Dr. Rajesh Kumar, IPS
Member Secretary

West Bengal Pollution Control Board
(Department of Environment, Government of West Bengal)
Paribesh Bhawan, Bldg. 10A, Block LA
Sector III, Salt Lake, Kolkata 700 106

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Memo no. 528-397/WPB/OSE/2019 Date: 17/06/2019

केन्द्रीय प्रदूषण नियंत्रण बोर्ड
परिवेश भवन, पूर्वी अर्जुन नगर, दिल्ली-32
117782
21 JUN 2019
Central Pollution Control Board
Parivesh Bhavan, East Arjun Nagar, Delhi-32

To
The Member Secretary
Central Pollution Control Board
Paribesh Bhawan,
East Arjun Nagar, Delhi
Pin- 110 032.

117782/MS
24/6/19

MS
IPC-VII
SO (R-A)
24/6/19
25/6/19

Sub: Action Plan for Polluted Industrial Areas (PIAs) in West Bengal.

Ref: Order of Hon'ble NGT, Principal Bench, New Delhi dt. 13.12.2018 in the matter O.A. no. 1038/2018.

Dear sir,

Enclosed please find herewith a copy of 'Action Plan for Industrial Areas (PIAs) in West Bengal' prepared in compliance with the above referred order of Hon'ble NGT. The said action plan has been prepared by a Committee for restoration of Environment Qualities in West Bengal constituted by the Chief Secretary to the Government of West Bengal. A copy of the notification for constitution of committee and the minutes of the meeting of the committee held on 27.05.2019 are also enclosed herewith for your perusal.

Thanking you.

17/6/2019
Member Secretary
Enclosed: As stated

Annexure 406

27

Government of West Bengal
Environment Department
PraniSampadBhavan, 5th floor, LB-2,Sec-III, Salt Lake, Kolkata-700106

NOTIFICATION

No. EN/416 / 3C-030/2019

Kolkata, the 27th February, 2019.

The Hon'ble National Green Tribunal, Principal Bench New Delhi, was pleased to pass an order dated 13.12.2018 in O.A. no. 1038/2018 regarding " CPCB to rank industrial units on pollution levels "directing all the States and Union Territories to prepare and finalise time bound action plans within three months with regard to identified polluted industrial clusters in Howrah, Haldia, Asansole and Durgapur in accordance with revised norms laid down by the CPCB to restore environmental qualities within norms.

In compliance with the aforesaid directions of the Hon'ble National Green Tribunal, Principal Bench New Delhi, the Governor is pleased to form the Committee for Restoration of Environment Qualities of identified polluted industrial Clusters in West Bengal comprising of the following members-

1. Additional Chief Secretary / Principal Secretary, Department of Industry, Commerce and Enterprises – Chairman.
2. Additional Chief Secretary / Principal Secretary, Department of Micro ,small and medium Enterprise and Textile
3. Additional Chief Secretary / Principal Secretary, Department of Environment – Convenor.
4. Additional Chief Secretary / Principal Secretary, Department of Urban Development and Municipal Affairs Department
5. Member Secretary , West Bengal Pollution Control Board
6. Chief Executive Officer, Kolkata Metropolitan Development Authority
7. District Magistrate's - Paschim Bardhaman / Purba Medinipur/ Howrah
8. Commissioner, Howrah Municipal Corporation
9. Chief Executive Officer, Haldia Development Authority
10. Chief Executive Officer, Asansol Durgapur Development Authority

The Committee may co-opt any other members as required.

The Committee will function under the overall supervision of the Chief Secretary, Govt of West Bengal.

By Order,

Sd/ M.K.De

Chief Secretary to the Govt. of West Bengal.

o/c

Government of West Bengal
Environment Department

Minutes of the First Meeting of the Committee constituted for Restoration of Environment Qualities of Identified Polluted Industrial Clusters in West Bengal as per the Order of Hon'ble NGT Principal Bench, New Delhi dated 13.12.2018 in O.A. No. 1038/2018 held on 27.05.2019 at 11.00 A.M. at the Conference Room of the Department of Environment.

Member Secretary, WBPCB initiated the meeting. He informed the house that ACS, ICE & ACS, Environment are slightly delayed and they would join the meeting later. He briefly apprised the objective of the meeting and gave an overview of the action plans prepared for 5 PIAs as per the Direction of Hon'ble NGT Principal Bench, New Delhi dated 13.12.2018 in O.A. No. 1038/2018. During the meeting a copy of the Action Plan was distributed amongst the members present.

A PowerPoint presentation was made before the committee members highlighting the objective and contents of the action plan prepared for 5 PIAs namely Haldia, Howrah, Asansol, Durgapur and Bandel. Committee members discussed on the action plan prepared, at length. After threadbare discussion, following decisions were taken:

i. Committee members approved the action plan in principle for sending to the Central Pollution Control Board as per the order of Hon'ble NGT.
ii. Committee members were requested to provide their additional inputs, if any, for incorporation in the action plan which may be sent to the CPCB subsequently as supplement.
iii. District Magistrate, Paschim Bardahaman suggested that a committee may be formed at District Level to oversee the implementation of action plan for each PIA on quarterly basis. Composition of the committee may be as follows:
    a. District Magistrate or his nominee
    b. Representative from the local development authority
    c. Representative from municipal corporation
    d. Representative from WBPCB

Meeting was ended with thanks to all the members.

(Alapan Bandopadhyay)
Additional Chief Secretary
Industry Commerce & Enterprises Deptt.,
Government of West Bengal.
&
Convener

GOVERNMENT OF WEST BENGAL

Action Plan for Polluted Industrial Areas (PIAs) in West Bengal

Prepared in connection to the order of Hon'ble NGT dated 13.12.2018 in the matter of OA no. 1038/2018

by

Committee for Restoration of Environment Qualities of PIAs in West Bengal

(Constituted vide Notification No. EN/416/3C-030/2019 dated 27.02.2019)

Contents

Government of West Bengal
Environment Department
PraniSampadBhavan, 5th floor, LB-2,Sec-III, Salt Lake, Kolkata-700106

NOTIFICATION

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The Committee may co-opt any other members as required.

The Committee will function under the overall supervision of the Chief Secretary, Govt of West Bengal.

By Order,

Sd/ M.K.De

Chief Secretary to the Govt. of West Bengal.

2. INTRODUCTION

Ministry of Environment & Forests (MoEF), Government of India had issued an Office Memorandum dated 13.01.2010 imposing a moratorium on setting up of new industries and also expansion of existing industries requiring Environmental Clearance as per the EIA notification S. O. 1533(E) dated 14.09.2006 and its amendments thereof, located in critically polluted industrial areas (CPA) namely Haldia, Howrah and Asansol.

Based on the environmental load bearing capacity of sensitive areas like Haldia, Howrah and Asansol which have so many major industries, the West Bengal Pollution Control Board (WBPCB) has taken elaborate action plan since 2010 involving the major industries and Local Bodies of the concerned areas. WBPCB submitted reports to CPCB on implementation of such action plan for the critically polluted areas in the State of West Bengal.

Reassessment of CEPI score during 2013 revealed that continuous efforts initiated by WBPCB for implementation of Pollution Abatement Action Plans for up-gradation of environmental quality in these critically polluted areas show decreasing trend in CEPI score for all three Critically Polluted Areas as compared to CEPI score during 2010, both calculated by CPCB:

Name of the critically polluted area	CEPI Score during 2010	CEPI Score during 2013
Asansol	70.20	56.01
Haldia	75.43	61.58
Howrah	74.84	61.11

CPCB has undertaken a project for monitoring environmental qualities during 2017-18 of around 100 Polluted Industrial Areas (PIAs) throughout the country (which includes all 3 CPAs, one SPA and one additional site (Bandel) of our state) by engaging a third party; the monitored data of the project will subsequently be used for calculating CEPI score of the respective areas.

The latest CEPI scores for the above mentioned 5 PIAs in West Bengal have already been evaluated by CPCB. WBPCB has already communicated to CPCB vide letter no 14-4A-11/2010-Part II dated 05.03.2019 for sharing the same.

WBPCB also engaged third party in January 2019 for monitoring of environmental qualities in 5 PIAs in West Bengal. Based on the monitoring report and as per the order of the Hon'ble NGT dated 13.12.2018 in the matter of OA no. 1038/2018, (ANNEXURE I) action plan has been prepared for 5 PIAs in West Bengal in accordance with the revised norms laid down by CPCB.

For preparation of action plan large industries falling under 17 category, GPIs and highly polluting Red category have been considered. Also, action plan includes various action points of the ULB and developmental authorities.

ACTION PLAN FOR POLLUTED INDUSTRIAL AREA, HALDIA

3. ACTION PLAN FOR POLLUTED INDUSTRIAL AREA, HALDIA

3.1 Area Details

Haldia is one of the most rapidly growing towns in West Bengal and in on the deltaic tidal range of the Ganga basin. It is located at distance of 125 km South-West of Kolkata and 50 km from the Bay of Bengal at the confluence of three rivers Hooghly, Haldi & Rupnarayan in Purba Midnapore district, Haldia is also one of the biggest ports in the Eastern region and focal point for industrial development in West Bengal. The Haldia Planning Area (HPA) is bounded by the rivers Hooghly, Haldi & Hajli canal and covers a total area of around 2257 sq. km. spread over 1141 mouzas. The HPA is divided in four police stations namely, Haldia, Mahisadal, Sutahata & Durgachak. The area under Haldia police station is completely urbanized and fall within the Haldia Municipal area. The Sutahata police station, which consists of mouzas of both Sutahata I & II blocks, is the largest police station with 75% of the mouzas under rural occupation.

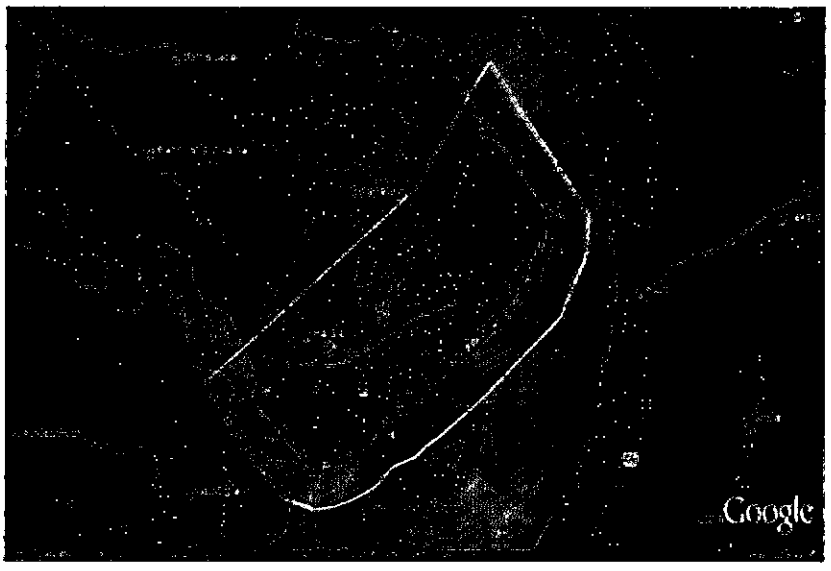
3.2 Location

Haldia is located at 22.03 ° N latitude & 88.06 ° E longitude. It has an average elevation of 8 metres MSL.

3.3 Demarcation of Geographical Boundaries and Impact Zones

Figure 3.1: Boundary of Polluted Industrial Area in Haldia

Figure 3.2 Map of Haldia PIA



A= Lat 22° 1'2.60"N Log 88° 3'33.69"E
B= Lat 22° 2'56.60"N Log 88° 1'42.35"E
C= Lat 22° 8'51.62"N Log 88° 9'47.71"E
D= Lat 22° 6'43.50"N Log 88°11'33.08"E

The total population of Haldia and adjoining Sutahata is around 4.17 lakhs (as per 2011 census) while the population of the Haldia Municipal region is around 2 lakhs. The sensitive receptors include one sub-divisional hospital, around 7 nursing homes, about twelve educational institutions, one sub-divisional court are located within Haldia Municipal region.

The river Ganga (locally Hooghly river) and its tributary the river Haldi and a number of small natural streams draining into them form the main inland water system. Besides, there exist several ponds and ditches in the area under concern. Ponds are utilized mainly for domestic purposes & fish rearing and occasionally for irrigation.

The Green Belt Canal (GBC) which was originally built for fire-water supply to the port area is presently carrying most of the trade effluent of the industries located at Haldia Municipal Area. The GBC has a stretch from the Oil Jetty-1 in the Haldia Dock Area to the Patikhali gate end.

3.4 Information on Pollution Sources Status in PIA

a.	Name of the Polluted Industrial Area	Haldia Industrial Area
b.	Demarcated Area of the PIA in Sq. Km	87
c.	Number of 17 Category Industries Covered under the area	9
d.	Number of Red Category Industry Covered under the area	30
e.	Total Human Population	4.17 lakhs
f.	At least three criteria pollutants in each air, surface water and ground water	Air - PM_{10}, NO_x, CO Surface Water - O&G, BOD, COD Ground Water - pH, Fluoride, Arsenic

Compliance Status of the Industries, Waste Management Facilities

Sl No.	Total Number of Units	Total Number of Units	Number of Units with inadequate facilities	Remarks if any
1.	Large Scale industries	39	All industries having adequate facility	-
2.	Medium and small-scale industries	Nil	N.A.	-
3.	CETPs	Not Required	N.A.	-
4.	TSDF	01	Adequate	-
5.	STPs	01	Adequate	-
6.	CBMWTF	01	Adequate	-
7.	MSW Management Facility	01	Adequate	-

3.5 Water Environment

The GBC and the Hooghly River are regularly monitored at specific locations. The GBC is guarded by metallic gates at both ends and does not seem to have a definite flow profile. The Patikhali gates are opened to discharge the effluent.

Table 3.1: Analysis Results of Green Belt Canal during the year 2018

Parameter *	Stations														
	Near Oil Jetty			Between Catchpit #1 & #2 near TTL Gate			Between Catchpit #2 & #3 of IOCL			Sample near Pillar No. 571			Between Catchpit #3 & #4 of IOCL		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
pH	7.43	6.37	6.85	7.25	6.40	6.81	8.23	5.35	6.86	8.75	6.62	7.11	7.57	6.53	6.96
TSS	15180.0	26.0	2380.83	6400.00	14.00	1220.30	47880.00	22.00	4116.50	27820.00	10.00	2467.92	7700.00	8.00	726.50
BOD	1037.5	5.29	184.71	3916.67	4.25	493.45	16562.50	3.43	1426.30	8125.00	1.88	714.63	418.75	1.78	77.17
COD	2977.2	40.08	542.34	21865.00	33.83	2391.53	78609.00	18.18	6740.44	34888.00	17.84	3030.52	892.00	15.05	222.24
O&G	6654.10	1.30	695.04	21.80	BDL	6.44	5576.90	BDL	626.82	8437.30	BDL	1206.93	696.00	1.10	71.49
Sulfide	51.84	0.194	7.70	144.00	0.194	18.99	426.24	0.20	39.93	322.56	0.194	37.03	9.72	0.396	2.74
Total Chromium	0.26	BDL	-	4.29	BDL	1.70	1.56	BDL	-	3.07	BDL	-	0.33	BDL	0.26
Copper	7.7	0.19	2.19	5.96	BDL	1.77	1.19	BDL	0.70	2.54	BDL	1.33	1.08	BDL	0.51
Cyanide	0.13	BDL	0.12	0.13	BDL	0.117	0.16	BDL	0.130	0.14	BDL	0.13	0.15	BDL	0.14
Flouride	0.73	0.36	0.52	0.67	0.38	0.49	1.93	0.36	0.61	0.62	0.35	0.47	0.85	0.29	0.48
Iron	382.4	0.13	34.59	313.00	BDL	34.35	639.50	0.32	56.60	59.00	0.18	9.32	58.00	BDL	10.46
Lead	2.76	BDL		7.25	BDL	2.65	0.15	BDL	0.15	11.03	BDL	5.63	8.79	BDL	8.79
Phenols	1.17	BDL	0.76	0.59	BDL		0.42	BDL	0.36	0.59	BDL	0.44	0.50	BDL	0.47
Phospate-P	0.71	0.06	0.25	0.60	0.07	0.24	1.17	0.07	0.35	0.61	0.04	0.24	0.72	0.08	0.23
Zinc	67.5	BDL	6.43	8.59	0.06	1.32	2.97	BDL	0.68	2.79	BDL	0.46	1.15	BDL	0.32

**All units in mg/l except pH, Cr +6 values are BDL for all monitoring stations*

Table 3.1 Contd.....: Analysis Results of Green Belt Canal during the year 2018

Parameter*	Stations																	
	Between Catchpit #4 & #5 of IOCL			Between Catchpit #5 & #6 of IOCL			After Catchpit #6 near HT/LT connection point			Near Rail Gate in front of the bridge			Infront of CFCL Main Gate			Near Patikhali Gate		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
pH	7.30	6.02	6.72	7.25	6.41	6.89	7.48	6.75	7.14	7.10	2.52	6.48	7.25	2.75	6.51	7.65	6.06	6.96
TSS	3440.00	8.00	493.67	4150.00	10.00	590.17	1108.00	16.00	247.17	1673.00	12.00	185.08	108.00	6.00	39.73	1436.00	14.00	422.33
BOD	1100.00	1.40	162.42	240.00	1.75	47.77	9.17	1.86	4.48	13.33	2.60	6.57	10.63	2.00	6.29	12.50	1.54	4.84
COD	4321.00	12.62	694.36	643.65	16.45	158.90	53.47	22.01	31.20	122.58	14.71	36.88	58.85	14.34	34.23	206.00	9.49	41.05
O&G	1329.70	<1.00	151.86	168.42	<1.00	20.51	2.75	BDL	1.71	1.50	BDL	1.28	1.70	BDL	1.32	1.50	BDL	1.17
Sulfide	17.088	BDL	4.09	9.892	BDL	2.32	1.139	BDL	0.62	3.92	BDL	1.51	1.763	BDL	1.05	3.456	BDL	1.27
Total Chromium	BDL		-	0.11	BDL	-	BDL	BDL	-	BDL		-	0.22	BDL	-	BDL		-
Copper	5.63	BDL	2.97	0.76	BDL	0.62	0.14	BDL	-	BDL-		-	BDL		-	BDL		-
Cyanide	0.22	BDL	0.19	2.41	BDL	1.28	BDL	BDL	-	0.12	BDL	-	0.10	BDL	-	-	-	-
Flouride	0.66	0.26	0.43	0.62	0.27	0.42	0.68	0.26	0.50	0.69	0.35	0.49	0.62	0.36	0.51	0.61	0.36	0.50
Iron	130.78	BDL	28.16	353.50	0.18	32.92	11.40	0.36	2.37	7.17	0.19	1.60	2.06	0.18	0.65	18.65	0.19	5.72
Lead	0.20	BDL	0.17	7.39	BDL	2.67	2.65	BDL	1.01	2.27	BDL	2.27	3.86	BDL	3.86	BDL		-
Phenols	0.41	BDL	0.35	BDL		-	BDL		-	BDL		-	BDL		-	BDL		-
Phospate-P	0.24	0.02	0.14	2.02	BDL	0.31	0.38	0.03	0.14	0.67	0.03	0.20	0.66	0.02	0.30	1.87	0.03	0.34
Zinc	2.76	BDL	0.56	5.61	0.05	0.74	0.85	BDL	0.25	0.49	BDL	0.17	0.39	BDL	0.15	4.30	BDL	0.65

**All units in mg/l except pH, Cr +6 values are BDL for all monitoring stations*

Table 3.2: Present Status of Surface Water Quality of Haldia (Monitored by Third Party during February 2019)

Sl. No.	Parameter	Unit	Haldi River Near IOCL Hospital, Haldia (Location Code- SW-1)	Hooghly River at Patikhali, Haldia (Location Code- SW-2)	Pond behind Sakuntala Housing Complex, Haldia (Location Code- SW-3)	Pond at Chiranjibpur Behind Haldia P.S. near CTP Colony, Haldia (Location Code- SW-4)
1	Sanitary Survey	----	Drainage system found & no Toilet nearby	Drainage system found & no Toilet nearby	Bathing, Domestic Washing found no Toilet system nearby	Drainage system found & no Toilet nearby
2	General appearance	----	Turbid	Turbid	Turbid	Transparent
3	Colour	Hazen	2	2	3	<1.0
4	Smell	----	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable
5	Transparency	Cm	12	25	70	92
6	Ecological Survey	-----	Present Insect/ Fish	Present Insect/ Fish	Present Insect/ Fish	Present Insect/ Fish
7	pH at 25 deg C	----	7.3	7.2	7.2	7.3
8	Oil & Grease	mg/L	<1.0	<1.0	<1.0	<1.0
9	Suspended solids	mg/L	240	175	12	<5.0
10	DO (% of saturation)	-----	7.5/97.0	7.4/95.0	6.6/85.0	6.7/83.0
11	COD	mg/L	15.36	15.3	22.94	11.47
12	BOD	mg/L	2	2	2.8	1.8
13	Electrical Conductivity	µmhos/ cm	14470	12240	892	1580
14	TDS	mg/L	8520	7188	538	920
15	Nitrite-Nitrogen	mg/L	<0.005	<0.005	<0.005	<0.005
16	Nitrate-Nitrogen	mg/L	4.52	3.78	3.25	2.14
17	Total Nitrogen (NO2+NO3)	mg/L	4.52	3.78	3.25	2.14
18	Free Ammonia	mg/L	<0.05	<0.05	<0.05	<0.05
19	Total Residual Chlorine	mg/L	<0.05	<0.05	<0.05	<0.05
20	Cyanide	mg/L	<0.01	<0.01	<0.01	<0.01
21	Fluoride	mg/L	<0.05	<0.05	<0.05	<0.05
22	Chloride	mg/L	3943	3325	161.51	294.52
23	Sulphate	mg/L	471	410	41.28	43.85
24	Sulphides	mg/L	<0.05	<0.05	<0.05	<0.05
25	Total hardness	mg/L	1760	1480	154	262

Sl. No.	Parameter	Unit	Haldi River Near IOCL Hospital, Haldia (Location Code- SW-1)	Hooghly River at Patikhali, Haldia (Location Code- SW-2)	Pond behind Sakuntala Housing Complex, Haldia (Location Code- SW-3)	Pond at Chiranjibpur Behind Haldia P.S. near CTP Colony, Haldia (Location Code- SW-4)
26	Dissolved Phosphate (as P)	mg/L	<0.05	<0.05	<0.05	<0.05
27	Total Phosphorous (as P)	mg/L	<0.05	<0.05	<0.05	<0.05
28	TKN	mg/L	<0.5	<0.5	<0.5	<0.5
29	Total Ammonia (NH4+NH3)	mg/L	<0.05	<0.05	<0.05	<0.05
30	Phenols	mg/L	<0.001	<0.001	<0.001	<0.001
31	Surface Active Agents	mg/L	<0.10	<0.10	<0.10	<0.10
32	Hexavalent Chromium (Cr^{+6})	mg/L	<0.02	<0.02	<0.02	<0.02
33	Bioassay (Zebra fish)	%	------	-------	------	100% Survival of fish after 96hours exposure in 1005 Sample.
34	SAR	—	3.42	3.94	5.72	2.39
35	Zinc (Zn)	mg/L	<0.001	<0.001	<0.001	<0.001
36	Nickel (Ni)	mg/L	0.003	0.003	<0.001	<0.001
37	Copper (Cu)	mg/L	0.029	0.149	0.050	0.053
38	Chromium (Cr)	mg/L	<0.001	<0.001	<0.001	<0.001
39	Arsenic (As)	mg/L	0.001	<0.001	0.005	0.007
40	Lead (Pb)	mg/L	<0.001	<0.001	<0.001	<0.001
41	Cadmium (Cd)	mg/L	<0.001	<0.001	<0.001	<0.001
42	Mercury (Hg)	mg/L	<0.001	<0.001	<0.001	<0.001
43	Managanese (Mn)	mg/L	<0.001	<0.001	<0.001	<0.001
44	Iron (Fe)	mg/L	0.108	0.037	0.003	0.254
45	Vanadium (V)	mg/L	0.016	0.016	0.003	0.015
46	Selenium (Se)	mg/L	0.001	0.005	0.003	0.002
47	BORON (B)	mg/L	0.750	0.690	0.136	0.153
48	Total Coliform	MPN/100ml	21	17	17	14
49	Faecal Coliform	MPN/100ml	9	9	5	6
50	Organo-Chlorine	µg/L	<0.01	<0.01	<0.01	<0.01
51	PAH	µg/L	<0.01	<0.01	<0.01	<0.01
52	PCB	µg/L	<0.01	<0.01	<0.01	<0.01
53	PCT	µg/L	<0.01	<0.01	<0.01	<0.01

Predominant sources contributing to various pollutants are Oil Refinery, Petro-chemical units, Pesticide manufacturing unit, Lead-acid battery manufacturing unit, Vegetable Oil processing units, Fertilizer manufacturing unit and Sugar Refining unit.

All the Red category and Grossly Polluting Industries have established Effluent Treatment Plants (ETPs). The treated effluent is discharged to the GBC (which leads to River Hooghly) as well as directly to the River Hooghly in a couple of cases.

The State Board monitors the level of pollutants in the River Hooghly and the GBC regularly. Besides this the individual units are monitored with respect to their effluent discharge by maintaining a proper schedule. All the water polluting industries have established Effluent Treatment Plants (ETPs) of their own.

3.6 Air Environment

Table 3.3 - Present Status of Ambient Air Quality of Haldia (Monitored by Third Party during February 2019)

Sl. No.	Location	Concentration of pollutants												
		Results	PM10 (µg/m³)	PM2.5 (µg/m³)	SO2 (µg/m³)	NO2 (µg/m³)	Ammonia (µg/m³)	Lead (µg/m³)	Nickel (ng/m³)	Arsenic (ng/m³)	Benz(α)P (ng/m³)	CO (mg/m³)	Ozone (µg/m³)	Benzene (µg/m³)
1.	Super Market (Haldia, PCB), AAQM-1	No. of Reading	9	3	18	18	18	9	9	9	9	72	72	3
		Max. Value	249	57	23.6	48.3	43.5	<0.1	<10.0	<2.0	<0.5	1.16	<10.0	2.05
		Min Value	46	27	13.2	27.5	23.3	<0.1	<10.0	<2.0	<0.5	0.58	<10.0	<2.0
		Arithmetic Value	129	45	18.2	37.5	34.7	<0.1	<10.0	<2.0	<0.5	0.85	<10.0	<2.0
2.	Priyambada Housing Complex (WBPCB Lab) AAQM-2	No. of Reading	9	3	18	18	18	9	9	9	9	72	72	3
		Max. Value	122	43	23.5	46.5	50.6	<0.1	<10.0	<2.0	<0.5	1.23	<10.0	2.18
		Min Value	66	28	13.2	24.5	28.1	<0.1	<10.0	<2.0	<0.5	0.52	<10.0	<2.0
		Arithmetic Value	99	36	16.6	35.2	38.3	<0.1	<10.0	<2.0	<0.5	0.83	<10.0	<2.0

Sl. No.	Location	Concentration of pollutants												
		Results	PM10 (µg/m³)	PM2.5 (µg/m³)	SO2 (µg/m³)	NO2 (µg/m³)	Ammonia (µg/m³)	Lead (µg/m³)	Nickel (ng/m³)	Arsenic (ng/m³)	Benz(a)P (ng/m³)	CO (mg/m³)	Ozone (µg/m³)	Benzene (µg/m³)
3.	WBIIDC Ruchi Soya Industries Ltd. AAQM-3	No. of Reading	9	3	18	18	18	9	9	9	9	72	72	3
		Max. Value	265	88	25.6	49.4	50.1	<0.1	<10.0	<2.0	<0.5	1.14	<10.0	<2.0
		Min Value	75	40	14.5	32.8	34.7	<0.1	<10.0	<2.0	<0.5	0.54	<10.0	<2.0
		Arithmetic Value	164	57	19.7	40.9	42.2	<0.1	<10.0	<2.0	<0.5	0.82	<10.0	<2.0
4.	IOCL Hospital AAQM-4	No. of Reading	9	3	18	18	18	9	9	9	9	72	72	3
		Max. Value	97	24	21.6	43.2	43.3	<0.1	<10.0	<2.0	<0.5	1.24	<10.0	<2.0
		Min Value	53	17	13.4	28.5	27.5	<0.1	<10.0	<2.0	<0.5	0.58	<10.0	<2.0
		Arithmetic Value	79	20	16.6	35.6	36.3	<0.1	<10.0	<2.0	<0.5	0.85	<10.0	<2.0

Predominant sources are industrial pollution arising out of different industries like refineries, fertilisers, pesticides, petro-chemical, industrial batteries, sponge iron industries, non-recovery type coke ovens vegetable oil processing etc.

3.7 Land Environment (Soil and Ground Water)

Table 3.4 Present Status of Ground Water Quality of Haldia (Monitored by Third Party during February 2019)

Sl. No.	Parameter	Unit	Hand Pump near Anusuya Housing, Haldia (Location Code-GW-1)	Hand Pump near Vidyasagar More (IOCL Main Gate), Haldia (Location Code-GW-2)	Hand Pump at Durgachak D Block, Haldia (Location Code-GW-3)	Hand Pump water at Prtiyambada Complex, Haldia (Location Code-GW-4)
1	Sanitary Survey	----	Drainage system found & no Toilet nearby	Drainage system found & no Toilet nearby	Drainage system found & no Toilet nearby	Drainage system found & no Toilet nearby
2	General appearance	----	Transparent	Transparent	Transparent	Transparent
3	Colour	Hazen	<1.0	<1.0	<1.0	<1.0
4	Smell	----	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable
5	Transparency	Cm	92	95	88	88
6	pH at 26deg C	----	7.3	7.4	7.3	7.4

Sl. No.	Parameter	Unit	Hand Pump near Anusuya Housing, Haldia (Location Code-GW-1)	Hand Pump near Vidyasagar More (IOCL Main Gate), Haldia (Location Code-GW-2)	Hand Pump at Durgachak D Block, Haldia (Location Code-GW-3)	Hand Pump water at Prtiyambada Complex, Haldia (Location Code-GW-4)
7	Oil & Grease	mg/L	<1.0	<1.0	<1.0	<1.0
8	Suspended solids	mg/L	<5.0	<5.0	<5.0	<5.0
9	COD	mg/L	12.43	12.43	7.65	10.52
10	BOD	mg/L	1.8	1.5	<1.0	1.8
11	Electrical Conductivity	µmhos/cm	1464	960	2080	1510
12	TDS	mg/L	860	566	1190	884
13	Nitrite-Nitrogen	mg/L	<0.005	<0.005	<0.005	<0.005
14	Nitrate-Nitrogen	mg/L	<0.5	<0.5	<0.5	<0.5
15	Total Nitrogen (NO2+NO3)	mg/L	<0.5	<0.5	<0.5	<0.5
16	Free ammonia	mg/L	<0.05	<0.05	<0.05	<0.05
17	Total Residual Chlorine	mg/L	<0.05	<0.05	<0.05	<0.05
18	Cyanide	mg/L	<0.01	<0.01	<0.01	<0.01
19	Fluoride	mg/L	<0.05	<0.05	<0.05	<0.05
20	Chloride	mg/L	266.02	204.26	403.78	285.02
21	Sulphate	mg/L	57.2	40.72	65.21	50.65
22	Sulphides	mg/L	<0.05	<0.05	<0.05	<0.05
23	Total hardness	mg/L	226	196	340	204
24	Dissolved Phosphate (as P)	mg/L	<0.05	<0.05	<0.05	<0.05
25	Total Phosphorous (as P)	mg/L	<0.05	<0.05	<0.05	<0.05
26	TKN	mg/L	<0.5	<0.5	<0.5	<0.5
27	Total Ammonia (NH4+NH3)	mg/L	<0.05	<0.05	<0.05	<0.05
28	Phenols	mg/L	<0.001	<0.001	<0.001	<0.001
29	Surface Active Agents	mg/L	<0.10	<0.10	<0.10	<0.10
30	Hexavalent Chromium (Cr^{+6})	mg/L	<0.02	<0.02	<0.02	<0.02
31	Bioassay (Zebra fish)	%	------	-------	------	100% Survival of fish after 96hours exposure in 1005 Sample.
32	SAR	----	8.05	10.60	6.83	9.01
33	Zinc (Zn)	mg/L	0.085	0.001	<0.001	0.059
34	Nickel (Ni)	mg/L	<0.001	<0.001	<0.001	<0.001
35	Copper (Cu)	mg/L	<0.001	<0.001	<0.001	<0.001
36	Chromium (Cr)	mg/L	<0.001	<0.001	<0.001	<0.001
37	Arsenic (As)	mg/L	<0.001	0.001	<0.001	<0.001
38	Lead (Pb)	mg/L	<0.001	<0.001	<0.001	<0.001
39	Cadmium (Cd)	mg/L	<0.001	<0.001	<0.001	<0.001
40	Mercury (Hg)	mg/L	<0.001	<0.001	<0.001	<0.001
41	Managanese (Mn)	mg/L	<0.001	<0.001	0.005	0.010

Sl. No.	Parameter	Unit	Hand Pump near Anusuya Housing, Haldia (Location Code-GW-1)	Hand Pump near Vidyasagar More (IOCL Main Gate), Haldia (Location Code-GW-2)	Hand Pump at Durgachak D Block, Haldia (Location Code-GW-3)	Hand Pump water at Prtiyambada Complex, Haldia (Location Code-GW-4)
42	Iron (Fe)	mg/L	0.001	0.023	0.089	0.008
43	Vanadium (V)	mg/L	0.003	0.001	0.003	0.003
44	Selenium (Se)	mg/L	<0.001	<0.001	<0.001	<0.001
45	Boron (B)	mg/L	0.192	0.163	0.231	0.236
46	Total Coliform	MPN/100ml	<2	<2	<2	<2
47	Faecal Coliorm	MPN/100ml	<2	<2	<2	<2
48	Organo-Chlorine	µg/L	<0.01	<0.01	<0.01	<0.01
49	PAH	µg/L	<0.01	<0.01	<0.01	<0.01
50	PCB	µg/L	<0.01	<0.01	<0.01	<0.01
51	PCT	µg/L	<0.01	<0.01	<0.01	<0.01

3.8 Action plan for Haldia PIA

3.8.1 Name of the Industry: Haldia Dock Complex, Kolkata Port Trust

The HDC has already implemented the following good practices for betterment of environmental quality of the area:

- Inside dock area, 5 nos. tankers with effective water spraying system are in operation for 24 hours for dust suppression.
- All roads inside dock area are paved road made by bituminous, concreted or paver block.
- Domestic effluent is generated from offices and residential complex and same is treated in stabilization / oxidation pond before disposal.
- On-site emergency training programme along with other port operations issues are being conducted on monthly basis especially at work places within dock areas / operations areas by the in-house faculty.
- There is separate storm water drainage line. No waste water is allowed to be mixed with storm water line. All drains inside dock area and in township area are being cleaned on regular basis to avoid water logging.

Short Term Action Points (including continuous activities)

Sl No.	*Action points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental issues to be addressed*
1	Installation of additional facilities for improvement of dust suppression inside dock area.	60 Lakhs	March 2020	Reduction of dust emission, improvement of air quality
2	Additional Green belt development at the dock zone, office areas and residential zones as well as along roadsides wherever vacant spaces are available within the port.	28 Lakhs	March 2020	Improvement of overall air quality and biodiversity
3.	Drain cleaning and maintenance on regular intervals / requirement basis	1.3 Lakhs	March 2020	Improve drainage system and prevent water logging
4.	Railway flyover: HDC provided land as required	HDC's contribution Rs 30 Crore, Total project cost Rs 127 Crore being executed by NHAI	December 2019	Ease movement of traffic from HDC. Will reduce vehicular pollution in the area.

Medium Term Action Points (1 year – 3 years)

Sl No	*Action points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental issues to be addressed*
1	Identification of more areas for plantation within port jurisdiction	25 Lakhs / annum	March 2022	Improvement of overall air quality and biodivpavedersity
2	Construction of retaining wall beside drain at specified locations are in progress.	2.30 Crore	December 2021	Improve drainage system
3	Improvement of Road: Inside dock area, Haldia township to Durgachawk	30 Crore	December 2021	Improvement of overall air

Sl No	*Action points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental issues to be addressed*
	(within Haldia Municipality) Construction of Truck terminals and parking area: 6,000 sq meter	2 Crore	December 2021	quality Improvement of Air Quality

Long Term Action Points

Sl No	*Action points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental issues to be addressed*
1	Upgradation of existing sewerage system at Haldia township and installation of a new STP of capacity of 4.0 MLD.	18 Core.	December 2023	Treatment of sewage from township and improvement of water quality

3.8.2 Name of the Industry: MCPI Private Limited (Formerly MCC PTA India *Corp. Private Limited*, Materials Chemicals and Performance Intermediaries Private Limited)

The industry has already implemented the following good practices for betterment of environmental quality of the area in addition to compliance with effluent and emission norms:

- Recycling of effluent (RO reject) from water treatment plant and use in cooling tower makeup.
- In 2018, unit has installed sludge dryer in new plant (HP) to reduce solid waste generation.
- Constructed paved road and truck parking area with paved bricks.
- Installed on-line stack emission monitoring systems, continuous ambient air quality monitoring and effluent monitoring systems
- Re-use of Solid Hazardous Waste in cement industry as Co-Processing material.
- Green Belt area rain water is collected in natural lagoon of 3.5 Lakh m^3 capacity and part of this water is used for plant operations and firefighting system.
- Training/ Awareness program for on-site emergency are conducted regularly

Short Term Action Points (including continuous activities)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	RO reject water is used for cleaning of paved road and parking area for suppression of dust.	11 Lakhs	Continuous activity/ March 2020	Reduce Particulate Matter (PM) within the plant area.
2.	Complying the EC/NOC conditions by monitoring the Air, Water, Noise, LDAR Monitoring & Stack emission monitoring, Work Environment monitoring etc.	36 Lakhs	Continuous activity/ March 2020	Regulation of emission/ effluent generation. LDAR monitoring help to reduce the VOC emissions within the plant area.
3.	For existing plant, following will be adopted: • Existing diesel operated Forklifts will be replaced with Battery Operated Forklifts. • Utilizing low sulphur content FO	45 Lakhs	March 2020	Reduce the CO, CO_2, dust, emissions during operation of Forklifts. Reduction in SO_2 emission
4.	Modification of scrubber, installation of new bag filter and replacement of eliminators in desulphurisation unit will be implemented in the existing plant	10 lakhs	March 2020	Reduce the VOC emissions and Dust. Reduction in SO_2 emission
5.	Tree plantation will be developed within the plant, surrounding the plant and housing complex.	5 Lakhs	March 2020	Reduction of air pollution.

Medium Term Action Points (1 year -3 years)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Developed green belt of 33% of the plant premises and is maintaining the green belt. Every year new local tree plantation carried out as per DFO directions. Removal of old dead plants and plantation of new plants & maintenance carried out	20 Lakhs per year 20 X 3=60 lakhs	March 2022	Improve the Air Quality surrounding the plant and help to protect the Biodiversity.
2.	Maintenance of drainage network at outside of MCPI boundary canal and inside canal; periodic cleaning is done.	15X3 = 45 Lakhs	March 2022	Avoid floods during heavy rains as well as water contamination.

3.8.3. Name of the Industry: IVL Dhunseri Petrochem Industries Private Limited

The industry has already implemented the following good practices for betterment of environmental quality of the area in addition to compliance with effluent and emission norms:

- All roads inside factory premises are concreted and are thoroughly cleaned regularly
- Initiatives taken towards energy efficiency improvements, recycling, sustainable use of resources and environmental protection activities likes installation of LED lamp, installation of energy efficiency motor & compressor, green transportation like battery operated forklift
- EC/NOC conditions are complied with on a continuous basis
- Installation of and operation of on-line monitoring system
- The unit is practicing rain water harvesting
- The drainage network of entire plant is being maintained on a regular basis
- Training/Awareness Program for on-site emergency is being given to employees time to time.

Short Term Action Points (including continuous activities)

Sl. No.	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be address*
1.	Provision for dust suppression facility outside factory gate to control dust emission due to vehicle movement.	1.5 Lacs	December 2019	Reduction of PM emission
2.	The unit will install ESP with stack attached with TFH-2 which is under progress. Two more stripping column added to reduce effluent load in ETPs.	3.25 Crore	December 2019	Reduction in Particulate Matter emission and achieving better performance for ETP
3.	The unit has installed a Greenfield Waste Water Recycling Plant to reuse 85-90% of treated water. Unit plans to reuse 10-15% of reject water from the recycle plant for maintaining dust free environment and road washing etc.	-	Continuous	Reduce water consumption significantly. Reduction in pollution load to the environment due to less quantity of water discharge.
4.	Unit planned to set up two additional AAQM station in strategic location in the plant in addition to one online AAQM station.	Rs. 3 Lacs	December 2019	Regular monitoring of ambient air quality.

Medium Term Action Points (1 year -3 years)

Sl. No.	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be address*
1	New plantations are done in every year. The unit is planning for development of additional greeneries including total maintenance of green belts like grass cutting, maintenance of existing plants and new plantation	14.48016 Lakhs	Continuous activity	Control of dust in the adjoining area.
2	To control emission level, the unit plans to install ESP attached with TFH-1	Rs. 3.75 Crore	December 2021	Reduction in Particulate Matter emission

3.8.4. Name of the Industry: Emami Agrotech Limited, Haldia

The industry has already implemented the following good practices for betterment of environmental quality of the area in addition to compliance with effluent and emission norms:

- All internal roads are paved (RCC)
- Treated water is utilised for gardening, ash quenching
- Installation and operation on-line monitoring system to ensure compliance with environmental norms
- Training and awareness programme are carried out regularly as a preparedness during emergency
- All drains inside the plant are made of RCC, proper maintenance of drainage network is carried out

Short Term Action Points (including continuous activities)

Sl. No.	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Provision for dust suppression system- design is in progress	15 lakhs	February 2020	Reduce PM in ambient air

Sl. No.	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
2.	Development of additional greeneries	0.5 Lakhs	November 2019	Dust mitigation
3.	Reduction of specific water consumption	70 Lakhs	February 2020	Water Conservation and Reduction in water pollution of recipient water body.

Medium Term Action Points (1 year -3 years)

Sl. No.	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	planned to develop and increase the greenbelt	15 Lakhs	January 2022	Improve the Air Quality surrounding the plant

3.8.5. Name of the Industry: Exide Industries Limited

The industry has already implemented the following good practices for betterment of environmental quality of the area in addition to compliance with effluent and emission norms:

- All roads inside factory premises are paved and are thoroughly cleaned regularly
- Most advanced and clean technology used in process in collaboration with globally best available expertise for lead acid battery manufacturing which leads to minimum waste generation
- All process equipment has inbuilt APC system attached to bag filter / wet scrubbers
- Installed On-line monitoring system at both out discharge points viz: Lagoon discharge and Traction discharge outlets, systems are operational
- Reuse of water practised in various plant areas viz. Reuse of RO waste water in ETP plant operation & floor wash; Reuse of Treated water from Lagoon and Traction ETP for road washing
- As per corporate policy every employee has to undergo training on SHE and are made aware about on-site emergency plan as part of induction training.

- Drainage system inside factory is present in ring main network. All drains are RCC and the entire network is under constant surveillance for both maintenance and analysis purpose

Short Term Action Points (including continuous activities)

Sl No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	• Introduction of 16 nos Industrial type root vacuum cleaners in Automotive & Industrial segments. • Installed 11 nos of water spray monitors capable of forming water cloud mist	1.25 Lakhs per unit	Continuous activity, upto March 2020	Less SPM, RPM
2.	• Donate saplings every year as part of CSR project to Haldia Development Authority • In existing plant saplings have been planted around the boundary wall and surrounding RCC road.	2.5 Lakhs (Approx)	March 2020	Control of ambient dust

Medium Term Action Points (1 year -3 years)

Sl No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Plantation of saplings around the boundary wall and surrounding RCC road. More plantation will be taken up in the next 3 years.	5 Lakhs	March 2023	Control of ambient dust

3.8.6. Name of the Industry: Adani Wilmar Limited Unit I

The industry has already implemented the following good practices for betterment of environmental quality of the area in addition to compliance with effluent and emission norms:

- All vacant land is covered by paver block inside the factory.
- NOC/ Consent to Operate conditions are complied with on a continuous basis
- Treated water is being reused for various purposes like gardening / maintaining green belt, sprinkling in dust prone area & road cleaning etc.

- Installation and operation of on-line monitoring system for emission and effluent
- Training/Awareness Program is imparted to employees from time to time for on-site emergency
- The drainage network of entire plant is being maintained on a regular basis
- The unit has already installed one AAQM station

Short Term Action Points (including continuous activities)

Sl. No.	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	1400 Meter Square paved area will be developed outside the Factory	100 Lakh	March 2020	Reduction in dust emission due to vehicular movement
2.	Periodic Maintenance of the pollution control system	10 Lakh	March 2020	Reduction in air emission and effluent discharge from the unit.

Medium Term Action Points (1 Year – 3 Years)

Sl. No.	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1	Around 1400 plants [*Chhatim, Jhau Gaach*] have already been planted in the factory premises and outside the factory and additional greenery will be developed	1.5 Lakh	March 2022	Control of dust in the adjoining area.

3.8.7. Name of the Industry: Haldia Petrochemicals Ltd.

The industry has already implemented the following good practices for betterment of environmental quality of the area in addition to compliance with effluent and emission norms:

- EC/NOC conditions are complied with on a continuous basis
- Solar Water Heater of capacity 1000 LPD has been installed at the roof top
- Treated waste water is being used for watering of trees inside greenbelt periodically in dry season.

- Installation of and operation of on-line monitoring system
- Training/Awareness Program is imparted to employees from time to time for on-site emergency.
- The drainage network of entire plant is being maintained on a regular basis
- The unit has already installed one AAQM station as per EC condition

Short Term Action Points (including continuous activities)

Sl. No.	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	New Py Gas Desulphurization unit is installed for removal of sulfur content of py gas to produce cleaner Euro VI grade motor spirit. A major part of the Py-gas volume is blended with other product streams of naphtha cracking to produce Euro-IV Motor Spirit (MS). By the second stage Py Gas Hydrogenation unit the sulfur content will be reduced to 10 ppm in order to produce Euro VI grade motor sprit.	85 Crores	Implemented in March 2019	Reduction in overall SO_x emission
2.	3000 nos. of sapling were planted on 2018-19 and plantation of 5000 nos. of sapling has been planned for 2019-20 inside the plant.	2.64 lakhs	March 2020	Control of dust in the adjoining area.
3.	Rainwater harvesting in the East Pond-A/B with inter-connectivity of the surface drains from non-plant area	Rs. 22.5 Lakhs	March 2020	Rain water will be utilized to reduce freshwater consumption.

3.8.8 Name of the Industry: Haldia Refinery, Indian Oil Corporation Limited

The industry has already implemented the following good practices for betterment of environmental quality of the area in addition to compliance with effluent and emission norms:

- Adopted dust suppression systems as a continuous process in construction and dust prone areas for betterment of air quality
- Roads inside refinery are paved, repair of roads done periodically.
- Expenditure of Rs. 1656.6 Lakh (approx.) during 2018-19 has been incurred for compliance of EC/NOC conditions for efficient operation of pollution control system and compliance with environmental norms
- Installed Online analyzers in year 2016/2017 for monitoring of effluents and stack emission
- Training and awareness programme for preparedness during emergency carried out periodically

Short Term Action Points (including continuous activities)

Sl. no.	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	I. Low Sulphur Internal fuel oil used in heaters. II. Sulphur free fuel gas after Amine wash used in heaters.	--	Already implemented during 2018-19	Improvement of air quality with respect to SO_x emission
2.	I. All new heaters will be equipped with low NOx burners. II. Old heaters burners are being replaced with low NOx burners.	1.6 Crore	March 2020	Improvement of air quality
3.	Tertiary treatment plant with RO installed by the unit. Utilisation of treated water (450 KLD) will be done	An amount of Rs 202 lakhs incurred during 2018-19.	2018-2019	Water conservation and reduction of pollution in recipient water body.
4.	Tree plantation will be done in all nearby region of Haldia refinery like previous years during World environment Day and 'Bano Mohotsav'. Tree plantation is	An amount of Rs 0.6 lakhs incurred during 2018-19	Continuous activity	Reduction of dust emission.

Sl. no.	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
	being done in nearby region, schools, municipality /HDA area with due permission.			
5.	Sludge oil recovery & recycling done before disposal	An amount of Rs 443 lakhs incurred in sludge oil recycling during 2018-19	Continuous activity	Waste Minimization
6.	Additional AAQM station (2 nos) shall be started in project area.	3 Crore	March 2020.	To monitor ambient air quality
7.	Rain water harvesting done at two locations in 2018-19	42 Lakh	Continuous activity	Water Conservation
8.	Schemes under implementation stage in 2019-20 to reduce specific water consumption further	145 Lakh	March 2020	Reduction in water pollution of recipient water body
9.	Haldia refinery is on final stage of installing LPG pumping facilities to Durgapur LPG bottling plant.	Pipeline already constructed.	March 2020	This will eliminate LPG bullet movement from Haldia Refinery resulting in improvement of air quality.

Medium Term Action Points (1 year – 3 years)

Sl. no.	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1	I. Maintenance of drainage network within refinery is being done before start of monsoon. II. Periodic cleaning done as per requirement.	--	On-going process carried out on yearly basis	Improved drainage network resulting in reduction of water pollution

Sl. no.	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
2.	Natural gas shall be used as fuel in heaters in Haldia refinery to reduce stack emission	Design and budget are under preparation	March 2022	Air Pollution

3.8.9 Name of the Industry: Haldia Energy Limited

The industry has already implemented the following good practices for betterment of environmental quality of the area in addition to compliance with effluent and emission norms:

- Areas prone to fugitive emission (Coal handling, ash handling areas, transfer points etc.) are equipped with dust extraction and dust suppression system.
- EC/NOC/ Consent to Operate conditions are complied with on a continuous basis
- All the internal roads have been made pucca (bitumen) and good housekeeping practices are being followed to keep the roads clean.
- Installed ESP with 99.9 % efficiency designed to maintain the PM level below 50 mg/Nm^3 along with ammonia dosing system
- Installed dry fly ash collection system
- Installed automatic organic waste composter machine for composting kitchen and garden wastes to form organic manures.
- The administrative building has been conferred as a Platinum rated Green Building by the IGBC
- 30 KWp rooftop solar panel installed.
- Approximate water savings of 9 m^3/day achieved by the usage of water efficient toilet fixtures and reuse of the treated water from the sewage treatment plant.
- Waste water is being utilized for road cleaning, gardening, coal pile sprinkling, ash conditioning etc.
- Online emission monitoring system, online effluent monitoring station and Continuous ambient air quality monitoring station (CAAQMS) have already been installed
-
- Training/Awareness Program is imparted to employees from time to time for on-site emergency
- The drainage network of entire plant is being maintained on a regular basis
- The unit has already installed one AAQM station

Short Term Action Points (including continuous activities)

Sl. No	*Action Points (including source and mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental issues to be addressed*
1.	Almost 30% of the waste water is recycled inside plant. Continual efforts are being given for increasing the recycling of the water as far as possible.	--	March 2020	Reduce water consumption. Reduction in pollution load to the environment due to less quantity of water discharge.
2.	Planned to plant around 10,000 saplings in coming year.	10.0 Lakh	March 2020	Control of dust in the adjoining area.
3.	Increased rainwater harvesting area in 2018 to 4000 sq.m from existing 1000 sq.m. Addition of another 6000 sq.m of roof top area for rainwater harvesting is in progress. One new water pond is being constructed for utilization of rain water.	1.2 Crore	March 2020	Rain water will be utilized to reduce freshwater consumption.

Medium Term Action Points (1 year -3 years)

Sl. No	*Action Points (including source and mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental issues to be addressed*
1	Development of wide Green belt of broad leaf local species along the periphery of the plant. Planned to plant around 20,000 saplings in coming three years span.	50 Lakh	March 2022	Control of dust in the adjoining area.

3.8.10 Name of the Industry: Hiranmaye Energy ltd, Haldia

Short Term Action Points (including continuous activities)

Sl. No.	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Provision for dust suppression system	10 lakhs	March 2020	Control of fugitive dust.
2.	Installation and maintenance of pollution control equipment as per EC/ NOC conditions	233.924 lakhs	March 2020	Control Air pollution
3.	Reduction of water consumption and utilization of treated waste water	5.6 lakhs	March 2020	Minimization of water uses. Prevention of water pollution.
4.	Installation of and operation of on-line monitoring system.	0.3 lakhs	March 2020	Continuous monitoring of stack emission
5.	Development of Greenbelt	2.5 Lakhs	March 2020	Control of dust in the adjoining area.

Medium Term Action points (1 year-3 years)

Sl. No.	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Green belt to be developed over at least 33% of the plant premises	10 Lakhs	December 2022	Control of dust in the adjoining area.
2.	Training/Awareness Program for on-site emergency and environmental issues	1 Lakh	December 2022	Emergency preparedness and awareness on environmental issues among staff, workers.

Sl. No.	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
3.	Proper maintenance of drainage network	10 lakhs	December 2022	Control inundation at the time of heavy rain.
4.	Installation of Continuous AAQM Station as per EC condition for monitoring of parameters such as PM $_{10}$, $PM_{2.5}$, NOx, SO_2	80 Lakhs	March 2022	Monitoring of air quality

3.8.11 Name of the industry: Hindustan Petroleum Corporation Limited, Haldia Terminal

Short term Action Points (including continuous activities)

Sl. No.	*Action Points including source & mitigation measures*	*Estimated Cost (Rs)*	*Target Date*	*Environmental issues to be addressed*
1	Installation of solar panels	45 Lakhs	July 2019	Reduction in GHG
2	Tree Plantation and development of greeneries	0.2 Lakhs	Dec 2019	Control of dust in the adjoining area.
3	Proper maintenance of drainage network. (Augmentation of drainage)	10 Lakhs	Dec 2019	Reduction in water pollution

Medium Term Action Points (1 year - 3 Year)

Sl. No.	*Action Points including source & mitigation measures*	*Estimated Cost*	*Target Date*	*Environmental issues to be addressed*
1	Training for on-site emergency and environmental awareness	10 Lakhs	March 2022	Awareness generation amongst the people

3.8.12 Name of the industry: Electrosteel Castings Limited

The industry has already implemented the following good practices for betterment of environmental quality of the area in addition to compliance with effluent and emission norms:

- NOC/ Consent to Operate conditions are complied with on a continuous basis
- All internal roads are paved
- Installation and operation of on-line monitoring system for emission
- Training/Awareness Program is imparted to employees from time to time for on-site emergency and environmental issues
- Developed green belt along the periphery

Short Term Action Points (Up to 1 year including continuous activities)

Sl. No.	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be address*
1	Installation of fire hydrant and 5 nos. stationary water sprinklers in coke oven coal yard	5 Lacs	March 2020	Control of re-suspension of particulate matter
2	Installation of WHRB based 5 MW CPP for utilizing hot flue gas of third coke oven battery	29.75 Crore	December 2019	Generation of power using WHRB will result in reduction of carbon footprint
3	Installation of additional bag filter in sponge iron plant (intermediate bin)	8 Lakhs	March 2020	Better control of fugitive emission from I.bin.
4	Provisions for utilization of more treated wastewater from pond of coke oven plant	5.5 Lakhs	March 2020	Reduced raw water consumption by 4500 KL/ year
5	Plantation of 2000 saplings for additional greeneries development	1 Lakh	March 2020	Control of dust emission in adjoining area

Medium Term Action Points (1 year -3 years)

Sl. No.	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be address*
1	Plantation of 6000 saplings for more greenery development	3 lakhs	March 2022	Control of dust emission in adjoining area
2	Installation of AAQM Station as per EC condition 3 nos. additional manual AQM stations will be fixed up in surrounding villages	Rs. 20.0 Lacs	March 2022	Monitor ambient air quality for taking appropriate action

3.8.13 Name of the Industry: Hindustan Unilever Limited

The industry has already implemented the following good practices for betterment of environmental quality of the area in addition to compliance with effluent and emission norms:

- NOC/ Consent to Operate conditions are complied with on a continuous basis
- All internal roads are made of RCC
- Upgradation of air pollution control system has been made
- Treated water is entirely used for bathroom flushing and gardening
- Training/Awareness Program is imparted to employees from time to time for on-site emergency and environmental issues

Short Term Action Points (Up to 1 year including continuous activities)

Sl. No.	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be address*
1	Plantation of about 200 saplings inside the factory and along periphery	0.2 Lakhs	Dec 2019	Control of dust emission in adjoining area
2	Proper maintenance of drainage network	3 Lakhs	December 2019	Reduction in water pollution

Medium Term Action Points (1-3 years)

Sl. No.	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be address*
1	Development of additional greeneries	1 Lakh	Dec 2021	Control of dust emission in adjoining area

3.8.14. Name of the Industry: Lal Baba Seamless Tubes Pvt. Ltd.

The industry has already implemented the following good practices for betterment of environmental quality of the area in addition to compliance with effluent and emission norms:

- NOC/ Consent to Operate conditions are complied with on a continuous basis
- Training/Awareness Program is imparted to employees from time to time for on-site emergency and environmental issues

Short Term Points (including Continuous Activities)

SL. No.	*Action Points (Including Source & Mitigation Measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1	Construction of Paved Road	2 Lakhs	February 2020	Reduction in dust emission
2	Upgradation / Modification of Pollution Control System for effective operation of ETP	2 Lakhs	November 2019	Better control of water pollution
3	Provision for Zero Liquid Discharge (ZLD)	8 Lakhs	January 2020	Reduction in water pollution
4	Utilization of Treated Wastewater in gardening	0.25 Lakhs	January 2020	Reduction in water consumption
5	Development of Greeneries with Three Tier Green Belt	3 Lakhs	March 2020	Control of dust emission in adjoining areas
6	Provision for Rain Water Harvesting	5 Lakhs	October 2019	Reduction in fresh water consumption

Medium Term Action Points (1 Year - 3years)

Sl. No.	*Action Points (Including Source & Mitigation Measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to Be Addressed*
1.	Development of additional greeneries will be developed	3 Lakhs	March 2022	Control of dust emission in adjoining areas

3.8.15 Name of the Industry: Petrocarbon and Chemicals Limited

The industry has already implemented the following good practices for betterment of environmental quality of the area in addition to compliance with effluent and emission norms:

- Unit has provided adequate measures for dust suppression
- All internal roads are paved
- Over 33% of plant area already covered under green belt
- Training/Awareness Program is imparted to employees from time to time for on-site emergency and environmental issues
- Proper maintenance of drainage network
- NOC/ Consent to Operate conditions are complied with on a continuous basis

Short Term Action Points (including continuous activities)

Sl. No.	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environment Issues to be addressed*
1	The industry will install Waste Heat Recovery Boiler and Power Facilities along with its auxiliaries to generate power	31.25 crores (approx.)	March 2020	Reduction in GHG emission
2	Additional development of greeneries will be done	0.97 Lakhs	March 2020	Control of dust emission in adjoining area
3	A 50X20X3 mtrs reservoir will be constructed for Rain Water Harvesting and water storage for the plant with 7 days hold-up capacity	1.55 Crore	March 2020	Reduction in fresh water consumption

3.8.16 Name of the Industry: Tata Power Company Limited

The industry has already implemented the following good practices for betterment of environmental quality of the area in addition to compliance with effluent and emission norms:

- Unit has provided adequate measures for dust suppression including periodic cleaning of road
- NOC/ Consent to Operate conditions are complied with on a continuous basis
- All internal roads are paved
- Installation and operation of on-line monitoring system.
- Training/Awareness Program is imparted to employees from time to time for on-site emergency and environmental issues

Short Term Action Points (including continuous activities)

Sl No.	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1	Development of greeneries	0.1 Lakhs	March 2020	Reduction in dust emission
2	Provision of rain water harvesting	15 Lakhs	March 2020	Reduction in fresh water consumption

Medium Term Action Points (1 year – 3 years)

Sl. No.	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1	Additional Green belt will be developed	0.3 Lakhs	March 2022	Reduction in dust emission

3.8.17 Name of the Industry: Tata Steel Limited, Hooghly Metcoke Division

The industry has already implemented the following good practices for betterment of environmental quality of the area in addition to compliance with effluent and emission norms:

- NOC/ Consent to Operate conditions are complied with on a continuous basis
- All internal roads are paved
- The waste water generated mainly from power plant cooling tower / Boiler blowdown is being directly used for coke quenching purpose.

- Training/Awareness Program is imparted to employees from time to time for on-site emergency and environmental issues

Short Term Action Points (including continuous activities)

Sl. No.	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Procuring a IVC machine is under progress for dust extraction	50 lakhs	March 2020	Control of dust from the industry
2	Installation of vertical pipeline at different junction houses for operation of IVC machine	20 Lakhs	March 2020	Reduction of dust emission
3	Every year 2000 – 3000 trees are being planted for development of greeneries	3 Lakhs	March 2020	Reduction of dust emission
4	Target of 10% reduction in specific water consumption has been taken in FY20.	12 Lakh	March 2020	Reduction in waste water generation

Medium Term Action Points (1 – 3 years)

Sl. No.	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Planting new trees every year and replacing the saplings	20 Lakhs (approx.)	December 2023	Reduction of dust emission
2	Proper maintenance of drainage network and regular mechanized drain cleaning .	15 Lakhs (approx.)	March 2021	Minimise contamination of effluent
3	One number of AAQM station will be constructed.	85 Lakhs (approx.)	March 2022	Monitoring of ambient air quality

3.8.18 Name of the Industry: IRC Agrochemicals Pvt Ltd

The industry has already implemented the following good practices for betterment of environmental quality of the area in addition to compliance with effluent and emission norms:

- NOC/ Consent to Operate conditions are complied with on a continuous basis
- Bituminous road inside factory and separate cemented pedestrian walkway along the road.
- Installed online emission monitoring system which is under operation
- Constructed well maintained concrete drain at both side of the road inside factory and acid resistance lining drains are available inside plants
- Training/Awareness Program is imparted to employees from time to time for on-site emergency and environmental issues

Medium Term Action Points (1 – 3 Years)

Sl No.	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1	Unit is implementing following projects: 1) 6 MW STG Cogen project to convert vent process steam to captive power 2) Use of Biomass (sawdust briquettes) as fuel to HAG of DAP#2 as supplement/alternate fuel to Fuel Oil. 3) Alkali scrubber is provided in Sulphuric Acid plant stacks to achieve lower emissions than the CTO conditions. Ammonia will be used in this scrubber and the scrubber liquor in DAP process will be reused	Project#1: Rs.5600 lakhs (Rs. 56 Cr) Project#2: Rs.400 lakhs (Rs. 4 Cr) Project #3: Rs 150 lakhs (Rs 1.5 Cr)	March 2021	Improvement of air emission from the industry
2	Installation of new RO for further treatment of ETP treated water, to recover 70 – 80% as permeate water to be used as raw water in cooling tower purpose and 20 – 30% reject water, which will be used as process water to DAP / NPK 1 & 2 and SSP plants.	Rs. 550 lakhs	March 2021	Water reuse and reduction in fresh water consumption

Sl No.	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
3	Unit has planned to further improve the greenery by 800 – 1000 nos of fresh tree plantation in each year for next 3 – 4 years.	2 lakhs	March 2022	Reduction in dust emission in the adjoining area

3.8.19 Name of the Industry: Adani Wilmar Limited Unit II

The industry has already implemented the following good practices for betterment of environmental quality of the area in addition to compliance with effluent and emission norms:

- NOC/ Consent to Operate conditions are complied with on a continuous basis
- Constructed RCC road inside factory
- Treated water is being reused for various purposes like gardening / maintaining green belt, sprinkling in dust prone area & road cleaning etc.

Short Term Action Points (including continuous activities)

Sl. No.	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1	All vacant land will be cover by paver block inside the Plant	15 Lakh	March 2020	Minimise dust emission
2	New ash conveying system for thermosyphon boilers	35 Lakh	April 2019	Control ash dispersion from boiler

Medium Term Action Points (1 Year – 3 Years)

Sl. No.	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1	Around 750 plants [CHHATIM, JHAU GAACH] have already been planted in the factory premises and outside of the factory. Additional greenery developed every year.	1.0 Lakh	March 2022	Minimise dust emission in adjoining areas.

3.8.20 Name of the Industry: Manaksia Aluminium Company Limited, Haldia

The industry has already implemented the following good practices for betterment of environmental quality of the area in addition to compliance with effluent and emission norms:

- NOC/ Consent to Operate conditions are complied with on a continuous basis
- Constructed RCC road inside factory
- Drain cleaning & repairing job is being undertaken by our company each year compulsorily
- Training/Awareness Program is imparted to employees from time to time for on-site emergency and environmental issues

Short Term Action Points (including continuous activities)

Sl. No.	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be address*
1	Water sprinkler to be installed in dust generated areas	3 Lakhs	September 2019	Minimize dust emission
2	Planning to commission regenerative type "Melting Furnace".	100 Lakhs	August 2020	Minimize smoke & dust emission Air Pollution
3	Replacement of "Dust Collection System" to be completed in 02 phases.	120 Lakhs	01st Phase: November 2019 02nd Phase: February 2020	Control of Air Pollution
4	Discharged Water will be chemically treated and collected in a reservoir which will further used for gardening, road cleaning & dust-suppression	20 Lakhs	December 2019	Control of Water Pollution
5	In the 01st phase of development of greeneries, following trees will be planted: Palm Tree, Mango Tree, Pomegranate Tree, Guava Tree etc In the 02nd Phase, on the "World Environment Day" i.e. on 05th June 2019, 50 big trees and around 100 small plants will be planted.	5 Lakhs	**01st Phase:** June 2019 **02nd Phase:** 30th November 2019	Minimise dust emission

3.8.21 Name of the Industry: Ruchi Soya Industries Limited

The industry has already implemented the following good practices for betterment of environmental quality of the area in addition to compliance with effluent and emission norms:

- Unit has provided adequate measures for dust suppression
- NOC/ Consent to Operate conditions are complied with on a continuous basis
- 75 - 95% treated water is utilised for Green Belt development, Ash quenching and Coal yard fire mitigation
- Training/Awareness Program is imparted to employees from time to time for on-site emergency and environmental issues
- Proper maintenance of drainage network

Short Term Action Points (including continuous activity)

Sl. No.	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environment Issues to be addressed*
1	Construction of Paved Roads already completed 95% and remaining 5% is covered in infrastructural development Capex plan	25 Lakhs	March 2020	Reduction in dust emission
2	Development of additional greeneries	2.5 Lakhs	March 2020	Control of dust emission in adjoining area

Medium Term Action Points (1 Year to 3 Year)

Sl. No.	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environment Issues to be addressed*
1	Additional green belt development will be done	5.75 Lakhs	March 2021	Reduction in dust emission

3.8.22 Name of the Industry: United Phosphorous Limited.

The industry has already implemented the following good practices for betterment of environmental quality of the area in addition to compliance with effluent and emission norms:

- NOC/ Consent to Operate conditions are complied with on a continuous basis
- Constructed paved road inside factory
- Installed online effluent monitoring system which is under operation
- Training/Awareness Program is imparted to employees from time to time for on-site emergency and environmental issues
- Developed 34% area as green belt

Short Term Action Points (including continuous activities)

Sl. No.	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1	Provision for dust suppression system	2.5 Lakhs	October 2019	Reduction in coal dust emission
2	The industry will conduct the study to explore the possibility to implement (ZLD)	8.5 Lakhs	January 2020	Minimize water consumption and effluent generation
3	Ambient air quality monitoring to be carried out by engaging third party	1.5 Lakhs	January 2020	Monitoring of air quality parameters

3.8.23 Name of the Stakeholder: Haldia Development Authority

Long Term Action Points

Sl. No.	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs.)*	*Target Date*	*Environmental issues to be addressed.*
1.	Green belt to be developed in the Haldia Township area. Plantation at road flank and other area in Haldia town – Approx 5 Hectare	150 Lakhs	September 2020	Improvement of overall air quality and biodiversity
2.	Facility for rain water harvesting to be implemented. Ground water recharge by digging well/pits at strategic locations.	100 Lakhs	March 2021	Improvement of ground water aquifer
3.	Repairing and up-gradation of different industrial and public roads in Haldia – 22 KM	4200 Lakhs	November 2020	Improvement of traffic movement thereby improvement of air quality
4.	Development of New Truck Terminal adjacent to HPL Link Road – 10 Acre area	2000 Lakhs	November 2020	Removal of traffic congestion from the road, thereby improvement of air quality
5.	A Public Private initiative was taken by HDA by forming a company, West Bengal Waste Management Ltd. (WBWML) with Ramky Enviro Engineers Ltd. (REEL) as private partner, for collection, transportation, segregation, treatment and disposal of Municipal Solid Waste as well as Industrial and Bio Medical Solid waste. The project was conceived on the land of around 100 Acre allotted by HDA. WBWML has been operating successfully since 2006.	--	In operation	Management of Bio medical Waste, Municipal Solid Waste and Hazardous Waste

Sl. No.	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs.)*	*Target Date*	*Environmental issues to be addressed.*
6.	Construction of Storm Water Drain – 6 KM	1500 Lakhs	March 2021	Reduce water logging and water pollution

3.8.24 Name of the Stakeholder: Haldia Municipality

Long Term Action Points

Sl. No.	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs.)*	*Target Date*	*Environmental issues to be addressed.*
1.	Green belt to be developed in the Haldia Township area.	5 Crores	March 2021	Improvement of overall air quality and biodiversity
2.	Facility for rain water harvesting by digging ponds	5 Crores	-	Improvement of ground water aquifer and use of rain water for plantation, road cleaning
3.	Development of infrastructure such as improvement of road condition, railway flyover, construction of truck terminals and parking facility	150 Crore	March 2021	Improvement of traffic movement thereby improvement of air quality
4.	Infrastructure for MSW	2.88 Crore/ annum	Continuous activity	Disposed at MSW facility by WBWML

Sl. No.	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs.)*	*Target Date*	*Environmental issues to be addressed.*
5.	Laying of Sewerage System and Construction of STP	100 Crore	March 2022	Control of water pollution due to sewage generated in Haldia
6.	Storm water management by canal excavation or re excavation	65 Crores	March 2022	Reduce water logging and water pollution

As per action plan of Haldia PIA, a total amount of Rupees 720.98 crores has been earmarked for execution of various environmental improvement activities by large industries, Haldia Development Authority and Haldia Municipality by December 2023.

ACTION PLAN FOR POLLUTED INDUSTRIAL AREA, HOWRAH

4. ACTION PLAN FOR POLLUTED INDUSTRIAL AREA, HOWRAH

4.1 Area Details:

Bounded by the river Hooghly on the east and the Rupnarayan on the west and intersected by the Damodar, the district of Howrah has a total area of 1467 square kilometres and a population of 4,841,638 as per 2011 census and is one of the highly urbanized areas of West Bengal. The district is named after its headquarters, the city of Howrah, located on the west bank of the Hooghli River. Howrah city is connected to its twin city of Kolkata by the Howrah Bridge which is known as Rabindra Setu and another bridge called Vidyasagar Setu. The district has a rich legacy of industrial development from the British period which plays a vital role in the economy of both the state and the country as a whole. Consistent growth of industries and simultaneous urbanization have seriously affected the environment of the district.

In order to characterize the environmental quality and assess the impact on the environment in respect of Polluted Industrial Area (PIA), the Central Pollution Control Board (CPCB) has considered two major industrial clusters of Howrah district namely the **Jalan Industrial Complex and the Bamungachi Area.**

4.2 Location

The Howrah district lies between 22°48′ N and 22°12′ N latitudes and between 88°23′ E and 87°50′ E longitudes. It has an average elevation of 12 metres above MSL.

Jalan Industrial Complex: Jalan Industrial Complex is a privately developed/promoted industrial hub and is not recognized as industrial zone/cluster by any governmental organization. The complex comprises of Mouza- Begri, Baniara & Biprannapara. New industries are constantly being set up, increasing the area of the complex.

Bamungachi Area : It mostly comprises of Area under Malipanchghora, Liluah, Bally, Bantra Police Stations. Those areas are mostly coming under Howrah Municipal Corporation area.

4.3 Demarcation of Geographical Boundaries and Impact Zones

Figure 4.1: Boundary of Polluted Industrial Area in Howrah

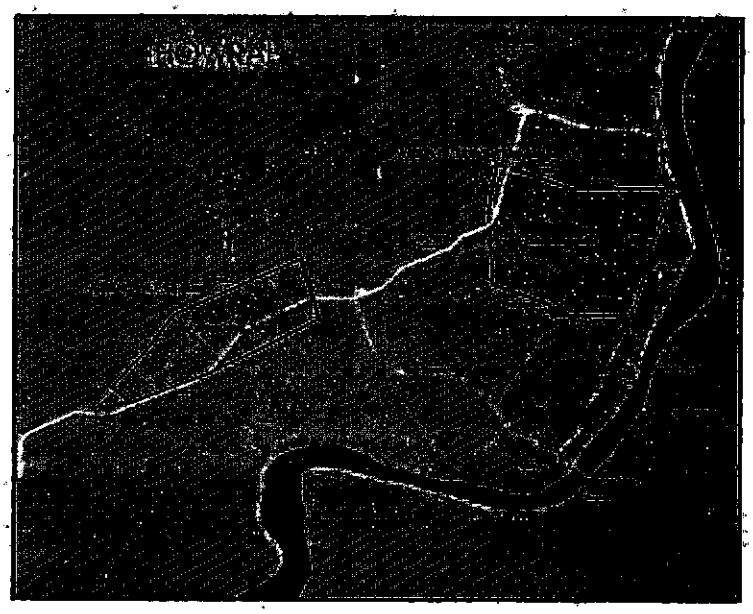
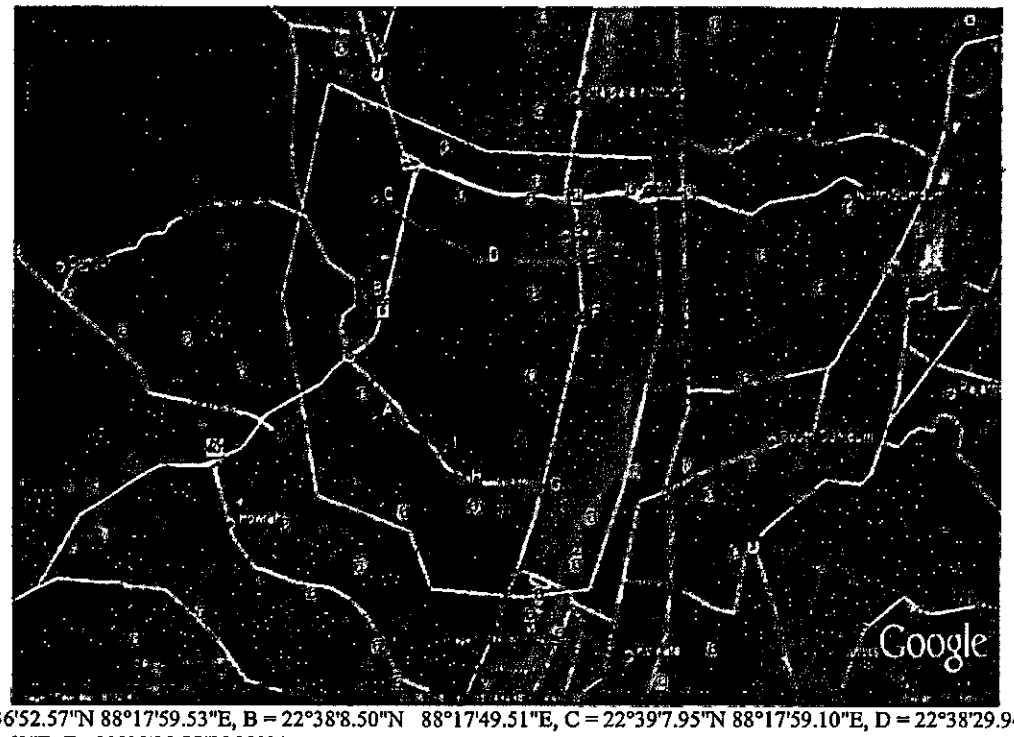


Figure 4.2: Map of Howrah PIA (Jalan Complex) along with impact zone

A = 22°34'33.10"N,88°11'38.19"E,B = 22°34'53.38"N 88°11'12.72"E, C = 22°36'3.99"N88°12'1.87"E,
D = 22°37'17.50"N 88°14'26.44"E, E = 22°36'1.25"N 88°14'52.31"E

Figure 4.3: Map of Polluted Industrial Area in Howrah (Bamungachi) along with impact zone



A = 22°36'52.57"N 88°17'59.53"E, B = 22°38'8.50"N 88°17'49.51"E, C = 22°39'7.95"N 88°17'59.10"E, D = 22°38'29.94"N 88°19'34.63"E, E= 22°38'28.77"N 88°21'3.58"E, F = 22°37'53.52"N 88°21'7.96"E, G = 22°36'739"N 88°20'31.33"E, H = 22°36'12.21"N 88°19'19.93"E, I = 22°36'32.79"N 88°19'3.63"E

There are no human settlements inside the Jalan Industrial complex and neither any sensitive receptors within its impact zone. Barojora canal passes alongside the complex. Four *nacchas* (narrow waterways, or water channels) are connected to the Barojora canal. Before the Complex came up, the land was solely used for agricultural purpose, and the water of the Barojora canal and the *nacchas* was used for irrigation purpose. There are no Ecological Parks, sanctuaries, ecologically significant flora and fauna or any eco sensitive zones in this area or monuments of historical / archaeological / religious importance

The Bamungachi area is a dense conglomerate of industry and human settlement. Population density of the area may be the highest among the peer cities of the country. Rani Jheel is a major water body in Bamungachi area. Santragachi Jheel is also located in the said area. Belurmath, a place of religious importance is located in the area.

4.4 Information on Pollution Sources Status in PIA

a.	Name of the Polluted Industrial Area	**Jalan Industrial Complex**
b.	Demarcated Area of the PIA in Sq. Km	13
c.	Number of 17 Category Industries Covered under the area	1
d.	Number of Red Category Industry Covered under the area	71
e.	Total Human Population	-
f.	At least three criteria pollutants in each air, surface water and ground water	Air - PM_{10}, NO_x, CO Surface Water - O&G, BOD, COD Ground Water - pH, Fluoride, Arsenic

Compliance Status of the Industries, Waste Management Facilities

Sl No.	Total Number of Units	Total Number of Units	Number of Units with inadequate facilities	Remarks if any
1.	Large Scale industries	06	All industries having adequate facility	
2.	Medium and small-scale industries	66	All industries having adequate facility	
3.	CETPs	Nil	N.A.	Individual industries have their own ETP
4.	TSDF	Nil	N.A.	Hazardous waste generated are disposed through common TSDF located at Haldia
5.	STPs	Nil	N.A.	Industries have provided septic tank and soakpit for their domestic effluent
6.	CBMWTF	Nil	N.A.	Biomedical waste generated are disposed through common facility at Belgachia, Howrah
7.	MSW Management Facility	Nil	N.A.	Complex is located in Panchayet area

a.	Name of the Polluted Industrial Area	**Bamumgachi Industrial Area**
b.	Demarcated Area of the PIA in Sq. Km	19.5
c.	Number of 17 Category Industries Covered under the area	3
d.	Number of Red Category Industry Covered under the area	80
e.	Total Human Population	-
f.	At least three criteria pollutants in each air, surface water and ground water	Air - PM_{10}, NO_x, CO Surface Water - O&G, BOD, COD Ground Water - pH, Fluoride, Arsenic

Compliance Status of the Industries, Waste Management Facilities

Sl No.	Total Number of Units	Total Number of Units	Number of Units with inadequate facilities	Remarks if any
1.	Large Scale industries	3	All industries are having adequate facility	
2.	Medium and small-scale industries	80	All industries are having adequate facility	
3.	CETPs	Nil	N.A.	Individual industries have their own ETP
4.	TSDF	Nil	N.A.	Hazardous waste generated are disposed through common TSDF located at Haldia
5.	STPs	Nil	N.A.	Bamungachi area is mostly under HMC area which has STP facility. Industries in Panchayet area have provided septic tank and soakpit for their domestic effluent
6.	CBMWTF	Nil	N.A.	Biomedical waste generated are disposed through common facility at Belgachia, Howrah
7.	MSW Management Facility	Nil	N.A.	Bamungachi area is mostly under HMC area. MSW generated from industries in HMC area are disposed through local conservancy system.

4.5 Water Environment

Table 4.1: Present Status of Surface Water Quality of Howrah (Monitored by Third Party during February 2019)

Sl. No.	Parameter	Unit	Pond Water Near Betor Health Centre, Howrah (SW-1)	Ganga River Water near Salkia, Howrah (SW-2)	Pond Water Near Seacom Engg. College, Howrah (SW-3)	Pond Water Saraswati Complex, Andul, Near Biprannapara Primary School, Howrah (SW-4)
1.	Sanitary Survey	---	Drainage System & Toilet not found nearby	Drainage System &Toilet not found nearby	Drainage System &Toilet not found nearby	Drainage System& Toilet not found nearby
2.	General Appearance	---	Transparent	Transparent	Turbid	Turbid
3.	Color	Hazen	2	<1.0	4	5
4.	Smell	---	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable
5.	Transparency	cm	84	84	81	81
6.	Ecological Survey	---	Present Insect/Fish	Present Insect/Fish	Present Insect/Fish	Present Insect/Fish
7.	pH at 25 deg C	---	7.2	7.2	7.4	7.3
8.	Oil Grease	mg/L	<1.0	<1.0	<1.0	<1.0
9.	Suspended Solids	mg/L	8.67	9.33	17.67	17.67
10.	DO (% of saturation)	---	6.5/83.66	7.9/96.33	6.6/87.66	6.6/84.33
11.	COD	mg/L	19.76	10.84	30.91	24.22
12.	BOD	mg/L	2.50	1.73	3.10	3.10
13.	Electrical conductivity	µmhos /cm	832	440	2596	2330
14.	TDS	mg/L	467	246	1493	1388
15.	Nitrite-Nitrogen	mg/L	<0.005	<0.005	<0.005	<0.005
16.	Nitrate-Nitrogen	mg/L	2.44	<0.5	6.54	10.12
17.	Total Nitrogen (NO2+NO3)	mg/L	2.44	<0.50	6.54	10.12
18.	Free Ammonia	mg/L	<0.05	<0.05	<0.05	<0.05
19.	Total Residual Chlorine	mg/L	<0.05	<0.05	<0.05	<0.05
20.	Cyanide	mg/L	<0.01	<0.01	<0.01	<0.01

Sl. No.	Parameter	Unit	Pond Water Near Betor Health Centre, Howrah (SW-1)	Ganga River Water near Salkia, Howrah (SW-2)	Pond Water Near Seacom Engg. College, Howrah (SW-3)	Pond Water Saraswati Complex, Andul, Near Biprannapara Primary School, Howrah (SW-4)
21.	Fluoride	mg/L	0.21	<0.05	0.35	0.29
22.	Chloride	mg/L	61.87	28.77	655.68	578.54
23.	Sulphate	mg/L	12.78	9.51	31.03	50.06
24.	Sulphides	mg/L	<0.05	<0.05	<0.05	<0.05
25.	Total Hardness	mg/L	231	159	476	523
26.	Dissolved Phosphates (as P)	mg/L	<0.05	<0.05	<0.05	<0.05
27.	Total Phosphorous (as P)	mg/L	<0.05	<0.05	<0.05	<0.05
28.	TKN	mg/L	<0.5	<0.5	<0.5	<0.5
29.	Total Ammonia (NH4+NH3) - Nitrogen	mg/L	<0.05	<0.05	<0.05	<0.05
30.	Phenols	mg/L	<0.001	<0.001	<0.001	<0.001
31.	Surface Active Agents	mg/L	<0.10	<0.10	<0.10	<0.10
32.	Hexavalent Chromium (Cr^{+6})	mg/L	<0.02	<0.02	<0.02	<0.02
33.	Bioassay (Zebra Fish)	%	---	---	100% Survival of fish after 96 hours exposure in 100% Sample	---
34.	SAR	---	3.90	1.98	3.17	2.96
35.	Zinc (Zn)	mg/L	0.01	<0.001	0.01	0.001
36.	Nickel (Ni)	mg/L	0.002	<0.001	<0.001	<0.001
37.	Copper (Cu)	mg/L	<0.001	<0.001	0.002	0.001
38.	Chromium (Cr)	mg/L	<0.001	<0.001	<0.001	<0.001
39.	Arsenic (As)	mg/L	0.002	0.002	0.002	0.001
40.	Lead (Pb)	mg/L	<0.001	<0.001	<0.001	<0.001
41.	Cadmium (Cd)	mg/L	<0.001	<0.001	<0.001	<0.001
42.	Mercury (Hg)	mg/L	<0.001	<0.001	<0.001	<0.001
43.	Managanese (Mn)	mg/L	<0.001	<0.001	<0.001	<0.001
44.	Iron (Fe)	mg/L	0.001	0.005	0.002	0.01

Sl. No.	Parameter	Unit	Pond Water Near Betor Health Centre, Howrah (SW-1)	Ganga River Water near Salkia, Howrah (SW-2)	Pond Water Near Seacom Engg. College, Howrah (SW-3)	Pond Water Saraswati Complex, Andul, Near Biprannapara Primary School, Howrah (SW-4)
45.	Vanadium (V)	mg/L	0.001	0.001	0.001	0.001
46.	Selenium (Se)	mg/L	<0.001	<0.001	<0.001	<0.001
47.	Boron (B)	mg/L	0.046	0.026	0.037	0.027
48.	Total Coliform	MPN/ 100 ml	14	18	13	13
49.	Faecal Coliform	MPN/ 100 ml	3	4	3	2
50.	Organo-Chlorine Pesticides	µg/L	<0.01	<0.01	<0.01	<0.01
51.	PAH	µg/L	<0.01	<0.01	<0.01	<0.01
52.	PCB	µg/L	<0.01	<0.01	<0.01	<0.01
53.	PCT	µg/L	<0.01	<0.01	<0.01	<0.01

In the Jalan Industrial Complex, the major sources contributing to water pollution are galvanising industry, industries with pickling facility, dyeing and bleaching industry, vegetable oil refining and processing industry, coal tar distillation plants and so on. Besides this, effluent is generated due to floor wash and vessel wash of miscellaneous industries like paint blending, biscuits manufacturing etc. Effluent generation from vegetable oil processing industries and dyeing & bleaching industries is continuous in nature where as effluent generation from galvanising industry are intermittent. Vegetable oil processing industries have their Effluent Treatment Plant comprising biological treatment system and all galvanising industries and cold rolling mills have individual treatment system with physico chemical process of treatment.

For Bamungachi Area the units are predominantly air polluting in nature though there is presence of a few pickling, galvanising units and jute mill.

All the Red category Industries have established Effluent Treatment Plants (ETPs) on their own. The Begri Canal is the effluent receiving drain for Jalan Industrial Complex. Rani Jheel and river Hoogly are the major effluent recipient water body for the water polluting units of the Bamungachi area.The State Board monitors the level of pollutants in the River Hooghly at two stations regularly. Besides this the individual units are monitored with respect to their effluent discharge by maintaining a proper schedule.

4.6 Air Environment

Table 4. 2: Present Status of Ambient Air Quality of in Howrah (Monitored by Third Party during February 2019)

Sl. No.	Location	Concentration of Pollutants											
		Results	PM 10 (µg/m³)	PM 2.5 (µg/m³)	SO2 (µg/m³)	NO2 (µg/m³)	Ammonia (µg/m³)	Lead (µg/m³)	Nickel (ng/m³)	Arsenic (ng/m³)	Benz (a)P (ng/m³)	CO (mg/m³)	OZONE (µg/m³)	Benzene (µg/m³)
1	Betor High School (AAQM-1)	No. of Readings	9	3	18	18	18	9	9	9	9	72	72	3
		Max. Value	227	85	20.0	37.1	43.3	0.12	16.02	1.97	<0.5	1.12	<10.0	2.10
		Min Value	85	37	14.2	28.5	32.1	0.03	3.10	0.82	<0.5	0.37	<10.0	<2.0
		Arithmetic Mean	138	57	16.3	32.6	37.3	0.05	8.07	1.23	<0.5	0.82	<10.0	<2.0
2	Reflex Pvt. Ltd (AAQM-2)	No. of Readings	9	3	18	18	18	9	9	9	9	72	72	3
		Max. Value	275	92	22.4	45.3	48.1	0.08	13.67	1.53	<0.5	1.14	<10.0	2.15
		Min Value	102	46	15.4	31.5	35.8	0.03	4.95	<0.5	<0.5	0.37	<10.0	<2.0
		Arithmetic Mean	190	74	18.1	39.3	40.6	0.05	8.31	0.95	<0.5	0.81	<10.0	<2.0
3	Arabinda High School (AAQM-3)	No. of Readings	9	3	18	18	18	9	9	9	9	72	72	3
		Max. Value	449	95	21.3	35.1	37.4	0.08	11.42	1.12	<0.5	1.23	<10.0	3.17
		Min Value	182	51	14.2	26.2	26.2	0.03	4.0	<0.5	<0.5	0.52	<10.0	2.14

Sl. No.	Location	Concentration of Pollutants												
		Results	PM 10 (µg/m³)	PM 2.5 (µg/m³)	SO2 (µg/m³)	NO2 (µg/m³)	Ammonia (µg/m³)	Lead (µg/m³)	Nickel (ng/m³)	Arsenic (ng/m³)	Benz (a)P (ng/m³)	CO (mg/m³)	OZONE (µg/m³)	Benzene (µg/m³)
		Arithmetic Mean	270	75	16.1	30.6	31.6	0.06	8.05	0.98	<0.5	0.83	<10.0	2.64
4	Seacom Engineering College (AAQM-4)	No. of Readings	9	3	18	18	18	9	9	9	9	72	72	3
		Max. Value	490	111	19.3	45.1	47.2	0.08	11.88	1.29	<0.5	1.23	<10.0	3.54
		Min Value	273	96	14.1	32.5	34.2	0.03	3.69	<0.5	<0.5	0.37	<10.0	2.72
		Arithmetic Mean	396	103	16.2	38.0	39.6	0.05	7.71	1.05	<0.5	0.84	<10.0	3.09

Major air polluting industries in Jalan Industrial Complex are CI Foundry, Induction furnace with rolling mill, Plywood factory, Zinc processing unit, Secondary Lead Smelting, Hot Dip Galvanizing Unit, Vegetable oil refining and processing industry, Silicate manufacturing. unit, Dyeing and Bleaching industry, Cement Unit etc.

The industrial cluster in Bamungachi Area is predominantly comprising of foundries, re-rolling mills, some forging units and galvanising units and numerous engineering units. A few number of lead smelting units are also operating in the area. Cast Iron Foundries may be considered as the main contributor of air pollution in the area.

4.7 Land Environment (Soil and Ground Water)

Table 4.3 Present Status of Ground Water Quality of Howrah (Monitored by Third Party during February 2019)

Sl. No.	Parameter	Unit	Hand Pump Water Near Betor High School, Howrah (GW-1)	Hand Pump Water at Arabinda High School, Bamungachi, Howrah (GW-2)	Hand Pump Water at SeacomEngg. College, Howrah (GW-3)	Hand Pump Water at Reflex Communication Pvt Ltd, Biprannapara, Howrah (GW-4)
1.	Sanitary Survey	---	Drainage system found & no Toilet nearby	Drainage system found & no Toilet nearby	Drainage system found & no Toilet nearby	Drainage system found & no Toilet nearby
2.	General Appearance	---	Transparent	Transparent	Transparent	Transparent
3.	Color	Hazen	<1.0	<1.0	<1.0	<1.0
4.	Smell	---	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable
5.	Transparency	cm	87	84	92	93
6.	pH at 26 deg C	---	7.23	7.27	7.27	7.3
7.	Oil Grease	mg/L	<1.0	<1.0	<1.0	<1.0
8.	Suspended Solids	mg/L	<5.0	8.67	<5.0	<5.0
9.	COD	mg/L	12.75	15.30	16.57	12.75
10.	BOD	mg/L	1.63	2.47	2.53	2.10
11.	Electrical conductivity	µmhos/cm	2370	2233	2353	823
12.	TDS	mg/L	1373.33	1281.33	1420.00	469.33
13.	Nitrite-Nitrogen	mg/L	<0.005	<0.005	<0.005	<0.005
14.	Nitrate-Nitrogen	mg/L	<0.5	<0.5	<0.5	<0.5
15.	Total Nitrogen (NO2+NO3)	mg/L	<0.5	<0.5	<0.5	<0.5
16.	Free Ammonia	mg/L	<0.05	<0.05	<0.05	<0.05
17.	Total	mg/L	<0.05	<0.05	<0.05	<0.05

Sl. No.	Parameter	Unit	Hand Pump Water Near Betor High School, Howrah (GW-1)	Hand Pump Water at Arabinda High School, Bamungachi, Howrah (GW-2)	Hand Pump Water at SeacomEngg. College, Howrah (GW-3)	Hand Pump Water at Reflex Communication Pvt Ltd, Biprannapara, Howrah (GW-4)
	Residual Chlorine					
18.	Cyanide	mg/L	<0.01	<0.01	<0.01	<0.01
19.	Fluoride	mg/L	0.31	0.23	0.22	0.21
20.	Chloride	mg/L	523.90	478.91	716.75	48.05
21.	Sulphate	mg/L	43.64	35.87	50.26	7.61
22.	Sulphides	mg/L	<0.05	<0.05	<0.05	<0.05
23.	Total Hardness	mg/L	653	630	716	224
24.	Dissolved Phosphates (as P)	mg/L	<0.05	<0.05	<0.05	<0.05
25.	Total Phosphorous (as P)	mg/L	<0.05	<0.05	<0.05	<0.05
26.	TKN	mg/L	<0.5	<0.5	<0.5	<0.5
27.	Total Ammonia (NH4+NH3)	mg/L	<0.05	<0.05	<0.05	<0.05
28.	Phenols	mg/L	<0.001	<0.001	<0.001	<0.001
29.	Surface Active Agents	mg/L	<0.10	<0.10	<0.10	<0.10
30.	Hexavalent Chromium (Cr^{+6})	mg/L	<0.02	<0.02	<0.02	<0.02
31.	Bioassay (Zebra Fish)	%				100% Survival of fish after 96 hours exposure in 100% Sample
32.	SAR	---	2.91	3.21	1.80	2.01
33.	Zinc (Zn)	mg/L	<0.001	0.015	0.01	0.031
34.	Nickel (Ni)	mg/L	0.001	0.001	0.00	0.001

Sl. No.	Parameter	Unit	Hand Pump Water Near Betor High School, Howrah (GW-1)	Hand Pump Water at Arabinda High School, Bamungachi, Howrah (GW-2)	Hand Pump Water at SeacomEngg. College, Howrah (GW-3)	Hand Pump Water at Reflex Communication Pvt Ltd, Biprannapara, Howrah (GW-4)
35.	Copper (Cu)	mg/L	<0.001	<0.001	<0.001	<0.001
36.	Chromium (Cr)	mg/L	<0.001	<0.001	<0.001	<0.001
37.	Arsenic (As)	mg/L	<0.001	0.001	0.001	<0.001
38.	Lead (Pb)	mg/L	<0.001	<0.001	<0.001	<0.001
39.	Cadmium (Cd)	mg/L	<0.001	<0.001	<0.001	<0.001
40.	Mercury (Hg)	mg/L	<0.001	<0.001	<0.001	<0.001
41.	Managanese (Mn)	mg/L	0.146	0.026	0.316	0.053
42.	Iron (Fe)	mg/L	0.003	0.001	0.002	<0.001
43.	Vanadium (V)	mg/L	<0.001	<0.001	<0.001	<0.001
44.	Selenium (Se)	mg/L	<0.001	<0.001	<0.001	<0.001
45.	Boron (B)	mg/L	0.035	0.017	0.012	0.014
46.	Total Coliform	MPN/ 100 ml	<2	<2	<2	<2
47.	Faecal Coliform	MPN/ 100 ml	<2	<2	<2	<2
48.	Organo-Chlorine Pesticides	µg/L	<0.01	<0.01	<0.01	<0.01
49.	PAH	µg/L	<0.01	<0.01	<0.01	<0.01
50.	PCB	µg/L	<0.01	<0.01	<0.01	<0.01
51.	PCT	µg/L	<0.01	<0.01	<0.01	<0.01

The Galvanising, Zinc Processing, Secondary Lead Smelting, Vegetable Oil Processing & Refining units are main source of generation of Hazardous waste. All the units are under Authorisation Management of the WBPCB and Registered with Common Hazardous Waste Disposal Facility. There are no healthcare units inside the Jalan Industrial complex. In Bamungachi all the healthcare units is registered with common biomedical waste treatment facility.

4.8 Action Plan for Howrah PIA

4.8.1 Name of the Industry: Jindal India Limited, Jangalpur, Jalan Industrial Complex

The industry has already implemented the following good practices for betterment of environmental quality of the area in addition to compliance with effluent and emission norms:

- Complying with NOC/ Consent to Operate conditions on a regular basis
- Using water spray nozzles for dust suppression on a continuous basis
- Practicing rain water harvesting (holding capacity 8000 m^3)
- Carrying out regular cleaning and proper maintenance of drainage system

Short Term Action Points (including continuous activities)

Sl. No.	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be address*
1	Construction of concrete roads	5.00 Lakhs	November 2019	Reduction of PM in ambient air and improvement of ambient air quality
2	Installation of Solar power panel of around 5.5 MW	250.00 Lakhs	March 2020	Energy conservation
3	Plantation of around 200 plants will be undertaken for development of greeneries	0.60 Lakhs	September 2019	Improvement of air quality in adjoining area

Medium Term Action Points (1 year -3 years)

Sl. No.	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be address*
1	Additional green belt will be developed in the plant premises	5.00 Lakhs	March 2022	Improvement of air quality in adjoining area.

Sl. No.	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be address*
2	Training on onsite emergency and environmental awareness will be imparted to the employees	0.20 Lakhs	April 2020	Awareness for on-site emergency and environmental issues

4.8.2 Name of the Industry: Rupa & Company Ltd. (Domjur Unit) Jalan Industrial Complex

Short Term Action Points (including continuous activities)

Sl No.	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1	Utilization of treated wastewater for road cleaning and gardening purpose	5 Lakhs	March 2020	Water conservation
2	Development of greeneries in vacant spaces and gardening	3 lakhs	March 2020	Control of dust emission in adjoining area, improvement of air quality

Medium Term Action Points (1 year -3 years)

Sl No.	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1	Installation of pneumatic dust collection system including silo for boiler	300 Lakhs	December 2022	Minimise dust emission from boiler area
2	Installation of new bag filter with SS material for 12 TPH boiler	40 Lakhs	December 2020	Minimise PM emission

5.8.3 Name of the Industry: Kiswok Industries Pvt Ltd (Unit-II), Jalan Industrial Complex

The industry has already implemented the following good practices for betterment of environmental quality of the area in addition to compliance with effluent and emission norms:

- Paved road constructed inside plant premises
- Rain water harvesting is practiced

Short Term Action Points (including continuous activity)

Sl No.	*Action Points (Including source & mitigation measures)*	*Estimated Cost (Rs.)*	*Target Date*	*Environmental Issue to be addressed*
1	Water sprinkler system for dust suppression	2.90 Lakhs	March 2020	Improvement of air quality
2	Upgradation / modification of pollution control system.	3 Crore	October 2019	Improvement in stack emission quality
3	Installation of ETP and utilisation of treated water	11 Lacs	October 2019	Water conservation and reduction of water pollution
4	200 saplings will be planted for development of greeneries	0.23 Lakhs	March 2020	Control of dust emission in adjoining area, improvement of air quality

4.8.4 Name of the Industry: BMW Industries Limited, Jalan Industrial complex

Short term Action points (including continuous activities)

Sl No.	*Action Points (Including Source & Mitigation Measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental issues to be addressed*
1	Provision of Dust Suppression System	25 Lakhs	September 2019	Improvement of air quality
2	Construction of Paved Road	125 Lakhs	September 2019	Reduction of dust emission
3	Up gradation / Modification of Effluent Treatment Plant and Utilisation of treated waste water	200 Lakhs	June 2019	Improvement of effluent quality
4	Development of greeneries	0.5 Lakhs	June 2019	Control of dust emission in adjoining area

4.8.5 Name of the Industry: Vinayak Oil & Fats Pvt. Ltd. Jalan Industrial Complex

The industry has already implemented the following good practices for betterment of environmental quality of the area in addition to compliance with effluent and emission norms:

- Upgradation of air pollution control system and ETP has been done
- Treated water is partly used for road washing, ash cooling etc.
- Gardening has been done in available spaces
- Training/Awareness Program for employees from time to time on on-site emergency and environmental issues
- Proper maintenance of drainage network is carried out

Short term Action points (including continuous activities)

Sl No.	*Action Points (Including Source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date.*	*Environmental Issues to be addressed*
1	Compliance of Consent to Operate conditions	36 lakhs	Continuous activity	Compliance of environmental standards

4.8.6 Name of the Industry: Ambica Jute Mills Limited. Bamungachi Area

Short Term Action Points (including continuous activities)

Sl No.	*Action Points (Including Source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1	Installation of equipment for mist formation inside the production area to control the humidity, temperature & dust	4 Lakhs	June 2019	Reduction in dust generation
2	Increase of Stack height of Smithy furnace upto 15 metres from ground level.	0.5 Lakhs	May 2019	Better dispersion of air pollutants/ reduction in air pollution
3	Relaying of bitumen road in the western side of mill premises	3.5 Lakhs	June2019	Reduction of PM in ambient air and improvement of ambient air quality
4	Replacement of Bag filter system at existing boiler	4 Lakhs	July 2019	Reduction in PM emission from stack
5	Training / Awareness Program for Employees about safety aspects and environmental issues	2 Lakhs	December 2019	Preparedness regarding on - site emergency and environmental awareness
6	Construction of a concrete channel system to utilize the treated water for gardening propose	1 Lakh	March 2020	Water conservation

Medium Term Action Points (1 year -3 years)

Sl No.	*Action Points (Including Source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1	Construction of new drains in the areas where it does not exist.	10 Lakhs	December 2020	Reduction of water logging and water pollution

4.8.7 Name of the Industry: Asbesco India Pvt. Ltd. Bamungachi Area

Short Term Action Points (including continuous activities)

Sl No.	*Action Points (Including Source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1	Upgradation of existing bag filter and water scrubber system	6.5 Lakhs	December 2019	Control of air emission and effluent quality
2	Upgradation of drainage system to utilise treated water for gardening purpose	1 Lakh	March 2020	Water conservation

Medium Term Action Points (1 year -3 years)

Sl. No.	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be address*
1	Construction of drains in new areas	5 Lakhs	December 2020	Reduce water logging and water pollution

4.8.8 Name of the Stakeholder: Welfare Society for the Members of Jalan Industrial Complex

Short and Medium Action Points

Sl. No.	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs.)*	*Target Date*	*Environmental issues to be addressed.*
1.	Green belt will be developed in Jalan Industrial Complex along 5 Kms road stretch	1.10 Lakhs	December 2019	Improvement of overall air quality and biodiversity
2.	Development and improvement of road condition and parking facility	1.82 Crores	March 2020	Improvement of traffic movement thereby improvement of air quality
3.	Facility for collection of recyclable solid waste	1.125 lakhs	December 2019	Solid Waste management
4.	Construction of proper drainage facility	2.9 Crores	March 2021	Reduce water logging and water pollution

Sl. No.	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs.)*	*Target Date*	*Environmental issues to be addressed.*
5.	Desilting of drainage at Jalan Complex	10 lakhs	March 2020	Reduce water logging and water pollution

As per action plan of Howrah PIA, a total amount of Rupees 18.30 Crores has been earmarked for execution of various environmental improvement activities by large industries and Welfare Society for the Members of Jalan Industrial Complex by March 2022.

ACTION PLAN FOR POLLUTED INDUSTRIAL AREA, ASANSOL

5. ACTION PLAN FOR POLLUTED INDUSTRIAL AREA, ASANSOL

5.1 Area Details

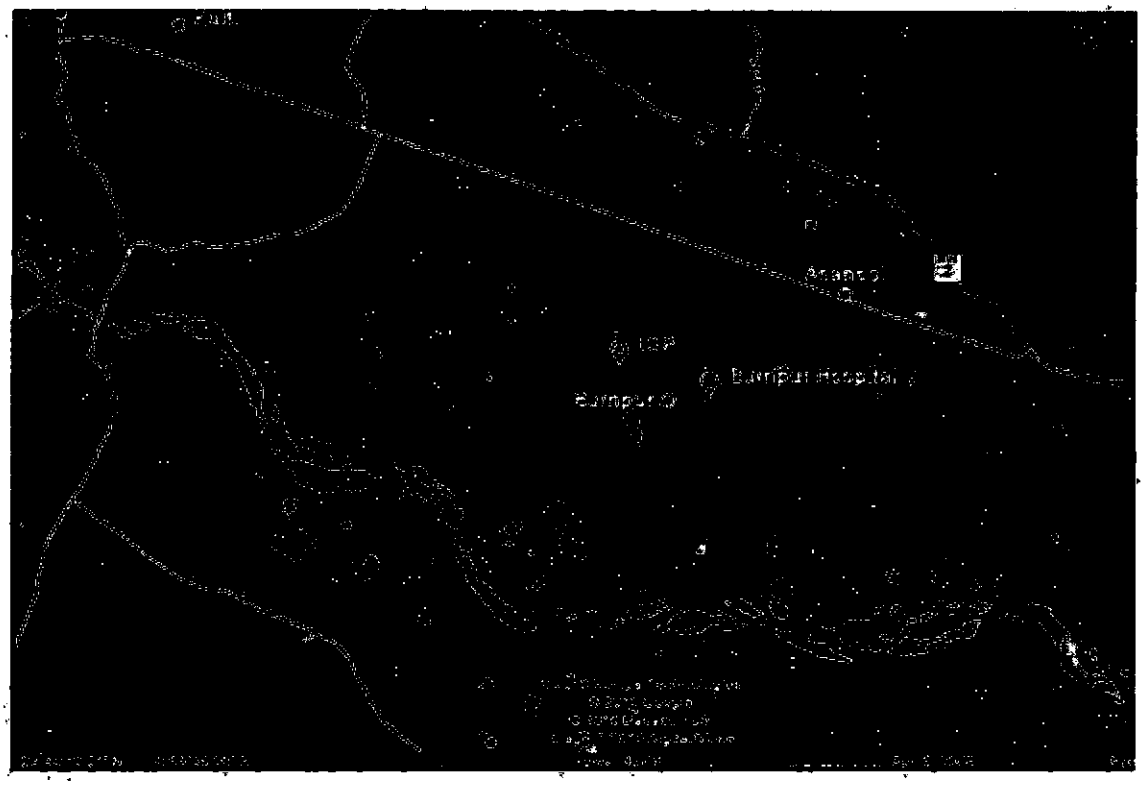
The Asansol-Burnpur area is located in the land area between the river Ajoy on northern side and river Damodar on the southern side. The area is located within the Raniganj-Asansol coal mine belt. Topography of this area is generally flat and sloping from north to south. A number of canals are passing through the area ultimately leading to the river Damodar, acting as drainage canals of the area. The Asansol Municipal area is about 127.24 sq.km

5.2 Location

Asansol is located at 23.03 degrees 40 minutes 25 second N & 86 degrees 56 minutes 45 second East. It has an average elevation of 110-130 metres MSL.

5.3 Demarcation of Geographical Boundaries and Impact Zones

Figure 5.1 Map of Polluted Industrial Area in Asansol



The economy of Asansol is primarily dependent on its steel, coal and railways. IISCO (Indian Iron and Steel Company Ltd.) was the first steel making unit established in India at present day Kulti, the Burnpur unit came up later. Other industries in the area include Refractory manufacturing units, Sodium silicate manufacturing units, Cement plants, Bottling plants, Chemical unit, Paper manufacturing unit etc. Eastern Coalfields which has its headquarters in Sanctoria near Dishergarh, has a big presence in the area due to the huge deposits of high quality Coal. However, most of the coalfields and surrounding residential colonies are located away from the main city of Asansol. Nearby areas like Ranigunj, Chinakuri and Jamuria are of particular importance for coal blocks. Railways is a big contributor to the economy of Asansol and they are credited with developing the city in late 19th century.

The cumulative effects of industries as well as other infrastructural development in the region has made an impact on the local environment.

5.4 Information on Pollution Sources Status in PIA

a.	Name of the Polluted Industrial Area	Asansol Area
b.	Demarcated Area of the PIA in Sq. Km	314.28 sq km
c.	Number of 17 Category Industries Covered under the area	16
d.	Number of Red Category Industry Covered under the area	78
e.	Total Human Population	Not available
f.	At least three criteria pollutants in each air, surface water and ground water	Air - PM_{10}, $PM_{2.5}$, SO_2, NO_x Surface Water - BOD, DO, Fecal Coliform Ground Water - Sulphate, Fluoride, Arsenic

Compliance Status of the Industries, Waste Management Facilities

Sl No.	Total Number of Units	Total Number of Units	Number of Units with inadequate facilities	Remarks if any
1.	Large Scale industries	23	Nil	

Sl No.	Total Number of Units	Total Number of Units	Number of Units with inadequate facilities	Remarks if any
2.	Medium and small-scale industries	71	Nil	
3.	CETPs	Nil	N.A.	Those units requiring ETP have installed the same
4.	TSDF	Nil	N.A.	Hazardous waste generated are disposed through common TSDF M/s West Bengal Waste Management Ltd. located at Haldia, Purba Medinipur which is beyond the Asansol PIA
5.	STPs	Nil	N.A.	Construction of STP of M/s IISCO Steel Plant and M/s Bengal Shrishti Infrastructure Ltd. are almost complete and same will be commissioned soon
6.	CBMWTF	Nil	N.A.	BMW is being disposed through M/s Medicare Environmental Management Pvt. Ltd. located at Managalpur, Ranigunj, Paschim Bardhaman which is beyond the Asansol PIA.
7.	MSW Management Facility	Nil	N.A.	Asansol Municipal Corporation is dumping their solid waste to municipal solid waste dumping ground.

5.5 Water Environment

Table 5.1: Present Status of Surface Water Quality at Asansol (Monitored by Third Party during February 2019)

Sl. No.	Parameter	Unit	Pond Water Near SDO office near Spandan Udyan, Asansol (Location Code: SW-1)	Pond Water at Hirapur, Asansol (Location Code: SW-2)	Damodar River Water Near Suryanagar, Asansol (Location Code: SW-3	Barakar River Water Near Kulti, Asansol (Location Code: SW-4)
1	Sanitary Survey	---	Bathing, Domestic Washing found & no Toilet system nearby	Bathing, Domestic Washing found & no Toilet system nearby	Bathing, Domestic Washing found & no Toilet system nearby	Bathing, Domestic Washing found & no Toilet nearby
2	General Appearance	---	Turbid	Turbid	Transparent	Transparent
3	Color	Hazen	<1.0	<1.0	<1.0	<1.0
4	Smell	---	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable

Sl. No.	Parameter	Unit	Pond Water Near SDO office near Spandan Udyan, Asansol (Location Code: SW-1)	Pond Water at Hirapur, Asansol (Location Code: SW-2)	Damodar River Water Near Suryanagar, Asansol (Location Code: SW-3	Barakar River Water Near Kulti, Asansol (Location Code: SW-4)
5	Transparency	cm	79	82	88	87
6	Ecological Survey	---	Present Insect/Fish	Present Insect/Fish	Present Insect/Fish	Present Insect/Fish
7	pH at 25 deg C	---	7.3	7.2	7.3	7.3
8	Oil Grease	mg/L	<1.0	<1.0	<1.0	<1.0
9	Suspended Solids	mg/L	16.33	11.33	9.33	8.67
10	DO (% of saturation)	---	6.6/83.6	6.3/82.3	7.9/95.0	7.9/95.6
11	COD	mg/L	10.84	11.15	6.69	8.60
12	BOD	mg/L	1.83	2.17	<1.0	<1.0
13	Electrical conductivity	µmhos/cm	773	664	297	461
14	TDS	mg/L	432	371	176	258
15	Nitrite-Nitrogen	mg/L	<0.005	<0.005	<0.005	<0.005
16	Nitrate-Nitrogen	mg/L	<0.5	<0.5	<0.5	3.85
17	Total Nitrogen (NO2+NO3)	mg/L	<0.5	<0.5	<0.5	3.85
18	Free Ammonia	mg/L	<0.05	<0.05	<0.05	<0.05
19	Total Residual Chlorine	mg/L	<0.05	<0.05	<0.05	<0.05
20	Cyanide	mg/L	<0.01	<0.01	<0.01	<0.01
21	Fluoride	mg/L	<0.05	<0.05	<0.05	0.17
22	Chloride	mg/L	48.37	40.98	14.46	30.69
23	Sulphate	mg/L	13.09	14.99	2.39	5.48
24	Sulphides	mg/L	<0.05	<0.05	<0.05	<0.05
25	Total Hardness	mg/L	185	164	85	143
26	Dissolved Phosphates (as P)	mg/L	<0.05	<0.05	<0.05	<0.05
27	Total Phosphorous	mg/L	<0.05	<0.05	<0.05	<0.05

Sl. No.	Parameter	Unit	Pond Water Near SDO office near Spandan Udyan, Asansol (Location Code: SW-1)	Pond Water at Hirapur, Asansol (Location Code: SW-2)	Damodar River Water Near Suryanagar, Asansol (Location Code: SW-3	Barakar River Water Near Kulti, Asansol (Location Code: SW-4)
	(as P)					
28	TKN	mg/L	<0.5	<0.5	<0.5	<0.5
29	Total Ammonia (NH4+NH3) - Nitrogen	mg/L	<0.05	<0.05	<0.05	<0.05
30	Phenols	mg/L	<0.001	<0.001	<0.001	<0.001
31	Surface Active Agents	mg/L	<0.10	<0.10	<0.10	<0.10
32	Hexavalent Chromium (Cr^{+6})	mg/L	<0.02	<0.02	<0.02	<0.02
33	Bioassay (Zebra Fish)	%	-	100% Survival of fish after 96 hours exposure in 100% Sample		
34	SAR	---	1.27	2.60	1.85	1.98
35	Zinc (Zn)	mg/L	0.003	0.009	0.007	0.005
36	Nickel (Ni)	mg/L	<0.001	<0.001	<0.001	<0.001
37	Copper (Cu)	mg/L	<0.001	<0.001	0.001	0.002
38	Chromium (Cr)	mg/L	<0.001	<0.001	<0.001	<0.001
39	Arsenic (As)	mg/L	0.002	0.002	0.002	0.005
40	Lead(Pb)	mg/L	<0.001	<0.001	<0.001	<0.001
41	Cadmium (Cd)	mg/L	<0.001	<0.001	<0.001	<0.001
42	Mercury (Hg)	mg/L	<0.001	<0.001	<0.001	<0.001
43	Managanese (Mn)	mg/L	<0.001	<0.001	<0.001	<0.001
44	Iron (Fe)	mg/L	0.003	0.007	0.005	0.005
45	Vanadium (V)	mg/L	0.001	0.001	0.001	0.001
46	Selenium (Se)	mg/L	<0.001	<0.001	<0.001	<0.001

Sl. No.	Parameter	Unit	Pond Water Near SDO office near Spandan Udyan, Asansol (Location Code: SW-1)	Pond Water at Hirapur, Asansol (Location Code: SW-2)	Damodar River Water Near Suryanagar, Asansol (Location Code: SW-3	Barakar River Water Near Kulti, Asansol (Location Code: SW-4)
47	Boron (B)	mg/L	0.030	0.029	0.029	0.022
48	Total Coliform	MPN/100 ml	9	13	21	22
49	Faecal Coliform	MPN/100 ml	2	2	6	6
50	Organo-Chlorine Pesticides	µg/L	<0.01	<0.01	<0.01	<0.01
51	PAH	µg/L	<0.01	<0.01	<0.01	<0.01
52	PCB	µg/L	<0.01	<0.01	<0.01	<0.01
53	PCT	µg/L	<0.01	<0.01	<0.01	<0.01

The major rivers are Damodar and Barakar. Other than these major rivers there are a number of nullahas of which the important ones are Nunia, Dihika, Damra and Gharui. The waste water generated at different sources are carried through the existing drainage network ultimately reaching the river Damodar.

Major source of various pollutants is Integrated Steel Plant at Burnpur. Other than effluent from the Integrated Steel Plant, some amount of effluent generated in the industrial area at Kanyapur also reaches river Damodar via Damra canal. The treated effluents of IISCO Steel plant and effluent generated at the township of IISCO is discharged to river Damodar through Damra & Dihika nullahs. Other industrial and domestic effluents of Asansol area are carried through Nunia & Gharui nullahs which leads to river Damodar.

About 40,000KLD of Industrial effluent is generated by the various process industries. Besides, about 20,000 KLD of municipal sewage arising out of the residential establishments is also generated.

5.6 Air Environment

Present Status of Ambient Air Quality at Asansol (Monitored by Third Party during February 2019)

Sl. No.	Location	Results	Concentration of Pollutants											
			PM 10 (µg/m³)	PM 2.5 (µg/m³)	SO2 (µg/m³)	NO2 (µg/m³)	Ammonia (µg/m³)	Lead (µg/m³)	Nickel (ng/m³)	Arsenic (ng/m³)	Benz (a)P (ng/m³)	CO (mg/m³)	OZONE (µg/m³)	Benzene (µg/m³)
1	PWD Executive Engg. Office (AAQM-1)	No. of Readings	9	3	18	18	18	9	9	9	9	72	72	3
		Max. Value	271	96	24.2	37.8	39.4	0.08	13.38	1.88	<0.5	1.11	<10.0	2.32
		Min Value	187	46	17.8	31.4	34.2	0.02	3.82	<0.5	<0.5	0.47	<10.0	<2.0
		Arithmetic Mean	237	77	20.4	34.3	36.5	0.05	7.57	1.06	<0.5	0.87	<10.0	2.21
2	IISCO Town office (AAQM-2)	No. of Readings	9	3	18	18	18	9	9	9	9	72	72	3
		Max. Value	343	54	24.5	38.9	44.0	0.09	15.83	2.14	<0.5	1.25	<10.0	2.22
		Min Value	148	38	17.5	33.2	37.6	0.03	5.45	<0.5	<0.5	0.45	<10.0	<2.0
		Arithmetic Mean	211	48	20.8	35.9	40.3	0.05	8.55	1.03	<0.5	0.86	<10.0	<2.0
3	Suryanagar High School (AAQM-3)	No. of Readings	9	3	18	18	18	9	9	9	9	72	72	3
		Max. Value	399	84	19.6	31.7	40.0	0.12	15.21	2.03	<0.5	1.34	<10.0	2.56
		Min Value	125	42	10.4	24.8	29.8	0.03	4.68	<0.5	<0.5	0.42	<10.0	<2.0
		Arithmetic Mean	243	68	13.8	28.0	35.3	0.06	9.44	1.34	<0.5	0.77	<10.0	2.46
4	Kulti Municipality office (AAQM-4)	No. of Readings	9	3	18	18	18	9	9	9	9	72	72	3
		Max. Value	550	93	21.7	38.2	39.7	0.07	13.47	1.72	<0.5	1.21	<10.0	2.84
		Min Value	131	35	15.2	31.7	34.8	0.03	4.71	<0.5	<0.5	0.42	<10.0	<2.0
		Arithmetic Mean	299	70	18.0	34.2	36.4	0.05	8.66	1.23	<0.5	0.88	<10.0	2.49

Predominant sources contributing to various pollutants are different industries like Integrated steel plants, Refractory manufacturing units, Sodium silicate manufacturing units, Cement plants, Bottling plants, Chemical unit, Paper manufacturing unit. Other than industrial pollution, vehicular

pollution and pollution generated form fossil fuel burning in domestic settlement also contribute to air pollution in a congested area like Asansol..

5.7 Land Environment (Soil and Ground Water)

Table 5.3: Present Status of Ground Water Quality at Asansol (Monitored by Third Party during February 2019)

Sl. No.	Parameter	Unit	Hand Pump Water near Suryanagar High School, Asansol (Baba Bhutnath Mandir) (Location Code:GW-1)	Hand Pump Water Near Burnpur Railway Station, Asansol (Location Code:GW-2)	Dug well water at Shanta Dangal Shibmandir, Asansol (Location Code:GW-3)	Hand Pump Water at Kulti Municipality Office, Asansol (Location Code:GW-4)
1	Sanitary Survey	---	Drainage system found & no Toilet nearby	Drainage system found & no Toilet nearby	Drainage system found & no Toilet nearby	Drainage system found & no Toilet nearby
2	General Appearance	---	Transparent	Transparent	Transparent	Transparent
3	Color	Hazen	<1.0	<1.0	<1.0	<1.0
4	Smell	---	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable
5	Transparency	cm	93	86	92	92
6	pH at 26 deg C	---	7.37	7.23	7.30	7.33
7	Oil Grease	mg/L	<1.0	<1.0	<1.0	<1.0
8	Suspended Solids	mg/L	<5.0	<5.0	<5.0	<5.0
9	COD	mg/L	9.24	16.57	11.15	11.15
10	BOD	mg/L	1.77	2.60	1.97	2.00
11	Electrical conductivity	µmhos/cm	640	2243	1105	1018
12	TDS	mg/L	362.33	1312.00	560.33	581.67
13	Nitrite-Nitrogen	mg/L	<0.005	<0.005	<0.005	<0.005
14	Nitrate-Nitrogen	mg/L	<0.5	6.16	4.33	<0.5
15	Total Nitrogen (NO2+NO3)	mg/L	<0.5	6.16	4.33	<0.5
16	Free Ammonia	mg/L	<0.05	<0.05	<0.05	<0.05
17	Total Residual Chlorine	mg/L	<0.05	<0.05	<0.05	<0.05
18	Cyanide	mg/L	<0.01	<0.01	<0.01	<0.01
19	Fluoride	mg/L	0.18	0.28	<0.05	<0.05
20	Chloride	mg/L	39.21	122.14	102.05	97.23

Sl. No.	Parameter	Unit	Hand Pump Water near Suryanagar High School, Asansol (Baba Bhutnath Mandir) (Location Code:GW-1)	Hand Pump Water Near Burnpur Railway Station, Asansol (Location Code:GW-2)	Dug well water at Shanta Dangal Shibmandir, Asansol (Location Code:GW-3)	Hand Pump Water at Kulti Municipality Office, Asansol (Location Code:GW-4)
21	Sulphate	mg/L	12.96	78.99	30.22	27.70
22	Sulphides	mg/L	<0.05	<0.05	<0.05	<0.05
23	Total Hardness	mg/L	96	1210	271	360
24	Dissolved Phosphates (as P)	mg/L	<0.05	<0.05	<0.05	<0.05
25	Total Phosphorous (as P)	mg/L	<0.05	<0.05	<0.05	<0.05
26	TKN	mg/L	<0.5	<0.5	<0.5	<0.50
27	Total Ammonia (NH4+NH3)	mg/L	<0.05	<0.05	<0.05	<0.05
28	Phenols	mg/L	<0.001	<0.001	<0.001	<0.001
29	Surface Active Agents	mg/L	<0.10	<0.10	<0.10	<0.10
30	Hexavalent Chromium (Cr^{+6})	mg/L	<0.02	<0.02	<0.02	<0.02
31	Bioassay (Zebra Fish)	%	-	-	-	100% Survival of fish after 96 hours exposure in 100% Sample
32	SAR	—	3.20	2.89	3.28	3.03
33	Zinc (Zn)	mg/L	<0.001	<0.001	<0.001	0.03
34	Nickel (Ni)	mg/L	<0.001	<0.001	<0.001	<0.001
35	Copper (Cu)	mg/L	<0.001	<0.001	<0.001	<0.001
36	Chromium (Cr)	mg/L	<0.001	<0.001	<0.001	<0.001
37	Arsenic (As)	mg/L	<0.001	0.002	<0.001	<0.001
38	Lead(Pb)	mg/L	<0.001	<0.001	<0.001	<0.001
39	Cadmium (Cd)	mg/L	<0.001	<0.001	<0.001	<0.001
40	Mercury (Hg)	mg/L	<0.001	<0.001	<0.001	<0.001
41	Managanese (Mn)	mg/L	0.136	<0.001	0.27	0.045
42	Iron (Fe)	mg/L	0.003	<0.001	0.003	<0.001
43	Vanadium (V)	mg/L	<0.001	<0.001	<0.001	<0.001
44	Selenium (Se)	mg/L	<0.001	<0.001	<0.001	<0.001
45	Boron (B)	mg/L	0.026	0.013	0.009	0.010
46	Total Coliform	MPN/100	<2	<2	<2	<2

Sl. No.	Parameter	Unit	Hand Pump Water near Suryanagar High School, Asansol (Baba Bhutnath Mandir) (Location Code:GW-1)	Hand Pump Water Near Burnpur Railway Station, Asansol (Location Code:GW-2)	Dug well water at Shanta Dangal Shibmandir, Asansol (Location Code:GW-3)	Hand Pump Water at Kulti Municipality Office, Asansol (Location Code:GW-4)
		ml				
47	Faecal Coliform	MPN/100 ml	<2	<2	<2	<2
48	Organo-Chlorine Pesticides	µg/L	<0.01	<0.01	<0.01	<0.01
49	PAH	µg/L	<0.01	<0.01	<0.01	<0.01
50	PCB	µg/L	<0.01	<0.01	<0.01	<0.01
51	PCT	µg/L	<0.01	<0.01	<0.01	<0.01

5.8 Action Plan for Asansol PIA

5.8.1 Name of the Industry: SAIL-IISCO Steel Plant, Burnpur

The industry has already implemented the following good practices for betterment of environmental quality of the area in addition to compliance with effluent and emission norms:

- Overall modernisation of the industry already undertaken
- Provided adequate equipment for dust suppression in various unit operations
- Construction of paved road
- Adequate greenbelt has been developed
- Installation of on-line monitoring system for emission and effluent generated
- Installation of Total 5 nos. of AAQMs [4 nos. inside plant & 1 no in Township]
- Training and Awareness Program for onsite emergency preparedness and environmental issues

Short Term Action Points (including continuous activities)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Implementation of ZLD	--	March 2020	Reduce effluent discharge and control of water pollution

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
2.	Construction of STP and utilization of treated wastewater	5 Crore	March 2020	Water conservation
3.	Provision for rain water harvesting	3.8 Crore	March 2020	Water conservation and utilization of natural resources

5.8.2 Name of Industry: India Power Corporation Limited (IPCL), Dishergarh Power Station (DPS).

The industry has already implemented the following good practices for betterment of environmental quality of the area in addition to compliance with effluent and emission norms:

- Paved roads have been constructed
- On-line monitoring system has been installed

Short Term Action Points (including continuous activities)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Provision for dust suppression system	3 Lakhs	March 2020	Improvement of Air Quality
2.	Development of greeneries	0.45 lakhs	March 2020	Reduction of dust emission in adjoining area
3.	Proper maintenance of drainage network	2.22 lakhs	March 2020	Prevent water logging and contamination

Medium Term Action Points (1 year – 3 years)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Development of additional greenbelt	1.5 Lakhs	December 2021	Reduction of dust emission in adjoining area

5.8.3 Name of the Industry: Impex Ferrotech Ltd.

Short Term Action Points (including continuous activities)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Installation of dust suppression system and upgradation of APCD	25 Lakhs	March 2020	Improvement of air quality
2.	Construction of paved road	5 lakhs	March 2020	Reduction in dust emission
3.	Development of additional greeneries by planting 1000 saplings	0.37 lakhs	November 2019	Reduction of dust emission in adjoining area
4.	Installation of on-line monitoring system	5 Lakhs	March 2020	Monitoring of emission on continuous basis

5.8.4 Name of the Industry: United Spirits Limited

Medium Term Action Points (1 year – 3 years)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Provision for dust suppression system	3 lakhs	June, 2020	Minimize dust emission in the working environment
2.	Green belt development	2 Lakhs	April, 2020	Control dust emission in adjoining areas
3.	Upgradation /modification of pollution control system	5 lakhs	June 2020	Minimise water pollution
4.	Maintenance of Drainage network	3 lakhs	December 2020	Prevent water logging and contamination

5.8.5 Name of the Industry: BMA Stainless Limited

The industry has already implemented the following good practices for betterment of environmental quality of the area in addition to compliance with effluent and emission norms:

- Installation of dust suppression system
- Ensure optimal use of natural resources for sustainable development

- Construction of Paved roads

Short Term Action Points (including continuous activity)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Upgradation /Modification of pollution control system	30 lakhs	June 2019	Improvement of air quality

Medium Term Action Points (1 year – 3 years)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Development and maintenance of additional greeneries	1.5 lakhs	March 2022	Control dust emission in adjoining areas

5.8.6 Name of the Industry: Great Eastern Energy Corporation Ltd.

The industry has already implemented the following good practices for betterment of environmental quality of the area in addition to compliance with effluent and emission norms:

Short Term Action Points (including continuous activity)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Compliance of 'Consent' conditions	10.5 Lakhs	Continuous activity (upto March 2020)	Maintenance of environmental norms

Medium Term Action Points (1 year – 3 years)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Development and maintenance of additional greeneries	1.32 lakhs	March 2022	Control dust emission in adjoining areas

5.8.7 Name of the Industry: Bejdih Colliery

Short Term Action Points (including continuous activity)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Provision for water sprinkling and dust mitigation	36 Lakhs	Continuous activity (upto March 2020)	Improvement of air quality
2.	Construction of paved road	1.5 Crore	March 2020	Reduction in dust emission due to vehicular movement
3.	Development of additional greeneries	20.61 lakhs	March 2020	Control dust emission in adjoining areas

5.8.8 Name of the Industry: Chinakuri 1/2 Pits Colliery

Short Term Action Points (including continuous activity)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Provision for water sprinkling and dust mitigation	36 Lakhs	Continuous activity (upto March 2020)	Improvement of air quality
2.	Construction of paved road	1.5 Crore	March 2020	Reduction in dust emission due to vehicular movement
3.	Development of additional greeneries	16.48 lakhs	March 2020	Control dust emission in adjoining areas

5.8.9 Name of the Industry: Chinakuri 3 Pits Colliery

Short Term Action Points (including continuous activity)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Provision for water sprinkling and dust mitigation	56 Lakhs	Continuous activity (upto March 2020)	Improvement of air quality
2.	Construction of paved road	1.5 Crore	March 2020	Reduction in dust emission due to vehicular movement
3.	Development of additional greeneries	41.22 lakhs	March 2020	Control dust emission in adjoining areas

5.8.10 Name of the Industry: Dhemomain Colliery

Short Term Action Points (including continuous activity)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Provision for water sprinkling and dust mitigation	56 Lakhs	Continuous activity (upto March 2020)	Improvement of air quality
2.	Construction of paved road	1.5 Crore	March 2020	Reduction in dust emission due to vehicular movement
3.	Development of additional greeneries	43.28 lakhs	March 2020	Control dust emission in adjoining areas

5.8.11 Name of the Industry: Sodepur Colliery

Short Term Action Points (including continuous activity)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Provision for water sprinkling and dust mitigation	56 Lakhs	Continuous activity (upto March 2020)	Improvement of air quality
2.	Construction of paved road	1.5 Crore	March 2020	Reduction in dust emission due to vehicular movement
3.	Development of additional greeneries	30.91 lakhs	March 2020	Control dust emission in adjoining areas

5.8.12 Name of the Industry: Ramnagar Colliery, SAIL

Short Term Action Points (including continuous activity)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Provision for water sprinkling and dust mitigation	5.67 Lakhs	Continuous activity (upto March 2020)	Improvement of air quality
2.	Construction of paved road	0.83 Lakhs	July 2019	Reduction in dust emission due to vehicular movement
3.	Development of additional greeneries	3.96 lakhs	March 2020	Control dust emission in adjoining areas

Medium Term Action Points (1-3 Years)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Training and awareness on environmental issues and emergency preparedness	1 lakh	March 2022	Proper management and control of environmental pollution
2.	Development of Green belt	12 lakhs	March 2022	Reduction of dust emission in adjoining areas
3.	Monitoring of ambient air quality	7.64 Lakhs	May 2020	Monitoring of air quality

5.8.13 Name of the Stakeholder : Asansol Durgapur Development Authority

Short and Medium Term Action Points

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Development of green belt and maintenance of waterbodies	14.43 Crores	March 2020	Improvement of overall air quality and biodiversity
2.	Improvement of road condition, construction of fly over, truck terminals and parking facilities	3.86 Crores	March 2022	Improvement of traffic movement thereby improvement of air quality

As per action plan of Asansol PIA, a total amount of Rupees 42.16 Crores has been earmarked for execution of various environmental improvement activities by large industries, Asansol Durgapur Development Authority by March 2022.

ACTION PLAN FOR POLLUTED INDUSTRIAL AREA, DURGAPUR

6. ACTION PLAN FOR POLLUTED INDUSTRIAL AREA, DURGAPUR

6.1 Area Details

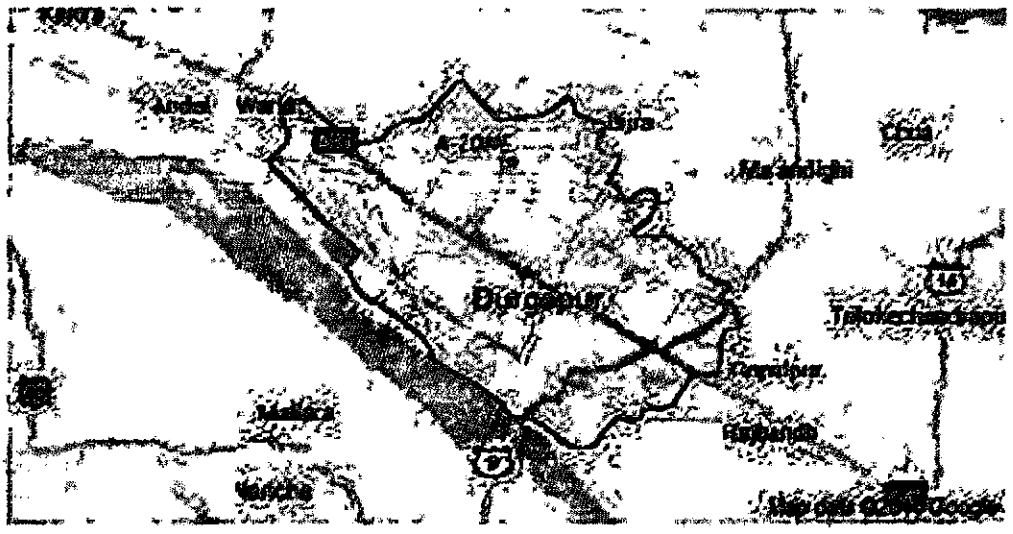
Durgapur is the third largest urban agglomeration after Kolkata and Asansol in West Bengal and happens to be the second planned city in India after Chandigarh. Durgapur is situated on the bank of the Damodar River, just before it enters the alluvial plains of Bengal. Durgapur is by far the most industrialized city in eastern India. Major industries located in Durgapur are steel based and coal-based power plants. Large graphite electrode manufacturing, carbon black producing units and cement Plants are situated in Durgapur

6.2 Location

Durgapur is located at 23.55°N latitude 87.32°E longitude. It has an average elevation of 65 metres MSL.

6.3 Boundary of Durgapur PIA (Durgapur Municipal Corporation)

Figure 6.1 : Map of Durgapur PIA



6.4 Information on Pollution Sources Status in PIA

g.	Name of the Polluted Industrial Area	Durgapur, (Durgapur Municipal Corporation Area)
h.	Demarcated Area of the PIA in Sq. Km	154. Most of the industrial establishments are located at Raturia-Angadpur Industrial area within DMC
i.	Number of 17 Category Industries Covered under the area	28
j.	Number of Red Category Industry Covered under the area	38
k.	Total Human Population	5,63,557 (As per census 2011, data obtained from DMC)
l.	At least three criteria pollutants in each air, surface water and ground water	Air - PM_{10}, $PM_{2.5}$, SO_2, NO_x Surface Water - BOD, DO, Fecal Coliform Ground Water - Sulphate, Fluoride, Arsenic

Compliance Status of the Industries, Waste Management Facilities

Sl No.	Total Number of Units	Total Number of Units	Number of Units with inadequate facilities	Remarks if any
1.	Large Scale industries	33	Nil	-
2.	Medium and small-scale industries	33	Nil	-
3.	CETPs	Nil	Nil	Individual Industries have ETP and effluent generated are treated in ETP before discharge
4.	TSDF	Nil	Nil	Hazardous waste generated are disposed through common TSDF located at Haldia
5.	STPs	04	Nil	i) Township of Durgapur Steel Plant ii) Township of Durgapur Projects Limited iii)Township of Durgapur Thermal Power Station iv)Durgapur Municipal Corporation
6.	CBMWTF	Nil	Nil	Bio medical waste generated in the area are treated and disposed at nearby CBMWTF located approximately 20 km from Durgapur

Sl No.	Total Number of Units	Total Number of Units	Number of Units with inadequate facilities	Remarks if any
7.	MSW Management Facility	01	Nil	

Table 6.1: Present Status of Ambient Air Quality Monitoring at Durgapur (Monitored by Third Party during February 2019)

Sl. No.	Location	Concentration of pollutants												
		Results	PM10 (µg/m³)	PM2.5 (µg/m³)	SO2 (µg/m³)	NO2 (µg/m³)	Ammonia (µg/m³)	Lead (µg/m³)	Nickel (ng/m³)	Arsenic (ng/m³)	Benz(a)P (ng/m³)	CO (mg/m³)	Ozone (µg/m³)	Benzene (µg/m³)
1.	Alstom Directorate at EDC Club AAQM-1	No. of Reading	9	3	18	18	18	9	9	9	9	72	72	3
		Max. Value	156	34	23.2	35.7	39.2	0.08	10.30	1.14	<0.5	0.96	<10.0	<2.0
		Min Value	74	22	8.0	24.0	30.0	0.02	1.59	<0.5	<0.5	0.37	<10.0	<2.0
		Arithmetic Value	116	26	16.1	30.1	34.5	0.04	6.01	0.84	<0.5	0.73	<10.0	<2.0
2.	DSTV Office AAQM-2	No. of Reading	9	3	18	18	18	9	9	9	9	72	72	3
		Max. Value	424	102	21.4	35.2	41.4	0.08	11.33	1.04	<0.5	1.14	<10.0	2.23
		Min Value	150	89	12.0	25.0	30.0	0.03	3.90	<0.5	<0.5	0.54	<10.0	<2.0
		Arithmetic Value	262	96	16.7	31.8	36.6	0.04	6.68	0.79	<0.5	0.78	<10.0	<2.0
3.	DTPS Directorate Bungalow AAQM-3	No. of Reading	9	3	18	18	18	9	9	9	9	72	72	3
		Max. Value	255	87	25.0	34.4	45.6	0.07	10.47	1.19	<0.5	1.12	<10.0	2.37
		Min Value	120	52	14.3	22.8	30.0	0.02	1.40	<0.5	<0.5	0.37	<10.0	<2.0
		Arithmetic Value	166	68	20.2	29.0	36.1	0.04	4.75	<0.5	<0.5	0.77	<10.0	<2.0
4.	Durgapur DPL Township AAQM-4	No. of Reading	9	3	18	18	18	9	9	9	9	72	72	3
		Max. Value	270	97	24.5	35.2	44.2	0.05	8.40	<0.5	<0.5	1.14	<10.0	2.74
		Min Value	129	53	12.0	27.5	33.0	0.02	2.82	<0.5	<0.5	0.59	<10.0	<2.0
		Arithmetic Value	194	80	17.8	31.6	38.4	0.04	5.13	<0.5	<0.5	0.85	<10.0	<2.0
5.	IQ City Hospital AAQM-5	No. of Reading	9	3	18	18	18	9	9	9	9	72	72	3
		Max. Value	264	93	22.0	35.6	42.2	0.08	10.73	0.92	<0.5	1.12	<10.0	2.68
		Min Value	139	72	11.0	19.0	29.0	0.02	0.48	<0.5	<0.5	0.37	<10.0	<2.0
		Arithmetic Value	212	85	15.9	29.8	35.7	0.04	5.48	<0.5	<0.5	0.78	<10.0	2.46
6.	Kwality Hotel Near Bhiringi More AAQM-6	No. of Reading	9	3	18	18	18	9	9	9	9	72	72	3
		Max. Value	298	102	22.6	42.7	44.1	0.08	10.85	1.11	<0.5	1.23	<10.0	2.42
		Min Value	145	72	15.0	30.6	23.9	0.03	3.12	<0.5	<0.5	0.57	<10.0	<2.0
		Arithmetic Value	209	85	19.3	36.8	37.6	0.05	6.42	0.76	<0.5	0.83	<10.0	2.25
7.	Mahanand a cancer Diagnostic & Welfare	No. of Reading	9	3	18	18	18	9	9	9	9	72	72	3
		Max. Value	179	50	21.4	40.4	43.3	0.08	10.78	1.18	<0.5	1.23	<10.0	<2.0
		Min Value	123	39	12.4	29.6	33.3	0.03	2.62	<0.5	<0.5	0.56	<10.0	<2.0
		Arithmetic Value	152	45	17.4	33.8	37.8	0.05	9.0	0.80	<0.5	0.85	<10.0	<2.0
8.	WBPCB Stuff Quater AAQM-8	No. of Reading	9	3	18	18	18	9	9	9	9	72	72	3
		Max. Value	290	92	19.0	35.0	37.2	0.08	10.82	1.12	<0.5	1.13	<10.0	2.67
		Min Value	120	66	8.0	24.0	30.0	0.03	2.77	<0.5	<0.5	0.57	<10.0	<2.0
		Arithmetic Value	198	80	14.1	29.1	33.0	0.05	6.53	0.88	<0.5	0.82	<10.0	<2.0

Table 6.2: Present Status of Surface Water Quality of Durgapur (Monitored by Third Party during February 2019) (SW 1 - SW 4)

Sl. No.	Parameter	Unit	Damodar River Water Durgapur Barrage (Up Stream) (Location Code- SW-1)	Cannel Water at Raturia, Durgapur (Location Code- SW-2)	Cannel Water near ASP Gate, Durgapur (Location Code- SW-3)	Paddwapukur Pond Water near Mamra Bazar, Durgapur (Location Code- SW-4)
1	Sanitary Survey	----	Bathing, Domestic washing found & no Toilet system nearby	Drainage system & Toilet found nearby	Drainage system & Toilet found nearby	Bathing, Domestic washing found & no Toilet system nearby
2	General appearance	-----	Transparent	Turbid	Turbid	Turbid
3	Colour	Hazen	<1.0	<1.0	<1.0	4
4	Smell	----	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable
5	Transparency	Cm	94	84	82	68
6	Ecological Survey	-----	Present Insect/ Fish	Present Insect/ Fish	Present Insect/ Fish	Present Insect/ Fish
7	pH at 25 deg C	----	7.3	7.2	7.3	7.3
8	Oil & Grease	mg/L	<1.0	<1.0	<1.0	<1.0
9	Suspended solids	mg/L	10	12	35	40
10	DO (% of saturation)	-----	7.8/95.0	6.6/83.0	6.4/85.0	5.8/73.0
11	COD	mg/L	6.69	10.52	21.03	18.16
12	BOD	mg/L	<1.0	1.8	2.8	2.6
13	Electrical Conductivity	µmhos/ cm	365	374	697	716
14	TDS	mg/L	204	218	408	415
15	Nitrite-Nitrogen	mg/L	<0.005	<0.005	<0.005	<0.005
16	Nitrate-Nitrogen	mg/L	<0.5	3.82	7.62	4.16

Sl. No.	Parameter	Unit	Damodar River Water Durgapur Barrage (Up Stream) (Location Code- SW-1)	Cannel Water at Raturia, Durgapur (Location Code- SW-2)	Cannel Water near ASP Gate, Durgapur (Location Code- SW-3)	Paddwapukur Pond Water near Mamra Bazar, Durgapur (Location Code- SW-4)
17	Total Nitrogen (NO2+NO)	mg/L	<0.5	3.82	7.62	4.16
18	Free Ammonia	mg/L	<0.05	<0.05	<0.05	<0.05
19	Total Residual Chlorine	mg/L	<0.05	<0.05	<0.05	<0.05
20	Cyanide	mg/L	<0.01	<0.01	<0.01	<0.01
21	Fluoride	mg/L	<0.05	<0.05	<0.05	<0.05
22	Chloride	mg/L	22.66	34.71	62.68	84.37
23	Sulphate	mg/L	6.72	9.03	10.95	20.34
24	Sulphides	mg/L	<0.05	<0.05	<0.05	<0.05
25	Total hardness	mg/L	108	116	160	166
26	Dissolved Phosphate (as P)	mg/L	<0.05	<0.05	<0.05	<0.05
27	Total Phosphorous (as P)	mg/L	<0.05	<0.05	<0.05	<0.05
28	TKN	mg/L	<0.5	<0.5	<0.5	<0.5
29	Total Ammonia (NH4+NH3)	mg/L	<0.05	<0.05	<0.05	<0.05
30	Phenols	mg/L	<0.001	<0.001	<0.001	<0.001
31	Surface Active Agents	mg/L	<0.10	<0.10	<0.10	<0.10
32	Hexavalent Chromium (Cr^{+6})	mg/L	<0.02	<0.02	<0.02	<0.02
33	Bioassay (Zebra fish)	%	------	-------	------	100% survival of fish after 96hours exposure in 100% Sample.

Sl. No.	Parameter	Unit	Damodar River Water Durgapur Barrage (Up Stream) (Location Code- SW-1)	Cannel Water at Raturia, Durgapur (Location Code- SW-2)	Cannel Water near ASP Gate, Durgapur (Location Code- SW-3)	Paddwapukur Pond Water near Mamra Bazar, Durgapur (Location Code- SW-4)
34	SAR	----	1.48	1.54	2.83	3.19
35	Zinc (Zn)	mg/L	<0.001	<0.001	<0.001	<0.001
36	Nickel (Ni)	mg/L	0.001	0.001	0.002	0.002
37	Copper (Cu)	mg/L	<0.001	<0.001	<0.001	<0.001
38	Chromium (Cr)	mg/L	<0.001	<0.001	<0.001	<0.001
39	Arsenic (As)	mg/L	<0.001	0.005	0.004	0.002
40	Lead (Pb)	mg/L	<0.001	<0.001	<0.001	<0.001
41	Cadmium (Cd)	mg/L	<0.001	<0.001	<0.001	<0.001
42	Mercury (Hg)	mg/L	<0.001	<0.001	<0.001	<0.001
43	Managanese (Mn)	mg/L	0.001	0.002	0.002	0.018
44	Iron (Fe)	mg/L	0.006	0.007	0.011	0.157
45	Vanadium (V)	mg/L	0.001	0.001	0.001	<0.001
46	Selenium (Se)	mg/L	<0.001	<0.001	<0.001	<0.001
47	Boron (B)	mg/L	0.011	0.012	0.023	0.015
48	Total Coliform	MPN/100ml	70	50	30	110
49	Faecal Coliform	MPN/100ml	<2	<2	<2	4
50	Organo-Chlorine	µg/L	<0.01	<0.01	<0.01	<0.01
51	PAH	µg/L	<0.01	<0.01	<0.01	<0.01
52	PCB	µg/L	<0.01	<0.01	<0.01	<0.01
53	PCT	µg/L	<0.01	<0.01	<0.01	<0.01

Table 6.2 Contd.....Present Status of Surface Water Quality of Durgapur (Monitored by Third Party during February 2019) (SW 5 - SW 8)

Sl. No.	Parameter	Unit	Pond Water at DSP Township, Durgapur (Location Code- SW-5)	Pond water at Muchipara, Durgapur (Location Code- SW-6)	Intake Reservoir of DSP & NSPCL, Durgapur (Location Code- SW-7)	Outfall of DSP, DVC & DTPS near Damodar River, Durgapur (Location Code- SW-8)
1	Sanitary Survey	----	Bathing, Domestic washing found & no Toilet system nearby	Bathing, Domestic washing found & no Toilet system nearby	Drainage system & Toilet not found nearby	Drainage system found & Toilet not found nearby
2	General appearance	----	Turbid	Turbid	Turbid	Turbid
3	Colour	Hazen	<1.0	<1.0	<1.0	<1.0
4	Smell	----	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable
5	Transparency	Cm	80	75	85	82
6	Ecological Survey	-----	Present Insect/ Fish	Present Insect/ Fish	Present Insect/ Fish	Present Insect/ Fish
7	pH at 25 deg C	----	7.4	7.5	7.4	7.2
8	Oil & Grease	mg/L	<1.0	<1.0	<1.0	<1.0
9	Suspended solids	mg/L	22	20	18	15
10	DO (% of saturation)	-----	6.3/83.0	6.7/85.0	6.7/83.0	6.7/83.0
11	COD	mg/L	9.56	12.43	11.47	24.86
12	BOD	mg/L	1.6	1.3	2.2	2.4
13	Electrical Conductivity	µmhos /cm	910	400	410	671
14	TDS	mg/L	516	225	236	392
15	Nitrite-Nitrogen	mg/L	<0.005	<0.005	<0.005	<0.005
16	Nitrate-Nitrogen	mg/L	4.48	2.1	3.16	4.1

Sl. No.	Parameter	Unit	Pond Water at DSP Township, Durgapur (Location Code- SW-5)	Pond water at Muchipara, Durgapur (Location Code- SW-6)	Intake Reservoir of DSP & NSPCL, Durgapur (Location Code- SW-7)	Outfall of DSP, DVC & DTPS near Damodar River, Durgapur (Location Code- SW-8)
17	Total Nitrogen (NO2+NO3)	mg/L	4.48	2.1	3.16	4.1
18	Free Ammonia	mg/L	<0.05	<0.05	<0.05	<0.05
19	Total Residual Chlorine	mg/L	<0.05	<0.05	<0.05	<0.05
20	Cyanide	mg/L	<0.01	<0.01	<0.01	<0.01
21	Fluoride	mg/L	<0.05	<0.05	<0.05	<0.05
22	Chloride	mg/L	86.78	43.39	25.07	43.39
23	Sulphate	mg/L	25.45	9.36	7.48	10.15
24	Sulphides	mg/L	<0.05	<0.05	<0.05	<0.05
25	Total hardness	mg/L	150	86	124	190
26	Dissolved Phosphate (as P)	mg/L	<0.05	<0.05	<0.05	<0.05
27	Total Phosphorous (as P)	mg/L	<0.05	<0.05	<0.05	<0.05
28	TKN	mg/L	<0.5	<0.5	<0.5	<0.5
29	Total Ammonia (NH4+NH3)	mg/L	<0.05	<0.05	<0.05	<0.05
30	Phenols	mg/L	<0.001	<0.001	<0.001	<0.001
31	Surface Active Agents	mg/L	<0.10	<0.10	<0.10	<0.10
32	Hexavalent Chromium (Cr^{+6})	mg/L	<0.02	<0.02	<0.02	<0.02
33	Bioassay (Zebra fish)	%	100% Survival of fish after 96hours exposure in 100% Sample.	------	------	-------

Sl. No.	Parameter	Unit	Pond Water at DSP Township, Durgapur (Location Code- SW-5)	Pond water at Muchipara, Durgapur (Location Code- SW-6)	Intake Reservoir of DSP & NSPCL, Durgapur (Location Code- SW-7)	Outfall of DSP, DVC & DTPS near Damodar River, Durgapur (Location Code- SW-8)
34	SAR	----	5.03	2.90	1.58	2.79
35	Zinc (Zn)	mg/L	<0.001	<0.001	<0.001	<0.001
36	Nickel (Ni)	mg/L	0.003	0.001	0.001	0.002
37	Copper (Cu)	mg/L	<0.001	<0.001	<0.001	0.001
38	Chromium (Cr)	mg/L	<0.001	<0.001	<0.001	<0.001
39	Arsenic (As)	mg/L	0.078	0.005	0.004	0.004
40	Lead (Pb)	mg/L	<0.001	<0.001	<0.001	<0.001
41	Cadmium (Cd)	mg/L	<0.001	<0.001	<0.001	<0.001
42	Mercury (Hg)	mg/L	<0.001	<0.001	<0.001	<0.001
43	Managanese (Mn)	mg/L	0.0018	0.003	0.005	0.002
44	Iron (Fe)	mg/L	0.082	0.021	0.005	0.017
45	Vanadium (V)	mg/L	0.001	0.001	0.001	0.006
46	Selenium (Se)	mg/L	<0.001	<0.001	<0.001	0.001
47	Boron (B)	mg/L	0.031	0.009	0.014	0.031
48	Total Coliform	MPN/ 100ml	130	90	40	23
49	Faecal Coliform	MPN/ 100ml	4	2	<2	<2
50	Organo-Chlorine	µg/L	<0.01	<0.01	<0.01	<0.01
51	PAH	µg/L	<0.01	<0.01	<0.01	<0.01
52	PCB	µg/L	<0.01	<0.01	<0.01	<0.01
53	PCT	µg/L	<0.01	<0.01	<0.01	<0.01

Table 6.3: Present Status of Ground Water Quality of Durgapur (Monitored by Third Party during February 2019) (GW 1 - GW 4)

Sl. No.	Parameter	Unit	Dug Well at Palashdiha, Durgapur (Location Code- GW-1)	Dug Well at Banachity Football Ground, Durgapur (Location Code- GW-2)	Hand Pump at Arjunpur Kali Mandir, Durgapur (Location Code- GW-3)	Hand Pump at DPL Basti, Bidhannagar, Durgapur (Location Code- GW-4)
1	Sanitary Survey	----	Drainage system found & no Toilet nearby	Drainage system found & no Toilet nearby	Drainage system found & no Toilet nearby	Drainage system found & no Toilet nearby
2	General appearance	----	Transparent	Transparent	Transparent	Transparent
3	Colour	Hazen	<1.0	<1.0	<1.0	<1.0
4	Smell	----	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable
5	Transparency	Cm	90	90	92	90
6	pH at 26 deg C	----	7.2	7.3	7.3	7.2
7	Oil & Grease	mg/L	<1.0	<1.0	<1.0	<1.0
8	Suspended solids	mg/L	<5.0	<5.0	<0.5	<0.5
9	COD	mg/L	9.56	7.65	8.6	9.56
10	BOD	mg/L	<1.0	<1.0	<1.0	1.4
13	Electrical Conductivity	µmhos/cm	560	950	807	504
14	TDS	mg/L	308	552	463	285
13	Nitrite-Nitrogen	mg/L	<0.005	<0.005	<0.005	<0.005
14	Nitrate-Nitrogen	mg/L	10.32	2.16	<0.5	1.58
15	Total Nitrogen (NO2+NO3)	mg/L	10.32	2.16	<0.5	1.58
16	Free Ammonia	mg/L	<0.05	<0.05	<0.05	<0.05

Sl. No.	Parameter	Unit	Dug Well at Palashdiha, Durgapur (Location Code- GW-1)	Dug Well at Banachity Football Ground, Durgapur (Location Code- GW-2)	Hand Pump at Arjunpur Kali Mandir, Durgapur (Location Code- GW-3)	Hand Pump at DPL Basti, Bidhannagar, Durgapur (Location Code- GW-4)
17	Total Residual Chlorine	mg/L	<0.05	<0.05	<0.05	<0.05
18	Cyanide	mg/L	<0.01	<0.01	<0.01	<0.01
19	Fluoride	mg/L	<0.05	<0.05	<0.05	<0.05
20	Chloride	mg/L	96.42	110.89	40.02	53.03
21	Sulphate	mg/L	31.9	29.58	12.46	14.9
22	Sulphides	mg/L	<0.05	<0.05	<0.05	<0.05
23	Total hardness	mg/L	150	194	370	112
24	Dissolved Phosphate (as P)	mg/L	<0.05	<0.05	<0.05	<0.05
25	Total Phosphorous (as P)	mg/L	<0.05	<0.05	<0.05	<0.05
26	TKN	mg/L	<0.5	<0.5	<0.5	<0.5
27	Total Ammonia (NH4+NH3)	mg/L	<0.05	<0.05	<0.05	<0.05
28	Phenols	mg/L	<0.001	<0.001	<0.001	<0.001
29	Surface Active Agents	mg/L	<0.10	<0.10	<0.10	<0.10
30	Hexavalent Chromium (Cr^{+6})	mg/L	<0.02	<0.02	<0.02	<0.02
31	Bioassay (Zebra fish)	%	------	100% Survival of fish after 96hours exposure in 100%Sample.	------	------
32	SAR	----	2.03	3.99	1.32	1.71
33	Zinc (Zn)	mg/L	0.242	0.058	0.029	0.015
34	Nickel (Ni)	mg/L	0.026	0.004	0.004	0.002

Sl. No.	Parameter	Unit	Dug Well at Palashdiha, Durgapur (Location Code- GW-1)	Dug Well at Banachity Football Ground, Durgapur (Location Code- GW-2)	Hand Pump at Arjunpur Kali Mandir, Durgapur (Location Code- GW-3)	Hand Pump at DPL Basti, Bidhannagar, Durgapur (Location Code- GW-4)
35	Copper (Cu)	mg/L	<0.001	<0.001	<0.001	<0.001
36	Chromium (Cr)	mg/L	<0.001	<0.001	<0.001	<0.001
37	Arsenic (As)	mg/L	<0.001	<0.001	<0.001	<0.001
38	Lead (Pb)	mg/L	<0.001	<0.001	<0.001	<0.001
39	Cadmium (Cd)	mg/L	<0.001	<0.001	<0.001	<0.001
40	Mercury (Hg)	mg/L	<0.001	<0.001	<0.001	<0.001
41	Managanese (Mn)	mg/L	0.164	0.022	2.237	0.169
42	Iron (Fe)	mg/L	0.003	0.001	0.069	0.012
43	Vanadium (V)	mg/L	0.001	0.002	<0.001	<0.001
44	Selenium (Se)	mg/L	<0.001	<0.001	<0.001	<0.001
45	Boron (B)	mg/L	0.025	0.021	0.021	<0.001
46	Total Coliform	MPN/100 ml	<2	<2	<2	<2
47	Faecal Coliform	MPN/100 ml	<2	<2	<2	<2
48	Organo-Chlorine	µg/L	<0.01	<0.01	<0.01	<0.01
49	PAH	µg/L	<0.01	<0.01	<0.01	<0.01
50	PCB	µg/L	<0.01	<0.01	<0.01	<0.01
51	PCT	µg/L	<0.01	<0.01	<0.01	<0.01

Table 6.3 Contd....Present Status of Ground Water Quality of Durgapur (Monitored by Third Party during February 2019) (GW 5 – GW 8)

Sl. No.	Parameter	Unit	Dug Well at DSP Township, Durgapur (Location Code- GW-5)	Hand Pump at DPL Township, Durgapur (Location Code- GW-6)	Dug Well at Bhiringi Kali Mandir, Durgapur (Location Code- GW-7)	Hand Pump at City Centre Kali Bari, Durgapur (Location Code- GW-8)
1	Sanitary Survey	----	Drainage system found & no Toilet nearby	Drainage system found & no Toilet nearby	Drainage system found & no Toilet nearby	Drainage system found & no Toilet nearby
2	General appearance	----	Transparent	Transparent	Transparent	Transparent
3	Colour	Hazen	<1.0	<1.0	<1.0	<1.0
4	Smell	----	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable
5	Transparency	Cm	88	84	94	90
6	pH at 26 deg C	----	7.2	7.3	7.2	7.3
7	Oil & Grease	mg/L	<1.0	<1.0	<1.0	<1.0
8	Suspended solids	mg/L	<5.0	<5.0	<0.5	<0.5
9	COD	mg/L	12.43	11.47	9.56	10.52
10	BOD	mg/L	1.6	1.8	<1.0	1.3
13	Electrical Conductivity	µmhos/ cm	340	445	564	318
14	TDS	mg/L	190	256	328	182
13	Nitrite-Nitrogen	mg/L	<0.005	<0.005	<0.005	<0.005
14	Nitrate-Nitrogen	mg/L	2.1	1.02	1.92	1.58
15	Total Nitrogen (NO2+NO3)	mg/L	2.1	1.02	1.92	1.58
16	Free Ammonia	mg/L	<0.05	<0.05	<0.05	<0.05

Sl. No.	Parameter	Unit	Dug Well at DSP Township, Durgapur (Location Code- GW-5)	Hand Pump at DPL Township, Durgapur (Location Code- GW-6)	Dug Well at Bhiringi Kali Mandir, Durgapur (Location Code- GW-7)	Hand Pump at City Centre Kali Bari, Durgapur (Location Code- GW-8)
17	Total Residual Chlorine	mg/L	<0.05	<0.05	<0.05	<0.05
18	Cyanide	mg/L	<0.01	<0.01	<0.01	<0.01
19	Fluoride	mg/L	<0.05	<0.05	<0.05	<0.05
20	Chloride	mg/L	50.62	60.27	51.1	40.02
21	Sulphate	mg/L	12.75	13.4	18.26	12.43
22	Sulphides	mg/L	<0.05	<0.05	<0.05	<0.05
23	Total hardness	mg/L	70	220	156	80
24	Dissolved Phosphate (as P)	mg/L	<0.05	<0.05	<0.05	<0.05
25	Total Phosphorous (as P)	mg/L	<0.05	<0.05	<0.05	<0.05
26	TKN	mg/L	<0.5	<0.5	<0.5	<0.5
27	Total Ammonia (NH4+NH3)	mg/L	<0.05	<0.05	<0.05	<0.05
28	Phenols	mg/L	<0.001	<0.001	<0.001	<0.001
29	Surface Active Agents	mg/L	<0.10	<0.10	<0.10	<0.10
30	Hexavalent Chromium (Cr^{+6})	mg/L	<0.02	<0.02	<0.02	<0.02
31	Bioassay (Zebra fish)	%	100% survival of fish after 96hours exposure in 100%Sample.	------	-------	----
32	SAR	----	2.78	1.79	2.16	2.34
33	Zinc (Zn)	mg/L	0.107	0.032	0.024	0.009
34	Nickel (Ni)	mg/L	0.002	0.002	0.002	0.002

Sl. No.	Parameter	Unit	Dug Well at DSP Township, Durgapur (Location Code- GW-5)	Hand Pump at DPL Township, Durgapur (Location Code- GW-6)	Dug Well at Bhiringi Kali Mandir, Durgapur (Location Code- GW-7)	Hand Pump at City Centre Kali Bari, Durgapur (Location Code- GW-8)
35	Copper (Cu)	mg/L	<0.001	<0.001	0.001	<0.001
36	Chromium (Cr)	mg/L	<0.001	<0.001	<0.001	<0.001
37	Arsenic (As)	mg/L	<0.001	<0.001	<0.001	0.008
38	Lead (Pb)	mg/L	<0.001	<0.001	<0.001	<0.001
39	Cadmium (Cd)	mg/L	<0.001	<0.001	<0.001	<0.001
40	Mercury (Hg)	mg/L	<0.001	<0.001	<0.001	<0.001
41	Managanese (Mn)	mg/L	0.072	1.068	0.198	0.047
42	Iron (Fe)	mg/L	0.014	0.036	0.007	0.018
43	Vanadium (V)	mg/L	<0.001	<0.001	0.001	<0.001
44	Selenium (Se)	mg/L	<0.001	<0.001	<0.001	<0.001
45	Boron (B)	mg/L	<0.001	0.014	0.022	0.007
46	Total Coliform	MPN/100ml	<2	<2	<2	<2
47	Faecal Coliform	MPN/100ml	<2	<2	<2	<2
48	Organo-Chlorine	µg/L	<0.01	<0.01	<0.01	<0.01
49	PAH	µg/L	<0.01	<0.01	<0.01	<0.01
50	PCB	µg/L	<0.01	<0.01	<0.01	<0.01
51	PCT	µg/L	<0.01	<0.01	<0.01	<0.01

6.5 Action Plan for Durgapur PIA

6.5.1 Name of the Industry: Durgapur Steel Plant, SAIL

The industry has already implemented the following good practices for betterment of environmental quality of the area in addition to compliance with effluent and emission norms:

- Installed Dust Suppression Systems
- Complying with EC/NOC norms
- All internal roads are paved
- Installed on-line stack emission monitoring systems, continuous ambient air quality monitoring and effluent monitoring systems
- 34% of total area is under green cover
- Training/ Awareness Program for on-site emergency and environmental issues are conducted regularly
- Development of water bodies in neighbouring locality as rain water harvesting structure
- Installed STP for township

Short Term Action Points (including continuous activities)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Development of green cover by planting 50000 saplings	30 Lakhs	March 2020	Betterment of Air quality

Medium Term Action Points (1 year -3 years)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Installation of dust suppression systems	230 crores	September 2020	Improvement of ambient air quality
2.	Provision for achieving ZLD in two phases	100 crores & 300 crores	June 2022 & December 2022	Reduce effluent discharge and reduction of fresh water consumption

6.5.2 Name of the Industry: Durgapur Projects Limited

The industry has already implemented the following good practices for betterment of environmental quality of the area in addition to compliance with effluent and emission norms:

- Installed Dust Suppression Systems
- Complying with EC/NOC norms
- All internal roads are paved
- Installed on-line stack emission monitoring systems, continuous ambient air quality monitoring
- Adequate green cover developed within plant as well as township area
- Training/ Awareness Program for on-site emergency are conducted regularly
- Installed STP in township
- Solar power generation facility installed in ash pond area

Medium Term Action Points (1 year -3 years)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Installation of FGD system	--	March 2022	Improvement of ambient air quality

6.5.3 Name of the Industry: Durgapur Thermal Power Station, DVC

The industry has already implemented the following good practices for betterment of environmental quality of the area in addition to compliance with effluent and emission norms:

- Installed Dust Suppression Systems
- Complying with EC/NOC norms
- All internal roads are paved
- Installed on-line stack emission monitoring systems
- 35% greeneries developed within plant premises
- Training/ Awareness Program for on-site emergency and environmental issues are conducted regularly

Short Term Action Points (including continuous activities)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Installation of dust suppression system in silo area	1.35 Lakhs	July 2019	Improvement of ambient air quality
2.	Development of additional greeneries in ash pond area	0.25 Lakhs	April 2020	Dust mitigation in ash pond area

Medium Term Action Points (1 year -3 years)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Training and awareness of employees on environmental issues	0.4 Lakhs	December 2021	Better control of environmental pollution
2.	Maintenance of drainage network within the plant	1 Lakhs	December 2020	Reduce water contamination
3.	Greenbelt development over at least 33% of plant area	0.5 Lakhs	April 2022	Dust mitigation in the adjoining area

6.5.4 Name of the Industry: NSPCL Durgapur

The industry has already implemented the following good practices for betterment of environmental quality of the area in addition to compliance with effluent and emission norms:

- Installed Dust Suppression Systems
- Complying with EC/NOC norms
- All internal roads are paved
- Installed on-line stack emission monitoring systems
- Achieved ZLD status
- Adequate greeneries developed within plant premises
- Implemented solar power generation

Short Term Action Points (including continuous activities)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Installation of ETP for utilization of treated waste water	500 Lakhs	December 2019	Control of water pollution and reduction in fresh water consumption
2.	Plantation of additional 1600 trees	4 Lakhs	March 2020	Dust mitigation in the adjoining area

Medium Term Action Points (1 year -3 years)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Training and awareness of employees on environmental issues	3 Lakhs	March 2022	Better control of environmental pollution
2.	Maintenance of drainage network within the plant	5 Lakhs	March 2022	Reduce water contamination
3.	Greenbelt development	12 Lakhs	March 2022	Dust mitigation in the adjoining area

6.5.5 Name of the Industry: Graphite India Limited

The industry has already implemented the following good practices for betterment of environmental quality of the area in addition to compliance with effluent and emission norms:

- Installed Dust Suppression Systems
- Complying with EC/NOC norms
- All internal roads are paved
- Adequate greeneries developed within plant premises

Short Term Action Points (including continuous activities)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Adoption of cleaner technology: i) Provision for fuel change of Reid-Hammer furnaces (FO to CBM) ii) Replacement of old Re-baking furnaces	120 Lakhs 9800 Lakhs	December 2019 May 2020	Improvement of air quality
2.	Plantation of additional trees	1.7 lakh/year	December 2019	Dust mitigation in the adjoining area
3.	Maintenance of drainage network within the plant	51 Lakhs	June 2019	Reduce water contamination
4.	Installation of dust collector for Baked Scrap Crushing Area, installation of mobile road sweeping machine for dust suppression	69 Lakhs	December 2019	Reduction in dust emission
5.	Upgradation/ modification of pollution control system	18 Lakhs	November 2019	Improvement in stack emission quality

Medium Term Action Points (1 year -3 years)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Additional greenbelt development	1.7 Lakh/year	March 2022	Dust mitigation in the adjoining area

6.5.6 Name of the Industry: Durgapur Chemicals Limited

The industry has already implemented the following good practices for betterment of environmental quality of the area in addition to compliance with effluent and emission norms:

- Complying with Consent conditions
- All internal roads are paved
- Adequate greeneries developed within plant premises

Short Term Action Points (including continuous activities)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Provision for dust suppression system	0.5 Lakhs	March 2020	Control of fugitive emission and dust
2.	Plantation of additional trees	0.5 Lakhs	March 2020	Dust mitigation in the adjoining area
3.	Upgradation of pollution control device	3 Lakhs	November 2019	Reduce emission
4.	Training and awareness on environmental issues and onsite emergency plan	3.15 Lakhs	December 2019	Awareness on environmental issues

Medium Term Action Points (1 year -3 years)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Additional greenbelt development	0.6 Lakhs	December 2021	Dust mitigation in the adjoining area
2.	Construction of new drainage network	25 Lakhs	December 2021	Reduce water contamination

6.5.7 Name of the Industry: Jai Balaji Industries Ltd. – Unit III

The industry has already implemented the following good practices for betterment of environmental quality of the area in addition to compliance with effluent and emission norms:

- Installed Dust Suppression Systems
- Complying with Consent conditions
- Most of the internal roads are paved

Short Term Action Points (including continuous activities)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Provision for dust suppression system	10 Lakhs	April 2020	Control of fugitive emission and dust
2.	Plantation of additional trees	3 Lakhs	April 2020	Dust mitigation in the adjoining area
3.	Construction of paved road	50 Lakhs	April 2020	Reduce air pollution
4.	Program for waste minimization	5 Lakhs	April 2020	Waste minimization

Medium Term Action Points (1 year -3 years)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Additional greenbelt development	10 Lakhs	April 2022	Dust mitigation in the adjoining area
2.	Construction of new drainage network	40 Lakhs	April 2022	Reduce water contamination

6.5.8 Name of the Industry: Jai Balaji Industries Ltd. – Unit IV

The industry has already implemented the following good practices for betterment of environmental quality of the area in addition to compliance with effluent and emission norms:

- Installed Dust Suppression Systems

- Complying with Consent conditions
- Most of the internal roads are paved

Short Term Action Points (including continuous activities)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Provision for dust suppression system	10 Lakhs	April 2020	Control of fugitive emission and dust
2.	Plantation of additional trees	3 Lakhs	April 2020	Dust mitigation in the adjoining area
3.	Construction of paved road	50 Lakhs	April 2020	Reduce air pollution
4.	Program for waste minimization	5 Lakhs	April 2020	Waste minimization

Medium Term Action Points (1 year -3 years)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Additional greenbelt development	10 Lakhs	April 2022	Dust mitigation in the adjoining area
2.	Construction of new drainage network	40 Lakhs	April 2022	Reduce water contamination

6.5.9 Name of the Industry: Shyam Ferro Alloys Limited

The industry has already implemented the following good practices for betterment of environmental quality of the area in addition to compliance with effluent and emission norms:

- Installed Dust Suppression Systems
- Complying with Consent conditions
- Most of the internal roads are paved

Short Term Action Points (including continuous activities)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Provision for dust suppression system	10 Lakhs	October 2019	Control of fugitive emission and dust
2.	Plantation of additional trees	5 Lakhs	March 2020	Dust mitigation in the adjoining area
3.	Construction of paved road	50 Lakhs	January 2020	Reduce air pollution
4.	Upgradation of APCD	150 Lakhs	July 2019	Reduce air pollution

Medium Term Action Points (1 year -3 years)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Additional greenbelt development	20 Lakhs	March 2023	Dust mitigation in the adjoining area

6.5.10 Name of the Industry: Karthik Alloys Limited (Unit-II)

Short Term Action Points (including continuous activities)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Provision for dust suppression system	4 Lakhs	December 2019	Control of fugitive emission and dust
2.	Plantation of additional trees	1 Lakhs	March 2020	Dust mitigation in the adjoining area

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
3.	Online Monitoring System	10 Lakhs	January 2020	Continuous monitoring of stack emission
4.	Upgradation of APCD	15 Lakhs	March 2020	Reduce air pollution
5.	Installation of ambient air quality monitoring station	10 Lakhs	January 2020	Monitoring of ambient air quality

Medium Term Action Points (1 year -3 years)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Additional greenbelt development	1 Lakh	December 2021	Dust mitigation in the adjoining area

6.5.11 Name of the Industry: SPS Steels Rolling Mills Limited (SPS Steel & Power Limited)

The industry has already implemented the following good practices for betterment of environmental quality of the area in addition to compliance with effluent and emission norms:

- Installed Dust Suppression Systems
- Complying with Consent conditions
- Most of the internal roads are paved

Short Term Action Points (including continuous activities)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Provision for dust suppression system	3 Lakhs	February 2020	Control of fugitive emission and dust

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
2.	Plantation of additional trees	1 Lakh	April 2020	Dust mitigation in the adjoining area
3.	Upgradation of APCD	10 Lakhs	February 2020	Reduce air pollution

Medium Term Action Points (1 year -3 years)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Additional greenbelt development	2 Lakhs	November 2020	Dust mitigation in the adjoining area

6.5.12 Name of the Industry: Sharp Ferro Alloys Limited

Short Term Action Points (including continuous activities)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Provision for dust suppression system	0.5 Lakhs	December 2019	Control of fugitive emission and dust
2.	Plantation of additional trees	10 Lakhs	March 2020	Dust mitigation in the adjoining area
3.	Upgradation of APCD	20 Lakhs	March 2020	Reduce air pollution

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
4.	Construction of paved road	2 Lakhs	March 2020	Reduce air pollution
5.	Installation of online monitoring system	11 Lakhs	March 2020	Continuous monitoring of stack emission
6.	Provision for rain water harvesting	15 Lakhs	March 2020	Water conservation and utilization of natural resources

Medium Term Action Points (1 year -3 years)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Additional greenbelt development	30 Lakhs	March 2022	Dust mitigation in the adjoining area

6.5.13 Name of the Industry: Philips Carbon Black Ltd

- Installed Dust Suppression Systems
- Complying with Consent conditions
- Most of the internal roads are paved
- Adequate greeneries developed within plant premises

Short Term Action Points (including continuous activities)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Construction of paved road	45 Lakhs	October 2019	Control of fugitive emission and dust

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
2.	Plantation of additional trees	1 Lakhs	August 2019	Dust mitigation in the adjoining area
3.	Provision to achieve ZLD	70 Lakhs	December 2019	Reduce fresh water consumption and control of water pollution
4.	Installation of online monitoring system	26 Lakhs	November 2019	Continuous monitoring of stack emission

Medium Term Action Points (1 year -3 years)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Additional greenbelt development	10 Lakhs	March 2021	Dust mitigation in the adjoining area

6.5.14 Name of the Industry: Surya Alloy Industries Ltd

Short Term Action Points (including continuous activities)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Construction of paved road	1.5 Lakhs	March 2020	Control of fugitive emission and dust
2.	Plantation of additional trees	1 Lakhs	September 2019	Dust mitigation in the adjoining area

Medium Term Action Points (1 year -3 years)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Additional greenbelt development	3 Lakhs	December 2022	Dust mitigation in the adjoining area

6.5.15 Name of the Industry: Maharaja

Short Term Action Points (including continuous activities)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Provision for dust suppression system	0.8 Lakhs	July 2019	Control of fugitive emission and dust
2.	Construction of paved road	2.5 Lakhs	October 2019	Control of fugitive emission and dust
3.	Plantation of addition al trees	3 Lakhs	June 2019	Dust mitigation in the adjoining area

6.5.16 Name of the Industry: Bagalamukhi Industries Private Limited

Short Term Action Points (including continuous activities)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Provision for dust suppression system	0.2 Lakhs	March 2020	Control of fugitive emission and dust
2.	Provision for rain water harvesting	2 Lakhs	March 2020	Minimization of fresh water consumption and utilization of natural resource

Medium Term Action Points (1 year -3 years)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Additional greenbelt development	2 Lakhs	April 2022	Dust mitigation in the adjoining area
2.	Upgradation of APCD	13 Lakhs	July 2020	Control of air pollution

6.5.17 Name of the Industry: KIC Metaliks Ltd.

Short Term Action Points (including continuous activities)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Provision for dust suppression system	5 Lakhs	March 2020	Control of fugitive emission and dust
2.	Additional green belt development	2 Lakhs	March 2020	Dust mitigation in the adjoining area
3.	Upgradation of APCD	150 Lakhs	March 2020	Control of air pollution

Medium Term Action Points (1 year -3 years)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Additional greenbelt development	10 Lakhs	March 2022	Dust mitigation in the adjoining area

6.5.18 Name of the Industry: Shivam India Ltd.

Short Term Action Points (including continuous activities)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Provision for dust suppression system	25 Lakhs	July 2019	Control of fugitive emission and dust

Medium Term Action Points (1 year -3 years)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Additional greenbelt development	5 Lakhs	March 2022	Dust mitigation in the adjoining area

6.5.19 Name of the Industry: Ritesh Trade Fin Limited

Short Term Action Points (including continuous activities)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Strengthening of paved road	3 Lakhs	November 2019	Control of fugitive emission and dust
2.	Modification of APCD	1 Lakhs	December 2019	Control of emission of particulate matter
3.	Additional greenbelt development	0.5 Lakhs	August 2019	Dust mitigation in the adjoining area

6.5.20 Name of the Industry: Ma Chandi Durga Ispat Limited

Medium Term Action Points (1 year -3 years)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Upgradation/Modification of APCD	20 Lakhs	April 2020	Control of emission of particulate matter

6.5.21 Name of the Industry: Adhunik Corporation Limited

Short Term Action Points (including continuous activities)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Strengthening/ repairing of paved road	3 Lakhs	March 2020	Control of fugitive emission and dust
2.	Upgradation/ Replacement of bag filter	2 Lakhs	March 2020	Control of emission of particulate matter
3.	Installation of dry fog system and operation of dust suppression system	1 Lakh	March 2020	Control of fugitive emission and dust
4.	Additional greenbelt development	2 Lakhs	March 2020	Dust mitigation in the adjoining area

6.5.22 Name of the Industry: Haldia Steel Limited (Unit II)

Short Term Action Points (including continuous activities)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Repairing of paved road inside the plant	6.5 Lakhs	March 2020	Control of fugitive emission and dust

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
2.	Modification/ Upgradation of APCD	12 lakhs	December 2019	Control of emission of particulate matter
3.	Installation and operation of dust suppression system	8 Lakhs	March 2020	Control of fugitive emission and dust
4.	Additional greenbelt development	4 lakhs	September 2019	Dust mitigation in the adjoining area

6.5.23 Name of the Industry: Haldia Steel Limited (Unit I)

Short Term Action Points (including continuous activities)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Repairing of paved road inside the plant	3 lakhs	March 2020	Control of fugitive emission and dust
2.	Modification/ Upgradation of APCD	5 lakhs	December 2019	Control of emission of particulate matter
3.	Installation of online monitoring system	17.5 Lakhs	March 2020	Monitoring of stack emission
4.	Additional tree plantation	2.5 lakhs	September 2019	Dust mitigation in the adjoining area

6.5.24 Name of the Industry: CP Sponge Private Limited

Short Term Action Points (including continuous activities)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Repairing of paved road inside the plant	5 lakhs	March 2020	Control of fugitive emission and dust

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
2.	Replacement of bag filters and overhauling of ESP	15 lakhs	March 2020	Control of emission of particulate matter
3.	Installation and operation of dry fog and dust suppression system	15 Lakhs	March 2020	Control of fugitive emission and dust
4.	Additional greenbelt development	0.5 Lakhs	September 2019	Dust mitigation in the adjoining area

6.5.25 Name of Stakeholder: Asansol Durgapur Development Authority

Short Term Action Points (including continuous activity)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Improvement, upgradation, strengthening and widening of roads in Durgapur Municipal Corporation area	100 Crores	March 2020	Control of dust pollution due to vehicular movement
2.	Construction of drainage system along with concrete road at Ward No. 12 within DMC	2.56 Crores	March 2020	Reduce water logging and water pollution

Name of Stakeholder: Durgapur Municipal Corporation

Long Term Action Points

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Development of greenbelt in Durgapur Municipal Corporation area	10 Crores	Continuous activity/ March 2023	Control of dust pollution in adjoining area
2.	Proper infrastructure for collection, transportation segregation, treatment and disposal of Municipal Solid waste	64 Crore	December 2023	Solid waste management
3.	Laying of sewerage system and installation of sewage treatment plant	287.53 Crores	December 2023	Control of water pollution due to sewage generated in Durgapur

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
4.	Storm water management including storm water drain	27.49 Crores	December 2023	Reduce water logging and water pollution

As per action plan of Durgapur PIA, a total amount of Rupees 1241.995 Crores has been earmarked for execution of various environmental improvement activities by large industries, Asansol Durgapur Development Authority and Durgapur Municipal Corporation by December 2023.

ACTION PLAN FOR POLLUTED INDUSTRIAL AREA, BANDEL

7 ACTION PLAN FOR POLLUTED INDUSTRIAL AREA, BANDEL

7.1 Area Details

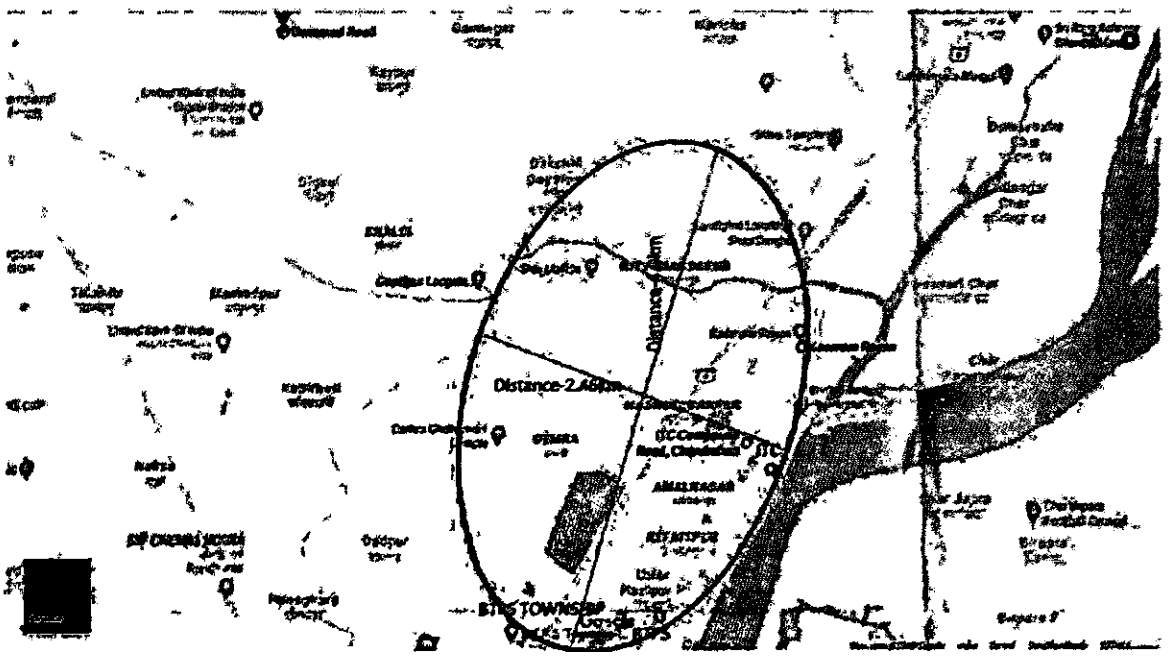
Bandel is a town in the Hooghly district of West Bengal. The main river that flows by Bandel is Ganges. The town is in Gangetic plain. It is founded by Portuguese settlers and falls under the jurisdiction of Chandernagore Police Commissionerate. It is a part of the area covered by Kolkata Metropolitan Development Authority (KMDA). Bandel is a major rail junction station of Eastern Railway zone, it is 40 km from Howrah station..

7.2 Location:

Bandel is located at 22°55′22″N latitude & 88°22′46″E longitude. It has an average elevation of 16 metres MSL.

7.3 Boundary of Bandel PIA

Figure 7.1 Map of Polluted Industrial Area, Bandel



7.4 Information on Pollution Sources Status in PIA

m.	Name of the Polluted Industrial Area	Bandel, Hooghly
n.	Demarcated Area of the PIA in Sq. Km	17.29
o.	Number of 17 Category Industries Covered under the area	02
p.	Number of Red Category Industry Covered under the area	05
q.	Total Human Population	1,77,833 (approx.)
r.	At least three criteria pollutants in each air, surface water and ground water	Air - PM_{10}, SO_2, Lead Surface Water - BOD, DO, Total Coliform, Ground Water - Total Coliform, Iron, Arsenic

Compliance Status of the Industries, Waste Management Facilities

Sl No.	Total Number of Units	Total Number of Units	Number of Units with inadequate facilities	Remarks if any
1.	Large Scale industries	03	Nil	
2.	Medium and small-scale industries	02	Nil	
3.	CETPs	Nil	Nil	Individual Industries have ETP and effluent generated are treated in ETP before discharge
4.	TSDF	Nil	Nil	Hazardous waste generated are disposed through common TSDF located at Haldia
5.	STPs	01	Nil	Domestic effluent of rest units is discharged to soakpit via septic tank
6.	CBMWTF	Nil	Nil	Bio medical Waste generated are collected, transported, treated and disposed at Medicare Environmental Management Pvt. Ltd., (CBMWTF) Kalyani, Nadia
7.	MSW Management Facility	Nil	Nil	The industries are located in rural (Panchayet) area

Table 7.1 : Present Status of Ambient Air Quality at Bandel (Monitored by Third Party during February 2019)

Sl. No.	Location	Concentration of pollutants												
		Results	PM10 (µg/m³)	PM2.5 (µg/m³)	SO2 (µg/m³)	NO2 (µg/m³)	Ammonia (µg/m³)	Lead (µg/m³)	Nickel (ng/m³)	Arsenic (ng/m³)	Benz(α)P (ng/m³)	CO (mg/m³)	Ozone (µg/m³)	Benzene (µg/m³)
1.	Kaplia Dairy AAQM-1	No. of Reading	9	3	18	18	18	9	9	9	9	72	72	3
		Max. Value	376	86	23.3	39.1	41.1	0.04	7.82	1.28	<0.5	1.24	21	2.49
		Min Value	157	58	14.2	30.2	35.2	0.01	4.26	0.61	<0.5	0.48	<10.0	<2.0
		Arithmetic Value	272	71	18.1	34.3	38.3	0.03	5.78	0.90	<0.5	0.92	19.4	2.08
2.	Jupiter Alloy (WBPCB Lab) AAQM-2	No. of Reading	9	3	18	18	18	9	9	9	9	72	72	3
		Max. Value	346	111	23.2	38.3	44.9	0.08	10.0	1.50	<0.5	1.24	<10.0	<2.0
		Min Value	153	76	16.5	30.4	35.1	0.02	3.54	0.61	<0.5	0.43	<10.0	<2.0
		Arithmetic Value	243	94	20.2	34.9	40.3	0.04	6.03	0.98	<0.5	0.84	<10.0	<2.0
3.	Bandel Church AAQM-3	No. of Reading	9	3	18	18	18	9	9	9	9	72	72	3
		Max. Value	361	89	22.6	37.4	38.4	0.09	10.69	2.01	<0.5	1.17	<10.0	<2.0
		Min Value	127	49	14.1	28.5	28.8	0.02	4.26	0.75	<0.5	0.42	<10.0	<2.0
		Arithmetic Value	215	75	19.0	33.3	33.8	0.04	6.31	1.35	<0.5	0.88	<10.0	<2.0
4.	Bright Brick Field AAQM-4	No. of Reading	9	3	18	18	18	9	9	9	9	72	72	3
		Max. Value	280	106	17.6	36.9	41.9	0.08	10.06	1.96	<0.5	1.21	<10.0	<2.0
		Min Value	118	57	10.3	27.8	30.3	0.03	4.59	0.78	<0.5	0.46	<10.0	<2.0
		Arithmetic Value	196	84	13.8	32.7	35.3	0.05	6.47	1.37	<0.5	0.85	<10.0	<2.0
5.	Khadina More AAQM-5	No. of Reading	9	3	18	18	18	9	9	9	9	72	72	3
		Max. Value	257	39	23.1	39.8	45.3	0.07	8.99	1.93	<0.5	1.24	<10.0	2.08
		Min Value	98	28	14.4	29.4	33.5	0.03	4.50	0.72	<0.5	0.45	<10.0	<2.0
		Arithmetic Value	190	33	18.6	34.7	40.9	0.05	6.01	1.41	<0.5	0.89	<10.0	<2.0
6.	ITC Ltd. AAQM-6	No. of Reading	9	3	18	18	18	9	9	9	9	72	72	3
		Max. Value	227	76	25.9	44.2	44.5	0.05	6.43	1.86	<0.5	1.13	<10.0	<2.0

Sl. No.	Location	Concentration of pollutants												
		Results	PM10 (µg/m³)	PM2.5 (µg/m³)	SO2 (µg/m³)	NO2 (µg/m³)	Ammonia (µg/m³)	Lead (µg/m³)	Nickel (ng/m³)	Arsenic (ng/m³)	Benz(α)P (ng/m³)	CO (mg/m³)	Ozone (µg/m³)	Benzene (µg/m³)
		Min Value	91	49	18.4	29.2	30.2	0.03	4.26	1.37	<0.5	0.55	<10.0	<2.0
		Arithmetic Value	154	59	21.7	36.9	39.0	0.04	5.19	1.63	<0.5	0.90	<10.0	<2.0
7.	Lead Stone Energy Ltd. AAQM-7	No. of Reading	9	3	18	18	18	9	9	9	9	72	72	3
		Max. Value	365	110	21.2	40.5	50.1	0.04	8.22	1.28	<0.5	1.41	<10.0	2.86
		Min Value	222	89	12.1	28.3	32.1	0.02	4.23	0.62	<0.5	0.43	<10.0	2.18
		Arithmetic Value	304	99	17.1	34.0	39.7	0.03	6.22	0.97	<0.5	0.85	<10.0	2.51
8.	Jaya Industries Ltd. AAQM-8	No. of Reading	9	3	18	18	18	9	9	9	9	72	72	3
		Max. Value	224	71	22.0	41.5	43.8	0.09	11.59	1.71	<0.5	1.15	<10.0	<2.0
		Min Value	126	56	10.4	30.2	28.8	0.02	3.71	0.60	<0.5	0.45	<10.0	<2.0
		Arithmetic Value	191	65	15.5	34.3	36.1	0.04	5.96	1.23	<0.5	0.89	<10.0	<2.0

Table 7.2: Present Status of Surface Water Quality of Bandel (Monitored by Third Party during February 2019) (SW 1-SW4)

Sl. No.	Parameter	Unit	Pond Water Near Bighati Brick Field, Bandel (Location Code- SW-1)	Pond water near Jupiter Alloy, Bandel (Location Code- SW-2)	Pond Water Near Jaya Industries pvt. Ltd., Bandel (Location Code- SW-3)	Pond Water near Kapila Cattle Feed Industries, Bandel (Location Code- SW-4)
1	Sanitary Survey	----	Bathing, Domestic washing found & no Toilet system nearby	Drainage system found & no Toilet nearby	Drainage system found & no Toilet nearby	Bathing, Domestic washing found & no Toilet system nearby
2	General appearance	----	Transparent	Turbid	Turbid	Turbid
3	Colour	Hazen	<1.0	3	3	2
4	Smell	----	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable
5	Transparency	Cm	92	82	82	82
6	Ecological Survey	-----	Present Insect/ Fish	Present Insect/ Fish	Present Insect/ Fish	Present Insect/ Fish
7	pH at 25 deg C	-----	7.4	7.3	7.4	7.3
8	Oil & Grease	mg/L	<1.0	<1.0	<1.0	<1.0
9	Suspended solids	mg/L	<5.0	15	14	12
10	DO (% of saturation)	-----	6.7/85.0	6.5/85.0	6.6/83.0	6.4/85.0
11	COD	mg/L	7.65	34.42	9.56	9.56
12	BOD	mg/L	<1.0	2.8	1.5	<1.0
13	Electrical Conductivity	µmhos/cm	550	796	675	260
14	TDS	mg/L	312	460	380	145
15	Nitrite-Nitrogen	mg/L	<0.005	<0.005	<0.005	<0.005
16	Nitrate-Nitrogen	mg/L	<0.5	4.38	4.82	1.53
17	Total Nitrogen (NO2+NO3)	mg/L	<0.5	4.38	4.82	1.53

Sl. No.	Parameter	Unit	Pond Water Near Bighati Brick Field, Bandel (Location Code- SW-1)	Pond water near Jupiter Alloy, Bandel (Location Code- SW-2)	Pond Water Near Jaya Industries pvt. Ltd., Bandel (Location Code- SW-3)	Pond Water near Kapila Cattle Feed Industries, Bandel (Location Code- SW-4)
18	Free Ammonia	mg/L	<0.05	<0.05	<0.05	<0.05
19	Total Residual Chlorine	mg/L	<0.05	<0.05	<0.05	<0.05
20	Cyanide	mg/L	<0.01	<0.01	<0.01	<0.01
21	Fluoride	mg/L	<0.05	<0.05	<0.05	<0.05
22	Chloride	mg/L	27.48	55.44	62.68	13.5
23	Sulphate	mg/L	9.86	13.21	15	4.8
24	Sulphides	mg/L	<0.05	<0.05	<0.05	<0.05
25	Total hardness	mg/L	168	236	240	76
26	Dissolved Phosphate (as P)	mg/L	<0.05	<0.05	<0.05	<0.05
27	Total Phosphorous (as P)	mg/L	<0.05	<0.05	<0.05	<0.05
28	TKN	mg/L	<0.5	<0.5	<0.5	<0.5
29	Total Ammonia (NH4+NH3)	mg/L	<0.05	<0.05	<0.05	<0.05
30	Phenols	mg/L	<0.001	<0.001	<0.001	<0.001
31	Surface Active Agents	mg/L	<0.10	<0.10	<0.10	<0.10
32	Hexavalent Chromium (Cr^{+6})	mg/L	<0.02	<0.02	<0.02	<0.02
33	Bioassay (Zebra fish)	%	------	-------	------	-----
34	SAR	----	1.78	3.31	1.58	0.51
35	Zinc (Zn)	mg/L	0.013	<0.001	<0.001	<0.001
36	Nickel (Ni)	mg/L	0.002	0.003	0.004	0.002
37	Copper (Cu)	mg/L	0.004	0.001	<0.001	0.002
38	Chromium (Cr)	mg/L	<0.001	<0.001	<0.001	<0.001

Sl. No.	Parameter	Unit	Pond Water Near Bighati Brick Field, Bandel (Location Code- SW-1)	Pond water near Jupiter Alloy, Bandel (Location Code- SW-2)	Pond Water Near Jaya Industries pvt. Ltd., Bandel (Location Code- SW-3)	Pond Water near Kapila Cattle Feed Industries, Bandel (Location Code- SW-4)
39	Arsenic (As)	mg/L	0.004	0.005	<0.001	0.006
40	Lead (Pb)	mg/L	<0.001	<0.001	<0.001	<0.001
41	Cadmium (Cd)	mg/L	<0.001	<0.001	<0.001	<0.001
42	Mercury (Hg)	mg/L	<0.001	<0.001	<0.001	<0.001
43	Managanese (Mn)	mg/L	0.005	0.003	0.003	0.001
44	Iron (Fe)	mg/L	0.003	0.018	0.019	0.035
45	Vanadium (V)	mg/L	<0.001	0.004	0.002	<0.001
46	Selenium (Se)	mg/L	<0.001	<0.001	<0.001	<0.001
47	Boron (B)	mg/L	0.020	0.070	0.049	0.030
48	Total Coliform	MPN/100 ml	130	170	220	500
49	Faecal Coliorm	MPN/100 ml	4	6	10	14
50	Organo-Chlorine	µg/L	<0.01	<0.01	<0.01	<0.01
51	PAH	µg/L	<0.01	<0.01	<0.01	<0.01
52	PCB	µg/L	<0.01	<0.01	<0.01	<0.01
53	PCT	µg/L	<0.01	<0.01	<0.01	<0.01

Table 7.2 Contd.....Present Status of Surface Water Quality of Bandel (Monitored by Third Party during February 2019) (SW 5-SW 8)

Sl. No.	Parameter	Unit	Pond Water Near Khadina More Bandel (Location Code- SW-5)	Pond water near ITC Ltd., Bandel (Location Code- SW-6)	Naihati Ghat, Ganges River, Bandel (Location Code- SW-7)	Pond Water near Bandel Church, Bandel (Location Code- SW-8)
1	Sanitary Survey	----	Bathing, Domestic washing found & no Toilet system nearby	Bathing, Domestic washing found & no Toilet system nearby	Bathing, Domestic washing found & no Toilet system nearby y	Bathing, Domestic washing found & no Toilet system nearby
2	General appearance	----	Turbid	Turbid	Transparent	Turbid
3	Colour	Hazen	<1.0	<1.0	<1.0	<1.0
4	Smell	----	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable
5	Transparency	Cm	84	90	84	86
6	Ecological Survey	-----	Present Insect/ Fish	Present Insect/ Fish	Present Insect/ Fish	Present Insect/ Fish
7	pH at 25 deg C	----	7.4	7.2	7.2	7.3
8	Oil & Grease	mg/L	<1.0	<1.0	<1.0	<1.0
9	Suspended solids	mg/L	10	10	14	10
10	DO (% of saturation)	-----	6.5/85.0	6.3/83.0	7.7/95.0	6.2/83.0
11	COD	mg/L	12.43	9.56	6.69	9.56
12	BOD	mg/L	1.8	1.8	<1.0	<1.0
13	Electrical Conductivity	µmhos/cm	670	567	598	532
14	TDS	mg/L	375	318	337	305
15	Nitrite-Nitrogen	mg/L	<0.005	<0.005	<0.005	<0.005
16	Nitrate-Nitrogen	mg/L	4.15	1.52	<0.5	<0.5
17	Total Nitrogen (NO2+NO3)	mg/L	4.15	1.52	<0.5	<0.5

Sl. No.	Parameter	Unit	Pond Water Near Khadina More Bandel (Location Code- SW-5)	Pond water near ITC Ltd., Bandel (Location Code- SW-6)	Naihati Ghat, Ganges River, Bandel (Location Code- SW-7)	Pond Water near Bandel Church, Bandel (Location Code- SW-8)
18	Free Ammonia	mg/L	<0.05	<0.05	<0.05	<0.05
19	Total Residual Chlorine	mg/L	<0.05	<0.05	<0.05	<0.05
20	Cyanide	mg/L	<0.01	<0.01	<0.01	<0.01
21	Fluoride	mg/L	<0.05	<0.05	<0.05	<0.05
22	Chloride	mg/L	48.21	35.19	38.57	37.12
23	Sulphate	mg/L	12.43	8.14	10.26	6.42
24	Sulphides	mg/L	<0.05	<0.05	<0.05	<0.05
25	Total hardness	mg/L	172	154	156	150
26	Dissolved Phosphate (as P)	mg/L	<0.05	<0.05	<0.05	<0.05
27	Total Phosphorous (as P)	mg/L	<0.05	<0.05	<0.05	<0.05
28	TKN	mg/L	<0.5	<0.5	<0.5	<0.5
29	Total Ammonia (NH4+NH3)	mg/L	<0.05	<0.05	<0.05	<0.05
30	Phenols	mg/L	<0.001	<0.001	<0.001	<0.001
31	Surface Active Agents	mg/L	<0.10	<0.10	<0.10	<0.10
32	Hexavalent Chromium (Cr^{+6})	mg/L	<0.02	<0.02	<0.02	<0.02
33	Bioassay (Zebra fish)	%	------	100% Survival of fish after 96hours exposure in 100% Sample.	------	100% Survival of fish after 96hours exposure in 100% Sample.
34	SAR	----	2.82	1.89	1.55	1.66
35	Zinc (Zn)	mg/L	<0.001	<0.001	0.002	0.001

Sl. No.	Parameter	Unit	Pond Water Near Khadina More Bandel (Location Code- SW-5)	Pond water near ITC Ltd., Bandel (Location Code- SW-6)	Naihati Ghat, Ganges River, Bandel (Location Code- SW-7)	Pond Water near Bandel Church, Bandel (Location Code- SW-8)
36	Nickel (Ni)	mg/L	0.002	0.003	0.003	0.003
37	Copper (Cu)	mg/L	<0.001	<0.001	0.002	0.001
38	Chromium (Cr)	mg/L	<0.001	<0.001	<0.001	<0.001
39	Arsenic (As)	mg/L	0.004	0.003	0.005	0.003
40	Lead (Pb)	mg/L	<0.001	<0.001	<0.001	<0.001
41	Cadmium (Cd)	mg/L	<0.001	<0.001	<0.001	<0.001
42	Mercury (Hg)	mg/L	<0.001	<0.001	<0.001	<0.001
43	Managanese (Mn)	mg/L	0.001	0.001	0.061	0.019
44	Iron (Fe)	mg/L	0.004	0.004	1.32	0.005
45	Vanadium (V)	mg/L	0.002	0.003	0.003	0.002
46	Selenium (Se)	mg/L	<0.001	<0.001	<0.001	<0.001
47	Boron (B)	mg/L	0.084	0.040	0.043	0.048
48	Total Coliform	MPN/100 ml	130	170	110	70
49	Faecal Coliform	MPN/100 ml	2	4	2	<2
50	Organo-Chlorine	µg/L	<0.01	<0.01	<0.01	<0.01
51	PAH	µg/L	<0.01	<0.01	<0.01	<0.01
52	PCB	µg/L	<0.01	<0.01	<0.01	<0.01
53	PCT	µg/L	<0.01	<0.01	<0.01	<0.01

Table 7.3 Present Status of Ground Water Quality of Bandel (Monitored by Third Party during February 2019) (GW 1 - GW 4)

Sl. No.	Parameter	Unit	Hand Pump Water Near Jupiter Alloy (Location Code- GW-1)	Hand Pump Water Near Bandel Church (Location Code- GW-2)	Hand Pump Water Near Bighati Brick Field (Location Code- GW-3)	Bore Well at ITC Ltd., Tribeney Unit, Bandel (Location Code- GW-4)
1	Sanitary Survey	----	Drainage system found & no Toilet nearby	Drainage system found & no Toilet nearby	Drainage system found & no Toilet nearby	Drainage system found & no Toilet nearby
2	General appearance	----	Transparent	Transparent	Transparent	Transparent
3	Colour	Hazen	<1.0	<1.0	<1.0	<1.0
4	Smell	----	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable
5	Transparency	Cm	92	86	92	96
6	pH at 26 deg C	----	7.2	7.2	7.1	7.2
7	Oil & Grease	mg/L	<1.0	<1.0	<1.0	<1.0
8	Suspended solids	mg/L	<5.0	<5.0	<0.5	<0.5
9	COD	mg/L	12.43	11.47	9.56	5.74
10	BOD	mg/L	1.5	1.8	1.4	<1.0
13	Electrical Conductivity	µmhos/cm	531	965	832	576
14	TDS	mg/L	298	546	464	328
13	Nitrite-Nitrogen	mg/L	<0.005	<0.005	<0.005	<0.005
14	Nitrate-Nitrogen	mg/L	<0.5	<0.5	<0.5	<0.5
15	Total Nitrogen (NO2+NO3)	mg/L	<0.5	<0.5	<0.5	<0.5
16	Free Ammonia	mg/L	<0.05	<0.05	<0.05	<0.05
17	Total Residual Chlorine	mg/L	<0.05	<0.05	<0.05	<0.05
18	Cyanide	mg/L	<0.01	<0.01	<0.01	<0.01

Sl. No.	Parameter	Unit	Hand Pump Water Near Jupiter Alloy (Location Code- GW-1)	Hand Pump Water Near Bandel Church (Location Code- GW-2)	Hand Pump Water Near Bighati Brick Field (Location Code- GW-3)	Bore Well at ITC Ltd., Tribeney Unit, Bandel (Location Code- GW-4)
19	Fluoride	mg/L	<0.05	<0.05	<0.05	<0.05
20	Chloride	mg/L	20.25	55.44	30.37	13.02
21	Sulphate	mg/L	4.36	13.28	6.38	2.98
22	Sulphides	mg/L	<0.05	<0.05	<0.05	<0.05
23	Total hardness	mg/L	210	370	336	244
24	Dissolved Phosphate (as P)	mg/L	<0.05	<0.05	<0.05	<0.05
25	Total Phosphorous (as P)	mg/L	<0.05	<0.05	<0.05	<0.05
26	TKN	mg/L	<0.5	<0.5	<0.5	<0.5
27	Total Ammonia (NH4+NH3)	mg/L	<0.05	<0.05	<0.05	<0.05
28	Phenols	mg/L	<0.001	<0.001	<0.001	<0.001
29	Surface Active Agents	mg/L	<0.10	<0.10	<0.10	<0.10
30	Hexavalent Chromium (Cr^{+6})	mg/L	<0.02	<0.02	<0.02	<0.02
31	Bioassay (Zebra fish)	%	------	100% Survival of fish after 96hours exposure in 100%Sample.	------	100% Survival of fish after 96hours exposure in 100%Sample.
32	SAR	----	1.51	1.91	1.68	1.15
33	Zinc (Zn)	mg/L	0.015	0.012	0.045	0.012
34	Nickel (Ni)	mg/L	0.003	0.004	0.003	0.003
35	Copper (Cu)	mg/L	<0.001	<0.001	0.001	<0.001
36	Chromium (Cr)	mg/L	<0.001	<0.001	<0.001	<0.001

Sl. No.	Parameter	Unit	Hand Pump Water Near Jupiter Alloy (Location Code- GW-1)	Hand Pump Water Near Bandel Church (Location Code- GW-2)	Hand Pump Water Near Bighati Brick Field (Location Code- GW-3)	Bore Well at ITC Ltd., Tribeney Unit, Bandel (Location Code- GW-4)
37	Arsenic (As)	mg/L	<0.001	<0.001	0.001	<0.001
38	Lead (Pb)	mg/L	<0.001	<0.001	<0.001	<0.001
39	Cadmium (Cd)	mg/L	<0.001	<0.001	<0.001	<0.001
40	Mercury (Hg)	mg/L	<0.001	<0.001	<0.001	<0.001
41	Managanese (Mn)	mg/L	<0.001	0.784	0.146	0.118
42	Iron (Fe)	mg/L	0.021	0.001	0.001	0.009
43	Vanadium (V)	mg/L	<0.001	<0.001	<0.001	<0.001
44	Selenium (Se)	mg/L	<0.001	<0.001	<0.001	<0.001
45	Boron (B)	mg/L	0.036	0.073	0.052	0.023
46	Total Coliform	MPN/100ml	<2	<2	<2	<2
47	Faecal Coliorm	MPN/100ml	<2	<2	<2	<2
48	Organo-Chlorine	µg/L	<0.01	<0.01	<0.01	<0.01
49	PAH	µg/L	<0.01	<0.01	<0.01	<0.01
50	PCB	µg/L	<0.01	<0.01	<0.01	<0.01
51	PCT	µg/L	<0.01	<0.01	<0.01	<0.01

Table 7.3 Contd.....Present Status of Ground Water Quality of Bandel (Monitored by Third Party during February 2019) (GW 5 - GW 8)

Sl. No.	Parameter	Unit	Bore well at Lead Stone Energy Ltd. (Location Code- GW-5)	Hand Pump Water at Jaya Industries Pvt. Ltd. Bandel (Location Code- GW-6)	Hand Pump Water Near Khadina More P.S.-Bandel (Location Code- GW-7)	Hand Pump Water Near Kapila Cattle Feed Industries, Bandel (Location Code- GW-8)
1	Sanitary Survey	----	Drainage system found & no Toilet nearby	Drainage system found & no Toilet nearby	Drainage system found & no Toilet nearby	Drainage system found & no Toilet nearby
2	General appearance	----	Transparent	Transparent	Transparent	Transparent
3	Colour	Hazen	<1.0	<1.0	<1.0	<1.0
4	Smell	----	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable
5	Transparency	Cm	92	90	90	94
6	pH at 26 deg C	----	7.2	7.3	7.2	7.3
7	Oil & Grease	mg/L	<1.0	<1.0	<1.0	<1.0
8	Suspended solids	mg/L	<5.0	<5.0	<0.5	<0.5
9	COD	mg/L	9.56	12.43	9.56	12.43
10	BOD	mg/L	1.4	1.4	1.5	1.8
13	Electrical Conductivity	µmhos/ cm	532	602	617	548
14	TDS	mg/L	308	345	356	318
13	Nitrite-Nitrogen	mg/L	<0.005	<0.005	<0.005	<0.005
14	Nitrate-Nitrogen	mg/L	<0.5	<0.5	<0.5	<0.5
15	Total Nitrogen (NO2+NO3)	mg/L	<0.5	<0.5	<0.5	<0.5
16	Free Ammonia	mg/L	<0.05	<0.05	<0.05	<0.05
17	Total Residual Chlorine	mg/L	<0.05	<0.05	<0.05	<0.05
18	Cyanide	mg/L	<0.01	<0.01	<0.01	<0.01

Sl. No.	Parameter	Unit	Bore well at Lead Stone Energy Ltd. (Location Code- GW-5)	Hand Pump Water at Jaya Industries Pvt. Ltd. Bandel (Location Code- GW-6)	Hand Pump Water Near Khadina More P.S.-Bandel (Location Code- GW-7)	Hand Pump Water Near Kapila Cattle Feed Industries, Bandel (Location Code- GW-8)
19	Fluoride	mg/L	<0.05	<0.05	<0.05	<0.05
20	Chloride	mg/L	8.68	20.73	15.91	10.61
21	Sulphate	mg/L	3.45	5.37	3.7	4.03
22	Sulphides	mg/L	<0.05	<0.05	<0.05	<0.05
23	Total hardness	mg/L	208	260	244	210
24	Dissolved Phosphate (as P)	mg/L	<0.05	<0.05	<0.05	<0.05
25	Total Phosphorous (as P)	mg/L	<0.05	<0.05	<0.05	<0.05
26	TKN	mg/L	<0.5	<0.5	<0.5	<0.5
27	Total Ammonia (NH4+NH3)	mg/L	<0.05	<0.05	<0.05	<0.05
28	Phenols	mg/L	<0.001	<0.001	<0.001	<0.001
29	Surface Active Agents	mg/L	<0.10	<0.10	<0.10	<0.10
30	Hexavalent Chromium (Cr^{+6})	mg/L	<0.02	<0.02	<0.02	<0.02
31	Bioassay (Zebra fish)	%	------	------	------	----
32	SAR	----	1.56	1.40	1.78	1.35
33	Zinc (Zn)	mg/L	0.009	0.099	0.036	0.021
34	Nickel (Ni)	mg/L	0.003	0.003	0.004	0.003
35	Copper (Cu)	mg/L	<0.001	<0.001	<0.001	<0.001
36	Chromium (Cr)	mg/L	<0.001	<0.001	<0.001	<0.001
37	Arsenic (As)	mg/L	0.005	0.002	0.001	<0.001
38	Lead (Pb)	mg/L	<0.001	<0.001	<0.001	<0.001
39	Cadmium (Cd)	mg/L	<0.001	<0.001	<0.001	<0.001
40	Mercury (Hg)	mg/L	<0.001	<0.001	<0.001	<0.001

Sl. No.	Parameter	Unit	Bore well at Lead Stone Energy Ltd. (Location Code- GW-5)	Hand Pump Water at Jaya Industries Pvt. Ltd. Bandel (Location Code- GW-6)	Hand Pump Water Near Khadina More P.S.-Bandel (Location Code- GW-7)	Hand Pump Water Near Kapila Cattle Feed Industries, Bandel (Location Code- GW-8)
41	Managanese (Mn)	mg/L	0.049	0.233	0.359	0.071
42	Iron (Fe)	mg/L	0.025	0.006	0.135	0.015
43	Vanadium (V)	mg/L	<0.001	<0.001	<0.001	0.002
44	Selenium (Se)	mg/L	<0.001	<0.001	<0.001	<0.001
45	Boron (B)	mg/L	0.039	0.038	0.059	0.037
46	Total Coliform	MPN/100ml	<2	<2	<2	<2
47	Faecal Coliorm	MPN/100ml	<2	<2	<2	<2
48	Organo-Chlorine	µg/L	<0.01	<0.01	<0.01	<0.01
49	PAH	µg/L	<0.01	<0.01	<0.01	<0.01
50	PCB	µg/L	<0.01	<0.01	<0.01	<0.01
51	PCT	µg/L	<0.01	<0.01	<0.01	<0.01

7.5 Action Plan for Bandel PIA

7.5.1 Name of the Industry: Bandel Thermal Power Station, WBPDCL

The industry has already implemented the following good practices for betterment of environmental quality of the area in addition to compliance with effluent and emission norms:

- Installed Dust Suppression Systems at wagon tippler, coal stack yard of CHP
- Complying with EC/NOC norms
- All internal roads are paved
- Installed on-line stack emission monitoring systems, continuous ambient air quality monitoring and effluent monitoring systems
- Most of the available area is under green cover
- Training/ Awareness Program for on-site emergency are conducted regularly

Short and Medium Term Action Points (upto 3 years)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	• Installation of cooling tower to reduce specific water consumption for unit #5 • A clariflocculator along with ETP shall be installed for recycling process effluent	120 Crore	January 2022	Reduction of fresh water consumption as well as effluent generation and discharge
2.	Semi-dry FGD will be installed	145 Crore	January 2022	Improve the Air Quality surrounding the plant
3.	Development of Additional Greenbelt	4 Lakhs/ annum	Continuous activity	Reduction of dust emission in adjoining area

7.5.2 Name of the Industry: Kesoram Rayon, Unit: Cygnet Industries Ltd.

The industry has already implemented the following good practices for betterment of environmental quality of the area in addition to compliance with effluent and emission norms:

- Installed Dust Suppression Systems
- Complying with EC/NOC norms
- All internal roads are paved
- Installed on-line stack emission monitoring systems, continuous ambient air quality monitoring and effluent monitoring systems
- 33% of area is under green cover
- Training/ Awareness Program for on-site emergency are conducted regularly

Short and Medium Term Action Points (upto 3 years)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Upgradation of existing ESP by increasing number of fields to achieve stricter norms (150 mg/ Nm^3 to 50 mg/ Nm^3)	1.5 Crores	April 2020	Improvement of air and water quality

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
2.	Provision for recycling of treated effluent (from existing 1800 m^3/ day to 3800 m^3/day)	6 Lakhs	April 2020	Reduction of fresh water consumption
3.	Provision for rain water harvesting	1.05 Crores	April 2022	Better utilization of natural resources
4.	Green belt development	2 Lakhs/ annum	Continuous activity	Improvement of air quality surrounding the plant

7.5.3 Name of the Industry: ITC Limited PSPD, Unit Tribeni

The industry has already implemented the following good practices for betterment of environmental quality of the area in addition to compliance with effluent and emission norms:

- Installed Dust Suppression Systems
- Complying with EC/NOC norms
- All internal roads are paved
- Installed on-line stack emission monitoring systems, continuous ambient air quality monitoring and effluent monitoring systems
- Adequate greeneries developed within plant premises
- Training/ Awareness Program for on-site emergency and environmental issues are conducted regularly

Short and Medium Term Action Points (upto 3 years)

Sl. No	*Action Points (including source & mitigation measures)*	*Estimated Cost (Rs)*	*Target Date*	*Environmental Issues to be addressed*
1.	Reduction of specific water consumption (47 m^3/ ton to 45 m^3/ton) (45 m^3/ ton to 42m^3/ton by installation of new machines)	10 lakhs 350 Crores	September 2019 June 2022	Reduction of fresh water consumption
2	Recycling of treated effluent	-	June 2022	Better utilization of natural resources
3	Installation of online SOx-NOx monitoring system	30 lakhs	September 2019	Measurement of stack emission quality

As per action plan of Bandel PIA, a total amount of Rupees 618.07 Crores has been earmarked for execution of various environmental improvement activities by large industries by June 2022.

8. Conclusion

Continuous efforts initiated by WBPCB for implementation of Pollution Abatement Action Plans prepared during 2010-2011 for up-gradation of environmental quality in the following PIAs show decreasing trend in CEPI score (calculated by CPCB) compared to that during 2010 :

Name of the critically polluted area	CEPI Score during 2010	CEPI Score during 2013
Asansol	70.20	56.01
Haldia	75.43	61.58
Howrah	74.84	61.11

The present comprehensive action plan prepared in this report for the five PIAs in the State identified by CPCB in 2017-18 aims to achieve the CEPI score below 60 within December 2020.

ANNEXURE I

Item No. 05 Court No. 1

BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI

Original Application No. 1038/2018

News item published in "The Asian Age" Authored by Sanjay Kaw Titled "CPCB to rank industrial units on pollution levels"

Date of hearing: 13.12.2018

CORAM: HON'BLE MR. JUSTICE ADARSH KUMAR GOEL, CHAIRPERSON
HON'BLE MR. JUSTICE K. RAMAKRISHNAN, JUDICIAL MEMBER
HON'BLE DR. NAGIN NANDA, EXPERT MEMBER

ORDER

1. The matter has been taken up on the basis of news item titled "CPCB to rank industrial units on pollution levels" authored by Mr. Sanjay Kaw published in the Asian Age dated 06.12.2018. Out of 88 identified industrial-clusters, 48 industrial clusters in 16 States having Comprehensive Environmental Pollution Index (CEPI) score of 70 and above were identified as Critically Polluted Areas (CPAs). Further, 32 industrial clusters with CEPI scores between 60 and 70 were categorized as Seriously Polluted Areas (SPAs), and this was based on evaluation of CEPI carried out in the year 2009-10. In a later evaluation, the number of identified polluted industrial clusters went up to 100 in the year 2017-18.

2. CEPI is based on evaluation of environmental parameters including ambient air, surface water and health related statistics. Based on such study, directions have been issued by the Central Pollution Control Board (CPCB) under Section 18(1) (b) of the Water (Prevention and Control of Pollution) Act, 1974 for installation of Continuous Ambient Air Quality Monitoring Stations (CAAQMS) and

Real Time Water Quality Monitoring Stations (RTWQMS) at various locations.

3. Revised CEPI (2016) is comprised of the following components:

"

Component A	Scale of Industrial Activity	20 marks
Component B	Status of Ambient Env. Quality (Air/SW/GW)	50 Marks
Component C	Health related statistics	10 Marks
Component D	Compliance status of industries	20 Marks

"

4. As per direction of CPCB dated 26.04.2016, addressed to the State Pollution Control Boards (SPCBs), the SPCBs are required to take steps to ensure prevention, control and abatement of pollution in critically polluted industrial clusters by installing Environmental Quality Monitoring Systems for which purpose action plan in respect of monitoring mechanism are to be evolved, in the manner stated in the said order. Forty Three (43) Critically Polluted Areas and 32 Severely Polluted Areas were identified based on CEPI criteria in the Year 2009 are as follows:

S.No.	***Name of States***	***Clusters with CEPI >70 (43 Critically polluted Areas)***	***Clusters with CEPI 60-70 (32 Severely polluted areas)***
1.	*Andhra Pradesh*	*Vishakhapatnam (70.82)*	*Vijayawada (60.57)*
2.	*Bihar*	*--*	*West Singhbhum (67.30)*
3.	*Chhattisgarh*	*Korba (83.00)*	*Raipur (65.45)*
4.	*Delhi*	*Najafgarh-Drain Basin (79.54) including Anand Parbat, Naraina, Okhla, Wazirpur*	*--*
5.	*Gujarat*	*Ankleshwar (88.50), Vapi (88.09), Ahmedabad (75.28), Vatva (74.77),*	*Vadodara (66.91), Rajkot (66.76)*

		Bhavnagar (70.99), Junagarh (70.82)	
6.	Haryana	Faridabad (77.07), Panipat (71.99)	--
7.	Himachal Pradesh	--	Baddi (69.07), Kala Amb (68.77), Parwanoo (63.83)
8.	Jharkhand	Dhanbad (78.63)	Jamshedpur (66.06), Saraikela (65.38), Ramgarh (65.11), Bada jamtara (64.47)
9.	Karnataka	Mangalore (73.68), Bhadravati (72.33)	Raichur (68.07), Bidar (67.64), Pinia (65.11)
10.	Kerala	Greater Kochin (75.08)	--
11.	Madhya Pradesh	Indore (71.26)	Dewas (68.77), Nagda-ratlam (66.67), Rampur (65.09)
12.	Maharashtra	Chandrapur (83.88), Dombivalli (78.41), Aurangabad (77.44), Navi Mumbai (73.77), Tarapur (72.01)	Nashik (69.25), Chembur (69.19), Pimpari – Chinchwad (66.06)
13.	Orissa	Angul.Talchar (82.09), IB-Valley (74.00) Jharsugula (73.34)	Pardeep (69.26)
14.	Punjab	Ludhiana (81.66), Mandi Govindgarh (75.08)	Batala (68.59), Jalandhar (64.98)
15.	Rajasthan	Bhiwadi (82.91), Jodhpur (75.19), Pali (73.73)	Jaipur (66.82)
16.	Tamil Nadu	Vellore-North Arcot (81.79), Cuddalore (77.45), Manali (76.32), Coimbatore(72.38)	Tirupur(68.38), Mettur (66.98)
17.	Telangana	Patancheru-Bollaram (70.07)	--
18.	Uttar Pradesh	Ghaziabad (87.37), Singrauli (81.73), Noida (78.90), Kanpur (78.09), Agra (76.48), Varanasi-Mirjapur (73.79)	Moradabad (64.71), Aligarh (63.83), Ferozabad (60.51)
19.	Uttarakhand	--	Haridwar (61.01)

20.	*West Bengal*	*Haldia (75.43), Howrah (74.84), Asansole (70.20)*	*Durgapur (68.26)*

5. Purpose of economic development in any region is to provide opportunities for improved living by removing poverty and unemployment. While industrial development invariably creates more jobs in any region, such development has to be sustainable and compliant with the norms of environment. In absence of this awakening or tendency for monitoring, industrialization has led to environmental degradation on account of industrial pollution. It is imperative to ensure that steps are taken to check such pollution to uphold statutory norms. Adequate and effective pollution control methods are necessary.

6. Dust, smoke, fume and toxic gas emissions occur as a result of highly polluting industries such as thermal power plants, coal mines, cement, sponge iron, steel and ferrow alloys, petroleum and chemicals unless right technology is used and precaution taken. Industry specific clusters have not only become hazardous but also cause irreparable damage to our ecology and environment, often breaching the environment's carrying capacity, adversely affecting public health.

7. In *Karnataka Industrial Areas Development Board vs. C. Kenchappa & Ors*[1], the Hon'ble Supreme Court observed, as guiding rules for Sustainable Development, that humanity must take no more from nature than man can replenish and that people must adopt lifestyles and development paths that work within the nature's limit. In *Vellore Citizens Welfare Forum Vs. Union of India*[2], the Hon'ble Supreme Court recognized the Precautionary Principle and explained that environmental measures by the State Government and the

[1] (2006) 6 SSC 383
[2] AIR 1996 SC 2715

statutory authorities must anticipate, prevent and attack the causes of environmental degradation.

8. This Tribunal has applied the same principles in deciding matters[3] before it in terms of Section 20 of the National Green Tribunal Act 2010.

9. In view of above, we direct the SPCBs/ Committees to finalize the time bound action plans with regard to identified polluted industrial clusters in accordance with the revised norms laid down by the CPCB to restore environmental qualities within norms. Such action plan be finalized within three months from the date of receipt of copy of this order. In case of any left- out/missed areas in addition to 100 areas also, SPCBs should undertake CEPI assessment and formulate action plans.

10. The action plan may thereafter be looked into by the CPCB and steps taken for implementation so as to ensure that all the industrial clusters comply with laid down parameters as per the Water (Prevention & Control of Pollution) Act, 1974 and Air (Prevention & Control of Pollution) Act, 1981. The CPCB will be the Nodal agency. Meanwhile, CPCB will forward Assessment Report for 100 areas carried out during 2017-2018 to MoEF & CC before 28.02.2019 for appropriate action.

11. Needless to say that it will be open to the SPCBs/Committees and CPCB to take coercive measures including recovery of compensation for the damage to the environment on 'Polluter Pays' principle as well as also to direct taking of such precautionary

[3] Aditya N. Prasad & Ors. Vs. Union of India & Ors., Original Application No. 147/2016, Order dated 01.11.2018; We the People, Th. Gen. Secretary Vs Union of India & Ors. Original Application No. 214/2017, Order dated 01.11.2018; Westend Green Farms Society Vs. Union of India & Ors., Original Application No. 400 of 2017, Order dated 02.11.2018; Saloni Ailawadi Vs Union of India & Ors, Original Application No. 509/2015, Order dated 16.11.2018; Shantanu Sharma Vs Union of India & Ors, Original Application No. 117/2014, Order dated 20.11.2018; Dr. Arun Kumar Sharma Vs. Ministry of Environment, Forest and Climate Change & Anr., Original Application No. 312 of 2016, Order dated 26.11.2018.

measures as may be necessary on the basis of 'Precautionary principle'.

12. CPCB may serve copy of this order on all the SPCBs and the Committees who may furnish the same to the concerned Chief Secretaries. Ministry of Environment, Forest and Climate Change (MoEF&CC) may take necessary steps on its part based on CPCB Report for 100 areas mentioned above in accordance with law. The Report on the action taken by the CPCB and MoEF&CC in the matter may be furnished to this Tribunal by e-mail at ngt.filing@gmail.com before 31.05.2019. Copies of this order be sent by e-mail to CPCB and MoEF&CC for compliance.

13. The action plan to be prepared in the States may be done by the Committee constituted by the Chief Secretary within one month from today as several Departments may be involved in the exercise. The final preparation of the action plan including its execution may be overseen by the Chief Secretary of the concerned State, along with the other connected major environmental issues of the States, such as pollution of river stretches, non-attainment cities in terms of air quality and solid waste management, utilization of treated sewage, covered by order of this Tribunal dated 20.09.2018 in Original Application No. 673/2018, News Item Published in 'The Hindu' authored by Shri. Jacob Koshy titled "More river stretches are now critically polluted: CPCB", order dated 08.10.2018 in Original Application No. 681/2018, News Item Published In 'The Times of India' Authored by Shri. Vishwa Mohan Titled "NCAP with Multiple Timelines to Clear Air in 102 Cities to be released around August 15", order dated 20.08.2018 in Original Application No. 606/2018, Compliance of Municipal Solid Waste Management Rules, 2016 and order dated 27.11.2018 in Original Application No. 148/2016, Mahesh Chandra Saxena Vs. South Delhi Municipal Corporation &

Ors. The Chief Secretary will take meetings on all these issues once in three months (quarterly) and will forward Report to NGT by e-mail.

14. List for consideration of report of MoEF&CC and the CPCB on 08.07.2019.

Adarsh Kumar Goel, CP

K. Ramakrishnan, JM

Dr. Nagin Nanda, EM

December 13, 2018
Original Application No. 1038/2018
AG