+ +14.75 MW	P 3000 TCD+ +14.75 MW	T 7500 TCD + 29.5 MW	E 4500 TCD+ +14.75 MW	P 3000 TCD+ +14.75 MW	T 7500 TCD + 29.5 MW	E 4500 TCD+ +14.75 MW	P 3000 TCD+ +14.75 MW	T 7500 TCD+ 29.5 MW
1	Domestic	50	20	70	10	4	14	0	0	0	40	16	56	50	20	70
2	Cooling	200	150	350	150	110	260	40	35	75	10	5	15	160	115	275
3	Process water	310	210	520	3	2	5	0	0	0	307	208	515	310	210	520
4	Floor washing	29	19	48	0.3	0.2	0.5	0	0	0	28.7	18.8	47.5	29	19	48
5	Boiler 110 TPH	2640	0	2640	264	0	264	2338	0	2338	38	0	38	302	0	302
	Boiler 60 TPH	0	1440	1440	0	144	144	0	1275	1275	0	21	21	0	165	165
6	Spray pond water	0	0	0	600	400	1000	0	0	0	300	200	500	0	0	0
7	Excess Condensates	0	0	0	0	0	0	945	630	1575	0	0	0	0	0	-1575
Total	Domestic	50	20	70	10	4	14	0	0	0	40	16	56	50	20	70
	Industrial	3179	1819	4998	1017.3	656.2	1673.5	3323	1940	5263	683.7	452.8	1136.5	801	509	-265

Remark: The industry will draw **70 CMD** of water from AMBADI DAM for Domestic use.

Net Water requirement: 4998 – 5263 = -265 CMD

1310 CMD of excess condensates is being recycled into the process and boiler make up water. Remaining **265 CMD** treated excess condensates shall be used for greenbelt development.

Distillery division

Table 9 Water consumption details for various raw materials

Sr. No.	Propose	Water consumption (CMD)			
		C Molasses	B heavy molasses	Sugarcane juice/ syrup	Grains
Domestic					
1	Domestic	5	5	5	5
Industrial					
1	Process	1350	1050	576	783
2	Boiler make up	87	87	87	87
3	Cooling tower makeup	200	200	200	200
4	Washings	35	35	35	35
	Total	1672	1372	898	1105

Table 10 Wastewater generation details for various raw materials

Sr. No.	Propose	Wastewater Generation (CMD)				Remarks
		C Molasses	B heavy molasses	Sugarcane juice/ syrup	Grains	
Domestic						
1	Domestic	4	4	4	4	To Septic tank followed by soak pit
Industrial						
1	Process					
a	Concentrated Spentwash	280	204	65	84- DDGS for Cattle feed	To 30 TPH Incinerator boiler
b	Spentlees	225	225	225	0	To CPU
c	MEE Condensates	975	670	587	694	To CPU
2	Boiler blow down	15	15	15	15	To CPU
3	Cooling tower blow down	15	15	15	15	To CPU
4	Washings	35	35	35	35	To CPU
	Total	1545	1164	942	843	

Table 11 Treated effluent recycled from ZLD System for various raw materials

Sr. No.	Propose	Wastewater Generation (CMD)				Remarks
		C Molasses	B heavy molasses	Sugarcane juice/ syrup	Grains	
1	Treated effluent recycled from CPU	1265	960	877	759	None

Table 12 Net freshwater requirement for various raw materials

Sr. No.	Propose	Wastewater Generation (CMD)			
		C Molasses	B heavy molasses	Sugarcane juice/ syrup	Grains
Industrial					
1	Total water consumption including domestic	1677	1377	903	1110
2	Treated effluent recycled from CPU	1265	960	877	759
	Net fresh water requirement	412	471	26	351

E) Wastewater generation and its treatment technology

Sugar and Co-generation power plant

Table 13 Details of effluent generation, treatment scheme and disposal arrangement for sugar unit and co-generation power plant

Sr. No.	Description	Quantity CMD	Treatment technology and disposal
1	Sugar factory trade effluent	562.5	Treated in Sugar ETP based on primary and secondary treatment and disposed on land for irrigation
2	Co-generation Power plant effluent	74	Treated along with sugar factory effluent based on primary and secondary treatment and disposed on land for irrigation
3	Excess Condensates	1575	Treated in condensate polishing unit based on primary, secondary and tertiary treatment and reused as process water or utilities
4	Spray pond overflow	500	Treated in ETP after primary treatment as sedimentation
5	Domestic effluent	56	Septic tank followed by soak pit and disposed on land for gardening

Distillery unit

The industry shall adopt Zero Liquid Discharge System for the treatment of wastewater generated from the proposed distillery unit. The effluent streams are separated into strong stream (Spent wash) and weak stream (Spent lees, Utilities process condensates etc). The raw spent wash is treated based on Concentration and Incineration principles.

a) C Molasses as raw material:

The raw spent wash (1255 CMD) shall be concentrated in MEE (280 CMD (372 MT)). The evaporator condensates (975 CMD) shall be treated in proposed condensate polishing unit based on primary, secondary and tertiary treatment along with other dilute effluent streams (Spentlees-225 CMD, Boiler blow down of 15 CMD, Cooling tower blow down of 15 CMD, and Fermenter washings of 35 CMD totaling to 290 CMD) and recycled back as process water.

b) B' Heavy Molasses as raw material:

The raw spent wash (874 CMD) shall be concentrated in MEE (204 CMD (271 MT)). The evaporator condensates (670 CMD) shall be treated in proposed condensate polishing unit based on primary, secondary and tertiary treatment along with other dilute effluent streams and recycled back as process water.

c) Sugarcane Juice/ Syrup as raw material:

The raw spent wash (652 CMD) shall be concentrated in MEE (65 CMD (86 MT)). The evaporator condensates (587 CMD) shall be treated in proposed condensate polishing unit based on primary, secondary and tertiary treatment along with other dilute effluent streams and recycled back as process water.

d) Grain as raw material:

Spent wash which comes out from Analyser column contains 6 – 7 % solids (978 CMD). It is passed through Decanter centrifuge to separate the suspended solids present in spent wash. The part of suspended

solids separated out containing 70 % moisture is termed as wet cake or DWGS (Distillers Wet Grain Solubles) (207 CMD) DWGS directly may be used as cattle feed or it can be dried to convert in to DDGS.

After separation of suspended solids from spent wash the supernatant obtained from decanter is termed as thin slope (571 CMD). Thin slope containing solids approximate 2.5 % is send to multiple effect evaporators to enhance the concentration up to 32 – 35%. (Concentrated Slop- 47 CMD)

The thin slope is being concentrated up to 32 -35 % solids termed as thick syrup (47 CMD) is mixed with DWGS (207 CMD) and send to Dryer for producing DDGS.

Process condensate obtained from MEE (524 CMD) and DDGS (170 CMD) is treated in proposed condensate polishing unit based on primary, secondary and tertiary treatment along with other dilute effluent streams and recycled back as process water. The Total DDGS (84 CMD) shall be utilized for cattle feed

F) Air Emission Management

Table 14 Details of boilers and its APC equipment for existing as well as proposed

Sr. No.	Stack Attached to	Type of Fuel	Height in meters	APC Equipment
1	1*110 TPH boiler	Bagasse	72	ESP
	1* 60 TPH Boiler	Bagasse		
2	1*30 TPH Incinerator boiler	Concentrated spent wash + Bagasse/ Coal	100	ESP
3	DG Set	HSD	6	

G) Solid waste Management

a) Non Hazardous solid wastes details

Table 15 Details of non-hazardous waste generated and its disposal

Sr. No.	Description of waste	Quantity	Mode of Collection and Disposal
1.	Fly/ Boiler Ash	22.70 MT/D	All the solid wastes are mixed with press mud and sold as manure
2.	ETP Sludge	200 MT/A	
3.	Press mud	300 MT/D	
4.	Incinerator boiler Ash	69.5 MT/D	Sold as potash rich manure to farmers
Other Solid Wastes			
1.	Paper waste	0.01 MT/M	Manually collected and stored in a designated area and sold to scrap vendors
2.	Plastic waste	0.01 MT/M	
3.	Municipal Solid waste		
	Non-Biodegradable	7 MT/M	Manually collected and sold to scrap vendors
	Bio-degradable	10 MT/M	Used in Composting

b. Hazardous Waste

Table 16 Details of hazardous waste generated and its disposal

Sr. No.	Category	Description of waste	Quantity	Mode of Collection and Disposal
1.	5.1	Used Oil	1.5 KLA	Shall be collected in Leak Proof Containers and utilized as lubricant for bullock carts.

3.0 BASELINE ENVIRONMENTAL STATUS

3.1 AIR ENVIRONMENT

3.1.1 Meteorological characteristics of the study area

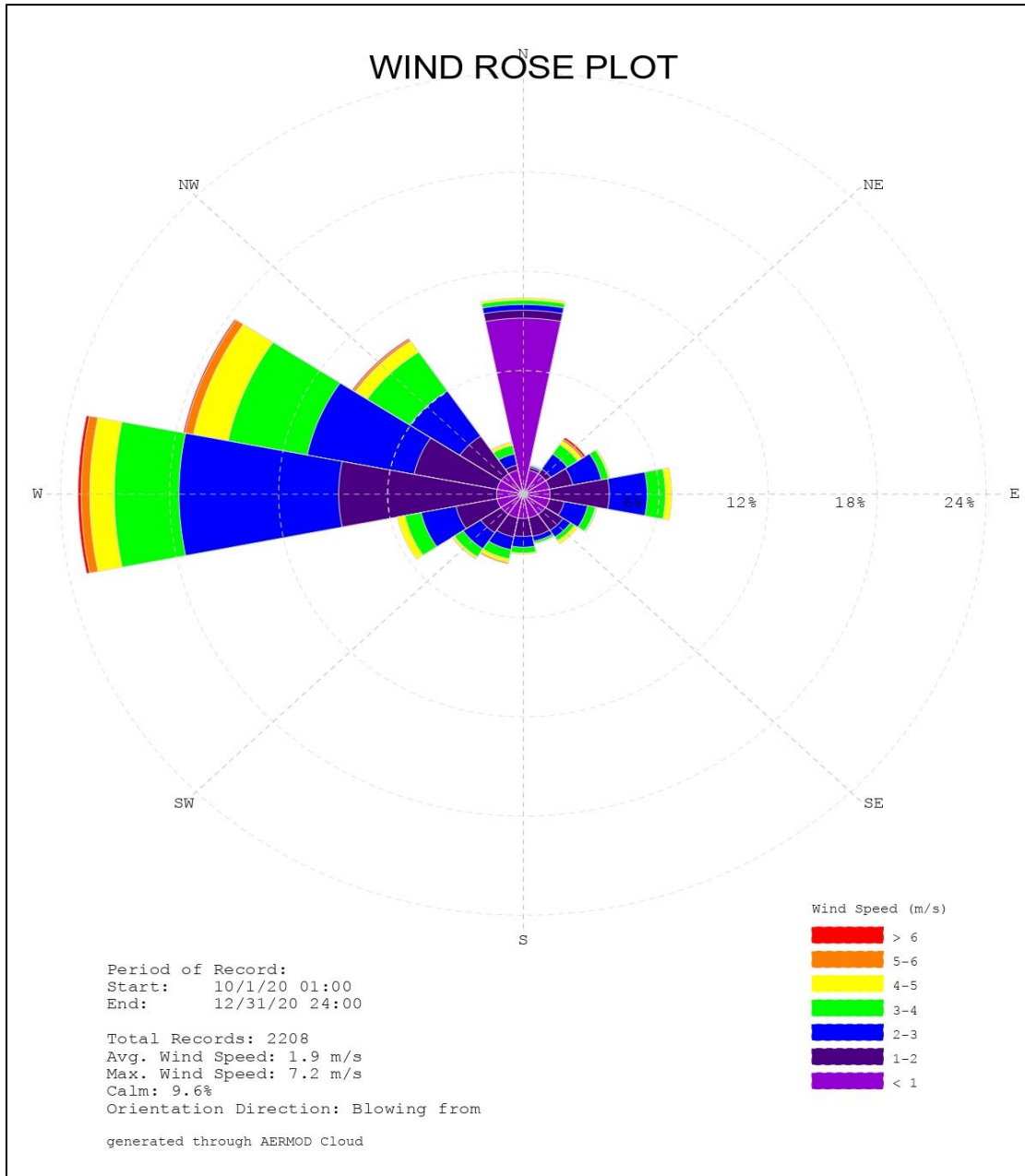


Figure-2 Windrose diagram for the study area (blowing from)

From **Figure 3.11** it can be seen that the Average wind speed of the study period is 1.9 m/s. and the predominant wind direction is from Northwest to Southeast direction. This has been used in selecting the receptors. A maximum number of receptors are in Southeast direction, which is opposite to predominant wind direction.

Table 17 Receptor summary

Sr. No.	Symbol	Description	Latitude	Longitude
1	AAQ-1	Near main gate	20°14'46.44"N	75° 7'52.73"E
2	AAQ-2	Near ETP	20°14'34.44"N	75° 7'44.03"E
3	AAQ-3	Near Balaji nagar, Kannad	20°15'42.30"N	75° 8'7.37"E
4	AAQ-4	Near Kunjkheda	20°14'37.19"N	75°11'18.67"E
5	AAQ-5	Near bahirgaon	20°13'52.66"N	75° 9'34.29"E
6	AAQ-6	Near Bhakangaon	20°12'11.60"N	75°10'34.51"E
7	AAQ-7	Near Rail Nawadi	20°14'23.51"N	75° 5'56.09"E
8	AAQ-8	Near Rail	20°15'1.36"N	75° 6'47.37"E
9	AAQ-9	Near Andhaner	20°16'26.04"N	75° 6'4.28"E

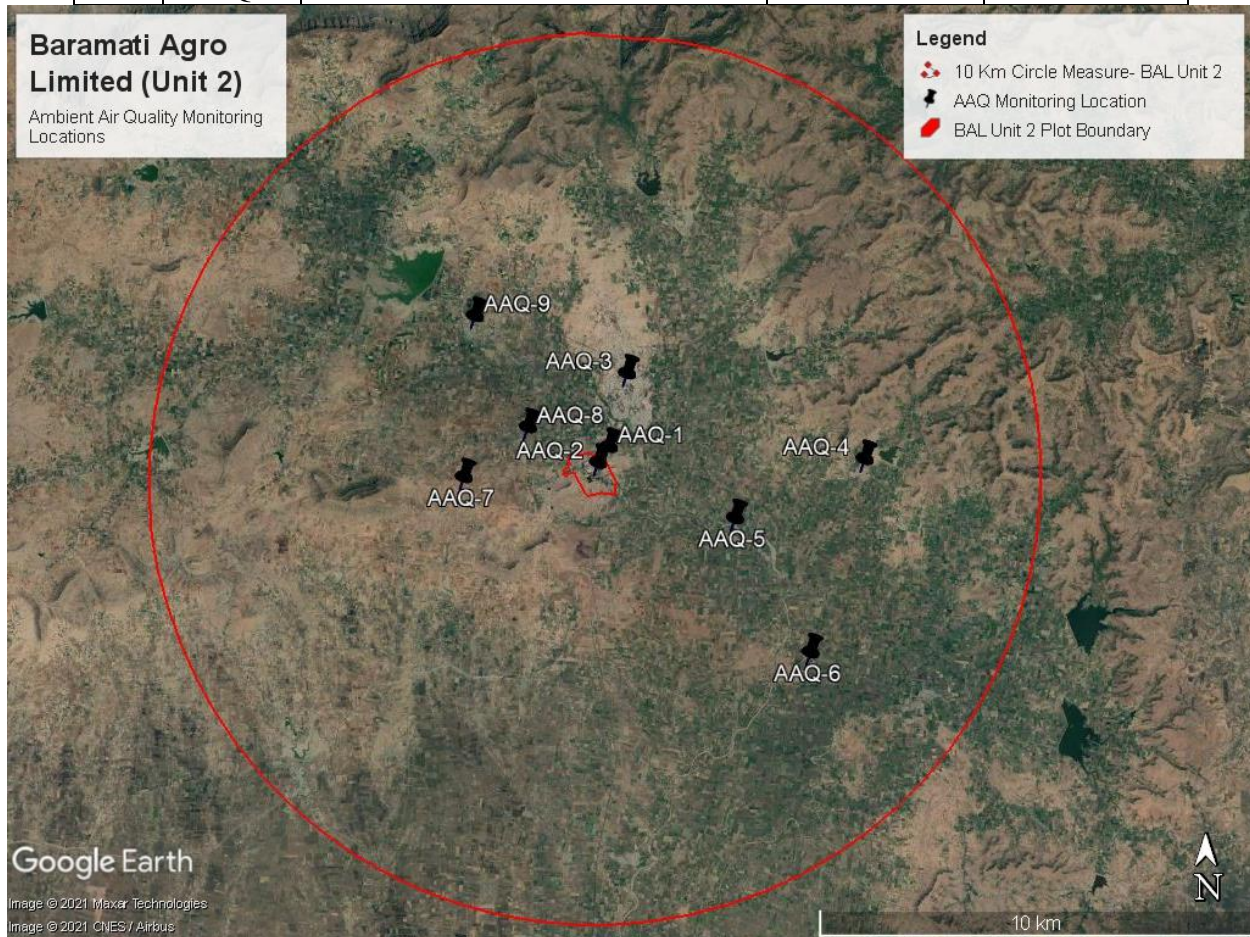


Figure-3 10 km. radius study area map indicating Ambient air quality monitoring locations

Table 18 Ambient air quality monitoring results

Sr. No.	Description of Receptor	Receptor/ Village		Concentration				
				PM ₁₀	PM _{2.5}	SO ₂	NO _x	CO
				µg/m ³	µg/m ³	µg/m ³	µg/m ³	mg/m ³
1	AAQ -1	Near main gate	Maximum	79.80	40.15	11.48	21.37	0.095
			Minimum	65.32	33.14	8.12	15.24	0.070
			Average	72.94	36.57	9.89	17.78	0.081
			Percentile 98%	79.74	40.03	11.45	21.15	0.093
2	AAQ -2	Near ETP	Maximum	78.96	40.81	11.75	20.98	0.095
			Minimum	65.20	32.10	8.15	15.06	0.071
			Average	71.97	36.03	9.97	18.16	0.082
			Percentile 98%	78.63	40.52	11.70	20.92	0.094
3	AAQ -3	Near Balaji nagar, Kannad	Maximum	61.48	37.85	11.95	20.89	0.095
			Minimum	55.42	24.48	8.36	15.27	0.074
			Average	58.61	31.57	9.56	17.91	0.083
			Percentile 98%	61.32	37.68	11.95	20.66	0.095
4	AAQ -4	Near Kunjkheda	Maximum	62.45	38.89	11.41	20.69	0.093
			Minimum	55.53	25.90	8.10	15.47	0.070
			Average	59.22	31.62	9.62	18.04	0.082
			Percentile 98%	62.39	38.33	11.31	20.51	0.093
5	AAQ -5	Near bahirgaon	Maximum	62.63	39.19	11.45	20.89	0.094
			Minimum	55.29	26.36	7.98	15.20	0.073
			Average	58.43	30.96	9.66	17.98	0.083
			Percentile 98%	62.17	37.82	11.33	20.77	0.094
6	AAQ -6	Near Bhakangaon	Maximum	62.68	37.85	11.48	20.78	0.093
			Minimum	55.68	25.86	8.06	13.54	0.072
			Average	59.42	31.96	9.75	17.45	0.083
			Percentile 98%	62.59	37.72	11.47	20.49	0.092
7	AAQ -7	Near Rail Nawadi	Maximum	61.78	36.52	11.58	20.43	0.093
			Minimum	55.69	29.21	8.28	15.28	0.072
			Average	58.68	32.27	9.72	18.10	0.082
			Percentile 98%	61.55	36.40	11.49	20.26	0.092
8	AAQ -8	Near Rail	Maximum	62.68	36.75	11.48	20.56	0.127
			Minimum	55.71	27.02	8.06	15.23	0.074
			Average	58.99	31.94	9.77	17.98	0.089
			Percentile 98%	62.54	36.52	11.42	20.37	0.121
9	AAQ -9	Near Andhaner	Maximum	62.84	35.14	11.41	20.21	0.106
			Minimum	55.69	26.46	8.12	15.20	0.069
			Average	59.83	31.10	9.80	17.84	0.083
			Percentile 98%	62.82	34.45	11.34	20.15	0.104
NAAQ Standards				100	60	80	80	2

3.1.1 IMPACT ON AIR QUALITY DUE TO PROPOSED ACTIVITY

Table 19 Details of the incremental concentrations due to proposed expansion

Sr No.	Receptor/Village	PM10- 24 hour concentration (µg/m3)			PM2.5- 24 hour concentration (µg/m3)			SO ₂ - 24 hour concentration (µg/m3)			NO _x - 24 hour concentration (µg/m3)		
		Background	Incremental	Total	Background	Incremental	Total	Background	Incremental	Total	Background	Incremental	Total
1	Near main gate	79.80	0.0	79.8	40.15	0.0	40.15	11.48	0.0	11.48	21.37	0.0	21.37
2	Near ETP	78.96	0.0	78.96	40.81	0.0	40.81	11.75	0.0	11.75	20.98	0.0	20.98
3	Near Balaji nagar, Kannad	61.48	0.0	61.48	37.85	0.0	37.85	11.95	0.0001	11.9501	20.89	0.0001	20.8901
4	Near Kunjkheda	62.45	0.0431	62.4931	38.89	0.0237	38.9137	11.41	0.1449	11.5549	20.69	0.1359	20.8259
5	Near bahirgaon	62.63	0.022	62.652	39.19	0.0147	39.2047	11.45	0.0741	11.5241	20.89	0.0694	20.9594
6	Near Bhakangaon	62.68	0.0009	62.6809	37.85	0.0006	37.8506	11.48	0.0031	11.4831	20.78	0.0029	20.7829
7	Near Rail Nawadi	61.78	0.0001	61.7801	36.52	0.0	36.52	11.58	0.0002	11.5802	20.43	0.0002	20.4302
8	Near Rail	62.68	0.0	62.68	36.75	0.0	36.75	11.48	0.0	11.48	20.56	0.0	20.56
9	Near Andhaner	62.84	0.0001	62.8401	35.14	0.0	35.14	11.41	0.0002	11.4102	20.21	0.0002	20.2102

3.2 WATER ENVIRONMENT

The unit is located at Mahatma Phule Nagar, Taluka Kannad, District Aurangabad, Maharashtra. Majority of the study area (10 km around site) is under agriculture land use. The industry is lifting fresh water from Ambadi Dam which is 7 km away from the industry. The permission is already available with the industry from respective authorities.

Ambadi Dam and Shivana River are main source of water for agriculture use. Shivana River is flowing at 1.5 km towards east from the project site .Groundwater is used as an alternate source in surrounding villages for domestic and drinking purposes. Therefore it is important to assess the existing baseline status of both ground water quality and surface water quality within the study area.

3.2.1 Ground water

Table 20 Details of the ground water quality monitoring sampling locations

Sr. No.	Symbol	Description	Latitude	Longitude
1	GW-1	Borewell near Kankawatinagar	20°14'54.00"N	75° 7'56.97"E
2	GW -2	Borewell near Kannad-Balaji Nagar	20°15'48.29"N	75° 7'59.21"E
3	GW -3	Well near Rithi	20°15'23.28"N	75° 9'56.83"E
4	GW -4	Well near Narsingpur	20°16'17.16"N	75° 9'5.65"E
5	GW -5	Well near Langda Tanda	20°18'19.18"N	75° 4'58.32"E
6	GW -6	Well near Rail Nawadi	20°14'23.61"N	75° 6'0.48"E
7	GW -7	Well near bahirgaon	20°13'43.42"N	75° 9'33.64"E
8	GW -8	Well near Shirsgaon	20°12'15.30"N	75° 5'22.01"E

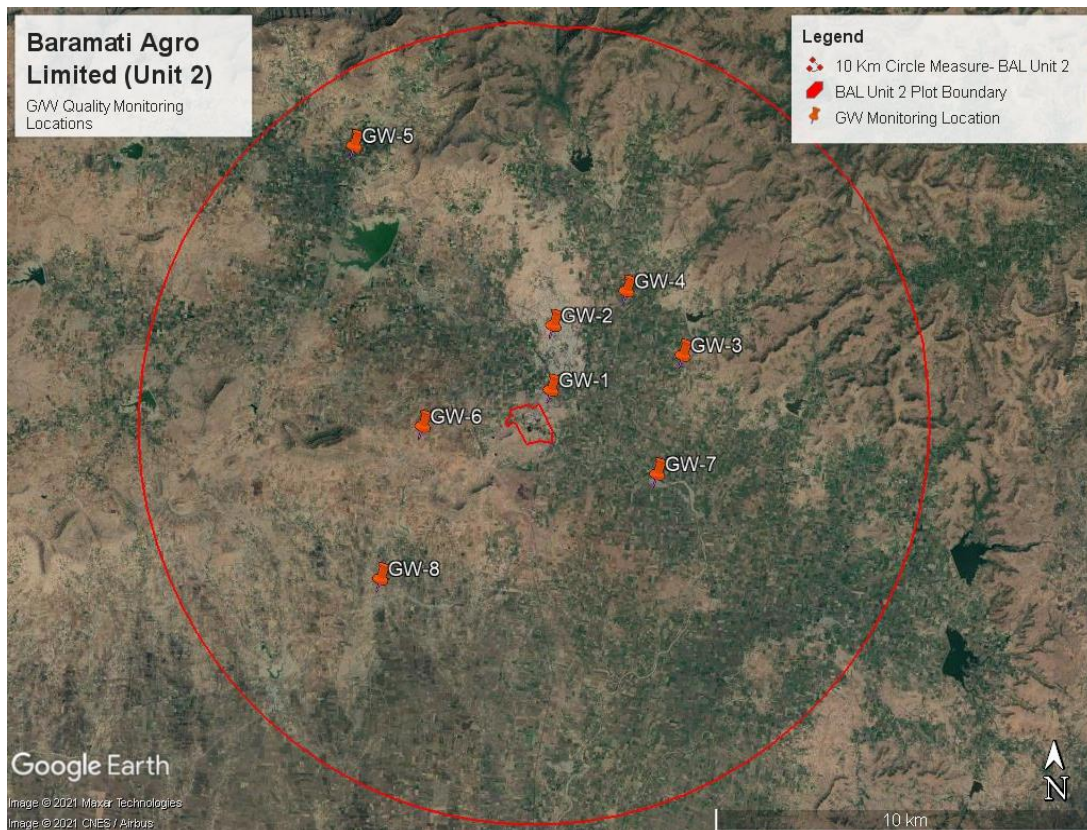


Figure 4 10 km. radius study area map indicating groundwater sampling location

Table 21 Groundwater analysis report within 10 km radius of the study area

Sr. No	Description	Unit	Results								Desirable	Permissible
			GW-1	GW-2	GW-3	GW-4	GW-5	GW-6	GW-7	GW-8	IS 10500:2012 Standards	
1	pH	---	6.94	6.92	6.96	6.8	6.58	6.75	6.26	6.14	6.5-8.5	No relaxation
2	Temperature	°C	26	26.4	26	26	26	26	26	26	Not Specified	
3	Turbidity	NTU	1.3	1.26	1.6	1.5	1.47	1.5	1.5	1.3	1	5
4	Electrical Conductivity	mS/cm	0.580	0.619	0.599	0.636	0.542	0.568	0.583	0.606	Not Specified	
5	Total Dissolved Solids	mg/lit	362	387	374	398	339	355	364	379	500	2000
6	Total Suspended Solids	mg/lit	3	5	5	4	3	5	3	4	Not Specified	
7	Salinity	ppt	1.6	1.5	2	1.8	1.3	1.5	1.2	1.6	Not Specified	
8	Chemical Oxygen Demand	mg/lit	9	12	8	7	8	8	8	9	Not Specified	
9	Biochemical Oxygen Demand @ 27°C for 3 days	mg/lit	3	5	4	3	4	3	3	3	Not Specified	
10	Chlorides as Cl-	mg/lit	112	118	125	100	88	123	114	131	250	1000
11	Sulphates as SO ₄ --	mg/lit	39	37	48	50	45	41	43	42	200	400
12	Fluoride as F ⁻	mg/lit	0.55	0.4	0.65	0.5	0.62	0.6	0.54	0.58	1	1.5
13	Total Alkalinity as CaCO ₃	mg/lit	152	158	160	168	153	120	147	155	200	600
14	Nitrate as NO ₃	mg/lit	1.7	1.2	1.8	1.6	1.6	1.6	1.6	1.5	45	No relaxation
15	Nitrite as NO ₂	mg/lit	0.04	0.05	0.09	0.12	0.1	0.14	0.1	0.12	Not Specified	
16	Ammonia as N	mg/lit	0.35	0.16	0.25	0.22	0.23	0.25	0.22	0.28	0.5	No Relaxation
17	Total Phosphate as PO ₄	mg/lit	0.19	0.18	0.12	0.18	0.15	0.16	0.18	0.15	Not Specified	

Sr. No	Description	Unit	Results								Desirable	Permissible
			GW-1	GW-2	GW-3	GW-4	GW-5	GW-6	GW-7	GW-8	IS 10500:2012 Standards	
18	Calcium as Ca	mg/lit	40	48	34	55	42	38	36	38	75	200
19	Magnesium as Mg	mg/lit	27	37	18	39	19	28	30	22	30	100
20	Total Hardness as CaCO ₃	mg/lit	213	274	160	300	184	212	215	187	200	600
21	Sodium as Na	mg/lit	29	21	22	21.5	24.23	27.15	28.12	30	Not Specified	
22	Iron as Fe	mg/lit	0.18	0.19	0.17	0.15	0.18	0.15	0.12	0.14	0.3	No Relaxation
23	Copper as Cu	mg/lit	0.03	0.06	0.04	0.05	0.06	0.07	0.08	0.06	0.05	1.5
24	Total Chromium as Cr	mg/lit	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	0.05	No Relaxation
25	Chromium as Cr+6	mg/lit	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	0.10	No Relaxation
26	Nickel as Ni	mg/lit	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	0.02	No relaxation
27	Cadmium as Cd	mg/lit	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	0.003	No relaxation
28	Mercury as Hg	mg/lit	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	0.001	No Relaxation
29	Arsenic as As	mg/lit	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	0.01	0.05
30	Cyanide as Cn	mg/lit	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	0.05	No Relaxation
31	Lead as Pb	mg/lit	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	0.01	No Relaxation
32	Zinc as Zn	mg/lit	0.03	0.05	0.05	0.04	0.03	0.04	0.05	0.05	5	15
33	Total Coliform	Org/m l	3	3	4	6	4	17	8	12	No Relaxation	
34	Fecal Coliform	Org/m l	Present	Present	Present	Present	Present	Present	Present	Present	No Relaxation	

3.2.2 Surface water

Table 22 Details of surface water quality monitoring locations

Sr. No.	Symbol	Description	Latitude	Longitude
1	SW-1	Ambadi Dam	20°16'56.50"N	75° 5'14.68"E
2	SW -2	Shivana River U/S of Kannad	20°16'8.56"N	75° 7'22.30"E
3	SW -3	Shivana River D/S of Kannad	20°14'47.80"N	75° 8'19.49"E
4	SW -4	Shivana River U/S of Bahirgaon	20°13'50.01"N	75° 9'15.32"E
5	SW -5	Shivana River D/S of Bahirgaon	20°13'10.58"N	75°10'24.96"E
6	SW -6	Shivana River near Hatnur	20°10'13.14"N	75° 8'42.67"E
7	SW -7	Lake near Rithi	20°16'2.62"N	75°10'8.26"E
8	SW-8	Satkunda Talav	20°18'51.84"N	75° 5'39.00"E

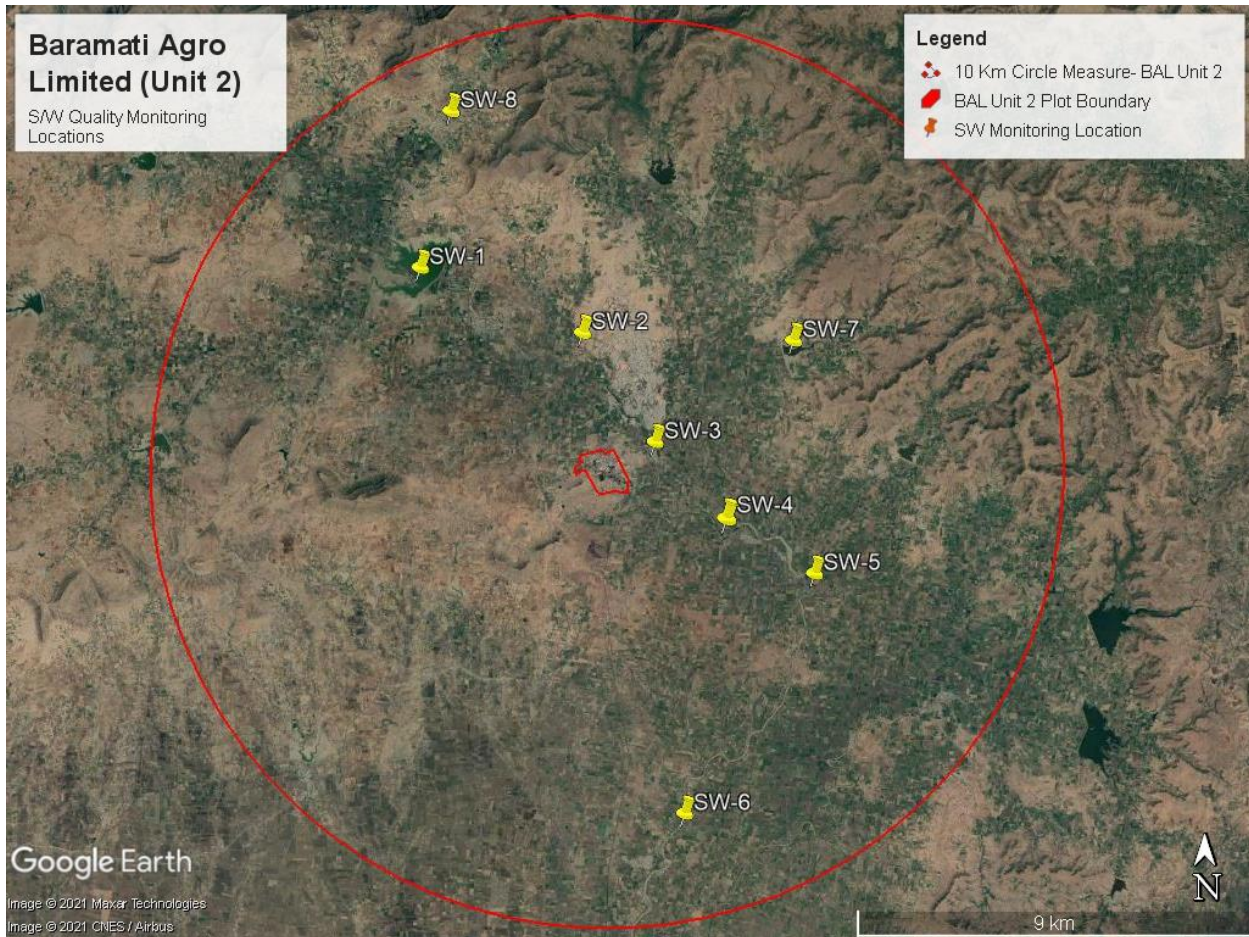


Figure 5 10 km. radius study area map indicating surface water sampling location

Table 23 Surface water analysis report within 10 km radius of the study area

Sr No	Description	Unit	Results								Desirable	Permissible
			SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	SW-7	SW-8	IS 10500:2012 Standards	
1	pH	---	7.24	7.18	7.63	7.35	7.63	7.14	7.1	7.1	6.5-8.5	No relaxation
2	Temperature	°C	28	27	27	27	27.4	27	27	27	Not Specified	
3	Turbidity	NTU	0.6	1.2	1.4	1.3	1.6	1.35	1.4	1.4	1	5
4	Electrical Conductivity	mS/cm	0.451	0.476	0.516	0.544	0.586	0.608	0.454	0.426	Not Specified	
5	Total Dissolved Solids	mg/lit	282	297	322	340	366	380	284	266	500	2000
6	Total Suspended Solids	mg/lit	8	6	18	6	6	8	10	10	Not Specified	
7	Salinity	ppt	30	4.5	5.1	4.3	4.4	4.5	4.4	4.4	Not Specified	
8	Dissolved Oxygen	mg/lit	4.8	5.5	5.4	5.3	5.2	5.4	4.7	4.6		
9	Chemical Oxygen Demand	mg/lit	26	32	40	38	42	48	28	25	Not Specified	
10	Biochemical Oxygen Demand @ 27°C for 3 days	mg/lit	10	14	18	19	20	21	12	15	Not Specified	
11	Chlorides as Cl-	mg/lit	68	72	82	94	96	104	80	78	250	1000
12	Sulphates as SO ₄ --	mg/lit	28	34	40	42	55	60	38	35	200	400
13	Fluoride as F ⁻	mg/lit	0	0.56	0.57	0.4	0.5	0.4	0	0	1	1.5
14	Total Alkalinity as CaCO ₃	mg/lit	120	132	134	145	151	154	112	95	200	600
15	Nitrate as NO ₃	mg/lit	3.2	3.4	5.2	4.2	6.2	6.8	3.1	1.9	45	No relaxation
16	Nitrite	mg/lit	1.33	0.02	0.18	0.03	0.65	0.02	0.02	0.02	Not Specified	
17	Ammonia as N	mg/lit	0.1	0.22	0.6	0.21	0.19	0.24	0.2	0.2	0.5	No Relaxation
18	Total Phosphate as PO ₄	mg/lit	0.21	0.05	0.18	0.03	0.09	0.05	0.06	0.06	Not Specified	

Sr No	Description	Unit	Results								Desirable	Permissible
			SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	SW-7	SW-8	IS 10500:2012 Standards	
19	Calcium as Ca	mg/lit	22	28	30	32	35	37	24	20	75	200
20	Magnesium as Mg	mg/lit	18	20	21	20	22	19	11	14	30	100
21	Total Hardness as CaCO ₃	mg/lit	130	153	163	163	179	172	106	108	200	600
22	Sodium as Na	%	9.32	0.04	2.13	0.02	0.05	0.02	0.04	0.04	Not Specified	
23	Iron as Fe	mg/lit	NIL	NIL	NIL	NIL	0.2	NIL	NIL	NIL	0.3	No Relaxation
24	Copper as Cu	mg/lit	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	0.05	1.5
25	Total Chromium as Cr	mg/lit	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	0.05	No Relaxation
26	Chromium as Cr+6	mg/lit	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	0.10	No Relaxation
27	Nickel as Ni	mg/lit	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	0.02	No relaxation
28	Cadmium as Cd	mg/lit	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	0.003	No relaxation
29	Mercury as Hg	mg/lit	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	0.001	No Relaxation
30	Arsenic as Ar	mg/lit	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	0.01	0.05
31	Cyanide as CN	mg/lit	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	0.05	No Relaxation
32	Lead as Pb	mg/lit	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	0.01	No Relaxation
33	Zinc as Zn	mg/lit	NIL	NIL	NIL	NIL	0.03	NIL	NIL	NIL	5	15
34	Total Coliform	Org/ml	34	18	21	27	27	43	29	11	No Relaxation	
35	Fecal Coliform	Org/ml	Present	Present	Present	Present	Present	Present	Present	Present	No Relaxation	

Note:

Remark: -Surface water quality is found to be good, which can be directly used for irrigation purpose. However, for drinking purpose, conventional treatment suggested.

Summary of the groundwater and surface water quality monitoring results

Table 24 Water Analysis Results

Sr. No	Parameters	Ground water		Surface water	
		Min	Max	Min	Max
1.	pH	6.14	6.96	7.10	7.63
2.	Total Dissolved Solids (mg/l)	39	398	266	380
3.	Total Hardness (mg/l)	160	300	106	179
4.	Chlorides (mg/l)	88	131	68	104
5.	Fluoride (mg/l)	0.4	0.65	0	0.57
6.	Sulphates (mg/l)	37	50	28	60

3.3 SOIL ENVIRONMENT

Table 25 Details of the soil sampling locations

Sr. No.	Symbol	Description	Latitude	Longitude
1	S-1	Near Water storage reservoir	20°14'28.72"N	75° 7'42.99"E
2	S-2	Near Kankawatinagar	20°14'53.82"N	75° 7'55.89"E
3	S-3	Near Kannad	20°15'56.71"N	75° 7'39.17"E
4	S-4	Near Rithi	20°15'48.79"N	75°10'15.85"E
5	S-5	Near Rail Nawadi	20°14'29.01"N	75° 6'3.06"E
6	S-6	Near Palasgaon	20°12'36.35"N	75° 5'57.13"E
7	S-7	Near Bhokangaon	20°12'12.81"N	75°10'28.61"E
8	S-8	Near hatnur	20° 9'56.90"N	75° 8'0.73"E

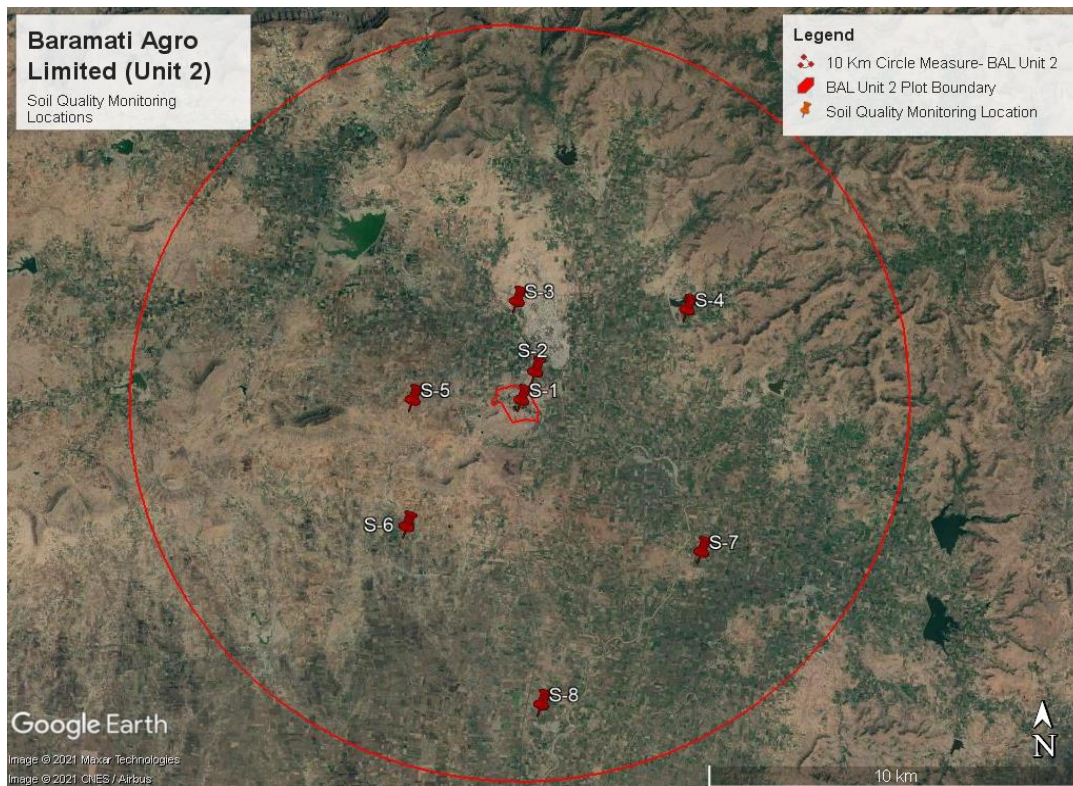


Figure 6 10 km. radius study area map indicating soil sampling location

Table 26 Soil Analysis report within 10 km radius of the study area

Sr. No.	Description	Unit	RESULT								Standard as per Ministry of Agriculture 2011
			S-1	S-2	S-3	S-4	S-5	S-6	S-7	S-8	
01	pH @ 25 °C	---	7.81	7.14	7.44	7.44	7.14	7.30	7.59	7.42	< 8.5
02	Electric Conductance	mS/cm	0.546	0.574	0.560	0.62	0.65	0.42	0.514	0.580	0.15 – 0.65
03	Colour		Black	Black	Black	Black	Black	Black	Black	Black	Ministry of Agriculture 2011
04	Texture	---									Not Specified
04A	Clay	%	53.00	57.00	48.00	33.00	35.00	37.00	48.00	42.00	Not Specified
04B	Sand	%	30.00	38.00	26.00	45.00	40.00	46.00	32.00	33.00	Not Specified
04C	Silt	%	17.00	5.00	26.00	22.00	25.00	17.00	20.00	21.00	Not Specified
05	Organic Matter	%	0.50	0.48	0.52	0.45	0.51	0.60	0.58	0.57	0.5 – 0.75
06	Bulk Density	g/cm ³	1.22	1.55	1.45	1.35	1.20	1.20	1.15	1.10	Not Specified
07	Porosity	%	50.00	48.00	54.00	46.00	42.00	52.00	46.00	40.00	Not Specified
08	Permeability	%	32.00	33.00	34.00	32.00	38.00	40.00	38.00	34.00	Not Specified
09	Water Holding Capacity	%	42.00	40.00	42.00	54.00	53.00	58.00	49.00	46.00	Not Specified
10	Sodium Adsorption Ratio (SAR)	---	11.45	10.77	11.54	11.00	12.00	12.00	13.10	12.75	10-18
11	Total Nitrogen Content	kg/ha	312.00	320.00	328.00	275.00	271.00	293.00	302.00	312.00	280 - 560
12	Available Potassium	kg/ha	158.12	142.23	140.10	163.00	161.00	174.00	156.00	153.14	108-280
13	Available Sodium	mg/kg	92.10	88.12	81.53	124.78	124.26	110.80	98.75	92.55	Not Specified
14	Available Phosphorus as P	kg/ha	14.70	10.30	14.20	18.60	15.74	17.46	13.45	11.24	10- 24.60
15	Cation Exchange Capacity	meq/100gm	0.52	0.58	0.52	0.75	0.75	0.60	0.54	0.51	Not Specified
16	Iron as Fe	mg/kg	5.12	5.44	5.12	4.22	4.10	4.12	3.85	3.40	Not Specified
17	Nickel as Ni	mg/kg	2.30	2.65	2.47	3.35	3.15	3.40	2.65	2.82	Not Specified
18	Zinc as Zn	mg/kg	3.44	3.12	3.55	4.12	4.66	4.50	3.90	3.34	Not Specified
19	Copper as Cu	mg/kg	4.42	4.74	4.32	2.00	1.80	3.00	4.12	4.11	Not Specified

Summary of the results

The soil samples were collected at total eight locations within the study area.

- The finding of the study reveals that pH of soil in the area ranged between **7.14** to **7.81** which is an indicative of the **neutral** to slightly alkaline soil.
- The values for Nitrogen was found to be better to more than sufficient at all location ranging between **271** to **328 kg/ha**.
- The concentration of Phosphorous was found to be less at all the locations ranging between **11.24** to **18.60 kg/ha**.
- The concentration of organic carbon was found to be medium to on an average sufficient at all the locations ranging between 0.45 to 0.60%.
- It is important to note that the concentration of potassium was found to be less at all locations ranging between **140.10** to **174 kg/ha**. This indicates it is required to use potash rich fertilizers for agriculture purposes
- Based on the above findings it can be concluded that the soil samples can be classified as per soil classification given by Tondon H.L.S. (2005). The samples fall under **low to medium low** fertile soils.

3.4 NOISE ENVIRONMENT

Table 27 Details of noise quality monitoring locations

Sr. No.	Symbol	Description	Latitude	Longitude
1	N-1	Near main gate	20°14'46.44"N	75° 7'52.73"E
2	N-2	Near ETP	20°14'34.44"N	75° 7'44.03"E
3	N-3	Near Balaji nagar, Kannad	20°15'42.30"N	75° 8'7.37"E
4	N-4	Near Kunjkheda	20°14'37.19"N	75°11'18.67"E
5	N-5	Near bahirgaon	20°13'52.66"N	75° 9'34.29"E
6	N-6	Near Bhakangaon	20°12'11.60"N	75°10'34.51"E
7	N-7	Near Rail Nawadi	20°14'23.51"N	75° 5'56.09"E
8	N-8	Near Rail	20°15'1.36"N	75° 6'47.37"E
9	N-9	Near Andhaner	20°16'26.04"N	75° 6'4.28"E

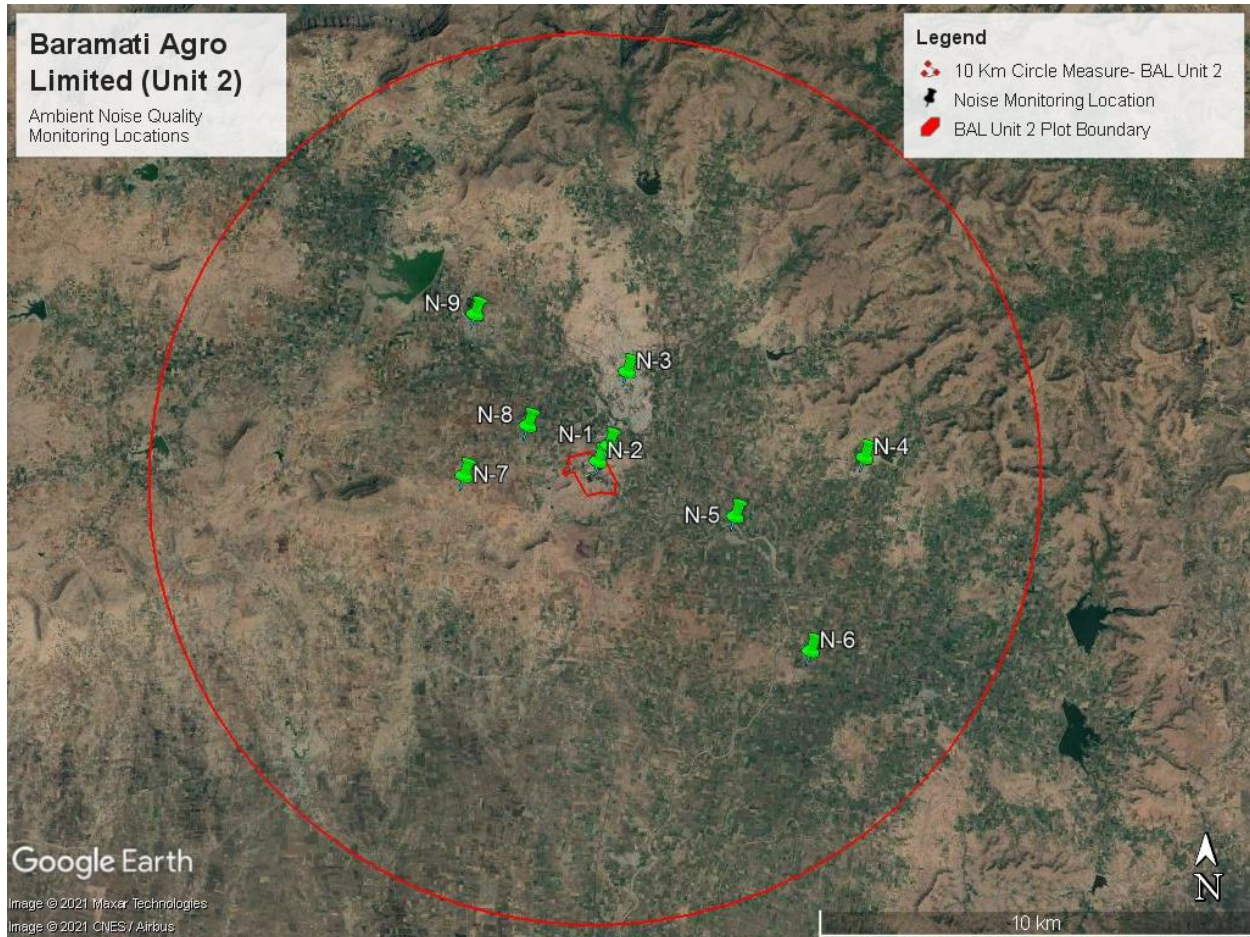


Figure 7 10 km. radius study area map indicating noise quality sampling location

Table 28 Noise levels of the study area

Sr No	Location	Category Of Area	(Leq dB(A)) Average		CPCB limit (Leq dB(A))	
			Day time	Night time	Day time	Night time
1	Near main gate	Industrial Area	69.6	66.96	75	70
2	Near ETP	Industrial Area	70.61	67.39	75	70
3	Near Balaji nagar, Kannad	Residential Area	52.54	40.50	55	45
4	Near Kunjkheda	Residential Area	53.29	41.13	55	45
5	Near bahirgaon	Residential Area	53.96	40.18	55	45
6	Near Bhakangaon	Residential Area	52.98	40.79	55	45
7	Near Rail Nawadi	Residential Area	53.71	41.38	55	45
8	Near Rail	Residential Area	52.41	40.24	55	45
9	Near Andhaner	Residential Area	53.72	40.65	55	45

Summary of the results

Daytime Noise Levels (Leq)_{day}

Industrial Zone: The day time noise level at the Project site was found in the range of 69.60 – 70.61 dB (A), which is well below the permissible limit of 75 dB (A).

Residential Zone: The daytime noise levels in all the residential locations were observed to be in the range of 52.41dB (A) to 53.96 dB (A).

Night time Noise Levels (Leq)_{night}

Industrial Zone: The night time noise level in the Project site was observed in the range of 66.96 – 67.39 dB (A), which is well below the permissible limit of 70 dB (A).

Residential Zone: The night time noise levels in all the residential locations were observed to be in the range of 40.18 dB (A) 41.38 dB (A)

The industry is making all efforts to control the noise levels within the limits by providing acoustic measures and silencer pads etc. all the employees in these work places **shall be** provided with ear plugs / muffs.

3.5 LAND USE/LAND COVER OF THE STUDY AREA

Table 29 Land use/ Land cover areas in km² around 10 km radius for project site

Sr No.	LULC Class	Area in Ha	Area in km ²	Percentage
1	Dense Vegetation	1271.54	12.72	3.61
2	Moderate Dense Vegetation	2494.58	24.95	7.08
3	Mixed Vegetation	377.69	3.78	1.07
4	Scrub Land	3797.51	37.98	10.78
5	Open Land	3812.11	38.12	10.82
6	Agriculture	11489.63	114.90	32.63
7	Fallow Land	10886.00	108.86	30.91
8	Industrial Area	70.43	0.70	0.20
9	Residential Area	245.61	2.46	0.70
10	Rural Area	31.10	0.31	0.09
11	Quarry/Mine	19.46	0.19	0.06
12	Reservoir/Ponds	554.38	5.54	1.57
13	Waterbody	167.22	1.67	0.47
	Total Area (in Ha)	35217.23	352.17	100.00

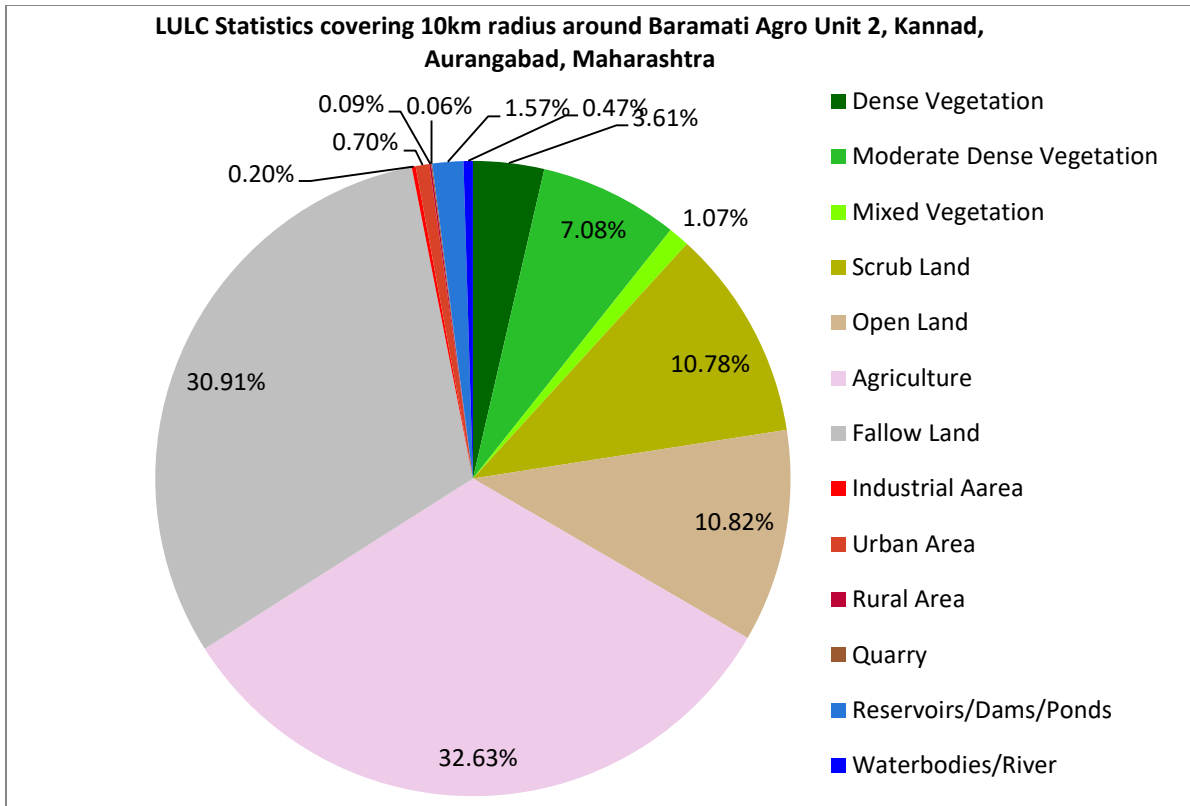


Figure 8 Pie chart of LULC classes around 10 km radius of Project site

4.0 IDENTIFICATION, PREDICTION AND MITIGATION MEASURES

The anticipated impacts during construction and operational phase due to the proposed activity on air, water, soil, noise, ecology and biodiversity, and socio-economic environment are assessed and mitigation measures to minimize the impacts on the same are suggested in Chapter 4 in this report.

5.0 ANALYSIS OF ALTERNATIVE (TECHNOLOGY AND SITE)

The technologies for the treatment and safe disposal of spent wash- most polluting element from distilleries and the site selection criteria are discussed in this chapter. Traditionally, the spent wash was used for irrigation of crops and for composting with press mud from sugar mills as filler material. At several places in the country, it used to be spread on land in an uncontrolled fashion, resulting in destruction of agricultural land and pollution of ground water. When it was not possible to use it on land, it was often discharged in surface waters affecting the riparian rights of other users of the water body. The new recommendations of CPCB/ MoEF & CC imposed a restriction on such utilization, of spent wash on agricultural land. Therefore, it has become necessary to look for technologies to reduce the volume and concentrate the spent wash, so that it can be handled effectively without damaging the environment.

This Industry has decided to undertake an “Alternative Analysis (AA)” for this project. The various alternatives are (1) Product (2) Raw materials, (3) Technology, Engineering & Hardware, (4) Site, and (5) Project

- Availability of raw material/fuel

- Proximity of molasses as a raw material and cost-effective transportation logistics
- Availability of water supply
- The availability of water from the source is adequate to meet the requirement of the proposed sugar & distillery expansion. For proposed project water will be sourced from Ujani dam
- Availability of infrastructural facility

Industrial infrastructural facilities such as roads, transport, security, water, power, administration etc. are available with existing factory. Community facilities such as quarters, medical services, education and training facility etc. are also available at site.

6.0 ENVIRONMENT MONITORING PROGRAMME

Table 30 Environment management programme

SR. NO	ITEM	PARAMETERS	FREQUENCY OF MONITORING	LOCATION
1.	Ambient Air quality at appropriate location for PM ₁₀ , PM _{2.5} , SO ₂ and NO _x ,	PM ₁₀ , PM _{2.5} , SO ₂ and NO _x	24 hourly, Quarterly	5 Locations 1 @ Upwind and 2 @ downwind directions from stack @ 120° to each other Near entry and exit gates
2.	Stationary Emission from Stack PM, SO ₂ , NO _x	PM, SO ₂ , NO _x	Monthly	1 DG set Stack, 2 Boiler Stack
3.	Water	Water quality parameters as per 10500:2012	Monthly	Drinking water locations
	Waste water quality (treated and Untreated)	pH, BOD, COD, TSS, Flow, TDS etc.	Monthly	ETP inlet and Outlet CPU Inlet and outlet Spentwash
4.	Noise	Day and Night levels Equivalent noise level- dB (A)	Quarterly or as often as required	6 Locations Upwind and downwind directions Near boilers and near main gate and ETP.
5.	Soil (Qualitative and quantitative testing/analysis to check the soil fertility,)	pH, Cation Exchange Capacity, Total Nitrogen, Phosphorous, Potassium, moisture, Permeability, Conductivity, Texture & structure, Organic carbon	Quarterly or as often as required	1 near Greenbelt 1 near ETP Composite sample shall be taken at each location
6.	Solid waste generation	Manual record keeping	To be updated daily	

SR. NO	ITEM	PARAMETERS	FREQUENCY OF MONITORING	LOCATION
	monitoring / Record Keeping			
7	Greenbelt and plantation monitoring	Type of species shall be decided based on soil & climatic conditions. The number of trees would be 1500 per hectare, however; the number of trees would vary depending on the type of soil	Six Monthly	
8	Carbon and Water foot Print Monitoring	Maintain the data of raw materials consumption, steam consumption, vehicle frequency for transport of raw materials, effluent generation, air emissions, hazardous waste generation, and raw material recovery	Daily and Monthly	

7.0 ADDITIONAL STUDIES

7.1: RISK ASSESSMENT

Hazard analysis involves the identification and quantification of the various hazards (unsafe condition) that exist in the plant during both construction and operation phases. On the other hand, risk analysis deals with the identification and quantification of the risk, the plant equipment and Personnel exposed to accidents resulting from the hazards present in the plant. Risk analysis involves the identification and assessment of risks to the population, which is likely to be exposed to as a result of hazards incidence.

This requires an assessment of failure probability, credible accident scenario, vulnerability of population, etc. Much of this information is difficult to get or generate consequently, the risk analysis in present case is confined to worst case and maximum credible accident studies and safety and risk aspect related to sulphitation process, alcohol storage and plant operations. Detailed Quantitative Risk Assessment (QRA) on potentially more hazardous and risky situations have been carried out in details and presented in the report in the later part.

8.0 BUDGETARY PROVISIONS TOWARDS ENVIRONMENTAL MANAGEMENT PLAN

Table 31 EMP Budget

Sr. No.	COMPONENT	PARTICULARS	CAPITAL INVESTMENT (IN LAKHS)	RECURRING INVESTMENT (IN LAKHS)	
1.	Air	Construction of new stack for boiler and ESP	860	20	
2.	Water	<ul style="list-style-type: none"> • Construction Sugar and distillery CPU • MEE & incineration boiler for Distillery Spent wash treatment 	3800	100	
3.	Noise	Acoustic enclosures, Silencer pads, ear plugs etc	15	3	
4.	Environment monitoring and Management	Quarterly Environment Monitoring (Per Year)	--	10	
		Ambient air monitoring			PM ₁₀ , PM _{2.5} , SO ₂ , NO _x
		Boiler & DG Set Monitoring			TPM, SO ₂ , NO _x
		Effluent (Treated & Untreated)			pH, COD, BOD, TSS, TDS, Oil & Grease
5.	Occupational Health	Glases, Breathing Masks, Gloves, Boots, Helmets, Ear Plugs etc. & annual health-medical checkup of workers, Occupational Health (training, OH center)	60	5	
6.	Greenbelt	Green belt development activity	20	4	
		Maintenance of green belt	--	5	
7.	Solid Waste Management	Solid Waste Management	30	10	
8.	Rain water harvesting	Rain water harvesting	15	2	
9.	Carbon and Water Foot Print	Maintain the data of raw materials consumption, steam consumption, vehicle frequency for transport of raw materials, effluent generation, air emissions, hazardous waste generation, and raw material recovery	--	5	
TOTAL COST (INR, LAKHS)			4800	164	

9.0 GREENBELT DEVELOPMENT PLAN

According to CPCB guidelines, 1500 trees should be available per hectare of land for Greenbelt development. Total plot area of the industry is 63.17 Hectares, out of which 22.30 Hectares of land is reserved for greenbelt development; hence there should be minimum 33450 no. of trees. At present there are 21728 trees, the remaining 11722 trees will be planted within 3 years. The industry proposes to plant 1000 to 1500 trees per year in order to increase the greenbelt over and above 33% of the total factory area

10.0 CORPORATE ENVIRONMENT RESPONSIBILITY PLAN

The capital cost of the proposed expansion project is Rs. 150 Crores. The industry has reserved **Rs. 1.125 Crores** (0.75 % of the cost of the project as per Office Memorandum Vide F. No. 22-65/2017-IA.III Dated 01.05.2018) which will be spent on the activities like sanitation and health, education, and educational facilities as a cost towards corporate environment responsibility (CER).

11.0 RAINWATER AND STORMWATER HARVESTING PLAN

The industry is making efforts to conserve natural resources by adopting green technologies and as such industry proposes to adopt rain water harvesting system. With the annual rainfall of 502 mm there is good potential to harvest rainwater. The rainwater harvesting system is installed at various buildings and about 16700 sq.m of area. 6706 m³ per year water is harvested. This harvested water shall be utilized for ground water recharge in order to increase the ground water table in the surrounding area

Storm water management system is also adopted by the industry. Separate drains of minimum 0.6 m * 1.0 m are provided for the collection and disposal of storm water from the industry premises.

Table 32 Rain water harvesting quantity

Sr. No	Location	Area M2	Average Run-off Factor	Rainfall in mm	The quantity of rainwater per year m ³
1	Built-up area	Only 16700m2 area use for rainwater harvesting	0.80	502	6706.72

Storm water harvesting

Table 33 Quantity of Storm water diverted to canal per annum

Sr. No	Location	Area M2	Average Run-off Factor	Rainfall in mm	The quantity of rainwater per year m ³
1	Total factory area - Builtup area	631700-16700 = 615000	0.40	502	123492

12.0 CONCLUSIONS

As the industry has provided all the necessary pollution control measures for water, Air and Solid and hazardous waste disposal, the negative impacts on the environment would be minimal/ negligible. The expansion programme would help the farmers to crush their produce in time which would help to minimize the loss of sugarcane tonnage and yield maximum financial benefits.