ENVIRONMENTAL MONITORING REPORT

FOR

6x600 MW COAL BASED POWER PLANT
OF KSK MAHANADI POWER COMPANY LTD
AT NARIYARA, JANJGIR-CHAMPA DISTRICT, CHHATTISGARH

MONTHLY REPORT: APRIL-2025

Client:

KSK Mahanadi Power Company Ltd
Nariyara, Chhattisgarh

Prepared by:

VIMTA Labs Ltd.
142, IDA, Phase-II, Cherlapally
Hyderabad – 500 051, Telangana State
www.vimta.com, env@vimta.com

1.0 INTRODUCTION

KSK Mahanadi Power Company Limited has installed 3 X 600 MW Power Plant at Narayana, Janjgir Champa District, Chhattisgarh.

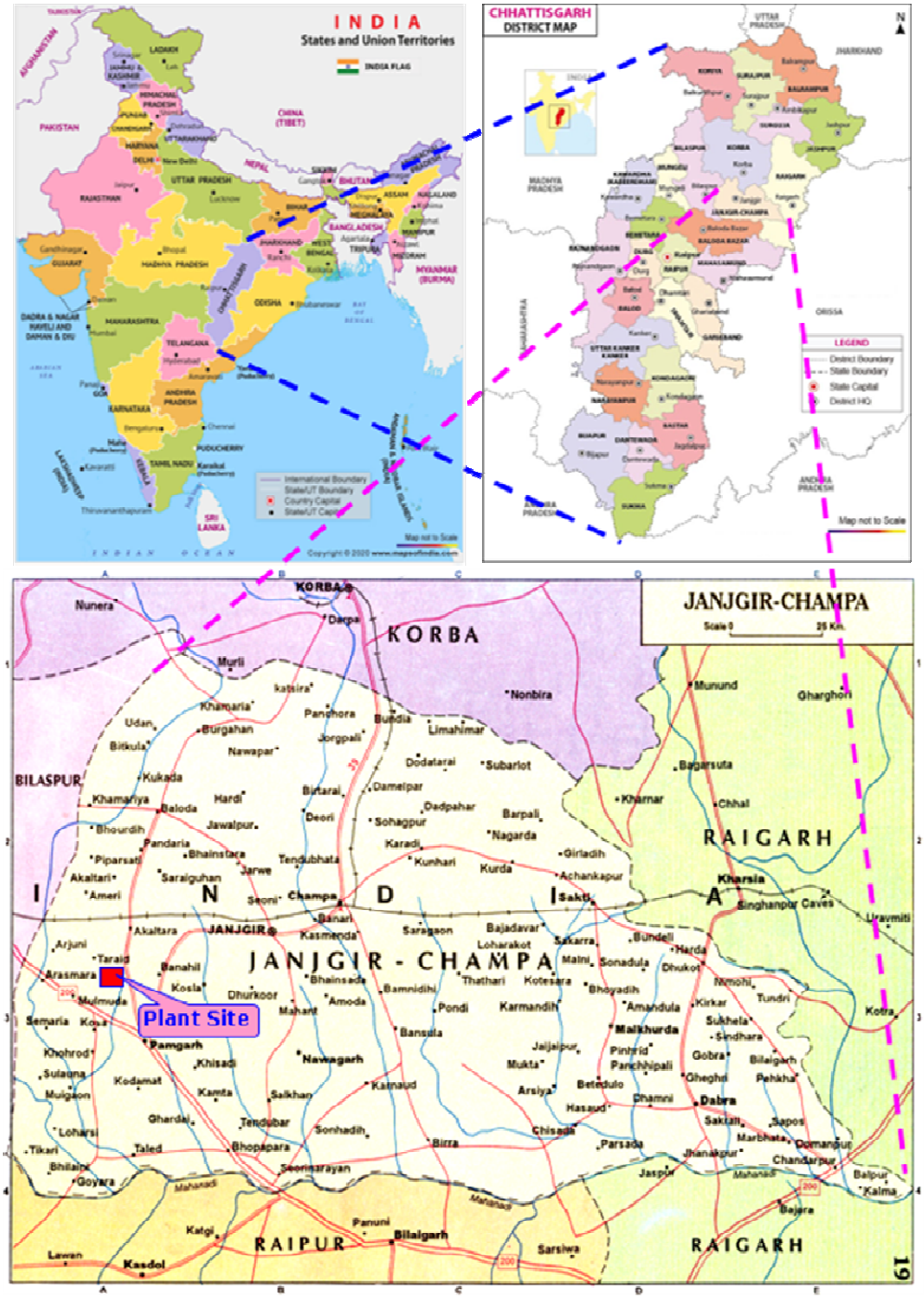
2.0 PROCESS DESCRIPTION

The 6x600 MW Power Plant has been constructed as a two phase configuration of 2x1800 MW unit, with two boilers. The project involves 6 Pulverized boiler, steam at 174 bars at 540 °C with six condensing turbo generator set having generating capacity of 600 MW of power each. Out six Units three units under operation and balance units are under construction.

3.0 DESCRIPTION OF ENVIRONMENT

The coal based thermal power plant is located near Nariyara village, Janjgir-Champa District, Chhattisgarh. The index map of the power plant and 10-km radius study area map are shown in **Figure-1** and **Figure-2** respectively.

The air, noise and water sampling locations are given in **Figure-3, Figure-4** and **Figure-5.**



Source: Maps of India

FIGURE-1
INDEX MAP

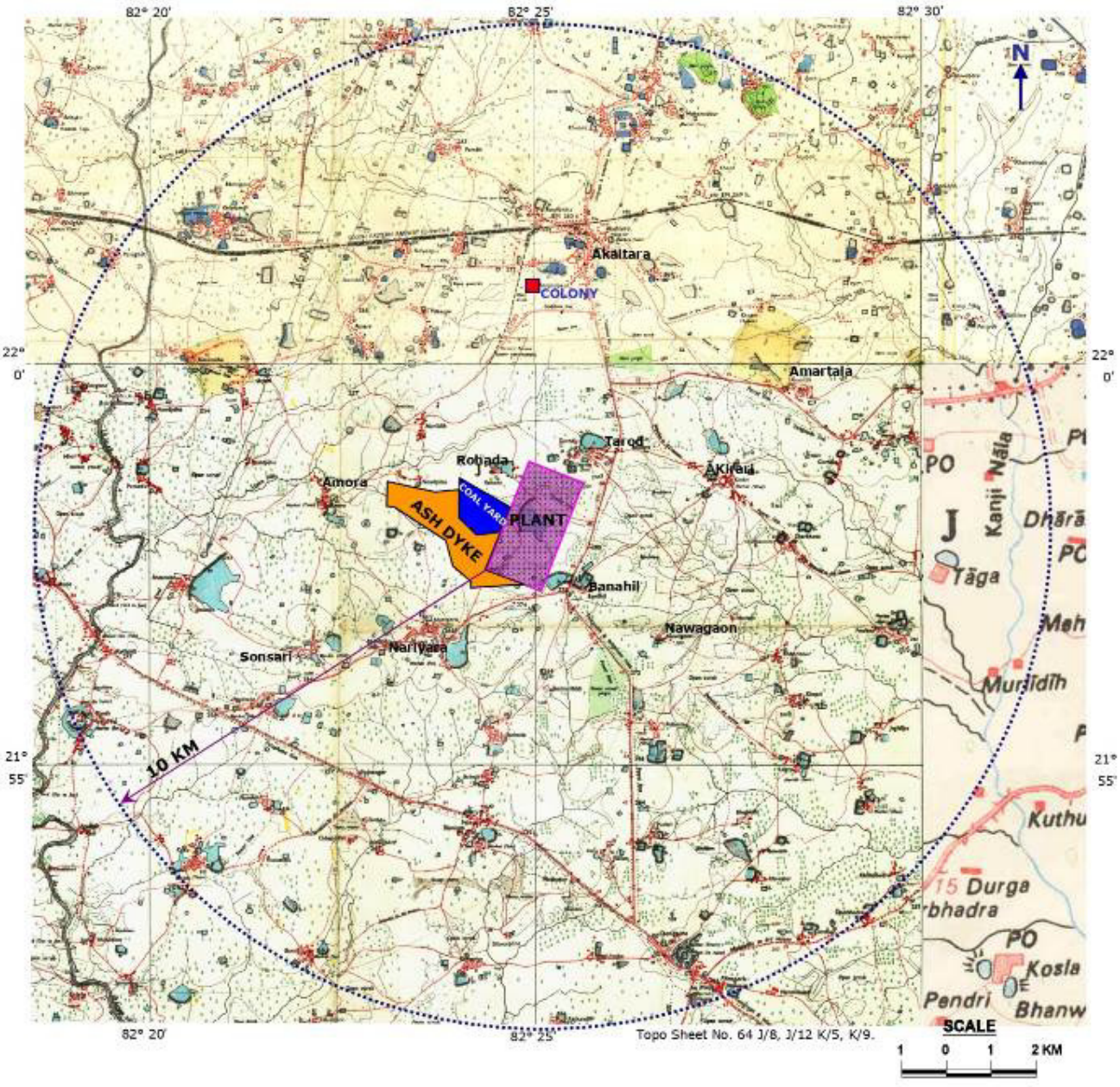


FIGURE-2
STUDY AREA MAP OF 10-KM RADIUS

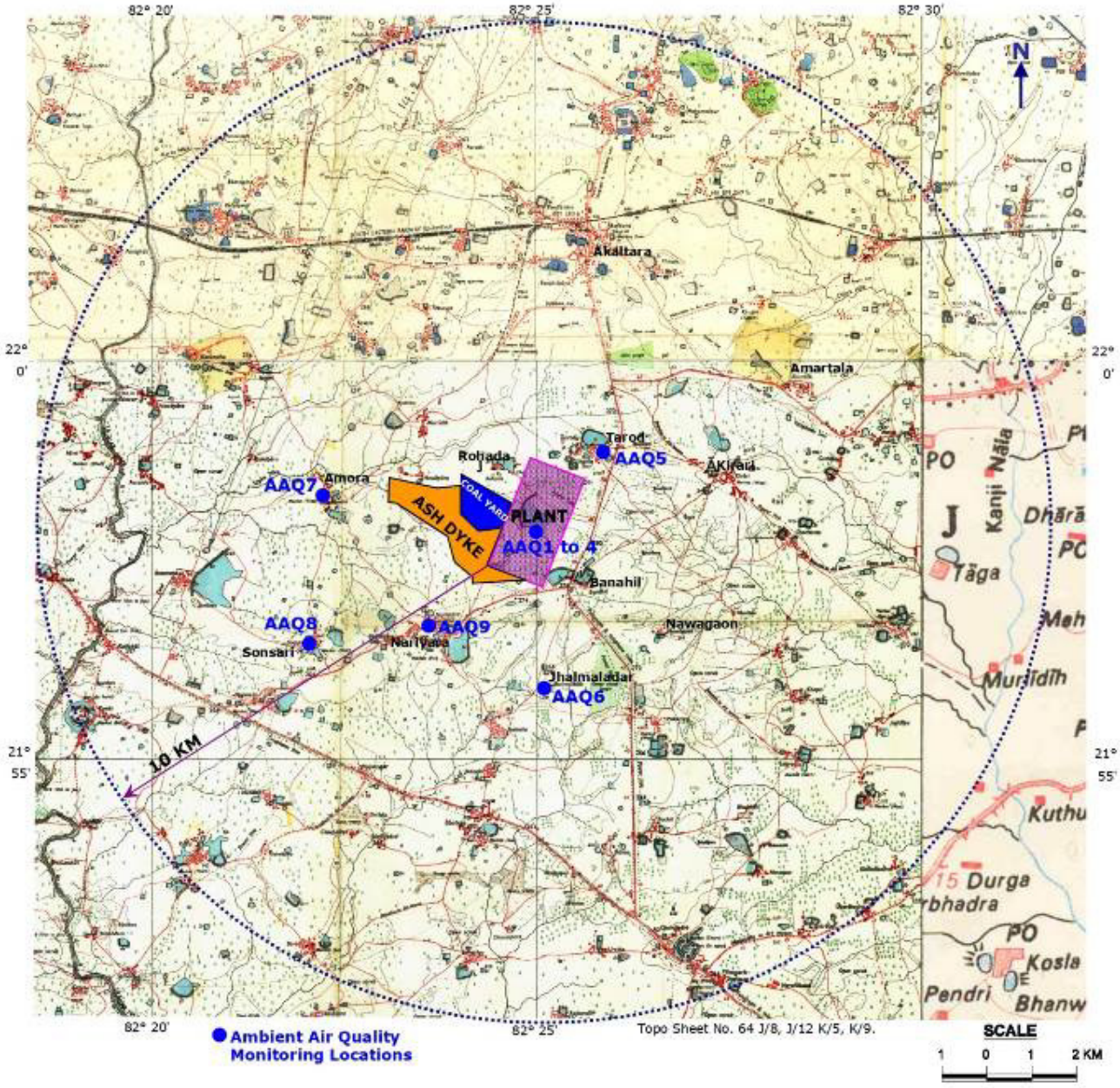


FIGURE-3
AMBIENT AIR QUALITY LOCATIONS

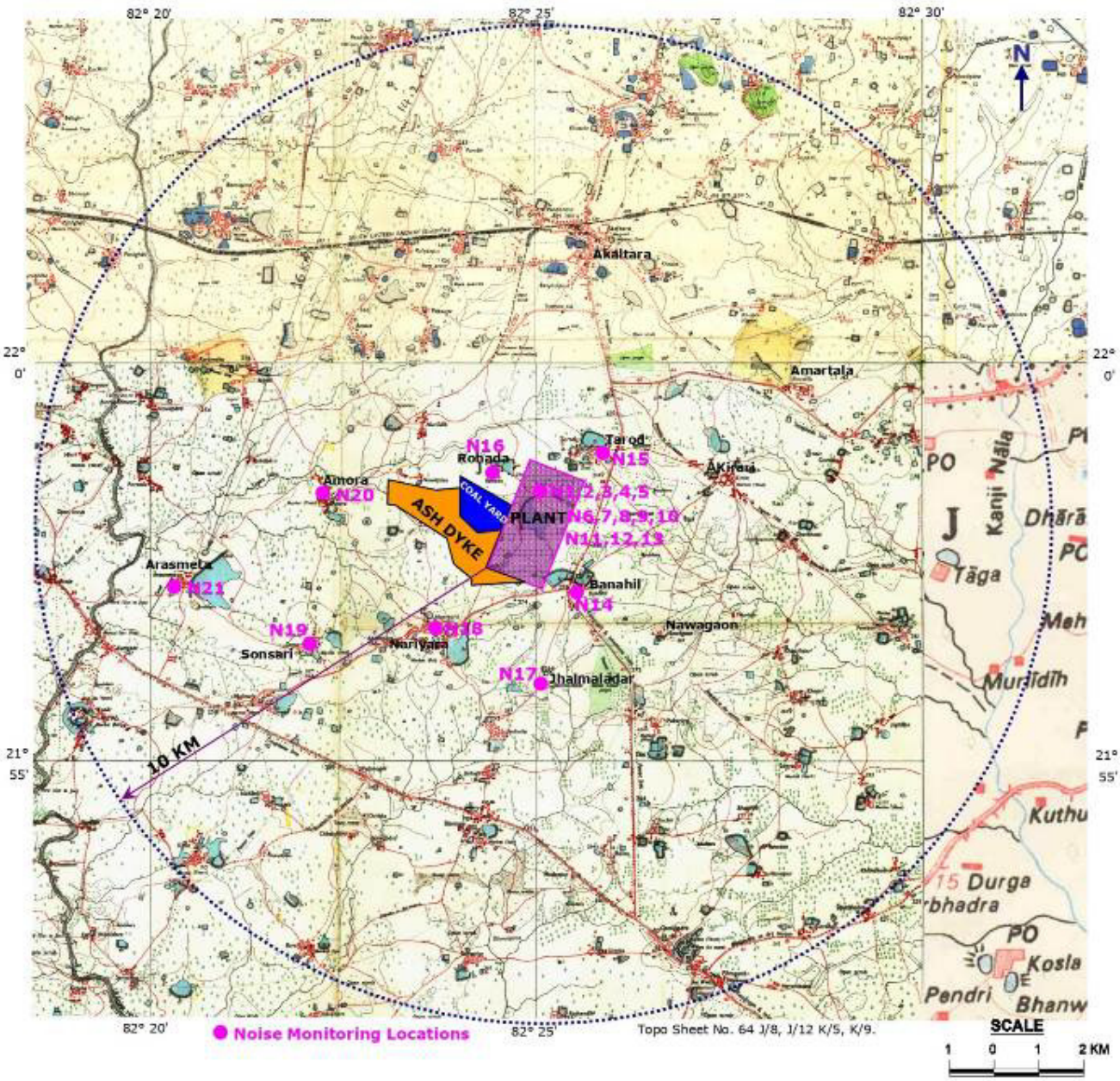


FIGURE-4
NOISE MONITORING LOCATIONS

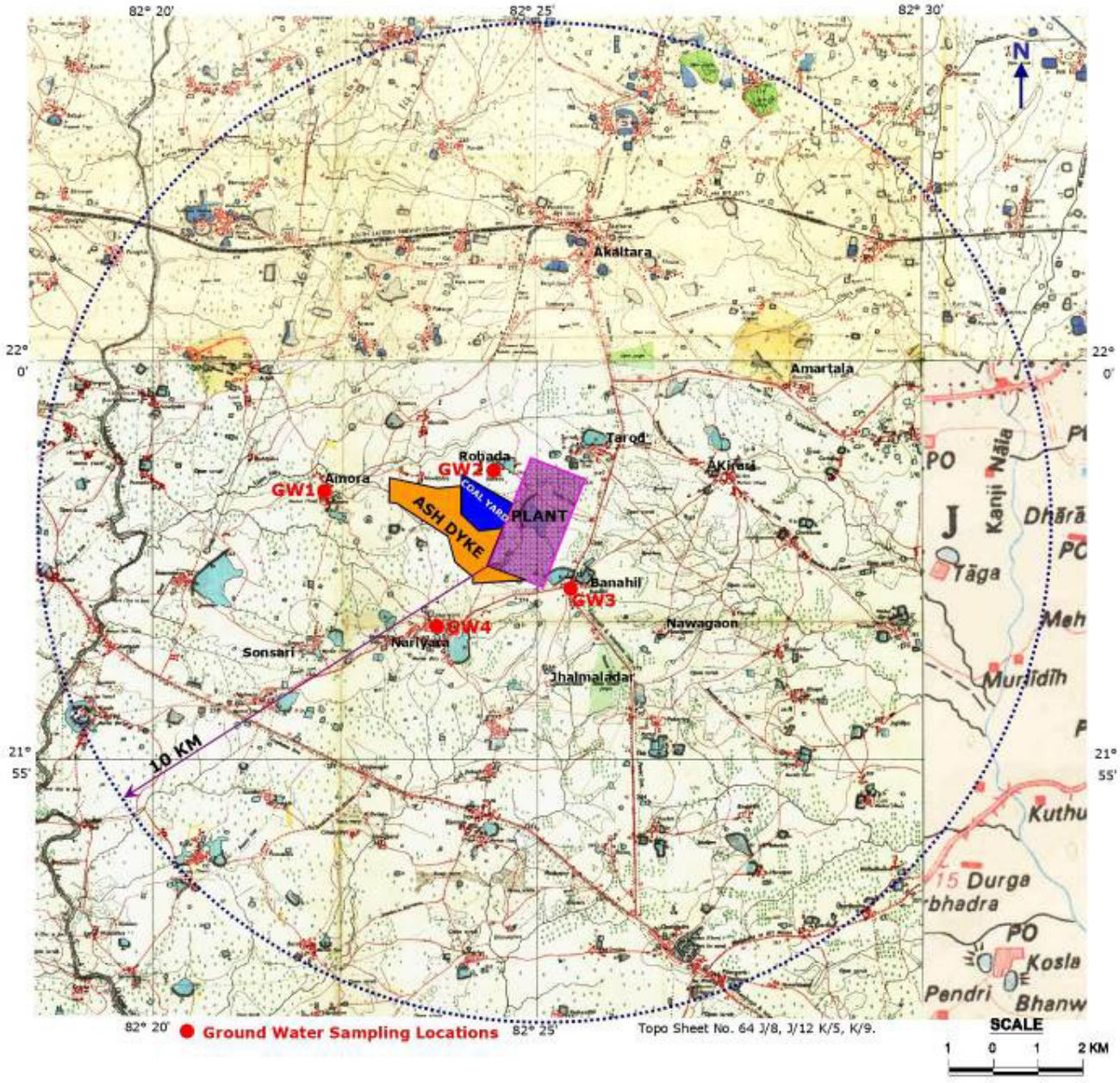


FIGURE-5
GROUND WATER SAMPLING LOCATIONS

4.0 Scope of Work

M/s KSK Mahanadi Power Company Limited is regularly carrying out the environmental monitoring in and around plant site, as it is a requirement under consent for establishment and consent to Operate from CECB, Chhattisgarh. KSK Mahanadi Power Company Limited entrusted the job of regular environmental monitoring to M/s. Vimta Lab Ltd, Hyderabad.

Monitoring of Ambient Air Quality, water quality and noise level measurement are part of the scope of work given to M/s Vimta Lab Ltd. The environmental monitoring study has been carried out at the following locations:

A] Ambient Air Quality

TABLE-1
AMBIENT AIR QUALITY MONITORING LOCATIONS

Location Code	Location Name	Direction w.r.t Plant	Distance from Plant (Km)
Inside the Premises			
AAQ1	BTG area	-	-
AAQ2	CHP area	-	-
AAQ3	DM Plant area	-	-
AAQ4	Ash handling area	-	-
Outside the Premises			
AAQ5	Tarod Village	NNE	0.8
AAQ6	Jhalmala Village	S	2.2
AAQ7	Amora Village	W	4.0
AAQ8	Sonsari Village	SW	4.3
AAQ9	Nariyara Village	SSW	1.8

B] Stack monitoring

Power Plant Unit –II, Unit – III and Unit - IV

C] Ambient Noise Levels

TABLE-2
AMBIENT NOISE LEVEL MONITORING LOCATIONS

Location Code	Location Name	Direction w.r.t Plant	Distance from Plant (Km)
Inside the Premises			
N1	TG floor	-	-
N2	Cooling tower	-	-
N3	Main Gate	-	-
N4	Boiler feed pump	-	-
N5	Admin Building area	-	-
N6	CHP Machine area	-	-
N7	AHP area	-	-
N8	Ash Silo area	-	-
N9	CW Pump house	-	-
N10	Compressor 1	-	-
N11	Compressor 2	-	-
N12	Compressor 3	-	-
N13	Compressor 4	-	-
Outside the Premises			
N14	Banahil Village	E	0.7
N15	Tarod Village	NNE	0.8

Location Code	Location Name	Direction w.r.t Plant	Distance from Plant (Km)
N16	Rogda Village	NW	1.5
N17	Jhalmala Village	S	2.2
N18	Nariyara Village	SSW	1.8
N19	Sonsari Village	SW	4.3
N20	Amora Village	W	4.0
N21	Arasmeta Village	W	6.8

D] Ground Water Sampling Locations

TABLE-3
GROUND WATER SAMPLING LOCATIONS

Location Code	Location Name	Direction w.r.t Plant	Distance from Plant (Km)
Ground Water Locations			
GW1	Amora Village	W	4.0
GW2	Rogda Village	NW	1.5
GW3	Banahill Village	E	0.7
GW4	Nariyara Village	SSW	1.8
Ash Pond Ground Water Locations			
GW5	Ash pond Location-1	--	--
GW6	Ash pond Location–2	--	--
GW7	Ash pond Location–3	--	--
GW8	Ash pond Location–4	--	--

E] Waste water samples Locations

TABLE-4
WASTE WATER SAMPLING LOCATIONS

Sr. No.	Code	Location
Unit –I		
1	WW1	CT blow down
2	WW2	Boiler blow down
3	WW3	Condenser Cooling Water
4	WW4	Guard pond
5	WW5	STP Outlet

F] Water Depth Sampling Locations

TABLE-5
WATER DEPTH SAMPLING LOCATIONS

Location Code	Location Name	Direction w.r.t Plant	Distance from Plant (Km)
Ground Water Depth Locations			
GW1	Banahill village	E	0.7
GW2	Nariyara Village	SSW	1.8
GW3	Amora Village	W	4.0
GW4	Rogda Village	NW	1.5
Ash pond Area			
ASH1	Ash pond Location-1	--	--
ASH2	Ash pond Location–2	--	--
ASH3	Ash pond Location–3	--	--
ASH4	Ash pond Location–4	--	--

5.0 METHODOLOGY OF MONITORING AND SAMPLING PROCEDURES

5.1 Ambient Air Quality Monitoring

Respirable dust samplers with suitable calibration were located in selected sampling stations as mentioned above, based on topography and wind pattern of the region. Samples were collected continuously on 24 hours average basis for $PM_{2.5}$, PM_{10}, SO_2, NO_2, Carbon Monoxide (CO), Ammonia, Lead, Arsenic, Nickel, Ozone, Benzene and Benzo(a)pyrene. Air samples were analyzed for SO_2 by West- Gaeke Method using Spectrophotometer at a wave length of 560 nm. For NO_2, the analysis was carried out using Sodium Arsenite Method, spetrophotometrically at a wave length of 540 nm. The Fine Particulate Matter $PM_{2.5}$ & PM_{10} is calculated by using gravimetric analysis. Pre-weighed Teflon filter paper and whatman GFA filter papers were used for determining the respirable particulate matter. The details of the sampling locations are presented in below **Table-1.**

5.2 Stack Gas Sampling

The stack sampling was carried out using ISO-Kinetic Method using pre-calibrated stack kit. Glass fiber thimbles were used for collecting particulate matter.

5.3 Ambient Noise Monitoring

Sound Pressure Levels (SPL) measurements were recorded at 8 locations. The readings were taken for every hour for 24-hrs. The day noise levels have been monitored during 6 am to 10 pm and night noise levels during 10 pm to 6 am at all the locations covered in the study area and 13 work zone noise levels. The details of the sampling locations are given in **Table-2.**

During each hour parameters like L10, L50, L90 and Leq were directly computed by the instrument based on the sound pressure levels.

5.4 Water Sampling

Water sample were collected and analyzed for Total Suspended Solids, Total Dissolved Solids, pH, Dissolved oxygen, Chemical Oxygen Demand, Biochemical Oxygen Demand, Oil & Grease, chlorides, sulphates, phosphates(Total), Zinc, chromium, copper, Iron(Total), as per standard methods published by APHA. The details of the sampling locations are given in **Table-3.**

5.5 Waste water Sampling

Waste water samples were collected and analyzed for Total Suspended Solids, Total Dissolved Solids, pH, Dissolved oxygen, Chemical Oxygen Demand, Biochemical Oxygen Demand, Oil & Grease, chlorides, sulphates, phosphates(Total), Zinc, chromium, copper, Iron(Total), as per standard methods published by APHA. The details of the sampling locations are given in **Table-4** and Water Depth levels of sampling locations are given in **Table-5.**

6.0 QUALITY ASSURANCE

Vimta Labs Ltd is accredited by NABL Govt. of India and follows quality systems as per ISO/IEC 17025-2017. The QA/QC procedures are laid prior to sample collection and laboratory analysis. It includes the standard procedures of sample collection, preservation, transportation and laboratory analysis with all documented procedures and continuous monitoring of Quality Control division.

7.0 RESULTS OF SURVEY DATA

The monitoring results of Ambient Air Quality analysis for the month of **April-2025** are presented in below **Table-6 to Table-10.**

7.1 Ambient Air Quality Monitoring Results

TABLE-6
AAQ MONITORING RESULTS

Monitoring Date	PM2.5	PM10	SO_2 µg/m³	NO_2 µg/m³	CO mg/m³
	Particulate Matter(µg/m³)				
BTG area – AAQ1					
01.04.2025	45.5	70.0	15.4	17.5	0.247
04.04.2025	47.6	67.4	16.5	19.5	0.272
07.04.2025	43.2	61.4	15.4	18.5	0.268
10.04.2025	47.2	71.8	14.7	16.5	0.247
14.04.2025	48.0	65.0	15.3	18.6	0.249
17.04.2025	52.7	73.1	16.1	17.5	0.268
21.04.2025	48.1	60.3	15.3	17.7	0.253
24.04.2025	42.6	76.4	16.3	19.0	0.270
Max	**52.7**	**76.4**	**16.5**	**19.5**	**0.272**
Min`	**42.6**	**60.3**	**14.7**	**16.5**	**0.247**
Avg	**46.9**	**68.2**	**15.6**	**18.1**	**0.259**
98%le	**52.1**	**75.9**	**16.5**	**19.4**	**0.272**
CHP area – AAQ2					
01.04.2025	45.5	70.1	16.9	20.5	0.275
04.04.2025	49.0	78.3	18.1	21.5	0.311
07.04.2025	47.6	74.3	16.4	20.4	0.312
10.04.2025	49.3	80.6	18.0	21.5	0.276
14.04.2025	53.2	70.4	16.3	20.3	0.310
17.04.2025	42.5	80.0	17.6	21.5	0.281
21.04.2025	49.1	71.3	18.0	20.7	0.306
24.04.2025	47.3	77.3	16.8	19.3	0.293
Max	**53.2**	**80.6**	**18.1**	**21.5**	**0.312**
Min	**42.5**	**70.1**	**16.3**	**19.3**	**0.275**
Avg	**47.9**	**75.3**	**17.3**	**20.7**	**0.296**
98%le	**52.7**	**80.5**	**18.1**	**21.5**	**0.312**
DM plant area – AAQ3					
01.04.2025	36.0	61.2	12.7	15.1	0.243
04.04.2025	42.3	69.1	15.3	17.3	0.247
07.04.2025	39.2	65.1	12.6	13.6	0.238
10.04.2025	46.2	70.2	14.2	17.7	0.258
14.04.2025	38.1	59.6	12.2	14.9	0.235
17.04.2025	42.3	69.1	13.3	16.4	0.249
21.04.2025	38.9	64.9	14.1	14.7	0.249
24.04.2025	43.3	68.4	12.8	17.2	0.257
Max	**46.2**	**70.2**	**15.3**	**17.7**	**0.258**
Min	**36.0**	**59.6**	**12.2**	**13.6**	**0.235**
Avg	**40.8**	**66.0**	**13.4**	**15.9**	**0.247**
98%le	**45.8**	**70.0**	**15.1**	**17.6**	**0.258**

TABLE-7
AAQ MONITORING RESULTS

Monitoring Date	PM2.5	PM10	SO_2 µg/m³	NO_2 µg/m³	CO mg/m³
	Particulate				
Ash handling area – AAQ4					
01.04.2025	39.4	69.4	14.3	17.8	0.260
04.04.2025	47.3	78.3	17.4	19.2	0.281
07.04.2025	50.1	75.3	13.7	16.7	0.251
10.04.2025	49.2	77.9	15.7	18.2	0.305
14.04.2025	41.4	70.8	14.4	16.7	0.296
17.04.2025	52.7	82.3	17.3	20.8	0.301
21.04.2025	39.4	81.0	13.3	17.6	0.295
24.04.2025	50.8	77.3	17.3	19.6	0.301
Max	**52.7**	**82.3**	**17.4**	**20.8**	**0.305**
Min	**39.4**	**69.4**	**13.3**	**16.7**	**0.251**
Avg	**46.3**	**76.5**	**15.4**	**18.3**	**0.286**
98%le	**52.4**	**82.1**	**17.4**	**20.6**	**0.304**
Tarod Village – AAQ5					
01.04.2025	36.3	62.0	11.7	13.2	0.167
04.04.2025	40.5	59.6	12.4	14.0	0.143
07.04.2025	30.7	60.7	11.8	12.4	0.162
10.04.2025	41.8	55.2	12.4	14.1	0.118
14.04.2025	32.4	58.3	10.8	12.7	0.163
17.04.2025	43.2	57.0	11.3	13.2	0.131
21.04.2025	34.2	61.5	11.7	12.7	0.163
24.04.2025	37.3	58.4	12.3	14.1	0.131
Max	**43.2**	**62.0**	**12.4**	**14.1**	**0.167**
Min	**30.7**	**55.2**	**10.8**	**12.4**	**0.118**
Avg	**37.1**	**59.1**	**11.8**	**13.3**	**0.147**
98%le	**43.0**	**61.9**	**12.4**	**14.1**	**0.167**
Jhalmala Village- AAQ6					
01.04.2025	36.5	60.2	11.4	14.1	0.173
04.04.2025	39.3	56.2	11.5	13.7	0.126
07.04.2025	41.3	60.1	10.5	12.4	0.145
10.04.2025	37.1	57.3	12.5	14.8	0.156
14.04.2025	34.0	57.2	11.1	13.5	0.128
17.04.2025	40.5	60.8	11.4	14.3	0.186
21.04.2025	36.3	58.4	10.6	12.7	0.168
24.04.2025	38.6	54.3	11.0	14.0	0.125
Max	**41.3**	**60.8**	**12.5**	**14.8**	**0.186**
Min	**34.0**	**54.3**	**10.5**	**12.4**	**0.125**
Avg	**38.0**	**58.1**	**11.3**	**13.7**	**0.151**
98%le	**41.2**	**60.7**	**12.4**	**14.7**	**0.184**
Limits as per NAAQS	**60**	**100**	**80**	**80**	**02**

Teflon filter paper was used in PM2.5 & whatman filter paper for PM10 weighed in Mettler electronic balance and computed as per standard methods PM2.5, PM10, SO_2, NOx is monitored on 24 hrs. Basis CO is monitored on 8 hours basis All the values are expressed in µg/m³ except CO is measured in mg/m³

TABLE-8
AAQ MONITORING RESULTS

Monitoring Date	PM2.5	PM10	SO_2 µg/m³	NO_2 µg/m³	CO mg/m³
	Particulate				
Amora Village - AAQ7					
01.04.2025	33.7	59.3	11.9	13.4	0.148
04.04.2025	34.3	62.5	13.2	14.2	0.152
07.04.2025	36.7	57.6	11.9	13.5	0.129
10.04.2025	33.3	63.7	13.0	13.7	0.147
14.04.2025	37.2	58.2	10.5	12.6	0.127
17.04.2025	34.6	65.8	13.1	14.6	0.145
21.04.2025	34.2	60.5	12.0	13.3	0.117
24.04.2025	36.3	59.4	13.0	14.4	0.155
Max	**37.2**	**65.8**	**13.2**	**14.6**	**0.155**
Min	**33.3**	**57.6**	**10.5**	**12.6**	**0.117**
Avg	**35.0**	**60.9**	**12.3**	**13.7**	**0.140**
98%le	**37.1**	**65.5**	**13.2**	**14.6**	**0.155**
Sonsari Village - AAQ8					
01.04.2025	35.2	60.2	12.1	13.1	0.131
04.04.2025	39.2	61.2	13.1	14.2	0.148
07.04.2025	35.3	57.0	10.8	13.1	0.129
10.04.2025	31.7	61.5	12.3	13.5	0.141
14.04.2025	38.2	58.3	11.4	12.6	0.137
17.04.2025	34.4	57.7	13.9	14.0	0.156
21.04.2025	36.7	60.6	12.2	13.2	0.162
24.04.2025	37.9	66.3	11.7	14.2	0.146
Max	**39.2**	**66.3**	**13.9**	**14.2**	**0.162**
Min	**31.7**	**57.0**	**10.8**	**12.6**	**0.129**
Avg	**36.1**	**60.4**	**12.2**	**13.5**	**0.144**
98%le	**39.1**	**65.6**	**13.8**	**14.2**	**0.161**
Nariyara Village – AAQ9					
01.04.2025	34.7	57.6	11.0	12.2	0.144
04.04.2025	38.3	55.5	10.8	13.4	0.158
07.04.2025	34.2	59.4	11.2	13.0	0.147
10.04.2025	33.6	51.0	12.0	14.3	0.175
14.04.2025	30.3	58.7	9.5	11.1	0.178
17.04.2025	36.1	53.5	12.2	14.0	0.147
21.04.2025	35.4	54.6	11.3	12.3	0.110
24.04.2025	39.4	55.3	12.2	14.1	0.152
Max	**39.4**	**59.4**	**12.2**	**14.3**	**0.178**
Min	**30.3**	**51.0**	**9.5**	**11.1**	**0.110**
Avg	**35.4**	**55.7**	**11.3**	**13.1**	**0.151**
98%le	**39.2**	**59.3**	**12.2**	**14.3**	**0.178**
Limits as per NAAQS	**60**	**100**	**80**	**80**	**02**

Teflon filter paper was used in PM2.5 & whatman filter paper for PM10 weighed in Mettler electronic balance and computed as per standard methods PM2.5, PM10, SO_2, NOx is monitored on 24 hrs. Basis CO is monitored on 8 hours basis All the values are expressed in µg/m³ except CO is measured in mg/m³

TABLE-9
AAQ MONITORING RESULTS

Monitoring Date & Location	Arsenic ng/m3	Nickel ng/m3	Lead µg/m3	O_3 µg/m3	NH_3 µg/m3	C_6H_6 µg/m3	Benzo(a) Pyrene ng/m3	Hg µg/m3
BTG area – AAQ1								
01.04.2025	<1.0	2.2	<0.001	10.6	<5.0	<1.0	<0.1	<0.001
04.04.2025	<1.0	1.4	<0.001	12.2	<5.0	<1.0	<0.1	<0.001
07.04.2025	<1.0	1.2	<0.001	11.3	<5.0	<1.0	<0.1	<0.001
10.04.2025	<1.0	1.0	<0.001	12.8	<5.0	<1.0	<0.1	<0.001
14.04.2025	<1.0	2.1	<0.001	11.7	<5.0	<1.0	<0.1	<0.001
17.04.2025	<1.0	1.3	<0.001	13.2	<5.0	<1.0	<0.1	<0.001
21.04.2025	<1.0	2.4	<0.001	8.6	<5.0	<1.0	<0.1	<0.001
27.03.2025	<1.0	1.1	<0.001	10.6	<5.0	<1.0	<0.1	<0.001
Max	**<1.0**	**2.4**	**<0.001**	**13.2**	**<5.0**	**<1.0**	**<0.1**	**<0.001**
Min	**<1.0**	**<1.0**	**<0.001**	**8.6**	**<5.0**	**<1.0**	**<0.1**	**<0.001**
Avg	**<1.0**	**1.6**	**<0.001**	**11.4**	**<5.0**	**<1.0**	**<0.1**	**<0.001**
98%	**<1.0**	**2.4**	**<0.001**	**13.1**	**<5.0**	**<1.0**	**<0.1**	**<0.001**
CHP area – AAQ2								
01.04.2025	<1.0	2.6	<0.001	10.1	<5.0	<1.0	<0.1	<0.001
04.04.2025	<1.0	1.6	<0.001	11.0	<5.0	<1.0	<0.1	<0.001
07.04.2025	<1.0	2.4	<0.001	8.7	<5.0	<1.0	<0.1	<0.001
10.04.2025	<1.0	1.5	<0.001	11.6	<5.0	<1.0	<0.1	<0.001
14.04.2025	<1.0	2.2	<0.001	9.8	<5.0	<1.0	<0.1	<0.001
17.04.2025	<1.0	<1.0	<0.001	15.3	<5.0	<1.0	<0.1	<0.001
21.04.2025	<1.0	2.5	<0.001	9.0	<5.0	<1.0	<0.1	<0.001
24.04.2025	<1.0	1.6	<0.001	11.1	<5.0	<1.0	<0.1	<0.001
Max	**<1.0**	**2.6**	**<0.001**	**15.3**	**<5.0**	**<1.0**	**<0.1**	**<0.001**
Min	**<1.0**	**<1.0**	**<0.001**	**8.7**	**<5.0**	**<1.0**	**<0.1**	**<0.001**
Avg	**<1.0**	**2.1**	**<0.001**	**10.8**	**<5.0**	**<1.0**	**<0.1**	**<0.001**
98%	**<1.0**	**2.6**	**<0.001**	**14.8**	**<5.0**	**<1.0**	**<0.1**	**<0.001**
DM plant area – AAQ3								
01.04.2025	<1.0	1.5	<0.001	8.8	<5.0	<1.0	<0.1	<0.001
04.04.2025	<1.0	1.6	<0.001	9.2	<5.0	<1.0	<0.1	<0.001
07.04.2025	<1.0	<1.0	<0.001	10.0	<5.0	<1.0	<0.1	<0.001
10.04.2025	<1.0	1.2	<0.001	8.9	<5.0	<1.0	<0.1	<0.001
14.04.2025	<1.0	1.5	<0.001	10.6	<5.0	<1.0	<0.1	<0.001
17.04.2025	<1.0	1.6	<0.001	9.8	<5.0	<1.0	<0.1	<0.001
21.04.2025	<1.0	<1.0	<0.001	11.4	<5.0	<1.0	<0.1	<0.001
24.04.2025	<1.0	1.3	<0.001	6.3	<5.0	<1.0	<0.1	<0.001
Max	**<1.0**	**1.6**	**<0.001**	**11.4**	**<5.0**	**<1.0**	**<0.1**	**<0.001**
Min	**<1.0**	**<1.0**	**<0.001**	**6.3**	**<5.0**	**<1.0**	**<0.1**	**<0.001**
Avg	**<1.0**	**1.5**	**<0.001**	**9.4**	**<5.0**	**<1.0**	**<0.1**	**<0.001**
98%	**<1.0**	**1.6**	**<0.001**	**11.3**	**<5.0**	**<1.0**	**<0.1**	**<0.001**
Limits as per	**06**	**20**	**1.0**	**100**	**400**	**05**	**01**	**-**

Below Detectable Limit for as and Ni 1.0 ng/m^3 Below Detectable Limit for Pb 0.001 µg/m^3 Ozone and CO is monitored on 8 hours basis Below Detectable Limit for O_3 50 µg/m^3 Below Detectable Limit for NH_3 5.0 µg/m^3

TABLE-10
AAQ MONITORING RESULTS

Monitoring Date & Location	Arsenic ng/m3	Nickel ng/m3	Lead µg/m3	O_3 µg/m3	NH_3 µg/m3	C_6H_6 µg/m3	Benzo(a) Pyrene ng/m3	Hg µg/m3
Ash handling area – AAQ4								
01.04.2025	<1.0	1.7	<0.001	8.9	<5.0	<1.0	<0.1	<0.001
04.04.2025	<1.0	<1.0	<0.001	13.5	<5.0	<1.0	<0.1	<0.001
07.04.2025	<1.0	2.6	<0.001	10.0	<5.0	<1.0	<0.1	<0.001
10.04.2025	<1.0	1.7	<0.001	14.9	<5.0	<1.0	<0.1	<0.001
14.04.2025	<1.0	2.8	<0.001	10.1	<5.0	<1.0	<0.1	<0.001
17.04.2025	<1.0	1.9	<0.001	12.2	<5.0	<1.0	<0.1	<0.001
21.04.2025	<1.0	2.4	<0.001	12.3	<5.0	<1.0	<0.1	<0.001
24.04.2025	<1.0	<1.0	<0.001	11.1	<5.0	<1.0	<0.1	<0.001
Max	**<1.0**	**2.8**	**<0.001**	**14.9**	**<5.0**	**<1.0**	**<0.1**	**<0.001**
Min	**<1.0**	**<1.0**	**<0.001**	**8.9**	**<5.0**	**<1.0**	**<0.1**	**<0.001**
Avg	**<1.0**	**2.2**	**<0.001**	**11.6**	**<5.0**	**<1.0**	**<0.1**	**<0.001**
98%	**<1.0**	**2.8**	**<0.001**	**14.7**	**<5.0**	**<1.0**	**<0.1**	**<0.001**
Tarod Village – AAQ5								
01.04.2025	<1.0	<1.0	<0.001	7.5	<5.0	<1.0	<0.1	<0.001
04.04.2025	<1.0	<1.0	<0.001	9.1	<5.0	<1.0	<0.1	<0.001
07.04.2025	<1.0	<1.0	<0.001	8.0	<5.0	<1.0	<0.1	<0.001
10.04.2025	<1.0	<1.0	<0.001	7.6	<5.0	<1.0	<0.1	<0.001
14.04.2025	<1.0	<1.0	<0.001	10.2	<5.0	<1.0	<0.1	<0.001
17.04.2025	<1.0	<1.0	<0.001	8.7	<5.0	<1.0	<0.1	<0.001
21.04.2025	<1.0	<1.0	<0.001	6.5	<5.0	<1.0	<0.1	<0.001
24.04.2025	<1.0	<1.0	<0.001	9.7	<5.0	<1.0	<0.1	<0.001
Max	**<1.0**	**<1.0**	**<0.001**	**10.2**	**<5.0**	**<1.0**	**<0.1**	**<0.001**
Min	**<1.0**	**<1.0**	**<0.001**	**6.5**	**<5.0**	**<1.0**	**<0.1**	**<0.001**
Avg	**<1.0**	**<1.0**	**<0.001**	**8.4**	**<5.0**	**<1.0**	**<0.1**	**<0.001**
98%	**<1.0**	**<1.0**	**<0.001**	**10.1**	**<5.0**	**<1.0**	**<0.1**	**<0.001**
Jhalmala Village- AAQ-6								
01.04.2025	<1.0	<1.0	<0.001	8.3	<5.0	<1.0	<0.1	<0.001
04.04.2025	<1.0	<1.0	<0.001	6.5	<5.0	<1.0	<0.1	<0.001
07.04.2025	<1.0	<1.0	<0.001	7.4	<5.0	<1.0	<0.1	<0.001
10.04.2025	<1.0	<1.0	<0.001	8.5	<5.0	<1.0	<0.1	<0.001
14.04.2025	<1.0	<1.0	<0.001	7.5	<5.0	<1.0	<0.1	<0.001
17.04.2025	<1.0	<1.0	<0.001	6.5	<5.0	<1.0	<0.1	<0.001
21.04.2025	<1.0	<1.0	<0.001	5.8	<5.0	<1.0	<0.1	<0.001
24.04.2025	<1.0	<1.0	<0.001	7.9	<5.0	<1.0	<0.1	<0.001
Max	**<1.0**	**<1.0**	**<0.001**	**8.5**	**<5.0**	**<1.0**	**<0.1**	**<0.001**
Min	**<1.0**	**<1.0**	**<0.001**	**5.8**	**<5.0**	**<1.0**	**<0.1**	**<0.001**
Avg	**<1.0**	**<1.0**	**<0.001**	**7.3**	**<5.0**	**<1.0**	**<0.1**	**<0.001**
98%	**<1.0**	**<1.0**	**<0.001**	**8.5**	**<5.0**	**<1.0**	**<0.1**	**<0.001**
Limits as per	**06**	**20**	**1.0**	**100**	**400**	**05**	**01**	**-**

TABLE-11
AAQ MONITORING RESULTS

Monitoring Date & Location	Arsenic ng/m3	Nickel ng/m3	Lead µg/m3	O_3 µg/m3	NH_3 µg/m3	C_6H_6 µg/m3	Benzo(a) Pyrene ng/m3	Hg µg/m3
Amora Village – AAQ7								
01.04.2025	<1.0	<1.0	<0.001	8.6	<5.0	<1.0	<0.1	<0.001
04.04.2025	<1.0	<1.0	<0.001	6.4	<5.0	<1.0	<0.1	<0.001
07.04.2025	<1.0	<1.0	<0.001	8.7	<5.0	<1.0	<0.1	<0.001
10.04.2025	<1.0	<1.0	<0.001	6.5	<5.0	<1.0	<0.1	<0.001
14.04.2025	<1.0	<1.0	<0.001	8.2	<5.0	<1.0	<0.1	<0.001
17.04.2025	<1.0	<1.0	<0.001	7.5	<5.0	<1.0	<0.1	<0.001
21.04.2025	<1.0	<1.0	<0.001	5.4	<5.0	<1.0	<0.1	<0.001
24.04.2025	<1.0	<1.0	<0.001	6.6	<5.0	<1.0	<0.1	<0.001
Max	**<1.0**	**<1.0**	**<0.001**	**8.7**	**<5.0**	**<1.0**	**<0.1**	**<0.00**
Min	**<1.0**	**<1.0**	**<0.001**	**5.4**	**<5.0**	**<1.0**	**<0.1**	**<0.00**
Avg	**<1.0**	**<1.0**	**<0.001**	**7.2**	**<5.0**	**<1.0**	**<0.1**	**<0.00**
98%	**<1.0**	**<1.0**	**<0.001**	**8.7**	**<5.0**	**<1.0**	**<0.1**	**<0.00**
Sonsari Village – AAQ8								
01.04.2025	<1.0	<1.0	<0.001	5.8	<5.0	<1.0	<0.1	<0.001
04.04.2025	<1.0	<1.0	<0.001	7.5	<5.0	<1.0	<0.1	<0.001
07.04.2025	<1.0	<1.0	<0.001	5.8	<5.0	<1.0	<0.1	<0.001
10.04.2025	<1.0	<1.0	<0.001	8.3	<5.0	<1.0	<0.1	<0.001
14.04.2025	<1.0	<1.0	<0.001	6.7	<5.0	<1.0	<0.1	<0.001
17.04.2025	<1.0	<1.0	<0.001	9.8	<5.0	<1.0	<0.1	<0.001
21.04.2025	<1.0	<1.0	<0.001	9.1	<5.0	<1.0	<0.1	<0.001
24.04.2025	<1.0	<1.0	<0.001	7.4	<5.0	<1.0	<0.1	<0.001
Max	**<1.0**	**<1.0**	**<0.001**	**9.8**	**<5.0**	**<1.0**	**<0.1**	**<0.00**
Min	**<1.0**	**<1.0**	**<0.001**	**5.8**	**<5.0**	**<1.0**	**<0.1**	**<0.00**
Avg	**<1.0**	**<1.0**	**<0.001**	**7.6**	**<5.0**	**<1.0**	**<0.1**	**<0.00**
98%	**<1.0**	**<1.0**	**<0.001**	**9.7**	**<5.0**	**<1.0**	**<0.1**	**<0.00**
Nariyara Village – AAQ9								
01.04.2025	<1.0	<1.0	<0.001	8.1	<5.0	<1.0	<0.1	<0.001
04.04.2025	<1.0	<1.0	<0.001	6.6	<5.0	<1.0	<0.1	<0.001
07.04.2025	<1.0	<1.0	<0.001	7.8	<5.0	<1.0	<0.1	<0.001
10.04.2025	<1.0	<1.0	<0.001	9.3	<5.0	<1.0	<0.1	<0.001
14.04.2025	<1.0	<1.0	<0.001	6.5	<5.0	<1.0	<0.1	<0.001
17.04.2025	<1.0	<1.0	<0.001	5.7	<5.0	<1.0	<0.1	<0.001
21.04.2025	<1.0	<1.0	<0.001	7.4	<5.0	<1.0	<0.1	<0.001
24.04.2025	<1.0	<1.0	<0.001	8.9	<5.0	<1.0	<0.1	<0.001
Max	**<1.0**	**<1.0**	**<0.001**	**9.3**	**<5.0**	**<1.0**	**<0.1**	**<0.00**
Min	**<1.0**	**<1.0**	**<0.001**	**5.7**	**<5.0**	**<1.0**	**<0.1**	**<0.00**
Avg	**<1.0**	**<1.0**	**<0.001**	**7.5**	**<5.0**	**<1.0**	**<0.1**	**<0.00**
98%	**<1.0**	**<1.0**	**<0.001**	**9.2**	**<5.0**	**<1.0**	**<0.1**	**<0.00**
Limits as per	**06**	**20**	**1.0**	**100**	**400**	**05**	**01**	**-**

Below Detectable Limit for as and Ni 1.0 ng/m^3 , Below Detectable Limit for Pb 0.001 µg/m^3 Ozone and CO is monitored on 8 hours basis Below Detectable Limit for O_3 50 µg/m^3 Below Detectable Limit for NH_3 5.0 µg/m^3

7.1.1 Observations (Inside the premises)

PM2.5: The maximum value for PM2.5 observed at CHP area as 53.2 µg /m^3 and minimum value for PM2.5 at DM Plant area as 36.0 µg/m^3. The 24 hours applicable limit inside the plant premises 60 µg /m^3 for industrial area.

PM10: The maximum value for PM10 observed at AHP area as 82.3 µg /m^3 and minimum value for PM10 at DM Plant area as 59.6 µg/m^3. The 24 hours applicable limit inside the plant premises 100 µg /m^3 for industrial area.

SO_2: The maximum value for SO_2 observed at CHP plant area as 18.1 µg /m^3 and minimum value for SO_2 at DM Plant area as 12.2 µg /m^3. The 24 hours applicable limit inside the plant premises 80 µg /m^3 for industrial area.

NO_2: The maximum value for NO_2 observed at CHP area as 21.5 µg /m^3 and minimum value for NO_2 at DM Plant area as 13.6 µg/m^3. The 24 hours applicable limit inside the plant premises 80 µg /m^3 for industrial area.

CO: The maximum value for CO observed at CHP area as 0.312 mg/m^3 and minimum value for CO at DM plant as 0.235 mg/m^3. The 8 hours applicable limit inside the plant premises 02 mg/m^3 for industrial area.

Ammonia: The maximum and minimum value for Ammonia observed at all the locations as <5.0 µg /m^3. The 24 hours' applicable limit inside the plant premises 400 µg /m^3 for industrial area

Nickel: The maximum value for Nickel observed at AHP area as 2.8 ng /m^3 and <1.0 ng /m minimum value for BTG, DM, CHP & AHP Plant area. The 24 hours' applicable limit inside the plant premises 20 ng/m^3 for industrial area.

Arsenic: The maximum and minimum value for Arsenic observed at all the locations as <1.0 ng /m^3. The 24 hours applicable limit inside the plant premises 6 ng/m^3 for industrial area

Lead: The maximum value for Lead observed at aii the locations as <0.001 µg /m^3. The 24 hours' applicable limit inside the plant premises 1 µg/m^3 for industrial area.

Ozone: The maximum value for Ozone observed at CHP area as 15.3 µg/m^3 and minimum value for Ozone DM Plant area as 6.3 µg /m^3. The 8 hours' applicable limit inside the plant premises 100 µg /m^3 for industrial area.

Benzo(a)Pyrene: The maximum and minimum value for Benzo(a)Pyrene observed at all the locations as <0.1 ng /m^3. The 24 hours applicable limit inside the plant premises 1 ng/m^3 for industrial area

Benzene: The maximum and minimum value for Benzene observed at all the locations as <1.0 µg /m^3. The 24 hours applicable limit inside the plant premises 5 µg /$m^3$for industrial area

Mercury: The maximum and minimum value for Mercury observed at all the locations as <0.001 µg g /m^3 for 24 hours.

7.1.2 Observations (Outside the premises)

PM2.5: The maximum value for PM2.5 observed at Tarod village as 43.2 µg /m^3 and minimum value for PM2.5 at nariyara village as 30.3 /m^3. The 24 hours applicable limit outside the plant premises 60 µg/$m^3$for Rural/Residential area.

PM10: The maximum value for PM10 observed at Sonsari village as 66.3 µg /m^3 and minimum value for PM10 at Nariyara village as a 51.0 µg /m^3. The 24 hours applicable limit outside the plant premises 100 µg /m^3 for Rural/Residential area.

SO_2: The maximum value for SO_2 observed at Sonsari village as 13.9 µg /m^3 and minimum value for SO_2 at Nariyara village as 9.5 µg /m^3. The 24 hours applicable limit outside the Plant premises 80 µg /m^3 for Rural/Residential area.

NOx: The maximum value for NOx observed at Jhalmala village as 14.8 µg /m^3 and minimum value for NOx at Nariyara village as 11.1 µg /m^3. The 24 hours applicable limit outside the plant premises 80 µg /m^3 for Rural/Residential area.

CO: The maximum value for CO observed at Jhalmala village as 0.186 mg/m^3 and minimum value for CO at Nariyara village as 0.110 mg/m^3. The 8 hours' applicable limit outside the plant premises 02 mg/m^3 for Rural/Residential area.

Ammonia: The maximum and minimum value for Ammonia observed at all the locations as <5.0 µg /m^3. The 24 hours applicable limit outside the plant premises 400 µg /m^3 for Rural/Residential area.

Nickel: The maximum and minimum value for Nickel observed at all the locations as <1.0 ng/m^3 . The 24 hours applicable limit outside the plant premises 20 ng/m^3 for Rural/Residential area.

Arsenic: The maximum and minimum value for Arsenic observed at all the locations as <1.0 ng /m^3. The 24 hours applicable limit outside the plant premises 6 ng/m^3 for Rural/Residential area

Lead: The maximum and minimum value for Lead observed at all the locations as <0.001 µg /m^3. The 24 hours applicable limit outside the plant premises 1 µg /m^3 for Rural/Residential area.

Ozone: The maximum value for Ozone observed at Tarod village as 10.2 µg /m^3 and minimum value for Ozone at Amora village as 5.4 µg /m^3. The 8 hours applicable limit outside the plant premises 100 µg/m^3 for Rural/Residential area.

Benzo(a)Pyrene: The maximum and minimum value for Benzo(a)Pyrene observed at all the locations as <0.1 ng /m^3. The 24 hours applicable limit outside the plant premises 1 ng/m^3 for Rural/Residential area

Benzene: The maximum and minimum value for Benzene observed at all the locations as <1.0 µg /m^3. The 24 hours applicable limit outside the plant premises 5 µg /m^{3}for Rural/Residential area

Mercury: The maximum and minimum value for Mercury observed at all the locations as <0.001 µg /m^3 for 24 hours.

Results and conclusions:

The results of the monitored data indicate that the ambient air quality of the region in general is conformity with respect to norms of National Ambient Air Quality standards of CPCB, at all locations monitored.

7.2 Noise Monitoring

7.2.1 Source Noise Monitoring – Inside the Plant Premises

The spot noise levels observed inside the premises at various locations is given in **Table-12**

TABLE-12
INDUSTRIAL NOISE LEVELS IN WORK ENVIRONMENT

Sr. No	Code	Location	Date of sampling	Noise Level L_{eq} [dB(A)]
1	N1	TG floor	02/04/2025	84.2
2	N2	Cooling tower#3	02/04/2025	83.0
3	N3	Main Gate	08/04/2025	59.7
4	N4	Boiler feed pump	02/04/2025	84.0
5	N5	Admin Building area	05/04/2025	56.7
6	N6	CHP Machine area	05/04/2025	82.8
7	N7	AHP area	05/04/2025	83.3
8	N8	Ash Silo area	05/04/2025	83.7
9	N9	CW Pump house	02/04/2025	84.1
10	N10	Compressor 1	08/04/2025	84.3
11	N11	Compressor 2	08/04/2025	83.6
12	N12	Compressor 3	08/04/2025	83.9
13	N13	Compressor 4	08/04/2025	84.2

7.2.2 Observations

The industrial noise levels within the premises at Work Zone area are observed to be in the range of 56.7 to 84.3 dB (A), which are within the prescribed limit of 85 dB (A).

7.2.3 Noise Monitoring – Outside the Premises

The statistical analysis is done for measured noise levels at four locations in the study area. The parameters are analyzed for L_{day}, L_{night}, and L_{dn}. The statistical analysis results are given in **Table-13.**

TABLE-13
AMBIENT NOISE LEVELS IN THE STUDY AREA

All the values are given in dB (A)

Code	Location	Date of sampling	L_{10}	L_{50}	L_{90}	L_{eq}	L_{day}	L_{night}	L_{dn}
N14	Banahill Village	15.04.2025	54.2	50.3	46.6	51.3	52.1	42.6	48.2
N15	Tarod Village	30.04.2025	50.3	46.4	42.7	47.4	48.2	43.0	45.7
N16	Rogda Village	29.04.2025	51.2	47.3	43.6	48.3	49.1	41.7	46.8
N17	Jhalmala Village	16.04.2025	53.8	49.9	46.2	50.9	51.7	42.4	47.6
N18	Nariyara Village	18.04.2025	51.7	47.8	44.1	48.8	49.6	40.8	45.3
N19	Sonsari Village	19.04.2025	52.9	49.0	45.3	50.0	50.8	42.1	46.5
N20	Amora Village	26.04.2025	53.3	49.4	45.7	50.4	51.2	42.9	47.0
N21	Arasmeta Village	25.04.2025	54.0	50.1	46.4	51.1	51.9	41.5	47.7

7.2.3.1 Observations

a) **Day time Noise Levels (L_{day})**

Residential Area

The daytime (L_{day}) noise levels are observed to be in the range of 52.1 dB (A) – 48.2 dB (A), which are within the prescribed limit of 55 dB (A).

b) **Night time Noise Levels (L_{night})**

Residential Area

The nighttime (L_{night}) noise levels were observed to be in the range of 43.0 dB (A) – 41.5 dB (A), which are within the prescribed limit of 45 dB (A).

7.3 Ground Water Quality

Four ground water samples were collected around Ash pond area and four ground water samples were collected at villages around the plant site and analyzed for various parameters. The analytical results are presented below in **Table-14** and **Table-15.**

TABLE-14
GROUND WATER QUALITY AROUND ASHPOND

Sr. No	Parameter	Units	GW5	GW6	GW7	GW8
	Sampling season		Pre Monsoon Season			
	Sampling date		11.04.2025	11.04.2025	11.04.2025	11.04.2025
	Date of analysis		14.042025	14.042025	14.042025	14.042025
1	pH	--	7.83	7.55	7.43	7.68
2	Color	Hazen	9	12	7	11
3	Taste	--	Agreeable	Agreeable	Agreeable	Agreeable
4	Odour	--	Agreeable	Agreeable	Agreeable	Agreeable
5	Conductivity	µs/cm	1142	874	1156	937
6	Turbidity	NTU	8	6	9	5
7	Total Dissolved Solids	mg/l	731	553	748	597
8	Total Hardness as $CaCO_3$	mg/l	370	364	351	299
9	Total Alkalinity as $CaCO_3$	mg/l	280	205	245	175
10	Calcium as Ca^{2+}	mg/l	82.2	56.2	78.3	62.4
11	Magnesium as Mg^{2+}	mg/l	40.2	30.1	38.3	34.8
12	Residual Chlorine	mg/l	<0.1	<0.1	<0.1	<0.1
13	Boron as B	mg/l	0.4	0.7	0.5	0.3
14	Chloride as Cl^-	mg/l	126.4	112.4	164.2	139.8
15	Sulphate as SO_4^{2+}	mg/l	84.8	61.0	75.4	78.9
16	Fluorides as F	mg/l	1.4	1.0	1.1	1.5
17	Nitrate as NO_3	mg/l	24.7	8.9	23.1	11.8
18	Sodium as Na^+	mg/l	83.2	70.6	92.3	71.8
19	Potassium as K^+	mg/l	15.1	10.2	19.2	10.5
20	Phenolic Compounds	mg/l	<0.001	<0.001	<0.001	<0.001
21	Cyanides as CN	mg/l	<0.02	<0.02	<0.02	<0.02
22	Anionic Detergents	mg/l	<0.1	<0.1	<0.1	<0.1
23	Mineral Oil	mg/l	<0.01	<0.01	<0.01	<0.01
24	Cadmium as Cd	mg/l	<0.003	<0.003	<0.003	<0.003
25	Total Arsenic as As	mg/l	<0.01	<0.01	<0.01	<0.01
26	Copper as Cu	mg/l	<0.01	<0.01	<0.01	<0.01
27	Led as Pb	mg/l	<0.01	<0.01	<0.01	<0.01
28	Manganse as Mn	mg/l	<0.01	<0.01	<0.01	<0.01
29	Iron as Fe	mg/l	0.12	0.06	0.13	0.10
30	Total Chromium (as Cr)	mg/l	<0.01	<0.01	<0.01	<0.01
31	Selenium as Se	mg/l	<0.01	<0.01	<0.01	<0.01
32	Zinc as Zn	mg/l	0.36	0.42	0.28	0.33
33	Aluminium as Al	mg/l	<0.01	<0.01	<0.01	<0.01
34	Mercury as Hg	mg/l	<0.001	<0.001	<0.001	<0.001
35	Pesticides	mg/l	Absent	Absent	Absent	Absent
36	E. Coli	--	Absent	Absent	Absent	Absent
37	Total Coliforms	MPN/100ml	<2	<2	<2	<2

Sampling Locations

GW5. Ash pond Location-1, GW6. Ash pond Location-2, GW7. Ash pond Location-3, GW8. Ash pond Location-4

7.3.1 Observations

7.3.2.1 Ground Water Around Ash pond Quality

The analysis results indicate that the pH and conductivity of the ground water was found to be in the range of 7.43– 7.83 and 874 to 1156 µS/cm. The Total Dissolved Solids were found to be in the ranging of 553 to 748 mg/L. The Other parameters like Chlorides, Sulphates, Nitrates and Fluorides were found to be in the range of observed to be 112.4 mg/l to 164.2 mg/l, 61.0 mg/l to 84.8 mg/l, 8.9 mg/l to 24.7 mg/l and 1.0 mg/l to 1.5 mg/l.

TABLE-15
GROUND WATER QUALITY IN STUDY AREA

Sr. No	Parameter	Units	GW1	GW2	GW3	GW4	Limits as per IS:10500
	Sampling season		Pre Monsoon Season				
	Sampling date		12.04.2025	12.04.2025	12.04.2025	12.04.2025	
	Date of analysis		14.04.2025	14.04.2025	14.04.2025	14.04.2025	
1	pH	--	7.45	7.62	7.72	7.53	6.5 – 8.5 (NR)
2	Color	Hazen	<1.0	<1.0	<1.0	<1.0	5(15)
3	Taste	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Odour	--	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Conductivity	µs/cm	811	793	847	962	$
6	Turbidity	NTU	<1.0	<1.0	<1.0	<1.0	1(5)
7	Total Dissolved Solids	mg/l	517	504	534	623	500(2000)
8	Total Hardness as $CaCO_3$	mg/l	241	238	275	306	200(600)
9	Total Alkalinity as $CaCO_3$	mg/l	195	145	190	225	200(600)
10	Calcium as Ca^{2+}	mg/l	46.2	48.6	56.8	64.2	75(200)
11	Magnesium as Mg^{2+}	mg/l	30.8	28.5	32.6	35.4	30(100)
12	Residual Chlorine	mg/l	<0.1	<0.1	<0.1	<0.1	0.2(1)
13	Boron as B	mg/l	0.02	0.06	0.03	0.05	0.5(1)
14	Chloride as Cl^-	mg/l	112.8	124.6	118.5	128.4	250(1000)
15	Sulphate as SO_4^{2+}	mg/l	38.9	60.1	48.5	55.1	200(400)
16	Fluorides as F	mg/l	0.9	0.6	0.8	1.3	1.0(1.5)
17	Nitrate as NO_3	mg/l	10.2	13.5	15.8	16.4	45(NR)
18	Sodium as Na^+	mg/l	69.9	67.2	62.5	70.0	$
19	Potassium as K^+	mg/l	8.9	9.1	8.9	18.4	$
20	Phenolic Compounds	mg/l	<0.001	<0.001	<0.001	<0.001	0.001(0.002)
21	Cyanides as CN	mg/l	<0.02	<0.02	<0.02	<0.02	0.05 (NR)
22	Anionic Detergents	mg/l	<0.1	<0.1	<0.1	<0.1	0.2 (1.0)
23	Mineral Oil	mg/l	<0.01	<0.01	<0.01	<0.01	0.5 (NR)
24	Cadmium as Cd	mg/l	<0.003	<0.003	<0.003	<0.003	0.003 (NR)
25	Total Arsenic as As	mg/l	<0.01	<0.01	<0.01	<0.01	0.01 (0.05)
26	Copper as Cu	mg/l	<0.01	<0.01	<0.01	<0.01	0.05 (1.5)
27	Led as Pb	mg/l	<0.01	<0.01	<0.01	<0.01	0.01 (NR)
28	Manganse as Mn	mg/l	<0.01	<0.01	<0.01	<0.01	0.1 (0.3)
29	Iron as Fe	mg/l	0.09	0.05	0.08	0.13	0.3(NR)
30	Total Chromium (as Cr)	mg/l	<0.01	<0.01	<0.01	<0.01	0.05(NR)
31	Selenium as Se	mg/l	<0.01	<0.01	<0.01	<0.01	0.01(NR)
32	Zinc as Zn	mg/l	0.25	0.18	0.21	0.30	5(15)
33	Aluminium as Al	mg/l	<0.01	<0.01	<0.01	<0.01	0.03(0.2)
34	Mercury as Hg	mg/l	<0.001	<0.001	<0.001	<0.001	0.001(NR)
35	Pesticides	mg/l	Absent	Absent	Absent	Absent	Absent
36	E. Coli	--	Absent	Absent	Absent	Absent	Absent
37	Total Coliforms	MPN/100ml	<2	<2	<2	<2	10

Note: *$ - Limits not specified; NR - No Relaxation Limits are shown in IS 10500 are Acceptable limits (Requirement) and in parenthesis are Permissible limit in absence of alternate source*

Sampling Locations

GW1. Amora Village (Bore well) , GW2. Rogda (Bore well)
GW3. Banahill (Bore well) , GW4. Nariyara Village (Bore well)

7.3.1 Observations

7.3.2.1 Ground Water Quality

The analysis results indicate that the pH and conductivity of the ground water was found to be in the range of 7.45 - 7.72 and 793 to 962 µS/cm. The Total Dissolved Solids were found to be well within the limits ranging from 504 to 623 mg/L. Other parameters like Chlorides, Sulphates, Nitrates and Fluorides were observed to be well within the prescribed limits. The overall physic-chemical analysis of all the parameters is well within the standards as per IS: 10500.

7.4 Waste Water Quality

Four waste water samples were collected within the plant site and analyzed for various parameters. The analytical results are presented below in **Table-16.**

TABLE-16
WASTE WATER QUALITY

Sr. No.	Parameters	Units	CT Blow Down	Boiler Blow Down	Condenser Cooling water	Guard Pond	Limits as per CECB& CPCB
			WW1	WW2	WW3	WW4	
	Sampling Date		11.04.2025	11.04.2025	11.04.2025	11.04.2025	
	Date of Analysis		14.04.2025	14.04.2025	14.04.2025	14.04.2025	
1	p^H	-	7.43	7.80	7.94	7.52	6.5-8.5
	Temperature	^oC	28.4	29.1	28.0	27.8	
3	Total Dissolved Solids	mg/l	475	13	16	588	-
4	Total Suspended Solids	mg/l	22.7	<1.0	<1.0	56.2	100
5	Dissolved Oxygen	mg/l	5.0	5.3	5.1	5.2	-
6	Biochemical Oxygen Demand, (3 days at 27^0C)	mg/l	<3	<3	<3	19.5	-
7	Chemical Oxygen Demand	mg/l	<5	<5	<5	90	-
8	Chlorides	mg/l	74.3	17.3	15.3	147.3	-
9	Sulphates	mg/l	65.3	15.7	13.2	128.4	-
10	Phosphates	mg/l	0.78	<0.01	<0.01	1.74	5.0
11	Zinc	mg/l	<0.01	<0.01	<0.01	0.43	1.0
12	Chromium	mg/l	<0.01	<0.01	<0.01	<0.01	0.2
13	Copper	mg/l	<0.01	<0.01	<0.01	<0.01	1.0
14	Free Available chlorine	mg/l	<0.2	<0.2	<0.2	<0.2	0.5
15	Irons	mg/l	<0.01	<0.01	<0.01	0.25	1.0
16	Oil & Grease	mg/l	<1.0	<1.0	<1.0	<1.0	20

7.4.1 Results and Conclusions

The data analysis to be as per CFO Norms and analytical results indicated that the guard pond waste water is well within the standard limits specified by EPA Notification [G.S.R.7, dt. Dec.22,1998].

7.4.2 Observations-Waste water quality.

The analysis results indicate that the pH ranges from 7.43 – 7.94 and the Total Suspended Solids were found to be within the limits ranging from <1.0-56.2 mg/l. Other parameters like Zinc, Chromium, Available, chloride, Iron and Oil& Grease were observed to be well within the prescribed limits.

7.4.3 Sewage Waste Water Quality

One Sewage water samples is collected and analyzed for various parameters. The survey analytical results are given in **Table-17.**

TABLE-17
SEWAGE WASTE WATER QUALITY

Sr.No	Parameter	UOM	WW5 (STP Outlet)
	Sampling Date		11.04.2025
	Date of Analysis		14.04.2025
1	pH	-	7.85
2	Total Dissolved Solids	mg/l	506
3	Total Suspended Solids	mg/l	42.3
4	Dissolved Oxygen	mg/l	5.2
5	Bio Chemical Oxygen Demand for 3 day 27^{O}C	mg/l	18.5
6	Chemical Oxygen Demand	mg/l	90
7	Chlorides	mg/l	115.4
8	Sulphates	mg/l	108.4
9	Phosphates	mg/l	0.64
10	Zinc	mg/l	0.37
11	Chromium	mg/l	<0.01
12	Copper	mg/l	<0.01
13	Available Chlorine	mg/l	<0.2
14	Iron	mg/l	0.18
15	Oil and Grease	mg/l	<1.0

7.5 Water Depth measurement

Four ground water depths at villages and plant and four ash pond area locations were measured and results are given in **Table-18.**

TABLE-18
WATER DEPTH MEASUREMENT

Location Code	Location Name	Depth(m)
GW1	Banahil Village	10.50
GW2	Nariyara Village	5.75
GW3	Amora Village	4.08
GW4	Rogda Village	5.08
ASH1	Ash pond Location-1	8.03
ASH2	Ash pond Location–2	7.08
ASH3	Ash pond Location-3	7.96
ASH4	Ash pond Location-4	1.67

7.6 Stack Emission Monitoring

The power plant has stack of height 275.0-m, which is the major source of air pollution. The stack emission monitoring for Unit – II, Unit - III & Unit - IV has been carried out and results are given in **Table-19 to 21.**

TABLE - 19
STACK EMISSION MONITORING UNIT -II

Sr. No.	Parameters	UOM	Result	Methods
Date Of Sampling	:28/04/2025			
Sampling Time	: 11.00 to 12.00 hrs			
Duration Of sampling	: 60 mints			
Date of sample analysis	: 30/04/2025			
Details of the source				
1	Capacity	MW	600	-
2	Stack Height	M	275	-
3	Duct Dimension	M	7.0	-
4	Duct area	m^2	38	-
Flue Gas Characteristics				
5	Temperature	°C	102	USEPA 1,2,3&4
6	Velocity	m/s	22.75	USEPA 1,2,3&4
7	Volumetric Flow Rate	Nm^3/s	659.85	USEPA 1,2,3&4
8	Particulate Matter	mg/Nm^3	21.82	USEPA 5
9	Sulfur dioxide	mg/Nm^3	1015	USEPA 6
10	Oxides of Nitrogen	mg/Nm^3	408	USEPA 7
11	Arsenic as As	mg/Nm^3	0.010	USEPA method -29
12	Cadmium as Cd	mg/Nm^3	0.016	USEPA method -29
13	Cobalt as Co	mg/Nm^3	<0.001	USEPA method -29
14	Nickel as Ni	mg/Nm^3	0.023	USEPA method -29
15	Copper as Cu	mg/Nm^3	0.035	USEPA method -29
16	Mercury as Hg	mg/Nm^3	0.010	USEPA method -29
17	Chromium as Cr	mg/Nm^3	0.027	USEPA method -29
18	Manganese as Mn	mg/Nm^3	0.039	USEPA method -29
19	Antimony as Sb	mg/Nm^3	<0.001	USEPA method -29
20	Lead as Pb	mg/Nm^3	0.041	USEPA method -29
21	Thallium as TI	mg/Nm^3	<0.001	USEPA method -29
22	Vanadium as V	mg/Nm^3	<0.001	USEPA method -29

The results indicate that the PM is observed as 21.82 mg/Nm^3.

TABLE-20
STACK EMISSION MONITORING UNIT -III

Sr. No.	Parameters	UOM	Result	Methods
Date Of Sampling : 28/04/2025				
Sampling Time : 12.10 to 13.10 hrs				
Duration Of sampling : 60 mints				
Date of sample analysis : 30/04/2025				
Details of the source				
1	Capacity	MW	600	-
2	Stack Height	M	275	-
3	Duct Dimension	M	7.0	-
4	Duct area	m^2	38	-
Flue Gas Characteristics				
5	Temperature	°C	116	USEPA 1,2,3&4
6	Velocity	m/s	24.05	USEPA 1,2,3&4
7	Volumetric Flow Rate	Nm^3/s	672.49	USEPA 1,2,3&4
8	Particulate Matter	mg/Nm^3	10.56	USEPA 5
9	Sulfur dioxide	mg/Nm^3	976	USEPA 6
10	Oxides of Nitrogen	mg/Nm^3	396	USEPA 7
11	Arsenic as As	mg/Nm^3	0.019	USEPA method -29
12	Cadmium as Cd	mg/Nm^3	0.014	USEPA method -29
13	Cobalt as Co	mg/Nm^3	<0.001	USEPA method -29
14	Nickel as Ni	mg/Nm^3	0.028	USEPA method -29
15	Copper as Cu	mg/Nm^3	0.038	USEPA method -29
16	Mercury as Hg	mg/Nm^3	0.008	USEPA method -29
17	Chromium as Cr	mg/Nm^3	0.020	USEPA method -29
18	Manganese as Mn	mg/Nm^3	0.040	USEPA method -29
19	Antimony as Sb	mg/Nm^3	<0.001	USEPA method -29
20	Lead as Pb	mg/Nm^3	0.036	USEPA method -29
21	Thallium as TI	mg/Nm^3	<0.001	USEPA method -29
22	Vanadium as V	mg/Nm^3	<0.001	USEPA method -29

The results indicate that the PM is observed as 10.56 mg/Nm^3.

TABLE-21
STACK EMISSION MONITORING UNIT -IV

Sr. No.	Parameters	UOM	Result	Methods
Date Of Sampling : 29/04/2025				
Sampling Time : 15.40 to 16.40 hrs				
Duration Of sampling : 60 mints				
Date of sample analysis : 01/05/2025				
Details of the source				
1	Capacity	MW	600	-
2	Stack Height	M	275	-
3	Duct Dimension	M	10.4 x 7.8	-
4	Duct area	m^2	81.12	-
Flue Gas Characteristics				
5	Temperature	°C	110	USEPA 1,2,3&4
6	Velocity	m/s	19.28	USEPA 1,2,3&4
7	Volumetric Flow Rate	Nm^3/s	1155.93	USEPA 1,2,3&4
8	Particulate Matter	mg/Nm^3	14.05	USEPA 5
9	Sulfur dioxide	mg/Nm^3	1006	USEPA 6
10	Oxides of Nitrogen	mg/Nm^3	422	USEPA 7
11	Arsenic as As	mg/Nm^3	0.034	USEPA method -29
12	Cadmium as Cd	mg/Nm^3	0.020	USEPA method -29
13	Cobalt as Co	mg/Nm^3	<0.001	USEPA method -29
14	Nickel as Ni	mg/Nm^3	0.023	USEPA method -29
15	Copper as Cu	mg/Nm^3	0.053	USEPA method -29
16	Mercury as Hg	mg/Nm^3	0.009	USEPA method -29
17	Chromium as Cr	mg/Nm^3	0.019	USEPA method -29
18	Manganese as Mn	mg/Nm^3	0.040	USEPA method -29
19	Antimony as Sb	mg/Nm^3	<0.001	USEPA method -29
20	Lead as Pb	mg/Nm^3	0.027	USEPA method -29
21	Thallium as TI	mg/Nm^3	<0.001	USEPA method -29
22	Vanadium as V	mg/Nm^3	<0.001	USEPA method -29

The results indicate that the PM is observed as 14.05 mg/Nm^3.