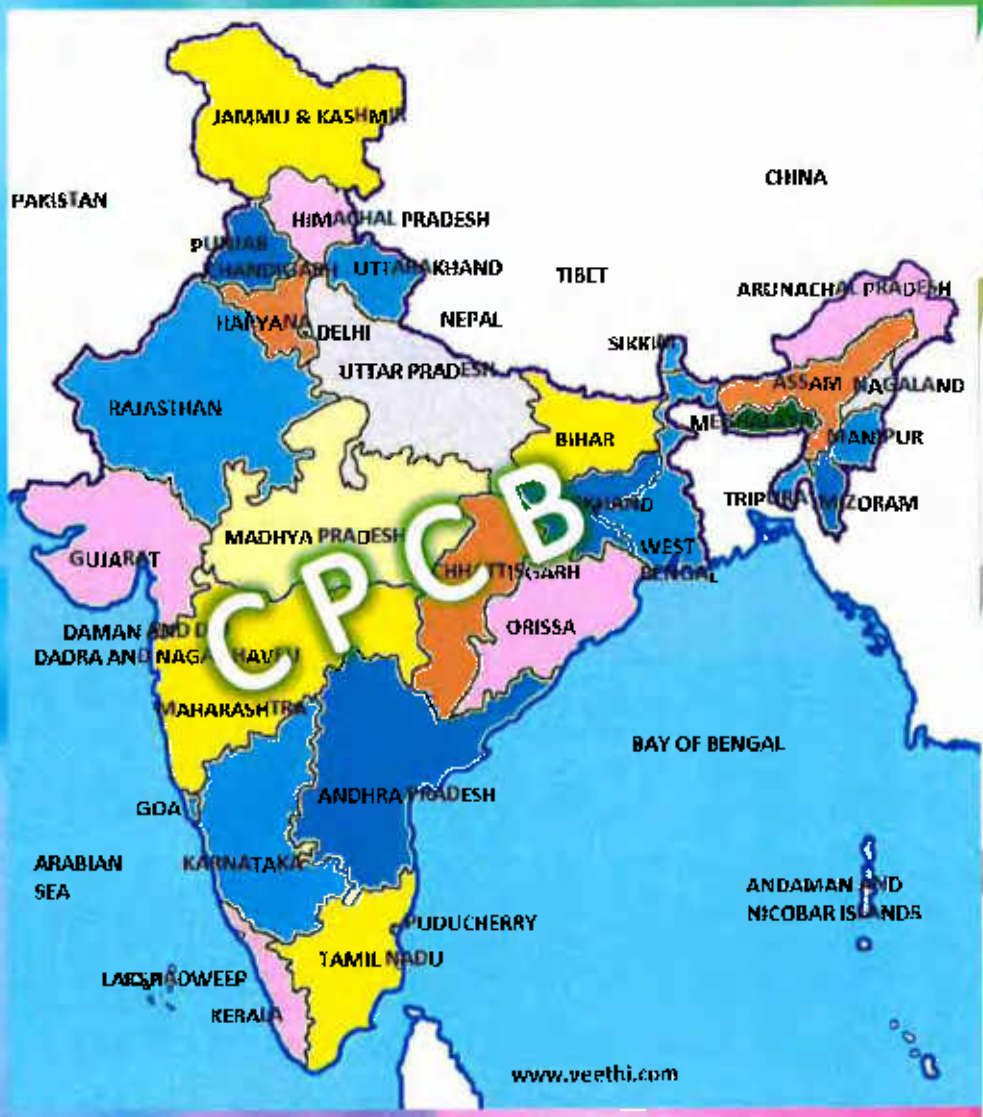
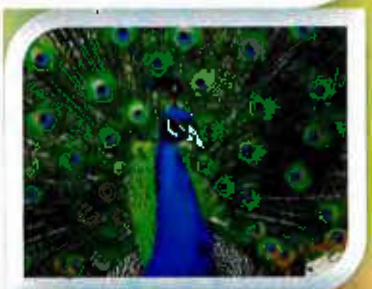
MONITORING, SAMPLING AND ANALYSIS OF AMBIENT AIR QUALITY, SURFACE & GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREAS OF INDIA (UNDER PHASE – 1) PROGRAMME





Submitted to

CENTRAL POLLUTION CONTROL BOARD

[Ministry of Environment & Forests]

Parivesh Bhawan, East Arjun Nagar, Delhi – 110 032

MAY - 2014

Submitted by :

M/s Bhagavathi Ana Labs, Hyderabad

FOREWORD

Central Pollution Control Board (CPCB), New Delhi has awarded the Project titled "Monitoring, Sampling and Analysis for Ambient Air Quality (AAQ), Surface water and Ground water quality for the identified 10 Critically Polluted Areas (CPA's) under Phase – 1 Programme" to M/s. Bhagavathi Ana Labs, Hyderabad.

Bhagavathi Ana Labs has mobilized teams for conducting the monitoring for the 10 Critically Polluted Areas (CPAs) viz., 1. Ankleshwar; 2.Ghaziabad; 3. Indore; 4 Jharsuguda; 5. Ludhiyana; 6 Panipat; 7. Patancheru & Bollaram; 8.Singrauli; 9. Vapi and 10. Vatva. Each team is provided mobile van equipped with analytical instruments in such a manner that the team can monitor four to six AAQ monitoring stations at a time, Surface water and Ground water samples are collected simultaneously. Each team comprised of Senior Environment Scientist, Environmental Engineers and Field Assistants.

During the study period, environmental quality monitoring was carried out in three rounds of monitoring/sampling (ambient air quality, surface water and ground water) at each location has been conducted on alternative days. The analysis of the collected samples was carried out and the final report is hereby submitted.

We are grateful for the guidance and support given by the officials of local State Pollution Control Boards (SPCB's) in the successful completion of the monitoring work.

We would like to mention our special thanks to Dr. A.B.Akolkar, Member Secretary, CPCB, Shri. N.K.Gupta, SEE & In-charge ESS, Mrs. Divya Sinha, SEE, Dr. H.V.C.Chary Guntupalli, EE and Ms. Reena K.Satavan, EE for their valuable guidance and support in the execution of the project in a successful manner.

BH. HARI BABU

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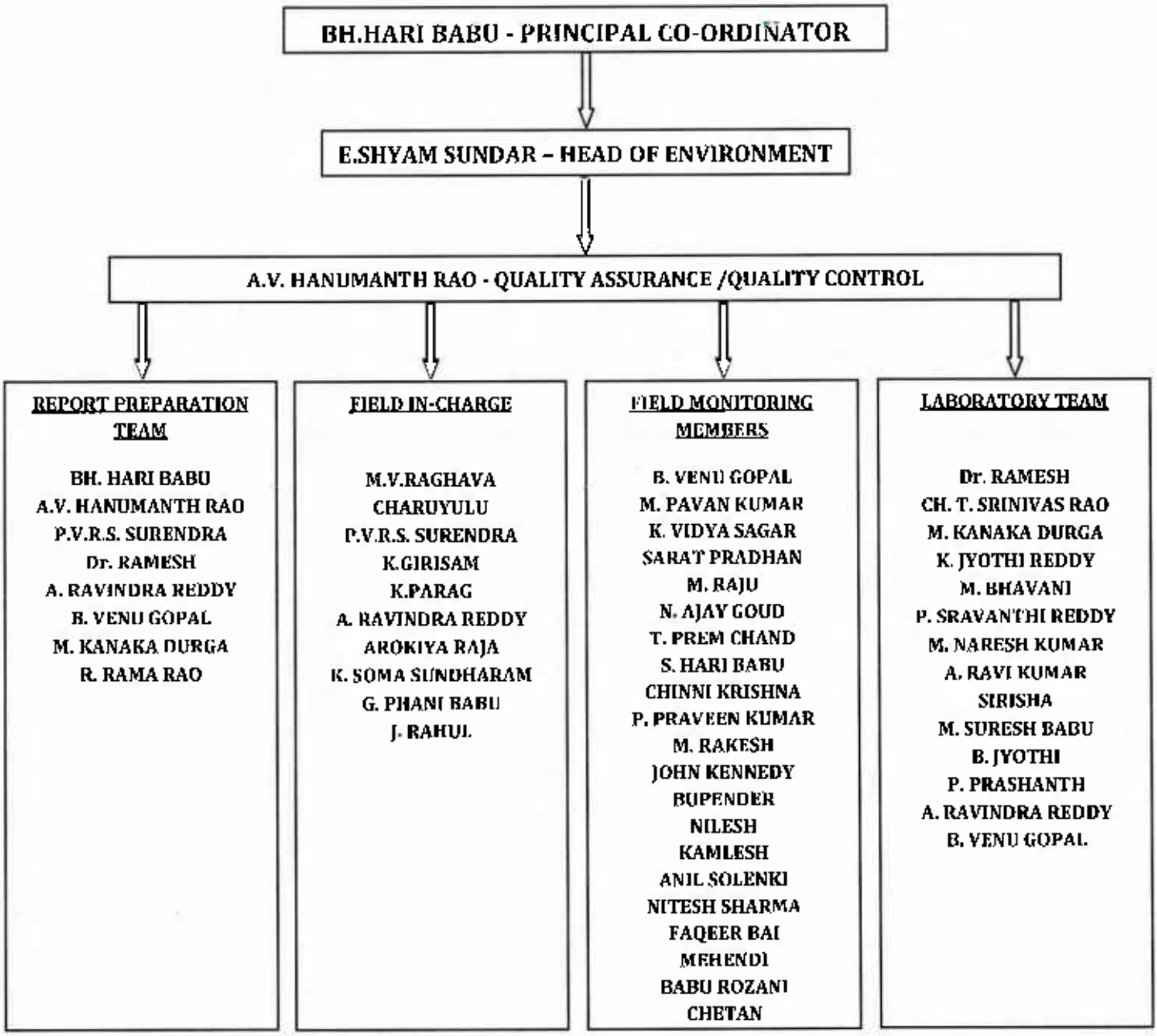
PROJECT TEAM



DETAILS OF 10 CRITICALLY POLLUTED AREAS (CPAs) UNDER PHASE – 1 PROGRAMME

Sampling locations and number of samples in different industrial clusters is provided in the below table:

S.No.	Industrial Cluster/Area	Potential Impact Zones	No. of Air samples	No. of Water samples	
				Surface Water	Ground Water
1.	Patancheru – Bollaram (Andhra Pradesh)	Patancheru Industrial Area and Bollaram Industrial Area	04	04	04
2.	Ankleshwar (Gujarat)	GIDC Ankleshwar and GIDC, Panoli	06	06	06
3.	Vapi (Gujarat)	GIDC Vapi	06	05	06
4.	Vatva (Gujarat)	GIDC Vatva, Narol Industrial Area (villages Piplaj, Shahwadi, Narol	04	04	04
5.	Indore (Madhya Pradesh)	a) Existing Industrial Area / Estates (09) and Indore City b) Manglia, Rau, Rajoda, Barlai, Sanwer road, Asrawad, Tejpurgadwadi	04	04	04
6.	Ghaziabad	**Sub Cluster A** • Mohan nagar/Mohan meakin Industrial Area • Rajinder nagar industrial area • Sahibabad industrial area • South side of GT (Grand Trunk Road) Industrial Area (Sahibabad) • Sahibabad Industrial Area Site – 4 **Sub-Cluster B** • Pandav nagar industrial area • Kavi nagar industrial area • Bulandshahar Road industrial area • Amrit nagar • Aryanagar industrial area **Sub-Cluster C** • Merrut road industrial area	16	18	16

S.No.	Industrial Cluster/Area	Potential Impact Zones	No. of Air samples	No. of Water samples	
				Surface Water	Ground Water
		Sub-Cluster D • Loni Industrial Area • Loni Road Industrial Area • Roop nagar Industrial Area **Sub-Cluster E** • Hapur Road Industrial Area • Dasna • Philkua **Sub-Cluster F** (Other scattered industrial area) • Southside of GT road • Kavi nagar • Tronica city • Anand nagar • Jindal nagar • Prakash nagar • Rural Industrial Estate			
7.	Panipat	i. Near Vill Machaurli & Jhattipur on NH-1, Panipat ii. Vill. Pasina Kalan Road (1km from NH-1) iii. Vill. Rishalu road (2kms from NH-1) iv. Adjoining area of Industrial Area Sector – 29, Part -1. v. Along vill. Ujha Road (upto 1km from Municipal limit vi. Village Sanoli Road and near village Kalamb Road vii. Road to Vill. Ugrakhaeri (Industrial Cluster) viii. Village Babali Road & Sonali Road (Industrial Cluster) ix. Shiv Nagar & Kishanpura, Panipat x. Shastri & Mahavir Colony, Panipat xi. Desraj Colony, Panipat xii. Near Bichapri Chowk,	22	20	22

S.No.	Industrial Cluster/Area	Potential Impact Zones	No. of Air samples	No. of Water samples	
				Surface Water	Ground Water
		Barsat Road xiii. Between noorwala & Barsat road xiv. Vill.Chhajpur, Panipat xv. Vill. Bhav xvi. GT road, near Toll Tax (Both the way 5kms NH-1) xvii. GT Road, near Babarpur vill. xviii. Kabri Road (1km area xix. Batra Colony, Panipat xx. Vill. Sondhapur, Panipat xxi. Gohana Road (5kms towards Gohana) xxii. Weavers Colony, Panipat			
8.	Singrauli	**Sonebhadra (UP)** • Dala • Obra • Renukoot • Anpara • Renusagar • Kakri • Dudhichuwa • Bina • Khadia • Shakti nagar • Rihand Nagar, Bijpur **Singrauli (Madhya Pradesh)** Vindhyachal nagar and existing NCL coal mine areas including the townships at Jayant, Nigahi, Dudhichua, Amlohri & Jhingurdah	18	18	18
9.	Ludhiyana	i. Focal Point Along along with NH-1 (Total Eight Phase) ii. Industrial Area-B (from Sherpur chowk to Gill road & Gill road to Miller Kotla road (left side of road)) iii. Mixed Industrial Area – Right side of Gill road	15	15	15

S.No.	Industrial Cluster/Area	Potential Impact Zones	No. of Air samples	No. of Water samples	
				Surface Water	Ground Water
		iv. Industrial Area – C (near Jugiana Village) v. Industrial Area A& Extension: Area between old GT road and Ludhiana By-pass road vi. Industrial Estate: Near Dholwal chowk vii. Mixes Industrial Area (MIA) Miller gunj viii. MIA – By-pass road ix. Bahdur Industrial Area x. Tejpur Industrial Complex xi. Rahon road Industries are spreaded over 4kms area on either side of road from By-pass road, Ludhiana xii. Kakkowal road – Industries are spreaded over the either side of road, 3kms from By-pass road. xiii. Noorwala road – Industries are spreaded over the either side of road, 3kms from By-pass road xiv. GT road West-Jalandhar side xv. Village-Gaushpura (paper mill + dying unit)			
10.	Jharsuguda	IB Valley of Jharsuguda (Industrial and Mining Area)	04	04	04
Total – 10 CPAs		**Total Samples in each category in each round**	**99**	**98**	**99**
		Total Samples in each category in 3 rounds	**297**	**294**	**297**

MONITORING, SAMPLING AND ANALYSIS

of

AMBIENT AIR QUALITY, SURFACE WATER QUALITY AND GROUND WATER QUALITY

in

IDENTIFIED CRITICALLY POLLUTED AREA (CPAs)

ANKLESHWAR

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

ANKLESHWAR - GUJARAT

AAQ MONITORING LOCATIONS

SAMPLE CODE	NAME OF THE MONITORING LOCATION	DATE OF SAMPLING	LATITUDE	LONGITUDE
AAQ – 1	Asian Paints Colony, SW direction to Industrial Area	1st Round: 26.12.2013 to 27.12.2013 2nd Round: 28.12.2013 to 29.12.2013 3rd Round: 30.12.2013 to 31.12.2013	N 21°36'29.2"	E 073°01'02.2"
AAQ – 2	BASF India Limited Unit –II	1st Round: 26.12.2013 to 27.12.2013 2nd Round: 28.12.2013 to 29.12.2013 3rd Round: 30.12.2013 to 31.12.2013	N 21°37'32.8"	E 073°02'50.8"
AAQ – 3	Meghmani Organics Ltd	1st Round: 26.12.2013 to 27.12.2013 2nd Round: 28.12.2013 to 29.12.2013 3rd Round: 30.12.2013 to 31.12.2013	N 21°36'54.9"	E 073°01'59.9"
AAQ – 4	Durga Traders	1st Round: 26.12.2013 to 27.12.2013 2nd Round: 28.12.2013 to 29.12.2013 3rd Round: 30.12.2013 to 31.12.2013	N 21°38'08.9"	E 073°01'01.2"
AAQ – 5	Solvay Specialty chemicals	1st Round: 26.12.2013 to 27.12.2013 2nd Round: 28.12.2013 to 29.12.2013 3rd Round: 30.12.2013 to 31.12.2013	N 21°32'32.9"	E 072°59'03.4"
AAQ – 6	Jhkal Chemicals Limited	1st Round: 26.12.2013 to 27.12.2013 2nd Round: 28.12.2013 to 29.12.2013 3rd Round: 30.12.2013 to 31.12.2013	N 21°34'40.7"	E 072°59'34.6"

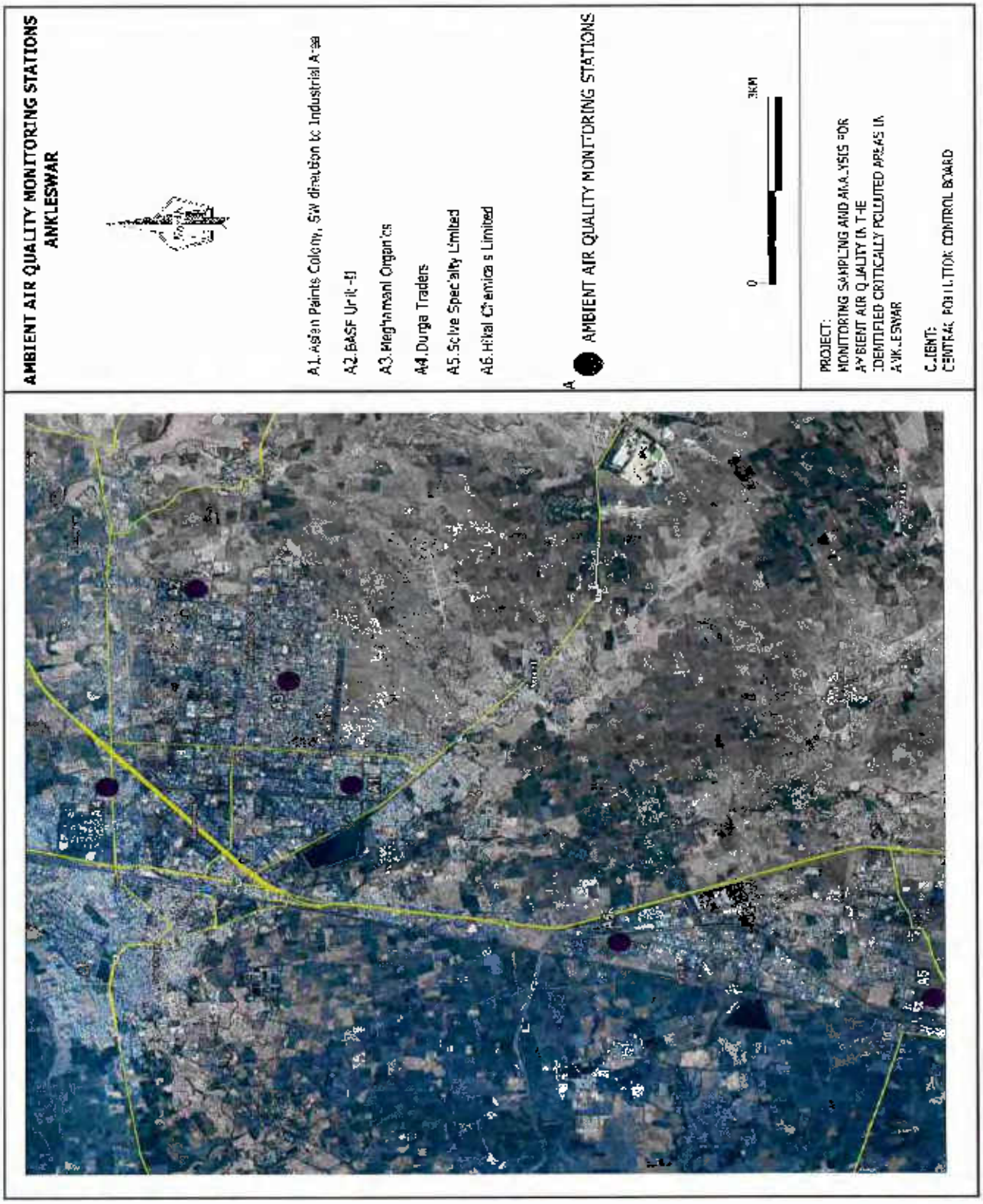
SURFACE WATER SAMPLING LOCATIONS

SAMPLE CODE	NAME OF THE SAMPLING LOCATION	DATE OF SAMPLING	LATITUDE	LONGITUDE
SW – 1	Lake at Sanjali village	1st Round: 27.12.2013 2nd Round:29.12.2013 3rd Round: 31.12.2013	N 21°33'18.70"	E 072°59'31.80"
SW 2	Amla Khadi	1st Round: 27.12.2013 2nd Round:29.12.2013 3rd Round: 31.12.2013	N 21°36'52.80"	E 072°59'59.09"
SW – 3	Vand Khadi	1st Round: 27.12.2013 2nd Round:29.12.2013 3rd Round: 31.12.2013	N 21°34'17.70"	E 072°58'25.70"
SW - 4	Amaravathi River	1st Round: 27.12.2013 2nd Round:29.12.2013 3rd Round: 31.12.2013	N 21°38'.07.6"	E 073°03'54.0"
SW - 5	Chapra Khadi	1st Round: 27.12.2013 2nd Round:29.12.2013 3rd Round: 31.12.2013	N 21°40'38.10"	E 073°00'58.10"
SW - 6	CETP Outlet water	1st Round: 27.12.2013 2nd Round:29.12.2013 3rd Round: 31.12.2013	N 21°37"10.06"	E 072°59'04.6"

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME
ANKLESHWAR - GUJARAT

GROUND WATER SAMPLING LOCATIONS

SAMPLE CODE	NAME OF THE SAMPLING LOCATION	DATE OF SAMPLING	LATITUDE	LONGITUDE
GW – 1	Sanjali village	1st Round: 27.12.2013 2nd Round:29.12.2013 3rd Round: 31.12.2013	N 21°33'17.9"	E 072°59'37.8"
GW - 2	Gujarat Gas Compound	1st Round: 27.12.2013 2nd Round:29.12.2013 3rd Round: 31.12.2013	N 21°37'27.7"	E 072°59'03.6"
GW – 3	Panali Village	1st Round: 27.12.2013 2nd Round:29.12.2013 3rd Round: 31.12.2013	N 21°32'18.7"	E 072°58'11.2"
GW – 4	Jitali Village	1st Round: 27.12.2013 2nd Round:29.12.2013 3rd Round: 31.12.2013	N 21°37'9.57"	E 073°04'56.3''
GW - 5	Andala Village	1st Round: 27.12.2013 2nd Round:29.12.2013 3rd Round: 31.12.2013	N 21°39'9.42"	E 073°04'19.2''
GW - 6	Old Pungam Village	1st Round: 27.12.2013 2nd Round:29.12.2013 3rd Round: 31.12.2013	N 21°38'13.6"	E 072°56'02.5''


AMBIENT AIR QUALITY MONITORING STATIONS
ANKLESWAR
A1.Asian Paints Colony, SW direction to Industrial Area
A2.BASF Unit-II
A3.Meghmani Organics
A4.Durga Traders
A5.Solve Specialty Limited
A6.Hikal Chemicals Limited
AMBIENT AIR QUALITY MONITORING STATIONS
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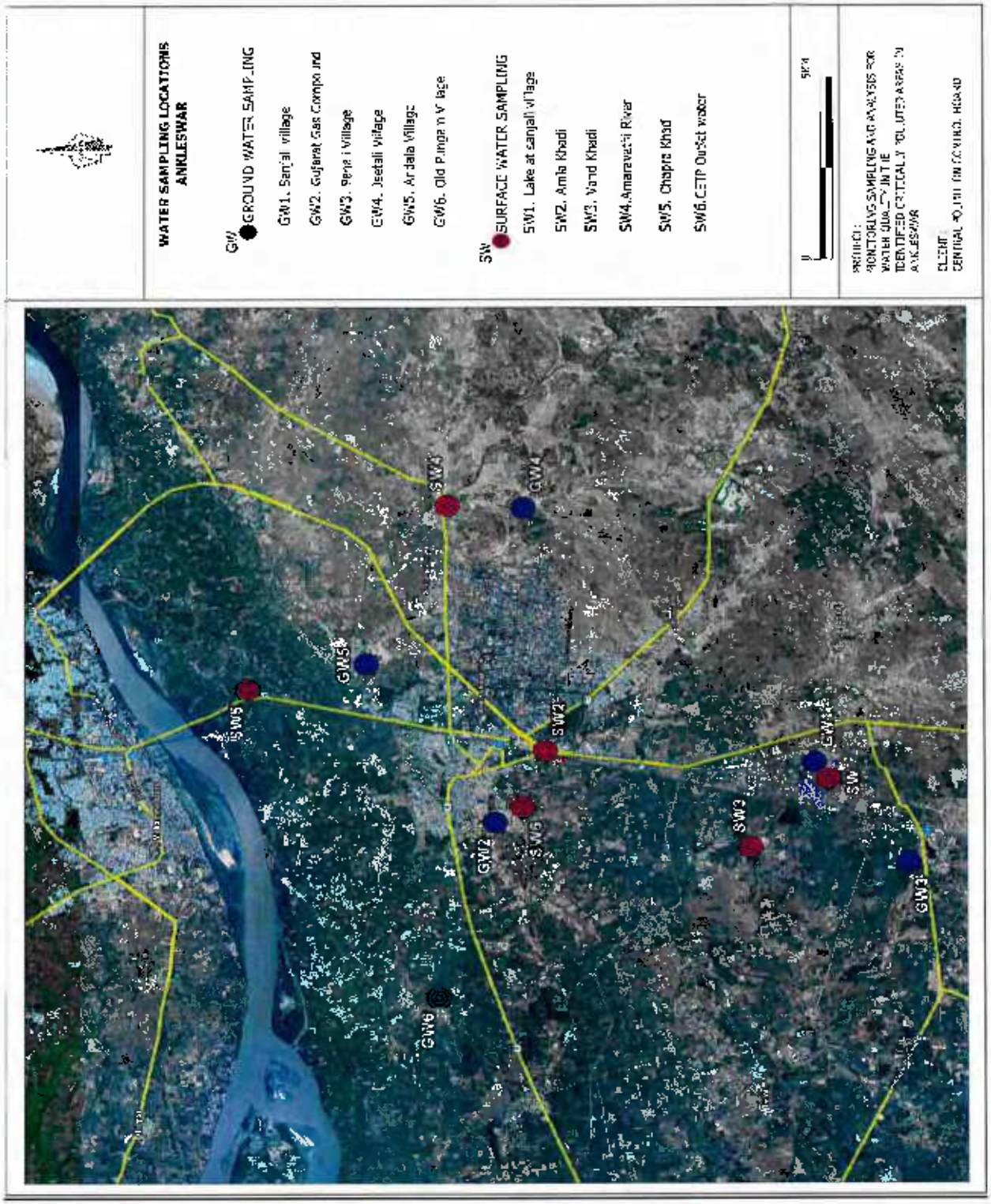
PROJECT:
MONITORING SAMPLING AND ANALYSIS FOR
AMBIENT AIR QUALITY IN THE
IDENTIFIED CRITICALLY POLLUTED AREAS IN
ANKLESWAR
CLIENT:
CENTRAL POLLUTION CONTROL BOARD


WATER SAMPLING LOCATIONS
ANKLESHWAR
GW
GROUND WATER SAMPLING
GW1. Sanjali Village
GW2. Gujarat Gas Compound
GW3. Rena i Village
GW4. Jeetali Village
GW5. Ardala Village
GW6. Old Panoli Village
SW
SURFACE WATER SAMPLING
SW1. Lake at sanjali village
SW2. Amla Khadi
SW3. Vand Khadi
SW4.Amaravathi River
SW5. Chapra Khadi
SW6.CETP Outlet water
GW1
GW2
GW3
GW4
GW5
GW6
SW1
SW2
SW3
SW4
SW5
SW6

AMBIENT AIR QUALITY MONITORING RESULTS

S.No.	Pollutants	AAQ – 1 Asian Paints Colony, SW direction to Industrial Area			AAQ – 2 BASF India Limited Unit - II			NAAQ Standards (2009)
		1st Round	2nd Round	3rd Round	1st Round	2nd Round	3rd Round	
		26.12.2013	28.12.2013	30.12.2013	26.12.2013	28.12.2013	30.12.2013	
I.	**Particulate Pollutants**							
1.	PM_{10} ($\mu g/m^3$)	57	69	75	61	76	68	**100 ($\mu g/m^3$)**
2	$PM_{2.5}$ $\mu g/m^3$)	26	31	38	28	42	37	**60 ($\mu g/m^3$)**
3	Arsenic (ng/m^3)	1.2	1.1	1.7	1.1	1.3	1.6	**06 (ng/m^3) (Annual)**
4	Nickel (ng/m^3)	3.4	4.7	4.2	6.1	4.7	3.9	**20 (ng/m^3) (Annual)**
5	Lead ($\mu g/m^3$)	0.11	0.09	0.15	0.10	0.14	0.08	**1.0($\mu g/m^3$) (24 hours)**
6	Benzo (a) Pyrene (ng/m^3)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**01 (ng/m^3) (Annual)**
II.	**Gaseous Pollutants**							
7	SO_2 ($\mu g/m^3$)	11.5	13.1	9.6	10.6	11.7	9.8	**80 ($\mu g/m^3$) (24 hours)**
8	NO_X ($\mu g/m^3$)	19.6	23.2	18.8	17.9	19.4	21.6	**80 ($\mu g/m^3$) (24 hours)**
9	NH_3 ($\mu g/m^3$)	10.7	7.8	9.0	9.5	7.5	10.2	**400 ($\mu g/m^3$) (24 hours)**
10	O_3 ($\mu g/m^3$)	9.8	11.2	14.2	12.0	10.5	12.6	**100 (8 hours) & 180 ($\mu g/m^3$) (1 hour)**
		20.6	18.0	16.4	22.3	21.4	17.8	
		4.4	3.8	< 2	3.5	5.2	8.0	
11	CO (mg/m^3)	< 2	< 2	< 2	< 2	< 2	< 2	**02 (8 hours) & 04 mg/m^3 (1 hour)**
		< 2	< 2	< 2	< 2	< 2	< 2	
		< 2	< 2	< 2	< 2	< 2	< 2	
12	Benzene ($\mu g/m^3$)	< 3	< 3	< 3	< 3	< 3	< 3	**05 ($\mu g/m^3$) (Annual)**

AMBIENT AIR QUALITY MONITORING RESULTS

S.No.	Pollutants	AAQ – 3 Meghamani Organics Limited			AAQ – 4 Durga Traders			NAAQ Standards (2009)
		1st Round	2nd Round	3rd Round	1st Round	2nd Round	3rd Round	
		26.12.2013	28.12.2013	30.12.2013	26.12.2013	28.12.2013	30.12.2013	
I.	**Particulate Pollutants**							
1	PM_{10} ($\mu g/m^3$)	79	84	92	85	106	74	**100 ($\mu g/m^3$)**
2	$PM_{2.5}$ ($\mu g/m^3$)	28	31	37	37	43	31	**60 ($\mu g/m^3$)**
3	Arsenic (ng/m^3)	2.3	1.4	1.9	1.6	2.1	1.3	**06 (ng/m^3) (Annual)**
4	Nickel (ng/m^3)	5.6	7.3	6.5	4.9	6.7	5.8	**20 (ng/m^3) (Annual)**
5	Lead ($\mu g/m^3$)	0.16	0.19	0.20	0.18	0.23	0.21	**1.0($\mu g/m^3$) (24 hours)**
6	Benzo (a) Pyrene (ng/m^3)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**01 (ng/m^3) (Annual)**
II.	**Gaseous Pollutants**							
7	SO_2 ($\mu g/m^3$)	12.2	14.1	11.7	12.3	13.1	10.6	**80 ($\mu g/m^3$) (24 hours)**
8	NO_X ($\mu g/m^3$)	22.6	20.8	17.4	21.8	19.6	17.9	**80 ($\mu g/m^3$) (24 hours)**
9	NH_3 ($\mu g/m^3$)	8.9	9.6	7.5	9.4	9.0	7.8	**400 ($\mu g/m^3$) (24 hours)**
10	O_3 ($\mu g/m^3$)	9.1	7.8	10.2	9.5	11.2	8.8	**100 (8 hours) & 180 ($\mu g/m^3$) (1 hour)**
		16.5	12.4	14.7	14.2	16.7	20.6	
		4.1	3.9	5.8	2.8	3.9	5.3	
11	CO (mg/m^3)	< 2	< 2	< 2	< 2	< 2	< 2	**02 (8 hours) & 04 mg/m^3 (1 hour)**
		< 2	< 2	< 2	< 2	< 2	< 2	
		< 2	< 2	< 2	< 2	< 2	< 2	
12	Benzene ($\mu g/m^3$)	< 3	< 3	< 3	< 3	< 3	< 3	**5 ($\mu g/m^3$) (Annual)**

AMBIENT AIR QUALITY MONITORING RESULTS

S.No.	Pollutants	AAQ -5 Solvay Specialty chemicals			AAQ – 6 Hikal Chemicals Limited			NAAQ Standards (2009)
		1st Round	2nd Round	3rd Round	1st Round	2nd Round	3rd Round	
		26.12.2013	28.12.2013	30.12.2013	26.12.2013	28.12.2013	30.12.2013	
I.	**Particulate Pollutants**							
1.	PM_{10} ($\mu g/m^3$)	91	84	79	76	81	68	**100 ($\mu g/m^3$)**
2	$PM_{2.5}$ ($\mu g/m^3$)	35	29	31	34	37	30	**60 ($\mu g/m^3$)**
3	Arsenic (ng/m^3)	2.3	1.6	1.2	1.1	1.6	1.4	**06 (ng/m^3) (Annual)**
4	Nickel (ng/m^3)	5.5	4.3	7.1	3.6	2.8	4.3	**20 (ng/m^3) (Annual)**
5	Lead ($\mu g/m^3$)	0.10	0.08	0.13	0.09	0.13	0.12	**1.0($\mu g/m^3$) (24 hours)**
6	Benzo (a) Pyrene (ng/m^3)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**01 (ng/m^3) (Annual)**
II.	**Gaseous Pollutants**							
7	SO_2 ($\mu g/m^3$)	12.1	14.8	10.6	13.9	11.7	15.2	**80 ($\mu g/m^3$) (24 hours)**
8	NO_X ($\mu g/m^3$)	21.5	19.2	17.8	21.2	19.7	26.2	**80 ($\mu g/m^3$) (24 hours)**
9	NH_3 ($\mu g/m^3$)	8.6	7.9	10.1	9.2	7.8	6.8	**400 ($\mu g/m^3$) (24 hours)**
10	O_3 ($\mu g/m^3$)	13.0	10.4	16.0	12.8	16.2	10.5	**100 (8 hours) & 180 ($\mu g/m^3$) (1 hour)**
		24.0	18.8	13.0	24.0	26.7	20.4	
		5.4	3.9	< 2.0	7.3	5.2	4.1	
11	CO (mg/m^3)	< 2	< 2	< 2	< 2	< 2	< 2	**02 (8 hours) & 04 mg/m^3 (1 hour)**
		< 2	< 2	< 2	< 2	< 2	< 2	
		< 2	< 2	< 2	< 2	< 2	< 2	
12	Benzene ($\mu g/m^3$)	< 3	< 3	< 3	< 3	< 3	< 3	**5 ($\mu g/m^3$) (Annual)**

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 1: Lake at Sanjali Village			Test Method
			1st Round 27.12.2013	2nd Round 29.12.2013	3rd Round 31.12.2013	
I	**Simple Parameters**					
1	Appearance	-	Pale Yellow	Pale Yellow	Pale Yellow	-
2	Colour (Hazen Units)	-	15	15	15	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.46	7.59	7.31	IS 3025: Part – 11
2	E C	µS/cm	690	620	650	IS 3025: Part – 14
3	Oil & Grease	mg/l	2	2	2	IS 3025: Part – 39
4	Suspended Solids	mg/l	18	20	17	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	5.0	4.9	5.1	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	48	42	46	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	10	9	9	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	0.04	0.04	0.03	APHA 4500 NO_2-B
9	Nitrate-Nitrogen as N	mg/l	0.63	0.68	0.56	APHA 4500 – NO_3-B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2–NO_3)	mg/l	0.67	0.72	0.59	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 NH_3-C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.5	0.5	0.4	IS 3025: Part – 60
15	Sulphides as S	mg/l	0.1	0.1	0.1	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	0.40	0.36	0.30	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	482	4.33	4.09	By Calculation
18	Total Coliforms	MPN/100ml	21	17	14	IS 1622
19	Fecal Coliforms	MPN/100ml	4	4	2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	0.62	0.58	0.54	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	3.5	3.6	3.2	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	2.1	2.2	2.0	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.03	0.02	0.03	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.01	0.01	0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.07	0.08	0.06	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	< 0.10	< 0.10	< 0.10	IS 3025: Part – 57

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW - 2: Anita Khadi			Test Method
			1st Round 27.12.2013	2nd Round 29.12.2013	3rd Round 31.12.2013	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	5	5	5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.68	7.94	7.73	IS 3025: Part – 11
2	E C	µS/cm	1880	1840	1850	IS 3025: Part 14
3	Oil & Grease	mg/l	1	1	1	IS 3025: Part – 39
4	Suspended Solids	mg/l	24	32	28	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	2.7	2.9	3.1	IS 3025: Part 38
6	Chemical Oxygen Demand	mg/l	38	34	34	IS 3025: Part 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	9	7	7	IS 3025: Part 44
8	Nitrite-Nitrogen as N	mg/l	0.02	0.02	0.02	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	0.59	0.68	0.56	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	0.61	0.70	0.58	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.9	0.9	0.8	IS 3025: Part 60
15	Sulphides as S	mg/l	0.10	0.10	0.10	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	0.28	0.20	0.26	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	4.64	5.18	4.96	By Calculation
18	Total Coliforms	MPN/100ml	12	14	11	IS 1622
19	Fecal Coliforms	MPN/100ml	4	4	2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	0.42	0.36	0.40	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	5.9	5.5	6.0	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	4.2	3.9	4.2	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.02	0.03	0.02	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 48
18	Manganese as Mn	mg/l	0.01	0.01	0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.10	0.09	0.10	IS 3025: Part 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.18	0.16	0.18	IS 3025: Part 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

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SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 3: Vand Khadi			Test Method
			1st Round 27.12.2013	2nd Round 29.12.2013	3rd Round 31.12.2013	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	5	5	5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.36	7.12	7.55	IS 3025: Part – 11
2	E C	µS/cm	1890	1910	1820	IS 3025: Part – 14
3	Oil & Grease	mg/l	1	1	1	IS 3025: Part – 39
4	Suspended Solids	mg/l	12	14	12	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	5.6	5.3	5.8	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	32	28	20	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	7	6	4	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	0.04	0.04	0.04	APHA 4500 – NO_2-B
9	Nitrate-Nitrogen as N	mg/l	0.45	0.56	0.45	APHA 4500 – NO_3-B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2–NO_3)	mg/l	0.49	0.60	0.49	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3-C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.9	0.9	0.9	IS 3025: Part – 60
15	Sulphides as S	mg/l	0.10	0.10	0.10	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	0.24	0.22	0.20	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	2.86	3.02	2.59	By Calculation
18	Total Coliforms	MPN/100ml	17	14	21	IS 1622
19	Fecal Coliforms	MPN/100ml	4	4	6	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	0.38	0.36	0.35	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	3.9	4.0	3.6	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	2.4	2.5	2.2	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.10	< 0.10	< 0.10	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.01	0.02	0.02	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.02	0.01	0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.18	0.20	0.17	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.16	0.18	0.16	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

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SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 4: Amaravathi River			Test Method
			1st Round 27.12.2013	2nd Round 29.12.2013	3rd Round 31.12.2013	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	5	5	5	IS 3025: Part 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	8.09	8.01	7.89	IS 3025: Part – 11
2	E C	µS/cm	980	960	920	IS 3025: Part – 14
3	Oil & Grease	mg/l	1	1	1	IS 3025: Part 39
4	Suspended Solids	mg/l	14	12	12	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	7.2	7.4	7.5	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	18	16	14	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	4	4	3	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	0.02	0.02	0.01	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	1.35	1.58	0.90	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrare-Nitrogen (NO_2+NO_3)	mg/l	1.37	1.60	0.91	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.6	0.6	0.5	IS 3025: Part – 60
15	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 29
16	Dissolved Phosphates as P	mg/l	0.22	0.20	0.24	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	2.38	2.70	2.58	By Calculation
18	Total Coliforms	MPN/100ml	9	14	11	IS 1622
19	Fecal Coliforms	MPN/100ml	2	4	4	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	0.36	0.32	0.38	APHA 4500 P.D
2	Total Kjeldal Nitrogen	mg/l	2.5	3.1	2.4	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	1.7	2.1	1.4	APHA 4500 – NH_4
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part - 43
5	Surfactants	mg/l	0.12	0.10	0.12	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.02	0.01	0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.11	0.10	0.10	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

ANKLESHWAR - GUJARAT

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 5: Chapra Khadi			Test Method
			1st Round 27.12.2013	2nd Round 29.12.2013	3rd Round 31.12.2013	
I	**Simple Parameters**					
1	Appearance	-	Light Brownish	Light Brownish	Light Brownish	-
2	Colour (Hazen Units)	-	30	30	25	IS 3025: Part 4
3	Odour (Smell)	-	Un agreeable	Un agreeable	Un agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.34	7.61	7.58	IS 3025: Part – 11
2	E C	µS/cm	3930	3820	3740	IS 3025: Part – 14
3	Oil & Grease	mg/l	2	2	2	IS 3025: Part – 39
4	Suspended Solids	mg/l	26	38	32	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	4.0	4.1	4.1	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	72	64	76	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	20	18	22	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	0.02	0.02	0.02	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	1.29	1.35	1.24	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	1.31	1.37	1.26	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	1.2	1.2	1.1	IS 3025: Part 60
15	Sulphides as S	mg/l	0.40	0.30	0.30	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	0.36	0.30	0.24	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	9.32	9.11	8.96	By Calculation
18	Total Coliforms	MPN/100ml	170	110	140	IS 1622
19	Fecal Coliforms	MPN/100ml	70	50	60	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	0.52	0.50	0.46	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	9.8	8.4	8.1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4–NH_3)-Nitrogen	mg/l	6.2	5.6	5.3	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	0.12	0.10	0.10	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.02	0.02	0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.03	0.02	0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.30	0.24	0.28	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 56
22	Boron as B	mg/l	0.36	0.32	0.30	IS 3025: Part – 57

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 6: CETP Outlet Water			Test Method
			1st Round 27.12.2013	2nd Round 29.12.2013	3rd Round 31.12.2013	
I	**Simple Parameters**					
1	Appearance	-	Brown	Brown	Brown	-
2	Colour (Hazen Units)	-	140	130	140	IS 3025: Part – 4
3	Odour (Smell)	-	Un-Agreeable	Un-Agreeable	Un-Agreeable	IS 3025: Part 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.62	7.29	7.46	IS 3025: Part 11
2	E C	µS/cm	4010	4180	4060	IS 3025: Part – 14
3	Oil & Grease	mg/l	5	6	5	IS 3025: Part – 39
4	Suspended Solids	mg/l	54	46	42	IS 3025: Part 17
5	Dissolved Oxygen	mg/l	3.8	3.9	4.1	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	320	310	300	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	85	82	75	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	0.12	0.10	0.12	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	2.09	2.26	2.48	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2–NO_3)	mg/l	2.15	2.36	2.60	By Calculation
11	Free Ammonia	mg/l	0.8	0.9	0.8	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	1.1	1.1	1.0	IS 3025: Part – 60
15	Sulphides as S	mg/l	1.4	1.2	1.2	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	0.76	0.80	0.74	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	9.88	10.12	9.61	By Calculation
18	Total Coliforms	MPN/100ml	110	140	170	IS 1622
19	Fecal Coliforms	MPN/100ml	30	40	50	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	1.04	1.10	1.00	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	90	99	83	APHA 4500 – Norg. B
3	Total Ammonia (NH_4 NH_3)-Nitrogen	mg/l	61	64	59	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.04	0.03	0.04	IS 3025: Part – 49
10	Nickel as Ni	mg/l	0.01	0.01	0.02	IS 3025: Part – 54
11	Copper as Cu	mg/l	0.04	0.04	0.05	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.16	0.15	0.15	APHA 3111 B
19	Iron as Fe	mg/l	0.80	0.82	0.80	IS 3025: Part 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.42	0.44	0.38	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

ANKLESHWAR - GUJARAT

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW-1: Sanjali Village			Test Method
			1st Round 27.12.2013	2nd Round 29.12.2013	3rd Round 31.12.2013	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.31	7.29	7.38	IS 3025: Part – 11
2	E.C	µS/cm	2290	2240	2180	IS 3025: Part 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part 17
5	Chemical Oxygen Demand	mg/l	4	6	4	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	0.01	0.01	0.01	APHA 4500 NO_2.B
8	Nitrate-Nitrogen as N	mg/l	8.35	8.13	8.35	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2–NO_3)	mg/l	8.36	8.14	8.36	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 NH_3.C
11	Total Residual Chlorine	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.8	0.8	0.7	IS 3025: Part 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	6.22	6.69	6.42	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr6	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.07	0.06	0.07	IS 3025: Part 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.20	0.18	0.17	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

ANKLESHWAR - GUJARAT

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW-2: Gujarat Gas Compound			Test Method
			1st Round 27.12.2013	2nd Round 29.12.2013	3rd Round 31.12.2013	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.63	7.41	7.96	IS 3025: Part – 11
2	E C	µS/cm	2760	2740	2760	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part - 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	6	4	6	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	0.01	0.01	0.01	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	5.42	5.19	6.09	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	5.43	5.20	6.10	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part - 27
13	Fluoride as F	mg/l	0.8	0.8	0.8	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	7.10	7.22	6.99	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 - NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 B
19	Iron as Fe	mg/l	0.09	0.10	0.10	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 56
22	Boron as B	mg/l	0.28	0.26	0.28	IS 3025: Part – 57

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW-3: Panati Village			Test Method
			1st Round 27.12.2013	2nd Round 29.12.2013	3rd Round 31.12.2013	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.86	7.70	7.84	IS 3025: Part – 11
2	E C	µS/cm	1510	1490	1540	IS 3025: Part 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	4	4	6	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part.– 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 NO_3.B
8	Nitrate-Nitrogen as N	mg/l	1.63	1.58	1.81	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	1.63	1.58	1.81	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 - NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.9	0.9	0.9	IS 3025: Part - 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	3.06	3.49	3.41	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.06	0.07	0.06	IS 3025: Part 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.12	0.10	0.12	IS 3025: Part – 57

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW-4: Jitali Village			Test Method
			1st Round 27.12.2013	2nd Round 29.12.2013	3rd Round 31.12.2013	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.66	7.72	7.81	IS 3025: Part 11
2	E C	µS/cm	2060	1980	2040	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	4	4	6	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	0.01	0.01	0.01	APHA 4500 NO_2 B
8	Nitrate-Nitrogen as N	mg/l	4.06	4.29	4.52	APHA 4500 – NO_3 B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	4.07	4.30	4.53	APHA 4500 –N C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 NH_3 C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.5	0.5	0.6	IS 3025: Part 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P D
16	Sodium Absorption Ratio (SAR)	-	2.83	2.49	2.92	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.06	0.07	0.06	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.15	0.13	0.14	IS 3025: Part 57

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW-5: Andala Village			Test Method
			1st Round 27.12.2013	2nd Round 29.12.2013	3rd Round 31.12.2013	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.48	7.66	7.81	IS 3025: Part - 11
2	E C	µS/cm	2080	2030	2060	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	4	4	6	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 NO_2.B
8	Nitrate-Nitrogen as N	mg/l	3.39	3.61	4.06	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	3.39	3.61	4.06	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.5	0.5	0.6	IS 3025: Part 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	3.19	3.26	3.41	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.06	0.06	0.05	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 56
22	Boron as B	mg/l	0.16	0.16	0.18	IS 3025: Part - 57

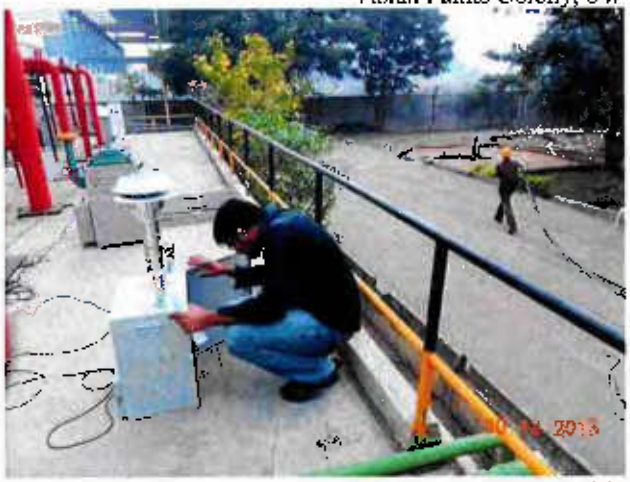
GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW-6: Old Pungam Village			Test Method
			1st Round 27.12.2013	2nd Round 29.12.2013	3rd Round 31.12.2013	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.92	7.64	7.83	IS 3025: Part 11
2	E C	µS/cm	1360	1290	1310	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part 17
5	Chemical Oxygen Demand	mg/l	6	4	4	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	0.01	0.01	0.01	APHA 4500 NO_2.B
8	Nitrate-Nitrogen as N	mg/l	1.13	0.90	1.13	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	1.14	0.91	1.14	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.5	0.5	0.5	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 P.D
16	Sodium Absorption Ratio (SAR)	-	3.18	2.98	3.16	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.07	0.07	0.08	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 57

AMBIENT AIR MONITORING LOCATIONS PHOTOGRAPHS

1st Round: 26.12.2013 to 27.12.2013

Asian Paints Colony, SW direction to Industrial Area



BASF Unit II

Meghamani Organics

AMBIENT AIR MONITORING LOCATIONS PHOTOGRAPHS

1st Round: 26.12.2013 to 27.12.2013

Durga Traders

Solve Speciality Limited

Hikal Chemicals Limited

SAMPLING LOCATION PHOTOGRAPHS OF SURFACE WATER

1st Round: 27.12.2013

Amaravathi River

Lake at Sanjali village

Amla Khadi

SAMPLING LOCATION PHOTOGRAPHS OF SURFACE WATER

1st Round: 27.12.2013

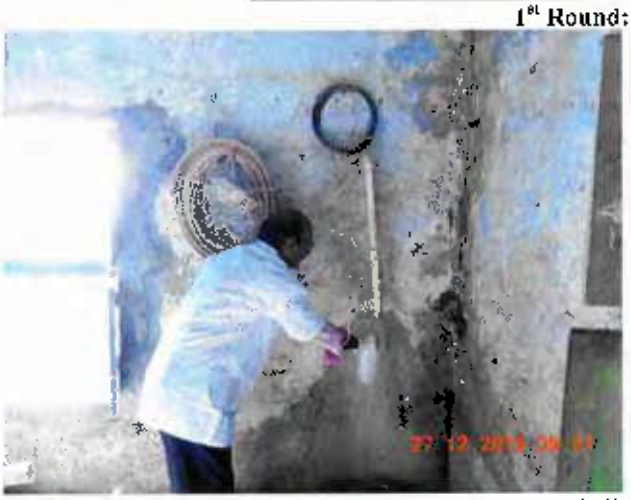
Vand Khadi

Chapra Khadi

CETP Outlet water

SAMPLING LOCATION PHOTOGRAPHS OF GROUND WATER

1st Round: 27.12.2013



Jitali Village

Andala Village

Sanjali village

SAMPLING LOCATION PHOTOGRAPHS OF GROUND WATER

1st Round: 27.12.2013

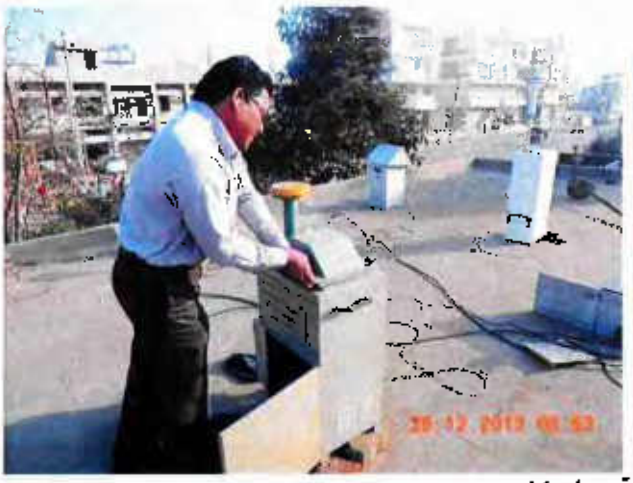
Panali Village

Gujarat Gas Compound

Old Pungam Village

AMBIENT AIR MONITORING LOCATIONS PHOTOGRAPHS

2nd Round: 28.12.2013 to 29.12.2013



Meghmani Organics

Asian paints colony

BASF Unit II

AMBIENT AIR MONITORING LOCATIONS PHOTOGRAPHS

2nd Round: 28.12.2013 to 29.12.2013

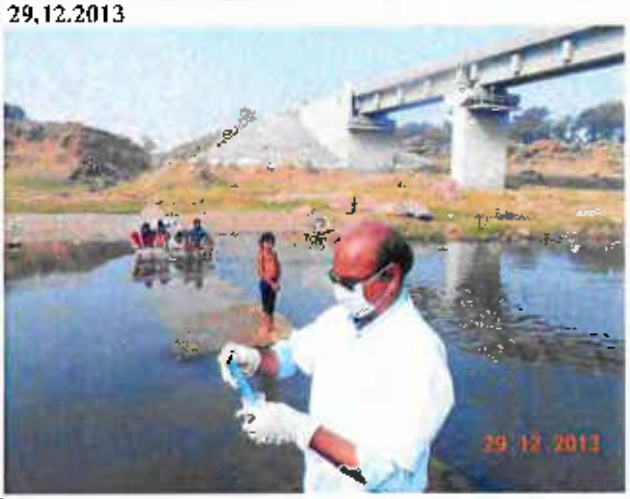
Durga traders

Solvay Specialty chemicals

Hikal Limited

SAMPLING LOCATION PHOTOGRAPHS OF SURFACE WATER

2nd Round: 29.12.2013



Amaravathi River

Chapra Khadi

Amla Khadi

SAMPLING LOCATION PHOTOGRAPHS OF SURFACE WATER

2nd Round: 29.12.2013

Vand Khadi

Lake at Sanjali Village

CETP Outlet

SAMPLING LOCATION PHOTOGRAPHS OF GROUND WATER

2nd Round: 29.12.2013

Jitali Village

Andala Village

Panali Village

SAMPLING LOCATION PHOTOGRAPHS OF GROUND WATER

2nd Round: 29.12.2013

Sanjali Village

Gujarath gas compound

Old Pungam Village

AMBIENT AIR MONITORING LOCATIONS PHOTOGRAPHS

3rd Round: 30.12.2013 to 31.12.2013

BASF Unit II

Asian paints colony

Durga Traders

AMBIENT AIR MONITORING LOCATIONS PHOTOGRAPHS

3rd Round: 30.12.2013 to 31.12.2013

Meghmani Organics

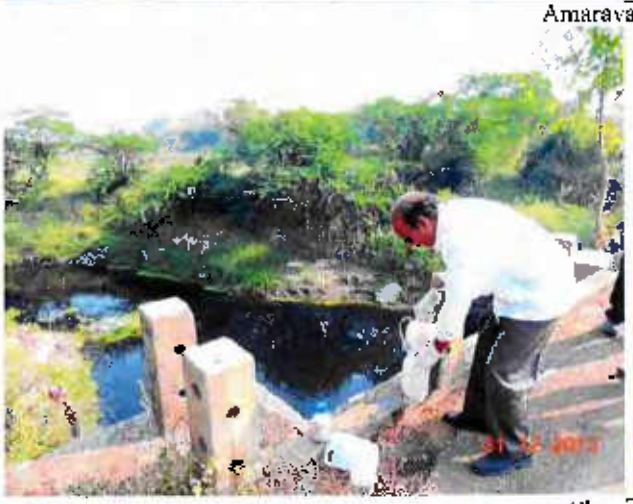
Hikal Limited

Solvay Specialty chemicals

SAMPLING LOCATION PHOTOGRAPHS OF SURFACE WATER

3rd Round: 31.12.2013

Amaravathi River



Chapra khadi

Amla Khadi

SAMPLING LOCATION PHOTOGRAPHS OF SURFACE WATER

3rd Round: 31.12.2013

Vand Khadi

Lake at Sanjali Village

CETP Outlet

AMPLING LOCATION PHOTOGRAPHS OF GROUND WATER

3rd Round: 31.12.2013

Jitali Village

Andala Village

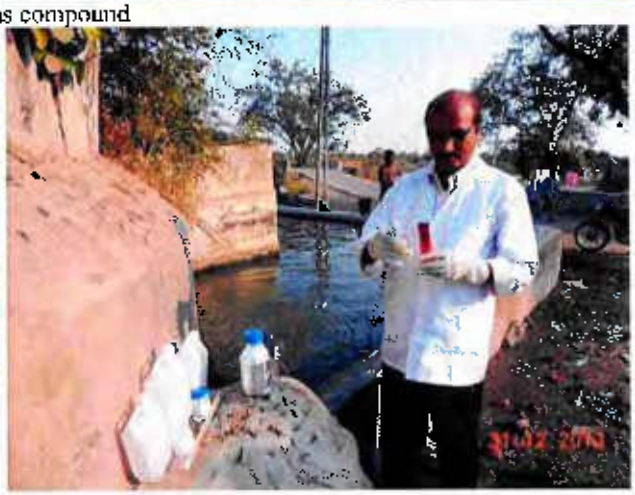
Panoli Village

SAMPLING LOCATION PHOTOGRAPHS OF GROUND WATER

3rd Round: 31.12.2013

Sanjali Village

Gujarath gas compound



Old Pungam Village

MONITORING, SAMPLING AND ANALYSIS

of

AMBIENT AIR QUALITY, SURFACE WATER QUALITY AND GROUND WATER QUALITY

in

IDENTIFIED CRITICALLY POLLUTED AREA (CPAs)

GHAZIABAD

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

GHAZIABAD – UTTAR PRADESH

AAQ MONITORING LOCATIONS

SAMPLE CODE	NAME OF THE MONITORING LOCATION	DATE OF SAMPLING	LATITUDE	LONGITUDE
AAQ – 1	Shahi Exports Pvt. Ltd (Unit of Sarala Fabrics) 30/2 Loni road, Mohan nagar,	1st Round: 09.01.2014 to 10.01.2014 2nd Round: 11.01.2014 to 12.01.2014 3rd Round: 13.01.2014 to 14.01.2014	N: 28° 41' 01.3"	E: 077° 22' 38.4"
AAQ – 2	Krishna foods A-33, Roop nagar Industrial area, Loni,	1st Round: 09.01.2014 to 10.01.2014 2nd Round: 11.01.2014 to 12.01.2014 3rd Round: 13.01.2014 to 14.01.2014	N: 28° 44' 37.8"	E: 077° 17' 53.5"
AAQ - 3	Sambhav Automobiles 31,Aarya Nagar Industrial Area, Main Road, Loni,	1st Round: 09.01.2014 to 10.01.2014 2nd Round: 11.01.2014 to 12.01.2014 3rd Round: 13.01.2014 to 14.01.2014	N: 28° 44' 09.8"	E: 077° 15' 54.5"
AAQ – 4	Mahadev Industries C - 10, Sector A2, Tronica City, Loni,	1st Round: 09.01.2014 to 10.01.2014 2nd Round: 11.01.2014 to 12.01.2014 3rd Round: 13.01.2014 to 14.01.2014	N: 28° 47' 18.7"	E: 077° 17' 20.2"
AAQ 5	Mohan Meakin Limited Mohan nagar,	1st Round: 15.01.2014 to 16.01.2014 2nd Round: 17.01.2014 to 18.01.2014 3rd Round: 20.01.2014 to 21.01.2014	N: 28° 40' 41.3"	E: 077° 22' 59.6"
AAQ – 6	Times of India 13/1, Site IV, Sahibabad,	1st Round: 15.01.2014 to 16.01.2014 2nd Round: 17.01.2014 to 18.01.2014 3rd Round: 20.01.2014 to 21.01.2014	N: 28° 39' 6.26"	E: 077° 19' 98.2"
AAQ – 7	Siva Electronica (I) Pvt Ltd Rajendra nagar Industrial area,	1st Round: 15.01.2014 to 16.01.2014 2nd Round: 17.01.2014 to 18.01.2014 3rd Round: 20.01.2014 to 21.01.2014	N: 28° 40' 65.1"	E: 077° 22' 55.1"
AAQ – 8	Raijade corrugating industry Prakash nagar Industrial area, Ghaziabad	1st Round: 15.01.2014 to 16.01.2014 2nd Round: 17.01.2014 to 18.01.2014 3rd Round: 20.01.2014 to 21.01.2014	N: 28° 40' 51.6"	E: 077° 20' 61.4"
AAQ – 9	Unichem Laboratories Ltd, C-31/32, Meerut Road Industrial Area,	1st Round: 22.01.2014 to 23.01.2014 2nd Round: 25.01.2014 to 26.01.2014	N: 28° 41' 05.6"	E: 077° 26' 12.6"
AAQ 9	Albert David Limited B-12/13, Meerut Road Industrial Area,	3rd Round: 27.01.2014 to 28.01.2014	N: 28° 41' 13.8"	E: 077° 26' 18.8"
AAQ – 10	Eagle Continental, Hindon Nagar, Dasna,	1st Round: 22.01.2014 to 23.01.2014 2nd Round: 24.01.2014 to 25.01.2014 3rd Round: 27.01.2014 to 28.01.2014	N: 28° 41' 32.1"	E: 077° 31' 36.3"
AAQ – 11	Jindal pipes Ltd, Jindal nagar,	1st Round: 22.01.2014 to 23.01.2014 2nd Round: 24.01.2014 to 25.01.2014 3rd Round: 27.01.2014 to 28.01.2014	N: 28° 41' 68.0"	E: 077° 34' 81.5"
AAQ 12	Sathe Engineering Co. Pvt. ltd., E-198 & 199, Kavi nagar industrial area	1st Round: 22.01.2014 to 23.01.2014 2nd Round: 24.01.2014 to 25.01.2014 3rd Round: 27.01.2014 to 28.01.2014	N: 28° 39' 75.0"	E: 077° 27' 49.6"
AAQ – 13	Aastha Medical Center, K. 1, 159, Kavi nagar	1st Round: 28.01.2014 to 29.01.2014 2nd Round: 30.01.2014 to 31.01.2014 3rd Round: 01.02.2014 to 02.02.2014	N: 28° 39' 85.2"	E: 077° 27' 16.5"
AAQ – 14	Sigma Enterprises, Plot No 50, Pandav Nagar Industrial Area,	1st Round: 28.01.2014 to 29.01.2014 2nd Round: 30.01.2014 to 31.01.2014 3rd Round: 01.02.2014 to 02.02.2014	N: 28° 39' 52.9"	E: 077° 28' 17.7"

SAMPLE CODE	NAME OF THE MONITORING LOCATION	DATE OF SAMPLING	LATITUDE	LONGITUDE
AAQ – 15	Amko exports, Bulandshahr Road Industrial Area	1st Round: 28.01.2014 to 29.01.2014 2nd Round: 30.01.2014 to 31.01.2014 3rd Round: 01.02.2014 to 02.02.2014	N: 28° 39' 55.8"	E: 077° 27' 96.1"
AAQ – 16	Rathi Super Steels Limited, South side G. T. Road,	1st Round: 28.01.2014 to 29.01.2014 2nd Round: 30.01.2014 to 31.01.2014 3rd Round: 01.02.2014 to 02.02.2014	N: 28° 38' 45.7"	E: 077° 26' 38.0"

SURFACE WATER SAMPLING LOCATIONS

SAMPLE CODE	NAME OF THE SAMPLING LOCATION	DATE OF SAMPLING (SHIFT- A & SHIFT- B)	LATITUDE	LONGITUDE
SW 1	Hindon river, Downstream, Near NH -24 Bridge	1st Round: 12.01.2014 2nd Round:14.01.2014 3rd Round: 16.01.2014	N: 28° 38' 14.4"	E: 077° 23' 64.5"
SW – 2	Hindon river, Downstream, Near Gaur city	1st Round: 12.01.2014 2nd Round:14.01.2014 3rd Round: 16.01.2014	N: 28° 36' 22.6"	E: 077° 25' 45.9"
SW - 3	Hindon river, Middle stream, Near Railway bridge, Near Mohan nagar	1st Round: 12.01.2014 2nd Round:14.01.2014 3rd Round: 16.01.2014	N: 28° 40' 03.4"	E: 077° 23' 97.6"
SW 4	Hindon river, Upstream, Near Bridge at Kathera village	1st Round: 12.01.2014 2nd Round:14.01.2014 3rd Round: 16.01.2014	N: 28° 41' 13.3"	E: 077° 23' 54.9"
SW - 5	Gang nahar, Upstream , Near Murad nagar regulator bridge	1st Round: 14.01.2014 2nd Round:16.01.2014 3rd Round: 18.01.2014	N: 28° 47' 61.5"	E: 077° 31' 00.3"
SW - 6	Gang nahar, Downstream , Near Masoori bridge, at NH-24	1st Round: 14.01.2014 2nd Round:16.01.2014 3rd Round: 18.02.2014	N: 28° 41' 43.0"	E: 077° 33' 44.2"
SW 7	Ganga river Upstream, before meeting nala, at Garhmukteswar	1st Round: 29.01.2014 2nd Round:31.01.2014 3rd Round: 02.02.2014	N: 28° 46' 02.5"	E: 078° 08' 32.5"
SW – 8	Ganga river Middle stream, at Garhmukteswar brijghat	1st Round: 29.01.2014 2nd Round:31.01.2014 3rd Round: 02.02.2014	N: 28° 45' 62.0"	E: 078° 08' 67.0"
SW – 9	Ganga river Downstream, at Poonth village	1st Round: 29.01.2014 2nd Round:31.01.2014 3rd Round: 02.02.2014	N: 28° 41' 62.5"	E: 078° 11' 17.5"

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

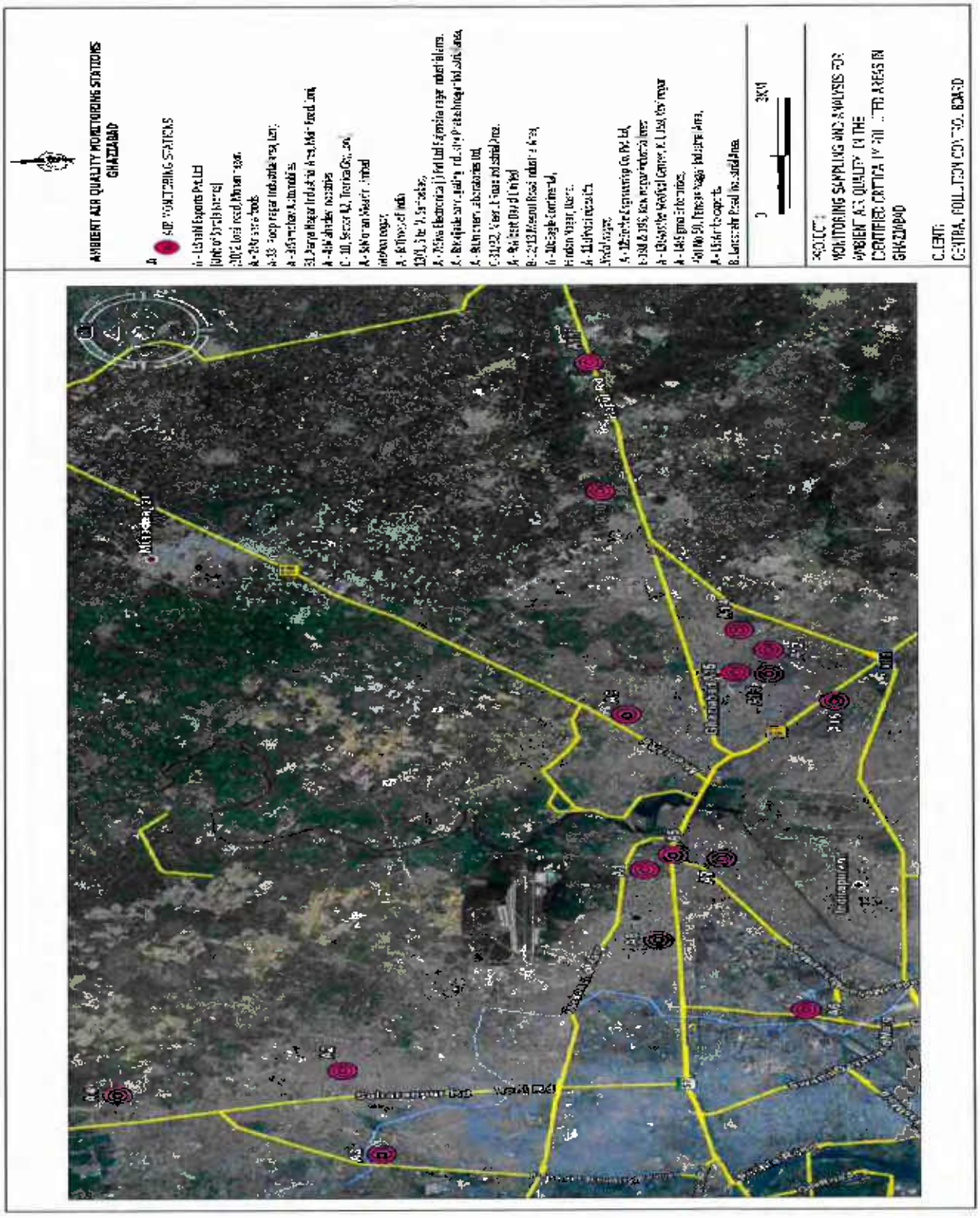
GHAZIABAD – UTTAR PRADESH

GROUND WATER SAMPLING LOCATIONS

SAMPLE CODE	NAME OF THE SAMPLING LOCATION	DATE OF SAMPLING	LATITUDE	LONGITUDE
GW – 1	Shahi Exports Pvt. Ltd (Unit of Sarala Fabrics) 30/2 Loni road, Mohan nagar,	1st Round: 09.01.2014 2nd Round:11.01.2014 3rd Round: 14.01.2014	N: 28° 41' 01.3"	E: 077° 22' 38.4"
GW - 2	Krishna foods A-33, Roop nagar Industrial area, Loni,	1st Round: 09.01.2014 2nd Round:11.01.2014 3rd Round: 14.01.2014	N: 28° 44' 37.8"	E: 077° 17' 53.5"
GW – 3	Sambhav Automobiles 31,Aarya Nagar Industrial Area, Main Road, Loni,	1st Round: 09.01.2014 2nd Round:11.01.2014 3rd Round: 14.01.2014	N: 28° 44' 09.8"	E: 077° 15' 54.5"
GW – 4	Mahadev Industries C - 10, Sector A2, Tronica City, Loni,	1st Round: 09.01.2014 2nd Round:11.01.2014 3rd Round: 14.01.2014	N: 28° 47' 18.7"	E: 077° 17' 20.2"
GW - 5	Mohan Meakin Limited Mohan nagar,	1st Round: 15.01.2014 2nd Round:17.01.2014 3rd Round: 20.01.2014	N: 28° 40' 41.3"	E: 077° 22' 59.6"
GW - 6	Times of India 13/1, Site IV, Sahibabad,	1st Round: 15.01.2014 2nd Round:17.01.2014 3rd Round: 20.01.2014	N: 28° 39' 6.26"	E: 077° 19' 98.2"
GW – 7	Siva Electronica (I) Pvt Ltd Rajendra nagar Industrial area,	1st Round: 15.01.2014 2nd Round:17.01.2014 3rd Round: 20.01.2014	N: 28° 40' 65.1"	E: 077° 22' 55.1"
GW – 8	National Engineering works, Raijade corrugating industry Prakash nagar Industrial area,	1st Round: 15.01.2014 2nd Round:17.01.2014 3rd Round: 20.01.2014	N: 28° 40' 51.6"	E: 077° 20' 61.4"
GW 9	Unichem Laboratories Ltd, C-31/32, Meerut Road Industrial Area,	1st Round: 23.01.2014 2nd Round:25.01.2014	N: 28° 41' 05.6"	E: 077° 26' 12.6"
GW – 9	Albert David Limited B-12/13,Meerut Road Industrial Area,	3rd Round: 28.01.2014	N: 28° 41' 13.8"	E: 077° 26' 18.8"
GW – 10	Eagle Continental, Hindon Nagar, Dasna,	1st Round: 23.01.2014 2nd Round:25.01.2014 3rd Round: 28.01.2014	N: 28° 41' 32.1"	E: 077° 31' 36.3"
GW – 11	Jindal pipes Ltd, Jindal nagar,	1st Round: 23.01.2014 2nd Round:25.01.2014 3rd Round: 28.01.2014	N: 28° 41' 68.0"	E: 077° 34' 81.5"
GW – 12	Sathe Engineering Co. Pvt. ltd., E-198 & 199, Kavi nagar industrial area	1st Round: 23.01.2014 2nd Round:25.01.2014 3rd Round: 27.01.2014	N: 28° 39' 75.0"	E: 077° 27' 49.6"
GW – 13	Aastha Medical Center, K. I, 159, Kavi nagar	1st Round: 28.01.2014 2nd Round:30.01.2014 3rd Round: 01.02.2014	N: 28° 39' 85.2"	E: 077° 27' 16.5"
GW – 14	Sigma Enterprises, Plot No 50, Pandav Nagar Industrial Area,	1st Round: 28.01.2014 2nd Round:30.01.2014 3rd Round: 01.02.2014	N: 28° 39' 52.9"	E: 077° 28' 17.7"
GW – 15	Amko exports, Bulandshahr Road Industrial Area	1st Round: 28.01.2014 2nd Round:30.01.2014 3rd Round: 01.02.2014	N: 28° 39' 55.8"	E: 077° 27' 96.1"
GW – 16	Rathi Super Steels Limited, South side G. T. Road,	1st Round: 28.01.2014 2nd Round:30.01.2014 3rd Round: 01.02.2014	N: 28° 38' 45.7"	E: 077° 26' 38.0"

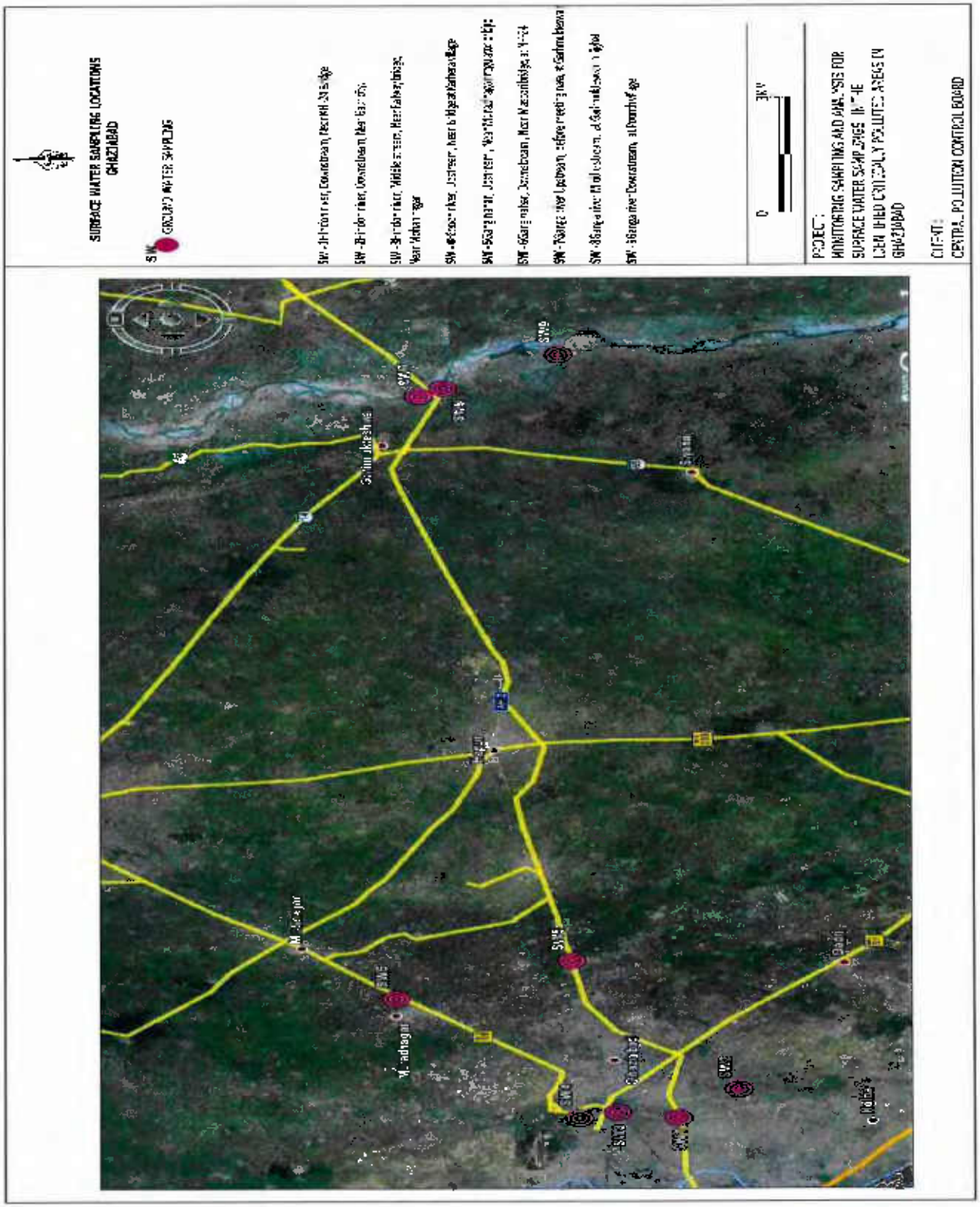
MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

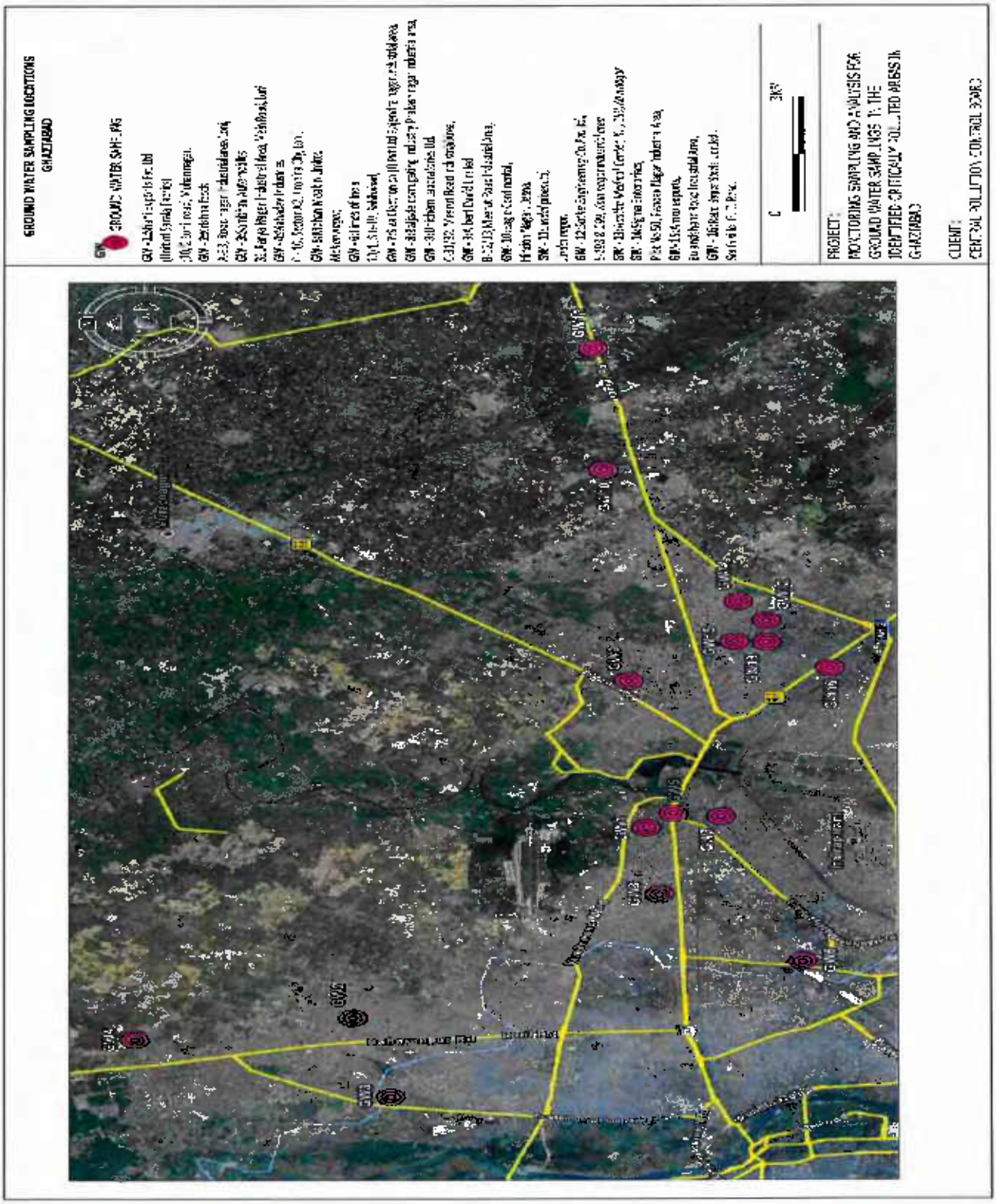
GHAZIABAD – UTTAR PRADESH



MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

GHAZIABAD – UTTAR PRADESH




GROUND WATER SAMPLING LOCATIONS
GHAZIABAD
GROUND WATER SAMPLING
PROJECT:
CLIENT:

AMBIENT AIR QUALITY MONITORING RESULTS

S.No.	Pollutants	AAQ – 1 Shahi Exports Pvt. Ltd.			AAQ – 2 Krishna foods, Roop nagar			NAAQ Standards (2009)
		1st Round	2nd Round	3rd Round	1st Round	2nd Round	3rd Round	
		09.01.2014	11.01.2014	13.01.2014	09.01.2014	11.01.2014	13.01.2014	
I.	**Particulate Pollutants**							
1.	PM_{10} (µg/m^3)	283	302	279	205	190	213	**100 (µg/m^3)**
2	$PM_{2.5}$ µg/m^3)	73	107	86	97	89	105	**60 (µg/m^3)**
3	Arsenic (ng/m^3)	2.6	3.8	2.2	3.0	3.6	2.5	**06 (ng/m^3) (Annual)**
4	Nickel (ng/m^3)	5.2	7.8	5.9	5.5	6.0	8.4	**20 (ng/m^3) (Annual)**
5	Lead (µg/m^3)	0.12	0.17	0.19	0.11	0.14	0.16	**1.0(µg/m^3) (24 hours)**
6	Benzo (a) Pyrene (ng/m^3)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**01 (ng/m^3) (Annual)**
II.	**Gaseous Pollutants**							
7	SO_2 (µg/m^3)	15.2	13.1	14.9	13.1	17.4	14.4	**80 (µg/m^3) (24 hours)**
8	NO_X (µg/m^3)	25.8	28.5	27.3	24.7	33.0	25.6	**80 (µg/m^3) (24 hours)**
9	NH_3 (µg/m^3)	18.0	22.4	19.5	45.8	34.6	37.5	**400 (µg/m^3) (24 hours)**
10	O_3 (µg/m^3)	8.6	9.4	15.1	9.5	11.4	5.7	**100 (8 hours) & 180 (µg/m^3) (1 hour)**
		18.4	22.8	34.3	16.5	22.2	11.7	
		4.8	9.0	10.2	4.4	6.7	2.9	
11	CO (mg/m^3)	< 2	< 2	< 2	< 2	< 2	< 2	**02 (8 hours) & 04 mg/m^3 (1 hour)**
		< 2	< 2	< 2	< 2	< 2	< 2	
		< 2	< 2	< 2	< 2	< 2	< 2	
12	Benzene (µg/m^3)	< 3	< 3	< 3	< 3	< 3	< 3	**05 (µg/m^3) (Annual)**

AMBIENT AIR QUALITY MONITORING RESULTS

S.No.	Pollutants	AAQ – 3 Sambhav Automobiles			AAQ – 4 Mahadev Industries			NAAQ Standards (2009)
		1st Round	2nd Round	3rd Round	1st Round	2nd Round	3rd Round	
		09.01.2014	11.01.2014	13.01.2014	09.01.2014	11.01.2014	13.01.2014	
I.	**Particulate Pollutants**							
1.	PM_{10} (µg/m^3)	254	281	241	218	265	235	100 (µg/m^3)
2	$PM_{2.5}$ µg/m^3)	82	64	76	87	63	99	60 (µg/m^3)
3	Arsenic (ng/m^3)	1.8	2.5	3.4	1.1	1.5	1.6	06 (ng/m^3) (Annual)
4	Nickel (ng/m^3)	6.7	8.1	10.8	5.3	4.7	7.2	20 (ng/m^3) (Annual)
5	Lead (µg/m^3)	0.16	0.12	0.17	0.14	0.18	0.21	1.0(µg/m^3) (24 hours)
6	Benzo (a) Pyrene (ng/m^3)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	01 (ng/m^3) (Annual)
II.	**Gaseous Pollutants**							
7	SO_2 (µg/m^3)	12.6	16.2	13.1	11.8	14.7	13.2	80 (µg/m^3) (24 hours)
8	NO_X (µg/m^3)	25.0	31.4	22.5	21.6	28.4	23.5	80 (µg/m^3) (24 hours)
9	NH_3 (µg/m^3)	14.2	21.1	19.4	16.4	13.5	12.4	400 (µg/m^3) (24 hours)
10	O_3 (µg/m^3)	11.7	9.4	4.8	10.8	12.4	14.4	100 (8 hours) & 180 (µg/m^3) (1 hour)
		19.7	16.9	12.2	16.8	21.9	12.7	
		3.8	6.0	4.6	3.2	3.8	2.8	
11	CO (mg/m^3)	< 2	< 2	< 2	< 2	< 2	< 2	02 (8 hours) & 04 mg/m^3 (1 hour)
		< 2	< 2	< 2	< 2	< 2	< 2	
		< 2	< 2	< 2	< 2	< 2	< 2	
12	Benzene (µg/m^3)	< 3	< 3	< 3	< 3	< 3	< 3	05 (µg/m^3) (Annual)

AMBIENT AIR QUALITY MONITORING RESULTS

S.No.	Pollutants	AAQ – 5 Mohan Meakin Limited			AAQ – 6 Times of India			NAAQ Standards (2009)
		1st Round	2nd Round	3rd Round	1st Round	2nd Round	3rd Round	
		15.01.2014	17.01.2014	20.01.2014	15.01.2014	17.01.2014	20.01.2014	
I.	**Particulate Pollutants**							
1.	PM_{10} (µg/m^3)	229	175	200	307	240	282	**100 (µg/m^3)**
2	$PM_{2.5}$ µg/m^3)	78	89	59	85	68	90	**60 (µg/m^3)**
3	Arsenic (ng/m^3)	2.0	1.7	1.5	2.1	1.8	2.4	**06 (ng/m^3) (Annual)**
4	Nickel (ng/m^3)	5.4	7.8	4.6	4.3	5.6	7.2	**20 (ng/m^3) (Annual)**
5	Lead (µg/m^3)	0.16	0.12	0.19	0.21	0.14	0.22	**1.0(µg/m^3) (24 hours)**
6	Benzo (a) Pyrene (ng/m^3)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**01 (ng/m^3) (Annual)**
II.	**Gaseous Pollutants**							
7	SO_2 (µg/m^3)	18.6	12.3	15.2	14.8	19.5	16.1	**80 (µg/m^3) (24 hours)**
8	NO_X (µg/m^3)	24.2	20.8	27.5	34.5	30.9	26.3	**80 (µg/m^3) (24 hours)**
9	NH_3 (µg/m^3)	16.3	13.9	18.2	11.1	12.7	14.0	**400 (µg/m^3) (24 hours)**
10	O_3 (µg/m^3)	9.2	6.0	7.9	8.6	5.1	6.3	**100 (8 hours) & 180 (µg/m^3) (1 hour)**
		14.3	11.7	15.9	14.9	12.1	12.6	
		3.6	2.2	3.8	3.2	2.5	1.6	
11	CO (mg/m^3)	< 2	< 2	< 2	< 2	< 2	< 2	**02 (8 hours) & 04 mg/m^3 (1 hour)**
		< 2	< 2	< 2	< 2	< 2	< 2	
		< 2	< 2	< 2	< 2	< 2	< 2	
12	Benzene (µg/m^3)	< 3	< 3	< 3	< 3	< 3	< 3	**05 (µg/m^3) (Annual)**

AMBIENT AIR QUALITY MONITORING RESULTS

S.No.	Pollutants	AAQ – 7 Siva Electronical (I) Pvt Ltd			AAQ – 8 Raijade corrugating industry			NAAQ Standards (2009)
		1st Round	2nd Round	3rd Round	1st Round	2nd Round	3rd Round	
		15.01.2014	17.01.2014	20.01.2014	15.01.2014	17.01.2014	20.01.2014	
I.	**Particulate Pollutants**							
1.	PM_{10} ($\mu g/m^3$)	296	198	233	182	151	169	**100 ($\mu g/m^3$)**
2	$PM_{2.5}$ ($\mu g/m^3$)	82	67	74	80	73	64	**60 ($\mu g/m^3$)**
3	Arsenic (ng/m^3)	2.1	1.9	2.6	1.6	1.3	1.4	**06 (ng/m^3) (Annual)**
4	Nickel (ng/m^3)	3.5	4.2	6.1	5.7	3.3	6.8	**20 (ng/m^3) (Annual)**
5	Lead ($\mu g/m^3$)	0.10	0.13	0.15	0.08	0.11	0.07	**1.0($\mu g/m^3$) (24 hours)**
6	Benzo (a) Pyrene (ng/m^3)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**01 (ng/m^3) (Annual)**
II.	**Gaseous Pollutants**							
7	SO_2 ($\mu g/m^3$)	17.8	16.5	13.9	18.3	21.9	16.8	**80 ($\mu g/m^3$) (24 hours)**
8	NO_x ($\mu g/m^3$)	29.3	26.2	21.7	30.1	28.0	24.9	**80 ($\mu g/m^3$) (24 hours)**
9	NH_3 ($\mu g/m^3$)	16.9	14.7	12.1	15.2	16.6	12.7	**400 ($\mu g/m^3$) (24 hours)**
10	O_3 ($\mu g/m^3$)	7.1	9.0	6.8	8.8	6.4	10.1	**100 (8 hours) & 180 ($\mu g/m^3$) (1 hour)**
		17.1	14.3	18.7	15.9	13.3	14.9	
		2.9	2.2	3.4	2.5	3.2	3.8	
11	CO (mg/m^3)	< 2	< 2	< 2	< 2	< 2	< 2	**02 (8 hours) & 04 mg/m^3 (1 hour)**
		< 2	< 2	< 2	< 2	< 2	< 2	
		< 2	< 2	< 2	< 2	< 2	< 2	
12	Benzene ($\mu g/m^3$)	< 3	< 3	< 3	< 3	< 3	< 3	**05 ($\mu g/m^3$) (Annual)**

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AMBIENT AIR QUALITY MONITORING RESULTS

S.No.	Pollutants	AAQ – 9			AAQ – 10			NAAQ Standards (2009)
		Unichem Laboratories Ltd		Albert David	Eagle Continental			
		1st Round	2nd Round	3rd Round	1st Round	2nd Round	3rd Round	
		22.01.2014	25.01.2014	27.01.2014	22.01.2014	24.01.2014	27.01.2014	
I.	**Particulate Pollutants**							
1.	PM_{10} ($\mu g/m^3$)	220	236	268	146	132	158	**100 ($\mu g/m^3$)**
2	$PM_{2.5}$ ($\mu g/m^3$)	64	78	81	55	61	56	**60 ($\mu g/m^3$)**
3	Arsenic (ng/m^3)	1.5	1.3	1.8	1.4	1.9	1.7	**06 (ng/m^3) (Annual)**
4	Nickel (ng/m^3)	7.2	5.3	8.7	5.5	7.6	6.2	**20 (ng/m^3) (Annual)**
5	Lead ($\mu g/m^3$)	0.22	0.27	0.19	0.09	0.13	0.07	**1.0($\mu g/m^3$) (24 hours)**
6	Benzo (a) Pyrene (ng/m^3)	0.89	1.07	0.73	< 0.5	< 0.5	< 0.5	**01 (ng/m^3) (Annual)**
II.	**Gaseous Pollutants**							
7	SO_2 ($\mu g/m^3$)	15.4	13.3	17.2	10.4	12.7	11.1	**80 ($\mu g/m^3$) (24 hours)**
8	NO_x ($\mu g/m^3$)	25.6	28.4	31.2	14.9	19.5	16.2	**80 ($\mu g/m^3$) (24 hours)**
9	NH_3 ($\mu g/m^3$)	13.4	11.9	16.5	8.4	9.8	10.9	**400 ($\mu g/m^3$) (24 hours)**
10	O_3 ($\mu g/m^3$)	8.0	7.6	9.4	6.9	7.6	8.8	**100 (8 hours) & 180 ($\mu g/m^3$) (1 hour)**
		15.2	11.7	18.4	13.3	11.7	23.5	
		3.5	3.8	4.4	4.8	3.8	6.7	
11	CO (mg/m^3)	< 2	< 2	< 2	< 2	< 2	< 2	**02 (8 hours) & 04 mg/m^3 (1 hour)**
		< 2	< 2	< 2	< 2	< 2	< 2	
		< 2	< 2	< 2	< 2	< 2	< 2	
12	Benzene ($\mu g/m^3$)	< 3	< 3	< 3	< 3	< 3	< 3	**05 ($\mu g/m^3$) (Annual)**

AMBIENT AIR QUALITY MONITORING RESULTS

S.No.	Pollutants	AAQ – 11 Jindal pipes Ltd			AAQ – 12 Sathe Engineering Co. Pvt. ltd			NAAQ Standards (2009)
		1st Round	2nd Round	3rd Round	1st Round	2nd Round	3rd Round	
		22.01.2014	24.01.2014	27.01.2014	22.01.2014	24.01.2014	27.01.2014	
I.	**Particulate Pollutants**							
1.	PM_{10} ($\mu g/m^3$)	256	281	238	237	262	219	**100 ($\mu g/m^3$)**
2	$PM_{2.5}$ ($\mu g/m^3$)	87	115	112	84	102	107	**60 ($\mu g/m^3$)**
3	Arsenic (ng/m^3)	2.0	2.6	1.7	2.5	1.9	2.6	**06 (ng/m^3) (Annual)**
4	Nickel (ng/m^3)	4.3	7.5	6.2	6.8	8.2	6.1	**20 (ng/m^3) (Annual)**
5	Lead ($\mu g/m^3$)	0.18	0.15	0.20	0.17	0.12	0.19	**1.0($\mu g/m^3$) (24 hours)**
6	Benzo (a) Pyrene (ng/m^3)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**01 (ng/m^3) (Annual)**
II.	**Gaseous Pollutants**							
7	SO_2 ($\mu g/m^3$)	17.6	16.2	14.6	14.1	17.3	13.8	**80 ($\mu g/m^3$) (24 hours)**
8	NO_x ($\mu g/m^3$)	25.7	29.2	20.9	27.2	31.5	23.4	**80 ($\mu g/m^3$) (24 hours)**
9	NH_3 ($\mu g/m^3$)	6.9	8.0	7.6	7.4	9.1	8.2	**400 ($\mu g/m^3$) (24 hours)**
10	O_3 ($\mu g/m^3$)	9.5	7.4	10.7	14.4	15.7	10.5	**100 (8 hours) & 180 ($\mu g/m^3$) (1 hour)**
		14.9	18.7	19.3	19.7	16.5	21.6	
		3.2	3.8	3.2	4.8	3.8	3.2	
11	CO (mg/m^3)	< 2	< 2	< 2	< 2	< 2	< 2	**02 (8 hours) & 04 mg/m^3 (1 hour)**
		< 2	< 2	< 2	< 2	< 2	< 2	
		< 2	< 2	< 2	< 2	< 2	< 2	
12	Benzene ($\mu g/m^3$)	< 3	< 3	< 3	< 3	< 3	< 3	**05 ($\mu g/m^3$) (Annual)**

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AMBIENT AIR QUALITY MONITORING RESULTS

S.No.	Pollutants	AAQ – 13 Aastha Medical Center			AAQ – 14 Sigma Enterprises			NAAQ Standards (2009)
		1st Round	2nd Round	3rd Round	1st Round	2nd Round	3rd Round	
		28.01.2014	30.01.2014	01.02.2014	28.01.2014	30.01.2014	01.02.2014	
I.	**Particulate Pollutants**							
1.	PM_{10} ($\mu g/m^3$)	92	108	84	211	186	204	**100 ($\mu g/m^3$)**
2	$PM_{2.5}$ ($\mu g/m^3$)	34	46	31	82	68	71	**60 ($\mu g/m^3$)**
3	Arsenic (ng/m^3)	1.2	2.1	1.7	1.3	1.7	2.3	**06 (ng/m^3) (Annual)**
4	Nickel (ng/m^3)	4.4	3.7	5.9	5.4	7.0	5.7	**20 (ng/m^3) (Annual)**
5	Lead ($\mu g/m^3$)	0.04	0.02	0.01	0.07	0.05	0.11	**1.0($\mu g/m^3$) (24 hours)**
6	Benzo (a) Pyrene (ng/m^3)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**01 (ng/m^3) (Annual)**
II.	**Gaseous Pollutants**							
7	SO_2 ($\mu g/m^3$)	10.1	12.3	9.5	12.5	14.7	16.2	**80 ($\mu g/m^3$) (24 hours)**
8	NO_X ($\mu g/m^3$)	24.7	27.1	21.8	24.3	26.7	30.4	**80 ($\mu g/m^3$) (24 hours)**
9	NH_3 ($\mu g/m^3$)	10.5	14.2	8.9	7.4	10.7	8.5	**400 ($\mu g/m^3$) (24 hours)**
10	O_3 ($\mu g/m^3$)	5.7	7.0	6.7	5.4	8.2	9.8	**100 (8 hours) & 180 ($\mu g/m^3$) (1 hour)**
		17.1	15.9	19.3	15.2	11.7	20.3	
		4.8	4.1	5.4	3.8	4.1	6.3	
11	CO (mg/m^3)	< 2	< 2	< 2	< 2	< 2	< 2	**02 (8 hours) & 04 mg/m^3 (1 hour)**
		< 2	< 2	< 2	< 2	< 2	< 2	
		< 2	< 2	< 2	< 2	< 2	< 2	
12	Benzene ($\mu g/m^3$)	< 3	< 3	< 3	< 3	< 3	< 3	**05 ($\mu g/m^3$) (Annual)**

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AMBIENT AIR QUALITY MONITORING RESULTS

S.No.	Pollutants	AAQ – 15 Amko exports			AAQ – 16 Rathi Super Steels Limited			NAAQ Standards (2009)
		1st Round	2nd Round	3rd Round	1st Round	2nd Round	3rd Round	
		28.01.2014	30.01.2014	01.02.2014	28.01.2014	30.01.2014	01.02.2014	
I.	**Particulate Pollutants**							
1.	PM_{10} ($\mu g/m^3$)	252	271	323	275	237	258	**100 ($\mu g/m^3$)**
2	$PM_{2.5}$ ($\mu g/m^3$)	63	78	85	79	62	74	**60 ($\mu g/m^3$)**
3	Arsenic (ng/m^3)	1.3	1.6	2.4	1.4	1.7	2.2	**06 (ng/m^3) (Annual)**
4	Nickel (ng/m^3)	5.7	7.6	6.3	5.7	4.5	7.2	**20 (ng/m^3) (Annual)**
5	Lead ($\mu g/m^3$)	0.14	0.17	0.23	0.23	0.30	0.26	**1.0($\mu g/m^3$) (24 hours)**
6	Benzo (a) Pyrene (ng/m^3)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**01 (ng/m^3) (Annual)**
II.	**Gaseous Pollutants**							
7	SO_2 ($\mu g/m^3$)	13.8	16.6	18.4	15.5	13.8	17.4	**80 ($\mu g/m^3$) (24 hours)**
8	NO_X ($\mu g/m^3$)	25.4	29.2	33.5	29.6	24.7	32.9	**80 ($\mu g/m^3$) (24 hours)**
9	NH_3 ($\mu g/m^3$)	10.1	8.5	11.3	11.5	13.8	12.6	**400 ($\mu g/m^3$) (24 hours)**
10	O_3 ($\mu g/m^3$)	6.7	9.8	7.6	7.2	12.1	9.8	**100 (8 hours) & 180 ($\mu g/m^3$) (1 hour)**
		16.5	21.3	23.2	14.3	18.7	37.7	
		4.4	4.1	4.8	3.8	5.1	4.9	
11	CO (mg/m^3)	< 2	< 2	< 2	< 2	< 2	< 2	**02 (8 hours) & 04 mg/m^3 (1 hour)**
		< 2	< 2	< 2	< 2	< 2	< 2	
		< 2	< 2	< 2	< 2	< 2	< 2	
12	Benzene ($\mu g/m^3$)	< 3	< 3	< 3	< 3	< 3	< 3	**05 ($\mu g/m^3$) (Annual)**

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

GHAZIABAD – UTTAR PRADESH

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	S W – 1 : Hindon river, Downstream, Near NH -24 Bridge (Shift : A)			Test Method
			1st Round 12.01.2014	2nd Round 14.01.2014	3rd Round 16.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Brownish	Greyish	Brownish	-
2	Colour (Hazen Units)	-	30	20	30	IS 3025: Part – 4
3	Odour (Smell)	-	Un-Agreeable	Un-Agreeable	Un-Agreeable	IS 3025: Part 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.72	7.76	7.69	IS 3025: Part 11
2	E.C	µS/cm	1450	1280	1470	IS 3025: Part - 14
3	Oil & Grease	mg/l	4	3	4	IS 3025: Part – 39
4	Suspended Solids	mg/l	284	248	268	IS 3025: Part 17
5	Dissolved Oxygen	mg/l	< 1	< 1	< 1	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	178	164	192	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	48	45	50	IS 3025: Part 44
8	Nitrite-Nitrogen as N	mg/l	0.05	0.07	0.07	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	0.90	0.67	0.90	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	0.95	0.74	0.97	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part - 27
14	Fluoride as F	mg/l	0.90	0.90	0.80	IS 3025: Part – 60
15	Sulphides as S	mg/l	1.4	1.2	2.1	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	1.8	1.9	1.7	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	4.6	4.20	4.58	By Calculation
18	Total Coliforms	MPN/100ml	1700	1400	2100	IS 1622
19	Fecal Coliforms	MPN/100ml	500	300	800	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	2.3	2.4	2.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	20	23	25	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	15	16	17	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	0.002	0.001	0.002	IS 3025: Part - 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.09	0.08	0.09	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	0.01	0.02	0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	<0.01	IS 3025: Part 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.16	0.14	0.15	APHA 3111 – B
19	Iron as Fe	mg/l	2.4	2.0	2.2	IS 3025: Part 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.18	0.14	0.17	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

GHAZIABAD – UTTAR PRADESH

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	S W – 1 : Hindon river, Downstream, Near NH -24 Bridge (Shift : B)			Test Method
			1st Round 12.01.2014	2nd Round 14.01.2014	3rd Round 16.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Brownish	Brownish	Brownish	-
2	Colour (Hazen Units)	-	30	40	35	IS 3025: Part 4
3	Odour (Smell)	-	Un-Agreeable	Un-Agreeable	Un-Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.75	7.54	7.57	IS 3025: Part – 11
2	E C	µS/cm	1350	1370	1380	IS 3025: Part – 14
3	Oil & Grease	mg/l	4	4	4	IS 3025: Part 39
4	Suspended Solids	mg/l	262	296	272	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	< 1	< 1	< 1	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	192	178	182	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	50	48	49	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	0.06	0.05	0.06	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	1.20	0.97	0.67	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2–NO_3)	mg/l	1.26	1.02	0.73	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.80	0.80	0.80	IS 3025: Part 60
15	Sulphides as S	mg/l	1.7	1.5	1.8	IS 3025: Part 29
16	Dissolved Phosphates as P	mg/l	2.1	2.2	1.6	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	4.03	4.16	4.05	By Calculation
18	Total Coliforms	MPN/100ml	2100	1200	1700	IS 1622
19	Fecal Coliforms	MPN/100ml	600	270	400	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	2.7	2.9	2.2	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	24	25	24	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	17	18	16	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	0.002	0.002	0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.07	0.06	0.07	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	0.01	0.01	0.02	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.14	0.15	0.13	APHA 3111 – B
19	Iron as Fe	mg/l	2.1	2.3	2.0	IS 3025: Part 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.14	0.16	0.16	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

GHAZIABAD – UTTAR PRADESH

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	S W – 2 : Hindon river, Downstream, Near Gaur city bridge (Shift : A)			Test Method
			1st Round 12.01.2014	2nd Round 14.01.2014	3rd Round 16.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Brownish	Greyish	Brownish	-
2	Colour (Hazen Units)	-	25	30	25	IS 3025: Part – 4
3	Odour (Smell)	-	Un-Agreeable	Un-Agreeable	Un-Agreeable	IS 3025: Part 5
II	**Regular Monitoring Parameters**					
1	pH	-	8.05	7.80	7.49	IS 3025: Part 11
2	E C	µS/cm	1480	1342	1642	IS 3025: Part 14
3	Oil & Grease	mg/l	4	4	4	IS 3025: Part – 39
4	Suspended Solids	mg/l	148	194	186	IS 3025: Part 17
5	Dissolved Oxygen	mg/l	< 1	< 1	< 1	IS 3025: Part 38
6	Chemical Oxygen Demand	mg/l	206	198	172	IS 3025: Part - 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	54	52	46	IS 3025: Part 44
8	Nitrite-Nitrogen as N	mg/l	0.10	0.07	0.07	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	0.40	0.43	0.43	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	0.50	0.50	0.50	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	1.1	1.0	1.0	IS 3025: Part – 60
15	Sulphides as S	mg/l	2.0	2.1	1.9	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	2.9	2.4	2.6	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	4.62	4.09	4.58	By Calculation
18	Total Coliforms	MPN/100ml	2200	1700	2100	IS 1622
19	Fecal Coliforms	MPN/100ml	600	300	500	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	3.4	3.0	3.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	27	25	25	APHA 4500 – Norg. B
3	Total Ammonia (NH_3+NH_4)-Nitrogen	mg/l	19	17	16	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	0.002	0.002	0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.07	0.08	0.06	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	0.01	0.02	0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.10	0.12	0.11	APHA 3111 – B
19	Iron as Fe	mg/l	2.1	1.9	1.8	IS 3025: Part 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.17	0.15	0.18	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

GHAZIABAD – UTTAR PRADESH

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	S W – 2 : Hindon river, Downstream, Near Gaur city bridge (Shift : B)			Test Method
			1st Round 12.01.2014	2nd Round 14.01.2014	3rd Round 16.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Brownish	Greyish	Brownish	-
2	Colour (Hazen Units)	-	30	25	30	IS 3025: Part – 4
3	Odour (Smell)	-	Un-Agreeable	Un-Agreeable	Un-Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.86	7.82	7.58	IS 3025: Part – 11
2	E.C	µS/cm	1750	1680	1760	IS 3025: Part – 14
3	Oil & Grease	mg/l	5	5	5	IS 3025: Part – 39
4	Suspended Solids	mg/l	232	216	168	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	< 1	< 1	< 1	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	226	208	164	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	60	56	44	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	0.05	0.05	0.06	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	0.47	0.47	0.44	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2–NO_3)	mg/l	0.52	0.52	0.50	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	1.0	0.90	0.90	IS 3025: Part – 60
15	Sulphides as S	mg/l	1.8	2.0	1.9	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	2.60	2.70	2.83	APHA 4500 P.D
17	Sodium Absorption Ratio (SAR)	-	4.91	4.78	5.02	By Calculation
18	Total Coliforms	MPN/100ml	2600	2100	1400	IS 1622
19	Fecal Coliforms	MPN/100ml	700	400	300	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	3.1	3.3	3.5	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	30	27	24	APHA 4500 Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	21	18	15	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	0.002	0.001	0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.08	0.07	0.09	IS 3025: Part 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 37
15	Lead as Pb	mg/l	0.02	0.01	0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 48
18	Manganese as Mn	mg/l	0.11	0.10	0.12	APHA 3111 - B
19	Iron as Fe	mg/l	1.9	1.7	1.9	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.20	0.23	0.25	IS 3025: Part 57

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	S W – 3 ; Hindon river, Middle stream, Near Railway bridge, Near Mohan nagar (Shift : A)			Test Method
			1st Round 12.01.2014	2nd Round 14.01.2014	3rd Round 16.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Brownish	Brownish	Brownish	-
2	Colour (Hazen Units)	-	50	50	40	IS 3025: Part 4
3	Odour (Smell)	-	Un-Agreeable	Un-Agreeable	Un-Agreeable	IS 3025: Part.– 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.95	7.62	7.54	IS 3025: Part.– 11
2	E C	µS/cm	554	562	518	IS 3025: Part – 14
3	Oil & Grease	mg/l	3	3	2	IS 3025: Part 39
4	Suspended Solids	mg/l	48	76	64	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	< 1	< 1	< 1	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	106	98	94	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	27	25	24	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	0.08	0.10	0.08	APHA 4500 - NO_2.B
9	Nitrate-Nitrogen as N	mg/l	0.90	0.90	0.84	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2–NO_3)	mg/l	0.98	1.00	0.92	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.60	0.60	0.60	IS 3025: Part 60
15	Sulphides as S	mg/l	1.0	0.9	0.7	IS 3025: Part 29
16	Dissolved Phosphates as P	mg/l	0.60	0.74	0.80	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	1.23	1.28	1.09	By Calculation
18	Total Coliforms	MPN/100ml	400	500	330	IS 1622
19	Fecal Coliforms	MPN/100ml	140	170	110	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	0.82	0.90	0.98	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	17	15	14	APHA 4500 - Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	11	10	9.0	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	0.001	0.001	0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.07	0.06	0.05	IS 3025: Part 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 48
18	Manganese as Mn	mg/l	0.06	0.05	0.04	APHA 3111 – B
19	Iron as Fe	mg/l	0.67	0.72	0.70	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.12	0.11	0.13	IS 3025: Part - 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

GHAZIABAD – UTTAR PRADESH

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 3 : Hindon river, Middle stream, Near Railway bridge, Near Mohan nagar (Shift : B)			Test Method
			1st Round 12.01.2014	2nd Round 14.01.2014	3rd Round 16.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Brownish	Brownish	Brownish	-
2	Colour (Hazen Units)	-	40	40	45	IS 3025: Part 4
3	Odour (Smell)	-	Un-Agreeable	Un-Agreeable	Un-Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.69	7.58	7.55	IS 3025: Part – 11
2	E C	µS/cm	578	534	512	IS 3025: Part – 14
3	Oil & Grease	mg/l	3	2	2	IS 3025: Part 39
4	Suspended Solids	mg/l	56	94	78	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	< 1	< 1	< 1	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	114	86	90	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	29	22	23	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	0.09	0.08	0.08	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	0.81	0.75	0.81	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	0.90	0.83	0.89	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.70	0.70	0.60	IS 3025: Part 60
15	Sulphides as S	mg/l	0.9	0.8	0.8	IS 3025: Part 29
16	Dissolved Phosphates as P	mg/l	0.67	0.86	0.62	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	1.12	1.08	1.02	By Calculation
18	Total Coliforms	MPN/100ml	700	340	600	IS 1622
19	Fecal Coliforms	MPN/100ml	210	110	170	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	0.84	1.1	0.80	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	19	14	16	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	12	10	11	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	0.002	0.001	0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.07	0.05	0.06	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.08	0.06	0.07	APHA 3111 – B
19	Iron as Fe	mg/l	0.72	0.75	0.80	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.14	0.12	0.11	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

GHAZIABAD – UTTAR PRADESH

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 4 ; Hindon river, Upstream, Near Bridge at Karhera village (Shift : A)			Test Method
			1st Round 12.01.2014	2nd Round 14.01.2014	3rd Round 16.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Brownish	Brownish	Brownish	-
2	Colour (Hazen Units)	-	50	60	50	IS 3025: Part -4
3	Odour (Smell)	-	Un-Agreeable	Un-Agreeable	Un-Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.86	7.52	7.48	IS 3025: Part – 11
2	E C	µS/cm	506	522	559	IS 3025: Part – 14
3	Oil & Grease	mg/l	3	3	3	IS 3025: Part 39
4	Suspended Solids	mg/l	76	88	64	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	< 1	< 1	< 1	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	174	152	156	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	47	40	41	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	0.08	0.09	0.09	APHA 4500 NO_2.B
9	Nitrate-Nitrogen as N	mg/l	1.00	0.97	0.97	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	1.08	1.06	1.06	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.60	0.70	0.60	IS 3025: Part 60
15	Sulphides as S	mg/l	0.8	0.9	1.0	IS 3025: Part 29
16	Dissolved Phosphates as P	mg/l	1.06	1.12	1.34	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	1.18	1.04	1.26	By Calculation
18	Total Coliforms	MPN/100ml	2200	1700	2100	IS 1622
19	Fecal Coliforms	MPN/100ml	900	600	800	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	1.46	1.38	1.62	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	19	15	16	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	12	9	10	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	0.002	0.001	0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.03	0.03	0.02	IS 3025: Part 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 48
18	Manganese as Mn	mg/l	0.07	0.06	0.05	APHA 3111 – B
19	Iron as Fe	mg/l	0.86	0.92	0.84	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.11	0.12	0.11	IS 3025: Part 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

GHAZIABAD - UTTAR PRADESH

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	S W – 4 : Hindon river, Upstream, Near Bridge at Karhera village (Shift : B)			Test Method
			1st Round 12.01.2014	2nd Round 14.01.2014	3rd Round 16.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Brownish	Brownish	Brownish	-
2	Colour (Hazen Units)	-	45	50	50	IS 3025: Part – 4
3	Odour (Smell)	-	Un-Agreeable	Un-Agreeable	Un-Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.59	7.45	7.56	IS 3025: Part – 11
2	E C	µS/cm	525	564	538	IS 3025: Part – 14
3	Oil & Grease	mg/l	4	4	3	IS 3025: Part – 39
4	Suspended Solids	mg/l	84	72	58	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	< 1	< 1	< 1	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	160	172	148	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	42	45	39	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	0.08	0.08	0.07	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	0.92	1.24	0.99	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	1.00	1.32	1.06	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.70	0.60	0.70	IS 3025: Part – 60
15	Sulphides as S	mg/l	0.8	1.0	0.9	IS 3025: Part 29
16	Dissolved Phosphates as P	mg/l	0.96	1.02	1.10	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	1.06	1.16	1.12	By Calculation
18	Total Coliforms	MPN/100ml	1700	2600	2100	IS 1622
19	Fecal Coliforms	MPN/100ml	700	1100	900	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	1.32	1.40	1.56	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	15	17	14	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	10	11	9	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	0.001	0.001	0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.02	0.03	0.02	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.06	0.05	0.04	APHA 3111 – B
19	Iron as Fe	mg/l	0.92	0.80	0.76	IS 3025: Part 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.12	0.10	0.11	IS 3025: Part - 57

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	S W – 5 : Gang nahar, Upstream , Near Murad nagar regulator bridge (Shift : A)			Test Method
			1st Round 14.01.2014	2nd Round 16.01.2014	3rd Round 18.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	5	5	5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part - 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.86	7.76	7.75	IS 3025: Part 11
2	E C	µS/cm	215	200	206	IS 3025: Part 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	18	14	12	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	5.6	5.4	5.5	IS 3025: Part 38
6	Chemical Oxygen Demand	mg/l	12	8	10	IS 3025: Part 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	3	2	2	IS 3025: Part 44
8	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	0.45	0.23	0.23	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	0.45	0.23	0.23	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.40	0.40	0.40	IS 3025: Part – 60
15	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	0.20	0.15	0.18	By Calculation
18	Total Coliforms	MPN/100ml	30	26	21	IS 1622
19	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.07	0.07	0.08	IS 3025: Part 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part - 57

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	S W – 5 : Gang nahar, Upstream , Near Murad nagar regulator bridge (Shift : B)			Test Method
			1st Round 14.01.2014	2nd Round 16.01.2014	3rd Round 18.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	5	5	5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.94	7.80	7.85	IS 3025: Part – 11
2	E C	µS/cm	220	204	202	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	16	12	14	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	5.7	5.5	5.6	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	14	10	8	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	3	2	2	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	0.34	0.23	0.23	APHA 4500 - NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	0.34	0.23	0.28	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part - 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.40	0.40	0.40	IS 3025: Part – 60
15	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 P.D
17	Sodium Absorption Ratio (SAR)	-	0.18	0.16	0.15	By Calculation
18	Total Coliforms	MPN/100ml	40	29	35	IS 1622
19	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 - NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.08	0.06	0.07	IS 3025: Part 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

GHAZIABAD – UTTAR PRADESH

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	S W – 6 : Gang nahar, Downstream , Near Masoori bridge, at NH-24 (Shift : A)			Test Method
			1st Round 14.01.2014	2nd Round 16.01.2014	3rd Round 18.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	5	5	5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	8.00	7.70	7.78	IS 3025: Part – 11
2	E C	µS/cm	219	195	208	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	24	12	14	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	5.5	5.5	5.6	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	12	6	4	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	3	2	2	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2 B
9	Nitrate-Nitrogen as N	mg/l	0.45	0.45	0.23	APHA 4500 NO_3 B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	0.45	0.45	0.23	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3 C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part 27
14	Fluoride as F	mg/l	0.40	0.20	0.20	IS 3025: Part – 60
15	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 - P.D
17	Sodium Absorption Ratio (SAR)	-	0.18	0.14	0.16	By Calculation
18	Total Coliforms	MPN/100ml	13	17	11	IS 1622
19	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 - Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part - 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 B
19	Iron as Fe	mg/l	0.08	0.09	0.08	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

GHAZIABAD – UTTAR PRADESH

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	S W – 6 : Gang nahar, Downstream , Near Masoori bridge, at NH-24 (Shift : B)			Test Method
			1st Round 14.01.2014	2nd Round 16.01.2014	3rd Round 18.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	5	5	5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	8.09	7.74	7.83	IS 3025: Part – 11
2	E C	µS/cm	222	211	203	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	16	10	10	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	5.4	5.6	5.6	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	12	8	4	IS 3025: Part 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	3	2	2	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 NO_2.B
9	Nitrate-Nitrogen as N	mg/l	0.45	0.45	0.23	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	0.45	0.45	0.23	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.40	0.40	0.40	IS 3025: Part – 60
15	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	0.19	0.16	0.15	By Calculation
18	Total Coliforms	MPN/100ml	8	14	11	IS 1622
19	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.08	0.08	0.07	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 57

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	S W – 7 : Ganga river Upstream, before meeting nala, at Garhmukteswar (Shift : A)			Test Method
			1st Round 29.01.2014	2nd Round 31.01.2014	3rd Round 02.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	5	5	5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.82	7.80	7.84	IS 3025: Part 11
2	E.C	µS/cm	273	252	289	IS 3025: Part - 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	12	14	12	IS 3025: Part 17
5	Dissolved Oxygen	mg/l	6.0	6.1	5.8	IS 3025: Part - 38
6	Chemical Oxygen Demand	mg/l	8	12	8	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	2	3	2	IS 3025: Part 44
8	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	0.23	0.23	0.23	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	0.23	0.23	0.23	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.30	0.30	0.30	IS 3025: Part – 60
15	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	0.25	0.27	0.24	By Calculation
18	Total Coliforms	MPN/100ml	17	21	13	IS 1622
19	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.08	0.06	0.07	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

GHAZIABAD – UTTAR PRADESH

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	S W – 7 : Ganga river Upstream, before meeting nala, at Garhmukteswar (Shift : B)			Test Method
			1st Round 29.01.2014	2nd Round 31.01.2014	3rd Round 02.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	5	5	5	IS 3025: Part 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.82	8.04	7.88	IS 3025: Part – 11
2	E C	µS/cm	269	294	283	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part 39
4	Suspended Solids	mg/l	10	10	10	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	6.1	6.1	6.0	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	8	12	12	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	2	3	3	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 - NO_2 B
9	Nitrate-Nitrogen as N	mg/l	0.23	0.23	0.23	APHA 4500 – NO_3 B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	0.23	0.23	0.23	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3 C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.30	0.30	0.30	IS 3025: Part 60
15	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part - 29
16	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	0.21	0.27	0.24	By Calculation
18	Total Coliforms	MPN/100ml	11	12	14	IS 1622
19	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_2+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.08	0.07	0.08	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 57

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	S W - 8 : Ganga river Middle stream, at Garhmukteswar brijghat (Shift : A)			Test Method
			1st Round 29.01.2014	2nd Round 31.01.2014	3rd Round 02.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	5	5	5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part - 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.85	7.81	7.88	IS 3025: Part - 11
2	E C	µS/cm	278	296	266	IS 3025: Part 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	14	14	12	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	6.2	6.1	6.1	IS 3025: Part 38
6	Chemical Oxygen Demand	mg/l	10	10	12	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	2	2	3	IS 3025: Part - 44
8	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	0.23	0.23	0.34	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	0.23	0.23	0.34	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.30	0.30	0.30	IS 3025: Part – 60
15	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	0.31	0.35	0.30	By Calculation
18	Total Coliforms	MPN/100ml	12	11	14	IS 1622
19	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4 / NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr6+	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.07	0.06	0.08	IS 3025: Part 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part - 57

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	S W – 8 : Ganga river Middle stream, at Garhmukteswar brijghat (Shift : B)			Test Method
			1st Round 29.01.2014	2nd Round 31.01.2014	3rd Round 02.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	5	5	5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.84	7.86	7.83	IS 3025: Part 11
2	E C	µS/cm	294	262	274	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part.– 39
4	Suspended Solids	mg/l	12	10	10	IS 3025: Part 17
5	Dissolved Oxygen	mg/l	6.2	6.0	5.9	IS 3025: Part - 38
6	Chemical Oxygen Demand	mg/l	10	8	10	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	2	2	2	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	0.23	0.34	0.23	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	0.23	0.34	0.23	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part - 27
14	Fluoride as F	mg/l	0.30	0.30	0.30	IS 3025: Part – 60
15	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	0.38	0.33	0.36	By Calculation
18	Total Coliforms	MPN/100ml	17	14	9	IS 1622
19	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 Norg. B
3	Total Ammonia (NH_4–NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part.– 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part - 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.07	0.06	0.07	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part - 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

GHAZIABAD – UTTAR PRADESH

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	S W – 9 : Ganga river Downstream, at Pounth village (Shift : A)			Test Method
			1st Round 29.01.2014	2nd Round 31.01.2014	3rd Round 02.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	5	5	5	IS 3025: Part 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.89	7.86	7.89	IS 3025: Part – 11
2	E C	µS/cm	264	275	296	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part 39
4	Suspended Solids	mg/l	14	14	12	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	6.1	6.0	6.0	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	10	12	14	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	2	3	3	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	0.34	0.45	0.34	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	0.34	0.45	0.34	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.30	0.30	0.30	IS 3025: Part – 60
15	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 29
16	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 P.D
17	Sodium Absorption Ratio (SAR)	-	0.28	0.31	0.35	By Calculation
18	Total Coliforms	MPN/100ml	17	11	12	IS 1622
19	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.08	0.06	0.07	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 - D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 57

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	S W – 9 : Ganga river Downstream, at Pranth village (Shift : B)			Test Method
			1st Round 29.01.2014	2nd Round 31.01.2014	3rd Round 02.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	5	5	5	IS 3025: Part - 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.76	7.86	7.86	IS 3025: Part – 11
2	E C	µS/cm	269	289	258	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part 39
4	Suspended Solids	mg/l	10	12	12	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	6.1	6.0	6.1	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	10	14	8	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	2	3	2	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	0.34	0.45	0.45	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	0.34	0.45	0.45	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.30	0.30	0.30	IS 3025: Part 60
15	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 29
16	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	0.31	0.36	0.27	By Calculation
18	Total Coliforms	MPN/100ml	14	8	11	IS 1622
19	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.07	0.06	0.08	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 57

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	G W – 1 : Shahi Exports Pvt. Ltd			Test Method
			1st Round 09.01.2014	2nd Round 11.01.2014	3rd Round 14.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.87	7.68	7.63	IS 3025: Part – 11
2	E C	µS/cm	4540	4560	4580	IS 3025: Part 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	4	4	4	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part. – 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 NO_2.B
8	Nitrate-Nitrogen as N	mg/l	1.89	1.92	2.26	APHA 4500 · NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	1.89	1.92	2.26	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	1.3	1.4	1.3	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 P.D
16	Sodium Absorption Ratio (SAR)	-	16.31	17.39	16.86	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.06	0.05	0.06	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.88	0.90	0.76	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

GHAZIABAD – UTTAR PRADESH

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	G W – 2 : Krishna foods, Roop nagar			Test Method
			1st Round 09.01.2014	2nd Round 11.01.2014	3rd Round 14.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.62	7.80	7.82	IS 3025: Part 11
2	E C	µS/cm	1530	1510	1520	IS 3025: Part 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	6	4	4	IS 3025: Part 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 NO_2.B
8	Nitrate-Nitrogen as N	mg/l	1.13	1.02	1.02	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	1.13	1.02	1.02	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.80	0.70	0.80	IS 3025: Part 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	3.67	3.42	3.59	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.06	0.07	0.06	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.18	0.20	0.21	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

GHAZIABAD – UTTAR PRADESH

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	G W – 3 : Sambhav Automobiles			Test Method
			1st Round 09.01.2014	2nd Round 11.01.2014	3rd Round 14.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.76	8.1	7.85	IS 3025: Part – 11
2	E C	µS/cm	2580	2620	2650	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	4	6	4	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	1.35	1.47	1.35	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	1.35	1.47	1.35	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part - 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part - 27
13	Fluoride as F	mg/l	1.1	1.1	1.1	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	9.86	10.01	10.14	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 Norg. B
3	Total Ammonia (NH_4–NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 - NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part- 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.07	0.08	0.07	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.36	0.38	0.42	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

GHAZIABAD – UTTAR PRADESH

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 4 : Mahadev Industries			Test Method
			1st Round 09.01.2014	2nd Round 11.01.2014	3rd Round 14.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.82	7.77	7.86	IS 3025: Part – 11
2	E.C	µS/cm	1580	1570	1590	IS 3025: Part 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	4	4	4	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_3.B
8	Nitrate-Nitrogen as N	mg/l	6.55	7.0	7.0	APHA 4500 NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	6.55	7.0	7.0	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.70	0.70	0.70	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 P.D
16	Sodium Absorption Ratio (SAR)	-	4.78	4.62	4.73	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4–NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part - 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.07	0.06	0.06	IS 3025: Part - 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.28	0.28	0.30	IS 3025: Part 57

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 5 : Mohan Meakin Limited			Test Method
			1st Round 15.01.2014	2nd Round 17.01.2014	3rd Round 20.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.68	7.70	7.57	IS 3025: Part – 11
2	E C	µS/cm	1750	1730	1740	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	4	4	6	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	1.35	1.13	1.35	APHA 4500 NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	1.35	1.13	1.35	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part - 27
13	Fluoride as F	mg/l	0.80	0.80	0.80	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	6.71	6.84	6.22	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 Norg. B
3	Total Ammonia (NH_4–NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 B
19	Iron as Fe	mg/l	0.06	0.05	0.06	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.24	0.25	0.28	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

GHAZIABAD – UTTAR PRADESH

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	G W –6 : Times of India			Test Method
			1st Round 15.01.2014	2nd Round 17.01.2014	3rd Round 20.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.38	7.32	7.26	IS 3025: Part – 11
2	E C	µS/cm	2830	2810	2860	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	6	4	6	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	1.58	1.47	1.58	APHA 4500 NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	1.58	1.47	1.58	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.80	0.80	0.80	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	5.40	5.21	5.64	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_5H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.08	0.06	0.07	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.28	0.25	0.26	IS 3025: Part 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

GHAZIABAD – UTTAR PRADESH

GROUND WATER QUALITY RESULTS

SL No.	Test Parameters	UOM	GW – 7 : Shiva Electronics Pvt. Ltd., Rajendra nagar			Test Method
			1st Round 15.01.2014	2nd Round 17.01.2014	3rd Round 20.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.98	7.98	7.26	IS 3025: Part – 11
2	E C	µS/cm	6120	6160	5870	IS 3025: Part 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	6	6	4	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 NO_2.B
8	Nitrate-Nitrogen as N	mg/l	2.03	2.15	1.92	APHA 4500 NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	2.03	2.15	1.92	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.90	0.90	0.90	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 P.D
16	Sodium Absorption Ratio (SAR)	-	9.58	9.36	9.12	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.09	0.09	0.08	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.32	0.34	0.30	IS 3025: Part – 57

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	G W 8 : National Engineering works, Prakash nagar			Test Method
			1st Round 15.01.2014	2nd Round 17.01.2014	3rd Round 20.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.98	7.57	7.59	IS 3025: Part – 11
2	E C	µS/cm	1770	1760	1710	IS 3025: Part 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	6	4	4	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 NO_2.B
8	Nitrate-Nitrogen as N	mg/l	1.13	1.02	1.02	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	1.13	1.02	1.02	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 - NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	1.2	1.2	1.2	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 P.D
16	Sodium Absorption Ratio (SAR)	-	6.18	6.14	6.07	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.05	0.06	0.06	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 56
22	Boron as B	mg/l	0.18	0.18	0.15	IS 3025: Part – 57

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 9			Test Method
			Unichem Laboratories Ltd,		Albert David	
			1st Round 23.01.2014	2nd Round 25.01.2014	3rd Round 28.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.45	7.81	7.45	IS 3025: Part – 11
2	E.C	µS/cm	1570	1580	1530	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	6	4	4	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	1.13	1.35	1.02	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	1.13	1.35	1.02	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.80	0.80	0.80	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	4.29	4.64	4.18	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.07	0.09	0.08	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.16	0.16	0.14	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

GHAZIABAD – UTTAR PRADESH

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 10 : Eagle Continental, Dasna			Test Method
			1st Round 23.01.2014	2nd Round 25.01.2014	3rd Round 28.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.72	7.81	7.74	IS 3025: Part 11
2	E C	µS/cm	792	780	760	IS 3025: Part - 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	4	4	4	IS 3025: Part 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	1.24	1.24	1.13	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	1.24	1.24	1.13	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.70	0.70	0.70	IS 3025: Part 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	1.38	1.42	1.17	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.05	0.05	0.05	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 56
22	Boron as B	mg/l	0.11	0.10	0.11	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

GHAZIABAD – UTTAR PRADESH

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	G W – 11 : Jindal pipes Ltd, Jindal nagar			Test Method
			1st Round 23.01.2014	2nd Round 25.01.2014	3rd Round 27.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.66	7.96	7.65	IS 3025: Part – 11
2	E C	µS/cm	799	782	768	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	4	4	4	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	1.02	1.13	1.02	APHA 4500 NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	1.02	1.13	1.02	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.70	0.80	0.70	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	1.08	1.01	0.96	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4–NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part - 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 B
19	Iron as Fe	mg/l	0.06	0.05	0.06	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.10	0.10	0.10	IS 3025: Part – 57

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	G W – 12 : Sathe Engineering Co. Pvt. ltd.			Test Method
			1st Round 23.01.2014	2nd Round 25.01.2014	3rd Round 27.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.98	7.62	7.94	IS 3025: Part – 11
2	E C	µS/cm	1370	1340	1320	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	6	8	6	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 - NO_2.B
8	Nitrate-Nitrogen as N	mg/l	2.71	2.94	2.94	APHA 4500 NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	2.71	2.94	2.94	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.80	0.80	0.70	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 P.D
16	Sodium Absorption Ratio (SAR)	-	2.92	2.61	2.59	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.07	0.09	0.08	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.16	0.18	0.22	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE -- 1 PROGRAMME

GHAZIABAD – UTTAR PRADESH

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	G W – 13 : Aastha Hospital, Kavi nagar			Test Method
			1st Round 28.01.2014	2nd Round 30.01.2014	3rd Round 01.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.43	7.76	7.40	IS 3025: Part – 11
2	E C	µS/cm	1110	1090	1080	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	6	4	4	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	5.42	5.65	5.42	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	5.42	5.65	5.42	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part 27
13	Fluoride as F	mg/l	0.80	0.80	0.80	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part - 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	3.15	2.83	2.69	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 Norg. B
3	Total Ammonia (NH_4–NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 NH_4
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 B
19	Iron as Fe	mg/l	0.08	0.07	0.08	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 56
22	Boron as B	mg/l	0.14	0.14	0.12	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

GHAZIABAD – UTTAR PRADESH

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 14 : Sigma Enterprises, Pandav Nagar			Test Method
			1st Round 28.01.2014	2nd Round 30.01.2014	3rd Round 01.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.47	7.72	7.48	IS 3025: Part – 11
2	E C	µS/cm	893	878	862	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	6	4	4	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 - NO_2-B
8	Nitrate-Nitrogen as N	mg/l	5.42	5.87	5.42	APHA 4500 NO_3-B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	5.42	5.87	5.42	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.70	0.70	0.80	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 P.D
16	Sodium Absorption Ratio (SAR)	-	1.15	1.01	0.90	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part - 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr6	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.06	0.06	0.05	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.10	0.11	0.10	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

GHAZIABAD – UTTAR PRADESH

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	G W – 15 : Amko exports, Bulandshahr Road			Test Method
			1st Round 28.01.2014	2nd Round 30.01.2014	3rd Round 01.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.75	7.97	7.71	IS 3025: Part 11
2	E C	µS/cm	1040	1010	1020	IS 3025: Part 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	6	4	4	IS 3025: Part 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2 B
8	Nitrate-Nitrogen as N	mg/l	2.71	2.48	2.48	APHA 4500 – NO_3 B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	2.71	2.48	2.48	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.80	0.80	0.80	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 P.D
16	Sodium Absorption Ratio (SAR)	-	1.37	1.16	1.21	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4 NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.07	0.06	0.07	IS 3025: Part - 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.12	0.10	0.11	IS 3025: Part 57

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 16 : Rathi Super Steels Limited,			Test Method
			1st Round 28.01.2014	2nd Round 30.01.2014	3rd Round 01.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.50	7.52	7.73	IS 3025: Part – 11
2	E C	µS/cm	1790	1740	1750	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part - 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part 17
5	Chemical Oxygen Demand	mg/l	6	6	4	IS 3025: Part - 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2 B
8	Nitrate-Nitrogen as N	mg/l	4.97	4.74	4.97	APHA 4500 – NO_3 B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	4.97	4.74	4.97	APHA 4500 –N C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3 C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part 27
13	Fluoride as F	mg/l	0.70	0.70	0.70	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P D
16	Sodium Absorption Ratio (SAR)	-	3.92	3.62	3.68	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 - Norg. B
3	Total Ammonia (NH_4 / NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part - 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 B
19	Iron as Fe	mg/l	0.07	0.08	0.07	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.20	0.20	0.18	IS 3025: Part – 57

AMBIENT AIR MONITORING LOCATIONS PHOTOGRAPHS

1st Round

AAQ – 1.Shahi Exports Pvt. Ltd

AAQ 2.Krishna foods, Roop nagar

AAQ – 3.Sambhav Automobiles

AAQ 4.Mahadev Industries

AAQ – 5.Mohan Meakin Limited

AAQ – 6.Times of India

AAQ – 7.Siva Electronica (I) Pvt Ltd Rajendra nagar

AAQ - 8.Raijade corrugating industry, Prakash nagar

AAQ – 9.Unichem Laboratories Ltd,

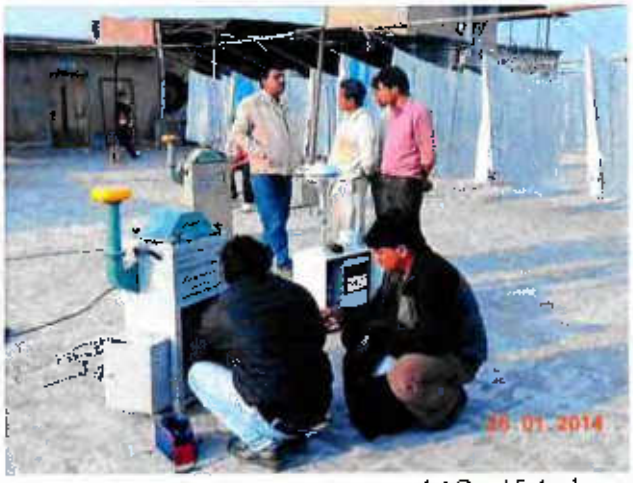
AAQ – 10.Eagle Continental, Dasna

AAQ – 11.Jindal pipes Ltd,

AAQ – 12.Sathe Engineering Co. Pvt. ltd.

AAQ 13.Aastha Medical Center, Kavi nagar

AAQ – 14.Sigma Enterprises, Pandav Nagar



AAQ – 15.Amko exports, Bulandshahr Road

AAQ – 16. Rathi Super Steels Limited, South side G. T. Road

SAMPLING LOCATION PHOTOGRAPHS OF SURFACE WATER

1st Round

SW – 1.Hindon River, Downstream, Near NH 24 Bridge (Shift: A)

SW – 1.Hindon River, Downstream, Near NH 24 Bridge (Shift: B)

SW 2: Hindon river, Downstream, Near Gaur city bridge (Shift: A)

SW - 2; Hindon river, Downstream, Near Gaur city bridge (Shift: B)

SW 3.Hindon river, Middle stream, Near Railway bridge, Near Mohan nagar (Shift: A)

SW - 3.Hindon river, Middle stream, Near Railway bridge, Near Mohan nagar (Shift: B)

SW 4.Hindon river, Upstream, Near Bridge at Karhera village (Shift: A)

SW – 4.Hindon river, Upstream, Near Bridge at Karhera village (Shift: B)

SW – 5.Gang nahar, Upstream, Near Murad nagar regulator bridge (Shift: A)

SW – 5.Gang nahar, Upstream, Near Murad nagar regulator bridge (Shift: B)

SW - 6.Gang nahar, Downstream, Near Masoori bridge, at NH-24 (Shift: A)

SW – 6.Gang nahar, Downstream, Near Masoori bridge, at NH-24 (Shift: B)

SW 7.Ganga river Upstream, before meeting nala, at Garhmukteswar (Shift: A)

SW – 7.Ganga river Upstream, before meeting nala, at Garhmukteswar (Shift: B)

SW – 8: Ganga river Middle stream, at Garhmukteswar Brijghat (Shift : A)

SW – 8: Ganga river Middle stream, at Garhmukteswar brijghat (Shift : B)

SW – 9: Ganga river Downstream, at Poonth village (Shift : A)

SW 9: Ganga river Downstream, at Poonth village (Shift: B)

SAMPLING LOCATION PHOTOGRAPHS OF GROUND WATER

1st Round

GW – 1: Shahi Exports Pvt. Ltd

GW – 2: Krishna foods, Roop nagar

GW – 3: Sambhav Automobiles

GW 4: Mahadev Industries

GW – 5: Mohan Meakin Limited

GW –6: Times of India

GW – 7: Shiva Electronics Pvt. Ltd., Rajendra nagar

GW – 8: National Engineering works, Prakash nagar

GW 9. Unichem Laboratories Ltd

GW – 10: Eagle Continental, Dasna

GW – 11: Jindal pipes Ltd, Jindal nagar

GW - 12: Sathe Engineering Co. Pvt. ltd.

GW – 13: Aastha Hospital, Kavi nagar

GW – 14: Signa Enterprises, Pandav Nagar

GW – 15: Amko exports, Bulandshahr Road

GW - 16: Rathi Super Steels Limited

AMBIENT AIR MONITORING LOCATIONS PHOTOGRAPHS

2nd Round

AAQ – 1.Shahi Exports Pvt. Ltd.

AAQ – 2.Krishna foods, Roop nagar

AAQ – 3.Sambhav Automobiles

AAQ – 4.Mahadev Industries

AAQ – 5.Mohan Meakin Limited

AAQ – 6.Times of India

AAQ 7.Siva Electronica (1) Pvt Ltd

AAQ 8.Raijade corrugating industry

AAQ - 9.Unichem Laboratories Ltd

AAQ – 10.Eagle Continental

AAQ – 11.Jindal pipes Ltd

AAQ – 12.Sathe Engineering Co. Pvt. Ltd

AAQ – 13.Aastha Medical Center

AAQ – 14. Sigma Enterprises

AAQ – 15.Amko exports

AAQ 16.Rathi Super Steels Limited

SAMPLING LOCATION PHOTOGRAPHS OF SURFACE WATER

2nd Round

SW – 1: Hindon river, Downstream, Near NH -24 Bridge (Shift: A)

SW – 1: Hindon river, Downstream, Near NH -24 Bridge (Shift: B)

SW – 2 : Hindon river, Downstream, Near Gaur city bridge (Shift : A)

SW 2: Hindon river, Downstream, Near Gaur city bridge (Shift: B)

SW – 3: Hindon river, Middle stream, Near Railway bridge, Near Mohan nagar (Shift: A)

SW – 3: Hindon river, Middle stream, Near Railway bridge, Near Mohan nagar (Shift: B)

SW – 4: Hindon river, Upstream, Near Bridge at Karhera village (Shift: A)

SW - 4: Hindon river, Upstream, Near Bridge at Karhera village (Shift: B)

SW – 5: Gang nahar, Upstream, Near Murad nagar regulator bridge (Shift: A)

SW – 5: Gang nahar, Upstream, Near Murad nagar regulator bridge (Shift: B)

SW – 6: Gang nahar, Downstream, Near Masoori bridge, at NH-24 (Shift: A)

SW – 6: Gang nahar, Downstream, Near Masoori bridge, at NH-24 (Shift: B)

SW – 7: Ganga river Upstream, before meeting nala, at Garhmukteswar (Shift: A)

SW – 7: Ganga river Upstream, before meeting nala, at Garhmukteswar (Shift: B)

SW – 8: Ganga river Middle stream, at Garhmukteswar brijghat (Shift : A)

SW – 8: Ganga river Middle stream, at Garhmukteswar brijghat (Shift : B)

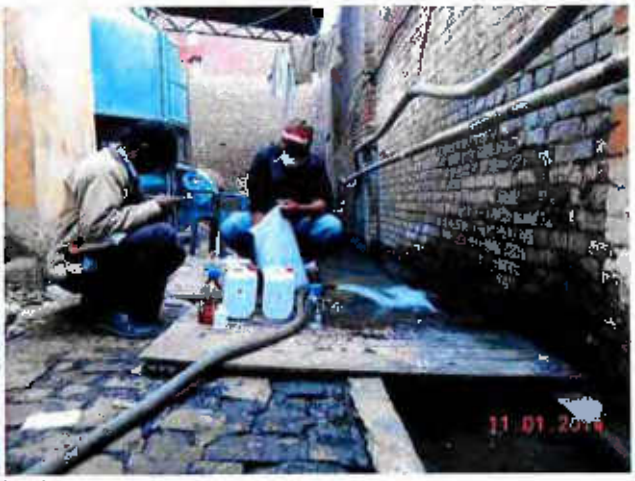
SW – 9: Ganga river Downstream, at Poonth village (Shift: A)

SW – 9: Ganga river Downstream, at Poonth village (Shift: B)

SAMPLING LOCATION PHOTOGRAPHS OF GROUND WATER

2nd Round

GW – 1: Shahi Exports Pvt. Ltd



GW – 2: Krishna foods, Roop nagar

GW – 3: Sambhav Automobiles

GW – 4: Mahadev Industries

GW – 5: Mohan Meakin Limited

GW – 6: Times of India

GW – 7: Shiva Electronics Pvt. Ltd., Rajendra nagar

GW - 8: National Engineering works, Prakash nagar

GW – 9. Unichem Laboratories Ltd

GW – 10: Eagle Continental, Dasna

GW – 11: Jindal pipes Ltd, Jindal nagar

GW – 12: Sathe Engineering Co. Pvt. Ltd

GW – 13: Aastha Hospital, Kavi nagar

GW – 14: Sigma Enterprises, Pandav Nagar

GW – 15: Amko exports, Bulandshahr Road

GW – 16: Rathi Super Steels Limited

AMBIENT AIR MONITORING LOCATIONS PHOTOGRAPHS

3rd Round

AAQ – 1.Shahi Exports Pvt. Ltd.

AAQ 2.Krishna foods, Roop nagar

AAQ – 3.Sambhav Automobiles

AAQ – 4.Mahadev Industries

AAQ – 5.Mohan Meakin Limited

AAQ – 6.Times of India

AAQ – 7.Siva Electronica (I) Pvt Ltd

AAQ – 8.Raijade corrugating industry

AAQ - 9. Albert David

AAQ – 10.Eagle Continental

AAQ – 11.Jindal pipes Ltd

AAQ – 12.Sathe Engineering Co. Pvt. ltd

AAQ – 13.Aastha Medical Center

AAQ – 14. Sigma Enterprises

AAQ 15.Amko exports

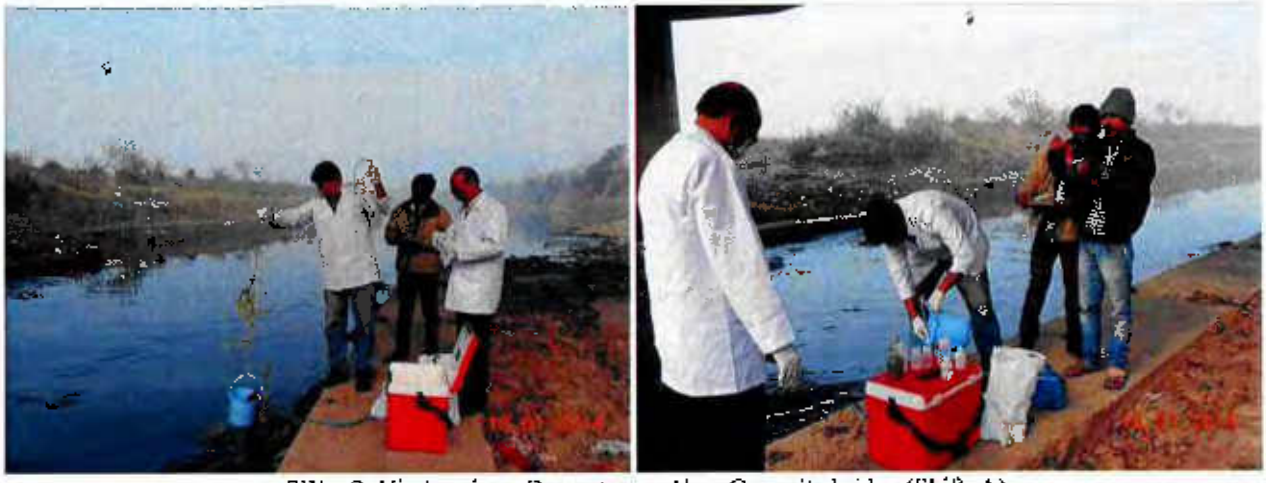
AAQ – 16.Rathi Super Steels Limited

SAMPLING LOCATION PHOTOGRAPHS OF SURFACE WATER

3rd Round

SW – 1: Hindon river, Downstream, Near NH -24 Bridge (Shift: A)

SW – 1: Hindon river, Downstream, Near NH -24 Bridge (Shift: B)



SW – 2: Hindon river, Downstream, Near Gaur city bridge (Shift: A)

SW – 2: Hindon river, Downstream, Near Gaur city bridge (Shift: B)

SW – 3: Hindon river, Middle stream, Near Railway bridge, Near Mohan nagar (Shift: A)

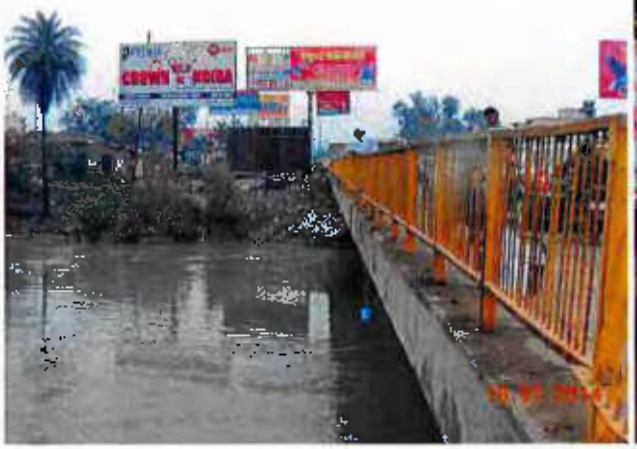
SW – 3: Hindon river, Middle stream, Near Railway bridge, Near Mohan nagar (Shift: B)

SW – 4: Hindon river, Upstream, Near Bridge at Karhera village (Shift: A)

SW – 4: Hindon river, Upstream, Near Bridge at Karhera village (Shift: B)

SW – 5: Gang nahar, Upstream, Near Murad nagar regulator bridge (Shift: A)

SW – 5: Gang nahar, Upstream, Near Murad nagar regulator bridge (Shift: B)



SW – 6: Gang nahar, Downstream, Near Masoori bridge, at NH-24 (Shift: A)

SW – 6: Gang nahar, Downstream, Near Masoori bridge, at NH-24 (Shift: B)

SW – 7: Ganga river Upstream, before meeting nala, at Garhmukteswar (Shift: A)

SW – 7: Ganga river Upstream, before meeting nala, at Garhmukteswar (Shift: B)

SW – 8: Ganga river Middle stream, at Garhmukteswar brijghat (Shift : A)

SW – 8: Ganga river Middle stream, at Garhmukteswar brijghat (Shift: B)

SW – 9: Ganga river Downstream, at Poonth village (Shift: A)

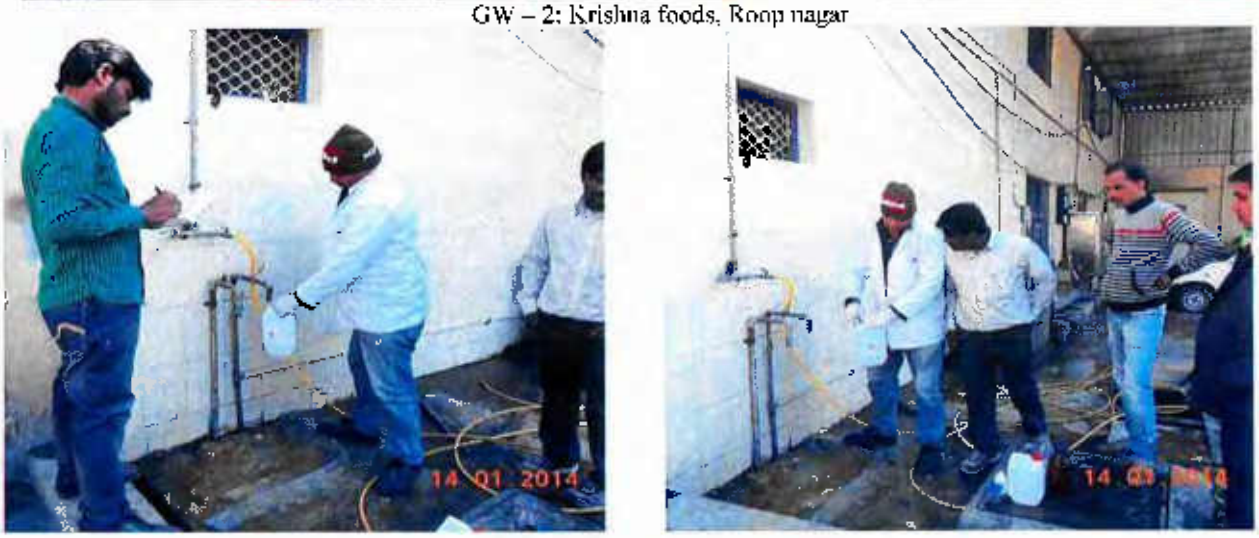
SW – 9: Ganga river Downstream, at Poonth village (Shift: B)

SAMPLING LOCATION PHOTOGRAPHS OF GROUND WATER

3rd Round

GW – 1: Shahi Exports Pvt. Ltd

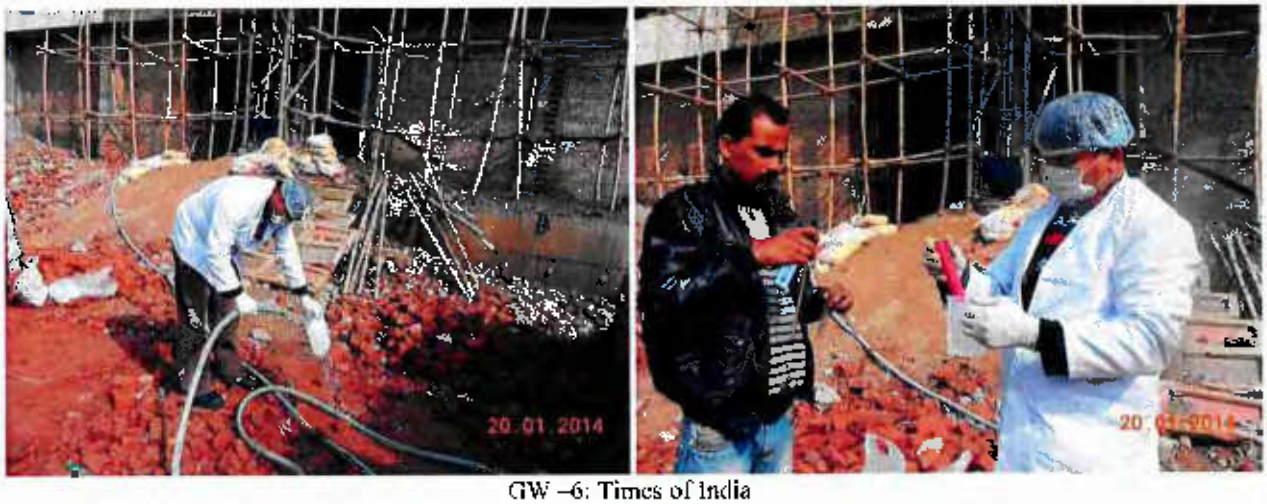
GW – 2: Krishna foods, Roop nagar



GW – 3: Sambhav Automobiles

GW 4: Mahadev Industries

GW – 5: Mohan Meakin Limited



GW –6: Times of India

GW 7: Shiva Electronics Pvt. Ltd., Rajendra nagar

GW 8: National Engineering works, Prakash nagar

GW – 9. Albert David

GW – 10: Eagle Continental, Dasna

GW – 11: Jindal pipes Ltd, Jindal nagar

GW – 12: Sathe Engineering Co. Pvt. Ltd

GW – 13: Aastha Hospital, Kavi nagar

GW – 14: Sigma Enterprises, Pandav Nagar

GW – 15: Amko exports, Bulandshahr Road

GW - 16: Rathi Super Steels Limited

MONITORING, SAMPLING AND ANALYSIS

of

AMBIENT AIR QUALITY, SURFACE WATER QUALITY AND GROUND WATER QUALITY

in

IDENTIFIED CRITICALLY POLLUTED AREA (CPAs)

INDORE

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME
INDORE – MADHYA PRADESH

AAQ MONITORING LOCATIONS

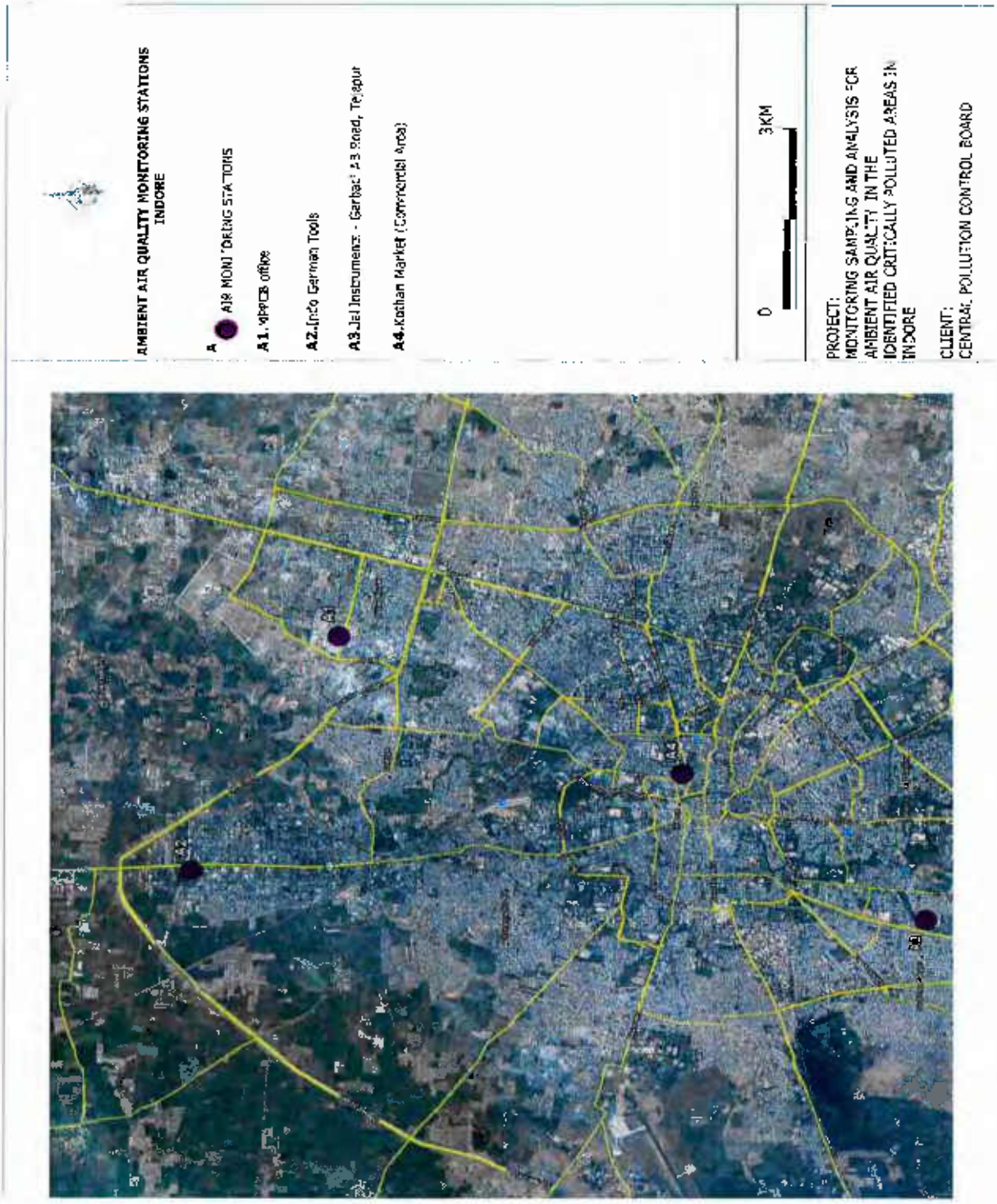
SAMPLE CODE	NAME OF THE MONITORING LOCATION	DATE OF SAMPLING	LATITUDE	LONGITUDE
AAQ – 1	MPPCB – RO office	1st Round: 08.01.2014 to 09.04.2014 2nd Round: 10.01.2014 to 11.01.2014 3rd Round: 12.01.2014 to 13.01.2014	N 22°45'44.3"	E 075°53'05.2"
AAQ 2	Indo German Tools	1st Round: 08.01.2014 to 09.04.2014 2nd Round: 10.01.2014 to 11.01.2014 3rd Round: 12.01.2014 to 13.01.2014	N 22°46'51.2"	E 075°50'49.1"
AAQ – 3	Jal Instruments, Tejapur Garbari Industrial Area	1st Round: 08.01.2014 to 09.04.2014 2nd Round: 10.01.2014 to 11.01.2014 3rd Round: 12.01.2014 to 13.01.2014	N 22°40'24.9"	E 075°3'55.7"
AAQ – 4	Kothari Market (Commercial Area)	1st Round: 08.01.2014 to 09.04.2014 2nd Round: 10.01.2014 to 11.01.2014 3rd Round: 12.01.2014 to 13.01.2014	N 22°43'09.4"	E 075°51'45.4"

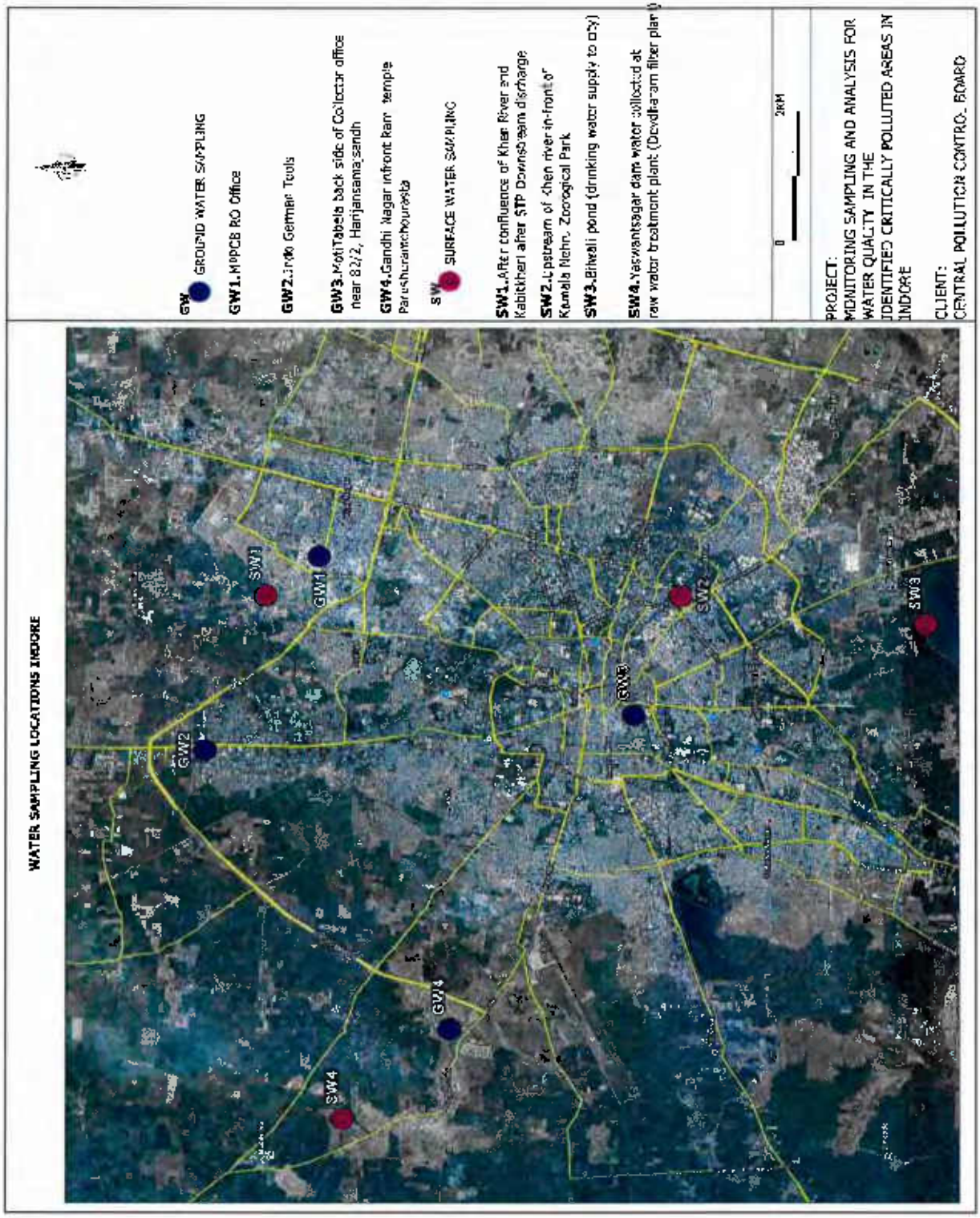
SURFACE WATER SAMPLING LOCATIONS

SAMPLE CODE	NAME OF THE SAMPLING LOCATION	DATE OF SAMPLING	LATITUDE	LONGITUDE
SW 1	After confluence of Khen River and Kabit kheri after STP Downstream discharge	1st Round: 09.01.2014 2nd Round:11.01.2014 3rd Round: 13.01.2014	N 22°46'15.9"	E 075°52'38.7"
SW – 2	Upstream of Khen river in-front of Kamala Nehru Park	1st Round: 09.01.2014 2nd Round:11.01.2014 3rd Round: 13.01.2014	N 22°42'12.9"	E 075°52'37.5"
SW – 3	Bilwali pond (drinking water supply to city)	1st Round: 09.01.2014 2nd Round:11.01.2014 3rd Round: 13.01.2014	N 22°39'49.9"	E 075°52'17.5"
SW – 4	Yaswant sagar dam water collected at raw water treatment plant (Devdharam filter plant)	1st Round: 09.01.2014 2nd Round:11.01.2014 3rd Round: 13.01.2014	N 22°45'30.6"	E 075°46'29.3"

GROUND WATER SAMPLING LOCATIONS

SAMPLE CODE	NAME OF THE SAMPLING LOCATION	DATE OF SAMPLING	LATITUDE	LONGITUDE
GW 1	MPPCB RO Office	1st Round: 09.01.2014 2nd Round:11.01.2014 3rd Round: 13.01.2014	N 22°45'44.3"	E 075°53'05.2"
GW – 2	Indo German Tools	1st Round: 09.01.2014 2nd Round:11.01.2014 3rd Round: 13.01.2014	N 22°46'51.2"	E 075°50'49.1"
GW – 3	Moti Tabela back side of Collector office near 82/2, Harijan samaj sandh	1st Round: 09.01.2014 2nd Round:11.01.2014 3rd Round: 13.01.2014	N 22°42'40.4"	E 075°51'13.7"
GW – 4	Gandhi Nagar infront Ram temple Parusburam chourasta	1st Round: 09.01.2014 2nd Round:11.01.2014 3rd Round: 13.01.2014	N 22°44'28.3"	E 075°47'32.4"


AMBIENT AIR QUALITY MONITORING STATIONS
INDORE
AIR MONITORING STATIONS
A1. MPPCB office
A2. Indo German Tools
A3. Jal Instruments - Garbad 23 Road, Tejpur
A4. Kothari Market (Commercial Area)
0
3KM
PROJECT:
MONITORING SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY IN THE IDENTIFIED CRITICALLY POLLUTED AREAS IN INDORE
CLIENT:
CENTRAL POLLUTION CONTROL BOARD


GW GROUND WATER SAMPLING
GW1. MPPCB RO Office
GW2. Info German Tools
GW3. MotiTabela back side of Collector office near 82/2, Harijansamajsandh
GW4. Gandhi Nagar infront Ram temple Paruchuranthourasta
SW SURFACE WATER SAMPLING
SW1. After confluence of Khan River and Kabitkheri after STP Downstream discharge
SW2. Upstream of Khan river in-front of Kamala Nehr. Zoological Park
SW3. Bilkali pond (drinking water supply to city)
SW4. Yaswantsagar dam water collected at raw water treatment plant (Devdikaram filter plant)
0
2KM
PROJECT:
MONITORING SAMPLING AND ANALYSIS FOR WATER QUALITY IN THE IDENTIFIED CRITICALLY POLLUTED AREAS IN INDORE
CLIENT:
CENTRAL POLLUTION CONTROL BOARD
WATER SAMPLING LOCATIONS INDORE
SW1
GW1
GW2
SW2
GW3
SW3
GW4
SW4

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

INDORE – MADHYA PRADESH

AMBIENT AIR QUALITY MONITORING

S.No.	Pollutants	AAQ – 1 MPPCB R.O office Indore			AAQ – 2 Indo German Tools			NAAQ Standards (2009)
		1st Round	2nd Round	3rd Round	1st Round	2nd Round	3rd Round	
		08.01.2014	10.01.2014	12.01.2014	08.01.2014	10.01.2014	12.01.2014	
I.	**Particulate Pollutants**							
1	PM_{10} (µg/m^3)	72	95	81	91	83	112	**100 (µg/m^3)**
2	$PM_{2.5}$ µg/m^3)	28	37	32	37	33	44	**60 (µg/m^3)**
3	Arsenic (ng/m^3)	1.6	2.3	1.5	2.1	1.3	1.7	**06 (ng/m^3) (Annual)**
4	Nickel (ng/m^3)	2.8	4.2	5.1	2.7	1.8	2.2	**20 (ng/m^3) (Annual)**
5	Lead (µg/m^3)	0.10	0.06	0.09	0.13	0.09	0.10	**1.0(µg/m^3) (24 hours)**
6	Benzo (a) Pyrene (ng/m^3)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**01 (ng/m^3) (Annual)**
II.	**Gaseous Pollutants**							
7	SO_2 (µg/m^3)	9.7	11.2	13.1	11.8	14.4	12.9	**80 (µg/m^3) (24 hours)**
8	NO_X (µg/m^3)	19.3	17.8	20.4	23.4	20.1	19.2	**80 (µg/m^3) (24 hours)**
9	NH_3 (µg/m^3)	10.8	12.3	18.1	9.8	12.9	10.7	**400 (µg/m^3) (24 hours)**
10	O_3 (µg/m^3)	8.2	10.5	7.8	11.2	9.4	7.8	**100 (8 hours) & 180 (µg/m^3) (1 hour)**
		15.5	20.2	17.6	15.7	19.2	14.4	
		4.1	5.7	3.9	5.2	3.8	3.1	
11	CO (mg/m^3)	< 2	< 2	< 2	< 2	< 2	< 2	**02 (8 hours) & 04 mg/m^3 (1 hour)**
		< 2	< 2	< 2	< 2	< 2	< 2	
		< 2	< 2	< 2	< 2	< 2	< 2	
12	Benzene (µg/m^3)	< 3	< 3	< 3	< 3	< 3	< 3	**05 (µg/m^3) (Annual)**

AMBIENT AIR QUALITY MONITORING RESULTS

S.No.	Pollutants	AAQ – 3 Jal Instruments, Tejapur Garbari Industrial Area			AAQ – 4 Kothari Market			NAAQ Standards (2009)
		1st Round	2nd Round	3rd Round	1st Round	2nd Round	3rd Round	
		08.01.2014	10.01.2014	12.01.2014	08.01.2014	10.01.2014	12.01.2014	
I.	**Particulate Pollutants**							
1	PM_{10} ($\mu g/m^3$)	74	87	91	142	129	135	100 ($\mu g/m^3$)
2	$PM_{2.5}$ $\mu g/m^3$)	27	44	36	53	34	49	60 ($\mu g/m^3$)
3	Arsenic (ng/m^3)	1.7	1.1	2.0	2.7	1.9	3.5	06 (ng/m^3) (Annual)
4	Nickel (ng/m^3)	2.6	3.7	4.1	3.8	2.9	4.7	20 (ng/m^3) (Annual)
5	Lead ($\mu g/m^3$)	0.14	0.11	0.10	0.21	0.17	0.20	1.0($\mu g/m^3$) (24 hours)
6	Benzo (a) Pyrene (ng/m^3)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	01 (ng/m^3) (Annual)
II.	**Gaseous Pollutants**							
7	SO_2 ($\mu g/m^3$)	10.7	13.3	11.5	14.9	17.2	13.7	80 ($\mu g/m^3$) (24 hours)
8	NO_X ($\mu g/m^3$)	19.8	21.5	25.6	25.5	31.4	19.8	80 ($\mu g/m^3$) (24 hours)
9	NH_3 ($\mu g/m^3$)	15.8	17.9	16.4	13.8	16.6	14.7	400 ($\mu g/m^3$) (24 hours)
10	O_3 ($\mu g/m^3$)	13.6	12.7	9.8	11.4	9.5	7.9	100 (8 hours) & 180 ($\mu g/m^3$) (1 hour)
		16.2	17.8	20.1	18.1	20.6	13.8	
		5.9	3.6	6.4	5.7	4.4	2.9	
11	CO (mg/m^3)	< 2	< 2	< 2	< 2	< 2	< 2	02 (8 hours) & 04 mg/m^3 (1 hour)
		< 2	< 2	< 2	< 2	< 2	< 2	
		< 2	< 2	< 2	< 2	< 2	< 2	
12	Benzene ($\mu g/m^3$)	< 3	< 3	< 3	4.2	< 3	3.7	05 ($\mu g/m^3$) (Annual)

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

INDORE – MADHYA PRADESH

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 1: After confluence of Khan River and Kabit kheri after STP Downstream discharge			Test Method
			1st Round 09.01.2014	2nd Round 11.01.2014	3rd Round 13.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Pale Yellow	Pale Yellow	Pale Yellow	-
2	Colour (Hazen Units)	-	15	20	15	IS 3025: Part 4
3	Odour (Smell)	-	Un agreeable	Un agreeable	Un agreeable	IS 3025: Part 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.55	7.74	7.93	IS 3025: Part – 11
2	E C	µS/cm	1290	1270	1310	IS 3025: Part - 14
3	Oil & Grease	mg/l	2	2	2	IS 3025: Part 39
4	Suspended Solids	mg/l	42	34	38	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	2.8	2.9	2.6	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	60	54	68	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	15	14	18	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	0.02	0.02	0.02	APHA 4500 NO_2.B
9	Nitrate-Nitrogen as N	mg/l	1.58	1.47	1.58	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	1.60	1.49	1.60	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.4	0.4	0.5	IS 3025: Part - 60
15	Sulphides as S	mg/l	0.2	0.3	0.2	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	2.1	2.4	1.8	APHA 4500 P.D
17	Sodium Absorption Ratio (SAR)	-	4.21	4.05	4.46	By Calculation
18	Total Coliforms	MPN/100ml	350	550	900	IS 1622
19	Fecal Coliforms	MPN/100ml	110	130	140	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	2.8	3.3	2.2	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	11	10	12	APHA 4500 - Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	6.2	5.6	7.0	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.03	0.05	0.04	IS 3025: Part 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.12	0.14	0.10	APHA 3111 – B
19	Iron as Fe	mg/l	0.15	0.18	0.20	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.14	0.16	0.17	IS 3025: Part 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

INDORE – MADHYA PRADESH

Sl. No.	Test Parameters	UOM	SW – 2: Upstream of Khan river in-front of Kamala Nehru Park			Test Method
			1st Round 09.01.2014	2nd Round 11.01.2014	3rd Round 13.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Greyish	Greyish	Greyish	-
2	Colour (Hazen Units)	-	40	40	35	IS 3025: Part – 4
3	Odour (Smell)	-	Un agreeable	Un agreeable	Un agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.25	7.36	7.61	IS 3025: Part – 11
2	E C	µS/cm	1410	1440	1450	IS 3025: Part 14
3	Oil & Grease	mg/l	4	5	4	IS 3025: Part – 39
4	Suspended Solids	mg/l	64	78	72	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	< 1	< 1	< 1	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	234	280	246	IS 3025: Part 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	60	72	64	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	0.05	0.05	0.04	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	1.81	2.03	2.03	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	1.86	2.08	2.07	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part 27
14	Fluoride as F	mg/l	0.5	0.6	0.6	IS 3025: Part – 60
15	Sulphides as S	mg/l	1.2	1.6	1.4	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	2.2	2.1	2.4	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	3.48	3.41	2.96	By Calculation
18	Total Coliforms	MPN/100ml	1400	1700	1400	IS 1622
19	Fecal Coliforms	MPN/100ml	140	210	170	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	2.9	2.8	2.9	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	20	26	22	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	13	18	15	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.04	0.06	0.05	IS 3025: Part 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.20	0.24	0.18	APHA 3111 – B
19	Iron as Fe	mg/l	0.9	1.1	1.0	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.14	0.16	0.16	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

INDORE – MADHYA PRADESH

Sl. No.	Test Parameters	UOM	SW – 3: Bilwali pond (drinking water supply to city)			Test Method
			1st Round 09.01.2014	2nd Round 11.01.2014	3rd Round 13.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	5	5	5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part 5
II	**Regular Monitoring Parameters**					
1	pH	-	8.10	8.05	7.94	IS 3025: Part – 11
2	E C	µS/cm	359	394	367	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	14	12	14	IS 3025: Part 17
5	Dissolved Oxygen	mg/l	6.5	6.8	6.9	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	18	22	16	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	3	4	3	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	0.01	0.01	0.02	APHA 4500 – NO_3.B
9	Nitrate-Nitrogen as N	mg/l	1.35	1.24	1.81	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2, NO_3)	mg/l	1.36	1.25	1.83	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.4	0.3	0.4	IS 3025: Part – 60
15	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	0.10	0.10	0.14	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	0.85	0.94	0.90	By Calculation
18	Total Coliforms	MPN/100ml	26	17	21	IS 1622
19	Fecal Coliforms	MPN/100ml	4	2	4	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	0.15	0.15	0.20	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr6	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.01	0.01	0.01	APHA 3111 B
19	Iron as Fe	mg/l	0.08	0.09	0.07	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

INDORE – MADHYA PRADESH

Sl. No.	Test Parameters	UOM	SW – 4: Yaswant sagar dam water collected at raw water treatment plant (Devdharam filter plant)			Test Method
			1st Round 09.01.2014	2nd Round 11.01.2014	3rd Round 13.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	8.12	8.01	7.96	IS 3025: Part – 11
2	E C	µS/cm	580	598	610	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	16	12	14	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	5.4	5.6	5.9	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	12	14	12	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	3	3	3	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	0.01	0.01	0.01	APHA 4500 - NO_2.B
9	Nitrate-Nitrogen as N	mg/l	0.90	0.90	1.02	APHA 4500 NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2 + NO_3)	mg/l	0.91	0.91	1.03	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.5	0.5	0.5	IS 3025: Part – 60
15	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part - 29
16	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 P.D
17	Sodium Absorption Ratio (SAR)	-	1.69	1.73	1.84	By Calculation
18	Total Coliforms	MPN/100ml	21	34	26	IS 1622
19	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4 / NH_3)- Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.03	0.02	0.04	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.01	0.01	0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.09	0.07	0.07	IS 3025: Part 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

INDORE – MADHYA PRADESH

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW-1: MPPCB RO Office			Test Method
			1st Round 09.01.2014	2nd Round 11.01.2014	3rd Round 13.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part - 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.98	7.84	7.86	IS 3025: Part – 11
2	E C	µS/cm	1020	1000	990	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	4	4	4	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	2.62	2.71	2.48	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	2.62	2.71	2.48	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part 27
13	Fluoride as F	mg/l	0.6	0.6	0.6	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	3.30	3.41	3.20	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 B
19	Iron as Fe	mg/l	0.08	0.07	0.07	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 56
22	Boron as B	mg/l	0.10	0.11	0.10	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE - I PROGRAMME

INDORE – MADHYA PRADESH

Sl. No.	Test Parameters	UOM	GW-2: Indo German Tools			Test Method
			1st Round 09.01.2014	2nd Round 11.01.2014	3rd Round 13.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.46	7.52	7.40	IS 3025: Part 11
2	E C	µS/cm	2580	2590	2500	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	6	6	4	IS 3025: Part 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	14.0	13.55	13.74	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	14.0	13.55	13.74	APHA 4500 - N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.5	0.5	0.5	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	2.83	2.75	2.92	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.09	0.08	0.09	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.18	0.20	0.17	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

INDORE – MADHYA PRADESH

Sl. No.	Test Parameters	UOM	GW-3: Moti Tabela back side of Collector office near 82/2, Harijan samaj sandh			Test Method
			1st Round 09.01.2014	2nd Round 11.01.2014	3rd Round 13.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part - 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part - 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.49	7.51	7.62	IS 3025: Part - 11
2	E C	µS/cm	1980	1950	1960	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	6	4	6	IS 3025: Part - 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	0.02	0.02	0.02	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	17.5	18.1	17.84	APHA 4500 - NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	17.52	18.12	17.86	APHA 4500 N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part - 27
13	Fluoride as F	mg/l	0.5	0.5	0.5	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	2.68	2.56	2.61	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4 NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 - B
19	Iron as Fe	mg/l	0.09	0.09	0.09	IS 3025: Part 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.16	0.18	0.18	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

INDORE – MADHYA PRADESH

Sl. No.	Test Parameters	UOM	GW-4: Gandhi Nagar in-front of Ram Mandir - Parushuram chourasta			Test Method
			1st Round 09.01.2014	2nd Round 11.01.2014	3rd Round 13.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.76	7.82	7.88	IS 3025: Part – 11
2	E C	µS/cm	940	970	960	IS 3025: Part - 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	4	4	4	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 NO_2.B
8	Nitrate-Nitrogen as N	mg/l	5.19	4.97	5.42	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2–NO_3)	mg/l	5.19	4.98	5.42	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.6	0.6	0.6	IS 3025: Part 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	0.96	0.92	0.98	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 B
19	Iron as Fe	mg/l	0.07	0.08	0.07	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 56
22	Boron as B	mg/l	0.10	0.11	0.12	IS 3025: Part – 57

AMBIENT AIR MONITORING LOCATIONS PHOTOGRAPHS

1st Round: 08.01.2014 & 09.01.2014

AAQ – 1: MPPCB Regional office

AAQ – 2: M/s. Indo – German Tools (near production block)

AAQ – 3: M/s. Jal Instruments – AB Road Garbari Industrial Area, Tejapur

AAQ – 4: Kothari Market (Commercial Area)

SAMPLING LOCATION PHOTOGRAPHS OF SURFACEWATER

SW – 1: Confluence Point of Khen River and Kabit River near STP outlet discharge point

SW – 2: Upstream of Khen river in-front of Kamala Nehru Park

SW – 3: Bilwadi Pond (near intake point for drinking water supply to the city)

SW – 4: Yaswant sagar dam water collected at raw water treatment plant near (Devdharam filter plant)

SAMPLING LOCATION PHOTOGRAPHS OF GROUNDWATER

GW – 1: MPPCB Regional office

GW 2: Indo German Tools (near Production block)

GW 3: Moti Tabela back side of collector office near harijan samaj sandh

GW- 4: Gandhinagar in-front of ram mandir at parushuram chourahi

AMBIENT AIR MONITORING LOCATIONS PHOTOGRAPHS

2nd Round: 10.01.2014 & 11.01.2014

AAQ – 1: MPPCB – Regional office

AAQ – 2: M/s. Indo German Tools (near production block)

AAQ – 3: M/s. Jal Instruments – AB Road Garbari Industrial Area, Tejapur

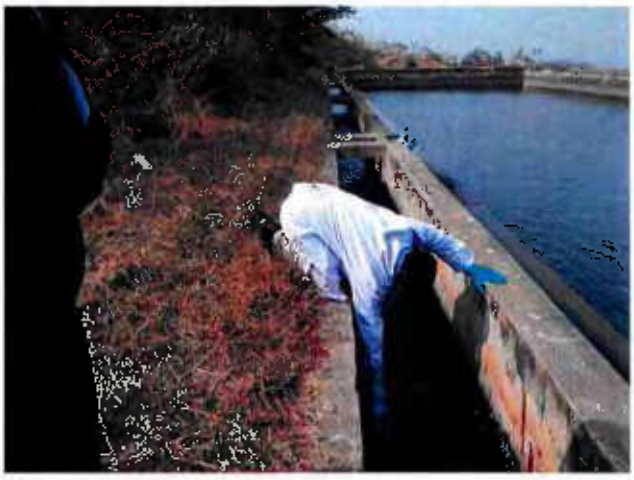
AAQ – 4: Kothari Market (Commercial Area)

SAMPLING LOCATION PHOTOGRAPHS OF SURFACEWATER

SW – 1: Confluence Point of Khen River and Kabit River near STP outlet discharge point

SW – 2: Upstream of Khen river in-front of Kamala Nehru Park

SW – 3: Bilwadi Pond (near intake point for drinking water supply to the city)

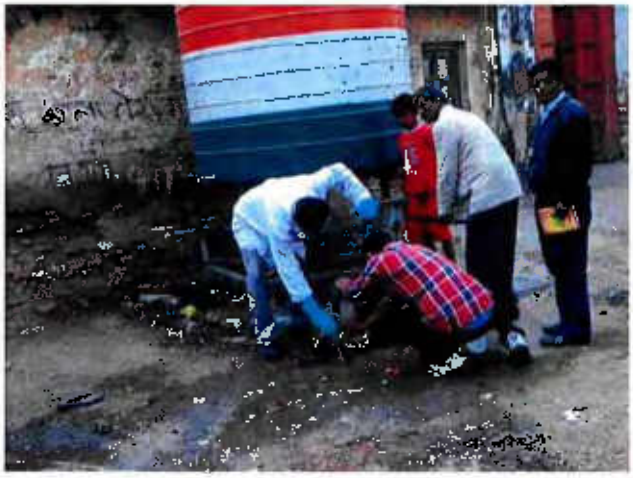


SW – 4: Yaswant sagar dam water collected at raw water treatment plant near (Devdharam filter plant)

SAMPLING LOCATION PHOTOGRAPHS OF GROUNDWATER

GW – 1: MPPCB Regional office

GW – 2: Indo German Tools (near Production block)



GW – 3: Moti Tabela back side of collector office near harijan samaj sandh

GW- 4: Gandhinagar in-front of ram mandir at parushuram chourahi

AMBIENT AIR MONITORING LOCATIONS PHOTOGRAPHS

3rd Round: 12.01.2014 & 13.01.2014

AAQ – 1: MPPCB – Regional office

AAQ – 2: M/s. Indo – German Tools (near production block)

AAQ – 3: M/s. Jal Instruments – AB Road Garbari Industrial Area, Tejapur

AAQ – 4: Kothari Market (Commercial Area)

SAMPLING LOCATION PHOTOGRAPHS OF SURFACEWATER

SW – 1: Confluence Point of Khen River and Kabit River near STP outlet discharge point

SW – 2: Upstream of Khen river in-front of Kamala Nehru Park

SW – 3: Bilwadi Pond (near intake point for drinking water supply to the city)

SW – 4: Yaswant sagar dam water collected at raw water treatment plant near (Devdharam filter plant)

SAMPLING LOCATION PHOTOGRAPHS OF GROUNDWATER

GW – 1: MPPCB Regional office

GW – 2: Indo – German Tools (near Production block)

GW – 3: Moti Tabela back side of collector office near harijan samaj sandh

GW- 4: Gandhinagar in-front of ram mandir at parushuram chourahi

MONITORING, SAMPLING AND ANALYSIS

of

AMBIENT AIR QUALITY, SURFACE WATER QUALITY AND GROUND WATER QUALITY

in

IDENTIFIED CRITICALLY POLLUTED AREA (CPAs)

JHARSUGUDA

AAQ MONITORING LOCATIONS

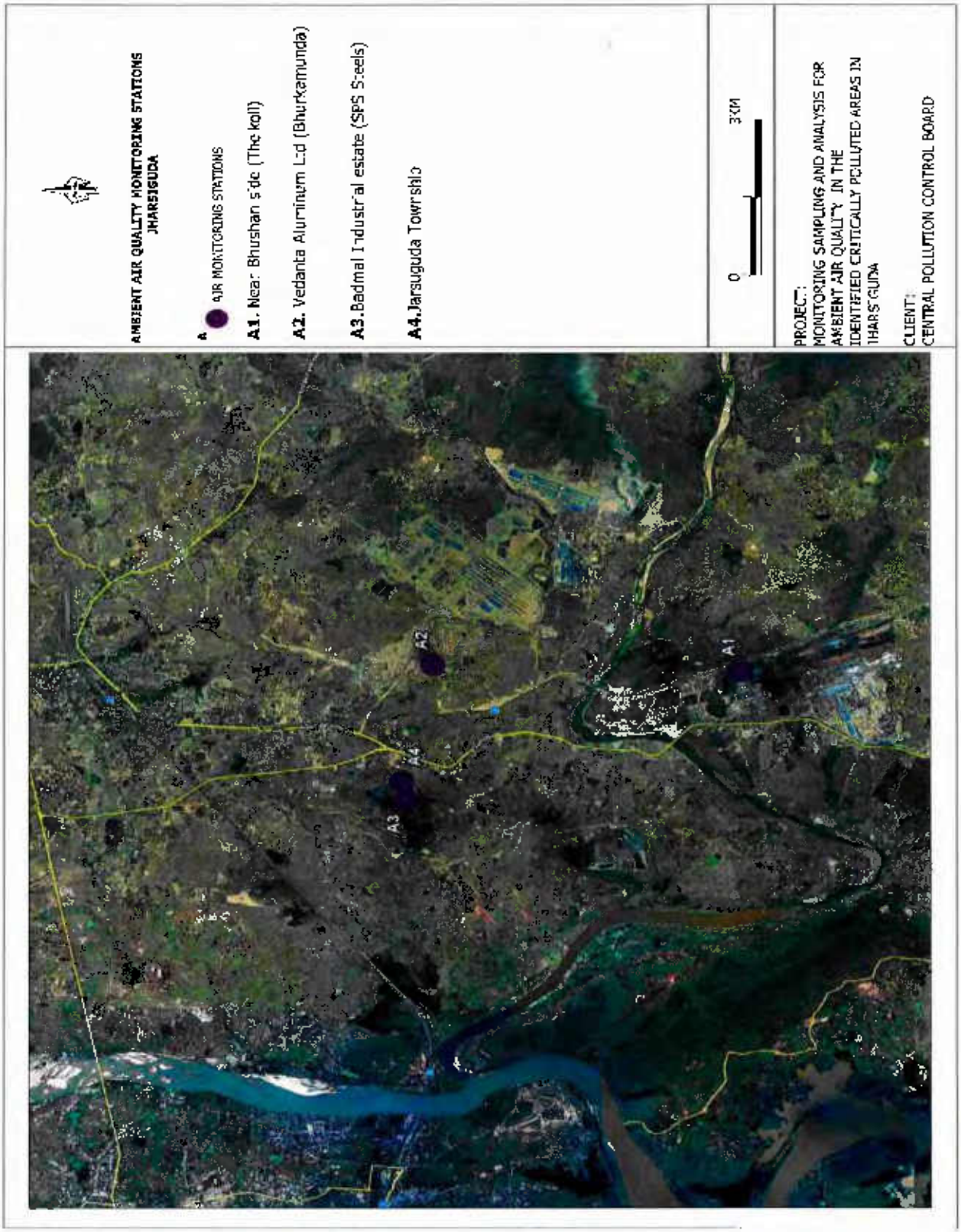
SAMPLE CODE	NAME OF THE MONITORING LOCATION	DATE OF SAMPLING	LATITUDE	LONGITUDE
AAQ – 1	Near Bhushan side (Thelkoli)	1st Round: 11.04.2014 to 12.04.2014 2nd Round: 13.04.2014 to 14.04.2014 3rd Round: 15.04.2014 to 16.04.2014	N 20°50.359'	E 85°05.940'
AAQ 2	Vedanta Aluminum Ltd (Bhurkamunda)	1st Round: 12.04.2014 to 13.04.2014 2nd Round: 14.04.2014 to 15.04.2014 3rd Round: 16.04.2014 to 17.04.2014	N 21°48.935'	E 84°01.467'
AAQ – 3	Badmal Industrial estate (SPS Steels)	1st Round: 12.04.2014 to 13.04.2014 2nd Round: 14.04.2014 to 15.04.2014 3rd Round: 16.04.2014 to 17.04.2014	N 21°49.179'	E 83°59.970'
AAQ – 4	Jarsuguda Township	1st Round: 11.04.2014 to 12.04.2014 2nd Round: 13.04.2014 to 14.04.2014 3rd Round: 15.04.2014 to 16.04.2014	N 21°49.211'	E 84°00.173'

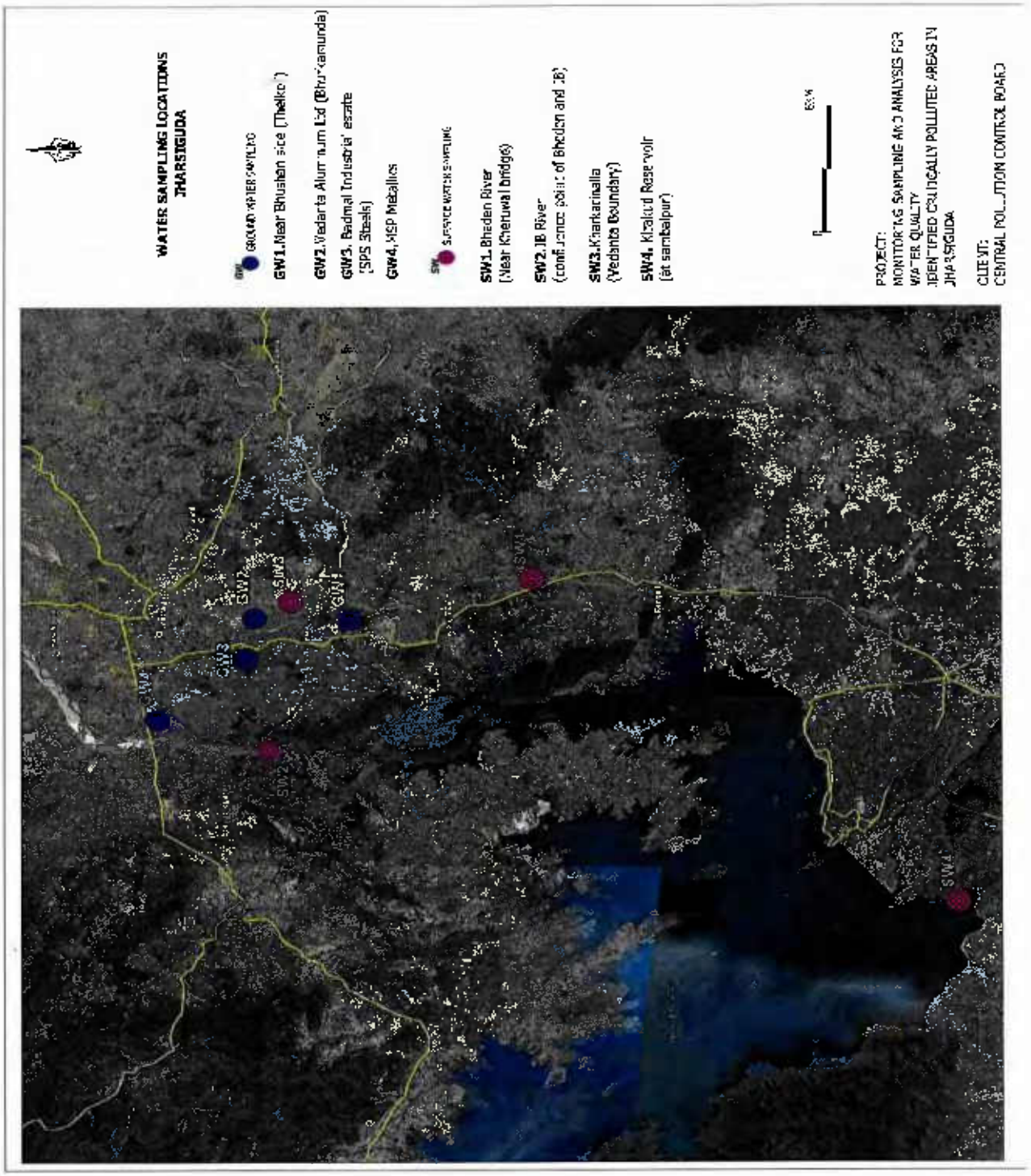
GROUND WATER SAMPLING LOCATIONS

SAMPLE CODE	NAME OF THE SAMPLING LOCATION	DATE OF SAMPLING	LATITUDE	LONGITUDE
GW – 1	Near Bhushan side (Thelkoli)	1st Round: 12.04.2014 2nd Round:14.04.2014 3rd Round: 16.04.2014	N 20°50.360'	E 85°05.936'
GW – 2	Vedanta Aluminum Ltd (Bhurkamunda)	1st Round: 12.04.2014 2nd Round:14.04.2014 3rd Round: 16.04.2014	N 21°48.935'	E 84°01.467'
GW – 3	Badmal Industrial estate (SPS Steels)	1st Round: 12.04.2014 2nd Round:14.04.2014 3rd Round: 16.04.2014	N 21°49.180'	E 83°59.820'
GW 4	MSP Metallics	1st Round: 12.04.2014 2nd Round:14.04.2014 3rd Round: 16.04.2014	N 21°51.660'	E 83°57.768'

SURFACE WATER SAMPLING LOCATIONS

SAMPLE CODE	NAME OF THE SAMPLING LOCATION	DATE OF SAMPLING	LATITUDE	LONGITUDE
SW – 1	Bheden River (Near Kheruwal bridge)	1st Round: 12.04.2014 2nd Round:14.04.2014 3rd Round: 16.04.2014	N 21°41.516'	E 84°2.920'
SW – 2	IB River (confluence point of Bheden and IB)	1st Round: 12.04.2014 2nd Round:14.04.2014 3rd Round: 16.04.2014	N 21°48.492'	E 83°56.645'
SW – 3	Kharkari nalla (Vedanta Boundary)	1st Round: 12.04.2014 2nd Round:14.04.2014 3rd Round: 16.04.2014	N 21°47.916'	E 84°2.076'
SW 4	Kirakud Reservoir (at sambalpur)	1st Round: 11.04.2014 2nd Round:13.04.2014 3rd Round: 15.04.2014	N 21°29.250'	E 83°51.016'


AMBIENT AIR QUALITY MONITORING STATIONS
JHARSUGUDA
AIR MONITORING STATIONS
A1. Near Bhushan side (The koll)
A2. Vedanta Aluminium Ltd (Bhurkamunda)
A3.Badmal Industrial estate (SPS Steels)
A4.Jarsuguda Townships
0
3KM
PROJECT:
MONITORING SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY IN THE IDENTIFIED CRITICALLY POLLUTED AREAS IN JHARSUGUDA
CLIENT:
CENTRAL POLLUTION CONTROL BOARD
A1
A2
A3
A4


WATER SAMPLING LOCATIONS
JHARSUGUDA
GW1.Near Bhushan site (Thelkoi)
GW2.Vedanta Alum num Ltd (Bhurkamunda)
GW3. Badmal Industrial estate
(SPS Steels)
GW4. MSP Metallics
SW1. Bhaden River
(Near Kherunwal bridge)
SW2. JB River
(confluence point of Bhaden and JB)
SW3.Kharkarinalla
(Vedanta Boundary)
SW4. Kirakud Reservoir
(at sambalpur)
PROJECT:
MONITORING SAMPLING AND ANALYSIS FOR WATER QUALITY
IDENTIFIED CRITICALLY POLLUTED AREAS IN JHARSUGUDA
CLIENT:
CENTRAL POLLUTION CONTROL BOARD

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

JHARSUGUDA - ODISHA

AMBIENT AIR QUALITY MONITORING

S.No.	Pollutants	AAQ – 1 Near Bhushan side (Thelkoli)			AAQ – 2 Vedanta Aluminum Ltd (Bhurkamunda)			NAAQ Standards (2009)
		1st Round	2nd Round	3rd Round	1st Round	2nd Round	3rd Round	
		11.04.2014	13.04.2014	15.04.2014	12.04.2014	14.04.2014	16.04.2014	
I.	**Particulate Pollutants**							
1.	PM_{10} ($\mu g/m^3$)	232	218	256	114	148	123	**100 ($\mu g/m^3$)**
2	$PM_{2.5}$ ($\mu g/m^3$)	54	62	53	42	53	44	**60 ($\mu g/m^3$)**
3	Arsenic (ng/m^3)	2.1	2.8	1.9	1.4	1.8	1.3	**06 (ng/m^3) (Annual)**
4	Nickel (ng/m^3)	6.8	8.1	5.3	6.2	5.9	4.6	**20 (ng/m^3) (Annual)**
5	Lead ($\mu g/m^3$)	0.18	0.15	0.11	0.13	0.16	0.19	**1.0($\mu g/m^3$) (24 hours)**
6	Benzo (a) Pyrene (ng/m^3)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**01 (ng/m^3) (Annual)**
II.	**Gaseous Pollutants**							
7	SO_2 ($\mu g/m^3$)	17.2	15.6	18.6	13.3	12.8	12.9	**80 ($\mu g/m^3$) (24 hours)**
8	NO_X ($\mu g/m^3$)	29.3	34.6	27.6	29.8	32.6	30.5	**80 ($\mu g/m^3$) (24 hours)**
9	NH_3 ($\mu g/m^3$)	28	34	25	18	26	22	**400 ($\mu g/m^3$) (24 hours)**
10	O_3 ($\mu g/m^3$)	8.2	7.7	6.2	5.3	5.9	5.2	**100 (8 hours) & 180 ($\mu g/m^3$) (1 hour)**
		18.4	16.9	17.3	10.8	11.6	9.4	
		6.1	6.6	6.8	5.1	5.4	5.9	
11	CO (mg/m^3)	< 2	< 2	< 2	< 2	< 2	< 2	**02 (8 hours) & 04 mg/m^3 (1 hour)**
		< 2	< 2	< 2	< 2	< 2	< 2	
		< 2	< 2	< 2	< 2	< 2	< 2	
12	Benzene ($\mu g/m^3$)	< 3	< 3	< 3	< 3	< 3	< 3	**5 ($\mu g/m^3$) (Annual)**

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME
JHARSUGUDA - ODISHA

AMBIENT AIR QUALITY MONITORING

S.No.	Pollutants	AAQ – 3 Badmal Industrial estate (SPS Steels)			AAQ – 4 Jarsuguda Township			NAAQ Standards (2009)
		1st Round	2nd Round	3rd Round	1st Round	2nd Round	3rd Round	
		12.04.2014	14.04.2014	16.04.2014	11.04.2014	13.04.2014	15.04.2014	
I.	**Particulate Pollutants**							
1.	PM_{10} (µg/m^3)	142	128	106	84	79	76	**100 (µg/m^3)**
2	$PM_{2.5}$ (µg/m^3)	32	39	48	29	36	32	**60 (µg/m^3)**
3	Arsenic (ng/m^3)	2.9	2.4	3.8	< 1	< 1	< 1	**06 (ng/m^3) (Annual)**
4	Nickel (ng/m^3)	5.2	6.8	7.4	2.8	3.7	5.2	**20 (ng/m^3) (Annual)**
5	Lead (µg/m^3)	0.19	0.23	0.15	0.04	0.07	0.06	**1.0(µg/m^3) (24 hours)**
6	Benzo (a) Pyrene (ng/m^3)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**01 (ng/m^3) (Annual)**
II.	**Gaseous Pollutants**							
7	SO_2 (µg/m^3)	15.5	17.3	14.9	10.9	9.7	10.2	**80 (µg/m^3) (24 hours)**
8	NO_x (µg/m^3)	26.0	29.4	31.2	25.8	22.3	24.9	**80 (µg/m^3) (24 hours)**
9	NH_3 (µg/m^3)	32.0	30.0	26.0	18.0	22.0	15.0	**400 (µg/m^3) (24 hours)**
10	O_3 (µg/m^3)	7.5	9.4	8.8	5.3	5.8	5.5	**100 (8 hours) & 180 (µg/m^3) (1 hour)**
		16.2	18.6	15.4	10.8	10.6	9.4	
		6.4	6.1	5.3	5.9	5.2	6.3	
11	CO (mg/m^3)	< 2	< 2	< 2	< 2	< 2	< 2	**02 (8 hours) & 04 mg/m^3 (1 hour)**
		< 2	< 2	< 2	< 2	< 2	< 2	
		< 2	< 2	< 2	< 2	< 2	< 2	
12	Benzene (µg/m^3)	< 3	< 3	< 3	< 3	< 3	< 3	**5 (µg/m^3) (Annual)**

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

JHARSUGUDA - ODISHA

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 1; Bheden River (Near Kheruwal bridge)			Test Method
			1st Round 12.04.2014	2nd Round 14.04.2014	3rd Round 16.04.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	5	5	5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	8.14	7.92	8.12	IS 3025: Part – 11
2	E C	µS/cm	370	406	364	IS 3025: Part - 14
3	Oil & Grease	mg/l	1	1	1	IS 3025: Part 39
4	Suspended Solids	mg/l	16	14	16	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	6.1	5.8	6.0	IS 3025: Part - 38
6	Chemical Oxygen Demand	mg/l	32	28	36	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	7	6	7	IS 3025: Part - 44
8	Nitrite-Nitrogen as N	mg/l	0.01	0.01	0.01	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	0.45	0.45	0.56	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2 NO_3)	mg/l	0.46	0.46	0.57	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.40	0.40	0.40	IS 3025: Part – 60
15	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 29
16	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 - P.D
17	Sodium Absorption Ratio (SAR)	-	0.92	0.95	0.87	By Calculation
18	Total Coliforms	MPN/100ml	17	21	22	IS 1622
19	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	2.0	1.7	1.4	APHA 4500 – Norg. B
3	Total Ammonia (NH_4–NH_3)-Nitrogen	mg/l	1.3	1.1	1.0	APHA 4500 NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.10	0.09	0.09	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 57

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 2; IB River (Confluence point of Bheden and IB)			Test Method
			1st Round 12.04.2014	2nd Round 14.04.2014	3rd Round 16.04.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	5	5	5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.32	7.58	7.24	IS 3025: Part – 11
2	E C	µS/cm	254	265	278	IS 3025: Part – 14
3	Oil & Grease	mg/l	1	1	1	IS 3025: Part – 39
4	Suspended Solids	mg/l	16	14	12	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	6.1	6.1	6.2	IS 3025: Part 38
6	Chemical Oxygen Demand	mg/l	20	16	12	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	5	4	3	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	0.02	0.01	0.01	APHA 4500 NO_2.B
9	Nitrate-Nitrogen as N	mg/l	0.68	0.79	0.68	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	0.70	0.80	0.69	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.40	0.40	0.40	IS 3025: Part 60
15	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	0.62	0.67	0.70	By Calculation
18	Total Coliforms	MPN/100ml	19	13	14	IS 1622
19	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 B
19	Iron as Fe	mg/l	0.12	0.12	0.10	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

JHARSUGUDA - ODISHA

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 3: Kharkari nalla (Vedanta Boundary)			Test Method
			1st Round 12.04.2014	2nd Round 14.04.2014	3rd Round 16.04.2014	
I	**Simple Parameters**					
1	Appearance	-	Light brown	Light brown	Light brown	-
2	Colour (Hazen Units)	-	30	25	30	IS 3025: Part.– 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.68	7.46	7.30	IS 3025: Part 11
2	E C	µS/cm	475	442	484	IS 3025: Part – 14
3	Oil & Grease	mg/l	1	1	1	IS 3025: Part – 39
4	Suspended Solids	mg/l	32	37	26	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	5.8	5.7	5.6	IS 3025: Part 38
6	Chemical Oxygen Demand	mg/l	26	34	30	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	7	8	7	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	0.02	0.02	0.02	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	0.79	0.90	0.56	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	0.81	0.92	0.58	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.80	0.80	0.80	IS 3025: Part – 60
15	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	1.48	1.29	1.57	By Calculation
18	Total Coliforms	MPN/100ml	50	60	50	IS 1622
19	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	2.8	3.5	3.1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	2.1	2.8	2.4	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.03	0.02	0.03	APHA 3111 - B
19	Iron as Fe	mg/l	0.36	0.32	0.37	IS 3025: Part 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 57

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 4: Kirakud Reservoir (at sambalpur)			Test Method
			1st Round 11.04.2014	2nd Round 13.04.2014	3rd Round 15.04.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	5	5	5	IS 3025: Part 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part.– 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.84	7.63	7.47	IS 3025: Part – 11
2	E C	µS/cm	178	169	150	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part 39
4	Suspended Solids	mg/l	34	31	29	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	6.0	6.0	6.1	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	16	14	20	IS 3025: Part 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	3	3	4	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	0.01	0.01	0.01	APHA 4500 NO_2 B
9	Nitrate-Nitrogen as N	mg/l	0.90	1.02	0.90	APHA 4500 – NO_3 B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	0.91	1.03	0.91	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3 C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.30	0.30	0.30	IS 3025: Part 60
15	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	0.59	0.46	0.45	By Calculation
18	Total Coliforms	MPN/100ml	19	22	27	IS 1622
19	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 B
19	Iron as Fe	mg/l	0.10	0.09	0.09	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part.– 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

JHARSUGUDA - ODISHA

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW-1: Near Bhushan side (Thelkoli)			Test Method
			1st Round 12.04.2014	2nd Round 14.04.2014	3rd Round 16.04.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.19	7.08	7.12	IS 3025: Part – 11
2	E C	µS/cm	238	204	226	IS 3025: Part - 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part - 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	6	4	4	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part - 44
7	Nitrite-Nitrogen as N	mg/l	0.02	0.02	0.02	APHA 4500 - NO_2.B
8	Nitrate-Nitrogen as N	mg/l	0.68	0.56	0.56	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2, NO_3)	mg/l	0.70	0.58	0.58	APHA 4500 -N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.30	0.30	0.30	IS 3025: Part - 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	0.60	0.59	0.65	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.06	0.07	0.07	IS 3025: Part - 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part - 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

JHARSUGUDA - ODISHA

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW-2: Vedanta Aluminium Ltd (Bhurkamunda)			Test Method
			1st Round 12.04.2014	2nd Round 14.04.2014	3rd Round 16.04.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	6.72	6.75	6.79	IS 3025: Part – 11
2	E C	µS/cm	240	256	248	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	4	6	6	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part 44
7	Nitrite-Nitrogen as N	mg/l	0.02	0.02	0.02	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	3.16	2.94	3.16	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2- NO_3)	mg/l	3.18	2.96	3.18	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.40	0.40	0.40	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	0.78	0.83	0.81	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 B
19	Iron as Fe	mg/l	0.04	0.05	0.04	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 - D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

JHARSUGUDA - ODISHA

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW-3: Badmal Industrial Estate (SPS Steels)			Test Method
			1st Round 12.04.2014	2nd Round 14.04.2014	3rd Round 16.04.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	6.60	6.67	6.81	IS 3025: Part – 11
2	E C	µS/cm	265	278	270	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part 17
5	Chemical Oxygen Demand	mg/l	6	6	6	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	0.02	0.02	0.02	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	3.84	4.06	3.84	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	3.86	4.08	3.86	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.40	0.40	0.40	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	0.47	0.56	0.54	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr6	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 B
19	Iron as Fe	mg/l	0.03	0.03	0.04	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

JHARSUGUDA - ODISHA

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	LOM	GW-4: MSP Metallics			Test Method
			1st Round 12.04.2014	2nd Round 14.04.2014	3rd Round 16.04.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	6.88	7.01	6.92	IS 3025: Part – 11
2	E.C	µS/cm	127	115	122	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	4	4	4	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part - 44
7	Nitrite-Nitrogen as N	mg/l	0.01	0.01	0.01	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	1.81	1.69	1.69	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2, NO_3)	mg/l	1.82	1.70	1.70	APHA 4500 N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part 27
13	Fluoride as F	mg/l	0.50	0.50	0.50	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	0.59	0.53	0.51	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 - P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+ NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 - NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.03	0.04	0.03	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 57

AMBIENT AIR MONITORING LOCATIONS PHOTOGRAPHS

AAQ - 1, Near Bhushan side (Thelkoli)

AAQ – 2, Vedanta Aluminum Ltd (Bhurkamunda)

AAQ - - 3.Badmal Industrial estate (SPS Steels)

AAQ 4, Jarsuguda Township

SAMPLING LOCATION PHOTOGRAPHS OF SURFACE WATER

SW – 1, Bheden River (Near Kheruwal Bridge)

SW – 2, IB River, (Confluence Point of Bheden and IB)

SW – 3, Kharkari Nalla (Vedanta Boundary)

SW – 4, Kirakud Reservoir (at sambalpur)

SAMPLING LOCATION PHOTOGRAPHS OF GROUND WATER

GW – 1, Near Bhushan side (Thelkoli)

GW – 2, Vedanta Aluminum Ltd (Bhurkamunda)

GW – 3, Badmal Industrial Estate (SPS Steels)

GW-4: MSP Metallics

MONITORING, SAMPLING AND ANALYSIS

of

AMBIENT AIR QUALITY, SURFACE WATER QUALITY AND GROUND WATER QUALITY

in

IDENTIFIED CRITICALLY POLLUTED AREA (CPAs)

LUDHIYANA

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME
LUDHIYANA – PUNJAB

AAQ MONITORING LOCATIONS

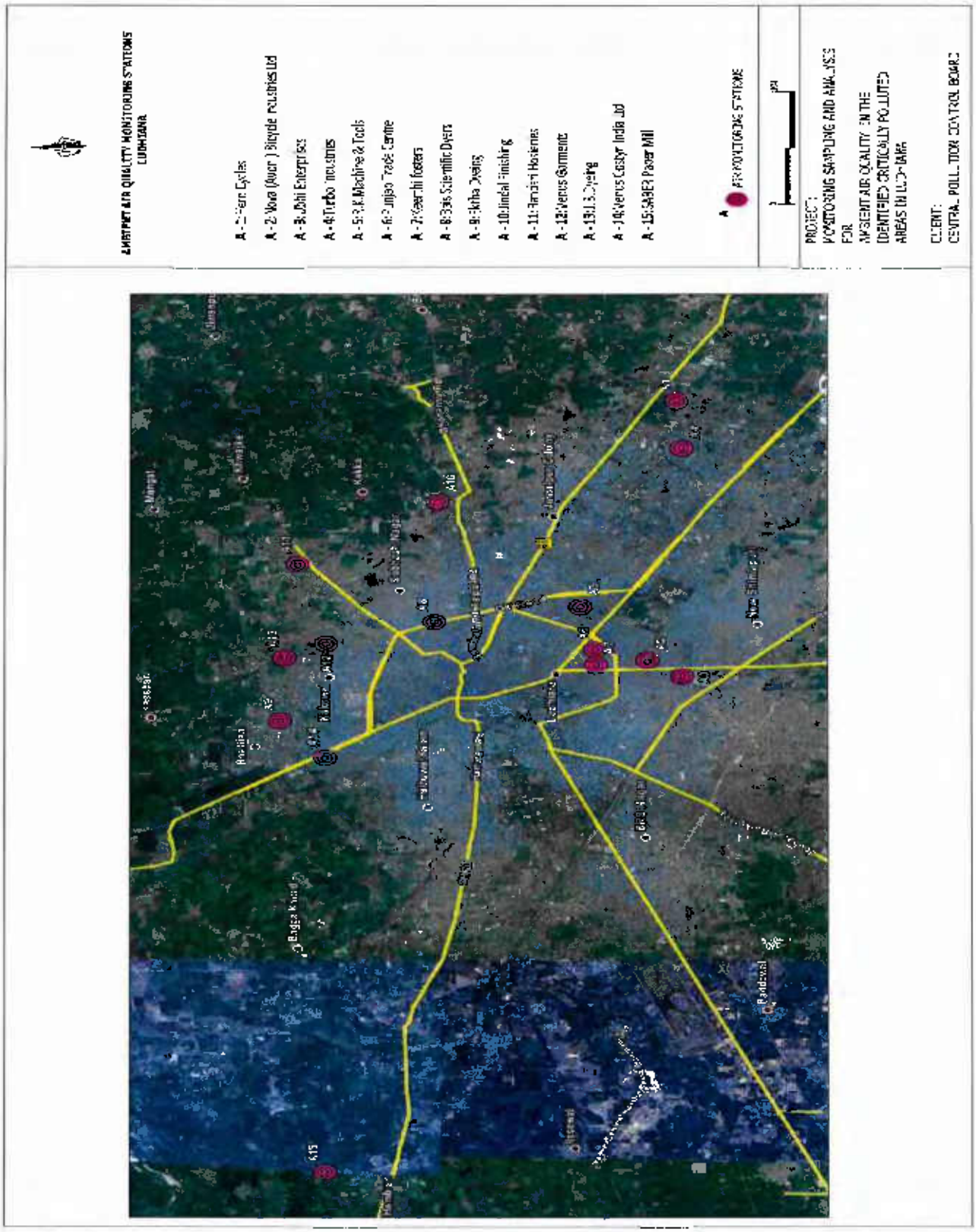
SAMPLE CODE	NAME OF THE MONITORING LOCATION	DATE OF SAMPLING	LATITUDE	LONGITUDE
AAQ – 1	Hero Cycles	1st Round: 10.02.2014 to 11.02.2014 2nd Round: 12.02.2014 to 13.02.2014 3rd Round: 14.02.2014 to 15.02.2014	N 30° 52.657'	E 075° 56.913'
AAQ 2	Nova (Avon) Bicycle Industries Ltd	1st Round: 04.02.2014 to 05.02.2014 2nd Round: 06.02.2014 to 07.02.2014 3rd Round: 08.02.2014 to 09.02.2014	N 30° 53.003'	E 075° 51.696'
AAQ - 3	Ubhi Enterprises	1st Round: 17.02.2014 to 18.02.2014 2nd Round: 19.02.2014 to 20.02.2014 3rd Round: 21.02.2014 to 22.02.2014	N 30° 52.600'	E 075° 51.380'
AAQ – 4	Turbo Industries	1st Round: 17.02.2014 to 18.02.2014 2nd Round: 19.02.2014 to 20.02.2014 3rd Round: 21.02.2014 to 22.02.2014	N 30° 51' 89.6"	E 075° 52' 94.0"
AAQ 5	R.K.Machine & Tools	1st Round: 04.02.2014 to 05.02.2014 2nd Round: 06.02.2014 to 07.02.2014 3rd Round: 08.02.2014 to 09.02.2014	N 30° 53.773'	E 075° 52.791'
AAQ – 6	Punjab Trade Centre	1st Round: 17.02.2014 to 18.02.2014 2nd Round: 19.02.2014 to 20.02.2014 3rd Round: 21.02.2014 to 22.02.2014	N 30° 53.601'	E 075° 51.912'
AAQ – 7	Keerthi fosters	1st Round: 17.02.2014 to 18.02.2014 2nd Round: 19.02.2014 to 20.02.2014 3rd Round: 21.02.2014 to 22.02.2014	N 30° 53.596'	E 075° 51.610'
AAQ – 8	Bais Scientific Dyers	1st Round: 04.02.2014 to 05.02.2014 2nd Round: 06.02.2014 to 07.02.2014 3rd Round: 08.02.2014 to 09.02.2014	N 30° 55.463'	E 075° 52.490'
AAQ – 9	Ektha Dyeing	1st Round: 10.02.2014 to 11.02.2014 2nd Round: 12.02.2014 to 13.02.2014 3rd Round: 14.02.2014 to 15.02.2014	N 30° 57.242'	E 075° 50.487'
AAQ – 10	Jindal Finishing	1st Round: 10.02.2014 to 11.02.2014 2nd Round: 12.02.2014 to 13.02.2014 3rd Round: 14.02.2014 to 15.02.2014	N 30° 55.419'	E 075° 54.894'
AAQ – 11	Bandari Hosieries	1st Round: 10.02.2014 to 11.02.2014 2nd Round: 12.02.2014 to 13.02.2014 3rd Round: 14.02.2014 to 15.02.2014	N 30° 57.038'	E 075° 53.634'
AAQ – 12	Venus Garments	1st Round: 24.02.2014 to 25.02.2014 2nd Round: 26.02.2014 to 27.02.2014 3rd Round: 28.02.2014 to 01.03.2014	N 30° 56.715'	E 075° 52.049'
AAQ 13	J.B.Dyeing	1st Round: 24.02.2014 to 25.02.2014 2nd Round: 26.02.2014 to 27.02.2014 3rd Round: 28.02.2014 to 01.03.2014	N 30° 57.190'	E 075° 51.757'
AAQ – 14	Venus Cosyn India Ltd	1st Round: 04.02.2014 to 05.02.2014 2nd Round: 06.02.2014 to 07.02.2014 3rd Round: 08.02.2014 to 09.02.2014	N 30° 56.730'	E 075° 49.767'
AAQ – 15	SABER Paper Mill	1st Round: 24.02.2014 to 25.02.2014 2nd Round: 26.02.2014 to 27.02.2014 3rd Round: 28.02.2014 to 01.03.2014	N 30° 56.730'	E 075° 41.402'

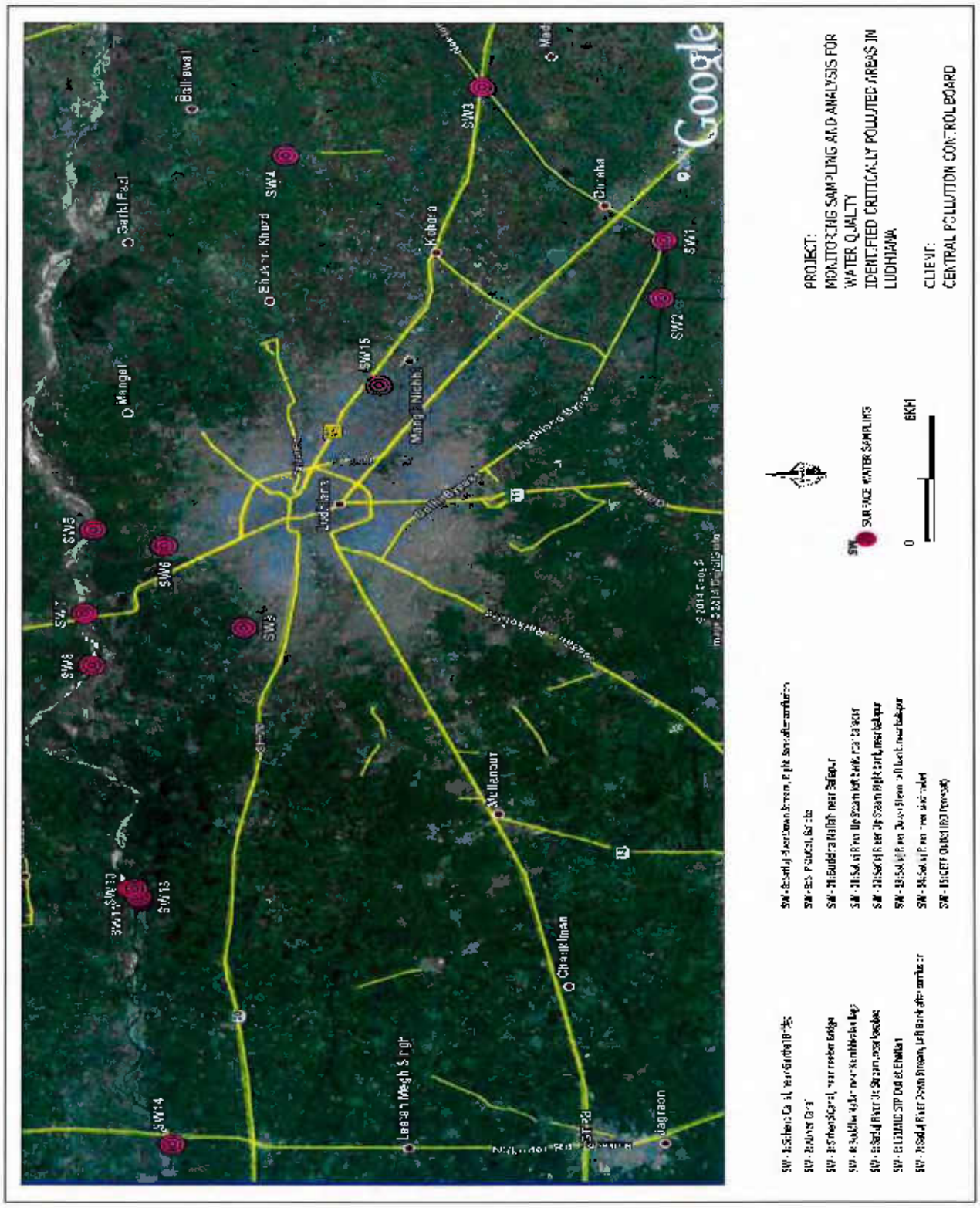
SURFACE WATER SAMPLING LOCATIONS

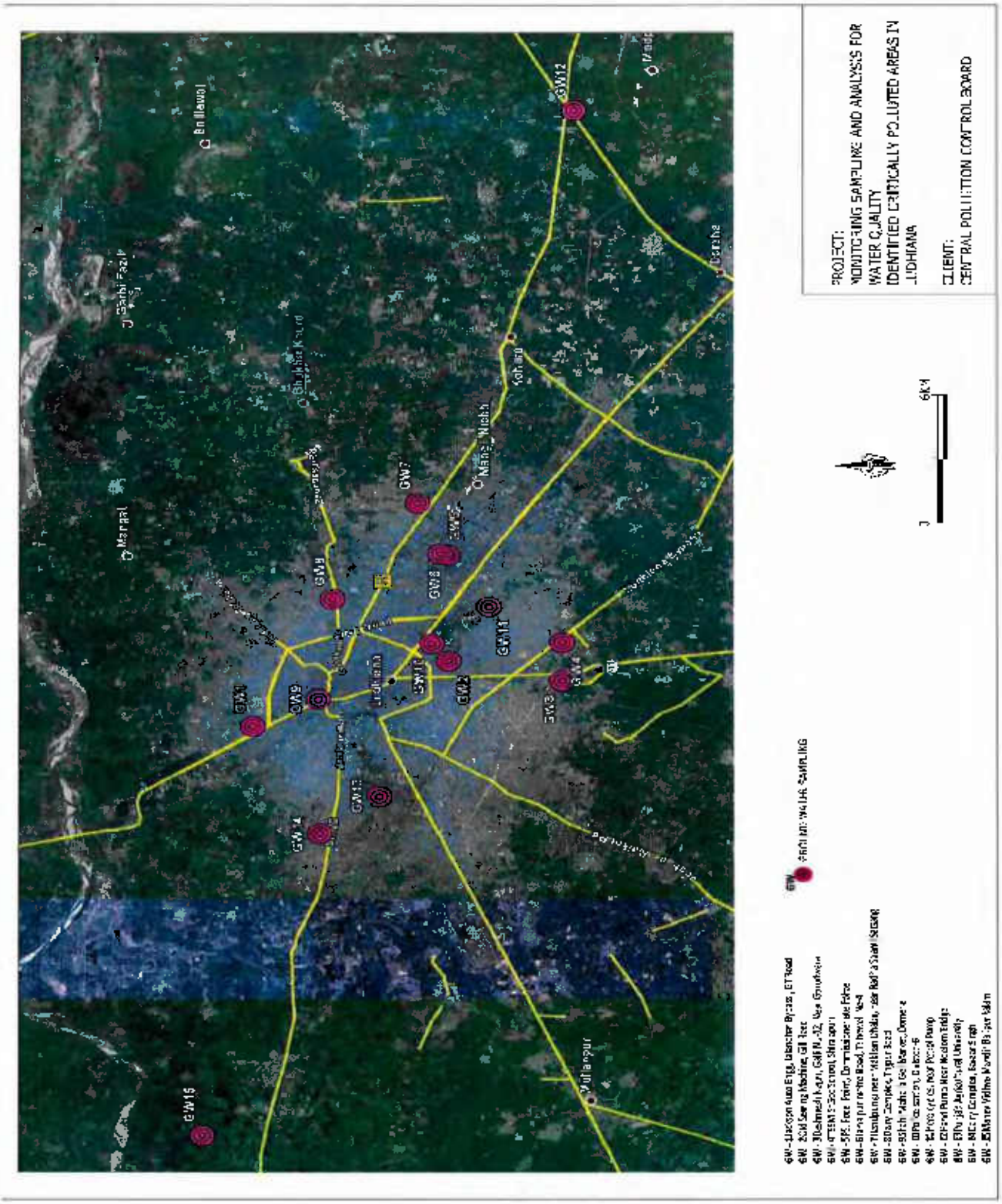
SAMPLE CODE	NAME OF THE SAMPLING LOCATION	DATE OF SAMPLING (SHIFT- A & SHIFT- B)	LATITUDE	LONGITUDE
SW - 1	Sirhend Canal, near Gurthali Bridge	1st Round: 18.02.2014 2nd Round: 20.02.2014 3rd Round: 22.02.2014	N 30° 46' 95.1"	E 076° 00' 87.5"
SW – 2	Abhor Canal	1st Round: 18.02.2014 2nd Round: 20.02.2014 3rd Round: 22.02.2014	N 30° 47' 00.4"	E 075° 58' 80.0"
SW – 3	Sirhend Canal, near neelom Bridge	1st Round: 18.02.2014 2nd Round: 20.02.2014 3rd Round: 22.02.2014	N 30° 50' 92.9"	E 076° 06' 37.8"
SW – 4	Buddha Nallah near Kumbhkala village	1st Round: 18.02.2014 2nd Round: 20.02.2014 3rd Round: 22.02.2014	N 30° 55' 24.2"	E 076° 03' 92.1"
SW - 5	Satluj River Up Stream, near kasabad	1st Round: 24.02.2014 2nd Round: 26.02.2014 3rd Round: 28.02.2014	N 30° 59' 44.0"	E 075° 50' 53.5"
SW - 6	111MLD STP Outlet, Bhattain	1st Round: 24.02.2014 2nd Round: 26.02.2014 3rd Round: 28.02.2014	N 30° 57' 88.2"	E 075° 49' 96.6"
SW – 7	Satluj River Down Stream, Left Bank after conflusion	1st Round: 24.02.2014 2nd Round: 26.02.2014 3rd Round: 28.02.2014	N 30° 59' 62.1"	E 075° 47' 53.8"
SW – 8	Satluj River Down Stream, Right Bank after conflusion	1st Round: 24.02.2014 2nd Round: 26.02.2014 3rd Round: 28.02.2014	N 30°56'08.7"	E 075°46'57.2"
SW – 9	STP Outlet, Balloke	1st Round: 24.02.2014 2nd Round: 26.02.2014 3rd Round: 28.02.2014	N 28° 41' 62.5"	E 078° 11' 17.5"
SW – 10	Buddha Nallah near Baliapur	1st Round: 24.02.2014 2nd Round: 26.02.2014 3rd Round: 28.02.2014	N: 30° 58' 50.6"	E: 078° 37' 69.5"
SW – 11	Satluj River Up Steam left bank, near baliapur	1st Round: 24.02.2014 2nd Round: 26.02.2014 3rd Round: 28.02.2014	N 30° 58' 59.9"	E 075° 37' 70.2"
SW – 12	Satluj River Up Steam Right bank, near baliapur	1st Round: 24.02.2014 2nd Round: 26.02.2014 3rd Round: 28.02.2014	N 30° 58' 35.3"	E 075° 37' 36.0"
SW – 13	Satluj River Down Steam left bank, near baliapur	1st Round: 24.02.2014 2nd Round: 26.02.2014 3rd Round: 28.02.2014	N 30° 58' 41.5"	E 075° 37' 42.2"
SW 14	Satluj River near sindhvabet	1st Round: 24.02.2014 2nd Round: 26.02.2014 3rd Round: 28.02.2014	N 30° 57' 56.9"	E 075° 28' 54.5"
SW – 15	CETP Outlet (RO Permeat)	1st Round: 25.02.2014 2nd Round: 27.02.2014 3rd Round: 01.03.2014	N 30° 53' 19.6"	E 075° 55' 74.2"

GROUND WATER SAMPLING LOCATIONS

SAMPLE CODE	NAME OF THE SAMPLING LOCATION	DATE OF SAMPLING	LATITUDE	LONGITUDE
GW - 1	Jackson Auto Engg, Jalandhar Bypass , GT Road	1st Round: 05.02.2014 2nd Round:07.02.2014 3rd Round: 09.02.2014	N 30° 56' 29.0"	E 075° 50' 13.6"
GW – 2	Old Sewing Machine, Gill Road	1st Round: 05.02.2014 2nd Round:07.02.2014 3rd Round: 09.02.2014	N 30° 53' 02.3"	E 077° 51' 56.3"
GW - 3	Dashmesh Nagar, Galli No-12, Near Gurudwara	1st Round: 05.02.2014 2nd Round:07.02.2014 3rd Round: 09.02.2014	N 30° 51' 02.8"	E 075° 51' 25.1"
GW – 4	TSSM Sr.Sec School, Shimlapuri	1st Round: 05.02.2014 2nd Round:07.02.2014 3rd Round: 09.02.2014	N 30° 51' 89.6"	E 075° 52' 94.0"
GW - 5	PS. Focal Point, Commissioner ate Police	1st Round: 11.02.2014 2nd Round:13.02.2014 3rd Round: 15.02.2014	N 30° 53' 11.0"	E 075° 54' 44.7"
GW - 6	Jamalpur metro Road, Tubewell No-4	1st Round: 11.02.2014 2nd Round:13.02.2014 3rd Round: 15.02.2014	N 30° 53' 3.58"	E 075° 54' 42.8"
GW – 7	Handpump near Makhan Dhaba, near Radha Soami Satsang	1st Round: 11.02.2014 2nd Round:13.02.2014 3rd Round: 15.02.2014	N 30° 53' 34.7"	E 075° 56' 05.1"
GW – 8	Dairy Complex, Tajpur Road	1st Round: 11.02.2014 2nd Round:13.02.2014 3rd Round: 15.02.2014	N 30° 55' 05.2"	E 075° 53' 34.0"
GW – 9	Shahi Mohalla Gol Market, Domeria	1st Round: 18.02.2014 2nd Round: 20.02.2014 3rd Round: 22.02.2014	N 30° 55' 20.1"	E 075° 50' 57.2"
GW - 10	Police station, Division-6	1st Round: 18.02.2014 2nd Round: 20.02.2014 3rd Round: 22.02.2014	N 30° 53' 65.1"	E 075° 52' 23.6"
GW 11	Hero cycles, near Petrol Pump	1st Round: 18.02.2014 2nd Round: 20.02.2014 3rd Round: 22.02.2014	N 30° 52' 91.3"	E 075° 53' 71.5"
GW – 12	Hand Pump Near Neelom Bridge	1st Round: 18.02.2014 2nd Round: 20.02.2014 3rd Round: 22.02.2014	N 30° 50' 90.2"	E 076° 06' 24.2"
GW – 13	Punjab Agricultural University	1st Round: 25.02.2014 2nd Round: 27.02.2014 3rd Round: 01.03.2014	N 30° 54' 16.0"	E 075° 48' 24.8"
GW – 14	Dairy Complex, Baldar Singh	1st Round: 25.02.2014 2nd Round: 27.02.2014 3rd Round: 01.03.2014	N 30° 55' 18.8"	E 075° 47' 70.0"
GW – 15	Manav Vidhya Mandir Balipur kalam	1st Round: 25.02.2014 2nd Round: 27.02.2014 3rd Round: 01.03.2014	N 30° 57' 39.4"	E 075° 39' 46.7"


AMBIENT AIR QUALITY MONITORING STATIONS
LUDHIANA
A - 2: Hero Cycles
A - 2: Nova (Avon) Bicycle Industries Ltd
A - 3: Ubhi Enterprises
A - 4: Turbo Industries
A - 5: R.K. Machine & Tools
A - 6: Punjab Trade Centre
A - 7: Keerthi fosters
A - 8: Bais Scientific Dyers
A - 9: Ekha Dyeing
A - 10: Jindal Finishing
A - 11: Bandari Hosieries
A - 12: Venus Garments
A - 13: J.B. Dyeing
A - 14: Venus Gostyr India Ltd
A - 15: SABER Paper Mill
AIR MONITORING STATIONS
PROJECT:
MONITORING SAMPLING AND ANALYSIS
FOR
AMBIENT AIR QUALITY IN THE
IDENTIFIED CRITICALLY POLLUTED
AREAS IN LUDHIANA
CLIENT:
CENTRAL POLLUTION CONTROL BOARD


PROJECT:
MONITORING SAMPLING AND ANALYSIS FOR WATER QUALITY
IDENTIFIED CRITICALLY POLLUTED AREAS IN LUDHIANA
CLIENT:
CENTRAL POLLUTION CONTROL BOARD
SURFACE WATER SAMPLING
0
6KM
Google
SW1
SW2
SW3
SW4
SW5
SW6
SW7
SW8
SW9
SW10
SW11
SW13
SW14
SW15
Ludhiana
Mangal Nichhi
Kohara
Chaukiman
Jagraon
Leetah Megh Singh
Mangal
Bhukhari Khurd
Garhi Fazl
Balliawal


PROJECT:
MONITORING SAMPLING AND ANALYSIS FOR WATER QUALITY
IDENTIFIED CRITICALLY POLLUTED AREAS IN LUDHIANA
CLIENT:
CENTRAL POLLUTION CONTROL BOARD
GW1
GW2
GW3
GW4
GW5
GW6
GW7
GW8
GW9
GW10
GW11
GW12
GW13
GW14
GW15
Manaal
Bhukhe Kaur
Mangal Nichh
Kohara
Dorahe
Mullanpur
Ludhiana
0
6KM

AMBIENT AIR QUALITY MONITORING RESULTS

S.No.	Pollutants	AAQ – 1 Hero Cycles			AAQ – 2 Nova (Avon) Bicycle Industries Ltd			NAAQ Standards (2009)
		1st Round	2nd Round	3rd Round	1st Round	2nd Round	3rd Round	
		10.02.2014	12.02.2014	14.02.2014	04.02.2014	06.02.2014	08.02.2014	
I.	**Particulate Pollutants**							
1.	PM_{10} ($\mu g/m^3$)	172	127	160	175	158	139	**100 ($\mu g/m^3$)**
2	$PM_{2.5}$ ($\mu g/m^3$)	48	37	42	68	49	57	**60 ($\mu g/m^3$)**
3	Arsenic (ng/m^3)	1.4	1.2	2.7	1.7	2.2	1.9	**06 (ng/m^3) (Annual)**
4	Nickel (ng/m^3)	6.7	5.8	9.1	3.8	5.4	5.2	**20 (ng/m^3) (Annual)**
5	Lead ($\mu g/m^3$)	0.08	0.11	0.07	0.03	0.07	0.02	**1.0($\mu g/m^3$) (24 hours)**
6	Benzo (a) Pyrene (ng/m^3)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**01 (ng/m^3) (Annual)**
II.	**Gaseous Pollutants**							
7	SO_2 ($\mu g/m^3$)	12.6	20.5	14.6	14.2	12.8	9.8	**80 ($\mu g/m^3$) (24 hours)**
8	NO_X ($\mu g/m^3$)	31.6	35.2	28.7	24.1	19.8	18.5	**80 ($\mu g/m^3$) (24 hours)**
9	NH_3 ($\mu g/m^3$)	10.2	15.3	9.6	6.2	8.4	7.9	**400 ($\mu g/m^3$) (24 hours)**
10	O_3 ($\mu g/m^3$)	6.3	5.7	8.1	6.9	9.2	8.3	**100 (8 hours) & 180 ($\mu g/m^3$) (1 hour)**
		19.5	17.3	19.4	16.5	18.2	14.7	
		5.1	4.6	3.2	5.6	9.4	7.5	
11	CO (mg/m^3)	< 2	< 2	< 2	< 2	< 2	< 2	**02 (8 hours) & 04 mg/m^3 (1 hour)**
		< 2	< 2	< 2	< 2	< 2	< 2	
		< 2	< 2	< 2	< 2	< 2	< 2	
12	Benzene ($\mu g/m^3$)	< 3	< 3	< 3	< 3	< 3	< 3	**05 ($\mu g/m^3$) (Annual)**

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME
LUDHIYANA – PUNJAB

AMBIENT AIR QUALITY MONITORING RESULTS

S.No.	Pollutants	AAQ – 3 Ubhi Enterprises			AAQ – 4 Turbo Industries			NAAQ Standards (2009)
		1st Round	2nd Round	3rd Round	1st Round	2nd Round	3rd Round	
		17.02.2014	19.02.2014	21.02.2014	17.02.2014	19.02.2014	21.02.2014	
I.	**Particulate Pollutants**							
1.	PM_{10} (µg/m^3)	165	216	188	148	176	140	**100 (µg/m^3)**
2	$PM_{2.5}$ (µg/m^3)	53	74	62	49	58	37	**60 (µg/m^3)**
3	Arsenic (ng/m^3)	1.7	5.1	1.6	2.7	1.9	2.2	**06 (ng/m^3) (Annual)**
4	Nickel (ng/m^3)	3.4	2.6	4.5	6.6	8.1	7.2	**20 (ng/m^3) (Annual)**
5	Lead (µg/m^3)	0.14	0.08	0.05	0.12	0.09	0.14	**1.0(µg/m^3) (24 hours)**
6	Benzo (a) Pyrene (ng/m^3)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**01 (ng/m^3) (Annual)**
II.	**Gaseous Pollutants**							
7	SO_2 (µg/m^3)	13.6	15.5	14.1	13.4	14.7	16.3	**80 (µg/m^3) (24 hours)**
8	NO_X (µg/m^3)	22.7	26.8	31.6	32.4	27.2	24.1	**80 (µg/m^3) (24 hours)**
9	NH_3 (µg/m^3)	15.4	14.9	12.3	5.8	6.4	5.9	**400 (µg/m^3) (24 hours)**
10	O_3 (µg/m^3)	5.2	6.1	5.9	8.4	8.9	7.2	**100 (8 hours) & 180 (µg/m^3) (1 hour)**
		18.6	17.4	18.1	19.4	17.2	16.3	
		6.1	5.7	6.9	6.9	8.1	7.9	
11	CO (mg/m^3)	< 2	< 2	< 2	< 2	< 2	< 2	**02 (8 hours) & 04 mg/m^3 (1 hour)**
		< 2	< 2	< 2	< 2	< 2	< 2	
		< 2	< 2	< 2	< 2	< 2	< 2	
12	Benzene (µg/m^3)	< 3	< 3	< 3	< 3	< 3	< 3	**05 (µg/m^3) (Annual)**

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME
LUDHIYANA – PUNJAB

AMBIENT AIR QUALITY MONITORING RESULTS

S.No.	Pollutants	AAQ – 5 R.K.Machine & Tools			AAQ – 6 Punjab Trade Centre			NAAQ Standards (2009)
		1st Round	2nd Round	3rd Round	1st Round	2nd Round	3rd Round	
		04.02.2014	06.02.2014	08.02.2014	17.02.2014	19.02.2014	21.02.2014	
I.	**Particulate Pollutants**							
1.	PM_{10} (µg/m^3)	162	145	176	112	123	117	**100 (µg/m^3)**
2	$PM_{2.5}$ (µg/m^3)	66	59	74	54	39	46	**60 (µg/m^3)**
3	Arsenic (ng/m^3)	2.7	2.1	1.8	1.6	4.6	1.8	**06 (ng/m^3) (Annual)**
4	Nickel (ng/m^3)	4.8	6.2	8.6	6.3	7.2	8.4	**20 (ng/m^3) (Annual)**
5	Lead (µg/m^3)	0.09	0.11	017	0.05	0.08	0.12	**1.0(µg/m^3) (24 hours)**
6	Benzo (a) Pyrene (ng/m^3)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**01 (ng/m^3) (Annual)**
II.	**Gaseous Pollutants**							
7	SO_2 (µg/m^3)	12.9	15.4	13.8	15.3	14.6	19.5	**80 (µg/m^3) (24 hours)**
8	NO_x (µg/m^3)	31.2	28.9	29.6	22.7	27.4	24.2	**80 (µg/m^3) (24 hours)**
9	NH_3 (µg/m^3)	13.4	12.8	11.6	8.2	7.4	10.7	**400 (µg/m^3) (24 hours)**
10	O_3 (µg/m^3)	6.4	5.3	9.9	5.9	6.8	9.1	**100 (8 hours) & 180 (µg/m^3) (1 hour)**
		18.4	16.7	19.2	18.1	16.7	19.5	
		9.5	8.9	6.1	6.3	8.4	7.9	
11	CO (mg/m^3)	< 2	< 2	< 2	< 2	< 2	< 2	**02 (8 hours) & 04 mg/m^3 (1 hour)**
		< 2	< 2	< 2	< 2	< 2	< 2	
		< 2	< 2	< 2	< 2	< 2	< 2	
12	Benzene (µg/m^3)	< 3	< 3	< 3	< 3	< 3	< 3	**05 (µg/m^3) (Annual)**

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME
LUDHIYANA – PUNJAB

AMBIENT AIR QUALITY MONITORING RESULTS

S.No.	Pollutants	AAQ – 7 Keerthi fosters			AAQ – 8 Bais Scientific Dyers			NAAQ Standards (2009)
		1st Round	2nd Round	3rd Round	1st Round	2nd Round	3rd Round	
		17.02.2014	19.02.2014	21.02.2014	04.02.2014	06.02.2014	08.02.2014	
I.	**Particulate Pollutants**							
1.	PM_{10} ($\mu g/m^3$)	138	119	130	149	135	126	**100 ($\mu g/m^3$)**
2	$PM_{2.5}$ ($\mu g/m^3$)	62	47	58	57	42	39	**60 ($\mu g/m^3$)**
3	Arsenic (ng/m^3)	1.4	1.9	1.2	1.4	2.8	1.6	**06 (ng/m^3) (Annual)**
4	Nickel (ng/m^3)	5.5	4.1	6.3	6.2	5.6	4.3	**20 (ng/m^3) (Annual)**
5	Lead ($\mu g/m^3$)	0.13	0.15	0.18	0.06	0.09	0.05	**1.0($\mu g/m^3$) (24 hours)**
6	Benzo (a) Pyrene (ng/m^3)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**01 (ng/m^3) (Annual)**
II.	**Gaseous Pollutants**							
7	SO_2 ($\mu g/m^3$)	15.2	16.8	14.5	16.7	12.3	13.5	**80 ($\mu g/m^3$) (24 hours)**
8	NO_X ($\mu g/m^3$)	35.2	38.4	29.8	28.6	27.1	30.6	**80 ($\mu g/m^3$) (24 hours)**
9	NH_3 ($\mu g/m^3$)	5.8	6.4	9.3	6.7	8.1	9.5	**400 ($\mu g/m^3$) (24 hours)**
10	O_3 ($\mu g/m^3$)	6.2	5.8	5.4	10.5	12.3	9.6	**100 (8 hours) & 180 ($\mu g/m^3$) (1 hour)**
		15.8	16.7	12.9	16.7	15.9	16.7	
		5.7	6.1	8.3	6.1	5.7	9.2	
11	CO (mg/m^3)	< 2	< 2	< 2	< 2	< 2	< 2	**02 (8 hours) & 04 mg/m^3 (1 hour)**
		< 2	< 2	< 2	< 2	< 2	< 2	
		< 2	< 2	< 2	< 2	< 2	< 2	
12	Benzene ($\mu g/m^3$)	< 3	< 3	< 3	< 3	< 3	< 3	**05 ($\mu g/m^3$) (Annual)**

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME
LUDHIYANA – PUNJAB

AMBIENT AIR QUALITY MONITORING RESULTS

S.No.	Pollutants	AAQ – 9 Ektha Dyeing			AAQ – 10 Jindal Finishing			NAAQ Standards (2009)
		1st Round	2nd Round	3rd Round	1st Round	2nd Round	3rd Round	
		10.02.2014	12.02.2014	14.02.2014	10.02.2014	12.02.2014	14.02.2014	
I.	**Particulate Pollutants**							
1.	PM_{10} (µg/m^3)	95	117	108	150	128	137	**100 (µg/m^3)**
2	$PM_{2.5}$ (µg/m^3)	42	47	34	52	44	38	**60 (µg/m^3)**
3	Arsenic (ng/m^3)	1.4	1.9	1.7	1.2	1.9	<1	**06 (ng/m^3) (Annual)**
4	Nickel (ng/m^3)	2.4	3.6	2.5	3.9	5.4	6.2	**20 (ng/m^3) (Annual)**
5	Lead (µg/m^3)	0.05	0.08	0.11	0.12	0.08	0.15	**1.0(µg/m^3) (24 hours)**
6	Benzo (a) Pyrene (ng/m^3)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**01 (ng/m^3) (Annual)**
II.	**Gaseous Pollutants**							
7	SO_2 (µg/m^3)	13.4	15.7	12.3	16.8	14.4	12.7	**80 (µg/m^3) (24 hours)**
8	NO_X (µg/m^3)	31.8	29.3	25.2	32.9	28.5	29.6	**80 (µg/m^3) (24 hours)**
9	NH_3 (µg/m^3)	6.2	5.8	7.9	6.6	8.1	9.3	**400 (µg/m^3) (24 hours)**
10	O_3 (µg/m^3)	5.8	6.7	5.1	5.8	5.1	9.8	**100 (8 hours) & 180 (µg/m^3) (1 hour)**
		17.2	15.9	11.4	19.2	15.6	18.5	
		9.2	5.8	6.7	6.9	8.4	8.6	
11	CO (mg/m^3)	< 2	< 2	< 2	< 2	< 2	< 2	**02 (8 hours) & 04 mg/m^3 (1 hour)**
		< 2	< 2	< 2	< 2	< 2	< 2	
		< 2	< 2	< 2	< 2	< 2	< 2	
12	Benzene (µg/m^3)	< 3	< 3	< 3	< 3	< 3	< 3	**05 (µg/m^3) (Annual)**

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

LUDHIYANA – PUNJAB

AMBIENT AIR QUALITY MONITORING RESULTS

S.No.	Pollutants	AAQ – 11 Bandari Hosieries			AAQ – 12 Venus Garments			NAAQ Standards (2009)
		1st Round	2nd Round	3rd Round	1st Round	2nd Round	3rd Round	
		10.02.2014	12.02.2014	14.02.2014	24.02.2014	26.02.2014	28.02.2014	
I.	**Particulate Pollutants**							
1.	PM_{10} (µg/m^3)	144	139	122	106	89	94	**100 (µg/m^3)**
2	$PM_{2.5}$ (µg/m^3)	95	72	57	48	33	37	**60 (µg/m^3)**
3	Arsenic (ng/m^3)	1.6	1.9	1.4	1.1	<1	1.7	**06 (ng/m^3) (Annual)**
4	Nickel (ng/m^3)	4.9	6.4	6.9	4.6	6.4	8.2	**20 (ng/m^3) (Annual)**
5	Lead (µg/m^3)	0.08	0.13	0.04	0.02	0.06	0.03	**1.0(µg/m^3) (24 hours)**
6	Benzo (a) Pyrene (ng/m^3)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**01 (ng/m^3) (Annual)**
II.	**Gaseous Pollutants**							
7	SO_2 (µg/m^3)	15.3	11.7	12.4	15.2	11.8	16.9	**80 (µg/m^3) (24 hours)**
8	NO_X (µg/m^3)	27.6	28.1	21.5	24.5	28.9	21.6	**80 (µg/m^3) (24 hours)**
9	NH_3 (µg/m^3)	12.8	16.2	15.7	12.1	16.8	12.3	**400 (µg/m^3) (24 hours)**
10	O_3 (µg/m^3)	5.4	5.6	6.4	8.2	5.8	6.9	**100 (8 hours) & 180 (µg/m^3) (1 hour)**
		15.8	13.2	16.7	15.4	16.9	12.5	
		6.8	5.7	9.2	5.8	6.7	5.1	
11	CO (mg/m^3)	< 2	< 2	< 2	< 2	< 2	< 2	**02 (8 hours) & 04 mg/m^3 (1 hour)**
		< 2	< 2	< 2	< 2	< 2	< 2	
		< 2	< 2	< 2	< 2	< 2	< 2	
12	Benzene (µg/m^3)	< 3	< 3	< 3	< 3	< 3	< 3	**05 (µg/m^3) (Annual)**

AMBIENT AIR QUALITY MONITORING RESULTS

S.No.	Pollutants	AAQ - 13 J.B.Dyeing			AAQ – 14 Venus Costyn India Ltd			NAAQ Standards (2009)
		1st Round	2nd Round	3rd Round	1st Round	2nd Round	3rd Round	
		24.02.2014	26.02.2014	28.02.2014	04.02.2014	06.02.2014	08.02.2014	
I.	**Particulate Pollutants**							
1.	PM_{10} ($\mu g/m^3$)	108	127	94	156	177	148	**100 ($\mu g/m^3$)**
2	$PM_{2.5}$ ($\mu g/m^3$)	39	44	35	49	62	42	**60 ($\mu g/m^3$)**
3	Arsenic (ng/m^3)	1.4	<1	1.3	2.1	1.7	1.3	**06 (ng/m^3) (Annual)**
4	Nickel (ng/m^3)	4.8	5.6	6.7	3.1	5.3	6.5	**20 (ng/m^3) (Annual)**
5	Lead ($\mu g/m^3$)	0.08	0.12	0.15	0.07	0.09	0.04	**1.0($\mu g/m^3$) (24 hours)**
6	Benzo (a) Pyrene (ng/m^3)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**01 (ng/m^3) (Annual)**
II.	**Gaseous Pollutants**							
7	SO_2 ($\mu g/m^3$)	13.8	16.1	19.2	17.2	14.3	11.7	**80 ($\mu g/m^3$) (24 hours)**
8	NO_X ($\mu g/m^3$)	31.2	26.1	24.2	25.6	19.8	28.2	**80 ($\mu g/m^3$) (24 hours)**
9	NH_3 ($\mu g/m^3$)	15.4	16.2	11.8	17.8	14.5	16.9	**400 ($\mu g/m^3$) (24 hours)**
10	O_3 ($\mu g/m^3$)	5.4	6.7	5.9	5.2	6.5	6.1	**100 (8 hours) & 180 ($\mu g/m^3$) (1 hour)**
		14.7	16.9	13.2	18.4	19.1	15.7	
		5.6	7.2	6.1	6.9	5.7	8.9	
11	CO (mg/m^3)	< 2	< 2	< 2	< 2	< 2	< 2	**02 (8 hours) & 04 mg/m^3 (1 hour)**
		< 2	< 2	< 2	< 2	< 2	< 2	
		< 2	< 2	< 2	< 2	< 2	< 2	
12	Benzene ($\mu g/m^3$)	< 3	< 3	< 3	< 3	< 3	< 3	**05 ($\mu g/m^3$) (Annual)**

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME
LUDHIYANA – PUNJAB

AMBIENT AIR QUALITY MONITORING RESULTS

S.No.	Pollutants	AAQ – 15 SABER Paper Mill			NAAQ Standards (2009)
		1st Round	2nd Round	3rd Round	
		24.02.2014	26.02.2014	28.02.2014	
I.	**Particulate Pollutants**				
1.	PM_{10} (µg/m^3)	76	77	68	**100 (µg/m^3)**
2	$PM_{2.5}$ (µg/m^3)	32	29	37	**60 (µg/m^3)**
3	Arsenic (ng/m^3)	1.2	1.9	<1	**06 (ng/m^3) (Annual)**
4	Nickel (ng/m^3)	2.8	4.1	5.7	**20 (ng/m^3) (Annual)**
5	Lead (µg/m^3)	0.09	0.05	0.12	**1.0(µg/m^3) (24 hours)**
6	Benzo (a) Pyrene (ng/m^3)	< 0.5	< 0.5	< 0.5	**01 (ng/m^3) (Annual)**
II.	**Gaseous Pollutants**				
7	SO_2 (µg/m^3)	16.2	14.3	12.7	**80 (µg/m^3) (24 hours)**
8	NO_x (µg/m^3)	28.6	29.1	23.2	**80 (µg/m^3) (24 hours)**
9	NH_3 (µg/m^3)	10.3	15.8	12.4	**400 (µg/m^3) (24 hours)**
10	O_3 (µg/m^3)	5.9	6.1	5.1	**100 (8 hours) & 180 (µg/m^3) (1 hour)**
		16.2	18.6	19.3	
		6.3	6.8	5.7	
11	CO (mg/m^3)	< 2	< 2	< 2	**02 (8 hours) & 04 mg/m^3 (1 hour)**
		< 2	< 2	< 2	
		< 2	< 2	< 2	
12	Benzene (µg/m^3)	< 3	< 3	< 3	**05 (µg/m^3) (Annual)**

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

LUDHIYANA – PUNJAB

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 1 ; Sirhend Canal, near Gurthali Bridge			Test Method
			1st Round 18.02.2014	2nd Round 20.02.2014	3rd Round 22.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	5	5	5	IS 3025: Part 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.72	8.05	7.99	IS 3025: Part – 11
2	E C	µS/cm	252	247	244	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part 39
4	Suspended Solids	mg/l	12	14	14	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	6.1	5.9	5.8	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	14	18	20	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	3	4	4	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	0.90	0.68	0.68	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	0.90	0.68	0.68	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.30	0.30	0.30	IS 3025: Part – 60
15	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 29
16	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 P.D
17	Sodium Absorption Ratio (SAR)	-	0.32	0.29	0.27	By Calculation
18	Total Coliforms	MPN/100ml	220	280	240	IS 1622
19	Fecal Coliforms	MPN/100ml	60	70	50	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.01	0.01	0.01	IS 3025: Part 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.09	0.11	0.10	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

LUDHIYANA – PUNJAB

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 2 : Abhor Canal			Test Method
			1st Round 18.02.2014	2nd Round 20.02.2014	3rd Round 22.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	5	5	5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.84	7.74	7.67	IS 3025: Part – 11
2	E C	µS/cm	275	246	252	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	14	12	12	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	5.6	5.7	5.8	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	18	12	16	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	4	3	4	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	0.34	0.45	0.34	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	0.34	0.45	0.34	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 - NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.30	0.30	0.30	IS 3025: Part – 60
15	Sulphides as S	mg/l	<0.1	<0.1	<0.1	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	0.24	0.21	0.19	By Calculation
18	Total Coliforms	MPN/100ml	330	270	340	IS 1622
19	Fecal Coliforms	MPN/100ml	170	120	130	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	1.4	1.4	1.7	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	1.0	1.1	1.4	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.01	0.01	0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.01	0.01	0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.10	0.09	0.10	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

LUDHIYANA – PUNJAB

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 3 : Sirhend Canal, near neelom Bridge			Test Method
			1st Round 18.02.2014	2nd Round 20.02.2014	3rd Round 22.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	10	10	10	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part - 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.39	7.55	7.50	IS 3025: Part - 11
2	E C	µS/cm	251	282	264	IS 3025: Part - 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	14	18	20	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	6.1	5.8	6.0	IS 3025: Part 38
6	Chemical Oxygen Demand	mg/l	16	20	16	IS 3025: Part 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	4	5	4	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	0.01	0.01	0.01	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	0.90	1.13	0.79	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	0.91	1.14	0.80	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part 27
14	Fluoride as F	mg/l	0.40	0.40	0.40	IS 3025: Part – 60
15	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part - 29
16	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	0.41	0.44	0.42	By Calculation
18	Total Coliforms	MPN/100ml	140	170	120	IS 1622
19	Fecal Coliforms	MPN/100ml	11	14	9	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.07	0.08	0.06	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.01	0.02	0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.14	0.12	0.13	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

LUDHIYANA – PUNJAB

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 4 : Buddha Nallah near Kumbhkala village			Test Method
			1st Round 18.02.2014	2nd Round 20.02.2014	3rd Round 22.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Pale Yellow	Pale Yellow	Pale Yellow	-
2	Colour (Hazen Units)	-	10	10	10	IS 3025: Part 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.18	7.91	7.54	IS 3025: Part – 11
2	E C	µS/cm	542	596	563	IS 3025: Part – 14
3	Oil & Grease	mg/l	1	1	1	IS 3025: Part – 39
4	Suspended Solids	mg/l	16	20	22	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	5.2	5.4	5.1	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	22	18	24	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	4	4	5	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	0.01	0.01	0.01	APHA 4500 NO_2.B
9	Nitrate-Nitrogen as N	mg/l	2.48	3.16	2.71	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	2.49	3.17	2.72	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.40	0.40	0.50	IS 3025: Part 60
15	Sulphides as S	mg/l	0.2	0.3	0.3	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	0.18	0.24	0.16	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	0.59	0.67	0.62	By Calculation
18	Total Coliforms	MPN/100ml	900	700	1100	IS 1622
19	Fecal Coliforms	MPN/100ml	170	140	210	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	0.26	0.32	0.25	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	1.8	1.7	2.0	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	1.4	1.3	1.5	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.03	0.02	0.02	APHA 3111 B
19	Iron as Fe	mg/l	0.18	0.16	0.15	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.15	0.16	0.18	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

LUDHIYANA – PUNJAB

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 5 : Satluj River Up Stream, near kasabad			Test Method
			1st Round 24.02.2014	2nd Round 26.02.2014	3rd Round 28.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	10	10	10	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.94	7.56	7.78	IS 3025: Part 11
2	E C	µS/cm	272	289	326	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	12	14	12	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	5.7	5.9	5.9	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	24	16	18	IS 3025: Part 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	4	3	3	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	0.01	0.01	0.01	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	0.45	0.34	0.45	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	0.46	0.35	0.46	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part 27
14	Fluoride as F	mg/l	0.40	0.40	0.40	IS 3025: Part – 60
15	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	0.12	0.13	0.18	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	0.42	0.48	0.57	By Calculation
18	Total Coliforms	MPN/100ml	90	70	60	IS 1622
19	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	0.16	0.18	0.25	APHA 4500 P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 - NH_4
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.01	0.01	0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.01	0.01	0.01	APHA 3111 B
19	Iron as Fe	mg/l	0.16	0.18	0.15	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

LUDHIYANA – PUNJAB

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 6 : 111MLD STP Outlet, Bhattain			Test Method
			1st Round 24.02.2014	2nd Round 26.02.2014	3rd Round 28.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Light brown	Light brown	Light brown	-
2	Colour (Hazen Units)	-	20	25	25	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.10	7.61	7.42	IS 3025: Part – 11
2	E C	µS/cm	1420	1490	1450	IS 3025: Part 14
3	Oil & Grease	mg/l	1	1	1	IS 3025: Part – 39
4	Suspended Solids	mg/l	42	59	61	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	3.5	3.2	3.4	IS 3025: Part 38
6	Chemical Oxygen Demand	mg/l	58	64	54	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	13	15	12	IS 3025: Part 44
8	Nitrite-Nitrogen as N	mg/l	0.01	0.01	0.01	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	5.19	5.87	5.42	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2–NO_3)	mg/l	5.20	5.88	5.43	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part 27
14	Fluoride as F	mg/l	0.70	0.70	0.70	IS 3025: Part – 60
15	Sulphides as S	mg/l	0.3	0.4	0.3	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	1.8	2.10	1.90	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	4.62	4.97	4.88	By Calculation
18	Total Coliforms	MPN/100ml	1300	2200	1400	IS 1622
19	Fecal Coliforms	MPN/100ml	110	170	130	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	2.3	2.70	2.5	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	21	25	23	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	14	17	15	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.09	0.09	0.08	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part - 48
18	Manganese as Mn	mg/l	0.05	0.06	0.05	APHA 3111 – B
19	Iron as Fe	mg/l	0.32	0.35	0.29	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.20	0.25	0.21	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

LUDHIYANA – PUNJAB

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 7 : Satluj River Down Stream, Left Bank after confluxion			Test Method
			1st Round 24.02.2014	2nd Round 26.02.2014	3rd Round 28.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Light Brown	Light Brown	Light Brown	-
2	Colour (Hazen Units)	-	10	10	10	IS 3025; Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part - 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.58	7.76	7.81	IS 3025: Part 11
2	E C	µS/cm	264	282	243	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	18	24	15	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	5.2	5.0	5.3	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	24	28	22	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	5	6	5	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	0.01	0.01	0.01	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	0.79	0.90	0.68	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2–NO_3)	mg/l	0.80	0.91	0.69	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part 27
14	Fluoride as F	mg/l	0.50	0.50	0.50	IS 3025: Part – 60
15	Sulphides as S	mg/l	0.2	0.2	0.2	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	1.3	1.1	1.0	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	0.65	0.79	0.61	By Calculation
18	Total Coliforms	MPN/100ml	900	1100	700	IS 1622
19	Fecal Coliforms	MPN/100ml	70	90	60	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	1.7	1.6	1.5	APHA 4500 P.D
2	Total Kjeldal Nitrogen	mg/l	2.4	2.8	2.1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	1.70	2.0	1.4	APHA 4500 NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part - 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.02	0.02	0.02	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 48
18	Manganese as Mn	mg/l	0.02	0.02	0.02	APHA 3111 B
19	Iron as Fe	mg/l	0.24	0.26	0.21	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.14	0.12	0.14	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

LUDHIYANA – PUNJAB

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 8 : Sutluj River Down Stream, Right Bank after confluision			Test Method
			1st Round 24.02.2014	2nd Round 26.02.2014	3rd Round 28.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Light Brown	Light Brown	Light Brown	-
2	Colour (Hazen Units)	-	10	10	10	IS 3025: Part 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.54	7.81	7.69	IS 3025: Part – 11
2	E C	µS/cm	262	270	290	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	18	22	20	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	4.5	4.8	4.6	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	34	30	36	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	8	7	8	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	0.01	0.01	0.01	APHA 4500 NO_2.B
9	Nitrate-Nitrogen as N	mg/l	0.68	0.79	0.68	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	0.69	0.80	0.69	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.60	0.60	0.60	IS 3025: Part – 60
15	Sulphides as S	mg/l	0.3	0.3	0.3	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	1.6	1.8	1.5	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	0.66	0.65	0.73	By Calculation
18	Total Coliforms	MPN/100ml	1100	900	1400	IS 1622
19	Fecal Coliforms	MPN/100ml	90	90	110	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	2.0	2.3	1.9	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	3.5	2.8	3.1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	2.8	2.1	2.5	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.01	0.01	0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr6	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.02	0.02	0.02	APHA 3111 B
19	Iron as Fe	mg/l	0.24	0.23	0.21	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.15	0.18	0.16	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

LUDHIYANA – PUNJAB

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 9 : STP Outlet, Balloke			Test Method
			1st Round 24.02.2014	2nd Round 26.02.2014	3rd Round 28.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Light brown	Light brown	Light brown	-
2	Colour (Hazen Units)	-	20	20	15	IS 3025: Part – 4
3	Odour (Smell)	-	Un Agreeable	Un Agreeable	Un Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.75	7.68	8.02	IS 3025: Part – 11
2	E C	µS/cm	916	988	934	IS 3025: Part – 14
3	Oil & Grease	mg/l	2	2	2	IS 3025: Part – 39
4	Suspended Solids	mg/l	64	78	68	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	3.0	2.8	2.7	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	58	50	64	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	14	12	15	IS 3025: Part 44
8	Nitrite-Nitrogen as N	mg/l	0.01	0.01	0.01	APHA 4500 NO_2.B
9	Nitrate-Nitrogen as N	mg/l	4.52	5.19	4.74	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	4.53	5.20	4.75	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.60	0.70	0.60	IS 3025: Part - 60
15	Sulphides as S	mg/l	0.4	0.3	0.3	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	1.8	2.2	2.1	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	2.01	2.20	2.14	By Calculation
18	Total Coliforms	MPN/100ml	2800	5000	3500	IS 1622
19	Fecal Coliforms	MPN/100ml	1300	1700	1400	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	2.3	2.8	2.6	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	16	15	17	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	11	10	12	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part - 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.05	0.04	0.05	IS 3025: Part – 49
10	Nickel as Ni	mg/l	0.01	0.02	0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.05	0.05	0.04	APHA 3111 – B
19	Iron as Fe	mg/l	0.78	0.91	0.72	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 56
22	Boron as B	mg/l	0.36	0.32	0.38	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

LUDHIYANA – PUNJAB

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 10 : Buddha Nallah near Baliapur			Test Method
			1st Round 24.02.2014	2nd Round 26.02.2014	3rd Round 28.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Blackish	Blackish	Blackish	-
2	Colour (Hazen Units)	-	40	50	50	IS 3025: Part – 4
3	Odour (Smell)	-	Un Agreeable	Un Agreeable	Un Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	6.98	7.20	7.06	IS 3025: Part – 11
2	E C	µS/cm	784	812	869	IS 3025: Part – 14
3	Oil & Grease	mg/l	4	4	4	IS 3025: Part - 39
4	Suspended Solids	mg/l	82	96	104	IS 3025: Part 17
5	Dissolved Oxygen	mg/l	< 1	< 1	< 1	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	156	178	182	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	42	48	50	IS 3025: Part - 44
8	Nitrite-Nitrogen as N	mg/l	0.02	0.02	0.02	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	1.35	1.81	2.26	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	1.37	1.83	2.28	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.70	0.60	0.70	IS 3025: Part – 60
15	Sulphides as S	mg/l	1.4	1.6	1.9	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	1.6	1.4	1.8	APHA 4500 - P.D
17	Sodium Absorption Ratio (SAR)	-	2.73	2.92	3.08	By Calculation
18	Total Coliforms	MPN/100ml	1100	1300	1400	IS 1622
19	Fecal Coliforms	MPN/100ml	500	800	900	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	2.0	1.9	2.2	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	23	25	27	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	15	16	18	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.01	0.01	0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.05	0.06	0.05	APHA 3111 – B
19	Iron as Fe	mg/l	0.52	0.65	068	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 56
22	Boron as B	mg/l	0.16	0.20	0.27	IS 3025: Part – 57

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 11 ; Satluj River Up Steam left bank, near ballapur			Test Method
			1st Round 24.02.2014	2nd Round 26.02.2014	3rd Round 28.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	5	5	5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.54	8.03	7.69	IS 3025: Part 11
2	E C	µS/cm	268	260	296	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	12	14	14	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	5.8	5.9	5.7	IS 3025: Part 38
6	Chemical Oxygen Demand	mg/l	12	14	16	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	3	4	4	IS 3025: Part 44
8	Nitrite-Nitrogen as N	mg/l	0.01	0.01	0.01	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	1.58	1.47	1.92	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	1.59	1.48	1.93	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.40	0.40	0.40	IS 3025: Part – 60
15	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	0.26	0.22	0.34	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	0.72	0.69	0.83	By Calculation
18	Total Coliforms	MPN/100ml	700	900	1100	IS 1622
19	Fecal Coliforms	MPN/100ml	140	170	210	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	0.34	0.38	0.42	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	1.8	2.1	2.0	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	1.4	1.7	1.4	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.01	0.01	0.01	APHA 3111 - B
19	Iron as Fe	mg/l	0.12	0.13	0.18	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 56
22	Boron as B	mg/l	0.14	0.16	0.15	IS 3025: Part – 57

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 12 : Satluj River Up Steam Right bank, near baliapur			Test Method
			1st Round 24.02.2014	2nd Round 26.02.2014	3rd Round 28.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	5	5	5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.04	7.20	7.15	IS 3025: Part – 11
2	E C	µS/cm	266	281	254	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part - 39
4	Suspended Solids	mg/l	12	14	12	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	5.5	5.2	5.4	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	14	18	12	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	3	4	3	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	1.13	1.02	1.47	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2–NO_3)	mg/l	1.13	1.02	1.47	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.50	0.50	0.40	IS 3025: Part – 60
15	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 29
16	Dissolved Phosphates as P	mg/l	0.22	0.24	0.20	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	0.70	0.74	0.68	By Calculation
18	Total Coliforms	MPN/100ml	1300	1700	1400	IS 1622
19	Fecal Coliforms	MPN/100ml	170	260	220	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	0.28	0.32	0.26	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	1.7	2.1	1.4	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	1.1	1.4	1.0	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.01	0.01	0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.13	0.15	0.12	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 56
22	Boron as B	mg/l	0.14	0.15	0.13	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

LUDHIYANA – PUNJAB

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 13 : Satluj River Down Steam left bank, near baliapur			Test Method
			1st Round 24.02.2014	2nd Round 26.02.2014	3rd Round 28.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Greyish	Greyish	Greyish	-
2	Colour (Hazen Units)	-	30	40	40	IS 3025: Part – 4
3	Odour (Smell)	-	Un Agreeable	Un Agreeable	Un Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.30	7.39	7.64	IS 3025: Part – 11
2	E C	µS/cm	685	694	752	IS 3025: Part – 14
3	Oil & Grease	mg/l	3	3	3	IS 3025: Part – 39
4	Suspended Solids	mg/l	68	52	84	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	2.8	2.6	2.6	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	96	108	120	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	25	30	34	IS 3025: Part - 44
8	Nitrite-Nitrogen as N	mg/l	0.02	0.02	0.02	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	1.35	1.58	1.92	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	1.37	1.60	1.94	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part 27
14	Fluoride as F	mg/l	0.70	0.70	0.70	IS 3025: Part – 60
15	Sulphides as S	mg/l	1.8	1.6	1.8	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	2.0	2.1	2.0	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	1.41	1.69	1.84	By Calculation
18	Total Coliforms	MPN/100ml	2200	2400	2800	IS 1622
19	Fecal Coliforms	MPN/100ml	600	800	900	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	2.6	2.9	2.9	APHA 4500 P.D
2	Total Kjeldal Nitrogen	mg/l	19	21	23	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	12	14	16	APHA 4500 NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.01	0.01	0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.04	0.04	0.03	APHA 3111 B
19	Iron as Fe	mg/l	0.42	0.45	0.48	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 - D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 56
22	Boron as B	mg/l	0.12	0.15	0.16	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

LUDHIYANA – PUNJAB

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 14 : Satluj River near sindhvabet			Test Method
			1st Round 24.02.2014	2nd Round 26.02.2014	3rd Round 28.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	5	5	5	IS 3025: Part 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.83	7.75	7.68	IS 3025: Part – 11
2	E C	µS/cm	267	245	254	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	12	14	12	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	5.8	5.4	5.5	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	14	18	16	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	3	4	4	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 NO_2.B
9	Nitrate-Nitrogen as N	mg/l	0.45	0.34	0.34	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	0.45	0.34	0.34	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.40	0.40	0.40	IS 3025: Part – 60
15	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	0.16	0.14	0.20	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	0.64	0.62	0.59	By Calculation
18	Total Coliforms	MPN/100ml	400	600	700	IS 1622
19	Fecal Coliforms	MPN/100ml	27	34	40	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	0.20	0.19	0.26	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	2.4	2.8	3.4	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	1.8	2.1	2.5	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 48
18	Manganese as Mn	mg/l	0.01	0.01	0.01	APHA 3111 - B
19	Iron as Fe	mg/l	0.08	0.10	0.09	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 - D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

LUDHIYANA – PUNJAB

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 15 : CETP Outlet (RO Permeat)			Test Method
			1st Round 25.02.2014	2nd Round 27.02.2014	3rd Round 01.03.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	5	5	5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.70	7.68	7.86	IS 3025: Part – 11
2	E C	µS/cm	592	637	609	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part - 39
4	Suspended Solids	mg/l	12	16	14	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	5.8	5.6	5.9	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	12	16	14	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	2	3	2	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	1.35	1.24	1.13	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2 · NO_3)	mg/l	1.35	1.24	1.13	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part - 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.50	0.50	0.50	IS 3025: Part - 60
15	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part - 29
16	Dissolved Phosphates as P	mg/l	0.23	0.18	0.20	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	0.84	0.78	0.92	By Calculation
18	Total Coliforms	MPN/100ml	12	9	11	IS 1622
19	Fecal Coliforms	MPN/100ml	<2	<2	<2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	0.29	0.24	0.26	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	<1	<1	<1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4 / NH_3)-Nitrogen	mg/l	<1	<1	<1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.01	0.01	0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.08	0.09	0.08	IS 3025: Part 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.26	0.28	0.23	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

LUDHIYANA – PUNJAB

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 1 : Jackson Auto Engg, Jalandhar Bypass , GT Road			Test Method
			1st Round 05.02.2014	2nd Round 07.02.2014	3rd Round 09.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.60	7.83	7.40	IS 3025: Part – 11
2	E C	µS/cm	632	602	620	IS 3025: Part 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	6	4	4	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	1.81	1.69	1.81	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	1.81	1.69	1.81	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.40	0.40	0.40	IS 3025: Part 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	0.86	0.81	0.80	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr6	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.07	0.07	0.06	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.12	0.11	0.11	IS 3025: Part - 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

LUDHIYANA – PUNJAB

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 2 : Old Sewing Machine, Gill Road			Test Method
			1st Round 05.02.2014	2nd Round 07.02.2014	3rd Round 09.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.75	7.86	7.63	IS 3025: Part – 11
2	E C	µS/cm	416	425	412	IS 3025: Part - 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	4	4	4	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	0.01	0.01	0.01	APHA 4500 – NO_2-B
8	Nitrate-Nitrogen as N	mg/l	2.60	2.93	2.71	APHA 4500 NO_3-B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	2.61	2.94	2.72	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.50	0.50	0.50	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 P.D
16	Sodium Absorption Ratio (SAR)	-	0.89	0.95	0.83	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 42
12	Hexavalent Chromium as Cr6	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.06	0.07	0.06	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 57

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 3 : Dashmesh Nagar, Galli No-12, Near Gurudwara			Test Method
			1st Round 05.02.2014	2nd Round 07.02.2014	3rd Round 09.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.78	7.92	7.80	IS 3025: Part – 11
2	E C	µS/cm	712	690	704	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	6	4	6	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	4.29	4.06	4.29	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	4.29	4.06	4.29	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.40	0.40	0.40	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	0.80	0.75	0.82	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_3–NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part - 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.01	0.02	0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.07	0.08	0.07	IS 3025: Part - 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 56
22	Boron as B	mg/l	0.15	0.13	0.12	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

LUDHIYANA – PUNJAB

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 4 : TSSM Sr.Sec School, Shimlapuri			Test Method
			1st Round 05.02.2014	2nd Round 07.02.2014	3rd Round 09.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.54	7.70	7.40	IS 3025: Part – 11
2	E C	µS/cm	1290	1280	1240	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	6	6	6	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	4.97	4.74	4.74	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	4.97	4.74	4.74	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.60	0.60	0.60	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	1.92	1.87	1.81	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.03	0.02	0.03	APHA 3111 – B
19	Iron as Fe	mg/l	0.11	0.10	0.12	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.21	0.19	0.18	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

LUDHIYANA – PUNJAB

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 5 : PS. Focal Point, Commissioner ate Police			Test Method
			1st Round 11.02.2014	2nd Round 13.02.2014	3rd Round 15.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.65	7.70	7.54	IS 3025: Part 11
2	E.C	µS/cm	531	550	562	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part - 17
5	Chemical Oxygen Demand	mg/l	4	6	4	IS 3025: Part 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part - 44
7	Nitrite-Nitrogen as N	mg/l	0.02	0.02	0.02	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	2.48	2.71	2.93	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2--NO_3)	mg/l	2.50	2.73	2.95	APHA 4500 N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.40	0.40	0.40	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	0.88	0.86	0.92	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 · P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 · NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.06	0.06	0.07	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.16	0.13	0.15	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

LUDHIYANA – PUNJAB

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 6 : Jamalpur metro Road, Tubewell No-4			Test Method
			1st Round 11.02.2014	2nd Round 13.02.2014	3rd Round 15.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.63	7.78	7.69	IS 3025: Part – 11
2	E C	µS/cm	1620	1600	1610	IS 3025: Part 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part.– 17
5	Chemical Oxygen Demand	mg/l	6	6	6	IS 3025: Part.– 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part.– 44
7	Nitrite-Nitrogen as N	mg/l	0.01	0.01	0.01	APHA 4500 NO_2.B
8	Nitrate-Nitrogen as N	mg/l	3.16	2.93	2.93	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2 NO_3)	mg/l	3.17	2.94	2.94	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part - 27
13	Fluoride as F	mg/l	0.70	0.70	0.70	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 P.D
16	Sodium Absorption Ratio (SAR)	-	2.05	1.91	2.08	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 - Norg. B
3	Total Ammonia (NH_4 NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part - 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCI	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.09	0.08	0.09	IS 3025: Part 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.19	0.18	0.20	IS 3025: Part - 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

LUDHIYANA – PUNJAB

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 7 : Handpump near Makhan Dhaba, near Radha Soami Satsang			Test Method
			1st Round 11.02.2014	2nd Round 13.02.2014	3rd Round 15.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.58	7.52	7.31	IS 3025: Part – 11
2	E.C	µS/cm	1180	1150	1190	IS 3025: Part- 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	6	6	6	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	0.01	0.01	0.01	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	7.90	7.45	7.90	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2–NO_3)	mg/l	7.91	7.46	7.91	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.70	0.70	0.70	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	2.99	2.87	3.13	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)- Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.10	0.09	0.10	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 56
22	Boron as B	mg/l	0.18	0.15	0.19	IS 3025: Part – 57

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 8 : Dairy Complex, Tajpur Road			Test Method
			1st Round 11.02.2014	2nd Round 13.02.2014	3rd Round 15.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.32	7.46	7.39	IS 3025: Part – 11
2	E.C	µS/cm	256	259	258	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part 39
4	Suspended Solids	mg/l	12	14	14	IS 3025: Part 17
5	Chemical Oxygen Demand	mg/l	4	6	6	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	0.68	0.56	0.68	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2–NO_3)	mg/l	0.68	0.56	0.68	APHA 4500 N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part 27
13	Fluoride as F	mg/l	0.30	0.30	0.30	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	0.82	0.91	0.86	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 - P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 B
19	Iron as Fe	mg/l	0.05	0.06	0.06	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

LUDHIYANA – PUNJAB

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 9 : Shahi Mohalla Gol Market, Domeria			Test Method
			1st Round 18.02.2014	2nd Round 20.02.2014	3rd Round 22.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.38	7.55	7.66	IS 3025: Part – 11
2	E C	µS/cm	986	960	942	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	6	6	4	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	4.06	3.84	3.84	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	4.06	3.84	3.84	APHA 4500–N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.50	0.50	0.50	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 - P.D
16	Sodium Absorption Ratio (SAR)	-	1.47	1.52	1.34	By Calculation
17	Total Coliforms	MPN/100ml	14	17	12	IS 1622
18	Fecal Coliforms	MPN/100ml	2	2	2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4 NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.02	0.02	0.02	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.08	0.08	0.07	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.12	0.12	0.10	IS 3025: Part – 57

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 10 : Police station, Division-6			Test Method
			1st Round 18.02.2014	2nd Round 20.02.2014	3rd Round 22.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.30	7.48	7.35	IS 3025: Part – 11
2	E C	µS/cm	836	847	820	IS 3025: Part 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	6	6	4	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	0.02	0.01	0.01	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	7.0	7.22	6.55	APHA 4500 NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	7.02	7.23	6.56	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.50	0.50	0.50	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 P.D
16	Sodium Absorption Ratio (SAR)	-	1.38	1.53	1.26	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 Norg. B
3	Total Ammonia (NH_3+NH_4)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.06	0.07	0.06	IS 3025: Part 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.01	0.01	0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.10	0.09	0.10	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.12	0.10	0.11	IS 3025: Part – 57

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 11 : Hero cycles, near Petrol Pump			Test Method
			1st Round 18.02.2014	2nd Round 20.02.2014	3rd Round 22.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.84	7.52	7.71	IS 3025: Part 11
2	E C	µS/cm	694	648	660	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part - 17
5	Chemical Oxygen Demand	mg/l	8	6	6	IS 3025: Part 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part - 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	7.0	7.22	7.68	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	7.0	7.22	7.68	APHA 4500 N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.60	0.60	0.60	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	2.41	2.54	2.32	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.09	0.08	0.08	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 - D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.72	0.84	0.76	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

LUDHIYANA – PUNJAB

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 12 : Hand Pump Near Neelom Bridge			Test Method
			1st Round 18.02.2014	2nd Round 20.02.2014	3rd Round 22.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.82	7.49	7.58	IS 3025: Part – 11
2	E.C.	µS/cm	192	216	189	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part 17
5	Chemical Oxygen Demand	mg/l	4	4	4	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	0.68	0.90	0.79	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	0.68	0.90	0.79	APHA 4500 -N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part 27
13	Fluoride as F	mg/l	0.30	0.30	0.30	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	0.38	0.42	0.39	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 B
19	Iron as Fe	mg/l	0.08	0.08	0.09	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

LUDHIYANA – PUNJAB

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 13 : Punjab Agricultural University			Test Method
			1st Round 25.02.2014	2nd Round 27.02.2014	3rd Round 01.03.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.29	7.52	7.30	IS 3025: Part – 11
2	E C	µS/cm	1030	1010	1040	IS 3025: Part - 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	6	4	6	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part - 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	5.87	5.42	5.87	APHA 4500 NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	5.87	5.42	5.87	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.70	0.70	0.70	IS 3025: Part - 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	1.72	1.67	1.84	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4–NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.01	0.01	0.02	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.01	0.01	0.01	APHA 3111 - B
19	Iron as Fe	mg/l	0.10	0.09	0.10	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 56
22	Boron as B	mg/l	0.14	0.13	0.15	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

LUDHIYANA – PUNJAB

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 14 : Dairy Complex, Baldar Singh			Test Method
			1st Round 25.02.2014	2nd Round 27.02.2014	3rd Round 01.03.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.64	7.27	7.60	IS 3025: Part – 11
2	E C	µS/cm	984	990	956	IS 3025: Part 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	6	6	4	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	3.84	4.06	3.84	APHA 4500 NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	3.84	4.06	3.84	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.60	0.60	0.60	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 P.D
16	Sodium Absorption Ratio (SAR)	-	1.76	1.88	1.64	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.02	0.02	0.02	IS 3025: Part 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.09	0.08	0.09	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.14	0.15	0.12	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

LUDHIYANA – PUNJAB

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 15 : Manav Vidhya Mandir Balipur kalam			Test Method
			1st Round 25.02.2014	2nd Round 27.02.2014	3rd Round 01.03.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part - 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.71	7.70	7.62	IS 3025: Part - 11
2	E C	µS/cm	712	727	724	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	4	4	4	IS 3025: Part 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_3.B
8	Nitrate-Nitrogen as N	mg/l	5.87	6.10	6.10	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen ($NO_2 \cdot NO_3$)	mg/l	5.87	6.10	6.10	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.70	0.70	0.70	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	1.46	1.52	1.40	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – N org. B
3	Total Ammonia (NH_4 / NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.02	0.02	0.02	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.01	0.01	0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.07	0.08	0.07	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.24	0.23	0.25	IS 3025: Part – 57

AMBIENT AIR MONITORING LOCATIONS PHOTOGRAPHS

AAQ-1, Hero Cycles

AAQ-2, Nova (Avon) Bicycle Industries Ltd

AAQ-3, Ubhi Enterprises

AAQ-4, Turbo Industries

AAQ-5, R.K. Machine & Tools

AAQ-6, Punjab Trade Centre

AAQ-7, Keerthi fosters

AAQ-8, Bais Scientific Dyers

AAQ-9, Ektha Dyeing

AAQ-10, Jindal Finishing

AAQ-11, Bandari Hosieries

AAQ-12, Venus Garments

AAQ-13, J.B.Dyeing

AAQ-14, Venus Costyn India Ltd

AAQ-15, SABER Paper Mill

SAMPLING LOCATION PHOTOGRAPHS OF SURFACE WATER

SW-1, Sirhend Canal, near Gurthali Bridge

SW-2, Abhor Canal

SW-3, Sirhend Canal, near neelom Bridge

SW-4, Buddha Nallah near Kumbhkala village

SW-5, Satluj River Up Stream, near kasabad

SW-6, 111MLD STP Outlet, Bhattain

SW-7, Satluj River Down Stream, Left Bank after conflusion

SW-8, Satluj River Down Stream, Right Bank after conflusion

SW-9, STP Outlet, Balloke

SW-10, Buddha Nallah near Baliapur

SW-11, Satluj River Up Steam left bank, near baliapur

SW-12, Satluj River Up Steam Right bank, near baliapur

SW-13, Satluj River Down Steam left bank, near baliapur

SW-14, Satluj River near sindhvabet

SW-15, CETP Outlet (RO Permeat)

SAMPLING LOCATION PHOTOGRAPHS OF GROUND WATER

GW-1, Jackson Auto Engg, Jalandhar Bypass , GT Road

GW-2, Old Sewing Machine, Gill Road

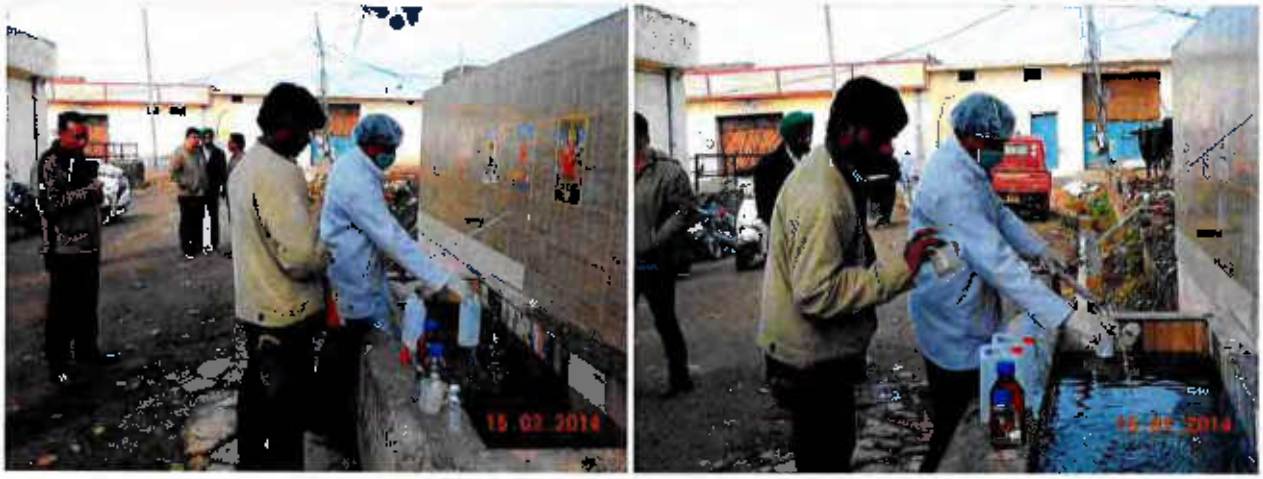
GW-3, Dashmesh Nagar, Galli No-12, Near Gurudwara

GW-4, TSSM Sr.Sec School, Shimlapuri

GW-5, PS. Focal Point, Commissioner ate Police

GW-6, Jamalpur metro Road, Tubewell No-4

GW-7, Handpump near Makhan Dhaba, near Radha Soami Satsang



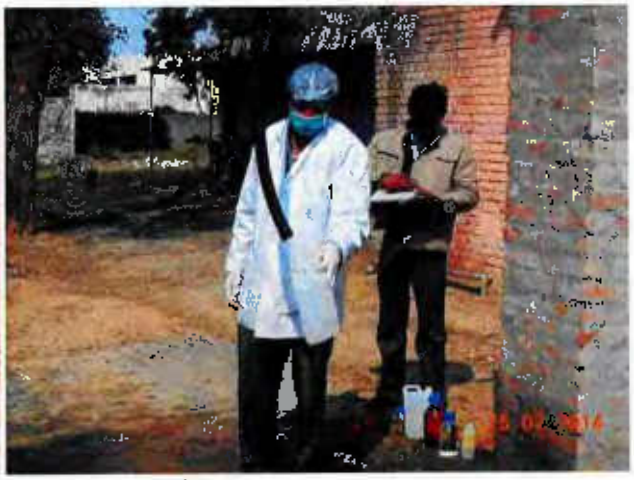
GW-8, Dairy Complex, Tajpur Road

GW-9, Shahi Mohalla Gol Market, Domeria

GW-10, Police station, Division-6

GW-11, Hero cycles, near Petrol Pump

GW-12, Hand Pump Near Neelom Bridge



GW-13, Punjab Agricultural University

GW-14, Dairy Complex, Baldar Singh

GW-15, Manav Vidhya Mandir Balipur kalam

MONITORING, SAMPLING AND ANALYSIS

of

AMBIENT AIR QUALITY, SURFACE WATER QUALITY AND GROUND WATER QUALITY

in

IDENTIFIED CRITICALLY POLLUTED AREA (CPAs)

PANIPAT

AAQ MONITORING LOCATIONS

SAMPLE CODE	NAME OF THE MONITORING LOCATION	DATE OF SAMPLING	LATTITUDE	LONGITUDE
AAQ – 1	Usha Works	1st Round: 23.01.2014 to 24.01.2014 2nd Round: 25.01.2014 to 26.01.2014 3rd Round: 27.01.2014 to 28.01.2014	N29°22'48.9''	E076°59'32.9''
AAQ – 2	Simran Exports	1st Round: 23.01.2014 to 24.01.2014 2nd Round: 25.01.2014 to 26.01.2014 3rd Round: 27.01.2014 to 28.01.2014	N29°22'07.1''	E076°59'03.5''
AAQ 3	Shiva shakthi exports	1st Round: 23.01.2014 to 24.01.2014 2nd Round: 25.01.2014 to 26.01.2014 3rd Round: 27.01.2014 to 28.01.2014	N29°18'40.0''	E076°59'49.7''
AAQ – 4	Golden Terry Towels ltd	1st Round: 23.01.2014 to 24.01.2014 2nd Round: 25.01.2014 to 26.01.2014 3rd Round: 27.01.2014 to 28.01.2014	N29°17'59.5''	E076°59'55.6''
AAQ – 5	Swastika exports	1st Round: 29.01.2014 to 30.01.2014 2nd Round: 31.01.2014 to 01.02.2014 3rd Round: 03.02.2014 to 04.02.2014	N29°23'03.0''	E076°58'24.3''
AAQ – 6	Kala Amb museum	1st Round: 29.01.2014 to 30.01.2014 2nd Round: 31.01.2014 to 01.02.2014 3rd Round: 03.02.2014 to 04.02.2014	N29°23'48.7''	E077°01'12.1''
AAQ – 7	Dabur Enterprises	1st Round: 29.01.2014 to 30.01.2014 2nd Round: 31.01.2014 to 01.02.2014 3rd Round: 03.02.2014 to 04.02.2014	N29°23'07.1''	E077°00'21.9''
AAQ 8	Devgiri Exports (ABC)	1st Round: 29.01.2014 to 30.01.2014 2nd Round: 31.01.2014 to 01.02.2014 3rd Round: 03.02.2014 to 04.02.2014	N29°27'17.9''	E076°58'02.6''
AAQ – 9	Lord Shiva	1st Round: 05.02.2014 to 06.02.2014 2nd Round: 07.02.2014 to 08.02.2014 3rd Round: 10.02.2014 to 11.02.2014	N29°25'52.9''	E076°58'19.4''
AAQ – 10	Mehak Spinning Mills	1st Round: 05.02.2014 to 06.02.2014 2nd Round: 07.02.2014 to 08.02.2014 3rd Round: 10.02.2014 to 11.02.2014	N29°26'01.6''	E076°59'53.2''
AAQ - 11	Kaushalya Spinning Mills	1st Round: 05.02.2014 to 06.02.2014 2nd Round: 07.02.2014 to 08.02.2014 3rd Round: 10.02.2014 to 11.02.2014	N29°24'50.1''	E076°58'54.6''
AAQ – 12	Ambica Textiles	1st Round: 05.02.2014 to 06.02.2014 2nd Round: 07.02.2014 to 08.02.2014 3rd Round: 10.02.2014 to 11.02.2014	N29°25'54.8''	E076°59'59.3''
AAQ – 13	Aggreshan Hospital	1st Round: 12.02.2014 to 13.02.2014 2nd Round: 14.02.2014 to 15.02.2014 3rd Round: 17.02.2014 to 18.02.2014	N29°23'57.5''	E076°58'31.0''
AAQ – 14	IOCL Refinery	1st Round: 12.02.2014 to 13.02.2014 2nd Round: 14.02.2014 to 15.02.2014 3rd Round: 17.02.2014 to 18.02.2014	N29°23'36.0''	E076°59'26.5''
AAQ – 15	Hans Spinning Mills	1st Round: 12.02.2014 to 13.02.2014 2nd Round: 14.02.2014 to 15.02.2014 3rd Round: 17.02.2014 to 18.02.2014	N29°22'40.3''	E077°02'36.7''
AAQ – 16	AKS Rugs	1st Round: 12.02.2014 to 13.02.2014 2nd Round: 14.02.2014 to 15.02.2014 3rd Round: 17.02.2014 to 18.02.2014	N29°21'03.1''	E076°59'13.0''

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME
PANIPAT – HARYANA

SAMPLE CODE	NAME OF THE MONITORING LOCATION	DATE OF SAMPLING	LATITUDE	LONGITUDE
AAQ – 17	Reveria Home	1st Round: 13.02.2014 to 14.02.2014 2nd Round: 15.02.2014 to 16.02.2014 3rd Round: 18.02.2014 to 19.02.2014	N29°22'17.7''	E076°58'20.2''
AAQ – 18	NFL Guest House	1st Round: 19.02.2014 to 20.02.2014 2nd Round: 21.02.2014 to 22.02.2014 3rd Round: 24.02.2014 to 25.02.2014	N29°23'07.6''	E076°57'56.7''
AAQ – 19	Next to R.S. Enterprises	1st Round: 20.02.2014 to 21.02.2014 2nd Round: 23.02.2014 to 24.02.2014 3rd Round: 25.02.2014 to 26.02.2014	N29°22'30.3''	E076°56'16.4''
AAQ 20	JA Woolen Pvt Ltd.	1st Round: 19.02.2014 to 20.02.2014 2nd Round: 21.02.2014 to 22.02.2014 3rd Round: 24.02.2014 to 25.02.2014	N29°24'06.4''	E076°56'49.2''
AAQ – 21	PK Industries Ltd.	1st Round: 19.02.2014 to 20.02.2014 2nd Round: 21.02.2014 to 22.02.2014 3rd Round: 24.02.2014 to 25.02.2014	N29°25'09.7''	E076°56'52.6''
AAQ – 22	Panipat Sugar Mill	1st Round: 19.02.2014 to 20.02.2014 2nd Round: 21.02.2014 to 22.02.2014 3rd Round: 24.02.2014 to 25.02.2014	N29°22'25.6''	E076°57'33.4''

SURFACE WATER SAMPLING LOCATIONS

SAMPLE CODE	NAME OF THE SAMPLING LOCATION	DATE OF SAMPLING (SHIFT- A & SHIFT- B)	LATITUDE	LONGITUDE
SW 1	Garunda drain	1st Round: 30.01.2014 2nd Round: 01.02.2014 3rd Round: 04.02.2014	N29°27'20.0''	E076°58'13.7''
SW 2	Panipat drain no.2	1st Round: 30.01.2014 2nd Round: 01.02.2014 3rd Round: 04.02.2014	N29°26'34.3''	E076°58'15.1''
SW – 3	Panipat drain no.1	1st Round: 13.02.2014 2nd Round: 16.02.2014 3rd Round: 18.02.2014	N29°23'39.0''	E076°59'26.8''
SW – 4	Yamuna River Down Stream	1st Round: 30.01.2014 2nd Round: 01.02.2014 3rd Round: 04.02.2014	N29°24'60.3''	E077°09'18.4''
SW - 5	Yamuna River Up Stream	1st Round: 30.01.2014 2nd Round: 01.02.2014 3rd Round: 04.02.2014	N29°24'58.2''	E077°18'24.2''
SW - 6	Panipat drain up stream near Chajjpur	1st Round: 30.01.2014 2nd Round: 01.02.2014 3rd Round: 04.02.2014	N29°22'55.5''	E077°04'00.6''
SW – 7	Panipat drain dowostream near Chajjpur	1st Round: 30.01.2014 2nd Round: 01.02.2014 3rd Round: 04.02.2014	N29°22'54.1''	E077°03'59.6''
SW – 8	Kala Amb pond near war memeorial	1st Round: 30.01.2014 2nd Round: 01.02.2014 3rd Round: 04.02.2014	N29°23'53.6''	E077°01'13.9''
SW – 9	Surface water Panipat canal gohana road	1st Round: 20.02.2014 2nd Round: 22.02.2014 3rd Round: 25.02.2014	N29°22'38.7''	E076°56'51.9''
SW 10	STP 10 MLD outlet	1st Round: 24.01.2014 2nd Round: 26.01.2014 3rd Round: 28.01.2014	N29°22'17.4''	E076°56'42.6''
SW – 11	STP 10 MLD inlet	1st Round: 24.01.2014 2nd Round: 26.01.2014 3rd Round: 28.01.2014	N29°22'16.1''	E076°56'36.1''
SW – 12	Surface water Panipat canal IOC munck Road	1st Round: 13.02.2014 2nd Round: 16.02.2014 3rd Round: 18.02.2014	N29°30.935'	E076°54.339'
SW – 13	STP 35 MLD inlet	1st Round: 24.01.2014 2nd Round: 26.01.2014 3rd Round: 28.01.2014	N29°20'06.6''	E076°59'36.5''
SW – 14	STP 35 MLD outlet	1st Round: 24.01.2014 2nd Round: 26.01.2014 3rd Round: 28.01.2014	N29°19'58.5''	E076°79'48.7''
SW – 15	CETP 21 MLD outlet	1st Round: 24.01.2014 2nd Round: 26.01.2014 3rd Round: 28.01.2014	N29°20'58.3''	E076°59'44.9''
SW – 16	CETP 21 MLD inlet	1st Round: 24.01.2014 2nd Round: 26.01.2014 3rd Round: 28.01.2014	N29°21'11.1''	E076°59'46.1''

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME
PANIPAT – HARYANA

SAMPLE CODE	NAME OF THE SAMPLING LOCATION	DATE OF SAMPLING (SHIFT- A & SHIFT- B)	LATITUDE	LONGITUDE
SW – 17	Panipat Drain Near Simla Gujran	1st Round: 24.01.2014 2nd Round: 26.01.2014 3rd Round: 28.01.2014	N29°19'12.0''	E077°03'31.3''
SW – 18	Main drain before mixing	1st Round: 24.01.2014 2nd Round: 26.01.2014 3rd Round: 28.01.2014	N29°16'26.1''	E077°07'28.7''
SW – 19	Main drain + Yamuna during mixing	1st Round: 24.01.2014 2nd Round: 26.01.2014 3rd Round: 28.01.2014	N29°16'25.4''	E077°07'29.1''
SW – 20	River Yamuna After mixing	1st Round: 24.01.2014 2nd Round: 26.01.2014 3rd Round: 28.01.2014	N29°16'13.7''	E077°07'34.4''

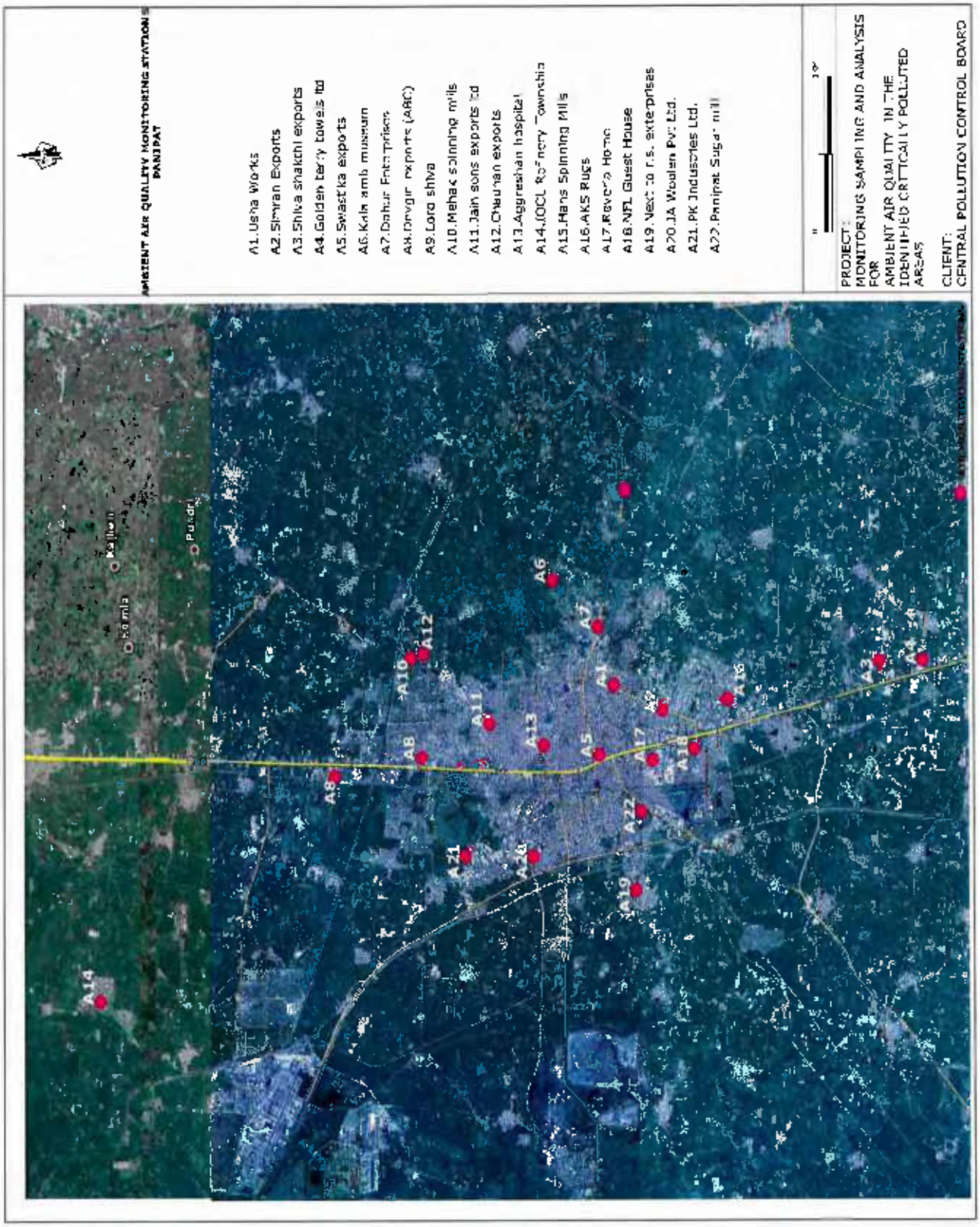
MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME
PANIPAT – HARYANA

GROUND WATER SAMPLING LOCATIONS

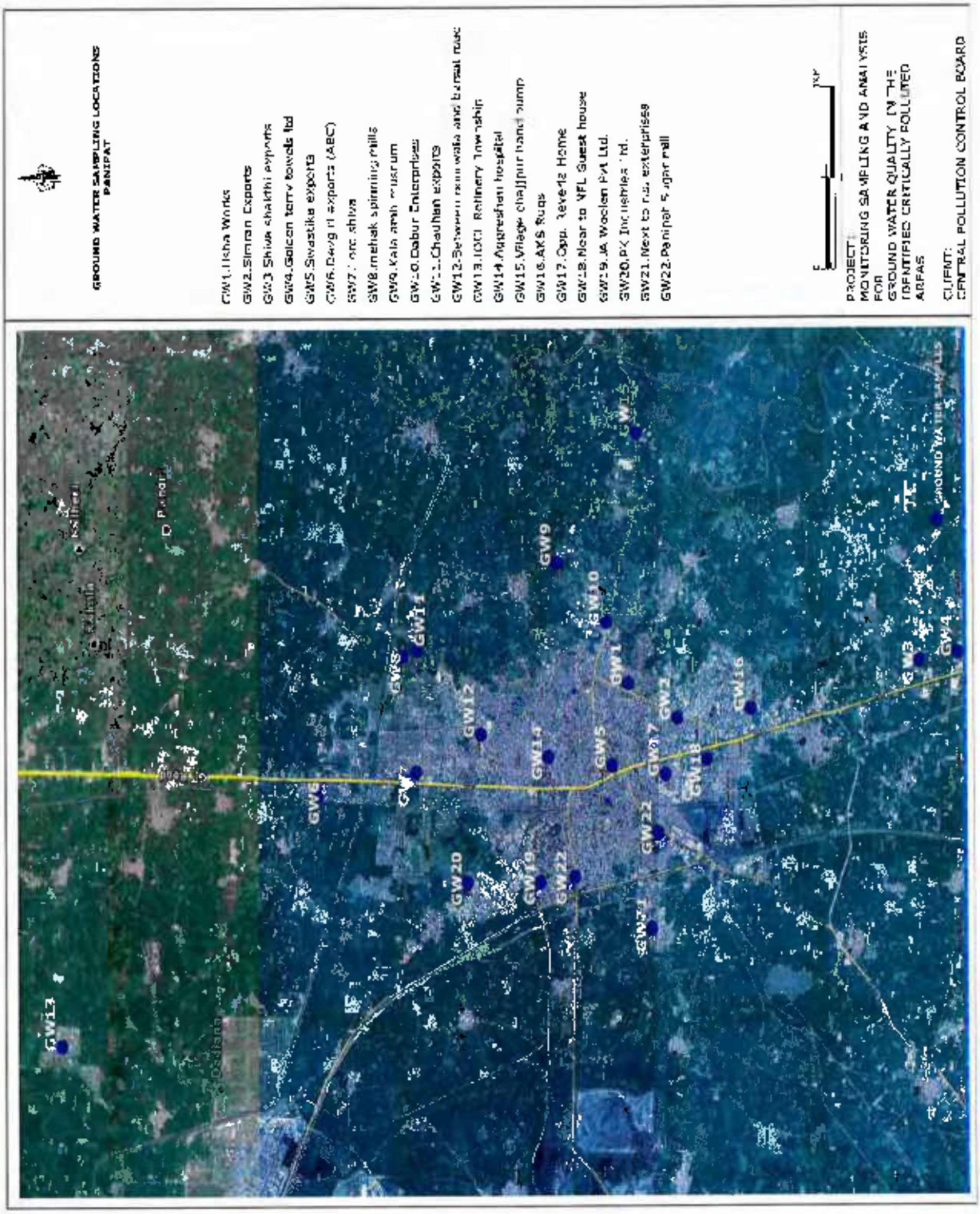
SAMPLE CODE	NAME OF THE SAMPLING LOCATION	DATE OF SAMPLING	LATITUDE	LONGITUDE
GW – 1	Usha Works	1st Round: 24.01.2014 2nd Round:26.01.2014 3rd Round: 28.01.2014	N29°22'06.2''	E076°59'30.1''
GW – 2	Simran Exports	1st Round: 23.01.2014 2nd Round:25.01.2014 3rd Round: 27.01.2014	N29°22'07.1''	E076°59'03.5''
GW – 3	Shiva shakthi exports	1st Round: 23.01.2014 2nd Round:25.01.2014 3rd Round: 27.01.2014	N29°18'40.0''	E076°59'49.7''
GW 4	Golden terry towels ltd	1st Round: 23.01.2014 2nd Round:25.01.2014 3rd Round: 27.01.2014	N29°17'59.5''	E076°59'55.6''
GW - 5	Swastika exports	1st Round: 29.01.2014 2nd Round:31.01.2014 3rd Round: 03.02.2014	N29°23'03.0''	E076°58'24.3''
GW - 6	Devgiri exports (ABC)	1st Round: 29.01.2014 2nd Round:31.01.2014 3rd Round: 03.02.2014	N29°27'17.9''	E076°58'02.0''
GW – 7	Lord shiva	1st Round: 06.02.2014 2nd Round:08.02.2014 3rd Round: 11.02.2014	N29°25'52.9''	E076°58'19.4''
GW – 8	Mehak spinning mills	1st Round: 06.02.2014 2nd Round:08.02.2014 3rd Round: 11.02.2014	N29°26'01.6''	E076°59'53.2''
GW – 9	Kala amb museum	1st Round: 29.01.2014 2nd Round:31.01.2014 3rd Round: 03.02.2014	N29°23'48.7''	E077°01'12.1''
GW – 10	Dabur Enterprises	1st Round: 29.01.2014 2nd Round:31.01.2014 3rd Round: 03.02.2014	N29°23'07.1''	E077°00'21.9''
GW – 11	Ambica textiles	1st Round: 06.02.2014 2nd Round:08.02.2014 3rd Round: 11.02.2014	N29°25'54.9''	E076°59'58.9''
GW – 12	Between noorwala and barsat road	1st Round: 06.02.2014 2nd Round:08.02.2014 3rd Round: 11.02.2014	N29°25'29.6''	E076°59'33.5''
GW – 13	IOCL refinery	1st Round: 13.02.2014 2nd Round:15.02.2014 3rd Round: 18.02.2014	N29°30.935'	E076°50.476'
GW – 14	Aggreshan hospital	1st Round: 13.02.2014 2nd Round:15.02.2014 3rd Round: 18.02.2014	N29°23'57.3''	E076°58'30.8''
GW - 15	Vilage chajjpur hand pump	1st Round: 13.02.2014 2nd Round:15.02.2014 3rd Round: 18.02.2014	N29°22.698'	E077°02.971'
GW - 16	AKS Rugs	1st Round: 13.02.2014 2nd Round:15.02.2014 3rd Round: 18.02.2014	N29°21'03.1''	E076°59'13.0''

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME
PANIPAT – HARYANA

SAMPLE CODE	NAME OF THE SAMPLING LOCATION	DATE OF SAMPLING	LATITUDE	LONGITUDE
GW – 17	Opp. Reveria Home	1st Round: 13.02.2014 2nd Round:15.02.2014 3rd Round: 18.02.2014	N29°22'17.7''	E076°58'20.2''
GW 18	Near to NFL Guest house	1st Round: 20.02.2014 2nd Round:22.02.2014 3rd Round: 25.02.2014	N29°21'38.6''	E076°58'35.5''
GW – 19	JA Woolen Pvt Ltd.	1st Round: 20.02.2014 2nd Round:22.02.2014 3rd Round: 25.02.2014	N29°24.096'	E076°56.839'
GW – 20	PK Industries Ltd.	1st Round: 20.02.2014 2nd Round:22.02.2014 3rd Round: 25.02.2014	N29°22.496'	E076°56.287'
GW - 21	Next to r.s. exterprises	1st Round: 20.02.2014 2nd Round:22.02.2014 3rd Round: 25.02.2014	N29°25.154'	E076°56.914'
GW – 22	Panipat Sugar mill	1st Round: 20.02.2014 2nd Round:22.02.2014 3rd Round: 25.02.2014	N29°22.424'	E076°57.569'


AMBIENT AIR QUALITY MONITORING STATIONS
PANIPAT
A1.Usha Works
A2.Simran Exports
A3.Shiva shakthi exports
A4.Golden terry towels ltd
A5.Swastika exports
A6.Kala amb museum
A7.Dahur Enterprises
A8.Devgiri exports (ABC)
A9.Lord shiva
A10.Mehak spinning mills
A11.Jain sons exports ltd
A12.Chauhan exports
A13.Aggreshan hospital
A14.IOCL Refinery Township
A15.Hans Spinning Mills
A16.AKS Rugs
A17.Revenue Home
A18.NFL Guest House
A19.Next to r.s. enterprises
A20.JA Woolen Pvt Ltd.
A21.PK Industries Ltd.
A22.Panipat Sugar mill
PROJECT:
MONITORING SAMPLING AND ANALYSIS FOR
AMBIENT AIR QUALITY IN THE IDENTIFIED CRITICALLY POLLUTED AREAS
CLIENT:
CENTRAL POLLUTION CONTROL BOARD
Kaithal
Pundri
Homla
A1
A3
A4
A5
A6
A7
A8
A10
A11
A12
A13
A14
A16
A17
A18
A19
A20
A21
A22

SURFACE WATER SAMPLING LOCATIONS
PANIPAT
SW1.Garunda drain
SW2.Panipat drain no.2
SW3.Panipat drain no.-
SW4.Yamuna River Down Stream
SW5.Yamuna River Up Stream
SW6.Panipat drain up stream near Chajpur
SW7.Panipat drain downstream near Chajpur
SW8.Kala Amb pond near war memorial
SW9.Surface water Panipat canal gohana road
SW10.STP 10 MLD outlet
SW11.STP 10 MLD inlet
SW12.Surface water Panipat canal IOC murak Road
SW13.STP 35 MLD inlet
SW14.STP 35 MLD outlet
SW15.CETP 21 MLD outlet
SW16.CETP 21 MLD inlet
SW17.Panipat Drain Near SimleGujran
SW18.Main drain before mixing
SW19.Main drain + Yamuna during mixing
SW20.River Yamuna After mixing
SW SURFACE WATER SAMPLING LOCATIONS
PROJECT:
MONITORING, SAMPLING AND ANALYSIS FOR SURFACE WATER QUALITY IN THE IDENTIFIED CRITICALLY POLLUTED AREAS IN PANIPAT
CLIENT:
CENTRAL POLLUTION CONTROL BOARD


GROUND WATER SAMPLING LOCATIONS
PANIPAT
GW1.Usha Works
GW2.Simran Exports
GW3.Shiva shakthi exports
GW4.Golcon terry towels ltd
GW5.Swastika exports
GW6.Garg oil exports (ABC)
GW7.Jai shiva
GW8.mehak spinning mills
GW9.Kala amb museum
GW10.Gabur Enterprises
GW11.Chauhan exports
GW12.Between rain water and borwell road
GW13.IOCL Refinery Township
GW14.Aggresfhan hospital
GW15.Village chaljpur hand pump
GW16.AKS Rugs
GW17.Opp. Revelz Home
GW18.Near to VFL Guest house
GW19.JA Woolen Pvt Ltd.
GW20.PK Industries Ltd.
GW21.Next to raj enterprises
GW22.Panipat Sugar mill
PROJECT:
MONITORING SAMPLING AND ANALYSIS FOR
GROUND WATER QUALITY IN THE IDENTIFIED CRITICALLY POLLUTED AREAS
CLIENT:
CENTRAL POLLUTION CONTROL BOARD
GW1
GW2
GW3
GW4
GW5
GW6
GW7
GW8
GW9
GW10
GW11
GW12
GW13
GW14
GW15
GW16
GW17
GW18
GW19
GW20
GW21
GW22

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

PANIPAT – HARYANA

AMBIENT AIR QUALITY MONITORING RESULTS

S.No.	Pollutants	AAQ – 1 Usha Works			AAQ 2 Simran Exports			NAAQ Standards (2009)
		1st Round	2nd Round	3rd Round	1st Round	2nd Round	3rd Round	
		23.01.2014	25.01.2014	27.01.2014	23.01.2014	25.01.2014	27.01.2014	
I.	**Particulate Pollutants**							
1.	PM_{10} (µg/m^3)	137	151	143	123	129	112	**100 (µg/m^3)**
2	$PM_{2.5}$ µg/m^3)	52	60	41	58	39	47	**60 (µg/m^3)**
3	Arsenic (ng/m^3)	1.5	1.9	5.1	1.8	2.4	1.7	**06 (ng/m^3) (Annual)**
4	Nickel (ng/m^3)	3.4	6.4	5.5	6.9	5.7	9.4	**20 (ng/m^3) (Annual)**
5	Lead (µg/m^3)	0.08	0.03	0.05	0.12	0.17	0.15	**1.0(µg/m^3) (24 hours)**
6	Benzo (a) Pyrene (ng/m^3)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**01 (ng/m^3) (Annual)**
II.	**Gaseous Pollutants**							
7	SO_2 (µg/m^3)	12.9	15.4	13.6	11.8	14.2	12.7	**80 (µg/m^3) (24 hours)**
8	NO_x (µg/m^3)	20.4	25.8	21.9	23.4	25.7	28.6	**80 (µg/m^3) (24 hours)**
9	NH_3 (µg/m^3)	26.9	29.4	30.5	18.5	16.9	17.5	**400 (µg/m^3) (24 hours)**
10	O_3 (µg/m^3)	6.4	6.9	8.4	8.5	7.6	9.5	**100 (8 hours) & 180 (µg/m^3) (1 hour)**
		18.7	19.4	21.6	21.2	18.9	19.7	
		6.4	5.9	9.8	6.2	5.7	8.1	
11	CO (mg/m^3)	< 2	< 2	< 2	< 2	< 2	< 2	**02 (8 hours) & 04 mg/m^3 (1 hour)**
		< 2	< 2	< 2	< 2	< 2	< 2	
		< 2	< 2	< 2	< 2	< 2	< 2	
12	Benzene (µg/m^3)	< 3	< 3	< 3	< 3	< 3	< 3	**05 (µg/m^3) (Annual)**

AMBIENT AIR QUALITY MONITORING RESULTS

S.No.	Pollutants	AAQ - 3 Shiva shakthi exports			AAQ – 4 Golden ferry towels ltd			NAAQ Standards (2009)
		1st Round	2nd Round	3rd Round	1st Round	2nd Round	3rd Round	
		23.01.2014	25.01.2014	27.01.2014	23.01.2014	25.01.2014	27.01.2014	
I.	**Particulate Pollutants**							
1.	PM_{10} ($\mu g/m^3$)	114	98	123	117	133	109	**100 ($\mu g/m^3$)**
2	$PM_{2.5}$ ($\mu g/m^3$)	49	52	39	31	43	36	**60 ($\mu g/m^3$)**
3	Arsenic (ng/m^3)	2.1	1.9	1.8	4.4	1.6	1.8	**06 (ng/m^3) (Annual)**
4	Nickel (ng/m^3)	6.7	8.2	6.4	4.4	6.2	7.9	**20 (ng/m^3) (Annual)**
5	Lead ($\mu g/m^3$)	0.16	0.19	0.22	0.11	0.09	0.15	**1.0($\mu g/m^3$) (24 hours)**
6	Benzo (a) Pyrene (ng/m^3)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**01 (ng/m^3) (Annual)**
II.	**Gaseous Pollutants**							
7	SO_2 ($\mu g/m^3$)	13.4	15.9	12.8	16.4	15.2	16.3	**80 ($\mu g/m^3$) (24 hours)**
8	NO_X ($\mu g/m^3$)	28.4	22.9	26.6	20.7	26.4	25.8	**80 ($\mu g/m^3$) (24 hours)**
9	NH_3 ($\mu g/m^3$)	6.8	9.5	8.9	14.8	19.6	17.2	**400 ($\mu g/m^3$) (24 hours)**
10	O_3 ($\mu g/m^3$)	9.5	7.6	10.5	6.2	5.9	8.4	**100 (8 hours) & 180 ($\mu g/m^3$) (1 hour)**
		20.9	21.6	18.6	18.9	19.6	22.8	
		5.4	6.9	5.3	6.4	5.7	6.8	
11	CO (mg/m^3)	< 2	< 2	< 2	< 2	< 2	< 2	**02 (8 hours) & 04 mg/m^3 (1 hour)**
		< 2	< 2	< 2	< 2	< 2	< 2	
		< 2	< 2	< 2	< 2	< 2	< 2	
12	Benzene ($\mu g/m^3$)	< 3	< 3	< 3	< 3	< 3	< 3	**05 ($\mu g/m^3$) (Annual)**

AMBIENT AIR QUALITY MONITORING RESULTS

S.No.	Pollutants	AAQ – 5 Swastika exports			AAQ – 6 Kala amb museum			NAAQ Standards (2009)
		1st Round	2nd Round	3rd Round	1st Round	2nd Round	3rd Round	
		29.01.2014	31.01.2014	03.02.2014	29.01.2014	31.01.2014	03.02.2014	
I.	**Particulate Pollutants**							
1.	PM_{10} ($\mu g/m^3$)	187	242	194	74	96	103	**100 ($\mu g/m^3$)**
2	$PM_{2.5}$ $\mu g/m^3$)	76	81	63	38	32	44	**60 ($\mu g/m^3$)**
3	Arsenic (ng/m^3)	2.6	3.1	2.8	<1	<1	<1	**06 (ng/m^3) (Annual)**
4	Nickel (ng/m^3)	7.4	8.7	9.5	2.4	3.9	2.3	**20 (ng/m^3) (Annual)**
5	Lead ($\mu g/m^3$)	0.13	0.18	0.22	0.05	0.08	0.03	**1.0($\mu g/m^3$) (24 hours)**
6	Benzo (a) Pyrene (ng/m^3)	< 0.5	0.81	< 0.5	< 0.5	< 0.5	< 0.5	**01 (ng/m^3) (Annual)**
II.	**Gaseous Pollutants**							
7	SO_2 ($\mu g/m^3$)	13.5	16.9	18.4	10.9	12.5	9.3	**80 ($\mu g/m^3$) (24 hours)**
8	NO_X ($\mu g/m^3$)	32.9	34.2	29.5	21.5	19.8	23.4	**80 ($\mu g/m^3$) (24 hours)**
9	NH_3 ($\mu g/m^3$)	18.5	15.4	16.3	6.9	8.8	6.1	**400 ($\mu g/m^3$) (24 hours)**
10	O_3 ($\mu g/m^3$)	5.4	6.2	9.8	5.2	6.5	9.1	**100 (8 hours) & 180 ($\mu g/m^3$) (1 hour)**
		16.2	14.8	19.3	13.8	16.7	19.9	
		4.8	5.2	6.1	5.6	6.6	9.2	
11	CO (mg/m^3)	< 2	< 2	< 2	< 2	< 2	< 2	**02 (8 hours) & 04 mg/m^3 (1 hour)**
		< 2	< 2	< 2	< 2	< 2	< 2	
		< 2	< 2	< 2	< 2	< 2	< 2	
12	Benzene ($\mu g/m^3$)	< 3	< 3	< 3	< 3	< 3	< 3	**05 ($\mu g/m^3$) (Annual)**

AMBIENT AIR QUALITY MONITORING RESULTS

S.No.	Pollutants	AAQ – 7 Dabur Enterprises			AAQ – 8 Devgiri exports (ABC)			NAAQ Standards (2009)
		1st Round	2nd Round	3rd Round	1st Round	2nd Round	3rd Round	
		29.01.2014	31.01.2014	03.02.2014	29.01.2014	31.01.2014	03.02.2014	
I.	**Particulate Pollutants**							
1.	PM_{10} (µg/m³)	153	172	158	127	138	151	**100 (µg/m³)**
2	$PM_{2.5}$ µg/m³)	50	60	49	34	46	41	**60 (µg/m³)**
3	Arsenic (ng/m³)	1.8	2.1	1.3	1.1	2.2	1.3	**06 (ng/m³) (Annual)**
4	Nickel (ng/m³)	9.4	7.9	12.1	6.3	8.1	5.9	**20 (ng/m³) (Annual)**
5	Lead (µg/m³)	0.09	0.12	0.17	0.11	0.15	0.12	**1.0(µg/m³) (24 hours)**
6	Benzo (a) Pyrene (ng/m³)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**01 (ng/m³) (Annual)**
II.	**Gaseous Pollutants**							
7	SO_2 (µg/m³)	13.2	11.8	14.4	15.2	12.1	16.9	**80 (µg/m³) (24 hours)**
8	NO_x (µg/m³)	24.2	21.9	28.5	22.1	27.8	21.6	**80 (µg/m³) (24 hours)**
9	NH_3 (µg/m³)	16.2	18.7	15.9	16.4	15.1	18.2	**400 (µg/m³) (24 hours)**
10	O_3 (µg/m³)	5.2	6.9	9.1	6.2	5.8	8.6	**100 (8 hours) & 180 (µg/m³) (1 hour)**
		20.5	21.9	16.2	18.9	21.4	16.7	
		5.4	6.1	5.3	6.5	6.9	8.2	
11	CO (mg/m³)	< 2	< 2	< 2	< 2	< 2	< 2	**02 (8 hours) & 04 mg/m³ (1 hour)**
		< 2	< 2	< 2	< 2	< 2	< 2	
		< 2	< 2	< 2	< 2	< 2	< 2	
12	Benzene (µg/m³)	< 3	< 3	< 3	< 3	< 3	< 3	**05 (µg/m³) (Annual)**

AMBIENT AIR QUALITY MONITORING RESULTS

S.No.	Pollutants	AAQ – 9 Lord shiva			AAQ – 10 Mehak spinning mills			NAAQ Standards (2009)
		1st Round	2nd Round	3rd Round	1st Round	2nd Round	3rd Round	
		05.02.2014	07.02.2014	10.02.2014	05.02.2014	07.02.2014	10.02.2014	
I.	**Particulate Pollutants**							
1.	PM_{10} ($\mu g/m^3$)	109	146	131	89	73	113	**100 ($\mu g/m^3$)**
2	$PM_{2.5}$ $\mu g/m^3$)	43	55	41	38	36	41	**60 ($\mu g/m^3$)**
3	Arsenic (ng/m^3)	1.6	1.9	2.1	1.9	2.8	1.2	**06 (ng/m^3) (Annual)**
4	Nickel (ng/m^3)	3.5	4.8	6.3	4.6	5.2	7.1	**20 (ng/m^3) (Annual)**
5	Lead ($\mu g/m^3$)	0.12	0.19	0.15	0.07	0.11	0.13	**1.0($\mu g/m^3$) (24 hours)**
6	Benzo (a) Pyrene (ng/m^3)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**01 (ng/m^3) (Annual)**
II.	**Gaseous Pollutants**							
7	SO_2 ($\mu g/m^3$)	14.7	13.1	18.2	13.5	15.2	17.0	**80 ($\mu g/m^3$) (24 hours)**
8	NO_X ($\mu g/m^3$)	30.5	24.9	29.2	22.2	28.1	24.6	**80 ($\mu g/m^3$) (24 hours)**
9	NH_3 ($\mu g/m^3$)	10.2	13.5	14.1	16.3	18.2	15.9	**400 ($\mu g/m^3$) (24 hours)**
10	O_3 ($\mu g/m^3$)	6.2	5.8	8.1	5.5	6.9	5.4	**100 (8 hours) & 180 ($\mu g/m^3$) (1 hour)**
		15.6	19.4	17.2	16.9	19.5	16.7	
		5.3	6.9	9.1	5.8	6.7	5.9	
11	CO (mg/m^3)	< 2	< 2	< 2	< 2	< 2	< 2	**02 (8 hours) & 04 mg/m^3 (1 hour)**
		< 2	< 2	< 2	< 2	< 2	< 2	
		< 2	< 2	< 2	< 2	< 2	< 2	
12	Benzene ($\mu g/m^3$)	< 3	< 3	< 3	< 3	< 3	< 3	**05 ($\mu g/m^3$) (Annual)**

AMBIENT AIR QUALITY MONITORING RESULTS

S.No.	Pollutants	AAQ - 11 Kaushalya Spinning mills			AAQ – 12 Ambica textiles			NAAQ Standards (2009)
		1st Round	2nd Round	3rd Round	1st Round	2nd Round	3rd Round	
		05.02.2014	07.02.2014	10.02.2014	05.02.2014	07.02.2014	10.02.2014	
I.	**Particulate Pollutants**							
1.	PM_{10} (µg/m^3)	79	115	92	119	98	105	**100 (µg/m^3)**
2	$PM_{2.5}$ µg/m^3)	31	42	37	38	33	43	**60 (µg/m^3)**
3	Arsenic (ng/m^3)	2.4	2.9	1.5	1.5	1.9	1.1	**06 (ng/m^3) (Annual)**
4	Nickel (ng/m^3)	4.9	6.6	8.4	5.5	4.1	5.7	**20 (ng/m^3) (Annual)**
5	Lead (µg/m^3)	0.12	0.09	0.08	0.11	0.08	0.06	**1.0(µg/m^3) (24 hours)**
6	Benzo (a) Pyrene (ng/m^3)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**01 (ng/m^3) (Annual)**
II.	**Gaseous Pollutants**							
7	SO_2 (µg/m^3)	11.3	13.2	14.1	15.6	13.8	12.6	**80 (µg/m^3) (24 hours)**
8	NO_X (µg/m^3)	22.6	21.9	28.1	23.4	21.6	19.2	**80 (µg/m^3) (24 hours)**
9	NH_3 (µg/m^3)	13.4	15.9	12.7	19.8	20.4	15.3	**400 (µg/m^3) (24 hours)**
10	O_3 (µg/m^3)	5.6	5.9	6.1	5.3	9.4	8.2	**100 (8 hours) & 180 (µg/m^3) (1 hour)**
		18.4	19.2	20.9	19.4	16.1	17.5	
		5.1	5.3	9.6	5.2	6.8	5.9	
11	CO (mg/m^3)	< 2	< 2	< 2	< 2	< 2	< 2	**02 (8 hours) & 04 mg/m^3 (1 hour)**
		< 2	< 2	< 2	< 2	< 2	< 2	
		< 2	< 2	< 2	< 2	< 2	< 2	
12	Benzene (µg/m^3)	< 3	< 3	< 3	< 3	< 3	< 3	**05 (µg/m^3) (Annual)**

AMBIENT AIR QUALITY MONITORING RESULTS

S.No.	Pollutants	AAQ – 13 Aggreshan hospital			AAQ – 14 IOCL refinery			NAAQ Standards (2009)
		1st Round	2nd Round	3rd Round	1st Round	2nd Round	3rd Round	
		12.02.201	14.02.2014	17.02.2014	12.02.201	14.02.2014	17.02.2014	
I.	**Particulate Pollutants**							
1.	PM_{10} (µg/m^3)	112	89	115	88	73	104	**100 (µg/m^3)**
2	$PM_{2.5}$ µg/m^3)	39	34	44	33	29	39	**60 (µg/m^3)**
3	Arsenic (ng/m^3)	<1	<1	<1	1.5	2.1	2.7	**06 (ng/m^3) (Annual)**
4	Nickel (ng/m^3)	4.2	6.1	4.8	6.2	8.4	9.3	**20 (ng/m^3) (Annual)**
5	Lead (µg/m^3)	0.07	0.09	0.12	0.14	0.11	0.08	**1.0(µg/m^3) (24 hours)**
6	Benzo (a) Pyrene (ng/m^3)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**01 (ng/m^3) (Annual)**
II.	**Gaseous Pollutants**							
7	SO_2 (µg/m^3)	12.7	14.1	10.8	12.5	15.2	14.6	**80 (µg/m^3) (24 hours)**
8	NO_X (µg/m^3)	26.2	29.1	26.6	25.6	29.2	27.1	**80 (µg/m^3) (24 hours)**
9	NH_3 (µg/m^3)	20.1	18.4	16.3	16.8	19.2	15.6	**400 (µg/m^3) (24 hours)**
10	O_3 (µg/m^3)	5.8	6.1	5.9	6.5	6.8	7.2	**100 (8 hours) & 180 (µg/m^3) (1 hour)**
		19.5	16.7	16.3	18.4	19.2	18.6	
		5.1	7.2	6.4	6.2	5.8	6.4	
11	CO (mg/m^3)	< 2	< 2	< 2	< 2	< 2	< 2	**02 (8 hours) & 04 mg/m^3 (1 hour)**
		< 2	< 2	< 2	< 2	< 2	< 2	
		< 2	< 2	< 2	< 2	< 2	< 2	
12	Benzene (µg/m^3)	< 3	< 3	< 3	< 3	< 3	< 3	**05 (µg/m^3) (Annual)**

AMBIENT AIR QUALITY MONITORING RESULTS

S.No.	Pollutants	AAQ – 15 Hans Spinning Mills			AAQ – 16 AKS Rugs			NAAQ Standards (2009)
		1st Round	2nd Round	3rd Round	1st Round	2nd Round	3rd Round	
		12.02.201	14.02.2014	17.02.2014	12.02.201	14.02.2014	17.02.2014	
I.	**Particulate Pollutants**							
1.	PM_{10} ($\mu g/m^3$)	159	138	126	82	74	91	**100 ($\mu g/m^3$)**
2	$PM_{2.5}$ $\mu g/m^3$)	41	57	43	34	38	29	**60 ($\mu g/m^3$)**
3	Arsenic (ng/m^3)	1.6	1.8	<1	<1	<1	<1	**06 (ng/m^3) (Annual)**
4	Nickel (ng/m^3)	3.4	5.6	4.5	5.6	6.9	8.2	**20 (ng/m^3) (Annual)**
5	Lead ($\mu g/m^3$)	0.11	0.09	0.15	0.07	0.04	0.02	**1.0($\mu g/m^3$) (24 hours)**
6	Benzo (a) Pyrene (ng/m^3)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**01 (ng/m^3) (Annual)**
II.	**Gaseous Pollutants**							
7	SO_2 ($\mu g/m^3$)	11.2	13.4	15.7	12.4	13.9	16.1	**80 ($\mu g/m^3$) (24 hours)**
8	NO_x ($\mu g/m^3$)	22.6	23.1	25.4	25.9	26.7	26.7	**80 ($\mu g/m^3$) (24 hours)**
9	NH_3 ($\mu g/m^3$)	10.1	13.5	12.6	16.2	14.5	16.9	**400 ($\mu g/m^3$) (24 hours)**
10	O_3 ($\mu g/m^3$)	5.8	6.4	5.3	6.9	7.2	8.3	**100 (8 hours) & 180 ($\mu g/m^3$) (1 hour)**
		20.1	26.5	24.9	24.2	26.3	28.1	
		5.2	6.3	5.8	5.1	6.9	9.2	
11	CO (mg/m^3)	< 2	< 2	< 2	< 2	< 2	< 2	**02 (8 hours) & 04 mg/m^3 (1 hour)**
		< 2	< 2	< 2	< 2	< 2	< 2	
		< 2	< 2	< 2	< 2	< 2	< 2	
12	Benzene ($\mu g/m^3$)	< 3	< 3	< 3	< 3	< 3	< 3	**05 ($\mu g/m^3$) (Annual)**

AMBIENT AIR QUALITY MONITORING RESULTS

S.No.	Pollutants	AAQ – 17 Reveria Home			AAQ – 18 NFL Guest House			NAAQ Standards (2009)
		1st Round	2nd Round	3rd Round	1st Round	2nd Round	3rd Round	
		13.02.201	15.02.2014	18.02.2014	19.02.201	21.02.2014	24.02.2014	
I.	**Particulate Pollutants**							
1.	PM_{10} ($\mu g/m^3$)	108	94	83	92	87	96	**100 ($\mu g/m^3$)**
2	$PM_{2.5}$ $\mu g/m^3$)	28	33	29	28	22	33	**60 ($\mu g/m^3$)**
3	Arsenic (ng/m^3)	<1	<1	<1	<1	<1	<1	**06 (ng/m^3) (Annual)**
4	Nickel (ng/m^3)	2.9	3.4	5.3	2.5	5.1	5.6	**20 (ng/m^3) (Annual)**
5	Lead ($\mu g/m^3$)	0.05	0.08	0.12	0.05	0.07	0.10	**1.0($\mu g/m^3$) (24 hours)**
6	Benzo (a) Pyrene (ng/m^3)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**01 (ng/m^3) (Annual)**
II.	**Gaseous Pollutants**							
7	SO_2 ($\mu g/m^3$)	14.4	11.5	13.3	10.8	12.9	14.5	**80 ($\mu g/m^3$) (24 hours)**
8	NO_x ($\mu g/m^3$)	20.9	19.5	22.7	25.5	21.6	24.2	**80 ($\mu g/m^3$) (24 hours)**
9	NH_3 ($\mu g/m^3$)	6.1	6.7	9.2	39.4	32.6	40.2	**400 ($\mu g/m^3$) (24 hours)**
10	O_3 ($\mu g/m^3$)	6.4	5.9	8.1	6.2	6.8	5.9	**100 (8 hours) & 180 ($\mu g/m^3$) (1 hour)**
		19.5	20.6	27.3	18.4	19.2	15.3	
		6.1	5.8	5.9	8.1	7.9	6.6	
11	CO (mg/m^4)	< 2	< 2	< 2	< 2	< 2	< 2	**02 (8 hours) & 04 mg/m^3 (1 hour)**
		< 2	< 2	< 2	< 2	< 2	< 2	
		< 2	< 2	< 2	< 2	< 2	< 2	
12	Benzene ($\mu g/m^3$)	< 3	< 3	< 3	< 3	< 3	< 3	**05 ($\mu g/m^3$) (Annual)**

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PJIASE – I PROGRAMME
PANIPAT – HARYANA

AMBIENT AIR QUALITY MONITORING RESULTS

S.No.	Pollutants	AAQ 19 Next to R.S. Enterprises			AAQ – 20 JA Woolen Pvt Ltd.			NAAQ Standards (2009)
		1st Round	2nd Round	3rd Round	1st Round	2nd Round	3rd Round	
		20.02.201	23.02.2014	25.02.2014	19.02.201	21.02.2014	24.02.2014	
I.	**Particulate Pollutants**							
1.	PM_{10} (µg/m³)	75	96	85	116	95	82	**100 (µg/m³)**
2	$PM_{2.5}$ µg/m³)	29	36	38	43	32	28	**60 (µg/m³)**
3	Arsenic (ng/m³)	<1	<1	<1	<1	<1	<1	**06 (ng/m³) (Annual)**
4	Nickel (ng/m³)	9.2	8.1	5.6	6.9	5.2	9.9	**20 (ng/m³) (Annual)**
5	Lead (µg/m³)	0.05	0.08	0.10	0.03	0.05	0.07	**1.0(µg/m³) (24 hours)**
6	Benzo (a) Pyrene (ng/m³)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**01 (ng/m³) (Annual)**
II.	**Gaseous Pollutants**							
7	SO_2 (µg/m³)	13.5	16.1	17.3	13.2	11.8	14.7	**80 (µg/m³) (24 hours)**
8	NO_X (µg/m³)	25.6	29.8	28.1	26.4	20.8	24.1	**80 (µg/m³) (24 hours)**
9	NH_3 (µg/m³)	26.4	25.2	29.6	24.2	26.9	21.3	**400 (µg/m³) (24 hours)**
10	O_3 (µg/m³)	5.3	6.9	8.2	6.6	6.5	8.7	**100 (8 hours) & 180 (µg/m³) (1 hour)**
		22.6	29.4	18.9	20.3	21.9	15.3	
		5.9	6.7	9.1	6.9	8.1	9.6	
11	CO (mg/m³)	< 2	< 2	< 2	< 2	< 2	< 2	**02 (8 hours) & 04 mg/m³ (1 hour)**
		< 2	< 2	< 2	< 2	< 2	< 2	
		< 2	< 2	< 2	< 2	< 2	< 2	
12	Benzene (µg/m³)	< 3	< 3	< 3	< 3	< 3	< 3	**05 (µg/m³) (Annual)**

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

PANIPAT – HARYANA

AMBIENT AIR QUALITY MONITORING RESULTS

S.No.	Pollutants	AAQ – 21 PK Industries Ltd.			AAQ – 22 Panipat Sugar mill			NAAQ Standards (2009)
		1st Round	2nd Round	3rd Round	1st Round	2nd Round	3rd Round	
		19.02.201	21.02.2014	24.02.2014	19.02.201	21.02.2014	24.02.2014	
I.	**Particulate Pollutants**							
1.	PM_{10} (µg/m^3)	117	109	94	166	182	141	**100 (µg/m^3)**
2	$PM_{2.5}$ µg/m^3)	43	35	28	63	76	45	**60 (µg/m^3)**
3	Arsenic (ng/m^3)	<1	<1	<1	1.1	1.9	1.6	**06 (ng/m^3) (Annual)**
4	Nickel (ng/m^3)	5.9	3.6	7.4	4.2	6.7	4.8	**20 (ng/m^3) (Annual)**
5	Lead (µg/m^3)	0.09	0.11	0.07	0.16	0.21	0.19	**1.0(µg/m^3) (24 hours)**
6	Benzo (a) Pyrene (ng/m^3)	0.73	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**01 (ng/m^3) (Annual)**
II.	**Gaseous Pollutants**							
7	SO_2 (µg/m^3)	16.2	15.8	12.4	16.9	19.7	18.3	**80 (µg/m^3) (24 hours)**
8	NO_X (µg/m^3)	29.6	24.8	27.1	24.9	26.2	29.4	**80 (µg/m^3) (24 hours)**
9	NH_3 (µg/m^3)	26.7	25.8	23.2	29.4	25.6	28.3	**400 (µg/m^3) (24 hours)**
10	O_3 (µg/m^3)	9.1	8.6	9.8	8.4	5.9	6.8	**100 (8 hours) & 180 (µg/m^3) (1 hour)**
		16.8	18.7	17.1	16.9	18.4	19.2	
		5.8	5.7	7.9	9.5	7.8	5.7	
11	CO (mg/m^3)	< 2	< 2	< 2	< 2	< 2	< 2	**02 (8 hours) & 04 mg/m^3 (1 hour)**
		< 2	< 2	< 2	< 2	< 2	< 2	
		< 2	< 2	< 2	< 2	< 2	< 2	
12	Benzene (µg/m^3)	< 3	< 3	< 3	< 3	< 3	< 3	**05 (µg/m^3) (Annual)**

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

PANIPAT – HARYANA

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 1 : Garunda drain			Test Method
			1st Round 30.01.2014	2nd Round 01.02.2014	3rd Round 04.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Pale yellow	Pale yellow	Pale yellow	-
2	Colour (Hazen Units)	-	15	15	20	IS 3025: Part – 4
3	Odour (Smell)	-	Un -Agreeable	Un -Agreeable	Un -Agreeable	IS 3025: Part 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.66	7.46	7.49	IS 3025: Part 11
2	E C	µS/cm	1530	1570	1490	IS 3025: Part – 14
3	Oil & Grease	mg/l	4	5	4	IS 3025: Part – 39
4	Suspended Solids	mg/l	42	48	36	IS 3025: Part 17
5	Dissolved Oxygen	mg/l	< 1	< 1	< 1	IS 3025: Part 38
6	Chemical Oxygen Demand	mg/l	86	108	98	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	24	29	26	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	3.16	3.61	3.39	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	3.16	3.61	3.39	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part 27
14	Fluoride as F	mg/l	1.0	0.90	0.90	IS 3025: Part – 60
15	Sulphides as S	mg/l	2.8	2.2	2.6	IS 3025: Part 29
16	Dissolved Phosphates as P	mg/l	4.4	4.9	5.5	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	4.62	4.12	4.04	By Calculation
18	Total Coliforms	MPN/100ml	1700	2800	2200	IS 1622
19	Fecal Coliforms	MPN/100ml	1100	1400	1300	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	4.9	5.6	6.0	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	25	29	26	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	20	24	23	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.14	0.15	0.16	IS 3025: Part 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 48
18	Manganese as Mn	mg/l	0.03	0.02	0.02	APHA 3111 – B
19	Iron as Fe	mg/l	0.30	0.34	0.29	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.34	0.30	0.28	IS 3025: Part 57

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	LOM	SW – 2 : Panipat drain No.2			Test Method
			1st Round 30.01.2014	2nd Round 01.02.2014	3rd Round 04.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Light pink	Light pink	Light pink	-
2	Colour (Hazen Units)	-	15	20	15	IS 3025: Part – 4
3	Odour (Smell)	-	Un -Agreeable	Un -Agreeable	Un -Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.65	7.72	7.89	IS 3025: Part – 11
2	E C	µS/cm	1490	1560	1530	IS 3025: Part – 14
3	Oil & Grease	mg/l	1	2	2	IS 3025: Part – 39
4	Suspended Solids	mg/l	14	18	14	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	4.5	4.2	4.0	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	50	46	58	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	12	10	12	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	0.02	0.02	0.02	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	2.94	2.71	2.94	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2–NO_3)	mg/l	2.96	2.73	2.96	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.80	0.80	0.80	IS 3025: Part – 60
15	Sulphides as S	mg/l	0.20	0.20	0.20	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	0.21	0.35	0.26	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	3.83	3.14	3.38	By Calculation
18	Total Coliforms	MPN/100ml	90	110	130	IS 1622
19	Fecal Coliforms	MPN/100ml	14	21	22	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	0.28	0.42	0.34	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	8.7	10	11	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	5.9	7.0	8.1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.12	0.11	0.12	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.01	0.02	0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.31	0.30	0.28	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.28	0.36	0.34	IS 3025: Part – 57

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 3 : Panipat drain No.1			Test Method
			1st Round 13.02.2014	2nd Round 16.02.2014	3rd Round 18.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Grey	Grey	Grey	-
2	Colour (Hazen Units)	-	60	80	90	IS 3025: Part – 4
3	Odour (Smell)	-	Un-Agreeable	Un-Agreeable	Un-Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.57	7.21	7.96	IS 3025: Part 11
2	E C	µS/cm	2120	2260	2230	IS 3025: Part – 14
3	Oil & Grease	mg/l	9	11	10	IS 3025: Part – 39
4	Suspended Solids	mg/l	112	120	134	IS 3025: Part 17
5	Dissolved Oxygen	mg/l	< 1	< 1	< 1	IS 3025: Part 38
6	Chemical Oxygen Demand	mg/l	496	520	540	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	165	175	180	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	0.02	0.02	0.02	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	3.16	3.61	4.06	APHA 4500 – NO_3.B
10	Nitrate-Nitrogen and Nitrate-Nitrogen (NO_2 NO_3)	mg/l	3.18	3.63	4.08	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part 27
14	Fluoride as F	mg/l	0.80	0.80	0.90	IS 3025: Part – 60
15	Sulphides as S	mg/l	4.5	4.2	4.6	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	5.6	5.9	5.8	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	5.84	6.07	5.93	By Calculation
18	Total Coliforms	MPN/100ml	2800	3000	3500	IS 1622
19	Fecal Coliforms	MPN/100ml	1700	2200	2200	IS 1622
III	**Specfal Parameters**					
1	Total Phosphorous as P	mg/l	6.4	6.8	6.5	APHA 4500 P.D
2	Total Kjeldal Nitrogen	mg/l	76	80	82	APHA 4500 - Norg. B
3	Total Ammonia (NH_4 NH_3)-Nitrogen	mg/l	54	58	59	APHA 4500 NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.04	0.05	0.04	IS 3025: Part - 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 48
18	Manganese as Mn	mg/l	0.02	0.03	0.02	APHA 3111 – B
19	Iron as Fe	mg/l	0.26	0.32	0.28	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.52	0.56	0.55	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE - 1 PROGRAMME

PANIPAT – HARYANA

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 4 : Yamuna River Down Stream			Test Method
			1st Round 30.01.2014	2nd Round 01.02.2014	3rd Round 04.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	5	5	5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	8.00	7.89	8.08	IS 3025: Part – 11
2	E.C	µS/cm	394	456	444	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	16	12	14	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	6.5	6.7	6.8	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	12	10	14	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	3	2	3	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	1.13	1.24	1.35	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	1.13	1.24	1.35	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.50	0.50	0.50	IS 3025: Part – 60
15	Sulphides as S	mg/l	0.2	0.2	0.2	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	0.10	0.10	0.12	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	0.29	0.33	0.30	By Calculation
18	Total Coliforms	MPN/100ml	300	500	350	IS 1622
19	Fecal Coliforms	MPN/100ml	14	21	17	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	0.12	0.12	0.16	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.09	0.10	0.10	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.11	0.12	0.10	IS 3025: Part – 57

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	S W – 5 : Yamuna River Up Stream			Test Method
			1st Round 30.01.2014	2nd Round 01.02.2014	3rd Round 04.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part - 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.86	7.98	7.97	IS 3025: Part – 11
2	E C	µS/cm	438	454	390	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part - 39
4	Suspended Solids	mg/l	12	14	12	IS 3025: Part - 17
5	Dissolved Oxygen	mg/l	6.4	6.8	6.5	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	16	12	14	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	3	3	3	IS 3025: Part – 44
8	Nitrite Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 - NO_2 B
9	Nitrate-Nitrogen as N	mg/l	1.02	1.13	1.02	APHA 4500 - NO_3 B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2 NO_3)	mg/l	1.02	1.13	1.02	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 NH_3 C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.50	0.50	0.50	IS 3025: Part - 60
15	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	0.38	0.34	0.30	By Calculation
18	Total Coliforms	MPN/100ml	170	210	170	IS 1622
19	Fecal Coliforms	MPN/100ml	12	14	11	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_3 NH_4)- Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.01	0.01	0.01	APHA 3111 B
19	Iron as Fe	mg/l	0.08	0.07	0.08	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.14	0.12	0.13	IS 3025: Part – 57

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 6 : Panipat drain up stream near Chajjpur			Test Method
			1st Round 30.01.2014	2nd Round 01.02.2014	3rd Round 04.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Pale yellow	Pale yellow	Pale yellow	-
2	Colour (Hazen Units)	-	10	10	10	IS 3025; Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.17	7.12	7.13	IS 3025: Part 11
2	E C	µS/cm	1170	1120	1230	IS 3025; Part – 14
3	Oil & Grease	mg/l	2	2	2	IS 3025; Part – 39
4	Suspended Solids	mg/l	28	34	30	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	3.8	3.9	3.6	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	42	48	40	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	10	11	10	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	0.03	0.03	0.03	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	3.61	3.39	3.61	APHA 4500 NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	3.64	3.42	3.64	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025; Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part 27
14	Fluoride as F	mg/l	0.60	0.60	0.60	IS 3025; Part – 60
15	Sulphides as S	mg/l	0.40	0.40	0.40	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	0.15	016	0.12	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	2.58	2.87	2.55	By Calculation
18	Total Coliforms	MPN/100ml	700	500	600	IS 1622
19	Fecal Coliforms	MPN/100ml	260	170	220	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	0.20	0.22	0.18	APHA 4500 P.D
2	Total Kjeldal Nitrogen	mg/l	4.7	4.5	5.2	APHA 4500 Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	3.5	3.4	3.9	APHA 4500 – NH_4
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025; Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.01	0.02	0.02	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025; Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025; Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025; Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.03	0.02	0.03	APHA 3111 – B
19	Iron as Fe	mg/l	0.25	0.28	0.22	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.22	0.25	0.26	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

PANIPAT – HARYANA

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 7 : Panipat drain downstream near Chajjpur			Test Method
			1st Round 30.01.2014	2nd Round 01.02.2014	3rd Round 04.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Pale yellow	Pale yellow	Pale yellow	-
2	Colour (Hazen Units)	-	10	10	10	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.16	7.19	7.14	IS 3025: Part - 11
2	E.C	µS/cm	1100	1120	1070	IS 3025: Part - 14
3	Oil & Grease	mg/l	1	1	1	IS 3025: Part – 39
4	Suspended Solids	mg/l	24	20	28	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	4.3	4.5	4.2	IS 3025: Part 38
6	Chemical Oxygen Demand	mg/l	56	42	48	IS 3025: Part 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	12	11	10	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	0.02	0.02	0.02	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	2.48	2.71	2.48	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2–NO_3)	mg/l	2.50	2.73	2.50	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part 27
14	Fluoride as F	mg/l	0.60	0.60	0.60	IS 3025: Part – 60
15	Sulphides as S	mg/l	0.5	0.4	0.4	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	0.28	0.22	0.18	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	2.39	2.54	2.25	By Calculation
18	Total Coliforms	MPN/100ml	900	700	800	IS 1622
19	Fecal Coliforms	MPN/100ml	40	20	40	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	0.35	0.28	0.26	APHA 4500 P.D
2	Total Kjeldal Nitrogen	mg/l	5.3	4.2	4.8	APHA 4500 Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	3.9	3.1	3.4	APHA 4500 NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.10	0.09	0.10	IS 3025: Part - 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.18	0.15	0.16	IS 3025: Part - 57

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 8 : Kala Amb pond near war memeorial			Test Method
			1st Round 30.01.2014	2nd Round 01.02.2014	3rd Round 04.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Pale yellow	Pale yellow	Pale yellow	-
2	Colour (Hazen Units)	-	20	20	20	IS 3025: Part 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	8.02	8.10	8.05	IS 3025: Part – 11
2	E.C	µS/cm	1500	1480	1450	IS 3025: Part – 14
3	Oil & Grease	mg/l	2	1	1	IS 3025: Part 39
4	Suspended Solids	mg/l	32	20	26	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	4.9	4.8	5.1	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	64	58	62	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	15	14	15	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	0.03	0.02	0.03	APHA 4500 NO_2-B
9	Nitrate-Nitrogen as N	mg/l	1.69	1.80	1.69	APHA 4500 – NO_3-B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2–NO_3)	mg/l	1.72	1.82	1.72	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 NH_3-C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.90	0.90	0.90	IS 3025: Part 60
15	Sulphides as S	mg/l	0.5	0.4	0.5	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	0.57	0.43	0.49	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	3.58	3.59	3.6	By Calculation
18	Total Coliforms	MPN/100ml	1100	900	700	IS 1622
19	Fecal Coliforms	MPN/100ml	210	170	140	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	0.66	0.51	0.58	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	8.7	7.8	9.0	APHA 4500 – Norg. B
3	Total Ammonia (NH_4–NH_3)-Nitrogen	mg/l	7.0	6.4	7.6	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.01	0.01	0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part - 48
18	Manganese as Mn	mg/l	0.03	0.02	0.02	APHA 3111 – B
19	Iron as Fe	mg/l	0.50	0.49	0.46	IS 3025: Part - 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 56
22	Boron as B	mg/l	0.36	0.38	0.35	IS 3025: Part - 57

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 9 : Surface water Panipat canal gohana road			Test Method
			1st Round 20.02.2014	2nd Round 22.02.2014	3rd Round 25.02.2014	
I	**Simple Parameters**					
1	Appearance	-	colourless	colourless	colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Un - Agreeable	Un - Agreeable	Un - Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.82	7.98	7.54	IS 3025: Part - 11
2	E C	µS/cm	254	269	291	IS 3025: Part - 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	12	10	12	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	5.2	5.6	5.1	IS 3025: Part 38
6	Chemical Oxygen Demand	mg/l	64	76	68	IS 3025: Part 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	15	18	16	IS 3025: Part - 44
8	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	0.56	0.79	0.90	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	0.56	0.79	0.90	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part - 27
14	Fluoride as F	mg/l	0.40	0.40	0.40	IS 3025: Part – 60
15	Sulphides as S	mg/l	0.3	0.3	0.3	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	0.18	0.24	0.20	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	0.39	0.43	0.52	By Calculation
18	Total Coliforms	MPN/100ml	2700	3200	2700	IS 1622
19	Fecal Coliforms	MPN/100ml	70	90	70	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	0.26	0.36	0.32	APHA 4500 P.D
2	Total Kjeldal Nitrogen	mg/l	4.8	6.2	5.6	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	3.9	4.5	4.2	APHA 4500 NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.09	0.09	0.10	IS 3025: Part 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.18	0.21	0.19	IS 3025: Part 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

PANIPAT – HARYANA

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 10: STP 10 MLD outlet			Test Method
			1st Round 24.01.2014	2nd Round 26.01.2014	3rd Round 28.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Greyish	Greyish	Greyish	-
2	Colour (Hazen Units)	-	70	80	80	IS 3025: Part 4
3	Odour (Smell)	-	Un-agreeable	Un-agreeable	Un-agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.37	7.92	7.66	IS 3025: Part – 11
2	E C	µS/cm	1430	1520	1490	IS 3025: Part – 14
3	Oil & Grease	mg/l	7	7	8	IS 3025: Part 39
4	Suspended Solids	mg/l	146	168	172	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	< 1	< 1	< 1	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	248	272	224	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	80	90	75	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	0.01	0.01	0.01	APHA 4500 NO_2.B
9	Nitrate-Nitrogen as N	mg/l	2.94	3.61	3.16	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2–NO_3)	mg/l	2.95	3.62	3.17	By Calculation
11	Free Ammonia	mg/l	0.10	0.10	0.10	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	1.0	1.0	1.0	IS 3025: Part 60
15	Sulphides as S	mg/l	2.4	2.5	2.8	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	5.0	5.2	5.8	APHA 4500 P.D
17	Sodium Absorption Ratio (SAR)	-	1.66	1.93	1.82	By Calculation
18	Total Coliforms	MPN/100ml	2200	2600	2100	IS 1622
19	Fecal Coliforms	MPN/100ml	800	900	700	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	5.8	5.9	6.5	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	49	53	57	APHA 4500 – Norg. B
3	Total Ammonia (NH_3 - NH_4)-Nitrogen	mg/l	30	32	33	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.01	0.01	0.01	IS 3025: Part 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 42
12	Hexavalent Chromium as Cr6	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.06	0.05	0.06	APHA 3111 – B
19	Iron as Fe	mg/l	0.78	0.69	0.82	IS 3025: Part 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.34	0.29	0.31	IS 3025: Part – 57

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 11 : STP 10 MLD inlet			Test Method
			1st Round 24.01.2014	2nd Round 26.01.2014	3rd Round 28.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Grey	Grey	Grey	-
2	Colour (Hazen Units)	-	90	90	80	IS 3025: Part - 4
3	Odour (Smell)	-	Un agreeable	Un agreeable	Un agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.25	7.56	7.14	IS 3025: Part – 11
2	E C	µS/cm	1350	1460	1420	IS 3025: Part – 14
3	Oil & Grease	mg/l	11	10	10	IS 3025: Part 39
4	Suspended Solids	mg/l	184	194	204	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	< 1	< 1	< 1	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	484	452	476	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	180	160	170	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 NO_2.B
9	Nitrate-Nitrogen as N	mg/l	1.13	1.58	1.47	APHA 4500 - NO_3.B
10	Nitrate-Nitrogen and Nitrate Nitrogen (NO_2+NO_3)	mg/l	1.13	1.58	1.47	By Calculation
11	Free Ammonia	mg/l	0.10	0.10	0.10	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	1.0	1.1	1.0	IS 3025: Part 60
15	Sulphides as S	mg/l	4.8	4.1	4.5	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	5.0	5.4	5.6	APHA 4500 - P.D
17	Sodium Absorption Ratio (SAR)	-	2.84	3.36	3.19	By Calculation
18	Total Coliforms	MPN/100ml	5000	9000	3500	IS 1622
19	Fecal Coliforms	MPN/100ml	2200	2400	1700	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	5.8	6.2	6.8	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	61	72	68	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	46	54	52	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.06	0.05	0.06	APHA 3111 B
19	Iron as Fe	mg/l	0.89	0.94	0.82	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 - D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 56
22	Boron as B	mg/l	0.36	0.43	0.38	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

PANIPAT – HARYANA

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 12 : Surface water Panipat canal IOC munek Road			Test Method
			1st Round 13.02.2014	2nd Round 16.02.2014	3rd Round 18.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colouless	Colouless	Colouless	-
2	Colour (Hazen Units)	-	5	5	5	IS 3025: Part 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.79	7.82	7.72	IS 3025: Part – 11
2	E.C	µS/cm	310	312	256	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part 39
4	Suspended Solids	mg/l	14	12	10	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	5.8	5.5	5.7	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	16	12	14	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	3	3	3	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 NO_2.B
9	Nitrate-Nitrogen as N	mg/l	0.45	0.56	0.68	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	0.45	0.56	0.68	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.30	0.30	0.30	IS 3025: Part 60
15	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	0.22	0.24	0.25	By Calculation
18	Total Coliforms	MPN/100ml	220	170	240	IS 1622
19	Fecal Coliforms	MPN/100ml	26	22	21	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 0.1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4–NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.01	0.01	0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.08	0.09	0.08	IS 3025: Part 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 56
22	Boron as B	mg/l	0.16	0.14	0.17	IS 3025: Part 57

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 13 ; STP 35 MLD inlet			Test Method
			1st Round 24.01.2014	2nd Round 26.01.2014	3rd Round 28.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Grey	Grey	Grey	-
2	Colour (Hazen Units)	-	80	70	80	IS 3025: Part 4
3	Odour (Smell)	-	Un Agreeable	Un Agreeable	Un Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.83	7.88	7.84	IS 3025: Part – 11
2	E C	µS/cm	4830	4810	4740	IS 3025: Part – 14
3	Oil & Grease	mg/l	9	10	10	IS 3025: Part 39
4	Suspended Solids	mg/l	126	104	112	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	< 1	< 1	< 1	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	394	342	386	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	140	130	145	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	0.01	0.01	0.01	APHA 4500 NO_2 B
9	Nitrate-Nitrogen as N	mg/l	2.03	2.26	2.03	APHA 4500 – NO_3 B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2, NO_3)	mg/l	2.04	2.27	2.04	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 NH_3 C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	1.2	1.2	1.2	IS 3025: Part 60
15	Sulphides as S	mg/l	3.0	2.8	2.9	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	3.8	3.8	4.0	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	9.26	9.98	9.03	By Calculation
18	Total Coliforms	MPN/100ml	13000	14000	17000	IS 1622
19	Fecal Coliforms	MPN/100ml	4000	5000	6000	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	4.6	4.9	5.2	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	59	57	62	APHA 4500 – Norg. B
3	Total Ammonia (NH_4 / NH_3)-Nitrogen	mg/l	39	39	42	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.06	0.06	0.06	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	0.01	0.01	0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	0.02	0.02	0.02	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.06	0.05	0.05	APHA 3111 B
19	Iron as Fe	mg/l	0.93	0.96	0.89	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 56
22	Boron as B	mg/l	0.56	0.59	0.52	IS 3025: Part – 57

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW 14 : STP 35 MLD outlet			Test Method
			1st Round 24.01.2014	2nd Round 26.01.2014	3rd Round 28.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Grayish	Grayish	Grayish	-
2	Colour (Hazen Units)	-	40	40	35	IS 3025: Part 4
3	Odour (Smell)	-	Un Agreeable	Un Agreeable	Un Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.45	7.85	7.62	IS 3025: Part – 11
2	E.C.	µS/cm	4289	4200	4110	IS 3025: Part – 14
3	Oil & Grease	mg/l	6	7	8	IS 3025: Part 39
4	Suspended Solids	mg/l	82	76	84	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	< 1	< 1	< 1	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	192	254	218	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	60	75	65	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	0.01	0.01	0.01	APHA 4500 NO_2 B
9	Nitrate-Nitrogen as N	mg/l	4.06	4.21	4.52	APHA 4500 - NO_3 B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	4.07	4.22	4.53	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3 C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	1.1	1.1	1.1	IS 3025: Part 60
15	Sulphides as S	mg/l	1.5	1.4	1.6	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	2.4	2.5	2.6	APHA 4500 P.D
17	Sodium Absorption Ratio (SAR)	-	9.25	9.52	9.40	By Calculation
18	Total Coliforms	MPN/100ml	1300	1700	1400	IS 1622
19	Fecal Coliforms	MPN/100ml	70	90	70	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	3.6	3.8	3.9	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	35	38	32	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	19	21	18	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.04	0.05	0.05	IS 3025: Part - 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	0.01	0.01	0.01	IS 3025: Part 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	0.04	0.03	0.04	IS 3025: Part - 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.02	0.03	0.03	APHA 3111 – B
19	Iron as Fe	mg/l	0.34	0.28	0.32	IS 3025: Part 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.40	0.36	0.38	IS 3025: Part – 57

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 15 : CETP 21 MLD outlet			Test Method
			1st Round 24.01.2014	2nd Round 26.01.2014	3rd Round 28.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Pink	Pink	Pink	-
2	Colour (Hazen Units)	-	100	90	100	IS 3025: Part – 4
3	Odour (Smell)	-	Un Agreeable	Un Agreeable	Un Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.94	7.45	7.93	IS 3025: Part – 11
2	E.C	µS/cm	6210	6120	6340	IS 3025: Part – 14
3	Oil & Grease	mg/l	6	5	5	IS 3025: Part – 39
4	Suspended Solids	mg/l	52	46	42	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	< 1	< 1	< 1	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	168	184	156	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	45	50	40	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	0.001	0.02	0.02	APHA 4500 NO_2.B
9	Nitrate-Nitrogen as N	mg/l	2.26	2.15	2.48	APHA 4500 NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2 NO_3)	mg/l	2.28	2.17	2.50	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.90	1.00	0.90	IS 3025: Part – 60
15	Sulphides as S	mg/l	3.4	3.2	3.7	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	0.80	0.70	0.70	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	24.89	23.92	26.73	By Calculation
18	Total Coliforms	MPN/100ml	5000	7000	4000	IS 1622
19	Fecal Coliforms	MPN/100ml	1400	1700	1100	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	1.2	1.0	1.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	23	22	18	APHA 4500 – Norg. B
3	Total Ammonia (NH_2 NH_3)-Nitrogen	mg/l	16	15	12	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.02	0.02	0.02	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.01	0.01	0.02	APHA 3111 – B
19	Iron as Fe	mg/l	0.34	0.26	0.32	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.48	0.42	0.45	IS 3025: Part – 57

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 16 : CETP 21 MLD inlet			Test Method
			1st Round 24.01.2014	2nd Round 26.01.2014	3rd Round 28.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Grey	Grey	Grey	-
2	Colour (Hazen Units)	-	70	80	60	IS 3025: Part – 4
3	Odour (Smell)	-	Un agreeable	Un agreeable	Un agreeable	IS 3025: Part 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.54	7.75	7.62	IS 3025: Part 11
2	E C	µS/cm	5960	6250	6160	IS 3025: Part – 14
3	Oil & Grease	mg/l	10	9	10	IS 3025: Part – 39
4	Suspended Solids	mg/l	108	116	102	IS 3025: Part 17
5	Dissolved Oxygen	mg/l	< 1	< 1	< 1	IS 3025: Part 38
6	Chemical Oxygen Demand	mg/l	352	386	344	IS 3025: Part 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	125	140	120	IS 3025: Part 44
8	Nitrite-Nitrogen as N	mg/l	0.01	0.02	0.01	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	1.35	1.24	1.47	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2 NO_3)	mg/l	1.36	1.26	1.48	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part 27
14	Fluoride as F	mg/l	1.0	1.0	1.0	IS 3025: Part – 60
15	Sulphides as S	mg/l	5.6	5.3	5.9	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	1.8	1.6	1.7	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	27.14	25.86	25.42	By Calculation
18	Total Coliforms	MPN/100ml	17000	22000	14000	IS 1622
19	Fecal Coliforms	MPN/100ml	8000	9000	6000	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	2.4	2.2	2.3	APHA 4500 P.D
2	Total Kjeldal Nitrogen	mg/l	38	35	34	APHA 4500 – Norg. B
3	Total Ammonia (NH_4 NH_3)-Nitrogen	mg/l	24	21	20	APHA 4500 NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.04	0.04	0.04	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr6	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.03	0.03	0.04	APHA 3111 B
19	Iron as Fe	mg/l	0.96	0.88	0.90	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 56
22	Boron as B	mg/l	0.78	0.84	0.74	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

PANIPAT – HARYANA

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW –17 : Panipat Drain Near Simla Gujran			Test Method
			1st Round 24.01.2014	2nd Round 26.01.2014	3rd Round 28.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Pale yellow	Pale yellow	Pale yellow	-
2	Colour (Hazen Units)	-	20	20	20	IS 3025: Part – 4
3	Odour (Smell)	-	Un - Agreeable	Un - Agreeable	Un - Agreeable	IS 3025: Part - 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.55	7.61	7.83	IS 3025: Part 11
2	E C	µS/cm	3160	3200	3240	IS 3025: Part – 14
3	Oil & Grease	mg/l	6	4	4	IS 3025: Part – 39
4	Suspended Solids	mg/l	52	46	58	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	< 1	< 1	< 1	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	108	98	114	IS 3025: Part 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	28	25	29	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	1.47	1.58	1.81	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	1.47	1.58	1.81	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	1.2	1.3	1.2	IS 3025: Part – 60
15	Sulphides as S	mg/l	1.6	1.5	1.8	IS 3025: Part - 29
16	Dissolved Phosphates as P	mg/l	3.0	3.4	3.5	APHA 4500 - P.D
17	Sodium Absorption Ratio (SAR)	-	9.83	9.48	9.71	By Calculation
18	Total Coliforms	MPN/100ml	2800	2200	1700	IS 1622
19	Fecal Coliforms	MPN/100ml	260	210	140	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	3.6	3.8	4.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	24	20	18	APHA 4500 Norg. B
3	Total Ammonia (NH_4–NH_3)-Nitrogen	mg/l	16	13	12	APHA 4500 NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.01	0.01	0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 48
18	Manganese as Mn	mg/l	0.04	0.03	0.04	APHA 3111 – B
19	Iron as Fe	mg/l	0.41	0.38	0.42	IS 3025: Part 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.59	0.60	0.64	IS 3025: Part 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

PANIPAT – HARYANA

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 18 : Main drain before mixing			Test Method
			1st Round 24.01.2014	2nd Round 26.01.2014	3rd Round 28.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Greyish	Greyish	Greyish	-
2	Colour (Hazen Units)	-	25	20	25	IS 3025: Part – 4
3	Odour (Smell)	-	Un - Agreeable	Un - Agreeable	Un - Agreeable	IS 3025: Part 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.49	7.50	7.74	IS 3025: Part 11
2	E C	µS/cm	2340	2290	2230	IS 3025: Part – 14
3	Oil & Grease	mg/l	6	4	3	IS 3025: Part – 39
4	Suspended Solids	mg/l	58	42	56	IS 3025: Part 17
5	Dissolved Oxygen	mg/l	< 1	< 1	< 1	IS 3025: Part 38
6	Chemical Oxygen Demand	mg/l	126	106	98	IS 3025: Part - 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	32	28	25	IS 3025: Part 44
8	Nitrite-Nitrogen as N	mg/l	0.01	0.01	0.01	APHA 4500 – NO_2 B
9	Nitrate-Nitrogen as N	mg/l	1.02	1.13	1.35	APHA 4500 – NO_3 B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	1.03	1.14	1.36	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3 C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part 27
14	Fluoride as F	mg/l	0.90	0.90	0.90	IS 3025: Part – 60
15	Sulphides as S	mg/l	1.6	1.4	1.2	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	0.54	0.36	0.42	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	8.04	8.31	8.48	By Calculation
18	Total Coliforms	MPN/100ml	1400	1300	1100	IS 1622
19	Fecal Coliforms	MPN/100ml	400	350	270	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	0.61	0.46	0.58	APHA 4500 P.D
2	Total Kjeldal Nitrogen	mg/l	19	17	15	APHA 4500 - Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	11	10	8.4	APHA 4500 NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.01	0.01	0.01	APHA 3111 B
19	Iron as Fe	mg/l	0.30	0.22	0.28	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 - D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 56
22	Boron as B	mg/l	0.58	0.50	0.46	IS 3025: Part – 57

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 19 : Main drain + Yamuna during mixing			Test Method
			1st Round 24.01.2014	2nd Round 26.01.2014	3rd Round 28.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Pale yellow	Pale yellow	Pale yellow	-
2	Colour (Hazen Units)	-	10	10	10	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.15	7.95	7.30	IS 3025: Part 11
2	E C	µS/cm	784	810	884	IS 3025: Part – 14
3	Oil & Grease	mg/l	2	2	2	IS 3025: Part – 39
4	Suspended Solids	mg/l	20	16	18	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	4.2	4.5	4.8	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	36	40	46	IS 3025: Part 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	8	9	10	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	1.92	1.69	1.81	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	1.92	1.69	1.81	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.80	0.80	0.80	IS 3025: Part – 60
15	Sulphides as S	mg/l	0.6	0.5	0.5	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	0.87	0.89	0.94	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	1.24	1.87	1.46	By Calculation
18	Total Coliforms	MPN/100ml	280	220	350	IS 1622
19	Fecal Coliforms	MPN/100ml	170	130	220	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	0.98	1.1	1.2	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	3.2	3.9	3.5	APHA 4500 Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	2.0	2.8	2.4	APHA 4500 NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 48
18	Manganese as Mn	mg/l	0.01	0.01	0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.12	0.15	0.16	IS 3025: Part 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.21	0.25	0.23	IS 3025: Part 57

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 20 : River Yamuna After mixing			Test Method
			1st Round 24.01.2014	2nd Round 26.01.2014	3rd Round 28.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	5	5	5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.06	7.13	7.04	IS 3025: Part – 11
2	E.C	µS/cm	752	724	828	IS 3025: Part – 14
3	Oil & Grease	mg/l	1	1	1	IS 3025: Part - 39
4	Suspended Solids	mg/l	14	12	12	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	5.4	5.6	5.4	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	24	20	20	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	6	5	5	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 NO_2 B
9	Nitrate-Nitrogen as N	mg/l	1.81	1.69	1.58	APHA 4500 NO_3 B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	1.81	1.69	1.58	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3 C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.70	0.70	0.70	IS 3025: Part – 60
15	Sulphides as S	mg/l	0.3	0.3	0.3	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	0.55	0.41	0.43	APHA 4500 P.D
17	Sodium Absorption Ratio (SAR)	-	1.16	1.12	1.22	By Calculation
18	Total Coliforms	MPN/100ml	170	140	110	IS 1622
19	Fecal Coliforms	MPN/100ml	60	50	50	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	0.62	0.46	0.50	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	1.3	2.1	1.4	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	1.1	1.7	1.1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 37
15	Lead as Ph	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.10	0.09	0.09	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.16	0.19	0.18	IS 3025: Part - 57

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 1 : Usha Works			Test Method
			1st Round 24.01.2014	2nd Round 26.01.2014	3rd Round 28.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.65	7.56	7.67	IS 3025: Part – 11
2	E C	µS/cm	1130	1120	1140	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	4	4	6	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	0.02	0.02	0.02	APHA 4500 NO_2.B
8	Nitrate-Nitrogen as N	mg/l	3.84	3.61	3.61	APHA 4500 NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	3.86	3.63	3.63	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.90	0.90	0.90	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 P.D
16	Sodium Absorption Ratio (SAR)	-	1.93	1.94	2.06	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part - 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.07	0.06	0.07	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.10	0.09	0.09	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 56
22	Boron as B	mg/l	0.26	0.28	0.27	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

PANIPAT – HARYANA

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	G W – 2: Shriram Exports			Test Method
			1st Round 23.01.2014	2nd Round 25.01.2014	3rd Round 27.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.60	7.63	7.77	IS 3025: Part 11
2	E C	µS/cm	1390	1410	1380	IS 3025: Part 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	6	6	8	IS 3025: Part 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	0.02	0.02	0.02	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	3.84	3.84	4.06	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	3.86	3.86	4.08	APHA 4500 N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.90	0.90	0.90	IS 3025: Part 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	2.0	1.93	2.30	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.05	0.06	0.05	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr6	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.02	0.02	0.02	APHA 3111 – B
19	Iron as Fe	mg/l	0.08	0.09	0.08	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 56
22	Boron as B	mg/l	0.32	0.35	0.34	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

PANIPAT – HARYANA

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 3 : Shiva shakthi exports			Test Method
			1st Round 23.01.2014	2nd Round 25.01.2014	3rd Round 27.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.63	7.60	7.57	IS 3025: Part – 11
2	E C	µS/cm	1280	1290	1270	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	4	6	6	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 NO_2-B
8	Nitrate-Nitrogen as N	mg/l	3.39	3.39	3.16	APHA 4500 – NO_3-B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	3.39	3.39	3.16	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.80	0.80	0.80	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 P.D
16	Sodium Absorption Ratio (SAR)	-	4.67	4.64	4.48	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 - P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.03	0.04	0.03	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 B
19	Iron as Fe	mg/l	0.09	0.10	0.09	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.28	0.25	0.26	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

PANIPAT – HARYANA

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 4 : Golden terry towels ltd			Test Method
			1st Round 23.01.2014	2nd Round 25.01.2014	3rd Round 27.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.78	7.87	7.75	IS 3025: Part – 11
2	E C	µS/cm	1700	1690	1670	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	8	6	8	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	4.97	5.19	4.52	APHA 4500 NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	4.97	5.19	4.52	APHA 4500 - N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.70	0.70	0.70	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 P.D
16	Sodium Absorption Ratio (SAR)	-	4.06	4.17	4.17	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 - P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 Norg. B
3	Total Ammonia (NH_4–NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 - NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.09	0.08	0.09	IS 3025: Part 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 42
12	Hexavalent Chromium as Cr^{6}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.09	0.10	0.10	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 - D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.39	0.35	0.37	IS 3025: Part – 57

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 5 ; Swastika exports			Test Method
			1st Round 29.01.2014	2nd Round 31.01.2014	3rd Round 03.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.76	7.75	7.75	IS 3025: Part – 11
2	E.C	µS/cm	1740	1720	1710	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	6	4	6	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 NO_2-B
8	Nitrate-Nitrogen as N	mg/l	9.02	9.71	9.26	APHA 4500 NO_3-B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	9.03	9.71	9.26	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	1.0	1.0	1.0	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	2.48	2.52	2.53	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4 NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.07	0.09	0.08	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 - B
19	Iron as Fe	mg/l	0.09	0.10	0.10	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 56
22	Boron as B	mg/l	0.30	0.27	0.26	IS 3025: Part – 57

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW - 6 : Devgiri exports (ABC)			Test Method
			1st Round 29.01.2014	2nd Round 31.01.2014	3rd Round 03.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.82	7.84	7.83	IS 3025: Part - 11
2	E C	µS/cm	784	765	780	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part - 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part 17
5	Chemical Oxygen Demand	mg/l	4	4	4	IS 3025: Part 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	1.02	0.90	1.13	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2 :NO_3)	mg/l	1.02	0.90	1.13	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 - NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part 27
13	Fluoride as F	mg/l	0.80	0.80	0.80	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	1.36	1.27	1.39	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 - Norg. B
3	Total Ammonia (NH_4 :NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 - NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.02	0.02	0.02	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 B
19	Iron as Fe	mg/l	0.08	0.07	0.08	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.19	0.17	0.18	IS 3025: Part – 57

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 7 : Lord shiva			Test Method
			1st Round 06.02.2014	2nd Round 08.02.2014	3rd Round 11.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	8.03	8.05	8.02	IS 3025: Part – 11
2	E.C	µS/cm	605	616	594	IS 3025: Part 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	4	4	4	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 NO_2.B
8	Nitrate-Nitrogen as N	mg/l	1.92	2.03	2.03	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2–NO_3)	mg/l	1.92	2.03	2.03	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.90	0.90	0.90	IS 3025: Part 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	1.72	1.60	1.45	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_3–NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.01	0.01	0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 311 – B
19	Iron as Fe	mg/l	0.06	0.06	0.06	IS 3025: Part 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.19	0.21	0.20	IS 3025: Part – 57

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 8 : Mehak spinning mills			Test Method
			1st Round 06.02.2014	2nd Round 08.02.2014	3rd Round 11.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.74	7.69	8.03	IS 3025: Part – 11
2	E C	µS/cm	722	737	784	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	4	4	4	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	2.26	2.48	2.26	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2–NO_3)	mg/l	2.26	2.48	2.26	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part 27
13	Fluoride as F	mg/l	0.70	0.70	0.70	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	2.90	2.79	2.88	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.01	0.01	0.01	IS 3025: Part 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.1	APHA 3111 B
19	Iron as Fe	mg/l	0.06	0.07	0.06	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.21	0.19	0.20	IS 3025: Part – 57

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	G W – 9: Kala amb museum			Test Method
			1st Round 29.01.2014	2nd Round 31.01.2014	3rd Round 03.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.87	7.81	7.89	IS 3025: Part – 11
2	E C	µS/cm	1080	1050	1070	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	6	4	6	IS 3025: Part - 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part - 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	1.92	1.69	1.81	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	1.92	1.69	1.81	APHA 4500 -N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	1.0	1.0	1.0	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	2.59	2.35	2.69	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 - Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.01	0.01	0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.01	0.01	0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.09	0.08	0.09	IS 3025: Part - 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Setenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.25	0.24	0.25	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

PANIPAT – HARYANA

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 10 : Dabur Enterprises			Test Method
			1st Round 29.01.2014	2nd Round 31.01.2014	3rd Round 03.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.95	7.77	7.82	IS 3025: Part – 11
2	E C	µS/cm	1020	1040	1020	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part 17
5	Chemical Oxygen Demand	mg/l	6	6	6	IS 3025: Part 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	2.94	3.16	2.48	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	2.94	3.16	2.48	APHA 4500 N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.90	0.90	0.90	IS 3025: Part 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	1.60	1.59	1.64	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4 NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.01	0.01	0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	0.01	0.01	0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.09	0.09	0.10	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.29	0.26	0.28	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

PANIPAT – HARYANA

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 11 : Ambica Textiles			Test Method
			1st Round 06.02.2014	2nd Round 08.02.2014	3rd Round 11.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.82	7.63	7.75	IS 3025: Part – 11
2	E.C	µS/cm	570	564	574	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	4	4	4	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	2.94	3.16	2.94	APHA 4500 NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	2.94	3.16	2.94	APHA 4500 -N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.90	0.90	0.90	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 P.D
16	Sodium Absorption Ratio (SAR)	-	1.97	1.82	2.03	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4–NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.02	0.02	0.02	IS 3025: Part – 49
10	Nickel as Ni	mg/l	0.01	0.01	0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.07	0.08	0.07	IS 3025: Part 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 56
22	Boron as B	mg/l	0.18	0.21	0.19	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE - I PROGRAMME

PANIPAT – HARYANA

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 12 : Between noorwala and barsat road			Test Method
			1st Round 06.02.2014	2nd Round 08.02.2014	3rd Round 11.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.78	7.87	7.91	IS 3025: Part 11
2	E C	µS/cm	631	647	652	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	4	4	4	IS 3025: Part - 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 NO_2.B
8	Nitrate-Nitrogen as N	mg/l	2.15	2.48	2.26	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2–NO_3)	mg/l	2.15	2.48	2.26	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.70	0.70	0.70	IS 3025: Part 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	3.06	2.69	2.85	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part - 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.01	0.01	0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	0.01	0.01	0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 B
19	Iron as Fe	mg/l	0.08	0.06	0.07	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.19	0.18	0.19	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

PANIPAT – HARYANA

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 13 : IOCL Refinery			Test Method
			1st Round 13.02.2014	2nd Round 15.02.2014	3rd Round 18.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.78	7.68	7.64	IS 3025: Part – 11
2	E C	µS/cm	1230	1250	1110	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	6	4	4	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 NO_2.B
8	Nitrate-Nitrogen as N	mg/l	3.84	4.29	4.29	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	3.84	4.29	4.29	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	1.0	1.0	1.0	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 P.D
16	Sodium Absorption Ratio (SAR)	-	3.15	2.92	2.80	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4 · NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.01	0.01	0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 - B
19	Iron as Fe	mg/l	0.09	0.08	0.09	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.26	0.25	0.21	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

PANIPAT – HARYANA

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 14 : Aggreshan Hospital			Test Method
			1st Round 13.02.2014	2nd Round 15.02.2014	3rd Round 18.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.94	7.83	8.01	IS 3025: Part – 11
2	E C	µS/cm	1260	1268	1210	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	6	6	4	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part 44
7	Nitrite-Nitrogen as N	mg/l	0.01	0.01	0.01	APHA 4500 – NO_2 B
8	Nitrate-Nitrogen as N	mg/l	10.61	10.84	10.84	APHA 4500 – NO_3 B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	10.62	10.85	10.85	APHA 4500 N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3 C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part 27
13	Fluoride as F	mg/l	1.0	1.0	1.0	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	0.67	0.69	0.63	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.02	0.02	0.02	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr6	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 - B
19	Iron as Fe	mg/l	0.08	0.08	0.07	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.22	0.20	0.21	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

PANIPAT – HARYANA

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 15 : Vilage chajjpur hand pump			Test Method
			1st Round 13.02.2014	2nd Round 15.02.2014	3rd Round 18.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Haven Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.92	7.86	7.95	IS 3025: Part – 11
2	E C	µS/cm	748	762	767	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part 39
4	Suspended Solids	mg/l	14	12	12	IS 3025: Part 17
5	Chemical Oxygen Demand	mg/l	6	6	4	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	2.15	2.26	2.15	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2–NO_3)	mg/l	2.15	2.26	2.15	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part - 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part 27
13	Fluoride as F	mg/l	0.9	0.9	0.9	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part - 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	2.98	3.02	2.80	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.03	0.02	0.03	IS 3025: Part 49
10	Nickel as Ni	mg/l	0.01	0.01	0.01	IS 3025: Part 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part.– 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.02	0.02	0.02	APHA 3111 – B
19	Iron as Fe	mg/l	0.20	0.16	0.15	IS 3025: Part 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.21	0.24	0.23	IS 3025: Part 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

PANIPAT – HARYANA

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 16 : AKS Rugs			Test Method
			1st Round 13.02.2014	2nd Round 15.02.2014	3rd Round 18.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.51	7.86	7.68	IS 3025: Part – 11
2	E.C	µS/cm	1160	1190	1140	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	6	6	4	IS 3025: Part - 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2 B
8	Nitrate-Nitrogen as N	mg/l	7.90	8.35	8.58	APHA 4500 – NO_3 B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2–NO_3)	mg/l	7.90	8.35	8.58	APHA 4500 N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3 C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part 27
13	Fluoride as F	mg/l	0.90	0.90	0.90	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	1.27	1.32	1.09	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 NH3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.04	0.04	0.03	IS 3025: Part – 49
10	Nickel as Ni	mg/l	0.01	0.01	0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 B
19	Iron as Fe	mg/l	0.09	0.09	0.08	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.29	0.27	0.28	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE 1 PROGRAMME

PANIPAT – HARYANA

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 17 : Opp. Reveria Home			Test Method
			1st Round 13.02.2014	2nd Round 15.02.2014	3rd Round 18.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part - 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.66	7.70	7.68	IS 3025: Part 11
2	E C	µS/cm	1450	1470	1460	IS 3025: Part 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	6	4	6	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	0.01	0.01	0.01	APHA 4500 - NO_2.B
8	Nitrate-Nitrogen as N	mg/l	9.48	9.71	9.26	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2- NO_3)	mg/l	9.49	9.72	9.27	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.90	0.90	0.90	IS 3025: Part 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	2.25	2.17	2.14	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_5H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.05	0.05	0.04	IS 3025: Part – 49
10	Nickel as Ni	mg/l	0.01	0.01	0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part - 48
18	Manganese as Mn	mg/l	0.02	0.02	0.02	APHA 3111 – B
19	Iron as Fe	mg/l	0.12	0.10	0.12	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.32	0.33	0.36	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

PANIPAT – HARYANA

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 18 : Near to NFL Guest house			Test Method
			1st Round 20.02.2014	2nd Round 22.02.2014	3rd Round 25.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.53	7.69	7.61	IS 3025: Part – 11
2	E C	µS/cm	856	895	876	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part - 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part 17
5	Chemical Oxygen Demand	mg/l	4	4	6	IS 3025: Part - 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	2.26	2.94	2.71	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	2.26	2.94	2.71	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part 27
13	Fluoride as F	mg/l	0.80	0.80	0.80	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	2.58	2.74	2.66	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.05	0.06	0.05	IS 3025: Part – 49
10	Nickel as Ni	mg/l	0.01	0.01	0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 B
19	Iron as Fe	mg/l	0.08	0.09	0.08	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.29	0.30	0.27	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE - 1 PROGRAMME

PANIPAT – HARYANA

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 19 : JA Woolen Pvt Ltd.			Test Method
			1st Round 20.02.2014	2nd Round 22.02.2014	3rd Round 25.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.90	7.68	7.82	IS 3025: Part – 11
2	E C	µS/cm	580	592	568	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	4	4	4	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 - NO_2 B
8	Nitrate Nitrogen as N	mg/l	2.15	2.48	2.03	APHA 4500 – NO_3 B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2 NO_3)	mg/l	2.15	2.48	2.03	APHA 4500 N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.9	0.9	0.9	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	1.43	1.62	1.36	By Calculation
17	Total Coliforms	MPN/100ml	17	14	13	IS 1622
18	Fecal Coliforms	MPN/100ml	2	2	2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4-NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_5H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.02	0.02	0.02	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 B
19	Iron as Fe	mg/l	0.07	0.08	0.07	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 - D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.20	0.21	0.19	IS 3025: Part – 57

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 20 : PK Industries Ltd.			Test Method
			1st Round 20.02.2014	2nd Round 22.02.2014	3rd Round 25.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.92	7.64	7.81	IS 3025: Part 11
2	E.C	µS/cm	668	694	683	IS 3025: Part 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	4	6	4	IS 3025: Part 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	3.16	3.39	2.94	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	3.16	3.39	2.94	APHA 4500 - N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.80	0.80	0.80	IS 3025: Part 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	1.45	1.69	1.56	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_3+NH_4)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.02	0.02	0.02	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.07	0.08	0.07	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 56
22	Boron as B	mg/l	0.26	0.23	0.25	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

PANIPAT – HARYANA

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 21 : Next to R.S. Enterprises			Test Method
			1st Round 20.02.2014	2nd Round 22.02.2014	3rd Round 25.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.92	7.68	7.79	IS 3025: Part – 11
2	E.C	µS/cm	835	849	874	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	4	4	6	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part · 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	3.39	3.61	4.06	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	3.39	3.61	4.06	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part · 27
13	Fluoride as F	mg/l	0.80	0.80	0.80	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	1.17	1.26	1.42	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_3+NH_4)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.01	0.01	0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.08	0.08	0.09	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.21	0.20	0.23	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

PANIPAT -- HARYANA

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	LOM	GW – 22 ; Panipat Sugar mill			Test Method
			1st Round 20.02.2014	2nd Round 22.02.2014	3rd Round 25.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.55	7.86	7.91	IS 3025: Part 11
2	E.C	µS/cm	934	982	956	IS 3025: Part 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	12	14	10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	6	4	4	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 NO_2 B
8	Nitrate-Nitrogen as N	mg/l	3.16	3.84	3.39	APHA 4500 – NO_3 B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2 / NO_3)	mg/l	3.16	3.84	3.39	APHA 4500 –N C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3 C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	1.0	1.0	1.0	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 P.D
16	Sodium Absorption Ratio (SAR)	-	2.43	2.85	2.56	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4 / NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.05	0.06	0.06	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part -- 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.01	0.01	0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.09	0.10	0.09	IS 3025: Part 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.25	0.28	0.27	IS 3025: Part 57

AMBIENT AIR MONITORING LOCATIONS PHOTOGRAPHS

I[st] Round

AAQ – 1, Usha Works

AAQ – 2, Simran Exports

AAQ 3, Shiva shakthi exports

AAQ – 4, Golden terry Towels ltd

AAQ 5, Swastika exports

AAQ – 6, Kala amb museum

AAQ – 7, Dabur Enterprises

AAQ – 8, Devgiri exports (ABC)

AAQ – 9, Lord shiva

AAQ – 10, Mehak spinning mills

AAQ – 11, Kaushalya Spinning mills

AAQ – 12, Ambica Textiles

AAQ – 13, Aggreshan Hospital

AAQ – 14, IOCL Refinery

AAQ – 15, Hans Spinning Mills

AAQ – 16, AKS Rugs

AAQ – 17, Reveria Home

AAQ - 18, Hand feb

AAQ – 19, Next to R.S. Enterprises

AAQ – 20, JA Woolen Pvt Ltd

AAQ – 21, PK Industries Ltd.

AAQ 22, Panipat Sugar mill

SAMPLING LOCATION PHOTOGRAPHS OF SURFACE WATER

1st Round

SW – 1, Garunda drain

SW – 2, Panipat Drain No.2

SW – 3, Panipat Drain No.1

SW – 4, Yamuna River Down Stream

SW – 5, Yamuna River Up Stream

SW – 6, Panipat drain up stream near Chajjpur

SW – 7, Panipat drain downstream near Chajjpur

SW – 8, Kala Amb Pond near war memorial

SW – 9, Surface water Panipat canal gohana road

SW – 10, STP 10 MLD outlet

SW – 11, STP 10 MLD inlet

SW – 12, Surface water Panipat canal IOC munck Road

SW – 13, STP 35 MLD inlet

SW – 14, STP 35 MLD outlet

SW – 15, CETP 21 MLD outlet

SW – 16, CETP 21 MLD inlet

SW – 17, Panipat Drain near Simla Gujran

SW – 18, Main drain before mixing

SW - 19, Main drain + Yamuna during mixing

SW – 20, River Yamuna After mixing

SAMPLING LOCATION PHOTOGRAPHS OF GROUND WATER

1st Round

GW – 1, Usha Works

GW - 2, Simran Exports

GW – 3, Shiva Shakthi Exports

GW 4, Golden Terry Towels ltd

GW – 5, Swastika Exports

GW – 6, Devgiri Exports (ABC)

GW 7, Lord Shiva

GW – 8, Mehak Spinning Mills

GW – 9, Kala Amb Museum

GW -10, Dabur Enterprises

GW -11, Ambica Textiles

GW – 12, Between noorwala and barsat road

GW – 13, IOCL Refinery

GW – 14, Aggreshan Hospital

GW – 15, Vilage Chajjpur Hand Pump

GW – 16, AKS Rugs

GW - 17, Opp. Reveria Home

GW – 18, Hand feb hand pump

GW - 19, JA Woolen Pvt Ltd.

GW – 20, PK Industries Ltd.

GW – 21, Next to RS Enterprises

GW – 22, Panipat Sugar mill

AMBIENT AIR MONITORING LOCATIONS PHOTOGRAPHS

2nd Round

AAQ-1, Usha Works

AAQ-2, Simran Exports

AAQ-3, Shiva shakthi exports

AAQ-4, Golden Terry Towels ltd

AAQ-5, Swastika exports

AAQ-6, Kala Amb museum

AAQ-7, Dabur Enterprises

AAQ-8, Devgiri Exports (ABC)

AAQ-9. Lord Shiva

AAQ-10, Mehak Spinning Mills

AAQ-11, Kaushalya Spinning Mills

AAQ-12, Ambica Textiles

AAQ-13, Aggreshan Hospital

AAQ-14, IOCL Refinery

AAQ-15, Hans Spinning Mills

AAQ-16, AKS Rugs

AAQ-17, Reveria Home

AAQ-18, Hand Reb NFL Guest House

AAQ-19, Next to R.S. Enterprises

AAQ-20, JA Woolen Pvt Ltd.

AAQ-21, PK Industries Ltd.

AAQ-22, Panipat Sugar Mill

SAMPLING LOCATION PHOTOGRAPHS OF SURFACE WATER

2nd Round

SW-1, Garunda drain

SW-2, Panipat drain No.2

SW-3, Panipat drain No.1

SW-4, Yamuna River Down Stream

SW-5, Yamuna River Up Stream

SW-6, Panipat drain up stream near Chajjpur

SW-7, Panipat drain downstream near Chajjpur

SW-8, Kala Amb pond near war memeorial

SW-9, Surface water Panipat canal gohana road

SW-10, STP 10 MLD outlet

SW-11, STP 10 MLD inlet

SW-12, Surface water Panipat canal IOC munek Road

SW-13, STP 35 MLD inlet

SW-14, STP 35 MLD outlet

SW-15, CETP 21 MLD outlet

SW-16, CETP 21 MLD inlet

SW-17, Panipat Drain Near Simla Gujran

SW-18, Main drain before mixing

SW-19, Main drain – Yamuna during mixing

SW-20, River Yamuna After mixing

SAMPLING LOCATION PHOTOGRAPHS OF GROUND WATER

2nd Round

GW-1, Usha Works

GW-2, Simran Exports

GW-3, Shiva shakthi exports

GW-4, Golden terry towels ltd

GW-5, Swastika exports

GW-6, Devgiri exports (ABC)

GW-7, Lord shiva

GW-8, Mehak spinning mills

GW-9, Kala amb museum

GW-10, Dabur Enterprises

GW-11, Ambica textiles

GW-12, Between noorwala and barsat road

GW-13, IOCL refinery

GW-14, Aggreshan hospital

GW-15, Vilage chajjpur hand pump

GW-16, AKS Rugs

GW-17, Opp. Reveria Home

GW-18, Hand feb hand pump

GW-19, JA Woolen Pvt Ltd.

GW-20, PK Industries Ltd.

GW-21, Next to R.S. enterprises

GW-22, Panipat Sugar mill

AMBIENT AIR MONITORING LOCATIONS PHOTOGRAPHS

3rd Round

AAQ-1, Usha Works

AAQ-2, Simran Exports

AAQ-3, Shiva shakthi exports

AAQ – 4, Golden Terry Towels ltd

AAQ – 5, Swastika exports

AAQ -6, Kala Amb museum

AAQ – 7, Dabur Enterprises

AAQ 8, Devgiri Exports (ABC)

AAQ – 9, Lord Shiva

AAQ – 10, Mehak Spinning Mills

AAQ – 11, Kaushalya Spinning Mills

AAQ – 12, Ambica Textiles

AAQ – 13, Aggreshan Hospital

AAQ – 14, IOCL Refinery

AAQ – 15, Hans Spinning Mills

AAQ - 16, AKS Rugs

AAQ – 17, Reveria Home

AAQ – 18, Hand feb NFL Guest House

AAQ 19, Next to R.S. Enterprises

AAQ - 20, JA Woolen Pvt Ltd.

AAQ 21, PK Industries Ltd.

AAQ – 22, Panipat Sugar Mill

SAMPLING LOCATION PHOTOGRAPHS OF SURFACE WATER

3rd Round

SW – 1, Garunda drain

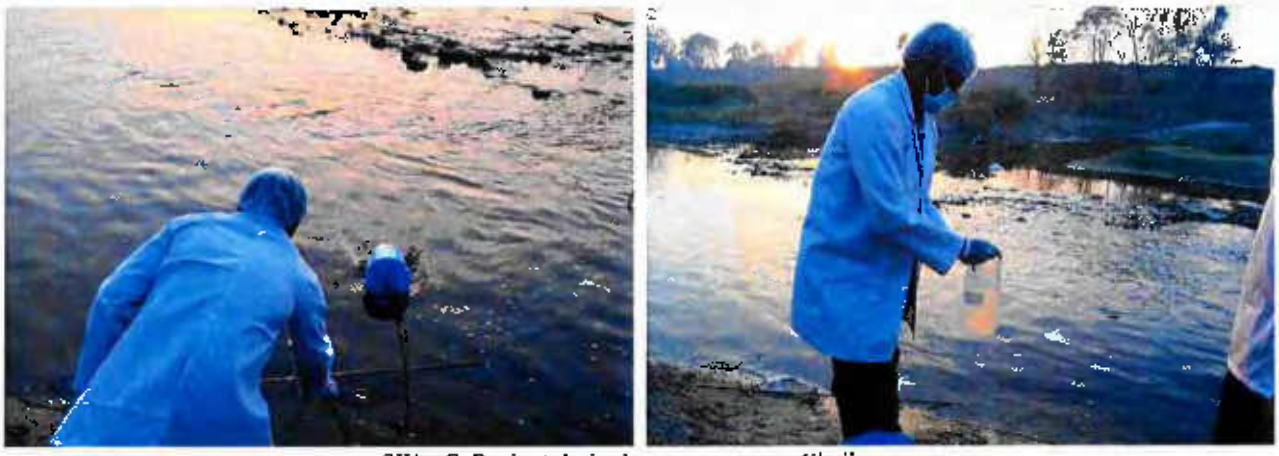
SW – 2, Panipat drain No.2

SW – 3, Panipat drain No.1

SW – 4, Yamuna River Down Stream

SW – 5, Yamuna River Up Stream

SW – 6, Panipat drain up stream near Chajjpur



SW – 7, Panipat drain downstream near Chajjpur

SW – 8, Kala Amb pond near war memeorial

SW – 9, Surface water Panipat canal gohana road

SW-10, STP 10 MLD outlet

SW-11, STP 10 MLD Inlet

SW-12, Surface water Panipat canal IOC munek Road

SW-13, STP 35 MLD inlet

SW-14, STP 35 MLD outlet

SW-15, CETP 21 MLD outlet

SW-16, CETP 21 MLD inlet

SW-17, Panipat Drain Near Simla Gujran

SW-18, Main drain before mixing

SW-19, Main drain - Yamuna during mixing

SW-20, River Yamuna After mixing

SAMPLING LOCATION PHOTOGRAPHS OF GROUND WATER

3rd Round

GW-1, Usha Works

GW-2, Simran Exports

GW-3, Shiva shakthi exports

GW-4, Golden terry towels ltd

GW-5, Swastika exports

GW-6, Devgiri exports (ABC)

GW-7, Lord shiva

GW-8, Mehak spinning mills

GW-9, Kala amb museum

GW-10, Dabur Enterprises

GW-11, Ambica textiles

GW-12, Between noorwala and barsat road

GW-13, IOCL refinery

GW-14, Aggreshan hospital

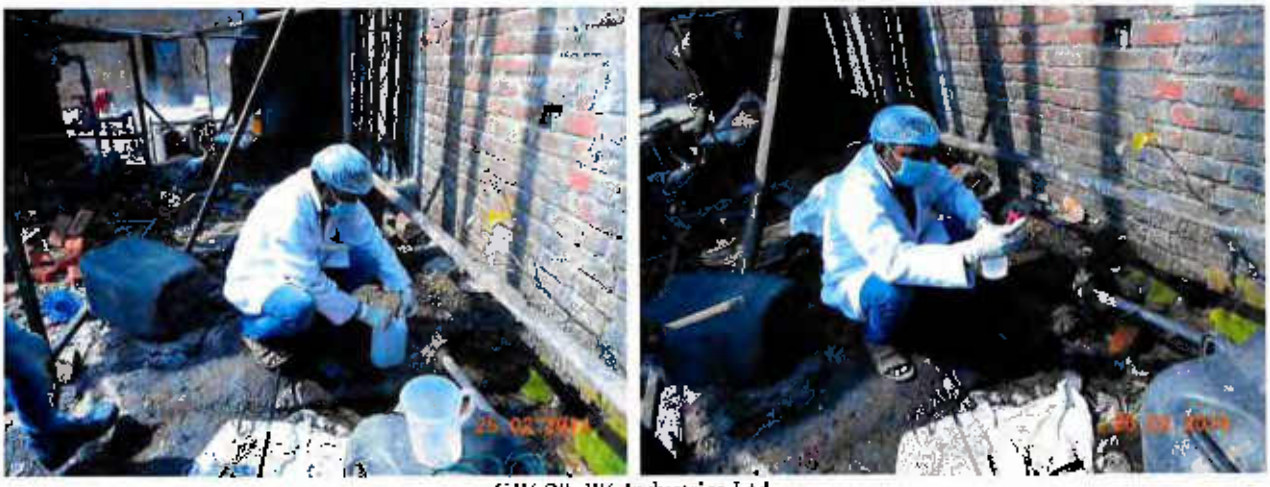
GW-15, Village chajjpur hand pump

GW-16, AKS Rugs

GW-17, Opp. Reveria Home

GW-18, Hand feb hand pump

GW-19, JA Woolen Pvt Ltd.



GW-20, PK Industries Ltd.

GW-21, Next to R.S. enterprises

GW-22, Panipat Sugar mill

MONITORING, SAMPLING AND ANALYSIS

of

AMBIENT AIR QUALITY, SURFACE WATER QUALITY AND GROUND WATER QUALITY

in

IDENTIFIED CRITICALLY POLLUTED AREA (CPAs)

PATANCHERU & BOLLARAM

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

PATANCHERU - BOLLARAM (ANDHRA PRADESH)

AAQ MONITORING LOCATIONS

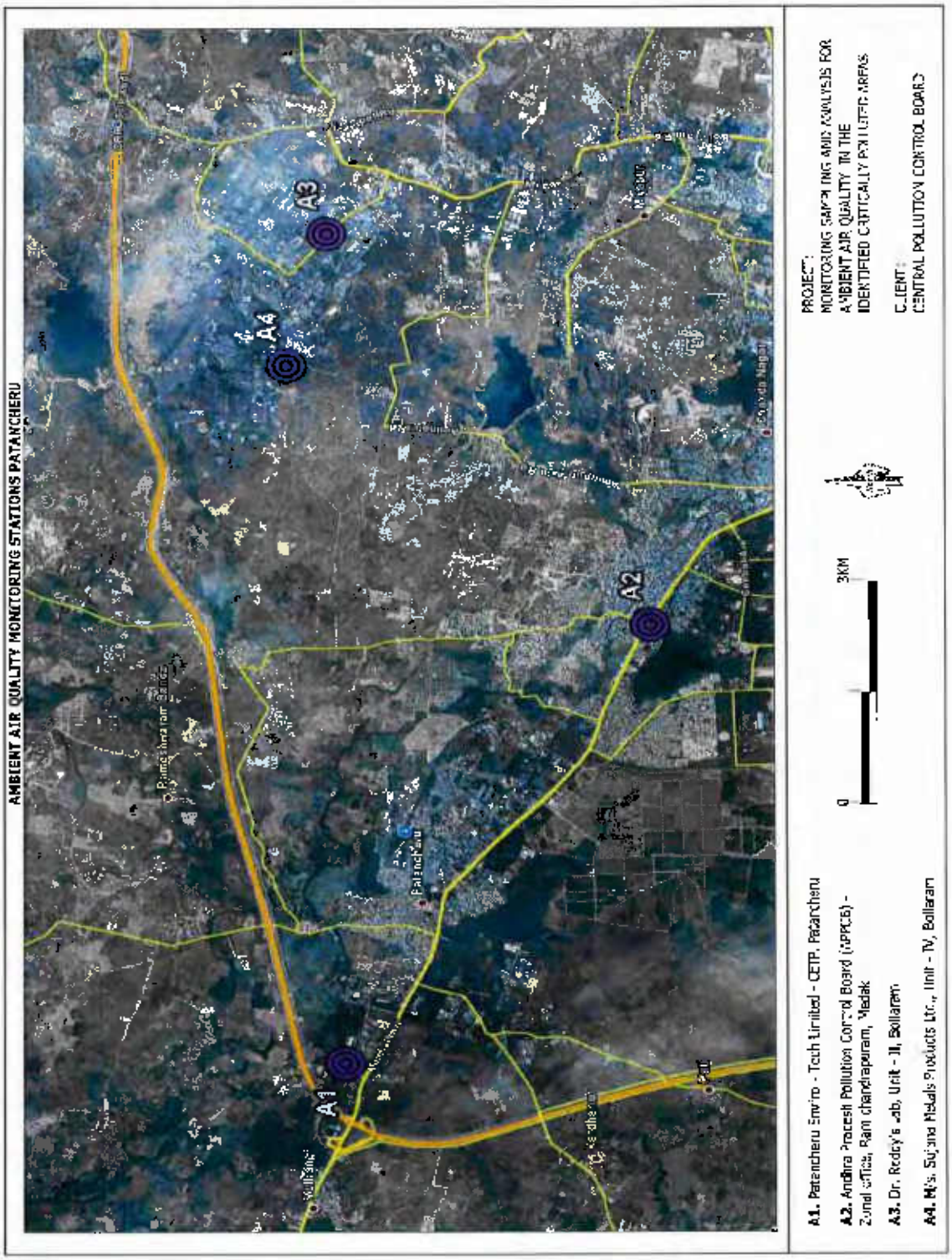
SAMPLE CODE	NAME OF THE MONITORING LOCATION	DATE OF SAMPLING	LATITUDE	LONGITUDE
AAQ 1	Patancheru Enviro Tech Limited – CETP, Patancheru	1st Round: 26.12.2013 to 27.12.2013 2nd Round: 28.12.2013 to 29.12.2013 3rd Round: 30.12.2013 to 31.12.2013	N 17°32.337'	E 078°14.683'
AAQ 2	Andhra Pradesh Pollution Control Board (APPCB) Zonal office, Ram chandrapuram, Medak	1st Round: 26.12.2013 to 27.12.2013 2nd Round: 28.12.2013 to 29.12.2013 3rd Round: 30.12.2013 to 31.12.2013	N 17°30.519'	E 078°18'016'
AAQ 3	Dr. Reddy's Lab. Unit II, Bollaram	1st Round: 26.12.2013 to 27.12.2013 2nd Round: 28.12.2013 to 29.12.2013 3rd Round: 30.12.2013 to 31.12.2013	N 17°32.448'	E 078°20.995'
AAQ – 4	M/s. Sujana Metals Products Ltd., Unit IV, Bollaram	1st Round: 26.12.2013 to 27.12.2013 2nd Round: 28.12.2013 to 29.12.2013 3rd Round: 30.12.2013 to 31.12.2013	N 17°32.687'	E 078°20.001'

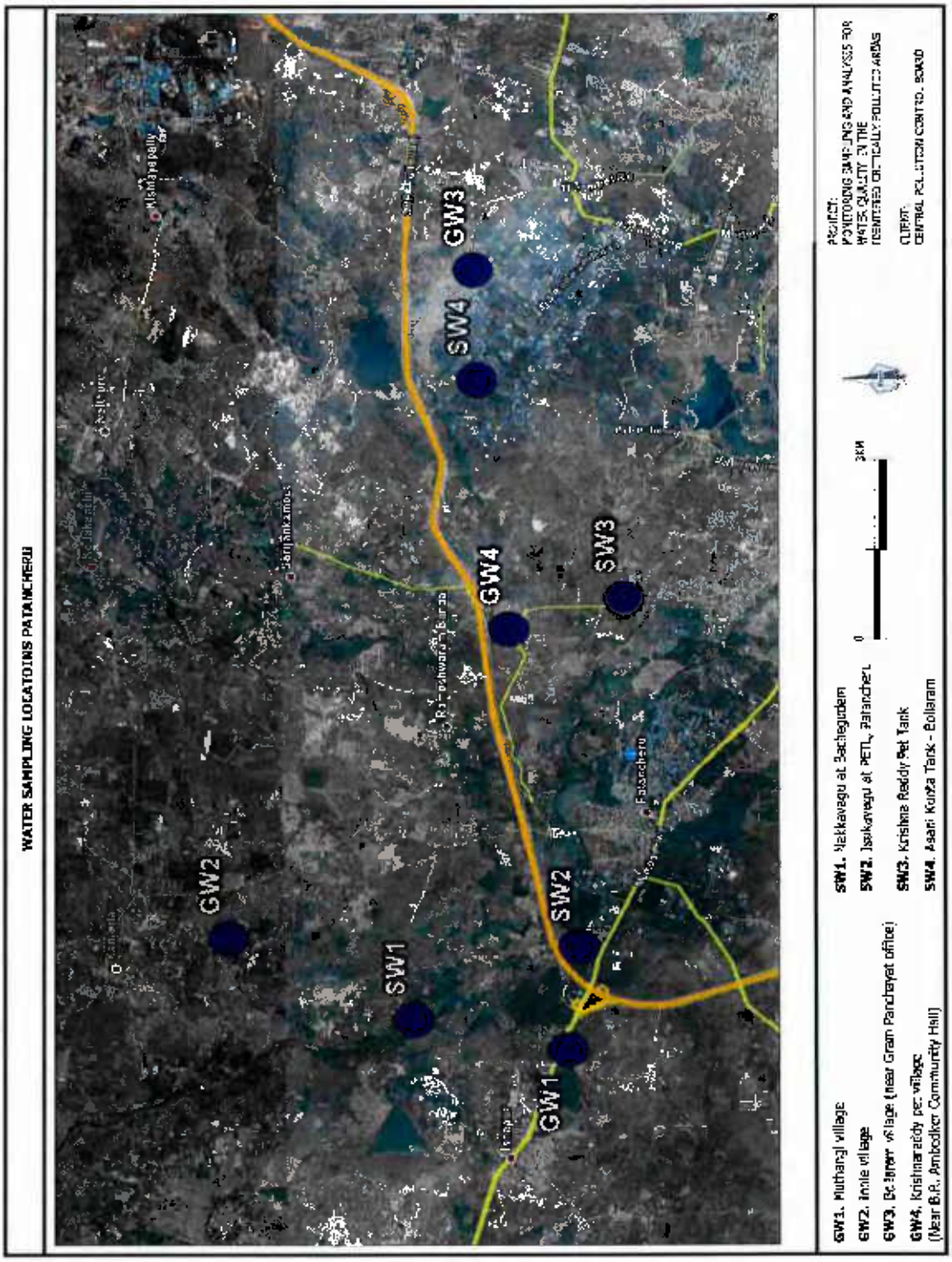
SURFACE WATER SAMPLING LOCATIONS

SAMPLE CODE	NAME OF THE SAMPLING LOCATION	DATE OF SAMPLING	LATITUDE	LONGITUDE
SW – 1	Nakkavagu at Bachegudem	1st Round: 27.12.2013 2nd Round:29.12.2013 3rd Round: 31.12.2013	N 17°33.648'	E 078°13.942'
SW – 2	Isukavagu at PETL, Patancheru	1st Round: 27.12.2013 2nd Round:29.12.2013 3rd Round: 31.12.2013	N 17°32.384'	E 078°14.628'
SW – 3	Krishna Reddy Pet Tank	1st Round: 27.12.2013 2nd Round:29.12.2013 3rd Round: 31.12.2013	N 17°33'03.7"	E 078°17'53.4"
SW – 4	Asani Kunta Tank - Bollaram	1st Round: 27.12.2013 2nd Round:29.12.2013 3rd Round: 31.12.2013	N 17°33'04.5"	E 078°19'55.5"

GROUND WATER SAMPLING LOCATIONS

SAMPLE CODE	NAME OF THE SAMPLING LOCATION	DATE OF SAMPLING	LATITUDE	LONGITUDE
GW 1	Muthangi village	1st Round: 27.12.2013 2nd Round:29.12.2013 3rd Round: 31.12.2013	N 17°32.469'	E 078°13.655'
GW – 2	Inole village	1st Round: 27.12.2013 2nd Round:29.12.2013 3rd Round: 31.12.2013	N 17°35.043'	E 078°14.708'
GW – 3	Bollaram village (near Gram Panchayat office)	1st Round: 27.12.2013 2nd Round:29.12.2013 3rd Round: 31.12.2013	N 17°33'11.8"	E 078°21'01.2"
GW - 4	Krishnareddy pet village, H.No.2-4/5 (Near B.R. Ambedkar Community Hall)	1st Round: 27.12.2013 2nd Round:29.12.2013 3rd Round: 31.12.2013	N 17°32'53.8"	E 078°17'38.1"


AMBIENT AIR QUALITY MONITORING STATIONS PATANCHERU
A1
A2
A3
A4
Patancheru
Bollaram
PROJECT:
MONITORING SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY IN THE IDENTIFIED CRITICALLY POLLUTED AREAS
CLIENT:
CENTRAL POLLUTION CONTROL BOARD
0
3KM
A1. Patancheru Enviro - Tech Limited - CETP, Patancheru
A2. Andhra Pradesh Pollution Control Board (APPCB) - Zonal office, Ramchandrapuram, Medak
A3. Dr. Reddy's Lab, Unit - II, Bollaram
A4. M/s. Sujana Metals Products Ltd., Unit - IV, Bollaram


WATER SAMPLING LOCATIONS PATANCHERU
GW1
GW2
GW3
GW4
SW1
SW2
SW3
SW4
Patancheru
GW1. Muthangi village
GW2. Inole village
GW3. Bachanur village (near Gram Panchayat office)
GW4. Krishnareddy peta village (Near B.R. Ambedkar Community Hall)
SW1. Nakkavagu at Bachugudem
SW2. Isukavagu at PETL, Patancheru
SW3. Krishna Reddy Pet Tank
SW4. Asani Kunta Tank - Bollaram
0
3KM
PROJECT:
MONITORING SAMPLING AND ANALYSIS FOR WATER QUALITY IN THE IDENTIFIED CRITICALLY POLLUTED AREAS
CLIENT:
CENTRAL POLLUTION CONTROL BOARD

AMBIENT AIR QUALITY MONITORING

S.No.	Pollutants	AAQ – 1 APPCB Zonal Office – R.C.Puram, Medak			AAQ – 2 PETL, Patancheru, Medak			NAAQ Standards (2009)
		1st Round	2nd Round	3rd Round	1st Round	2nd Round	3rd Round	
		26.12.2013	28.12.2013	30.12.2013	26.12.2013	28.12.2013	30.12.2013	
I.	**Particulate Pollutants**							
1.	PM_{10} (µg/m^3)	81	115	96	75	92	84	**100 (µg/m^3)**
2	$PM_{2.5}$ µg/m^3)	29	43	37	31	38	26	**60 (µg/m^3)**
3	Arsenic (ng/m^3)	1.2	1.9	1.5	0.7	0.8	0.8	**06 (ng/m^3) (Annual)**
4	Nickel (ng/m^3)	1.8	3.1	2.2	3.3	2.9	2.1	**20 (ng/m^3) (Annual)**
5	Lead (µg/m^2)	0.2	0.25	0.17	0.11	0.09	0.14	**1.0(µg/m^3) (24 hours)**
6	Benzo (a) Pyrene (ng/m^3)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**01 (ng/m^3) (Annual)**
II.	**Gaseous Pollutants**							
7	SO_2 (µg/m^3)	13.9	16.1	11.5	12.3	10.5	14.4	**80 (µg/m^3) (24 hours)**
8	NO_x (µg/m^3)	21.8	27.5	23.3	18.7	21.3	20.6	**80 (µg/m^3) (24 hours)**
9	NH_3 (µg/m^3)	20.6	17.3	19.4	33.4	37.6	40.1	**400 (µg/m^3) (24 hours)**
10	O_3 (µg/m^3)	13.7	10.4	15.5	14.1	11.8	9.6	**100 (8 hours) & 180 (µg/m^3) (1 hour)**
		16.3	14.8	20.1	17.6	20.7	15.9	
		2.9	3.3	4.2	2.7	4.1	3.3	
11	CO (mg/m^3)	< 2	< 2	< 2	< 2	< 2	< 2	**02 (8 hours) & 04 mg/m^3 (1 hour)**
		< 2	< 2	< 2	< 2	< 2	< 2	
		< 2	< 2	< 2	< 2	< 2	< 2	
12	Benzene (µg/m^3)	< 3	3.9	< 3	< 3	< 3	< 3	**05 (µg/m^3) (Annual)**

AMBIENT AIR QUALITY MONITORING RESULTS

S.No.	Pollutants	AAQ – 3 Dr. Reddy's Laboratories – Unit – II, IDA Bollaram			AAQ – 4 M/s. Sujana Re-Rolling Product, Unit – IV, Bollaram			NAAQ Standards (2009)
		1st Round	2nd Round	3rd Round	1st Round	2nd Round	3rd Round	
		26.12.2013	28.12.2013	30.12.2013	26.12.2013	28.12.2013	30.12.2013	
I.	**Particulate Pollutants**							
1.	PM_{10} ($\mu g/m^3$)	105	124	110	104	84	91	**100 ($\mu g/m^3$)**
2	$PM_{2.5}$ $\mu g/m^3$)	43	49	34	42	31	45	**60 ($\mu g/m^3$)**
3	Arsenic (ng/m^3)	1.1	1.6	1.4	1.5	1.2	0.9	**06 (ng/m^3) (Annual)**
4	Nickel (ng/m^3)	3.9	2.6	3.4	5.3	4.1	3.8	**20 (ng/m^3) (Annual)**
5	Lead ($\mu g/m^3$)	0.17	0.22	0.14	0.32	0.35	0.51	**1.0($\mu g/m^3$) (24 hours)**
6	Benzo (a) Pyrene (ng/m^3)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**01 (ng/m^3) (Annual)**
II.	**Gaseous Pollutants**							
7	SO_2 ($\mu g/m^3$)	14.2	12.1	13.7	12.5	11.3	10.4	**80 ($\mu g/m^3$) (24 hours)**
8	NO_x ($\mu g/m^3$)	18.5	23.4	20.9	27.1	22.6	20.7	**80 ($\mu g/m^3$) (24 hours)**
9	NH_3 ($\mu g/m^3$)	20.4	19.3	17.7	16.4	18.3	17.6	**400 ($\mu g/m^3$) (24 hours)**
10	O_3 ($\mu g/m^3$)	7.3	8.6	9.1	8.9	10.1	11.6	**100 (8 hours) & 180 ($\mu g/m^3$) (1 hour)**
		15.2	17.4	14.8	14.8	16.6	17.1	
		3.6	4.2	3.9	3.1	4.2	3.5	
11	CO (mg/m^3)	< 2	< 2	< 2	< 2	< 2	< 2	**02 (8 hours) & 04 mg/m^3 (1 hour)**
		< 2	< 2	< 2	< 2	< 2	< 2	
		< 2	< 2	< 2	< 2	< 2	< 2	
12	Benzene ($\mu g/m^3$)	< 3	< 3	< 3	< 3	< 3	< 3	**05 ($\mu g/m^3$) (Annual)**

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 1: Nakkavagu at Bachegudem			Test Method
			1st Round 27.12.2013	2nd Round 29.12.2013	3rd Round 31.12.2013	
I	**Simple Parameters**					
1	Appearance	-	Greyish	Greyish	Greyish	-
2	Colour (Hazen Units)	-	30	40	30	IS 3025: Part – 4
3	Odour (Smell)	-	Un agreeable	Un agreeable	Un agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.93	8.05	7.78	IS 3025: Part – 11
2	E C	µS/cm	1320	1360	1340	IS 3025: Part – 14
3	Oil & Grease	mg/l	6	4	6	IS 3025: Part – 39
4	Suspended Solids	mg/l	58	72	64	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	2.8	3.2	3.3	IS 3025: Part 38
6	Chemical Oxygen Demand	mg/l	74	68	62	IS 3025: Part 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	26	22	21	IS 3025: Part 44
8	Nitrite-Nitrogen as N	mg/l	0.18	0.20	0.19	APHA 4500 - NO_2.B
9	Nitrate-Nitrogen as N	mg/l	0.80	0.90	0.95	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	0.98	1.10	1.14	By Calculation
11	Free Ammonia	mg/l	0.20	0.20	0.20	APHA 4500 - NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part 27
14	Fluoride as F	mg/l	1.1	1.1	1.0	IS 3025: Part 60
15	Sulphides as S	mg/l	0.3	0.4	0.5	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	1.8	1.7	1.9	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	3.40	3.64	3.18	By Calculation
18	Total Coliforms	MPN/100ml	110	170	140	IS 1622
19	Fecal Coliforms	MPN/100ml	80	110	90	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	2.4	2.1	2.6	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	18	15	20	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	14	13	15	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	0.003	0.002	0.003	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.06	0.07	0.06	IS 3025: Part – 49
10	Nickel as Ni	mg/l	0.01	0.01	0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	0.01	0.01	0.02	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.03	0.03	0.04	APHA 3111 B
19	Iron as Fe	mg/l	0.09	0.08	0.09	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.16	0.18	0.16	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

PATANCHERU - BOLLARAM (ANDHRA PRADESH)

Sl. No.	Test Parameters	UOM	SW – 2: Isukavagu at PETL			Test Method
			1st Round 27.12.2013	2nd Round 29.12.2013	3rd Round 31.12.2013	
I	**Simple Parameters**					
1	Appearance	-	Greyish	Greyish	Greyish	-
2	Colour (Hazen Units)	-	35	40	35	IS 3025: Part – 4
3	Odour (Smell)	-	Un agreeable	Un agreeable	Un agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.78	7.94	7.90	IS 3025: Part – 11
2	E.C	µS/cm	1280	1340	1250	IS 3025: Part 14
3	Oil & Grease	mg/l	5	6	6	IS 3025: Part – 39
4	Suspended Solids	mg/l	46	68	54	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	1.6	1.8	1.6	IS 3025: Part 38
6	Chemical Oxygen Demand	mg/l	112	96	104	IS 3025: Part 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	31	28	29	IS 3025: Part 44
8	Nitrite-Nitrogen as N	mg/l	0.09	0.08	0.10	APHA 4500 - NO_2 B
9	Nitrate-Nitrogen as N	mg/l	1.20	1.24	1.31	APHA 4500 – NO_3 B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	1.29	1.32	1.41	By Calculation
11	Free Ammonia	mg/l	0.4	0.3	0.4	APHA 4500 – NH_3 C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part 27
14	Fluoride as F	mg/l	1.2	1.0	1.0	IS 3025: Part – 60
15	Sulphides as S	mg/l	0.3	0.5	0.4	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	2.8	2.6	2.2	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	3.19	3.64	3.26	By Calculation
18	Total Coliforms	MPN/100ml	23	22	26	IS 1622
19	Fecal Coliforms	MPN/100ml	9	8	11	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	3.2	3.0	2.6	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	26	27	29	APHA 4500 - Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	20	19	21	APHA 4500 – NH_4
4	Phenolic Compounds as C_6H_5OH	mg/l	0.004	0.005	0.004	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.21	0.26	0.24	IS 3025: Part - 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	0.01	0.01	0.01	IS 3025: Part 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.08	0.07	0.10	APHA 3111 – B
19	Iron as Fe	mg/l	0.11	0.14	0.12	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 - D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.13	0.10	0.12	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

PATANCHERU - BOLLARAM (ANDHRA PRADESH)

Sl. No.	Test Parameters	UOM	SW – 3; Krishnareddypet Tank			Test Method
			1st Round 27.12.2013	2nd Round 29.12.2013	3rd Round 31.12.2013	
I	**Simple Parameters**					
1	Appearance	-	Greenish	Greenish	Greenish	-
2	Colour (Hazen Units)	-	40	35	40	IS 3025: Part – 4
3	Odour (Smell)	-	Un agreeable	Un agreeable	Un agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.79	7.94	7.76	IS 3025: Part – 11
2	E C	µS/cm	3060	3180	3020	IS 3025: Part – 14
3	Oil & Grease	mg/l	4	4	5	IS 3025: Part – 39
4	Suspended Solids	mg/l	78	84	74	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	5.9	5.8	5.9	IS 3025: Part - 38
6	Chemical Oxygen Demand	mg/l	152	168	160	IS 3025: Part 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	38	44	38	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	0.04	0.04	0.03	APHA 4500 – NO_2-B
9	Nitrate-Nitrogen as N	mg/l	1.20	1.22	1.20	APHA 4500 – NO_3-B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	1.24	1.26	1.23	By Calculation
11	Free Ammonia	mg/l	0.10	0.10	0.10	APHA 4500 – NH_3-C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part 27
14	Fluoride as F	mg/l	1.2	1.1	1.2	IS 3025: Part – 60
15	Sulphides as S	mg/l	0.3	0.4	0.3	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	0.44	0.62	0.40	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	6.31	7.09	6.78	By Calculation
18	Total Coliforms	MPN/100ml	33	50	27	IS 1622
19	Fecal Coliforms	MPN/100ml	14	17	11	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	0.76	0.84	0.62	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	15	20	19	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	10	14	12	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	0.002	0.002	0.001	IS 3025: Part - 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.14	0.16	0.14	IS 3025: Part – 49
10	Nickel as Ni	mg/l	0.03	0.03	0.02	IS 3025: Part - 54
11	Copper as Cu	mg/l	0.01	0.01	0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	0.03	0.02	0.02	IS 3025: Part – 37
15	Lead as Pb	mg/l	0.01	0.01	0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.31	0.28	0.32	APHA 3111 - B
19	Iron as Fe	mg/l	0.35	0.42	0.36	IS 3025: Part 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 56
22	Boron as B	mg/l	1.0	1.1	1.0	IS 3025: Part - 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

PATANCHERU - BOLLARAM (ANDHRA PRADESH)

Sl. No.	Test Parameters	UOM	SW – 4: Asanikunta Tank			Test Method
			1st Round 27.12.2013	2nd Round 29.12.2013	3rd Round 31.12.2013	
I	**Simple Parameters**					
1	Appearance	-	Brownish	Brownish	Brownish	-
2	Colour (Hazen Units)	-	150	130	140	IS 3025: Part 4
3	Odour (Smell)	-	Un agreeable	Un agreeable	Un agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.57	7.69	7.84	IS 3025: Part – 11
2	E C	µS/cm	10120	10390	10210	IS 3025: Part – 14
3	Oil & Grease	mg/l	9	10	12	IS 3025: Part 39
4	Suspended Solids	mg/l	92	114	106	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	< 1.0	< 1.0	< 1.0	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	1120	1290	1340	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	390	450	480	IS 3025: Part.– 44
8	Nitrite-Nitrogen as N	mg/l	0.03	0.06	0.06	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	6.70	7.22	7.30	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2, NO_3)	mg/l	6.73	7.28	7.36	By Calculation
11	Free Ammonia	mg/l	0.8	0.9	0.8	APHA 4500 NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	1.6	1.8	1.6	IS 3025: Part – 60
15	Sulphides as S	mg/l	8.7	9.2	9.0	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	5.10	6.40	6.0	APHA 4500 P.D
17	Sodium Absorption Ratio (SAR)	-	22.53	23.16	24.98	By Calculation
18	Total Coliforms	MPN/100ml	21	34	27	IS 1622
19	Fecal Coliforms	MPN/100ml	9	12	11	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	6.2	7.60	6.90	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	104	126	138	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	78	82	94	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	0.005	0.004	0.008	IS 3025: Part - 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.28	0.32	0.30	IS 3025: Part – 49
10	Nickel as Ni	mg/l	0.11	0.10	0.12	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part.– 42
12	Hexavalent Chromium as Cr6	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	0.04	0.04	0.04	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part- 37
15	Lead as Pb	mg/l	0.01	0.01	0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.90	0.92	0.90	APHA 3111 B
19	Iron as Fe	mg/l	0.77	0.84	0.98	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	<0.01	APHA 3111 – D
21	Selenium as Se	mg/l	0.03	0.02	0.02	IS 3025: Part 56
22	Boron as B	mg/l	2.1	2.6	2.4	IS 3025: Part – 57

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW-1: Muthangi Village			Test Method
			1st Round 27.12.2013	2nd Round 29.12.2013	3rd Round 31.12.2013	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.82	7.98	7.88	IS 3025: Part – 11
2	E C	µS/cm	1610	1590	1630	IS 3025: Part - 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part - 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	4	4	4	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	0.07	0.04	0.05	APHA 4500 NO_2-B
8	Nitrate-Nitrogen as N	mg/l	8.13	7.68	8.58	APHA 4500 – NO_3-B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2-NO_3)	mg/l	8.20	7.72	8.63	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	1.0	1.0	1.0	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 P.D
16	Sodium Absorption Ratio (SAR)	-	5.06	4.94	4.79	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part - 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.20	0.24	0.20	IS 3025: Part 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 54
11	Copper as Cu	mg/l	0.01	0.01	0.01	IS 3025: Part - 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 37
15	Lead as Pb	mg/l	0.01	0.01	0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 48
18	Manganese as Mn	mg/l	0.03	0.02	0.03	APHA 3111 – B
19	Iron as Fe	mg/l	0.10	0.09	0.08	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 - D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.20	0.19	0.18	IS 3025: Part - 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

PATANCHERU - BOLLARAM (ANDHRA PRADESH)

Sl. No.	Test Parameters	UOM	GW-2: Inole Village			Test Method
			1st Round 27.12.2013	2nd Round 29.12.2013	3rd Round 31.12.2013	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.74	7.64	7.78	IS 3025: Part – 11
2	E.C	µS/cm	1290	1310	1340	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	6	4	6	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	0.01	0.02	0.02	APHA 4500 NO_2.B
8	Nitrate-Nitrogen as N	mg/l	7.90	7.68	8.13	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	7.91	7.70	8.15	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	1.2	1.1	1.2	IS 3025: Part 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	3.19	3.34	3.02	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.08	0.06	0.05	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 B
19	Iron as Fe	mg/l	0.08	0.07	0.08	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 56
22	Boron as B	mg/l	0.15	0.16	0.14	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

PATANCHERU - BOLLARAM (ANDHRA PRADESH)

Sl. No.	Test Parameters	UOM	GW-3: Bollaram Village			Test Method
			1st Round 27.12.2013	2nd Round 29.12.2013	3rd Round 31.12.2013	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.01	7.12	6.98	IS 3025: Part – 11
2	E.C	µS/cm	2650	2690	2560	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	8	6	8	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	0.03	0.02	0.03	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	4.06	4.18	3.95	APHA 4500 NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	4.09	4.20	3.98	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	1.1	1.1	1.0	IS 3025: Part - 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part - 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 - P.D
16	Sodium Absorption Ratio (SAR)	-	2.82	2.74	2.88	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 - P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.05	0.04	0.05	IS 3025: Part – 49
10	Nickel as Ni	mg/l	0.02	0.02	0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	0.02	0.02	0.02	IS 3025: Part – 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	0.01	0.01	0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.03	0.03	0.04	APHA 3111 - B
19	Iron as Fe	mg/l	0.08	0.10	0.09	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.20	0.18	0.20	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

PATANCHERU - BOLLARAM (ANDHRA PRADESH)

Sl. No.	Test Parameters	UOM	GW-4: Krishnareddypet Village			Test Method
			1st Round 27.12.2013	2nd Round 29.12.2013	3rd Round 31.12.2013	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.17	7.29	7.21	IS 3025: Part – 11
2	T.C	µS/cm	1400	1340	1410	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	6	4	6	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	0.02	0.02	0.02	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	4.29	4.51	4.06	APHA 4500 - NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	4.31	4.53	4.08	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	1.0	1.0	1.0	IS 3025: Part - 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	1.30	1.42	1.36	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.06	0.06	0.08	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr6	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	0.01	0.01	0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.07	0.07	0.06	IS 3025: Part - 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 - D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 56
22	Boron as B	mg/l	0.10	0.12	0.10	IS 3025: Part – 57

1st Round: 26.12.2013 & 27.12.2013

AMBIENT AIR MONITORING LOCATIONS PHOTOGRAPHS

AAQ – 1: APPCB – Zonal office, R.C.Puram

AAQ - 2: PETL, Patancheru

AAQ – 3: DR. Reddy's Laboratories, Unit - II, Bollaram

AAQ – 4: M/s. Sujana Metals Products Ltd., Unit – IV, Bollaram

SAMPLING LOCATION PHOTOGRAPHS OF SURFACEWATER

SW – 1: Issukavagu at PETL

SW – 2: Nakkavagu at Bachegudem

SW – 3: Krishnareddypet Tank

SW - 4: Asani Kunta

SAMPLING LOCATION PHOTOGRAPHS OF GROUNDWATER

GW – 1: Muthangi Village

GW 2: Inole Village

GW – 3: Bollaram Village

GW- 4: Krishnareddypet Village

2nd Round: 28.12.2013 & 29.12.2013

AMBIENT AIR MONITORING LOCATIONS PHOTOGRAPHS

AAQ – 1: APPCB – Zonal office, R.C.Puram

AAQ – 2: PETL, Patancheru

AAQ – 3: DR. Reddy's Laboratories, Unit – II, Bollaram

AAQ – 4: M/s. Sujana Metals Products Ltd., Unit IV, Bollaram

SAMPLING LOCATION PHOTOGRAPHS OF SURFACEWATER

SW – 1: Nakkavagu at Bachegudem

SW – 2: Issukavagu at PETL

SW – 3: Krishnareddypet Tank

SW – 4: Asani Kunta

SAMPLING LOCATION PHOTOGRAPHS OF GROUNDWATER

GW – 1: Muthangi Village

GW – 2: Inole Village

GW – 3: Bollaram Village

GW- 4: Krishnareddypet Village

3rd Round: 30.12.2013 & 31.12.2013

AMBIENT AIR MONITORING LOCATIONS PHOTOGRAPHS

AAQ 1: APPCB Zonal office, R.C.Puram

AAQ 2: PETL, Patancheru

AAQ – 3: DR. Reddy's Laboratories, Unit – II, Bollaram

AAQ 4: M/s. Sujana Metals Products Ltd., Unit – IV, Bollaram

SAMPLING LOCATION PHOTOGRAPHS OF SURFACEWATER

SW – 1: Nakkavagu at Bachegudem

SW – 2: Issukavagu at PETL

SW – 3: Krishnareddypet Tank

SW – 4: Asani Kunta

SAMPLING LOCATION PHOTOGRAPHS OF GROUNDWATER

GW – 1: Muthangi Village

GW – 2: Inole Village

GW – 3: Bollaram Village

GW- 4: Krishnareddypet Village

MONITORING, SAMPLING AND ANALYSIS

of

AMBIENT AIR QUALITY, SURFACE WATER QUALITY AND GROUND WATER QUALITY

in

IDENTIFIED CRITICALLY POLLUTED AREA (CPAs)

SINGRAULI

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

SINGRAULI – UTTAR PRADESH

AAQ MONITORING LOCATIONS

SAMPLE CODE	NAME OF THE MONITORING LOCATION	DATE OF SAMPLING	LATITUDE	LONGITUDE
AAQ 1	Executive club, NTPC Colony, Shakti nagar (Uttar Pradesh)	1st Round: 31.01.2014 to 01.02.2014 2nd Round: 03.02.2014 to 04.02.2014 3rd Round: 05.02.2014 to 06.02.2014	N28°06'45.7"	E082°41'17.0"
AAQ – 2	GM Office, NCL, Dudhichau, Khadia, (Uttar Pradesh)	1st Round: 07.02.2014 to 08.02.2014 2nd Round: 10.02.2014 to 11.02.2014 3rd Round: 12.02.2014 to 13.02.2014	N28°07'27.2"	E082°40'3.4"
AAQ – 3	Expert hostel, Khadia colony, NCL (Uttar Pradesh)	1st Round: 31.01.2014 to 01.02.2014 2nd Round: 03.02.2014 to 04.02.2014 3rd Round: 05.02.2014 to 06.02.2014	N28°07'21.0"	E082°41'17.7"
AAQ 4	Senior Transit Camp, NCL, Bina (Uttar Pradesh)	1st Round: 31.01.2014 to 01.02.2014 2nd Round: 03.02.2014 to 04.02.2014 3rd Round: 05.02.2014 to 06.02.2014	N24°09'25.1"	E082°46'16.1"
AAQ – 5	Guest house, NCL Amlori colony, Near Shiv mandir (Madhya Pradesh)	1st Round: 07.02.2014 to 08.02.2014 2nd Round: 10.02.2014 to 11.02.2014 3rd Round: 12.02.2014 to 13.02.2014	N24°05'56.5"	E082°36'20.2"
AAQ 6	Officers club, NCL, Kakri colony (Uttar Pradesh)	1st Round: 31.01.2014 to 01.02.2014 2nd Round: 03.02.2014 to 04.02.2014 3rd Round: 05.02.2014 to 06.02.2014	N24°10'45.5"	E082°40'17.0"
AAQ – 7	Hindalco colony (Hanuman mandir) Renusagar. (Uttar Pradesh)	1st Round: 25.01.2014 to 26.01.2014 2nd Round: 27.01.2014 to 28.01.2014 3rd Round: 29.01.2014 to 30.01.2014	N24°11'09.9"	E082°47'07.8"
AAQ – 8	IIIrd type colony, Anpara (Uttar Pradesh)	1st Round: 25.01.2014 to 26.01.2014 2nd Round: 27.01.2014 to 28.01.2014 3rd Round: 29.01.2014 to 30.01.2014	N24°11'57.2"	E082°46'14.0"
AAQ 9	Guest house, NCL colony, Jingurda (Madhya Pradesh)	1st Round: 07.02.2014 to 08.02.2014 2nd Round: 10.02.2014 to 11.02.2014 3rd Round: 12.02.2014 to 13.02.2014	N24°11'50.0"	E082°42'13.6"
AAQ – 10	Experts Hostel, Jayant, NCL Project. (Madhya Pradesh)	1st Round: 14.02.2014 to 15.02.2014 2nd Round: 17.02.2014 to 18.02.2014 3rd Round: 19.02.2014 to 20.02.2014	N24°07'03.1"	E082°39'26.5"
AAQ 11	NCL Area (Near Police station), Jayant. (Madhya Pradesh)	1st Round: 14.02.2014 to 15.02.2014 2nd Round: 17.02.2014 to 18.02.2014 3rd Round: 19.02.2014 to 20.02.2014	N24°07'14.8"	E082°39'45.5"
AAQ – 12	Guest House Sector-B, Dudichua, NCL Project (Madhya Pradesh)	1st Round: 07.02.2014 to 08.02.2014 2nd Round: 10.02.2014 to 11.02.2014 3rd Round: 12.02.2014 to 13.02.2014	N24°06'30.5"	E082°38'42.1"
AAQ – 13	Gust house, NCL residential colony, Nighai (Madhya Pradesh)	1st Round: 07.02.2014 to 08.02.2014 2nd Round: 10.02.2014 to 11.02.2014 3rd Round: 12.02.2014 to 13.02.2014	N24°06'30.0"	E082°37'40.5"
AAQ – 14	NTPC Vindhyanagar residential colony (NII 2) (Madhya Pradesh)	1st Round: 14.02.2014 to 15.02.2014 2nd Round: 17.02.2014 to 18.02.2014 3rd Round: 19.02.2014 to 20.02.2014	N24°05'26.8"	E082°38'41.4"
AAQ – 15	Main Market, NTPC Rihandnagar, Bijpur, (Uttar Pradesh)	1st Round: 14.02.2014 to 15.02.2014 2nd Round: 17.02.2014 to 18.02.2014 3rd Round: 19.02.2014 to 20.02.2014	N24°01'40.4"	E082°48'32.5"
AAQ – 16	Renukeswar mandir, Hindalco colony, Renukoot, (Uttar Pradesh)	1st Round: 25.01.2014 to 26.01.2014 2nd Round: 27.01.2014 to 28.01.2014 3rd Round: 29.01.2014 to 30.01.2014	N24°12'43.7"	E083°02'23.0"

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME
SINGRAULI – UTTAR PRADESH

SAMPLE CODE	NAME OF THE MONITORING LOCATION	DATE OF SAMPLING	LATITUDE	LONGITUDE
AAQ – 17	Guest house, Dalla town ship, Dalla (Uttar Pradesh)	1st Round: 25.01.2014 to 26.01.2014 2nd Round: 27.01.2014 to 28.01.2014 3rd Round: 29.01.2014 to 30.01.2014	N24°26'40.3"	E083°02'46.1"
AAQ – 18	Guest house , Obra colony, Obra, (Uttar Pradesh)	1st Round: 25.01.2014 to 26.01.2014 2nd Round: 27.01.2014 to 28.01.2014 3rd Round: 29.01.2014 to 30.01.2014	N24°26'54.9"	E083°02'44.7"

SURFACE WATER SAMPLING LOCATIONS

SAMPLE CODE	NAME OF THE SAMPLING LOCATION	DATE OF SAMPLING (SHIFT- A & SHIFT- B)	LATITUDE	LONGITUDE
SW – 1	Balia Nala Dn Stream, near Bridge, Shaktinagar, (Uttar Pradesh)	1st Round: 01.02.2014 2nd Round:04.02.2014 3rd Round: 06.02.2014	N24°05'56.6"	E082°42'05.3"
SW – 2	Balia Nala Up Stream, near Bridge, Kadia colony, (Uttar Pradesh)	1st Round: 01.02.2014 2nd Round:04.02.2014 3rd Round: 06.02.2014	N24°07'08.9"	E082°40'38.6"
SW – 3	Lake water near Senior Transit Camp, NCL, Bina, (Uttar Pradesh)	1st Round: 01.02.2014 2nd Round:04.02.2014 3rd Round: 06.02.2014	N24°09'28.8"	E082°46'11.7"
SW – 4	Kava nala, Anpara, (Uttar Pradesh)	1st Round: 01.02.2014 2nd Round:04.02.2014 3rd Round: 06.02.2014	N24°11'52.0"	E082°45'43.3"
SW - 5	Rihand river near Kohadowal village	1st Round: 01.02.2014 2nd Round:04.02.2014 3rd Round: 06.02.2014	N24°07'27.7"	E082°46'28.0"
SW - 6	Surya Nala, near police station bridge, Vindhyanagar	1st Round: 09.02.2014 2nd Round: 11.02.2014 3rd Round: 13.02.2014	N24°05'03.0"	E082°39'45.4"
SW 7	Rihand Reservoir near Baliyari village upstream	1st Round: 09.02.2014 2nd Round: 11.02.2014 3rd Round: 13.02.2014	N24°02'22.6"	E082°38'12.2"
SW – 8	Kanchana nallah near chauhan cold storage, Kachni	1st Round: 09.02.2014 2nd Round: 11.02.2014 3rd Round: 13.02.2014	N24°04'31.1"	E082°35'15.9"
SW – 9	Balia Nallah near Dudichua STP	1st Round: 09.02.2014 2nd Round: 11.02.2014 3rd Round: 13.02.2014	N24°07'20.1"	E082°40'3.9"
SW 10	Rihand river,Singrauli to rihand nagar road under rail bridge	1st Round: 15.02.2014 2nd Round: 18.02.2014 3rd Round: 20.02.2014	N24°02'01.7"	E082°37'28.6"
SW – 11	Murdhwa Nallah	1st Round: 26.01.2014 2nd Round: 28.01.2014 3rd Round: 30.01.2014	N24°13'33.8"	E083°02'32.6"
SW – 12	Rihand Reservior, Up Stream	1st Round: 26.01.2014 2nd Round: 28.01.2014 3rd Round: 30.01.2014	N24°11'42.6"	E083°02'41.2"
SW – 13	Dongia Nallah	1st Round: 26.01.2014 2nd Round: 28.01.2014 3rd Round: 30.01.2014	N24°11'55.1"	E083°02'36.1"

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME
SINGRAULI – UTTAR PRADESH

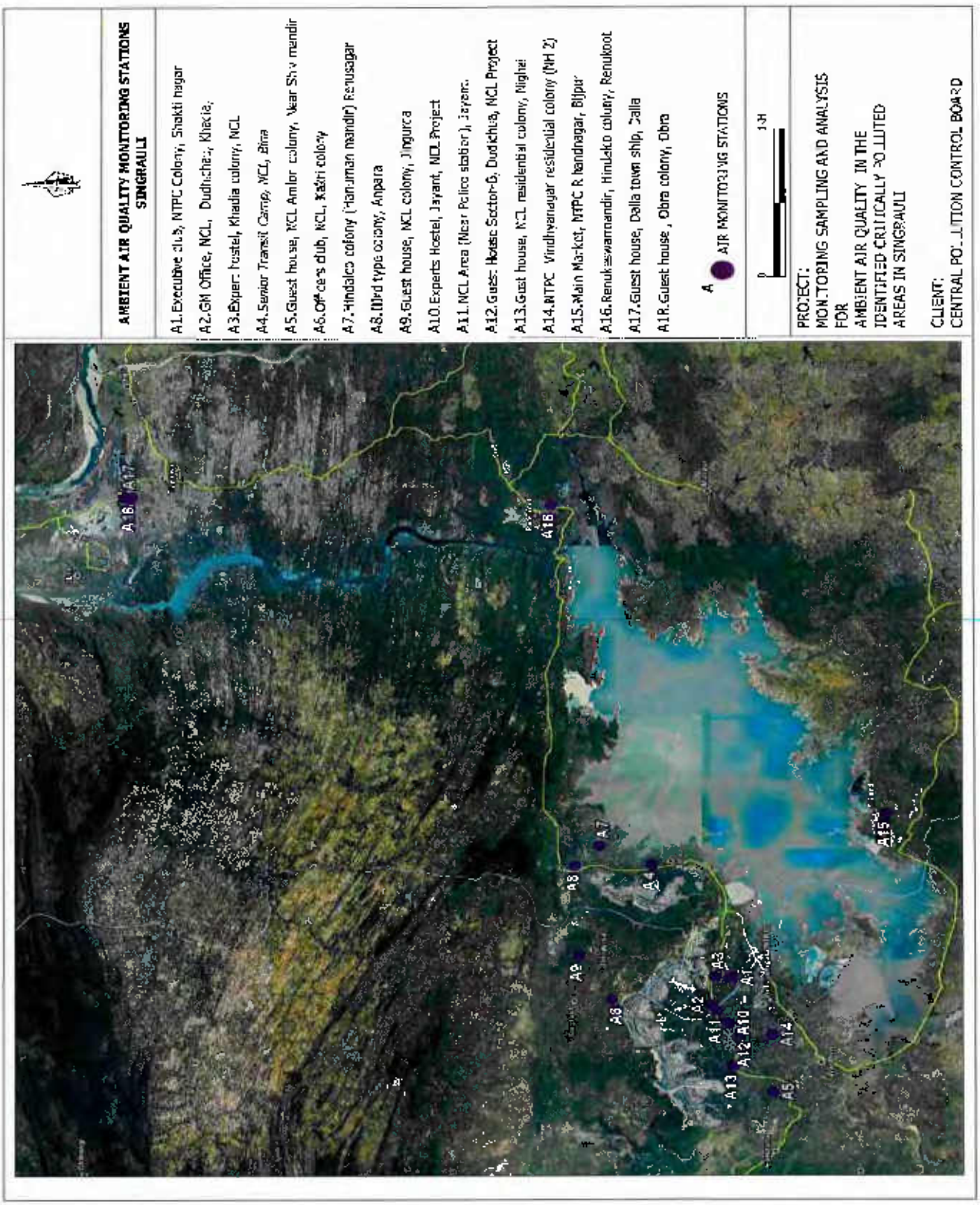
SAMPLE CODE	NAME OF THE SAMPLING LOCATION	DATE OF SAMPLING (SHIFT- A & SHIFT- B)	LATITUDE	LONGITUDE
SW 14	Rihand Dam Down Stream	1st Round: 15.02.2014 2nd Round: 18.02.2014 3rd Round: 20.02.2014	N24°12'33.7"	E083°00'06.2"
SW 15	Sone River mid stream	1st Round: 26.01.2014 2nd Round: 28.01.2014 3rd Round: 30.01.2014	N24°27'38.1"	E082°58'18.1"
SW – 16	Sone River upstream, near somnath mandir, gotheni	1st Round: 26.01.2014 2nd Round: 28.01.2014 3rd Round: 30.01.2014	N24°32'45.8"	E082°58'42.0"
SW – 17	Sone River near toll Bridge	1st Round: 26.01.2014 2nd Round: 28.01.2014 3rd Round: 30.01.2014	N24°32'10.2"	E083°01'20.4"
SW – 18	Sone River Down Stream	1st Round: 26.01.2014 2nd Round: 28.01.2014 3rd Round: 30.01.2014	N24°31'52.4"	E083°01'16.8"

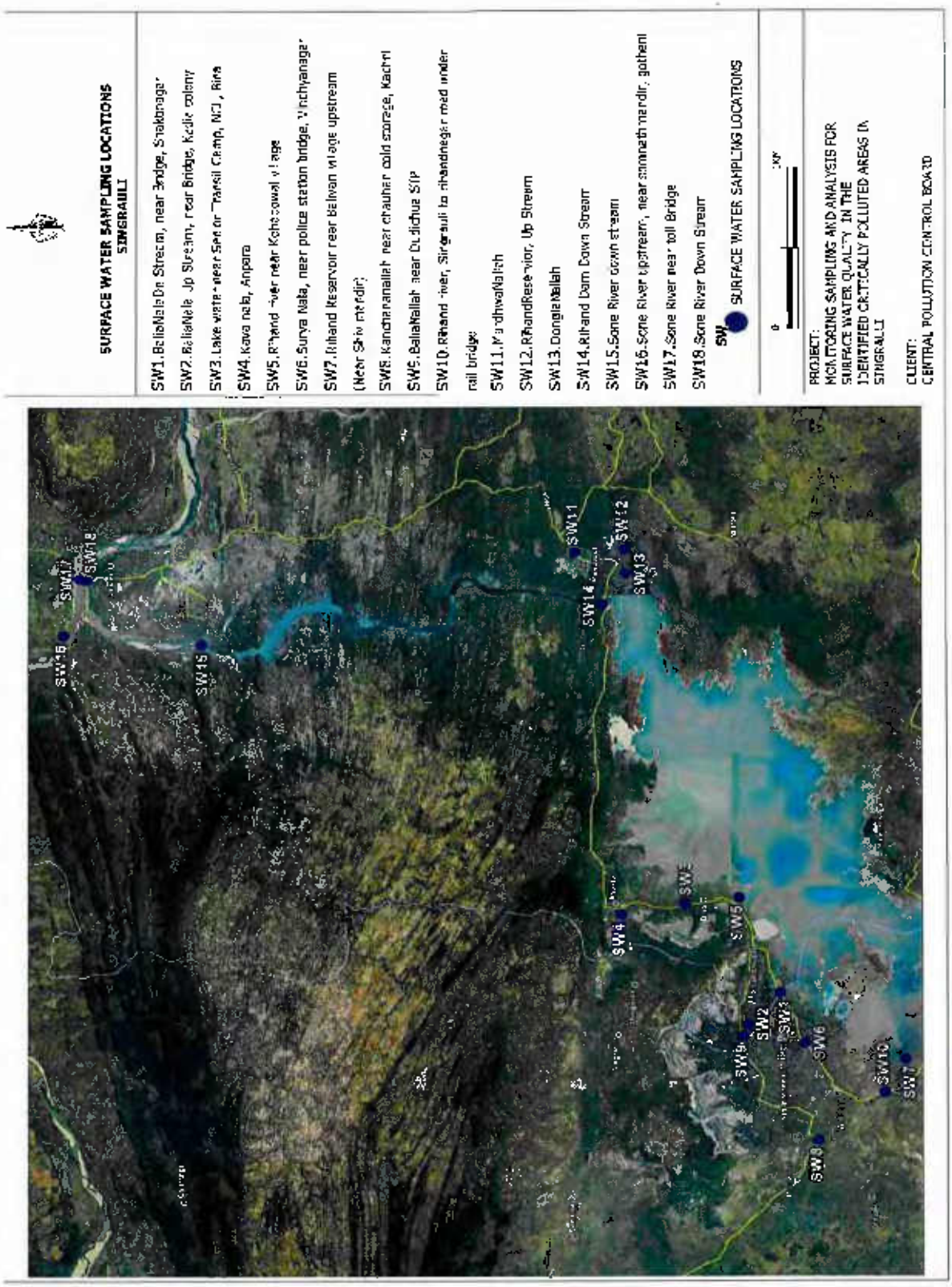
GROUND WATER SAMPLING LOCATIONS

SAMPLE CODE	NAME OF THE SAMPLING LOCATION	DATE OF SAMPLING	LATITUDE	LONGITUDE
GW – 1	Near Bank, NCL Colony, Bina, (Uttar Pradesh)	1st Round: 01.02.2014 2nd Round:04.02.2014 3rd Round: 06.02.2014	N24°08'55.5"	E082°46'12.4"
GW – 2	Main Shopping Centre, NTPC colony, Shakti Nagar	1st Round: 01.02.2014 2nd Round:04.02.2014 3rd Round: 06.02.2014	N24°06'35.7"	E082°41'03.1"
GW – 3	Primary School, Dudichua	1st Round: 09.02.2014 2nd Round:11.02.2014 3rd Round: 13.02.2014	N24°07'26.7"	E082°40'22.0"
GW – 4	Khadia Colony (Minor Q.No.-M-219)	1st Round: 01.02.2014 2nd Round:04.02.2014 3rd Round: 06.02.2014	N24°07'15.6"	E082°40'36.2"
GW - 5	Kakri Colony near Q-MQ-7 (NCL Project)	1st Round: 01.02.2014 2nd Round:04.02.2014 3rd Round: 06.02.2014	N24°10'41.6"	E082°46'33.6"
GW - 6	Anpara Colony near DAV College	1st Round: 26.01.2014 2nd Round:28.01.2014 3rd Round: 30.01.2014	N24°12'07.0"	E082°46'17.0"
GW 7	Near Q-SHF-176, NCL, Jhingurda (Near Shiv mandir)	1st Round: 09.02.2014 2nd Round:11.02.2014 3rd Round: 13.02.2014	N24°11'50.5"	E082°42'7.2"
GW – 8	Near Coal Gate (out side of Renusagar Power Division Boundary)	1st Round: 26.01.2014 2nd Round:28.01.2014 3rd Round: 30.01.2014	N24°10'59.0"	E082°46'41.3"
GW – 9	Near shiv mandir, Amlori (NCL Project)	1st Round: 09.02.2014 2nd Round:11.02.2014 3rd Round: 13.02.2014	N24°05'59.3"	E082°36'3.6"
GW – 10	Near Sabji mandi, NCL, Jayant, (Beside Police station)	1st Round: 15.02.2014 2nd Round: 18.02.2014 3rd Round: 20.02.2014	N24°07'14.2"	E082°39'47.9"

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME
SINGRAULI – UTTAR PRADESH

SAMPLE CODE	NAME OF THE SAMPLING LOCATION	DATE OF SAMPLING	LATITUDE	LONGITUDE
GW – 11	Saraswahraja Colony, Jayanth	1st Round: 15.02.2014 2nd Round: 18.02.2014 3rd Round: 20.02.2014	N24°06'54.2"	E082°39'52.8"
GW – 12	Near substation, Sector-B, Dudichua, NCL Project	1st Round: 09.02.2014 2nd Round:11.02.2014 3rd Round: 13.02.2014	N24°06'37.8"	E082°38'40.5"
GW – 13	Near Entrance Gate, Vivekananda statue, Nighai	1st Round: 09.02.2014 2nd Round:11.02.2014 3rd Round: 13.02.2014	N24°06'34.5"	E082°37'33.4"
GW – 14	Near Commercial Auto Mobiles, Beside Bharath Petrol Bunk, Vindhyanagar	1st Round: 15.02.2014 2nd Round: 18.02.2014 3rd Round: 20.02.2014	N24°04'37.4"	E082°39'05.4"
GW – 15	Punarwas-2, Rihandnagar	1st Round: 15.02.2014 2nd Round: 18.02.2014 3rd Round: 20.02.2014	N24°01'34.0"	E082°49'26.8"
GW - 16	Main road, Renukut market, near shiv park	1st Round: 26.01.2014 2nd Round:28.01.2014 3rd Round: 30.01.2014	N24°13'11.0"	E083°02'7.8"
GW – 17	Dalla area	1st Round: 26.01.2014 2nd Round:28.01.2014 3rd Round: 30.01.2014	N24°26'54.9"	E083°02'44.7"
GW – 18	Obra Colony near Hospital	1st Round: 26.01.2014 2nd Round:28.01.2014 3rd Round: 30.01.2014	N24°27'51.1"	E082°59'11.7"


AMBIENT AIR QUALITY MONITORING STATIONS SINGRAULI
A1.Executive club, NTPC Colony, Shakti nagar
A2.GM Office, NCL, Dudhichua, Khadia,
A3.Expert hostel, Khadia colony, NCL
A4.Senior Transit Camp, NCL, Jhiria
A5.Guest house, NCL Amlori colony, Near Shiv mandir
A6.Officers club, NCL, Kastri colony
A7.Hindalco colony (Hanuman mandir) Renusagar
A8.Third type colony, Anpara
A9.Guest house, NCL colony, Jhingurda
A10.Experts Hostel, Jayant, NCL Project
A11.NCL Area (Near Police station), Jayant.
A12.Guest House Sector-G, Dudichua, NCL Project
A13.Guest house, NCL residential colony, Mighai
A14.NTPC Vindhyanagar residential colony (NH 7)
A15.Main Market, NTPC R handnagar, Bijpur
A16.Renukeswaramandir, Hindalco colony, Renukoot
A17.Guest house, Dalla town ship, Dalla
A18.Guest house , Obra colony, Obra
AIR MONITORING STATIONS
PROJECT:
MONITORING SAMPLING AND ANALYSIS FOR
AMBIENT AIR QUALITY IN THE IDENTIFIED CRITICALLY POLLUTED AREAS IN SINGRAULI
CLIENT:
CENTRAL POLLUTION CONTROL BOARD


SURFACE WATER SAMPLING LOCATIONS
SINGRAULI
SW1.BelliaNalaDn Stream, near Bridge, Shaktinagar
SW2.BelliaNalla Up Stream, near Bridge, Kadia colony
SW3.Lake water near Sector Transit Camp, NTJ, Rihand
SW4.Kava nala, Anpara
SW5.Rihand river near Kohtawal village
SW6.Surya Nala, near police station bridge, Vindhyanagar
SW7.Rihand Reservoir near Belwan village upstream
(Near Shiv mandir)
SW8.Kanchanamallah near chauhan cold storage, Kachri
SW9.BallaNallah near Dudichua STP
SW10.Rihand river, Singrauli to rihandnagar road under
rail bridge
SW11.Madhwanallah
SW12.RihandReservior, Up Stream
SW13.DongleNallah
SW14.Rihand Dam Down Stream
SW15.Sone River down stream
SW16.Sone River upstream, near sonnath mandir, gothani
SW17.Sone River near toll Bridge
SW18.Sone River Down Stream
SURFACE WATER SAMPLING LOCATIONS
PROJECT:
MONITORING SAMPLING AND ANALYSIS FOR SURFACE WATER QUALITY IN THE IDENTIFIED CRITICALLY POLLUTED AREAS IN SINGRAULI
CLIENT:
CENTRAL POLLUTION CONTROL BOARD

GROUND WATER SAMPLING LOCATIONS SINGRAULI
GW1.Near Bank, NCL Colony, Bina
GW2.Main Shopping Centre, NTPC colony, Shakti Nagar
GW3.Primary School, Dudichua
GW4.Khadia Colony (Minor Q.No.-M-219)
GW5.Kakri Colony near Q-MQ-7 (NCL Project)
GW6.Anpara Colony near DAV College
GW7.Near Q-SH-F-176, NCL, Jhingurda (Near Shiv mandir)
GW8.Near Coal Gate
GW9.Near shiv mandir, Amlori (NCL Project)
GW10.Near Satyamandi, NCL, Jayant, (Beside Police station)
GW11.Sarasswatinagja Colony, Jayanth
GW12.Near substation, Sector-8, Duddichua, NCL Project
GW13.Near Entrance Gate, Vivekanand ji statue, Nigahi
GW14.Near Commercial Auto Mobiles,
GW15.Purnarwas-2, Jihandnagar
GW16.Main road, Renukut market, near shiv park
GW17.Dala area
GW18.Obra Colony near Hospital
GW GROUND WATER SAMPLING LOCATIONS
PROJECT:
MONITORING SAMPLING AND ANALYSIS FOR GROUND WATER QUALITY IN THE IDENTIFIED CRITICALLY POLLUTED AREAS IN SINGRAULI
CLIENT:
CENTRAL POLLUTION CONTROL BOARD
GW1
GW2
GW3
GW4
GW5
GW6
GW7
GW8
GW9
GW10
GW11
GW12
GW13
GW14

AMBIENT AIR QUALITY MONITORING RESULTS

S.No.	Pollutants	AAQ – 1 Executive club, NTPC Colony, Shakti nagar			AAQ – 2 GM Office, NCL, Dudhichau, Khadia,			NAAQ Standards (2009)
		1st Round	2nd Round	3rd Round	1st Round	2nd Round	3rd Round	
		31.01.2014	03.02.2014	05.02.2014	07.02.2014	10.02.2014	12.02.2014	
I.	**Particulate Pollutants**							
1.	PM_{10} ($\mu g/m^3$)	122	107	135	152	187	138	**100 ($\mu g/m^3$)**
2	$PM_{2.5}$ ($\mu g/m^3$)	54	47	36	53	69	41	**60 ($\mu g/m^3$)**
3	Arsenic (ng/m^3)	1.1	1.6	<1	2.3	1.9	3.7	**06 (ng/m^3) (Annual)**
4	Nickel (ng/m^3)	6.4	5.7	8.2	5.8	6.9	6.2	**20 (ng/m^3) (Annual)**
5	Lead ($\mu g/m^3$)	0.08	0.12	0.15	0.06	0.08	0.11	**1.0($\mu g/m^3$) (24 hours)**
6	Benzo (a) Pyrene (ng/m^3)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**01 (ng/m^3) (Annual)**
II.	**Gaseous Pollutants**							
7	SO_2 ($\mu g/m^3$)	18.6	20.3	19.4	22.4	23.8	21.6	**80 ($\mu g/m^3$) (24 hours)**
8	NO_x ($\mu g/m^3$)	25.4	26.1	24.2	37.8	40.1	38.1	**80 ($\mu g/m^3$) (24 hours)**
9	NH_3 ($\mu g/m^3$)	6.2	6.4	5.8	5.8	6.1	5.2	**400 ($\mu g/m^3$) (24 hours)**
10	O_3 ($\mu g/m^3$)	10.2	10.8	12.8	11.8	13.4	12.8	**100 (8 hours) & 180 ($\mu g/m^3$) (1 hour)**
		11.8	16.4	13.8	13.7	15.8	16.2	
		10.7	10.9	15.8	16.4	15.7	18.2	
11	CO (mg/m^3)	< 2	< 2	< 2	< 2	< 2	< 2	**02 (8 hours) & 04 mg/m^3 (1 hour)**
		< 2	< 2	< 2	< 2	< 2	< 2	
		< 2	< 2	< 2	< 2	< 2	< 2	
12	Benzene ($\mu g/m^3$)	< 3	< 3	< 3	< 3	< 3	< 3	**05 ($\mu g/m^3$) (Annual)**

AMBIENT AIR QUALITY MONITORING RESULTS

S.No.	Pollutants	AAQ – 3 Expert hostel, Khadia colony, NCL			AAQ – 4 Senior Transit Camp, NCL., Bina			NAAQ Standards (2009)
		1st Round	2nd Round	3rd Round	1st Round	2nd Round	3rd Round	
		31.01.2014	03.02.2014	05.02.2014	31.01.2014	03.02.2014	05.02.2014	
I.	**Particulate Pollutants**							
1.	PM_{10} (µg/m³)	251	187	172	148	119	125	**100 (µg/m³)**
2	$PM_{2.5}$ (µg/m³)	58	61	53	59	42	46	**60 (µg/m³)**
3	Arsenic (ng/m³)	1.6	2.9	1.4	2.3	1.4	3.9	**06 (ng/m³) (Annual)**
4	Nickel (ng/m³)	6.1	5.8	8.4	6.2	5.9	6.8	**20 (ng/m³) (Annual)**
5	Lead (µg/m³)	0.04	0.08	0.02	0.02	0.04	0.07	**1.0(µg/m³) (24 hours)**
6	Benzo (a) Pyrene (ng/m³)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**01 (ng/m³) (Annual)**
II.	**Gaseous Pollutants**							
7	SO_2 (µg/m³)	19.8	20.7	23.4	12.8	16.7	14.2	**80 (µg/m³) (24 hours)**
8	NO_x (µg/m³)	34.2	28.6	29.5	27.4	29.7	30.1	**80 (µg/m³) (24 hours)**
9	NH_3 (µg/m³)	14.7	15.2	14.1	16.7	16.2	18.2	**400 (µg/m³) (24 hours)**
10	O_3 (µg/m³)	6.4	6.8	7.3	5.9	6.8	9.4	**100 (8 hours) & 180 (µg/m³) (1 hour)**
		5.9	7.4	9.2	6.7	7.5	10.8	
		5.7	6.3	8.4	7.9	8.8	6.7	
11	CO (mg/m³)	< 2	< 2	< 2	< 2	< 2	< 2	**02 (8 hours) & 04 mg/m³ (1 hour)**
		< 2	< 2	< 2	< 2	< 2	< 2	
		< 2	< 2	< 2	< 2	< 2	< 2	
12	Benzene (µg/m³)	< 3	< 3	< 3	< 3	< 3	< 3	**05 (µg/m³) (Annual)**

AMBIENT AIR QUALITY MONITORING RESULTS

S.No.	Pollutants	AAQ – 5 Guest house, NCL Amlori colony, Near Shiv mandir			AAQ – 6 Officers club, NCL, Kakri colony			NAAQ Standards (2009)
		1st Round	2nd Round	3rd Round	1st Round	2nd Round	3rd Round	
		07.02.2014	10.02.2014	12.02.2014	31.01.2014	03.02.2014	05.02.2014	
I.	**Particulate Pollutants**							
1.	PM_{10} (µg/m^3)	109	94	88	157	139	167	**100 (µg/m^3)**
2	$PM_{2.5}$ (µg/m^3)	46	38	33	73	45	68	**60 (µg/m^3)**
3	Arsenic (ng/m^3)	1.8	3.9	<1	1.6	1.9	1.7	**06 (ng/m^3) (Annual)**
4	Nickel (ng/m^3)	6.4	5.9	9.4	5.8	6.7	4.2	**20 (ng/m^3) (Annual)**
5	Lead (µg/m^3)	0.04	0.07	0.03	0.07	0.09	0.05	**1.0(µg/m^3) (24 hours)**
6	Benzo (a) Pyrene (ng/m^3)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**01 (ng/m^3) (Annual)**
II.	**Gaseous Pollutants**							
7	SO_2 (µg/m^3)	13.8	16.9	15.4	20.4	21.7	18.2	**80 (µg/m^3) (24 hours)**
8	NO_X (µg/m^3)	26.4	22.8	19.6	38.4	27.9	31.5	**80 (µg/m^3) (24 hours)**
9	NH_3 (µg/m^3)	20.1	18.6	19.2	7.8	8.1	9.8	**400 (µg/m^3) (24 hours)**
10	O_3 (µg/m^3)	6.4	6.9	7.8	8.4	6.9	10.3	**100 (8 hours) & 180 (µg/m^3) (1 hour)**
		8.9	6.7	10.4	9.5	8.1	9.6	
		8.5	9.5	9.7	10.6	9.5	10.9	
11	CO (mg/m^3)	< 2	< 2	< 2	< 2	< 2	< 2	**02 (8 hours) & 04 mg/m^3 (1 hour)**
		< 2	< 2	< 2	< 2	< 2	< 2	
		< 2	< 2	< 2	< 2	< 2	< 2	
12	Benzene (µg/m^3)	< 3	< 3	< 3	< 3	< 3	< 3	**05 (µg/m^3) (Annual)**

AMBIENT AIR QUALITY MONITORING RESULTS

S.No.	Pollutants	AAQ – 7 Hindalco colony (Hanuman mandir) Renusagar			AAQ – 8 III type colony, Anpara			NAAQ Standards (2009)
		1st Round	2nd Round	3rd Round	1st Round	2nd Round	3rd Round	
		25.01.2014	27.01.2014	29.01.2014	25.01.2014	27.01.2014	29.01.2014	
I.	**Particulate Pollutants**							
1.	PM_{10} (µg/m³)	64	73	55	178	144	132	**100 (µg/m³)**
2	$PM_{2.5}$ (µg/m³)	29	32	38	55	44	45	**60 (µg/m³)**
3	Arsenic (ng/m³)	<1	<1	<1	1.6	2.9	2.1	**06 (ng/m³) (Annual)**
4	Nickel (ng/m³)	2.9	3.4	3.2	6.4	5.2	6.9	**20 (ng/m³) (Annual)**
5	Lead (µg/m³)	0.06	0.07	0.05	0.14	0.19	0.09	**1.0(µg/m³) (24 hours)**
6	Benzo (a) Pyrene (ng/m³)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**01 (ng/m³) (Annual)**
II.	**Gaseous Pollutants**							
7	SO_2 (µg/m³)	11.5	13.8	9.9	18.2	18.1	16.9	**80 (µg/m³) (24 hours)**
8	NO_X (µg/m³)	22.6	24.1	19.6	28.4	24.6	24.8	**80 (µg/m³) (24 hours)**
9	NH_3 (µg/m³)	10.2	10.8	9.4	10.7	12.7	11.6	**400 (µg/m³) (24 hours)**
10	O_3 (µg/m³)	6.4	5.9	5.8	10.4	10.9	11.4	**100 (8 hours) & 180 (µg/m³) (1 hour)**
		8.1	5.9	6.7	11.4	11.2	15.2	
		5.9	6.8	9.2	9.7	6.8	10.4	
11	CO (mg/m³)	< 2	< 2	< 2	< 2	< 2	< 2	**02 (8 hours) & 04 mg/m³ (1 hour)**
		< 2	< 2	< 2	< 2	< 2	< 2	
		< 2	< 2	< 2	< 2	< 2	< 2	
12	Benzene (µg/m³)	< 3	< 3	< 3	< 3	< 3	< 3	**05 (µg/m³) (Annual)**

AMBIENT AIR QUALITY MONITORING RESULTS

S.No.	Pollutants	AAQ – 9 Guest house, NCL colony, Jingurda			AAQ – 10 Experts Hostel, Jayant, NCL Project			NAAQ Standards (2009)
		1st Round	2nd Round	3rd Round	1st Round	2nd Round	3rd Round	
		07.02.2014	10.02.2014	12.02.2014	07.02.2014	10.02.2014	12.02.2014	
I.	**Particulate Pollutants**							
1.	PM_{10} ($\mu g/m^3$)	92	85	78	177	140	129	**100 ($\mu g/m^3$)**
2	$PM_{2.5}$ ($\mu g/m^3$)	49	32	28	57	67	52	**60 ($\mu g/m^3$)**
3	Arsenic (ng/m^3)	<1	<1	<1	2.7	1.2	1.8	**06 (ng/m^3) (Annual)**
4	Nickel (ng/m^3)	3.9	4.8	3.1	6.4	2.8	6.9	**20 (ng/m^3) (Annual)**
5	Lead ($\mu g/m^3$)	0.04	0.05	0.09	0.04	0.06	0.03	**1.0($\mu g/m^3$) (24 hours)**
6	Benzo (a) Pyrene (ng/m^3)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**01 (ng/m^3) (Annual)**
II.	**Gaseous Pollutants**							
7	SO_2 ($\mu g/m^3$)	14.8	16.4	15.9	16.4	18.5	19.2	**80 ($\mu g/m^3$) (24 hours)**
8	NO_X ($\mu g/m^3$)	24.3	21.8	25.6	30.8	28.6	27.3	**80 ($\mu g/m^3$) (24 hours)**
9	NH_3 ($\mu g/m^3$)	18.4	18.2	15.6	22.8	21.1	20.6	**400 ($\mu g/m^3$) (24 hours)**
10	O_3 ($\mu g/m^3$)	6.9	8.5	9.2	8.4	8.6	10.4	**100 (8 hours) & 180 ($\mu g/m^3$) (1 hour)**
		6.4	5.8	7.2	10.6	10.1	8.4	
		8.4	6.7	8.6	9.5	8.6	10.7	
11	CO (mg/m^3)	< 2	< 2	< 2	< 2	< 2	< 2	**02 (8 hours) & 04 mg/m^3 (1 hour)**
		< 2	< 2	< 2	< 2	< 2	< 2	
		< 2	< 2	< 2	< 2	< 2	< 2	
12	Benzene ($\mu g/m^3$)	< 3	< 3	< 3	< 3	< 3	< 3	**05 ($\mu g/m^3$) (Annual)**

AMBIENT AIR QUALITY MONITORING RESULTS

S.No.	Pollutants	AAQ – 11 NCL Area (Near Police station), Jayant.			AAQ – 12 Guest House Sector-B, Dudichua, NCL Project			NAAQ Standards (2009)
		1st Round	2nd Round	3rd Round	1st Round	2nd Round	3rd Round	
		07.02.2014	10.02.2014	12.02.2014	07.02.2014	10.02.2014	12.02.2014	
I.	**Particulate Pollutants**							
1.	PM_{10} ($\mu g/m^3$)	128	112	147	163	190	135	**100 ($\mu g/m^3$)**
2	$PM_{2.5}$ ($\mu g/m^3$)	52	68	45	59	66	70	**60 ($\mu g/m^3$)**
3	Arsenic (ng/m^3)	2.4	1.8	1.2	3.1	2.1	1.8	**06 (ng/m^3) (Annual)**
4	Nickel (ng/m^3)	3.1	5.7	4.4	6.7	5.8	9.1	**20 (ng/m^3) (Annual)**
5	Lead ($\mu g/m^3$)	0.03	0.05	0.09	0.04	0.07	0.05	**1.0($\mu g/m^3$) (24 hours)**
6	Benzo (a) Pyrene (ng/m^3)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**01 (ng/m^3) (Annual)**
II.	**Gaseous Pollutants**							
7	SO_2 ($\mu g/m^3$)	17.1	20.4	16.4	15.9	16.4	18.3	**80 ($\mu g/m^3$) (24 hours)**
8	NO_X ($\mu g/m^3$)	30.1	28.9	27.6	26.8	30.1	24.5	**80 ($\mu g/m^3$) (24 hours)**
9	NH_3 ($\mu g/m^3$)	6.4	5.9	8.7	6.1	7.4	10.2	**400 ($\mu g/m^3$) (24 hours)**
10	O_3 ($\mu g/m^3$)	6.4	10.4	9.1	10.4	7.4	8.6	**100 (8 hours) & 180 ($\mu g/m^3$) (1 hour)**
		14.8	15.1	8.6	17.4	16.9	12.5	
		5.4	6.1	8.7	5.4	6.1	6.7	
11	CO (mg/m^3)	< 2	< 2	< 2	< 2	< 2	< 2	**02 (8 hours) & 04 mg/m^3 (1 hour)**
		< 2	< 2	< 2	< 2	< 2	< 2	
		< 2	< 2	< 2	< 2	< 2	< 2	
12	Benzene ($\mu g/m^3$)	< 3	< 3	< 3	< 3	< 3	< 3	**05 ($\mu g/m^3$) (Annual)**

AMBIENT AIR QUALITY MONITORING RESULTS

S.No.	Pollutants	AAQ – 13 Gust house, NCL residential colony, Nighai			AAQ – 14 NTPC Vindhyanagar residential colony (NH 2)			NAAQ Standards (2009)
		1st Round	2nd Round	3rd Round	1st Round	2nd Round	3rd Round	
		07.02.2014	10.02.2014	12.02.2014	14.02.2014	17.02.2014	19.02.2014	
I.	**Particulate Pollutants**							
1.	PM_{10} ($\mu g/m^3$)	107	92	84	103	98	72	**100 ($\mu g/m^3$)**
2	$PM_{2.5}$ ($\mu g/m^3$)	39	34	29	39	31	26	**60 ($\mu g/m^3$)**
3	Arsenic (ng/m^3)	<1	<1	<1	<1	<1	<1	**06 (ng/m^3) (Annual)**
4	Nickel (ng/m^3)	3.4	2.9	4.7	2.8	6.4	5.6	**20 (ng/m^3) (Annual)**
5	Lead ($\mu g/m^3$)	0.06	0.08	0.04	0.02	0.07	0.05	**1.0($\mu g/m^3$) (24 hours)**
6	Benzo (a) Pyrene (ng/m^3)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**01 (ng/m^3) (Annual)**
II.	**Gaseous Pollutants**							
7	SO_2 ($\mu g/m^3$)	16.4	15.2	19.5	14.1	13.6	16.5	**80 ($\mu g/m^3$) (24 hours)**
8	NO_X ($\mu g/m^3$)	30.2	30.9	27.3	30.8	31.2	37.6	**80 ($\mu g/m^3$) (24 hours)**
9	NH_3 ($\mu g/m^3$)	14.6	19.4	12.7	5.9	6.1	9.7	**400 ($\mu g/m^3$) (24 hours)**
10	O_3 ($\mu g/m^3$)	7.6	9.4	10.5	6.9	7.9	10.4	**100 (8 hours) & 180 ($\mu g/m^3$) (1 hour)**
		20.1	17.6	12.9	18.7	19.4	16.8	
		6.7	8.1	5.8	6.9	8.4	7.3	
11	CO (mg/m^3)	< 2	< 2	< 2	< 2	< 2	< 2	**02 (8 hours) & 04 mg/m^3 (1 hour)**
		< 2	< 2	< 2	< 2	< 2	< 2	
		< 2	< 2	< 2	< 2	< 2	< 2	
12	Benzene ($\mu g/m^3$)	< 3	< 3	< 3	< 3	< 3	< 3	**05 ($\mu g/m^3$) (Annual)**

AMBIENT AIR QUALITY MONITORING RESULTS

S.No.	Pollutants	AAQ – 15 Main Market, NTPC Rihandnagar, Bijpur			AAQ – 16 Renukeswar mandir, Hindalco colony, Renukoot			NAAQ Standards (2009)
		1st Round	2nd Round	3rd Round	1st Round	2nd Round	3rd Round	
		07.02.2014	10.02.2014	12.02.2014	25.01.2014	27.01.2014	29.01.2014	
I.	**Particulate Pollutants**							
1.	PM_{10} ($\mu g/m^3$)	135	119	97	136	164	119	**100 ($\mu g/m^3$)**
2	$PM_{2.5}$ ($\mu g/m^3$)	42	48	33	41	34	37	**60 ($\mu g/m^3$)**
3	Arsenic (ng/m^3)	1.4	1.7	1.2	<1	<1	<1	**06 (ng/m^3) (Annual)**
4	Nickel (ng/m^3)	5.1	3.4	6.2	5.4	6.9	4.7	**20 (ng/m^3) (Annual)**
5	Lead ($\mu g/m^3$)	0.08	0.05	0.07	0.10	0.06	0.08	**1.0($\mu g/m^3$) (24 hours)**
6	Benzo (a) Pyrene (ng/m^3)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**01 (ng/m^3) (Annual)**
II.	**Gaseous Pollutants**							
7	SO_2 ($\mu g/m^3$)	12.8	16.6	15.8	15.2	16.9	12.5	**80 ($\mu g/m^3$) (24 hours)**
8	NO_x ($\mu g/m^3$)	22.8	26.2	23.2	21.4	24.9	20.8	**80 ($\mu g/m^3$) (24 hours)**
9	NH_3 ($\mu g/m^3$)	19.8	17.6	20.1	6.8	5.9	9.4	**400 ($\mu g/m^3$) (24 hours)**
10	O_3 ($\mu g/m^3$)	12.7	11.7	14.3	6.9	8.4	10.5	**100 (8 hours) & 180 ($\mu g/m^3$) (1 hour)**
		19.4	16.9	18.3	9.8	10.4	9.5	
		6.8	5.7	9.4	5.8	6.2	8.4	
11	CO (mg/m^3)	< 2	< 2	< 2	< 2	< 2	< 2	**02 (8 hours) & 04 mg/m^3 (1 hour)**
		< 2	< 2	< 2	< 2	< 2	< 2	
		< 2	< 2	< 2	< 2	< 2	< 2	
12	Benzene ($\mu g/m^3$)	< 3	< 3	< 3	< 3	< 3	< 3	**05 ($\mu g/m^3$) (Annual)**

AMBIENT AIR QUALITY MONITORING RESULTS

S.No.	Pollutants	AAQ – 17 Guest house, Dalla town ship, Dalla			AAQ – 18 Guest house , Obra colony, Obra			NAAQ Standards (2009)
		1st Round	2nd Round	3rd Round	1st Round	2nd Round	3rd Round	
		25.01.2014	27.01.2014	29.01.2014	25.01.2014	27.01.2014	29.01.2014	
I.	**Particulate Pollutants**							
1.	PM_{10} ($\mu g/m^3$)	162	136	122	202	170	156	**100 ($\mu g/m^3$)**
2	$PM_{2.5}$ ($\mu g/m^3$)	62	49	42	41	56	39	**60 ($\mu g/m^3$)**
3	Arsenic (ng/m^3)	<1	<1	<1	3.1	2.4	1.9	**06 (ng/m^3) (Annual)**
4	Nickel (ng/m^3)	6.1	5.8	7.9	6.4	5.4	7.8	**20 (ng/m^3) (Annual)**
5	Lead ($\mu g/m^3$)	0.03	0.07	0.01	0.07	0.09	0.04	**1.0($\mu g/m^3$) (24 hours)**
6	Benzo (a) Pyrene (ng/m^3)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**01 (ng/m^3) (Annual)**
II.	**Gaseous Pollutants**							
7	SO_2 ($\mu g/m^3$)	14.1	12.7	10.8	16.4	17.9	12.6	**80 ($\mu g/m^3$) (24 hours)**
8	NO_X ($\mu g/m^3$)	28.5	24.9	22.7	21.4	23.8	20.8	**80 ($\mu g/m^3$) (24 hours)**
9	NH_3 ($\mu g/m^3$)	20.1	18.6	19.4	6.4	5.9	8.2	**400 ($\mu g/m^3$) (24 hours)**
10	O_3 ($\mu g/m^3$)	6.4	9.7	10.5	6.9	5.9	8.7	**100 (8 hours) & 180 ($\mu g/m^3$) (1 hour)**
		18.4	16.9	20.7	16.8	19.4	18.2	
		4.9	5.7	6.1	6.8	5.4	8.9	
11	CO (mg/m^3)	< 2	< 2	< 2	< 2	< 2	< 2	**02 (8 hours) & 04 mg/m^3 (1 hour)**
		< 2	< 2	< 2	< 2	< 2	< 2	
		< 2	< 2	< 2	< 2	< 2	< 2	
12	Benzene ($\mu g/m^3$)	< 3	< 3	< 3	< 3	< 3	< 3	**05 ($\mu g/m^3$) (Annual)**

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 1 : Balia Nala Dn Stream, near Bridge, Shaktinagar			Test Method
			1st Round 01.02.2014	2nd Round 04.02.2014	3rd Round 06.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	5	5	5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.69	7.72	7.70	IS 3025: Part – 11
2	E.C.	µS/cm	240	262	224	IS 3025: Part 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	18	14	16	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	6.8	7.0	6.9	IS 3025: Part 38
6	Chemical Oxygen Demand	mg/l	20	16	20	IS 3025: Part - 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	5	4	4	IS 3025: Part 44
8	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 - NO_2.B
9	Nitrate-Nitrogen as N	mg/l	1.13	1.35	1.02	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	1.13	1.35	1.02	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 - NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.40	0.40	0.30	IS 3025: Part – 60
15	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	0.63	0.68	0.57	By Calculation
18	Total Coliforms	MPN/100ml	22	26	17	IS 1622
19	Fecal Coliforms	MPN/100ml	2	2	2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4^+/NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.02	0.02	0.02	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.01	0.02	0.01	APHA 3111 B
19	Iron as Fe	mg/l	0.18	0.16	0.18	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 57

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 2 : Balia Nala Up Stream, near Bridge, Kadia colony			Test Method
			1st Round 01.02.2014	2nd Round 04.02.2014	3rd Round 06.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Grey	Grey	Grey	-
2	Colour (Hazen Units)	-	30	25	30	IS 3025: Part – 4
3	Odour (Smell)	-	Un-Agreeable	Un-Agreeable	Un-Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.79	7.82	7.75	IS 3025: Part – 11
2	E C	µS/cm	592	614	640	IS 3025: Part – 14
3	Oil & Grease	mg/l	3	4	4	IS 3025: Part – 39
4	Suspended Solids	mg/l	128	140	112	IS 3025: Part 17
5	Dissolved Oxygen	mg/l	3.6	3.7	4.0	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	82	92	78	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	20	21	18	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	0.01	0.01	0.01	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	1.13	1.35	1.69	APHA 4500 - NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	1.14	1.36	1.70	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.70	0.70	0.70	IS 3025: Part 60
15	Sulphides as S	mg/l	0.2	0.2	0.2	IS 3025: Part 29
16	Dissolved Phosphates as P	mg/l	0.36	0.42	0.34	APHA 4500 - P.D
17	Sodium Absorption Ratio (SAR)	-	0.79	0.82	0.98	By Calculation
18	Total Coliforms	MPN/100ml	50	33	26	IS 1622
19	Fecal Coliforms	MPN/100ml	14	9	4	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	0.52	0.64	0.50	APHA 4500 P.D
2	Total Kjeldal Nitrogen	mg/l	7.8	8.7	8.4	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	4.8	5.6	5.3	APHA 4500 NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.06	0.07	0.07	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.03	0.03	0.04	APHA 3111 B
19	Iron as Fe	mg/l	0.92	0.84	0.96	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 56
22	Boron as B	mg/l	0.11	0.10	0.10	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

SINGRAULI – UTTAR PRADESH

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 3 : Lake water near Senior Transit Camp, NCL, Bina			Test Method
			1st Round 01.02.2014	2nd Round 04.02.2014	3rd Round 06.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	5	5	5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.62	7.58	7.46	IS 3025: Part 11
2	E C	µS/cm	742	730	706	IS 3025: Part 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	14	18	15	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	6.1	6.3	6.2	IS 3025: Part 38
6	Chemical Oxygen Demand	mg/l	12	16	14	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	3	4	3	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	2.71	2.48	2.03	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2 / NO_3)	mg/l	2.71	2.48	2.03	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part 27
14	Fluoride as F	mg/l	0.50	0.60	0.50	IS 3025: Part – 60
15	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	0.82	0.74	0.71	By Calculation
18	Total Coliforms	MPN/100ml	26	34	21	IS 1622
19	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 - Norg. B
3	Total Ammonia (NH_4 / NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.03	0.02	0.02	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.01	0.01	0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.09	0.08	.010	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.13	0.11	0.12	IS 3025: Part – 57

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 4 : Kava nala, Anpara			Test Method
			1st Round 01.02.2014	2nd Round 04.02.2014	3rd Round 06.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Light Brown	Light Brown	Light Brown	-
2	Colour (Hazen Units)	-	10	15	10	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.65	7.70	7.79	IS 3025: Part – 11
2	E C	µS/cm	580	562	538	IS 3025: Part 14
3	Oil & Grease	mg/l	1	2	1	IS 3025: Part – 39
4	Suspended Solids	mg/l	28	32	26	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	5.6	5.5	5.7	IS 3025: Part 38
6	Chemical Oxygen Demand	mg/l	22	18	24	IS 3025: Part 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	5	4	5	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 NO_2.B
9	Nitrate-Nitrogen as N	mg/l	0.45	0.34	0.34	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2 NO_3)	mg/l	0.45	0.34	0.34	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.60	0.50	0.50	IS 3025: Part 60
15	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	0.14	0.11	0.13	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	1.12	1.06	0.98	By Calculation
18	Total Coliforms	MPN/100ml	70	60	40	IS 1622
19	Fecal Coliforms	MPN/100ml	<2	<2	<2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	0.19	0.15	0.18	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	2.5	2.1	2.2	APHA 4500 – Norg. B
3	Total Ammonia (NH_4- NH_3)-Nitrogen	mg/l	1.4	1.1	1.3	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.02	0.02	0.02	IS 3025: Part 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 48
18	Manganese as Mn	mg/l	0.01	0.01	0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.12	0.15	0.10	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.11	0.12	0.12	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

SINGRAULI – UTTAR PRADESH

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	S W – 5 : Riband river near Kohadawal village			Test Method
			1st Round 01.02.2014	2nd Round 04.02.2014	3rd Round 06.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	10	10	10	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.48	7.43	7.42	IS 3025: Part – 11
2	E C	µS/cm	134	130	129	IS 3025: Part – 14
3	Oil & Grease	mg/l	2	1	1	IS 3025: Part – 39
4	Suspended Solids	mg/l	32	44	36	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	5.9	6.0	6.0	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	16	12	12	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	4	3	3	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	0.45	0.34	0.34	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	0.45	0.34	0.34	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.30	0.30	0.30	IS 3025: Part – 60
15	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	0.45	0.35	0.36	By Calculation
18	Total Coliforms	MPN/100ml	17	14	9	IS 1622
19	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.01	0.01	0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.03	0.02	0.02	APHA 3111 – B
19	Iron as Fe	mg/l	0.14	0.12	0.12	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 57

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 6 : Surya Nala, near police station bridge, Vindhyanagar			Test Method
			1st Round 09.02.2014	2nd Round 11.02.2014	3rd Round 13.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	5	5	5	IS 3025: Part - 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.47	7.40	7.82	IS 3025: Part – 11
2	E.C	µS/cm	352	322	338	IS 3025: Part – 14
3	Oil & Grease	mg/l	1	1	1	IS 3025: Part 39
4	Suspended Solids	mg/l	14	12	12	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	5.8	5.9	5.9	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	14	10	10	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	3	2	2	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	2.03	2.26	2.48	APHA 4500 NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	2.03	2.26	2.48	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.50	0.40	0.50	IS 3025: Part – 60
15	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 29
16	Dissolved Phosphates as P	mg/l	0.24	0.30	0.28	APHA 4500 P.D
17	Sodium Absorption Ratio (SAR)	-	0.92	0.86	0.89	By Calculation
18	Total Coliforms	MPN/100ml	11	9	6	IS 1622
19	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	0.40	0.46	0.42	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.01	0.01	0.01	IS 3025: Part - 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.01	0.01	0.01	APHA 3111 - B
19	Iron as Fe	mg/l	0.15	0.14	0.13	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 - D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 57

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 7 : Rihand Reservoir near Baliyari village upstream			Test Method
			1st Round 09.02.2014	2nd Round 11.02.2014	3rd Round 13.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	5	5	5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part - 5
II	**Regular Monitoring Parameters**					
1	pH	-	6.92	6.90	7.24	IS 3025: Part - 11
2	E C	µS/cm	504	502	488	IS 3025: Part 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	10	12	12	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	6.2	6.4	6.3	IS 3025: Part 38
6	Chemical Oxygen Demand	mg/l	10	8	10	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	2	2	3	IS 3025: Part 44
8	Nitrite-Nitrogen as N	mg/l	0.02	0.02	0.02	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	1.81	1.92	1.92	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2 : NO_3)	mg/l	1.83	1.94	1.94	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.40	0.40	0.40	IS 3025: Part – 60
15	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part - 29
16	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	1.32	1.36	1.14	By Calculation
18	Total Coliforms	MPN/100ml	4	6	4	IS 1622
19	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.01	0.01	0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.01	0.01	0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.10	0.09	0.10	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 - D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 57

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 8 : Kanchana nallah near chauhan cold storage, Kachni			Test Method
			1st Round 09.02.2014	2nd Round 11.02.2014	3rd Round 13.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	5	5	5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.94	7.98	7.96	IS 3025: Part – 11
2	E C	µS/cm	416	419	382	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	18	14	16	IS 3025: Part 17
5	Dissolved Oxygen	mg/l	6.2	6.0	6.2	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	10	14	12	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	2	3	3	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	1.13	0.90	1.35	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	1.13	0.90	1.35	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part 27
14	Fluoride as F	mg/l	0.40	0.40	0.40	IS 3025: Part – 60
15	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	0.12	0.10	0.10	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	0.88	0.76	0.85	By Calculation
18	Total Coliforms	MPN/100ml	600	900	700	IS 1622
19	Fecal Coliforms	MPN/100ml	11	17	14	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	0.16	0.15	0.16	APHA 4500 P.D
2	Total Kjeldal Nitrogen	mg/l	1.4	1.8	1.4	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	1.1	1.4	1.0	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	<0.001	< 0.001	< 0.001	IS 3025: Part 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.01	0.01	0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.01	0.01	0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.09	0.10	0.09	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 57

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 9 : Balia Nallah near Dudichua STP			Test Method
			1st Round 09.02.2014	2nd Round 11.02.2014	3rd Round 13.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Greyish	Greyish	Greyish	-
2	Colour (Hazen Units)	-	40	35	50	IS 3025: Part - 4
3	Odour (Smell)	-	Un agreeable	Un agreeable	Un agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.53	7.58	7.69	IS 3025: Part – 11
2	E.C	µS/cm	644	631	603	IS 3025: Part – 14
3	Oil & Grease	mg/l	3	3	3	IS 3025: Part – 39
4	Suspended Solids	mg/l	72	68	78	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	4.2	4.0	4.3	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	62	64	72	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	16	15	18	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	0.01	0.02	0.02	APHA 4500 – NO_2-B
9	Nitrate-Nitrogen as N	mg/l	2.93	3.16	3.39	APHA 4500 NO_3-B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2-HNO_3)	mg/l	2.94	3.18	3.41	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3-C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.50	0.50	0.60	IS 3025: Part - 60
15	Sulphides as S	mg/l	0.1	0.1	0.1	IS 3025: Part 29
16	Dissolved Phosphates as P	mg/l	0.18	0.24	0.20	APHA 4500 P.D
17	Sodium Absorption Ratio (SAR)	-	0.94	0.91	0.83	By Calculation
18	Total Coliforms	MPN/100ml	1400	1700	1100	IS 1622
19	Fecal Coliforms	MPN/100ml	130	140	90	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	0.25	0.32	0.26	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	6.4	5.9	7.3	APHA 4500 – Norg. B
3	Total Ammonia (NH_4 - NH_3)- Nitrogen	mg/l	4.5	4.2	5.0	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.02	0.02	0.02	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.04	0.03	0.03	APHA 3111 – B
19	Iron as Fe	mg/l	0.92	0.86	0.87	IS 3025: Part 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.14	0.12	0.13	IS 3025: Part 57

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW - 10: Rihand river,Singrauli to rihand nagar road under rail bridge			Test Method
			1st Round 15.02.2014	2nd Round 18.02.2014	3rd Round 20.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	5	5	5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	8.00	7.82	8.08	IS 3025: Part – 11
2	E C	µS/cm	418	408	390	IS 3025: Part 14
3	Oil & Grease	mg/l	1	1	1	IS 3025: Part – 39
4	Suspended Solids	mg/l	14	12	14	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	5.4	5.6	5.5	IS 3025: Part - 38
6	Chemical Oxygen Demand	mg/l	24	16	22	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	4	3	4	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 NO_2.B
9	Nitrate-Nitrogen as N	mg/l	0.79	0.68	1.02	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	0.79	0.68	1.02	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.40	0.40	0.40	IS 3025: Part 60
15	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	0.95	1.09	1.06	By Calculation
18	Total Coliforms	MPN/100ml	600	300	400	IS 1622
19	Fecal Coliforms	MPN/100ml	9	4	7	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	1.4	1.7	1.5	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	1.0	1.1	1.0	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.01	0.01	0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.01	0.01	0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.09	0.08	0.09	IS 3025: Part 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

SINGRAULI – UTTAR PRADESH

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 11 : Murdhwa Nallah			Test Method
			1st Round 26.01.2014	2nd Round 28.01.2014	3rd Round 30.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Pale yellow	Pale yellow	Pale yellow	-
2	Colour (Hazen Units)	-	10	15	10	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.64	7.59	7.76	IS 3025: Part 11
2	E C	µS/cm	520	528	518	IS 3025: Part – 14
3	Oil & Grease	mg/l	2	3	2	IS 3025: Part – 39
4	Suspended Solids	mg/l	46	48	54	IS 3025: Part 17
5	Dissolved Oxygen	mg/l	4.3	4.2	4.4	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	78	84	72	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	18	20	19	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	0.79	0.90	0.56	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2 / NO_3)	mg/l	0.79	0.90	0.56	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part 27
14	Fluoride as F	mg/l	0.80	0.80	0.80	IS 3025: Part – 60
15	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	0.18	0.18	0.17	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	0.92	0.96	0.84	By Calculation
18	Total Coliforms	MPN/100ml	800	1100	900	IS 1622
19	Fecal Coliforms	MPN/100ml	40	70	60	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	0.33	0.32	0.30	APHA 4500 P.D
2	Total Kjeldal Nitrogen	mg/l	6.7	5.3	6.4	APHA 4500 – Norg. B
3	Total Ammonia (NH_4 / NH_3)-Nitrogen	mg/l	4.6	3.8	4.2	APHA 4500 NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.02	0.01	0.01	IS 3025: Part 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 48
18	Manganese as Mn	mg/l	0.03	0.02	0.02	APHA 3111 – B
19	Iron as Fe	mg/l	0.14	0.16	0.15	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 57

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 12 : Rihand Reservior, Up Stream			Test Method
			1st Round 26.01.2014	2nd Round 28.01.2014	3rd Round 30.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	5	5	5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.61	7.67	7.64	IS 3025: Part – 11
2	E C	µS/cm	166	160	156	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	14	16	14	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	6.2	6.0	6.3	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	8	10	8	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	2	3	2	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 NO_2.B
9	Nitrate-Nitrogen as N	mg/l	0.23	0.34	0.23	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	0.23	0.34	0.23	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.20	0.20	0.20	IS 3025: Part - 60
15	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part - 29
16	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 P.D
17	Sodium Absorption Ratio (SAR)	-	0.52	0.51	0.46	By Calculation
18	Total Coliforms	MPN/100ml	17	22	14	IS 1622
19	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.01	0.01	0.01	IS 3025: Part - 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.08	0.09	0.08	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 57

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW - 13 : Dongia Nallah			Test Method
			1st Round 26.01.2014	2nd Round 28.01.2014	3rd Round 30.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Light yellow	Light yellow	Light yellow	-
2	Colour (Hazen Units)	-	15	20	15	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	8.15	8.20	8.23	IS 3025: Part - 11
2	E C	µS/cm	5980	5820	5890	IS 3025: Part – 14
3	Oil & Grease	mg/l	2	3	2	IS 3025: Part – 39
4	Suspended Solids	mg/l	46	48	39	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	3.7	3.5	3.6	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	72	80	64	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	17	18	15	IS 3025: Part - 44
8	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	1.92	2.03	2.03	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2–NO_3)	mg/l	1.92	2.03	2.03	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 - NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.80	0.80	0.80	IS 3025: Part – 60
15	Sulphides as S	mg/l	0.2	0.2	0.2	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	0.18	0.20	0.16	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	11.3	10.8	10.5	By Calculation
18	Total Coliforms	MPN/100ml	330	340	260	IS 1622
19	Fecal Coliforms	MPN/100ml	11	9	8	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	0.25	0.28	0.26	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	12	11	9.5	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	7.3	7.0	6.2	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part - 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.03	0.02	0.02	IS 3025: Part – 49
10	Nickel as Ni	mg/l	0.01	0.01	0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.01	0.02	0.02	APHA 3111 - B
19	Iron as Fe	mg/l	0.14	0.19	0.16	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 56
22	Boron as B	mg/l	0.53	0.49	0.51	IS 3025: Part – 57

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 14 : Rihand Dam Down Stream			Test Method
			1st Round 26.01.2014	2nd Round 28.01.2014	3rd Round 30.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	5	5	5	IS 3025: Part 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.96	7.90	7.94	IS 3025: Part – 11
2	E C	µS/cm	135	138	141	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part - 39
4	Suspended Solids	mg/l	14	12	16	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	5.9	6.0	6.1	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	8	10	8	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	2	2	2	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	0.23	0.23	0.23	APHA 4500 NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	0.23	0.23	0.23	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.30	0.30	0.30	IS 3025: Part – 60
15	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 29
16	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 - P.D
17	Sodium Absorption Ratio (SAR)	-	0.44	0.47	0.38	By Calculation
18	Total Coliforms	MPN/100ml	220	260	210	IS 1622
19	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 - P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 - Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 B
19	Iron as Fe	mg/l	0.08	0.09	0.08	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 - D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 57

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 15 : Sone River mid stream			Test Method
			1st Round 26.01.2014	2nd Round 28.01.2014	3rd Round 30.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Pale yellow	Pale yellow	Pale yellow	-
2	Colour (Hazen Units)	-	10	10	10	IS 3025: Part 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.98	8.01	8.10	IS 3025: Part – 11
2	E C	µS/cm	260	258	256	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	24	18	20	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	4.6	4.8	4.9	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	20	14	18	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	4	3	4	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 NO_2.B
9	Nitrate-Nitrogen as N	mg/l	0.45	0.45	0.56	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	0.45	0.45	0.56	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.30	0.30	0.30	IS 3025: Part 60
15	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	0.40	0.32	0.35	By Calculation
18	Total Coliforms	MPN/100ml	26	17	21	IS 1622
19	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 B
19	Iron as Fe	mg/l	0.08	0.09	0.09	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part - 57

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 16 : Sone River upstream, near somnath mandir, gotheni			Test Method
			1st Round 26.01.2014	2nd Round 28.01.2014	3rd Round 30.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	5	5	5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part - 5
II	**Regular Monitoring Parameters**					
1	pH	-	8.06	8.02	8.07	IS 3025: Part - 11
2	E C	µS/cm	274	263	256	IS 3025: Part 14
3	Oil & Grease	mg/l	<1	<1	<1	IS 3025: Part – 39
4	Suspended Solids	mg/l	24	22	20	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	4.9	4.8	4.9	IS 3025: Part 38
6	Chemical Oxygen Demand	mg/l	20	18	14	IS 3025: Part 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	4	4	3	IS 3025: Part 44
8	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	0.56	0.45	0.45	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	0.56	0.45	0.45	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.30	0.30	0.30	IS 3025: Part – 60
15	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	0.18	0.13	0.16	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	0.34	0.31	0.28	By Calculation
18	Total Coliforms	MPN/100ml	27	33	26	IS 1622
19	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	0.28	0.15	0.24	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4–NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.12	0.11	0.12	IS 3025: Part 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 57

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW –17 : Sone River near toll Bridge			Test Method
			1st Round 26.01.2014	2nd Round 28.01.2014	3rd Round 30.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	5	5	5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	8.01	8.08	8.12	IS 3025: Part – 11
2	E C	µS/cm	257	260	272	IS 3025: Part – 14
3	Oil & Grease	mg/l	1	1	1	IS 3025: Part – 39
4	Suspended Solids	mg/l	16	14	18	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	5.0	4.9	4.8	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	14	10	12	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	3	2	3	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2 B
9	Nitrate-Nitrogen as N	mg/l	0.45	0.45	0.56	APHA 4500 NO_3 B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	0.45	0.45	0.56	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3 C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.30	0.30	0.30	IS 3025: Part – 60
15	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 29
16	Dissolved Phosphates as P	mg/l	0.12	0.10	0.10	APHA 4500 P.D
17	Sodium Absorption Ratio (SAR)	-	0.35	0.37	0.45	By Calculation
18	Total Coliforms	MPN/100ml	120	140	170	IS 1622
19	Fecal Coliforms	MPN/100ml	6	9	12	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	0.18	0.15	0.16	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part. – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.08	0.09	0.09	IS 3025: Part 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 57

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 18 : Sone River Down Stream			Test Method
			1st Round 26.01.2014	2nd Round 28.01.2014	3rd Round 30.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	5	5	5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.80	7.76	7.72	IS 3025: Part – 11
2	E C	µS/cm	218	232	238	IS 3025: Part - 14
3	Oil & Grease	mg/l	1	1	1	IS 3025: Part - 39
4	Suspended Solids	mg/l	16	14	16	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	4.7	4.8	4.7	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	16	10	14	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	3	2	3	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	0.45	0.56	0.56	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	0.45	0.56	0.56	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.30	0.30	0.30	IS 3025: Part 60
15	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	0.34	0.39	0.46	By Calculation
18	Total Coliforms	MPN/100ml	90	60	110	IS 1622
19	Fecal Coliforms	MPN/100ml	12	9	14	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	<1	<1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4 NH_3)-Nitrogen	mg/l	<1	<1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part - 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.09	0.09	0.10	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 - D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 57

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 1 : Near Bank, NCL Colony, Bina			Test Method
			1st Round 01.02.2014	2nd Round 04.02.2014	3rd Round 06.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Pale yellow	Pale yellow	Pale yellow	-
2	Colour (Hazen Units)	-	10	10	10	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.39	7.40	7.49	IS 3025: Part – 11
2	E C	µS/cm	468	460	456	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	20	18	16	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	8	6	8	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	<2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 - NO_2.B
8	Nitrate-Nitrogen as N	mg/l	0.23	0.23	0.23	APHA 4500 – NO_3.B
9	Nitrate-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	0.23	0.23	0.23	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.50	0.50	0.50	IS 3025: Part - 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 - P.D
16	Sodium Absorption Ratio (SAR)	-	1.24	1.22	1.21	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 - Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr6	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.02	0.03	0.02	APHA 3111 – B
19	Iron as Fe	mg/l	0.18	0.24	0.20	IS 3025: Part - 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 57

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	G W – 2: Main Shopping Centre, NTPC colony, Shakti Nagar			Test Method
			1st Round 01.02.2014	2nd Round 04.02.2014	3rd Round 06.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.86	7.85	7.80	IS 3025: Part – 11
2	E C	µS/cm	534	522	541	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	12	10	10	IS 3025: Part 17
5	Chemical Oxygen Demand	mg/l	8	4	6	IS 3025: Part 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	3.39	2.94	3.16	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	3.39	2.94	3.16	APHA 4500 – N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.70	0.70	0.70	IS 3025: Part 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	0.95	0.99	1.05	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.04	0.03	0.04	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.01	0.02	0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.09	0.08	0.09	IS 3025: Part 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 57

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 3 : Primary School, Dudichua			Test Method
			1st Round 09.02.2014	2nd Round 11.02.2014	3rd Round 13.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.88	7.84	8.07	IS 3025: Part – 11
2	E.C	µS/cm	906	924	880	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	4	6	4	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 NO_2-B
8	Nitrate-Nitrogen as N	mg/l	2.71	3.16	3.16	APHA 4500 – NO_3-B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	2.71	3.16	3.16	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 - NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.01	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	1.0	1.0	1.0	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	2.82	2.47	2.64	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.04	0.03	0.03	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.01	0.01	0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.10	0.10	0.11	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.12	0.13	0.12	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

SINGRAULI – UTTAR PRADESH

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 4 : Khadia Colony (Minor Q.No.-M-219)			Test Method
			1st Round 01.02.2014	2nd Round 04.02.2014	3rd Round 06.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.84	7.80	7.86	IS 3025: Part – 11
2	E C	µS/cm	524	530	533	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part- 17
5	Chemical Oxygen Demand	mg/l	4	4	4	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 NO_2.B
8	Nitrate-Nitrogen as N	mg/l	0.23	0.34	0.34	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	0.23	0.34	0.34	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.70	0.70	0.70	IS 3025: Part 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	1.04	1.08	1.11	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4 NH_4)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.04	0.05	0.04	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 48
18	Manganese as Mn	mg/l	0.01	0.01	0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.09	0.08	0.09	IS 3025: Part 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

SINGRAULI – UTTAR PRADESH

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 5 : Kakri Colony near Q-MQ-7 (NCL Project)			Test Method
			1st Round 01.02.2014	2nd Round 04.02.2014	3rd Round 06.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.70	7.68	7.62	IS 3025: Part 11
2	E.C	µS/cm	834	832	827	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part - 17
5	Chemical Oxygen Demand	mg/l	6	8	6	IS 3025: Part - 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	1.13	1.02	0.90	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	1.13	1.02	0.90	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 - NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.70	0.70	0.70	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	1.88	1.77	1.84	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.02	0.02	0.02	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.01	0.01	0.01	APHA 3111 B
19	Iron as Fe	mg/l	0.09	0.08	0.09	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 56
22	Boron as B	mg/l	0.11	0.10	0.12	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

SINGRAULI – UTTAR PRADESH

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW –6 : Anpara Colony near DAV College			Test Method
			1st Round 26.01.2014	2nd Round 28.01.2014	3rd Round 30.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.65	7.62	7.69	IS 3025: Part – 11
2	E.C	µS/cm	565	570	567	IS 3025: Part - 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	4	6	4	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2-B
8	Nitrate-Nitrogen as N	mg/l	2.26	2.48	2.26	APHA 4500 NO_3-B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	2.26	2.48	2.26	APHA 4500 -N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.70	0.70	0.70	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 - P.D
16	Sodium Absorption Ratio (SAR)	-	1.18	1.26	1.22	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 NH_3
4	Phenolic Compounds as C_5H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.02	0.02	0.02	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.02	0.01	0.01	APHA 3111 B
19	Iron as Fe	mg/l	0.08	0.09	0.08	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 57

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 7 : Near Q-SHF-176, NCL, Jhingurda (Near Shiv mandir)			Test Method
			1st Round 09.02.2014	2nd Round 11.02.2014	3rd Round 13.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Reddish	Reddish	Reddish	-
2	Colour (Hazen Units)	-	100	100	100	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	6.63	6.69	6.98	IS 3025: Part – 11
2	E C	µS/cm	112	126	104	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	84	76	92	IS 3025: Part 17
5	Chemical Oxygen Demand	mg/l	8	10	8	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part 44
7	Nitrite-Nitrogen as N	mg/l	0.01	0.01	0.01	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	1.13	1.02	1.13	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2 · NO_3)	mg/l	1.14	1.03	1.14	APHA 4500 N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part 27
13	Fluoride as F	mg/l	0.20	0.20	0.20	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	1.57	1.45	1.39	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 - P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.96	0.92	0.89	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.20	0.20	0.18	APHA 3111 – B
19	Iron as Fe	mg/l	3.6	3.8	4.2	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 - D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

SINGRAULI – UTTAR PRADESH

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 8 : Near Coal Gate (outside of Renusagar Power Division Boundary)			Test Method
			1st Round 26.01.2014	2nd Round 28.01.2014	3rd Round 30.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.57	7.60	7.66	IS 3025: Part 11
2	E C	µS/cm	848	864	853	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part - 17
5	Chemical Oxygen Demand	mg/l	6	6	8	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	0.01	0.01	0.01	APHA 4500 NO_2.B
8	Nitrate-Nitrogen as N	mg/l	7.90	8.35	8.13	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	7.91	8.36	8.14	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.80	0.80	0.80	IS 3025: Part 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	2.24	2.26	2.27	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.18	0.21	0.23	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.02	0.02	0.02	APHA 3111 – B
19	Iron as Fe	mg/l	0.14	0.11	0.12	IS 3025: Part 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.16	0.18	0.16	IS 3025: Part 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

SINGRAULI – UTTAR PRADESH

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	G W – 9:Near shiv mandir, Amlori (NCL Project)			Test Method
			1st Round 09.02.2014	2nd Round 11.02.2014	3rd Round 13.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	5	5	5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.89	7.86	8.02	IS 3025: Part 11
2	E C	µS/cm	1010	996	982	IS 3025: Part - 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	12	10	12	IS 3025: Part - 17
5	Chemical Oxygen Demand	mg/l	4	4	4	IS 3025: Part 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	0.45	0.56	0.68	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	0.45	0.56	0.68	APHA 4500 N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.40	0.40	0.40	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	4.03	3.94	4.15	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.07	0.05	0.06	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.03	0.02	0.03	APHA 3111 - B
19	Iron as Fe	mg/l	0.15	0.13	0.14	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.24	0.19	0.18	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

SINGRAULI – UTTAR PRADESH

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 10 : Near Sabji mandi, NCL, Jayant, (Beside Police station)			Test Method
			1st Round 15.02.2014	2nd Round 18.02.2014	3rd Round 20.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.80	7.72	7.94	IS 3025: Part – 11
2	E C	µS/cm	444	430	410	IS 3025: Part 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	4	4	4	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	0.34	0.45	0.56	APHA 4500 NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	0.34	0.45	0.56	APHA 4500 -N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.30	0.30	0.30	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 P.D
16	Sodium Absorption Ratio (SAR)	-	0.45	0.39	0.38	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part - 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.05	0.06	0.05	IS 3025: Part 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part - 48
18	Manganese as Mn	mg/l	0.02	0.01	0.02	APHA 3111 – B
19	Iron as Fe	mg/l	0.14	0.12	0.13	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

SINGRAULI – UTTAR PRADESH

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – II : Saraswahraja Colony, Jayanth			Test Method
			1st Round 15.02.2014	2nd Round 18.02.2014	3rd Round 20.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.54	7.53	7.76	IS 3025: Part – 11
2	E C	µS/cm	690	672	638	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	4	6	4	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	3.16	3.39	2.94	APHA 4500 NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	3.16	3.39	2.94	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.40	0.40	0.40	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 P.D
16	Sodium Absorption Ratio (SAR)	-	0.75	0.72	0.63	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.04	0.06	0.05	IS 3025: Part - 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.02	0.01	0.02	APHA 3111 – B
19	Iron as Fe	mg/l	0.10	0.09	0.10	IS 3025: Part 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.16	0.13	0.12	IS 3025: Part – 57

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 12 : Near substation, Sector-B, Dudichua, NCL Project			Test Method
			1st Round 09.02.2014	2nd Round 11.02.2014	3rd Round 13.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.73	7.97	7.89	IS 3025: Part – 11
2	E C	µS/cm	628	594	588	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part - 17
5	Chemical Oxygen Demand	mg/l	6	4	4	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 NO_2.B
8	Nitrate-Nitrogen as N	mg/l	0.23	0.23	0.23	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	0.23	0.23	0.23	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.40	0.40	0.40	IS 3025: Part 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	0.62	0.56	0.53	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4 NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.11	0.12	0.10	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.03	0.04	0.03	APHA 3111 – B
19	Iron as Fe	mg/l	0.12	0.11	0.12	IS 3025: Part 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.11	0.10	0.11	IS 3025: Part 57

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 13 : Near Entrance Gate, Vivekananda statue, Nighai			Test Method
			1st Round 09.02.2014	2nd Round 11.02.2014	3rd Round 13.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Pale yellow	Pale yellow	Pale yellow	-
2	Colour (Hazen Units)	-	5	5	5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	8.01	7.79	8.09	IS 3025: Part – 11
2	E C	µS/cm	636	670	616	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	12	14	12	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	4	6	4	IS 3025: Part 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	4.29	4.52	4.06	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	4.29	4.52	4.06	APHA 4500 N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part 27
13	Fluoride as F	mg/l	0.40	0.40	0.40	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	0.72	0.79	0.68	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.18	0.16	0.20	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 48
18	Manganese as Mn	mg/l	0.04	0.05	0.04	APHA 3111 – B
19	Iron as Fe	mg/l	0.12	0.14	0.13	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.12	0.12	0.11	IS 3025: Part – 57

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 14 : Near Commercial Auto Mobiles, Beside Bharath Petrol Bunk, Vindhyanagar			Test Method
			1st Round 15.02.2014	2nd Round 18.02.2014	3rd Round 20.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Pale brown	Pale brown	Pale brown	-
2	Colour (Hazen Units)	-	15	10	15	IS 3025: Part 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.52	7.55	7.76	IS 3025: Part – 11
2	E.C	µS/cm	758	730	734	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part - 39
4	Suspended Solids	mg/l	20	16	20	IS 3025: Part - 17
5	Chemical Oxygen Demand	mg/l	8	6	8	IS 3025: Part 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	2.48	2.94	3.16	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	2.48	2.94	3.16	APHA 4500 N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part 27
13	Fluoride as F	mg/l	0.40	0.40	0.40	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	1.23	1.05	1.14	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.14	0.18	0.16	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.03	0.02	0.02	APHA 3111 – B
19	Iron as Fe	mg/l	0.28	0.25	0.26	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 56
22	Boron as B	mg/l	0.13	0.12	0.13	IS 3025: Part – 57

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 15 : Punarwas-2, Rihandnagar			Test Method
			1st Round 15.02.2014	2nd Round 18.02.2014	3rd Round 20.02.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part - 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.65	7.60	7.94	IS 3025: Part – 11
2	E C	µS/cm	964	985	910	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	4	4	4	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	4.97	5.19	5.19	APHA 4500 NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2–NO_3)	mg/l	4.97	5.19	5.19	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	1.0	1.0	1.0	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	1.44	1.48	1.42	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.06	0.07	0.06	IS 3025: Part - 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.01	0.01	0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.12	0.14	0.13	IS 3025: Part 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.18	0.19	0.15	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

SINGRAULI – UTTAR PRADESH

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 16 : Main road, Renukut market, near shiv park			Test Method
			1st Round 26.01.2014	2nd Round 28.01.2014	3rd Round 30.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.42	7.35	7.22	IS 3025: Part 11
2	E C	µS/cm	1340	1330	1300	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	8	6	8	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	0.02	0.02	0.02	APHA 4500 NO_2.B
8	Nitrate-Nitrogen as N	mg/l	7.90	7.45	7.68	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2 NO_3)	mg/l	7.92	7.47	7.70	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.80	0.80	0.80	IS 3025: Part 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	2.74	2.72	2.71	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.01	0.01	0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.01	0.01	0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.11	0.12	0.10	IS 3025: Part 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.26	0.24	0.21	IS 3025: Part 57

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 17 : Dalla area			Test Method
			1st Round 26.01.2014	2nd Round 28.01.2014	3rd Round 30.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.68	7.65	7.63	IS 3025: Part – 11
2	E.C	µS/cm	724	712	709	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	8	6	6	IS 3025: Part - 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	6.10	5.87	5.87	APHA 4500 NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	6.10	5.87	5.87	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.60	0.60	0.60	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 P.D
16	Sodium Absorption Ratio (SAR)	-	1.43	1.41	1.39	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.01	0.01	0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.01	0.01	0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.10	0.09	0.10	IS 3025: Part 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.16	0.15	0.13	IS 3025: Part 57

GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW – 18 : Obra Colony near Hospital			Test Method
			1st Round 26.01.2014	2nd Round 28.01.2014	3rd Round 30.01.2014	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.59	7.65	7.89	IS 3025: Part – 11
2	E C	µS/cm	672	662	657	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	6	4	4	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part - 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	0.45	0.23	0.23	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	0.45	0.23	0.23	APHA 4500 N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part - 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part - 27
13	Fluoride as F	mg/l	0.50	0.50	0.50	IS 3025: Part - 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	0.53	0.50	0.49	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.01	0.01	0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.01	0.02	0.01	APHA 3111 B
19	Iron as Fe	mg/l	0.12	0.10	0.11	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 56
22	Boron as B	mg/l	0.11	0.10	0.12	IS 3025: Part – 57

AMBIENT AIR MONITORING LOCATIONS PHOTOGRAPHS

1st Round

AAQ – 1, Executive club, NTPC Colony, Shakti nagar

AAQ – 2, GM Office, NCL, Dudhichan, Khadia,

AAQ – 3, Expert hostel, Khadia colony, NCL

AAQ – 4, Senior Transit Camp, NCL, Bina

AAQ 5, Guest house, NCL Amlori colony, Near Shiv mandir

AAQ -6, Officers club, NCL, Kakri colony

AAQ 7, Hindalco colony (Hanuman mandir) Renusagar

AAQ – 8, IIIrd type colony, Anpara

AAQ – 9, Guest house, NCL colony, Jingurda

AAQ – 10, Experts Hostel, Jayant, NCL Project

AAQ -11, NCL Area (Near Police station), Jayant.

AAQ 12, Guest House Sector-B, Dudichua, NCL Project

AAQ – 13, Gust house, NCL residential colony, Nighai

AAQ – 14, NTPC Vindhyanagar residential colony (NH 2)

AAQ-15, Main Market, NTPC Rihandnagar, Bijpur

AAQ – 16, Renukeswar mandir, Hindalco colony, Renukoot

AAQ – 17, Guest house, Dalla town ship, Dalla

AAQ -18, Guest house , Obra colony, Obra

SAMPLING LOCATION PHOTOGRAPHS OF SURFACE WATER

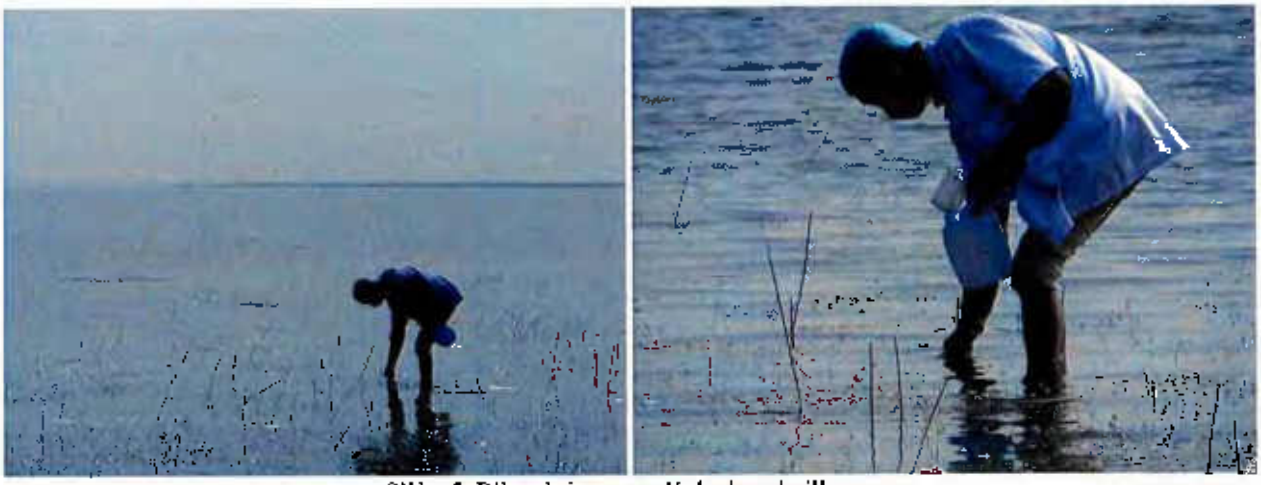
1st Round

SW – 1, Balia Nala Downstream, near Bridge, Shaktinagar

SW – 2, Balia Nala Up Stream, near Bridge, Kadia colony

SW – 3, Lake Water near Senior Transit Camp, NCL, Bina

SW – 4, Kava nala, Anpara



SW – 5, Rihand river near Kohadowal village

SW – 6, Surya Nala, near police station bridge, Vindhyanagar

SW – 7, Rihand Reservoir near Baliyari village upstream

SW – 8, Kanchana nallah near chauhan cold storage, Kachni

SW – 9, Balia Nallah near Dudichua STP

SW – 10, Rihand river,Singrauli to rihand nagar road under rail bridge

SW – 11, Murdhwa Nallah

SW – 12, Rihand Reservior, Up Stream

SW – 13, Dongia Nallah

SW – 14, Rihand Dam Down Stream

SW – 15, Sone River mid stream

SW – 16, Sone River upstream, near somnath mandir, gotheni

SW -17, Sone River near toll Bridge

SW – 18, Sone River Down Stream

SAMPLING LOCATION PHOTOGRAPHS OF GROUND WATER

1st Round

GW – 1, Near Bank, NCL Colony, Bina

GW – 2, Main Shopping Centre, NTPC colony, Shakti Nagar

GW – 3, Primary School, Dudichua

GW – 4, Khadia Colony (Minor Q.No.-M-219)

GW – 5, Kakri Colony near Q-MQ-7 (NCL Project)

GW – 6, Anpara Colony near DAV College

GW 7, Near Q-SIII-176, NCL, Jhingurda (Near Shiv mandir)

GW – 8, Near Coal Gate (out side of Renusagar Power Division Boundary)

GW – 9, Near shiv mandir, Amlori (NCL Project)

GW – 10, Near Sabji mandi, NCL, Jayant, (Beside Police station)

GW – 11, Saraswahraja Colony, Jayanth

GW – 12, Near substation, Sector-B, Dudichua, NCL Project

GW -13, Near Entrance Gate, Vivekananda statue, Nighai

GW – 14, Near Commercial Auto Mobiles, Beside Bharath Petrol Bunk, Vindhyanagar

GW – 15, Punarwas-2, Rihandnagar

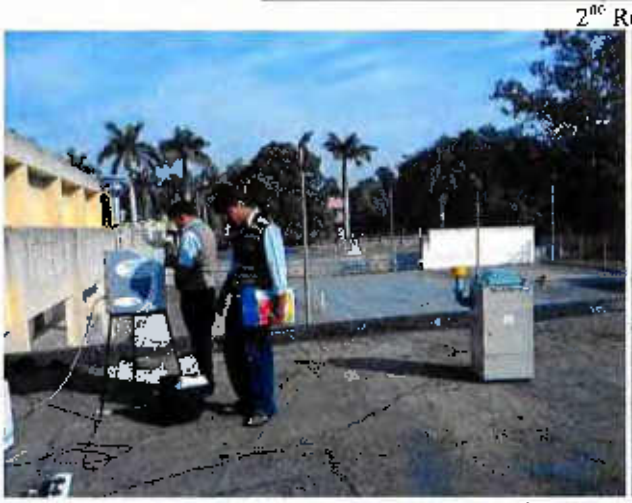
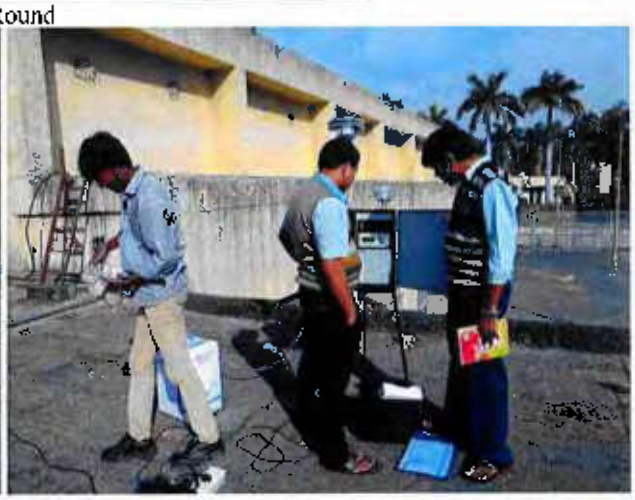
GW – 16, Main road, Renukut market, near Shiv Park

GW – 17, Dalla Area

GW – 18, Obra Colony near Hospital

AMBIENT AIR MONITORING LOCATIONS PHOTOGRAPHS

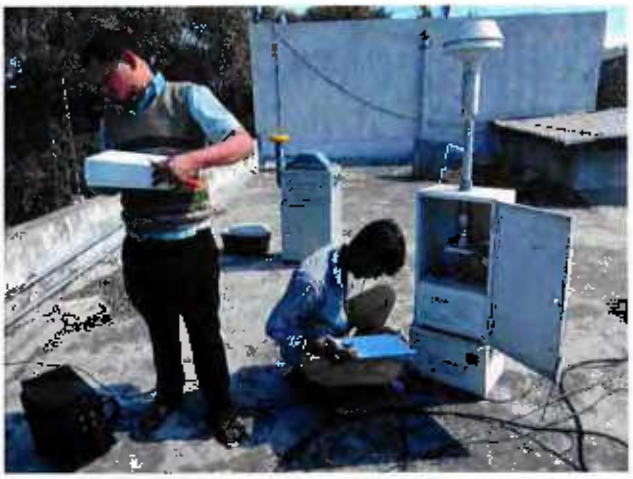
2nd Round

AAQ – 1, Executive club, NTPC Colony, Shakti nagar

AAQ – 2, GM Office, NCL, Dudhichau, Khadia,

AAQ – 3, Expert hostel, Khadia colony, NCL



AAQ – 4, Senior Transit Camp, NCL, Bina

AAQ 5, Guest house, NCL Amlori colony, Near Shiv mandir

AAQ 6, Officers club, NCL, Kakri colony

AAQ – 7, Hindalco colony (Hanuman mandir) Renusagar

AAQ 8, IIIrd type colony, Anpara

AAQ 9, Guest house, NCL colony, Jingurda

AAQ – 10, Experts Hostel, Jayant, NCL Project

AAQ -11, NCL Area (Near Police station), Jayant.

AAQ 12, Guest House Sector-B, Dudichua, NCL Project

AAQ – 13, Gust house, NCL residential colony, Nighai

AAQ – 14, NTPC Vindhyanagar residential colony (NH 2)

AAQ – 15, Main Market, NTPC Rihandnagar, Bijpur

AAQ – 16, Renukeswar mandir, Hindalco colony, Renukoot

AAQ – 17, Guest house, Dalla town ship, Dalla

AAQ – 18, Guest house , Obra colony, Obra

SAMPLING LOCATION PHOTOGRAPHS OF SURFACE WATER

2nd Round

SW – 1, Balia Nala Dn Stream, near Bridge, Shaktinagar

SW – 2, Balia Nala Up Stream, near Bridge, Kadia colony

SW -3, Lake water near Senior Transit Camp, NCL., Bina

SW – 4, Kava nala, Anpara

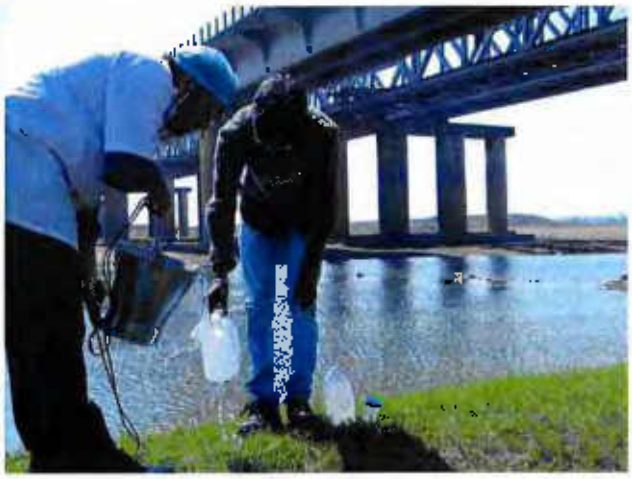
SW 5, Rihand river near Kohadowal village

SW – 6, Surya Nala, near police station bridge, Vindhyanagar

SW – 7, Rihand Reservoir near Baliyari village upstream

SW – 8, Kanchana nallah near chauhan cold storage, Kachni

SW – 9, Balia Nallah near Dudichua STP



SW – 10, Rihand river,Singrauli to rihand nagar road under rail bridge

SW – 11, Murdhwa Nallah

SW – 12, Rihand Reservior, Up Stream

SW 13, Dongia Nallah

SW – 14, Rihand Dam Down Stream

SW -15, Sone River mid stream

SW – 16, Sone River upstream, near somnath mandir, Gotheni

SW – 17, Sone River near toll Bridge

SW - 18, Sone River Down Stream

SAMPLING LOCATION PHOTOGRAPHS OF GROUND WATER

2nd Round

GW - 1, Near Bank, NCL Colony, Bina

GW -2, Main Shopping Centre, NTPC colony, Shakti Nagar

GW – 3, Primary School, Dudichua

GW – 4, Khadia Colony (Minor Q.No.-M-219)

GW – 5, Kakri Colony near Q-MQ-7 (NCL Project)

GW - 6, Anpara Colony near DAV College

GW-7, Near Q-SHF-176, NCL, Jhingurda (Near Shiv mandir)

GW – 8, Near Coal Gate (out side of Renusagar Power Division Boundary)

GW 9, Near shiv mandir, Amlori (NCL Project)

GW -10, Near Sabji mandi, NCL, Jayant, (Beside Police station)

GW – 11, Saraswahraja Colony, Jayanth

GW – 12, Near substation, Sector-B, Dudichua, NCL Project

GW -13, Near Entrance Gate, Vivekananda statue, Nighai

GW – 14, Near Commercial Auto Mobiles, Beside Bharath Petrol Bunk, Vindhyanagar

GW -15, Punarwas-2, Ribandnagar

GW – 16, Main road, Renukut market, near shiv park

GW -17, Dalla area

GW -18, Obra Colony near Hospital

AMBIENT AIR MONITORING LOCATIONS PHOTOGRAPHS

3rd Round

AAQ – 1, Executive club, NTPC Colony, Shakti nagar

AAQ – 2, GM Office, NCL., Dudhichau, Khadia,

AAQ – 3, Expert hostel, Khadia colony, NCL

AAQ – 4, Senior Transit Camp, NCL, Bina

AAQ – 5, Guest house, NCL Amlori colony, Near Shiv mandir

AAQ – 6, Officers club, NCL, Kakri colony

AAQ 7, Hindalco colony (Hanuman mandir) Renusagar

AAQ – 8, IIIrd type colony, Anpara

AAQ – 9, Guest house, NCL colony, Jingurda

AAQ -10, Experts Hostel, Jayant, NCL Project

AAQ – 11, NCL Area (Near Police station), Jayant.

AAQ – 12, Guest House Sector-B, Dudichua, NCL Project

AAQ – 13, Gust house, NCL residential colony, Nighai

AAQ – 14, NTPC Vindhyanagar residential colony (NH 2)

AAQ – 15, Main Market, NTPC Rihandnagar, Bijpur

AAQ 16, Renukeswar mandir, Hindalco colony, Renukoot

AAQ – 17, Guest house, Dalla town ship, Dalla

AAQ – 18, Guest house, Obra colony, Obra

SAMPLING LOCATION PHOTOGRAPHS OF SURFACE WATER

3rd Round

SW – 1, Balia Nala Dn Stream, near Bridge, Shaktinagar

SW – 2, Balia Nala Up Stream, near Bridge, Kadia colony

SW – 3, Lake Water near Senior Transit Camp, NCL, Bina

SW – 4, Kava nala, Anpara

SW – 5, Rihand River near Kohadowal village

SW – 6, Surya Nala, near police station bridge, Vindhyanagar

SW 7, Rihand Reservoir near Baliyari village upstream

SW – 8, Kanchana nallah near chauhan cold storage, Kachni

SW – 9, Balia Nallah near Dudichua ST

SW – 10, Rihand river,Singrauli to rihand nagar road under rail bridge

SW – 11, Murdhwa Nallah

SW – 12, Rihand Reservior, Up Stream

SW – 13, Dongia Nallah

SW – 14, Rihand Dam Down Stream

SW – 15, Sone River mid stream

SW – 16, Sone River upstream, near somnath mandir, gotheni

SW 17, Sone River near toll Bridge

SW – 18, Sone River Down Stream

SAMPLING LOCATION PHOTOGRAPHS OF GROUND WATER

3rd Round

GW – 1, Near Bank, NCL Colony, Bina

GW – 2, Main Shopping Centre, NTPC colony, Shakti Nagar

GW – 3, Primary School, Dudichua

GW 4, Khadia Colony (Minor Q.No.-M-219)

GW – 5, Kakri Colony near Q-MQ-7 (NCL Project)

GW – 6, Anpara Colony near DAV College

GW – 7, Near Q-SHF-176, NCL, Jhingurda (Near Shiv mandir)

GW – 8, Near Coal Gate (out side of Renusagar Power Division Boundary)

GW – 9, Near shiv mandir, Amlori (NCL Project)

GW – 10, Near Sabji mandi, NCL, Jayant, (Beside Police station)

GW – 11, Saraswahraja Colony, Jayanth

GW 12, Near substation, Sector-B, Dudichua, NCL Project

GW – 13, Near Entrance Gate, Vivekananda statue, Nighai

GW – 14, Near Commercial Auto Mobiles, Beside Bharath Petrol Bunk, Vindhyanagar

GW – 15, Punarwas-2, Rihandnagar

GW – 16, Main road, Renukut market, near shiv park

GW – 17, Dalla area

GW – 18, Obra Colony near Hospital

MONITORING, SAMPLING AND ANALYSIS

of

AMBIENT AIR QUALITY, SURFACE WATER QUALITY AND GROUND WATER QUALITY

in

IDENTIFIED CRITICALLY POLLUTED AREA (CPAs)

VAPI

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

VAPI - GUJARAT

AAQ MONITORING LOCATIONS

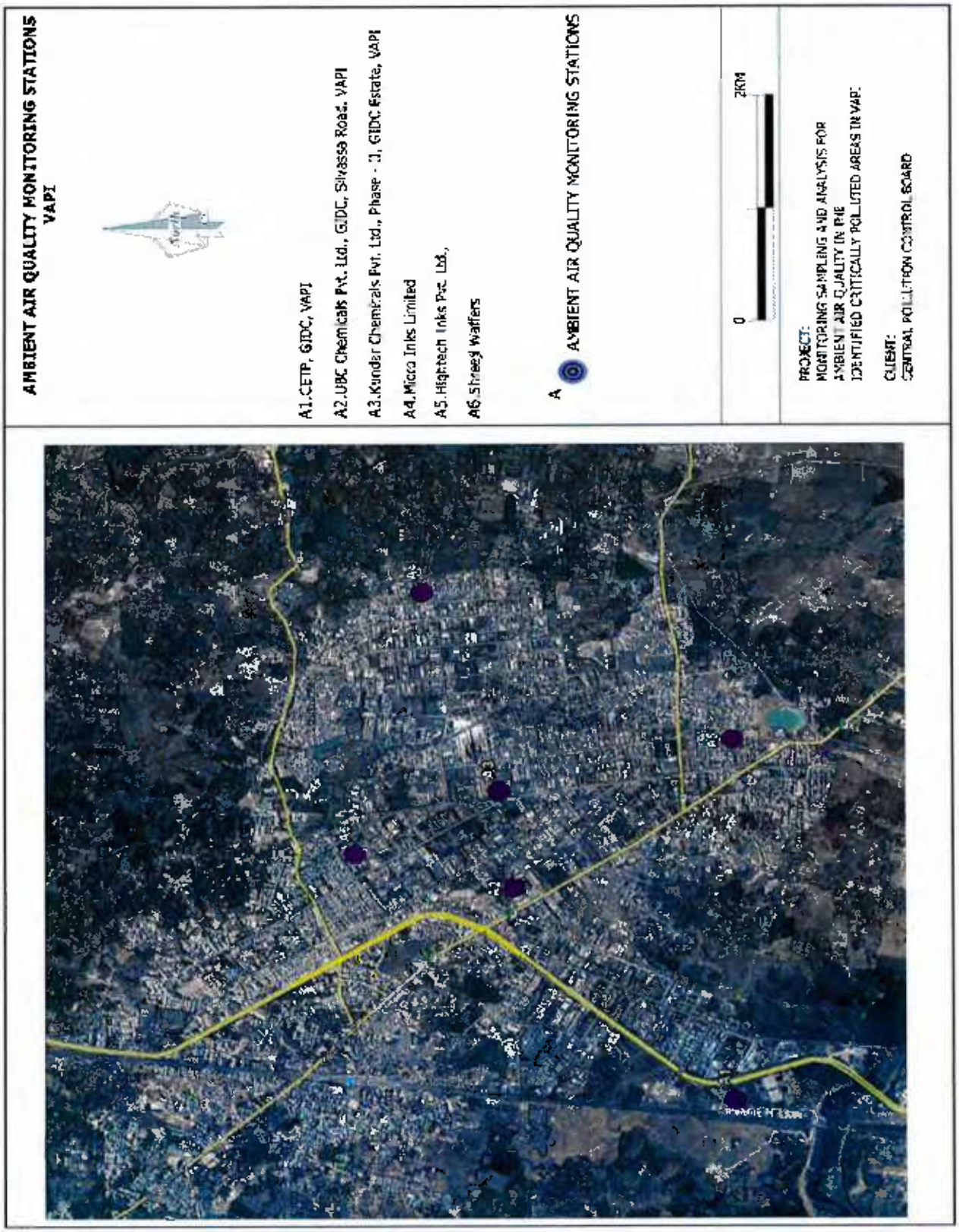
SAMPLE CODE	NAME OF THE MONITORING LOCATION	DATE OF SAMPLING	LATITUDE	LONGITUDE
AAQ – 1	CETP, GIDC, VAPI	1st Round: 26.12.2013 to 27.12.2013 2nd Round: 28.12.2013 to 29.12.2013 3rd Round: 30.12.2013 to 31.12.2013	N 20°21'54.3"	E 072°54'25.7"
AAQ – 2	UBC Chemicals Pvt. Ltd., GIDC, Silvassa Road, VAPI	1st Round: 26.12.2013 to 27.12.2013 2nd Round: 28.12.2013 to 29.12.2013 3rd Round: 30.12.2013 to 31.12.2013	N 20°20'46.8"	E 072°55'30.7"
AAQ – 3	Kundar Chemicals Pvt. Ltd., Phase – II, GIDC Estate, VAPI	1st Round: 26.12.2013 to 27.12.2013 2nd Round: 28.12.2013 to 29.12.2013 3rd Round: 30.12.2013 to 31.12.2013	N 20°21'50.5"	E 072°56'0.26"
AAQ - 4	Micro Inks Limited, VAPI	1st Round: 26.12.2013 to 27.12.2013 2nd Round: 28.12.2013 to 29.12.2013 3rd Round: 30.12.2013 to 31.12.2013	N 20°22'08.6"	E 072°57'01.1"
AAQ – 5	Hightech Inks Pvt. Ltd. VAPI	1st Round: 26.12.2013 to 27.12.2013 2nd Round: 28.12.2013 to 29.12.2013 3rd Round: 30.12.2013 to 31.12.2013	N 20°20'54.6"	E 072°56'15.9"
AAQ - 6	Shreeji Wafers,VAPI	1st Round: 26.12.2013 to 27.12.2013 2nd Round: 28.12.2013 to 29.12.2013 3rd Round: 30.12.2013 to 31.12.2013	N 20°22'24.8"	E 072°55'41.0"

SURFACE WATER SAMPLING LOCATIONS

SAMPLE CODE	NAME OF THE SAMPLING LOCATION	DATE OF SAMPLING	LATITUDE	LONGITUDE
SW – 1	River Damanganga after Silvassa	1st Round: 27.12.2013 2nd Round:29.12.2013 3rd Round: 31.12.2013	N 20°17'53.9"	E 072°58'34.8"
SW – 2	Bhilkhadi downstream near pumping station – 1	1st Round: 27.12.2013 2nd Round:29.12.2013 3rd Round: 31.12.2013	N 20°22'29.4"	E 072°55'51.7"
SW – 3	Bhilkhadi river near NH - 8	1st Round: 27.12.2013 2nd Round:29.12.2013 3rd Round: 31.12.2013	N 20°24'23.1"	E 072°54'53.9"
SW - 4	River Kolak near Koteshwar Mandir	1st Round: 27.12.2013 2nd Round:29.12.2013 3rd Round: 31.12.2013	N 20°26'16.8"	E 072°54'04.7"
SW - 5	River Damanganga at Jari Causeway	1st Round: 27.12.2013 2nd Round:29.12.2013 3rd Round: 31.12.2013	N 20°22'17.9"	E 072°52'50.8"
SW - 6	CETP outlet sample	1st Round: 27.12.2013 2nd Round:29.12.2013 3rd Round: 31.12.2013	N 20°20'35.9"	E 072°54'23.4"

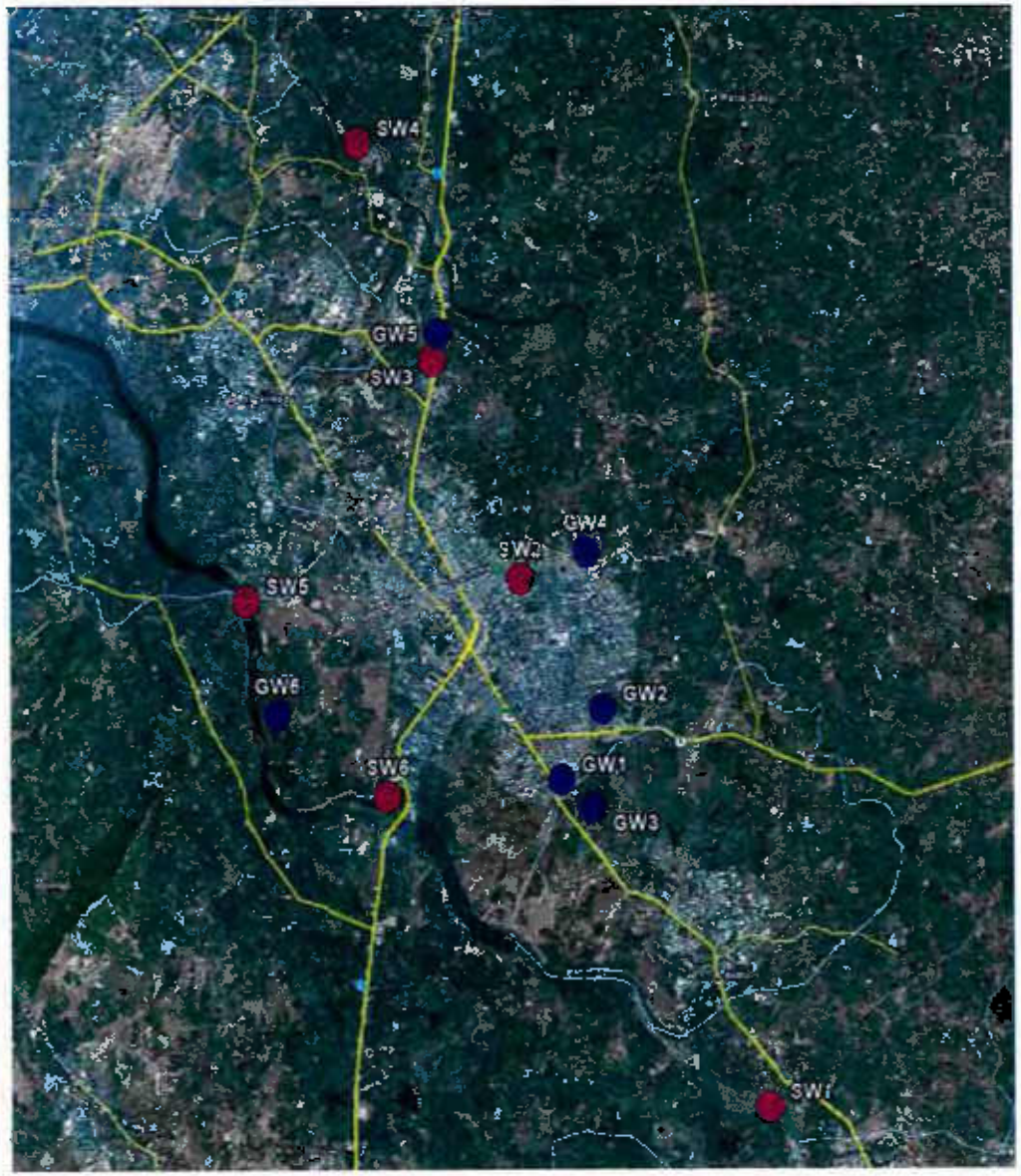
GROUND WATER SAMPLING LOCATIONS

SAMPLE CODE	NAME OF THE SAMPLING LOCATION	DATE OF SAMPLING	LATITUDE	LONGITUDE
GW – 1	Rajasthan Bhavan near Sameer Apartments, Chanod Village	1st Round: 27.12.2013 2nd Round:29.12.2013 3rd Round: 31.12.2013	N 20°20'44.4"	E 072°56'18.3"
GW – 2	Shree Khadim Husen, Plot No. 10, Dangara Fallia, Dehgaon Road, Dungara Village	1st Round: 27.12.2013 2nd Round:29.12.2013 3rd Round: 31.12.2013	N 20°21'21.4"	E 072°56'45.4"
GW 3	TSDF Site South East Direction to GIDC, VAPI	1st Round: 27.12.2013 2nd Round:29.12.2013 3rd Round: 31.12.2013	N 20°20'30.2"	E 072°56'38.8"
GW – 4	Shree S D Shinde Kanchana Nagar, North to GIDC, Chhiri Village.	1st Round: 27.12.2013 2nd Round:29.12.2013 3rd Round: 31.12.2013	N 20°22'43.0"	E 072°56'34.9"
GW - 5	Swaminarayan of Gurukul at 150m on the bank of BhilKhadi near NH-8, Selav Village	1st Round: 27.12.2013 2nd Round:29.12.2013 3rd Round: 31.12.2013	N 21°32'32.6"	E 072°59'03.3"
GW - 6	Zilla Panchayat near Gram Panchayat, Kala Falia, Namadha Village and 100m from River Daman Ganga	1st Round: 27.12.2013 2nd Round:29.12.2013 3rd Round: 31.12.2013	N 20°21'18.6"	E 072°53'11.0"


AMBIENT AIR QUALITY MONITORING STATIONS
VAPI
A1.CETP, GIDC, VAPI
A2.UBC Chemicals Pvt. Ltd., GIDC, Silvassa Road, VAPI
A3.Kundan Chemicals Pvt. Ltd., Phase - II, GIDC Estate, VAPI
A4.Micro Inks Limited
A5.Hightech Inks Pvt. Ltd.,
A6.Shreeji Wafers
A AMBIENT AIR QUALITY MONITORING STATIONS
0
2KM
PROJECT:
MONITORING SAMPLING AND ANALYSIS FOR
AMBIENT AIR QUALITY IN THE
IDENTIFIED CRITICALLY POLLUTED AREAS IN VAPI
CLIENT:
CENTRAL POLLUTION CONTROL BOARD

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

VAPI - GUJARAT



WATER SAMPLING LOCATIONS VAPI

North

GW
GROUND WATER SAMPLING

GW1. Rajasthan Bhavan near Sameer Apartments, Chanod Village

GW2. Shree Khadim Husen, Plot No. 10, Dangara Fallia, Dehgaon Road, Dungara Village

GW3. TSDF Site South East Direction to GIDC, VAPI

GW4. Shree S D Shinde Kanchana Nagar, North to GIDC, Chhiri Village

GW5. Swaminarayan of Gurukul at 150m on the bank of Bhilkhadi near NH-8, Selav Village

GW6. Zilla Panchayat near Gram Panchayat, Kata Falia, Namadha Village and 100m from River Daman Ganga

SW
SURFACE WATER SAMPLING

SW1. River Damanganga after Silvassa

SW2. Bhilkhadi downstream near pumping station - 1

SW3. Bhilkhadi river near NH - 8

SW4. River Kolak near Koteshwar Mandir

SW5. River Damanganga at Jari Causeway

SW6. CETP outlet sample

0 2KM

PROJECT:
MONITORING SAMPLING AND ANALYSIS FOR WATER QUALITY IN THE IDENTIFIED CRITICALLY POLLUTED AREAS IN VAPI

CLIENT:
CENTRAL POLLUTION CONTROL BOARD

AMBIENT AIR QUALITY MONITORING RESULTS

S.No.	Pollutants	AAQ – 1 CETP, GIDC, VAPI			AAQ – 2 UBC Chemicals Pvt. Ltd., Silvassa Road, VAPI			NAAQ Standards (2009)
		1st Round	2nd Round	3rd Round	1st Round	2nd Round	3rd Round	
		26.12.2013	28.12.2013	30.12.2013	26.12.2013	28.12.2013	30.12.2013	
I.	**Particulate Pollutants**							
1.	PM_{10} (µg/m^3)	87	74	96	105	82	79	**100 (µg/m^3)**
2	$PM_{2.5}$ µg/m^3)	33	31	40	38	32	27	**60 (µg/m^3)**
3	Arsenic (ng/m^3)	1.3	2.1	1.6	1.8	2.7	2.2	**06 (ng/m^3) (Annual)**
4	Nickel (ng/m^3)	7.3	8.1	5.9	4.8	7.1	5.6	**20 (ng/m^3) (Annual)**
5	Lead (µg/m^3)	0.10	0.08	0.10	0.07	0.11	0.08	**1.0(µg/m^3) (24 hours)**
6	Benzo (a) Pyrene (ng/m^3)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**01 (ng/m^3) (Annual)**
II.	**Gaseous Pollutants**							
7	SO_2 (µg/m^3)	14.2	12.8	15.7	13.7	11.3	10.9	**80 (µg/m^3) (24 hours)**
8	NO_X (µg/m^3)	24.9	20.5	28.1	21.9	24.2	19.2	**80 (µg/m^3) (24 hours)**
9	NH_3 (µg/m^3)	23.8	18.2	21.1	10.6	13.5	10.3	**400 (µg/m^3) (24 hours)**
10	O_3 (µg/m^3)	10.2	12.2	8..4	12.7	10.9	14.5	**100 (8 hours) & 180 (µg/m^3) (1 hour)**
		16.6	19.2	14.5	21.4	18.8	22.3	
		3.7	2.8	4.2	6.2	3.6	2.8	
11	CO (mg/m^3)	< 2	< 2	< 2	< 2	< 2	< 2	**02 (8 hours) & 04 mg/m^3 (1 hour)**
		< 2	< 2	< 2	< 2	< 2	< 2	
		< 2	< 2	< 2	< 2	< 2	< 2	
12	Benzene (µg/m^3)	< 3	< 3	< 3	< 3	< 3	< 3	**05 (µg/m^3) (Annual)**

AMBIENT AIR QUALITY MONITORING RESULTS

S.No.	Pollutants	AAQ – 3 Kundar Chemicals Pvt. Ltd.,			AAQ – 4 Micro Inks Pvt. Ltd.,			NAAQ Standards (2009)
		1st Round	2nd Round	3rd Round	1st Round	2nd Round	3rd Round	
		26.12.2013	28.12.2013	30.12.2013	26.12.2013	28.12.2013	30.12.2013	
I.	**Particulate Pollutants**							
1.	PM_{10} (µg/m³)	82	106	78	80	72	91	**100 (µg/m³)**
2	$PM_{2.5}$ µg/m³)	39	42	30	33	29	36	**60 (µg/m³)**
3	Arsenic (ng/m³)	1.2	1.5	2.3	2.7	1.9	2.3	**06 (ng/m³) (Annual)**
4	Nickel (ng/m³)	4.7	6.9	7.4	7.2	8.9	6.8	**20 (ng/m³) (Annual)**
5	Lead (µg/m³)	0.20	0.18	0.14	0.10	0.10	0.08	**1.0(µg/m³) (24 hours)**
6	Benzo (a) Pyrene (ng/m³)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**01 (ng/m³) (Annual)**
II.	**Gaseous Pollutants**							
7	SO_2 (µg/m³)	14.9	17.2	12.6	13.2	10.9	14.7	**80 (µg/m³) (24 hours)**
8	NO_X (µg/m³)	23.6	27.4	19.9	24.5	19.7	21.6	**80 (µg/m³) (24 hours)**
9	NH_3 (µg/m³)	16.5	21.3	14.6	18.4	14.7	20.2	**400 (µg/m³) (24 hours)**
10	O_3 (µg/m³)	10.4	13.7	9.2	8.5	14.0	9.3	**100 (8 hours) & 180 (µg/m³) (1 hour)**
		19.2	16.5	20.4	13.3	19.7	21.4	
		5.9	3.8	4.2	3.4	2.9	4.1	
11	CO (mg/m³)	< 2	< 2	< 2	< 2	< 2	< 2	**02 (8 hours) & 04 mg/m³ (1 hour)**
		< 2	< 2	< 2	< 2	< 2	< 2	
		< 2	< 2	< 2	< 2	< 2	< 2	
12	Benzene (µg/m³)	< 3	< 3	< 3	< 3	< 3	< 3	**05 (µg/m³) (Annual)**

AMBIENT AIR QUALITY MONITORING RESULTS

S.No.	Pollutants	AAQ - 5 Hi-tech Inks Pvt. Ltd.,			AAQ - 6 Sheerji Wafers			NAAQ Standards (2009)
		1st Round	2nd Round	3rd Round	1st Round	2nd Round	3rd Round	
		26.12.2013	28.12.2013	30.12.2013	26.12.2013	28.12.2013	30.12.2013	
I.	**Particulate Pollutants**							
1.	PM_{10} ($\mu g/m^3$)	105	92	81	95	88	111	**100 ($\mu g/m^3$)**
2	$PM_{2.5}$ $\mu g/m^3$)	44	32	28	38	33	47	**60 ($\mu g/m^3$)**
3	Arsenic (ng/m^3)	3.1	1.9	2.4	1.6	2.3	1.2	**06 (ng/m^3) (Annual)**
4	Nickel (ng/m^3)	9.2	6.8	8.7	7.3	8.4	10.5	**20 (ng/m^3) (Annual)**
5	Lead ($\mu g/m^3$)	0.21	0.14	0.20	0.18	0.20	0.24	**1.0($\mu g/m^3$) (24 hours)**
6	Benzo (a) Pyrene (ng/m^3)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**01 (ng/m^3) (Annual)**
II.	**Gaseous Pollutants**							
7	SO_2 ($\mu g/m^3$)	12.9	15.7	11.4	14.9	11.3	17.2	**80 ($\mu g/m^3$) (24 hours)**
8	NO_X ($\mu g/m^3$)	21.1	25.3	20.8	23.2	19.9	27.6	**80 ($\mu g/m^3$) (24 hours)**
9	NH_3 ($\mu g/m^3$)	17.6	12.1	9.5	10.2	12.6	8.9	**400 ($\mu g/m^3$) (24 hours)**
10	O_3 ($\mu g/m^3$)	10.2	7.6	8.9	10.8	6.7	11.2	**100 (8 hours) & 180 ($\mu g/m^3$) (1 hour)**
		18.7	15.3	20.1	14.6	19.1	16.3	
		4.2	2.8	3.5	5.3	3.3	4.2	
11	CO (mg/m^3)	< 2	< 2	< 2	< 2	< 2	< 2	**02 (8 hours) & 04 mg/m^3 (1 hour)**
		< 2	< 2	< 2	< 2	< 2	< 2	
		< 2	< 2	< 2	< 2	< 2	< 2	
12	Benzene ($\mu g/m^3$)	< 3	< 3	< 3	< 3	< 3	< 3	**05 ($\mu g/m^3$) (Annual)**

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

VAPI - GUJARAT

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 1: River Damanganga After Silvassa			Test Method
			1st Round 27.12.2013	2nd Round 29.12.2013	3rd Round 31.12.2013	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	5	5	5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.94	7.36	7.81	IS 3025: Part 11
2	E C	µS/cm	214	266	250	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part 17
5	Dissolved Oxygen	mg/l	7.2	7.0	6.8	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	18	18	16	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	4	4	3	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	0.01	0.01	0.01	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	0.22	0.22	0.22	APHA 4500 NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	0.23	0.23	0.23	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part - 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.3	0.4	0.4	IS 3025: Part – 60
15	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	0.82	0.96	0.89	By Calculation
18	Total Coliforms	MPN/100ml	70	50	40	IS 1622
19	Fecal Coliforms	MPN/100ml	4	4	2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 P.D
2	Total Kjeldal Nitrogen	mg/l	0.56	0.70	0.56	APHA 4500 Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	0.28	0.56	0.28	APHA 4500 NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr_6 D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 48
18	Manganese as Mn	mg/l	0.01	0.01	0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.09	0.10	0.10	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 - D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

VAPI - GUJARAT

Sl. No.	Test Parameters	UOM	SW – 2: Bhilkhadi Downstream near pumping station			Test Method
			1st Round 27.12.2013	2nd Round 29.12.2013	3rd Round 31.12.2013	
I	**Simple Parameters**					
1	Appearance	-	* Sample is not drawn ,as the stream was dried	* Sample is not drawn ,as the stream was dried	* Sample is not drawn ,as the stream was dried	-
2	Colour (Hazen Units)	-				IS 3025: Part – 4
3	Odour (Smell)	-				IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-				IS 3025: Part – 11
2	E C	µS/cm				IS 3025: Part 14
3	Oil & Grease	mg/l				IS 3025: Part – 39
4	Suspended Solids	mg/l				IS 3025: Part – 17
5	Dissolved Oxygen	mg/l				IS 3025: Part 38
6	Chemical Oxygen Demand	mg/l				IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l				IS 3025: Part 44
8	Nitrate-Nitrogen as N	mg/l				APHA 4500 NO_3.B
9	Nitrate-Nitrogen as N	mg/l				APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l				By Calculation
11	Free Ammonia	mg/l				APHA 4500 NH_3.C
12	Total Residual Chlorine	mg/l				IS 3025: Part – 26
13	Cyanide as CN	mg/l				IS 3025: Part – 27
14	Fluoride as F	mg/l				IS 3025: Part 60
15	Sulphides as S	mg/l				IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l				APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-				By Calculation
18	Total Coliforms	MPN/100ml				IS 1622
19	Fecal Coliforms	MPN/100ml				IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l				APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l				APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l				APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l				IS 3025: Part – 43
5	Surfactants	mg/l				IS 13428
6	Organo-chlorine Pesticides	mg/l				EPA 508
7	PAH	mg/l				EPA 525.2
8	PCB and PCT	mg/l				EPA 508
9	Zinc as Zn	mg/l				IS 3025: Part – 49
10	Nickel as Ni	mg/l				IS 3025: Part – 54
11	Copper as Cu	mg/l				IS 3025: Part – 42
12	Hexavalent Chromium as Cr^{6+}	mg/l				APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l				IS 3025: Part 52
14	Arsenic as As	mg/l				IS 3025: Part – 37
15	Lead as Pb	mg/l				IS 3025: Part – 47
16	Cadmium as Cd	mg/l				IS 3025: Part – 41
17	Mercury as Hg	mg/l				IS 3025: Part – 48
18	Manganese as Mn	mg/l				APHA 3111 – B
19	Iron as Fe	mg/l				IS 3025: Part 53
20	Vanadium as V	mg/l				APHA 3111 – D
21	Selenium as Se	mg/l				IS 3025: Part – 56
22	Boron as B	mg/l				IS 3025: Part 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

VAPI - GUJARAT

Sl. No.	Test Parameters	UOM	SW – 3: Bhilkhadi River near NH-8			Test Method
			1st Round 27.12.2013	2nd Round 29.12.2013	3rd Round 31.12.2013	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	10	10	10	IS 3025: Part 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	8.02	7.64	7.81	IS 3025: Part – 11
2	E C	µS/cm	640	690	580	IS 3025: Part – 14
3	Oil & Grease	mg/l	1	1	1	IS 3025: Part 39
4	Suspended Solids	mg/l	26	28	14	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	2.2	3.1	3.5	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	48	58	52	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	10	12	11	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	0.02	0.02	0.02	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	0.90	1.13	1.02	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2 NO_3)	mg/l	0.92	1.15	1.04	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.5	0.5	0.5	IS 3025: Part – 60
15	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	0.50	0.46	0.32	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	1.73	1.46	1.58	By Calculation
18	Total Coliforms	MPN/100ml	140	90	110	IS 1622
19	Fecal Coliforms	MPN/100ml	21	14	17	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	0.82	0.76	0.72	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	6.2	7.4	6.8	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	3.5	4.3	3.9	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	0.10	0.10	0.10	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.02	0.02	0.02	IS 3025: Part – 49
10	Nickel as Ni	mg/l	0.01	0.01	0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	0.01	0.01	0.02	IS 3025: Part - 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.05	0.07	0.06	APHA 3111 – B
19	Iron as Fe	mg/l	0.18	0.20	0.14	IS 3025: Part 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

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Sl. No.	Test Parameters	UOM	SW – 4: River Kolak near Koteshwar mandir			Test Method
			1st Round 27.12.2013	2nd Round 29.12.2013	3rd Round 31.12.2013	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	10	10	10	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.54	7.29	7.86	IS 3025: Part 11
2	E C	µS/cm	650	730	670	IS 3025: Part – 14
3	Oil & Grease	mg/l	1	1	1	IS 3025: Part – 39
4	Suspended Solids	mg/l	24	20	32	IS 3025: Part 17
5	Dissolved Oxygen	mg/l	3.6	3.8	4.3	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	42	34	46	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	10	9	10	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	0.01	0.01	0.01	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	1.13	1.35	1.24	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	1.14	1.36	1.25	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part 27
14	Fluoride as F	mg/l	0.9	0.9	0.8	IS 3025: Part – 60
15	Sulphides as S	mg/l	0.1	0.1	0.1	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	0.56	0.64	0.56	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	1.46	1.61	1.58	By Calculation
18	Total Coliforms	MPN/100ml	220	280	170	IS 1622
19	Fecal Coliforms	MPN/100ml	30	40	26	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	0.84	0.92	0.82	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	4.8	3.9	4.5	APHA 4500 – Norg. B
3	Total Ammonia (NH_4 + NH_3)-Nitrogen	mg/l	3.4	2.1	2.8	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 43
5	Surfactants	mg/l	0.10	0.10	0.10	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr6	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.01	0.01	0.02	APHA 3111 – B
19	Iron as Fe	mg/l	0.10	0.12	0.10	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 56
22	Boron as B	mg/l	0.10	0.10	0.10	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

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Sl. No.	Test Parameters	UOM	SW – 5: River Damanganga at Jari Causeway			Test Method
			1st Round 27.12.2013	2nd Round 29.12.2013	3rd Round 31.12.2013	
I	**Simple Parameters**					
1	Appearance	-	Light Brown	Light Brown	Light Brown	-
2	Colour (Hazen Units)	-	20	20	25	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part - 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.56	7.91	7.68	IS 3025: Part 11
2	E C	µS/cm	1690	1740	1730	IS 3025: Part – 14
3	Oil & Grease	mg/l	1	1	1	IS 3025: Part – 39
4	Suspended Solids	mg/l	24	28	20	IS 3025: Part 17
5	Dissolved Oxygen	mg/l	5.4	5.8	6.6	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	44	56	48	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	12	15	13	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	0.06	0.04	0.05	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	1.58	1.69	1.58	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2–NO_3)	mg/l	1.64	1.73	1.63	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part 27
14	Fluoride as F	mg/l	0.7	0.7	0.6	IS 3025: Part – 60
15	Sulphides as S	mg/l	0.1	0.1	0.1	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	0.26	0.26	0.20	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	2.64	2.91	2.83	By Calculation
18	Total Coliforms	MPN/100ml	90	110	140	IS 1622
19	Fecal Coliforms	MPN/100ml	17	21	19	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	0.50	0.52	0.46	APHA 4500 P.D
2	Total Kjeldal Nitrogen	mg/l	2.8	3.5	3.2	APHA 4500 Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	1.7	2.1	1.8	APHA 4500 NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part - 43
5	Surfactants	mg/l	0.10	0.12	0.10	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 48
18	Manganese as Mn	mg/l	0.02	0.02	0.03	APHA 3111 – B
19	Iron as Fe	mg/l	0.14	0.14	0.16	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.12	0.16	0.14	IS 3025: Part – 57

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Sl. No.	Test Parameters	UOM	SW – 6: CETP Outlet water			Test Method
			1st Round 27.12.2013	2nd Round 29.12.2013	3rd Round 31.12.2013	
I	**Simple Parameters**					
1	Appearance	-	Brownish	Brownish	Brownish	-
2	Colour (Hazen Units)	-	200	250	200	IS 3025: Part – 4
3	Odour (Smell)	-	Un agreeable	Un agreeable	Un agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.55	7.62	7.48	IS 3025: Part – 11
2	E C	µS/cm	8500	8450	8580	IS 3025: Part – 14
3	Oil & Grease	mg/l	4	5	5	IS 3025: Part - 39
4	Suspended Solids	mg/l	42	36	40	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	3.4	3.8	3.5	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	220	240	256	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	60	64	68	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	0.02	0.02	0.02	APHA 4500 - NO_2.B
9	Nitrate-Nitrogen as N	mg/l	3.39	3.84	3.52	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2–NO_3)	mg/l	3.41	3.86	3.52	By Calculation
11	Free Ammonia	mg/l	0.10	0.10	0.20	APHA 4500 NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	1.2	1.2	1.2	IS 3025: Part 60
15	Sulphides as S	mg/l	0.6	0.5	0.7	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	0.14	0.18	0.18	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	5.28	5.11	5.59	By Calculation
18	Total Coliforms	MPN/100ml	110	140	90	IS 1622
19	Fecal Coliforms	MPN/100ml	21	24	17	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	0.36	0.48	0.46	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	32	35	30	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	20	24	18	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	0.10	0.10	0.10	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.12	0.10	0.12	IS 3025: Part – 49
10	Nickel as Ni	mg/l	0.04	0.05	0.05	IS 3025: Part – 54
11	Copper as Cu	mg/l	0.03	0.04	0.03	IS 3025: Part – 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	0.03	0.04	0.04	IS 3025: Part - 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.15	0.16	0.14	APHA 3111 – B
19	Iron as Fe	mg/l	0.38	0.48	0.32	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.82	0.85	0.90	IS 3025: Part 57

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GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	LOM	GW-1: Rajasthan Bhavan near Sameer Apartments, Chanod village			Test Method
			1st Round 27.12.2013	2nd Round 29.12.2013	3rd Round 31.12.2013	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.69	7.84	7.71	IS 3025: Part – 11
2	E.C	µS/cm	692	710	684	IS 3025: Part - 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part - 17
5	Chemical Oxygen Demand	mg/l	4	6	4	IS 3025: Part - 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	0.01	0.01	0.01	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	0.22	0.22	0.22	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	0.23	0.23	0.23	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.7	0.6	0.7	IS 3025: Part 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	2.53	2.69	2.42	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr6	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 B
19	Iron as Fe	mg/l	0.07	0.08	0.07	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

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Sl. No.	Test Parameters	UOM	GW-2: Shree Khadim Husen, Dungara Village			Test Method
			1st Round 27.12.2013	2nd Round 29.12.2013	3rd Round 31.12.2013	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.59	7.42	7.54	IS 3025: Part 11
2	E.C	µS/cm	2980	3020	2940	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part 17
5	Chemical Oxygen Demand	mg/l	4	6	4	IS 3025: Part 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	2.03	2.26	1.92	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+ NO_3)	mg/l	2.03	2.26	1.92	APHA 4500 N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part 27
13	Fluoride as F	mg/l	0.6	0.6	0.6	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	5.48	5.72	5.09	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+ NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.07	0.07	0.06	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 56
22	Boron as B	mg/l	0.12	0.12	0.10	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

VAPI - GUJARAT

Sl. No.	Test Parameters	UOM	GW-3: TSDF Site South- East Direction, GIDC			Test Method
			1st Round 27.12.2013	2nd Round 29.12.2013	3rd Round 31.12.2013	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.71	7.62	7.89	IS 3025: Part – 11
2	E C	µS/cm	1760	1790	1810	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	6	6	4	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	0.02	0.02	0.02	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	4.97	5.42	4.52	APHA 4500 NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	4.99	5.44	4.54	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.6	0.6	0.6	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 P.D
16	Sodium Absorption Ratio (SAR)	-	2.74	3.02	2.59	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.08	0.09	0.08	IS 3025: Part 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.12	0.14	0.13	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

VAPI - GUJARAT

Sl. No.	Test Parameters	UOM	GW-4: Shree S D Shinde, Kanchana Nagar, North to GIDC, Chhiri village			Test Method
			1st Round 27.12.2013	2nd Round 29.12.2013	3rd Round 31.12.2013	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.85	7.64	7.78	IS 3025: Part – 11
2	E C	µS/cm	1010	1060	1040	IS 3025: Part 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	4	6	4	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 NO_2-B
8	Nitrate-Nitrogen as N	mg/l	1.63	1.81	1.58	APHA 4500 – NO_3-B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	1.63	1.81	1.58	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 - NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	1.0	1.0	1.0	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	2.82	3.02	2.66	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4–NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_5H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Posticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.07	0.08	0.07	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

VAPI - GUJARAT

Sl. No.	Test Parameters	UOM	GW-5: Swaminarayan of Gurukul at 150m on the bank of Bhilkhadi near NH-8			Test Method
			1st Round 27.12.2013	2nd Round 29.12.2013	3rd Round 31.12.2013	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part - 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part - 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.32	7.36	7.29	IS 3025: Part – 11
2	E.C	µS/cm	1130	1170	1140	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	4	4	4	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	0.01	0.01	0.01	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	2.48	2.26	2.37	APHA 4500 NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	2.49	2.27	2.38	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.6	0.6	0.6	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 - P.D
16	Sodium Absorption Ratio (SAR)	-	2.14	2.36	2.29	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 - P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.06	0.07	0.07	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 - D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

VAPI - GUJARAT

Sl. No.	Test Parameters	UOM	GW-6: Zilla Panchayat near Kata Falia, Namadha Village			Test Method
			1st Round 27.12.2013	2nd Round 29.12.2013	3rd Round 31.12.2013	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.31	7.46	7.42	IS 3025: Part – 11
2	E C	µS/cm	890	870	900	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	4	6	4	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	0.01	0.01	0.01	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	1.21	1.24	1.35	APHA 4500 NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2–NO_3)	mg/l	1.22	1.25	1.36	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.6	0.6	0.5	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	1.57	1.71	1.58	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 B
19	Iron as Fe	mg/l	0.06	0.06	0.07	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 57

AMBIENT AIR MONITORING LOCATIONS PHOTOGRAPHS

AAQ – 1.CETP, GIDC, VAPI

AAQ – 2.UBC Chemicals Pvt. Ltd., Silvassa Road, VAPI

AAQ - 3.Kundar Chemicals Pvt. Ltd

AMBIENT AIR MONITORING LOCATIONS PHOTOGRAPHS

AAQ 4.Micro Inks Pvt. Ltd

AAQ – 5.Hi-tech Inks Pvt. Ltd

AAQ - 6.Sheerji Wafers

SAMPLING LOCATION PHOTOGRAPHS OF SURFACE WATER

SW – 1: River Damanganga after Silvassa

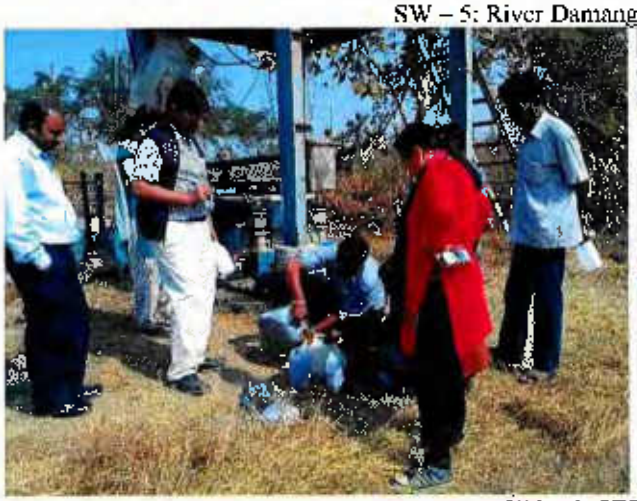
SW – 2: Bhilkhadi Downstream near pumping station (Dried)

SW – 3: Bhilkhadi River near NH-8

SAMPLING LOCATION PHOTOGRAPHS OF SURFACE WATER

SW – 4: River Kolak near Koteshwar mandir

SW – 5: River Damanganga at Jari Causeway



SW – 6: CETP Outlet water

SAMPLING LOCATION PHOTOGRAPHS OF GROUND WATER

GW-1: Rajasthan Bhavan near Sameer Apartments, Chanod village

GW-2: Shree Khadim Husen, Dungara Village

GW-3: TSDF Site South- East Direction, GIDC

SAMPLING LOCATION PHOTOGRAPHS OF GROUND WATER

GW-4: Shree S D Shinde, Kanchana Nagar, North to GIDC, Chhiri village

GW-5: Swaminarayan of Gurukul at 150m on the bank of Bhilkhadi near NH-8

GW-6: Zilla Panchayat near Kata Falia, Namadha Village

MONITORING, SAMPLING AND ANALYSIS

of

AMBIENT AIR QUALITY, SURFACE WATER QUALITY AND GROUND WATER QUALITY

in

IDENTIFIED CRITICALLY POLLUTED AREA (CPAs)

VATVA

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

VATVA - GUJARAT

AAQ MONITORING LOCATIONS

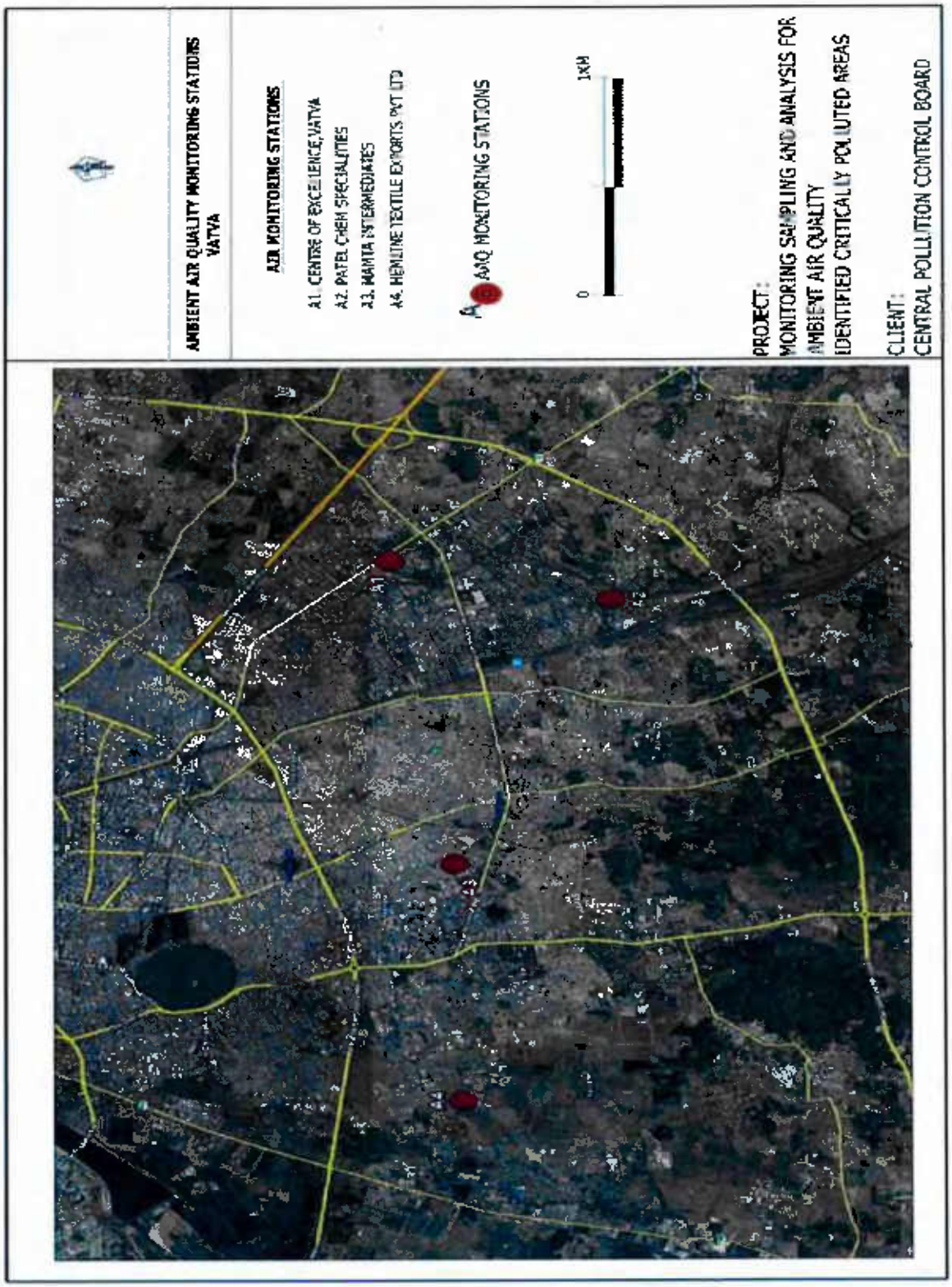
SAMPLE CODE	NAME OF THE MONITORING LOCATION	DATE OF SAMPLING	LATITUDE	LONGITUDE
AAQ – 1	Centre of Excellence, Vatva Industrial Association	1st Round: 26.12.2013 to 27.12.2013 2nd Round: 28.12.2013 to 29.12.2013 3rd Round: 30.12.2013 to 31.12.2013	N 22°58'11.0"	E 072°38'35.5"
AAQ – 2	M/s. Patel Chem Specialties	1st Round: 26.12.2013 to 27.12.2013 2nd Round: 28.12.2013 to 29.12.2013 3rd Round: 30.12.2013 to 31.12.2013	N 22°57'03.4"	E 072°38'16.8"
AAQ – 3	M/s. Mamta Intermediates	1st Round: 26.12.2013 to 27.12.2013 2nd Round: 28.12.2013 to 29.12.2013 3rd Round: 30.12.2013 to 31.12.2013	N 22°57'51.4"	E 072°36'08.3"
AAQ 4	M/s. Hemline Textile Exports Private Ltd.,	1st Round: 26.12.2013 to 27.12.2013 2nd Round: 28.12.2013 to 29.12.2013 3rd Round: 30.12.2013 to 31.12.2013	N 22°57'49.0"	E 072°34'13.1"

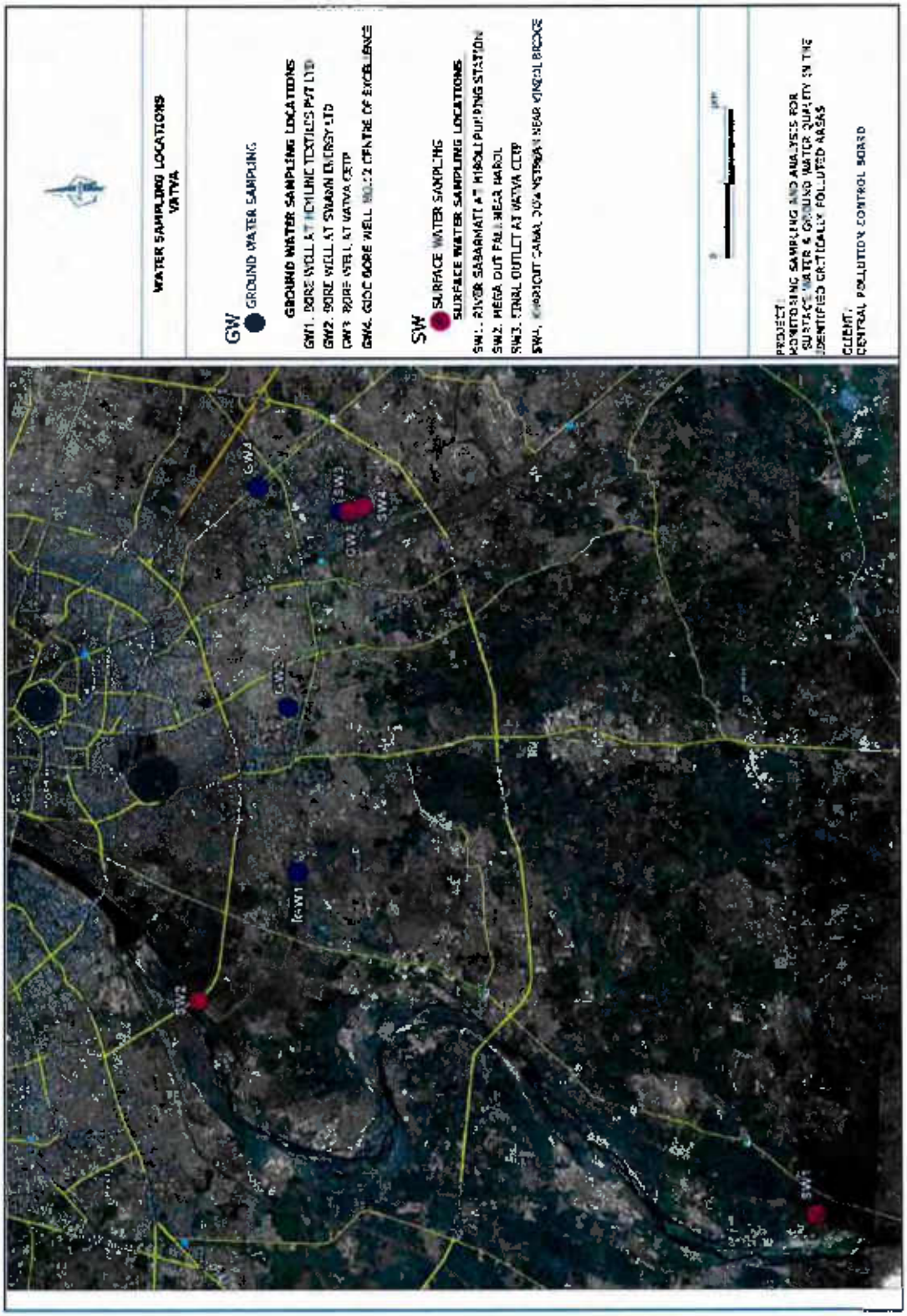
SURFACE WATER SAMPLING LOCATIONS

SAMPLE CODE	NAME OF THE SAMPLING LOCATION	DATE OF SAMPLING	LATITUDE	LONGITUDE
SW – 1	River Sabarmati at Miroli Pumping Station	1st Round: 27.12.2013 2nd Round:29.12.2013 3rd Round: 31.12.2013	N 22°52'34.1"	E 072°30'09.8"
SW – 2	Mega outfall near Narol	1st Round: 27.12.2013 2nd Round:29.12.2013 3rd Round: 31.12.2013	N 22°58'46.4"	E 072°32'39.3"
SW – 3	Final Outlet of Vatva CETP (Green Envn. Service Co-operative Society Ltd.,), GIDC – VATVA	1st Round: 27.12.2013 2nd Round:29.12.2013 3rd Round: 31.12.2013	N 22°57'15.9"	E 072°38'21.1"
SW – 4	Kharicut Canel downstream near Vinzol Bridge, Vatva	1st Round: 27.12.2013 2nd Round:29.12.2013 3rd Round: 31.12.2013	N 22°57'07.1"	E 072°38'24.2"

GROUND WATER SAMPLING LOCATIONS

SAMPLE CODE	NAME OF THE SAMPLING LOCATION	DATE OF SAMPLING	LATITUDE	LONGITUDE
GW – 1	Hemline Textile Pvt. Ltd., Shahwadi (Narol Industrial Area)	1st Round: 27.12.2013 2nd Round:29.12.2013 3rd Round: 31.12.2013	N 22°57'46.5"	E 072°34'09.6"
GW – 2	M/s. Swan Energy Ltd., Narol Vatva Road, Narol	1st Round: 27.12.2013 2nd Round:29.12.2013 3rd Round: 31.12.2013	N 22°57'52.1"	E 072°36'03.8"
GW 3	Vatva CETP (Green Envn. Service Co-operative Society Ltd.,) GIDC – VATVA	1st Round: 27.12.2013 2nd Round:29.12.2013 3rd Round: 31.12.2013	N 22°57'20.7"	E 072°38'20.8"
GW – 4	GIDC Bore well No.12, Centre of Excellence, Vatva Industrial Association, GIDC -Vatva	1st Round: 27.12.2013 2nd Round:29.12.2013 3rd Round: 31.12.2013	N 22°58'10.7"	E 072°38'37.7"


AMBIENT AIR QUALITY MONITORING STATIONS VATVA
AIR MONITORING STATIONS
A1. CENTRE OF EXCELLENCE, VATVA
A2. PATEL CHEM SPECIALITIES
A3. MANTA INTERMEDIATES
A4. HEMLINE TEXTILE EXPORTS PVT LTD
AAQ MONITORING STATIONS
0
1KM
PROJECT:
MONITORING SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY IDENTIFIED CRITICALLY POLLUTED AREAS
CLIENT:
CENTRAL POLLUTION CONTROL BOARD


WATER SAMPLING LOCATIONS
VATVA
GW
GROUND WATER SAMPLING
GROUND WATER SAMPLING LOCATIONS
GW1. BORE WELL AT HEMLINE TEXTILES PVT LTD
GW2. BORE WELL AT SWARN ENERGY LTD
GW3. BORE WELL AT VATVA CETP
GW4. GIDC BORE WELL
SW
SURFACE WATER SAMPLING
SURFACE WATER SAMPLING LOCATIONS
SW1. RIVER SABARMATI AT NIRMALI PUMPING STATION
SW2. MEGA OUT FALL NEAR NAROL
SW3. FINAL OUTLET AT VATVA CETP
SW4.
PROJECT:
MONITORING SAMPLING AND ANALYSIS FOR
SURFACE WATER & GROUND WATER QUALITY IN THE
IDENTIFIED CRITICALLY POLLUTED AREAS
CLIENT:
CENTRAL POLLUTION CONTROL BOARD

AMBIENT AIR QUALITY MONITORING

S.No.	Pollutants	AAQ – 1 Centre of Excellence, Vatva Industrial Association			AAQ – 2 M/s. Patel Chem Specialities			NAAQ Standards (2009)
		1st Round	2nd Round	3rd Round	1st Round	2nd Round	3rd Round	
		26.12.2013	28.12.2013	30.12.2013	26.12.2013	28.12.2013	30.12.2013	
I.	**Particulate Pollutants**							
1.	PM_{10} ($\mu g/m^3$)	82	75	64	69	77	84	**100 ($\mu g/m^3$)**
2	$PM_{2.5}$ ($\mu g/m^3$)	37	32	28	32	36	39	**60 ($\mu g/m^3$)**
3	Arsenic (ng/m^3)	1.8	2.3	2.9	2.3	1.6	1.5	**06 (ng/m^3) (Annual)**
4	Nickel (ng/m^3)	5.3	6.9	4.7	4.9	6.1	7.8	**20 (ng/m^3) (Annual)**
5	Lead ($\mu g/m^3$)	0.20	0.12	0.09	0.16	0.12	0.10	**1.0($\mu g/m^3$) (24 hours)**
6	Benzo (a) Pyrene (ng/m^3)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**01 (ng/m^3) (Annual)**
II.	**Gaseous Pollutants**							
7	SO_2 ($\mu g/m^3$)	10.8	12.5	9.7	11.6	15.2	12.4	**80 ($\mu g/m^3$) (24 hours)**
8	NO_X ($\mu g/m^3$)	18.4	21.3	19.5	20.4	27.7	21.3	**80 ($\mu g/m^3$) (24 hours)**
9	NH_3 ($\mu g/m^3$)	12.7	10.5	8.5	15.6	12.8	10.5	**400 ($\mu g/m^3$) (24 hours)**
10	O_3 ($\mu g/m^3$)	8.6	9.8	12.6	10.2	13.4	9.4	**100 (8 hours) & 180 ($\mu g/m^3$) (1 hour)**
		12.4	15.1	20.1	18.1	15.8	20.1	
		3.2	4.6	3.8	5.6	3.9	5.2	
11	CO (mg/m^3)	< 2	< 2	< 2	< 2	< 2	< 2	**02 (8 hours) & 04 mg/m^3 (1 hour)**
		< 2	< 2	< 2	< 2	< 2	< 2	
		< 2	< 2	< 2	< 2	< 2	< 2	
12	Benzene ($\mu g/m^3$)	< 3	< 3	< 3	< 3	< 3	< 3	**5 ($\mu g/m^3$) (Annual)**

AMBIENT AIR QUALITY MONITORING

S.No.	Pollutants	AAQ – 3 M/s. Mamata Intermediates			AAQ – 4 M/s. Hemline Textile Exports Private Ltd			NAAQ Standards (2009)
		1st Round	2nd Round	3rd Round	1st Round	2nd Round	3rd Round	
		26.12.2013	28.12.2013	30.12.2013	26.12.2013	28.12.2013	30.12.2013	
I.	**Particulate Pollutants**							
1.	PM_{10} ($\mu g/m^3$)	72	84	93	109	92	80	**100 ($\mu g/m^3$)**
2	$PM_{2.5}$ ($\mu g/m^3$)	25	29	31	42	37	32	**60 ($\mu g/m^3$)**
3	Arsenic (ng/m^3)	2.2	1.8	3.1	1.2	1.5	1.1	**06 (ng/m^3) (Annual)**
4	Nickel (ng/m^3)	7.2	5.8	8.4	5.6	4.2	6.3	**20 (ng/m^3) (Annual)**
5	Lead ($\mu g/m^3$)	010	0.16	0.12	0.20	0.13	0.18	**1.0($\mu g/m^3$) (24 hours)**
6	Benzo (a) Pyrene (ng/m^3)	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**01 (ng/m^3) (Annual)**
II.	**Gaseous Pollutants**							
7	SO_2 ($\mu g/m^3$)	13.1	10.7	12.2	10.9	12.6	15.3	**80 ($\mu g/m^3$) (24 hours)**
8	NO_X ($\mu g/m^3$)	27.7	21.5	24.4	19.8	21.5	23.2	**80 ($\mu g/m^3$) (24 hours)**
9	NH_3 ($\mu g/m^3$)	11.1	12.4	14.7	22.6	15.8	21.0	**400 ($\mu g/m^3$) (24 hours)**
10	O_3 ($\mu g/m^3$)	8.6	7.1	9.2	10.7	13.1	9.6	**100 (8 hours) & 180 ($\mu g/m^3$) (1 hour)**
		18.4	12.6	14.5	16.8	20.3	18.9	
		5.2	3.1	2.8	4.1	5.4	3.6	
11	CO (mg/m^3)	< 2	< 2	< 2	< 2	< 2	< 2	**02 (8 hours) & 04 mg/m^3 (1 hour)**
		< 2	< 2	< 2	< 2	< 2	< 2	
		< 2	< 2	< 2	< 2	< 2	< 2	
12	Benzene ($\mu g/m^3$)	< 3	< 3	< 3	< 3	< 3	< 3	**5 ($\mu g/m^3$) (Annual)**

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

VATVA - GUJARAT

SURFACE WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	SW – 1: River Sabarmati at Miroli Pumping Station			Test Method
			1st Round 27.12.2013	2nd Round 29.12.2013	3rd Round 31.12.2013	
I	**Simple Parameters**					
1	Appearance	-	Light Green	Light Green	Light Green	-
2	Colour (Hazen Units)	-	40	35	40	IS 3025: Part – 4
3	Odour (Smell)	-	Un agreeable	Un agreeable	Un agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.89	7.46	7.99	IS 3025: Part – 11
2	EC	µS/cm	2160	2080	2210	IS 3025: Part – 14
3	Oil & Grease	mg/l	5	6	5	IS 3025: Part – 39
4	Suspended Solids	mg/l	78	82	64	IS 3025: Part 17
5	Dissolved Oxygen	mg/l	1.2	1.3	1.2	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	156	148	172	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	45	42	48	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	0.02	0.02	0.02	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	3.39	3.16	3.84	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2 i NO_3)	mg/l	3.41	3.18	3.86	By Calculation
11	Free Ammonia	mg/l	0.1	0.1	0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part 27
14	Fluoride as F	mg/l	0.8	0.7	0.8	IS 3025: Part – 60
15	Sulphides as S	mg/l	6.5	6.2	7.1	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	2.0	1.8	2.4	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	6.48	6.31	6.89	By Calculation
18	Total Coliforms	MPN/100ml	70	40	90	IS 1622
19	Fecal Coliforms	MPN/100ml	14	11	17	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	2.8	2.6	3.0	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	37	39	42	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	21	22	24	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 43
5	Surfactants	mg/l	0.10	0.10	0.10	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.10	0.09	0.10	IS 3025: Part – 49
10	Nickel as Ni	mg/l	0.02	0.02	0.03	IS 3025: Part – 54
11	Copper as Cu	mg/l	0.01	0.01	0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr6	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.12	0.10	0.13	APHA 3111 – B
19	Iron as Fe	mg/l	0.82	0.80	0.89	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 56
22	Boron as B	mg/l	0.18	0.16	0.18	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

VATVA - GUJARAT

Sl. No.	Test Parameters	UOM	SW - 2: Mega outfall near Narol			Test Method
			1st Round 27.12.2013	2nd Round 29.12.2013	3rd Round 31.12.2013	
I	**Simple Parameters**					
1	Appearance	-	Brownish	Brownish	Brownish	-
2	Colour (Hazen Units)	-	100	110	100	IS 3025: Part – 4
3	Odour (Smell)	-	Un agreeable	Un agreeable	Un agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.94	7.36	7.51	IS 3025: Part – 11
2	E C	µS/cm	6200	6400	6100	IS 3025: Part 14
3	Oil & Grease	mg/l	8	9	8	IS 3025: Part – 39
4	Suspended Solids	mg/l	72	84	68	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	1.8	1.7	2.0	IS 3025: Part 38
6	Chemical Oxygen Demand	mg/l	380	420	388	IS 3025: Part 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	105	120	110	IS 3025: Part 44
8	Nitrite-Nitrogen as N	mg/l	0.04	0.03	0.03	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	3.16	3.39	2.94	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	3.20	3.42	2.97	By Calculation
11	Free Ammonia	mg/l	0.1	0.1	0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part 27
14	Fluoride as F	mg/l	1.0	1.0	1.0	IS 3025: Part – 60
15	Sulphides as S	mg/l	2.1	2.4	1.9	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	0.95	0.98	0.86	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	15.18	15.74	14.93	By Calculation
18	Total Coliforms	MPN/100ml	80	110	60	IS 1622
19	Fecal Coliforms	MPN/100ml	21	26	14	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	1.38	1.56	1.24	APHA 4500 P.D
2	Total Kjeldal Nitrogen	mg/l	56	52	48	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	35	37	32	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.16	0.18	0.16	IS 3025: Part 49
10	Nickel as Ni	mg/l	0.03	0.04	0.02	IS 3025: Part – 54
11	Copper as Cu	mg/l	0.01	0.02	0.02	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 37
15	Lead as Pb	mg/l	0.01	0.02	0.01	IS 3025: Part 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.62	0.78	0.60	APHA 3111 – B
19	Iron as Fe	mg/l	1.90	1.92	1.84	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 - D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.73	0.84	0.70	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

VATVA - GUJARAT

Sl. No.	Test Parameters	UOM	SW – 3: Final Outlet of Vatva CETP (Green Envn. Service Co-operative Society Ltd.,), GIDC – VATVA			Test Method
			1st Round 27.12.2013	2nd Round 29.12.2013	3rd Round 31.12.2013	
I	**Simple Parameters**					
1	Appearance	-	Brownish	Brownish	Brownish	-
2	Colour (Hazen Units)	-	120	130	120	IS 3025: Part 4
3	Odour (Smell)	-	Un agreeable	Un agreeable	Un agreeable	IS 3025: Part 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.47	7.62	7.98	IS 3025: Part - 11
2	E C	µS/cm	8200	8400	8100	IS 3025: Part – 14
3	Oil & Grease	mg/l	7	8	7	IS 3025: Part – 39
4	Suspended Solids	mg/l	56	62	48	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	3.1	3.0	3.2	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	254	272	238	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	75	80	65	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	0.04	0.03	0.04	APHA 4500 – NO_2.B
9	Nitrate-Nitrogen as N	mg/l	7.23	6.77	7.68	APHA 4500 NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	7.27	6.80	7.72	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part - 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	1.1	1.0	1.1	IS 3025: Part – 60
15	Sulphides as S	mg/l	1.0	1.2	1.0	IS 3025: Part 29
16	Dissolved Phosphates as P	mg/l	0.28	0.36	0.32	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	25.03	25.92	25.18	By Calculation
18	Total Coliforms	MPN/100ml	50	70	40	IS 1622
19	Fecal Coliforms	MPN/100ml	11	13	8	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	0.64	0.78	0.72	APHA 4500 P.D
2	Total Kjeldal Nitrogen	mg/l	45	43	41	APHA 4500 - Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	32	30	28	APHA 4500 NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	0.15	0.18	0.14	IS 3025: Part – 49
10	Nickel as Ni	mg/l	0.02	0.02	0.03	IS 3025: Part – 54
11	Copper as Cu	mg/l	0.02	0.03	0.02	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	0.05	0.04	0.04	IS 3025: Part – 52
14	Arsenic as As	mg/l	0.01	0.02	0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.76	0.84	0.76	APHA 3111 – B
19	Iron as Fe	mg/l	2.4	2.6	2.2	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.72	0.68	0.70	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

VATVA - GUJARAT

SL No.	Test Parameters	UOM	SW – 4: Kharicut Canal downstream near Vinzol Bridge, Vatva			Test Method
			1st Round 27.12.2013	2nd Round 29.12.2013	3rd Round 31.12.2013	
I	**Simple Parameters**					
1	Appearance	-	Pale Brownish	Pale Brownish	Pale Brownish	-
2	Colour (Hazen Units)	-	10	10	10	IS 3025: Part 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.42	7.09	7.26	IS 3025: Part – 11
2	E C	µS/cm	680	700	660	IS 3025: Part – 14
3	Oil & Grease	mg/l	1	1	1	IS 3025: Part 39
4	Suspended Solids	mg/l	18	20	16	IS 3025: Part – 17
5	Dissolved Oxygen	mg/l	5.2	5.1	5.4	IS 3025: Part – 38
6	Chemical Oxygen Demand	mg/l	18	28	22	IS 3025: Part – 58
7	Bio-chemical Oxygen Demand (BOD)	mg/l	4	6	5	IS 3025: Part – 44
8	Nitrite-Nitrogen as N	mg/l	0.02	0.02	0.02	APHA 4500 NO_2.B
9	Nitrate-Nitrogen as N	mg/l	1.35	1.58	1.24	APHA 4500 – NO_3.B
10	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	1.37	1.60	1.26	By Calculation
11	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 NH_3.C
12	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
13	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
14	Fluoride as F	mg/l	0.8	0.7	0.8	IS 3025: Part 60
15	Sulphides as S	mg/l	0.2	0.2	0.2	IS 3025: Part – 29
16	Dissolved Phosphates as P	mg/l	0.23	0.28	0.16	APHA 4500 – P.D
17	Sodium Absorption Ratio (SAR)	-	2.42	2.18	2.04	By Calculation
18	Total Coliforms	MPN/100ml	170	130	110	IS 1622
19	Fecal Coliforms	MPN/100ml	30	27	22	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	0.56	0.62	0.48	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	7.3	6.6	6.2	APHA 4500 – Norg. B
3	Total Ammonia (NH_4^+ NH_3)-Nitrogen	mg/l	4.2	3.9	3.4	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	0.01	0.01	0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.18	0.20	0.14	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 56
22	Boron as B	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

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GROUND WATER QUALITY RESULTS

Sl. No.	Test Parameters	UOM	GW-1: Hemlime Textile Pvt. Ltd., Shahwadi (Narol Industrial Area)			Test Method
			1st Round 27.12.2013	2nd Round 29.12.2013	3rd Round 31.12.2013	
I	**Simple Parameters**					
1	Appearance	-	Colour less	Colour less	Colourless	-
2	Colour (Hazen Units)	-	<5	<5	<5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.67	7.89	7.46	IS 3025: Part – 11
2	E C	µS/cm	1950	1930	1960	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	4	4	6	IS 3025: Part 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	0.01	0.01	0.01	APHA 4500 NO_2.B
8	Nitrate-Nitrogen as N	mg/l	0.68	0.45	0.68	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2-NO_3)	mg/l	0.69	0.46	0.69	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.6	0.6	0.6	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	5.42	5.18	5.36	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.09	0.08	0.09	IS 3025: Part 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.10	0.11	0.10	IS 3025: Part 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

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Sl. No.	Test Parameters	UOM	GW-2: M/s. Swan Energy Ltd., Narol Vatva Road, Narol			Test Method
			1st Round 27.12.2013	2nd Round 29.12.2013	3rd Round 31.12.2013	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.65	7.36	7.52	IS 3025: Part – 11
2	E C	µS/cm	1690	1730	1710	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part - 17
5	Chemical Oxygen Demand	mg/l	4	6	4	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part - 44
7	Nitrite-Nitrogen as N	mg/l	0.01	0.01	0.01	APHA 4500 NO_2 B
8	Nitrate-Nitrogen as N	mg/l	3.16	3.61	3.16	APHA 4500 – NO_3 B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2 + NO_3)	mg/l	3.17	3.62	3.17	APHA 4500 –N C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 - NH_3 C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.7	0.7	0.7	IS 3025: Part 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	6.61	6.32	6.54	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4 + NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 - NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 B
19	Iron as Fe	mg/l	0.07	0.08	0.07	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 56
22	Boron as B	mg/l	0.12	0.13	0.12	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – 1 PROGRAMME

VATVA - GUJARAT

Sl. No.	Test Parameters	UOM	GW-3: Vatva CETP (Green Envn. Service Co-operative Society Ltd.) GIDC – VATVA			Test Method
			1st Round 27.12.2013	2nd Round 29.12.2013	3rd Round 31.12.2013	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.62	7.39	7.56	IS 3025: Part – 11
2	E C	µS/cm	1950	1930	1940	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	6	4	6	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	mg/l	7.0	7.45	6.77	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	7.0	7.45	6.77	APHA 4500 –N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.9	0.8	0.9	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 - P.D
16	Sodium Absorption Ratio (SAR)	-	12.24	11.96	12.38	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 - P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 42
12	Hexavalent Chromium as $Cr6^+$	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part - 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.05	0.08	0.08	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.13	0.12	0.13	IS 3025: Part – 57

MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER AND GROUND WATER QUALITY IN THE IDENTIFIED 10 CRITICALLY POLLUTED AREA (CPA's) UNDER PHASE – I PROGRAMME

VATVA - GUJARAT

Sl. No.	Test Parameters	UOM	GW-4: GIDC Bore well No.12, Centre of Excellence, Vatva Industrial Association, GIDC -Vatva			Test Method
			1st Round 27.12.2013	2nd Round 29.12.2013	3rd Round 31.12.2013	
I	**Simple Parameters**					
1	Appearance	-	Colourless	Colourless	Colourless	-
2	Colour (Hazen Units)	-	< 5	< 5	< 5	IS 3025: Part – 4
3	Odour (Smell)	-	Agreeable	Agreeable	Agreeable	IS 3025: Part – 5
II	**Regular Monitoring Parameters**					
1	pH	-	7.77	7.79	7.62	IS 3025: Part – 11
2	E.C	µS/cm	2120	2190	2140	IS 3025: Part – 14
3	Oil & Grease	mg/l	< 1	< 1	< 1	IS 3025: Part – 39
4	Suspended Solids	mg/l	< 10	< 10	< 10	IS 3025: Part – 17
5	Chemical Oxygen Demand	mg/l	4	4	6	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	mg/l	< 2	< 2	< 2	IS 3025: Part 44
7	Nitrite-Nitrogen as N	mg/l	< 0.01	< 0.01	< 0.01	APHA 4500 - NO_2.B
8	Nitrate-Nitrogen as N	mg/l	8.12	7.45	7.90	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	mg/l	8.12	7.45	7.90	APHA 4500–N.C
10	Free Ammonia	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – NH_3.C
11	Total Residual Chlorine	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 26
12	Cyanide as CN	mg/l	< 0.02	< 0.02	< 0.02	IS 3025: Part – 27
13	Fluoride as F	mg/l	0.9	0.9	0.8	IS 3025: Part – 60
14	Sulphides as S	mg/l	< 0.1	< 0.1	< 0.1	IS 3025: Part – 29
15	Dissolved Phosphates as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	-	12.84	12.62	12.94	By Calculation
17	Total Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
18	Fecal Coliforms	MPN/100ml	< 2	< 2	< 2	IS 1622
III	**Special Parameters**					
1	Total Phosphorous as P	mg/l	< 0.1	< 0.1	< 0.1	APHA 4500 - P.D
2	Total Kjeldal Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	mg/l	< 1	< 1	< 1	APHA 4500 - NH_3
4	Phenolic Compounds as C_6H_5OH	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 43
5	Surfactants	mg/l	< 0.1	< 0.1	< 0.1	IS 13428
6	Organo-chlorine Pesticides	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
7	PAH	mg/l	Not Detected	Not Detected	Not Detected	EPA 525.2
8	PCB and PCT	mg/l	Not Detected	Not Detected	Not Detected	EPA 508
9	Zinc as Zn	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 49
10	Nickel as Ni	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 54
11	Copper as Cu	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 42
12	Hexavalent Chromium as Cr^{6+}	mg/l	< 0.05	< 0.05	< 0.05	APHA 3500 - Cr. D
13	Total Chromium as Cr	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 52
14	Arsenic as As	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 37
15	Lead as Pb	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part 47
16	Cadmium as Cd	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 41
17	Mercury as Hg	mg/l	< 0.001	< 0.001	< 0.001	IS 3025: Part – 48
18	Manganese as Mn	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – B
19	Iron as Fe	mg/l	0.06	0.07	0.06	IS 3025: Part – 53
20	Vanadium as V	mg/l	< 0.01	< 0.01	< 0.01	APHA 3111 – D
21	Selenium as Se	mg/l	< 0.01	< 0.01	< 0.01	IS 3025: Part – 56
22	Boron as B	mg/l	0.16	0.18	0.16	IS 3025: Part – 57

AMBIENT AIR MONITORING LOCATIONS PHOTOGRAPHS

AAQ – 1.Centre of Excellence, Vatva Industrial Association

AAQ – 2.M/s. Patel Chem Specialities

AMBIENT AIR MONITORING LOCATIONS PHOTOGRAPHS

AAQ – 3.M/s. Mamata Intermediates

AAQ – 4. M/s. Hemline Textile Exports Private Ltd

SAMPLING LOCATION PHOTOGRAPHS OF SURFACE WATER

SW – 1: River Sabarmati at Miroli Pumping Station

SW – 2: Mega outfall near Narol

SAMPLING LOCATION PHOTOGRAPHS OF SURFACE WATER

SW – 3: Final Outlet of Vatva CETP (Green Envn. Service Co-operative Society Ltd.,) GIDC – VATVA

SW – 4: Kharicut Canal downstream near Vinzol Bridge, Vatva

SAMPLING LOCATION PHOTOGRAPHS OF GROUND WATER

GW-1: Hemlime Textile Pvt. Ltd., Shahwadi (Narol Industrial Area)

GW-2: M/s. Swan Energy Ltd., Narol Vatva Road, Narol

SAMPLING LOCATION PHOTOGRAPHS OF GROUND WATER

GW-3: Vatva CETP (Green Envn. Service Co-operative Society Ltd.,) GIDC -- VATVA

GW-4: GIDC bore well No.12, Centre of Excellence, Vatva Industrial Association, GIDC -Vatva

ANNEXURES

WORK ORDER

केन्द्रीय प्रदूषण नियंत्रण बोर्ड
CENTRAL POLLUTION CONTROL BOARD
(पर्यावरण एवं वन मंत्रालय, भारत सरकार)
(MINISTRY OF ENVIRONMENT & FORESTS, GOVT. OF INDIA)

F.No. B-29012/ESS/CPA/2013-14

December 16, 2013

To

M/s Bhagavathi Ana Labs Limited,
8-2-248/5/A/42, Venkateswara Hills,
Road No. 3, Banjara Hills,
Hyderabad (AP), 500034.

Subject: **Work Order for the Project on 'Monitoring, Sampling and Analysis for ambient air quality, surface water and ground water quality in the identified 10 critically polluted areas (CPAs) under Phase-1 programme'.**

Ref :

(i) **This office Letter of even no. dated 29.08.2013**
(ii) **Your Letter No. BALPL/CPCB/2013-14 dated 06.09.2013**

Sir,

Apropos above, the Competent Authority in CPCB is pleased to award the Work on **'Monitoring, Sampling and Analysis for ambient air quality, surface water and ground water quality in the identified 10 critically polluted areas (CPAs) under Phase-1 programme'** to you on approved rate basis (per sample per location). The Work is awarded to you on the following terms and conditions:

Terms & Conditions:

1. The name of the Work is **"Monitoring, Sampling and Analysis for ambient air quality, surface water and ground water quality in the 10 critically polluted areas (CPAs) under Phase-1 programme".**

2. The project awarding agency is Central Pollution Control Board (CPCB), Delhi.

3. The project executing agency is M/s Bhagavathi Ana Labs Pvt. Ltd., # 8-2-248/5/A/42, Venkateswara Hills, Road No. 3, Banjara Hills, Hyderabad (AP), 50003, hereafter referred as 'Executing Agency'.

contd.. p 2/8/-

4. The Executing Agency shall carry out the monitoring, sampling and analysis work for ambient air quality, Surface and ground water monitoring in 10 identified CPAs during Dec. 2013. The work will commence within 10 days from the date of award of this work order. The approved rates of monitoring are as follows-
   i. Rs.10,800/- for sampling and analysis per sample per location for ambient air quality monitoring for parameters listed at Annexure-I
   ii. Rs. 5500/- for sampling and analysis per sample per location each for surface water quality monitoring for parameters listed at Annexure-I
   iii. Rs. 5500/- for sampling and analysis per sample per location each for ground water quality monitoring for parameters listed at Annexure-I.
   iv. These rates are inclusive of monitoring, sampling, analysis, transportation and any other miscellaneous charges. Service tax shall be paid as per the applicable norms.

5. The list of identified industrial clusters (critically polluted areas) for which monitoring, sampling and analysis work shall be carried out by the Executing Agency, is placed at Annexure-II.

6. The Executing Agency shall carry out the monitoring, sampling and analysis works as per Standard Methods and as per the norms. All the instruments / equipments / glass-wares etc. to be utilized in monitoring work and analysis of samples, should be properly calibrated and records of the calibration submitted to CPCB.

7. At each of the 10 CPAs, 24 hourly ambient air quality monitoring shall be carried out for parameters as listed at Annexure-I. Representative samples for surface water quality and ground water quality shall be collected from prominent surface and ground water bodies located in and around the clusters/ areas.

8. 3 rounds of monitoring / sampling (air, water & surface water) at each site / location shall be conducted with a gap of one or two days in all the identified critically polluted areas namely Ankleshwar, Vatwa, Vapi, Pattancheru - Bolaram, Jharsuguda, Indore, Ludhiana, Panipat, Ghaziabad and Singrauli

9. The Executing Agency shall not assign / outsource any component of the 'Work' to any other Agency.

10. The Executing Agency shall submit the complete monitoring, sampling and analysis reports before Jan 30, 2014.

11. The Executing Agency shall inform to CPCB Head Office about the constitution of the teams, names and contact nos. of team leaders and their visit schedule to the allocated CPAs for the monitoring and sampling works.

12. The Executing agency shall co-ordinate with the concerned Zonal Offices of CPCB and Zonal Offices of CPCB shall interact with concerned SPCBs officials for efficient monitoring and sampling works.

13. The Executing Agency shall provide the monitoring schedule to the concerned Zonal Offices of CPCB to ensure their participation in the monitoring & sampling works.

14. The Zonal Officer of CPCB shall finalize the sampling locations. The existing monitoring locations shall be retained in the current round of monitoring. Additional monitoring locations, if any required, can be included in the monitoring programme in consultation & approval with Zonal Office (CPCB) and Head Office, CPCB.

15. Payment shall be made in 2 parts as follows-
    a. 50 % of the payment shall be released on completion of the monitoring, sampling and analysis work and submission of the complete reports in respect of 5 CPAs.
    b. Remaining 50 % of the payment shall be released on completion of the monitoring, sampling and analysis work and submission of the complete reports in respect of remaining 5 CPAs.

16. Amendment of the Terms & Conditions of the Work Order : No amendment or modification of this Work Order shall be valid unless the same is made in writing by both the parties or their authorized representatives and specifically stating the same to be an amendment of this Work Order . The amendment shall be effective from the date on which they are made/ executed, unless otherwise agreed to.

17. All the information and data generated or collected during the execution of the work shall be treated as confidential and sole property of CPCB and the findings of the study shall not be disclosed / published without prior & written permission of CPCB.

18. This Work Order shall be operative until the completion of the project and acceptance of the final report by CPCB.

19. The project shall be implemented as per the approved rates as mentioned under the Clause 'Terms and Conditions' and CPCB will not provide any additional fund on account of cost escalation due to delay in project implementation or due to any other reasons whatsoever.

20. CPCB shall not have any responsibility for the personnel engaged under the project.

21. During the course of execution of the project, the Executing Agency shall provide the information to the participating CPCB officials regarding the methodologies/ techniques being adopted for sampling & analysis during execution of the project.

22. The Executing Agency will be bound to provide raw data, clarification etc. on the queries raised by CPCB , if any.

23. The Executing Agency shall submit 5 copies of final report along with the CD (Soft copy) on completion of the project. The final report should be submitted latest by Jan. 30, 2014. For any delay in submission of the final report beyond the specified period, penalty @ 1%per week of the project cost shall be charged subject to maximum penalty of 15% of the project cost.

24. Taxes as applicable, shall be deducted at source

25. In case of any dispute, the decision of the Chairman, CPCB will be final and binding to both the parties.

Acceptance of this Work Order shall be acknowledged and the same be forwarded to CPCB preferably before December 23, 2013. It is also requested to initiate the above mentioned work at the earliest.

Encl : As above

Yours faithfully

(J.S. Kamyotra)
Member Secretary

Annexure I

A. Ambient Air Quality Monitoring for following parameters:

i. SO_2, NO_2, PM_{10}, $PM_{2.5}$, Lead and Ammonia (for 24 hourly average monitoring values)
ii. O_3, CO (for 1 hrly average and 8 hrly average)
iii. Benzene, Benzo(O) Pyrene, Arsenic & Nickel (for 24 hrly average value)

B. Water Quality data of –

(a) **Prominent Surface Water bodies** such as outfalls of CETPs, ETPs, FETP, treated effluent drainage, river, canal, ponds, lakes and other such water supply resources flowing through the area or flowing adjoining the CPA.

(b) **Ground Water Quality** data of prominent ground water resources such as observation wells of Central Ground Water Board, drinking water wells, hand pumps, bore wells and other such water supply resources located in the industrial cluster/ area under consideration or in the peripheral areas.

Basic water quality requirements (for surface water and ground water both) are as follows-

(i) Simple Parameters -

Sanitary Survey, General Appearance, Color, Smell, Transparency and Ecological* (presence of animals like fish, insects etc. only in case of surface water bodies)

(ii) Regular Monitoring Parameters -

pH, O&G, Suspended Solids in mg/l, DO (% saturation), COD in mg/l , BOD in mg/l, Electrical Conductivity in µmhos/cm, Nitrite-Nitrogen , Nitrate-Nitrogen, (NO2+NO3) total nitrogen in mg/l, Free Ammonia, Total residual chlorine, cyanide, fluoride, sulphides, dissolved phosphates, SAR, Total coliforms, Fecal Coliform (MPN/100 ml),

(iii) Special Parameters -

Total phosphorous, TKN, Total Ammonia(NH4+NH3)-Nitrogen, Phenols, Surface Active Agents, Organo-chlorine pesticides, PAH, PCB and PCT, Zinc, Nickel, Copper, Hexa-valent chromium, Chromium (Total), Arsenic (Total), Lead, Cadmium, Mercury, , manganese, iron, vanadium, selenium, boron .

(iv) **Bio-assay (zebra Fish) Test** – For specified samples only.

Note :

- DO is not applicable in case of ground waters.
- DO in eutrophicated waters should include measurements for diurnal variations.
- SS limit is applicable only during non-monsoon period.
- Fecal Coliform values should meet for 90 % times.
- Static Bio-assay method may be adopted.

Annexure II

Table : Details of Ambient Air, Surface Water and Ground Water Quality Monitoring Locations in 10 Critically Polluted Areas (CPAs) under Phase-1 programme

S.No.	Industrial Cluster/Area	Potential Impact Zones	Expected Nos. of Air samples in each round	Expected Nos. of Water Samples in each round	
				SW	GW
1.	Ankleshwar (Gujarat)	GIDC Ankleshwar and GIDC Panoli	04	04	04
2.	Vapi (Gujarat)	GIDC Vapi	04	04	04
3.	Vatva (Gujarat)	GIDC Vatva, Narol Industrial Area (Villages Piplaj, Shahwadi, Narol)	04	04	04
4.	Panipat (Haryana)	i. Near Vill Machaurli & Jhattipur on NH-1,Panipat ii. Vill. Pasina Kalan Road(1 km from NH-1) iii. Vill. Rishalu Road(2 km from NH-1) iv. Adjoining area of industrial area Sector -29,part - 1 v. Along Vill. Ujha Road(upto 1 km from Municipal limit) vi. Village Sanoli Road and near village Kalamb Road vii. Road to Vill. Ugrakhaeri(Industrial cluster) viii. Village Babali Road & Sonali Road((Industrial cluster) ix. Shiv Nagar & Kishanpura,Panipat x. Shastri & MAhavir colony,Panipat xi. Desraj Colony,Panipat xii. Near Bichapri chowk, Barsat Road xiii. Between Noorwala & Barsat Road xiv. Vill. Chhajpur, ,Panipat xv. Vill. Bhavinswal, Barsat Road,Panipat xvi. GT road, near Toll tax(Both the way 5 km NH-1) xvii. GT Road, Near Babarpur Vill xviii. Kabri Road(1 KM area) xix. Batra Colony,Panipat xx. Vill Sondhapur,Panipat xxi. Gohana Road(5 Km towards Gohana) xxii. Weavers Colony,Panipat	22	22	22
5.	Ludhiana (Punjab)	i. Focal Point Along with NH -I - Total Eight Phase ii. Industrial Area-B- From Sherpur chowk to Gill road & Gill road to Miller Kotla road (left Side of Road) iii. Mixed Industrial Area –Right side of Gill road iv. Industrial area-C (near Jugiana Village) v. Industrial Area A & Extension : Area between old GT Road and	15	15	15

		Ludhiana By pass road vi. Industrial Estate : Near Dholwal chowk vii. Mixes Industrial Area(MIA) Miller gunj viii. MIA- By pass road ix. Bahdur Industrial Area x. Tejpur industrial Complex. xi. Rahon Road-Industries are spreaded over 4 km area on either side of road from by-pass road, Ludhina xii. Kakkowal Road - Industries are spreaded over the either side of road , 3 km from by-pass road xiii. Noorwala Road -- Industries are spreaded over the either side of road , 3 km from by-pass road xiv. Gt Road West-Jalandhar side xv. Village-Gaushpura (paper mill + dying unit)			
6.	Ghaziabad (Uttar Pradesh)	**Sub-cluster A** • Mohan nagar/ Mohan Meakin Industrial area • Rajinder nagar industrial area • Sahibabad industrial area • South side of GT (Grand trunk Road) Industrial area (Sahibabad) • Sahibabad Industrial area Site-4 **Sub-cluster B** • Pandav nagar industrial area • Kavi nagar industrial area • Bulandshahar Road industrial area • Amrit nagar • Aryanagar industrial area **Sub-cluster C** • Merrut road industrial area **Sub-cluster D** • Loni Industrial area • Loni road Industrial area • Roop nagar Industrial area **Sub-cluster E** • Hapur Road industrial area • Dasna • Philkua **Sub-cluster F (other scattered industrial areas)** • South side of GT road • Kavi Nagar • Tronica city • Anand Nagar • Jindal Nagar • Prakash Nagar • Rural Industrial estate	18	18	18
7.	Singrauli (Uttar Pradesh)	Sonebhadra (UP) • Dala • Obra	18	18	18

		• Renukoot • Anpara • Renusagar • Kakri • Dudhichuwa • Bina • Khadia • Shakti Nagar • Rihand Nagar,Bijpur Sigrauli (Madhya Pradesh) Vindhyachal Nagar and existing NCL coal mine areas including the townships at Jayant, Nigahi, Dudhichua, Amlohri & Jhingurdah			
8.	Patancheru- - Bollaram (Andhra Pradesh)	Patancheru Industrial Area and Bollaram Industrial Area	04	04	04
9.	Indore (Madhya Pradesh)	a) Existing industrial areas/ estates (09) and Indore city b) Manglia, Rau, Rajoda, Barlai, Sanwer road, Asrawad, Tejpurgadwadi	04	04	04
10.	Jharsuguda (Orissa)	Ib Valley of Jharsuguda (Industrial and Mining area)	04	04	04
Total – 10 CPAs		**Total samples in each category in each round**	**97**	**97**	**97**
		Total samples in each category in 3 rounds	**291**	**291**	**291**

TEST METHODS

PARAMETERS TESTED IN AMBIENT AIR AND ITS TEST METHODS

S.No.	Pollutants	Method of measurement
1.	Sulphur dioxide (SO_2), $\mu g/m^3$	IS 5182 (Part 2) – 2001, Modified West & Gaeke Method) & CPCB Manual
2.	Oxides of Nitrogen as NO_2 ,$\mu g/m^3$	IS 5182 (Part 6) – 2001, Modified Jacob & Hochheiser – Sodium Arsenite Method) & CPCB Manual
3.	Particulate Matter (RSPM/PM_{10}), $\mu g/m^3$	IS 5182 (Part – 23), 1999, RA 2009, Cyclone Flow Technique & CPCB Manual
4.	Particulate Matter ($PM_{2.5}$), $\mu g/m^3$	Internal SOP & CPCB Manual
5.	Ozone (O_3) $\mu g/m^3$	IS 5182 (Part 9), 1974, RA 209, UV Spectrophotometric Method/ISC Method No.411, 3rd Edition 1989 & CPCB Manual
6.	Lead, $\mu g/m^3$	USEPA Method – IO 3.5, (ICP – MS Method) & CPCB Manual
7.	CO, mg/m^3	IS 5182 (Part – 10), 1999, RA 2009, GC Method & CPCB Manual
8.	Ammonia (NH_3), $\mu g/m^3$	Method 401 – Air Sampling and Analysis, APHA, 3rd Edition & CPCB Manual
9.	Benzene ($C_6 H_6$), $\mu g/m^3$	USEPA Method – TO 3, Absorption and Desorption followed by GC-MS & CPCB Manual
10.	Benzo(a) pyrene (BaP), (Particulate Phase), ng/m^3	USEPA Method – TO 13A & CPCB Manual
11.	Arsenic, ng/m^3	USEPA Method – IO 3.5, (ICP – MS Method) & CPCB Manual
12.	Nickel, ng/m^3	USEPA Method – IO 3.5, (ICP – MS Method) & CPCB Manual

PARAMETERS TESTED IN SURFACE WATER AND GROUND WATER

TEST METHODS

Sl. No.	Test Parameters	Test Method
I	**Simple Parameters**	
1	Appearance	-
2	Colour (Hazen Units)	IS 3025: Part – 4
3	Odour (Smell)	IS 3025: Part – 5
II	**Regular Monitoring Parameters**	
1	pH	IS 3025: Part – 11
2	Electrical Conductivity	IS 3025: Part – 14
3	Oil & Grease	IS 3025: Part – 39
4	Suspended Solids	IS 3025: Part – 17
5	Chemical Oxygen Demand	IS 3025: Part – 58
6	Bio-chemical Oxygen Demand (BOD)	IS 3025: Part – 44
7	Nitrite-Nitrogen as N	APHA 4500 – NO_2.B
8	Nitrate-Nitrogen as N	APHA 4500 – NO_3.B
9	Nitrite-Nitrogen and Nitrate-Nitrogen (NO_2+NO_3)	By Calculation
10	Free Ammonia	APHA 4500 – NH_3.C
11	Total Residual Chlorine	IS 3025: Part – 26
12	Cyanide as CN	IS 3025: Part – 27
13	Fluoride as F	IS 3025: Part – 60
14	Sulphides as S	IS 3025: Part – 29
15	Dissolved Phosphates as P	APHA 4500 – P.D
16	Sodium Absorption Ratio (SAR)	By Calculation
17	Total Coliforms	IS 1622
18	Fecal Coliforms	IS 1622
III	**Special Parameters**	
1	Total Phosphorous as P	APHA 4500 – P.D
2	Total Kjeldal Nitrogen	APHA 4500 – Norg. B
3	Total Ammonia (NH_4+NH_3)-Nitrogen	APHA 4500 – NH_3
4	Phenolic compounds as C_6H_5OH	IS 3025: Part – 43
5	Surfactants	IS 13428
6	Organo-chlorine Pesticides	EPA 508
7	PAH	EPA 525.2
8	PCB and PCT	EPA 508
9	Zinc as Zn	IS 3025: Part – 49
10	Nickel as Ni	IS 3025: Part – 54
11	Copper as Cu	IS 3025: Part – 42
12	Hexavalent Chromium as $Cr6^+$	APHA 3500 - Cr. D
13	Total Chromium as Cr	IS 3025: Part – 52
14	Arsenic as As	IS 3025: Part – 37
15	Lead as Pb	IS 3025: Part – 47
16	Cadmium as Cd	IS 3025: Part – 41
17	Mercury as Hg	IS 3025: Part – 48
18	Manganese as Mn	APHA 3111 – B
19	Iron as Fe	IS 3025: Part – 53
20	Vanadium as V	APHA 3111 – D
21	Selenium as Se	IS 3025: Part – 56
22	Boron as B	IS 3025: Part – 57