ENVIRONMENTAL STATEMENT
IN
FORM-V

(Under Rule-14, Environmental (Protection) Rules, 1986)

(2018-2019)

FOR
CLUSTER NO. – 9

(GROUP OF MINES**)**

Kunustoria, Satgram and Sripur Area

Eastern Coalfields Limited

Prepared at

Regional Institute – I

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CMPDI

ISO 9001:2015 Company

ENVIRONMENTAL STATEMENT FOR CLUSTER NO. – 9 (GROUP OF MINES) FOR THE YEAR: 2018-2019

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CHAPTER – I

INTRODUCTION

1.1 GENESIS:

The Gazette Notification vide G.S.R No. 329 (E) dated13th March, 1992 and subsequently renamed to 'Environmental Statement' vide Ministry of Environment & Forests (MOEF), Govt. of India gazette notification No. G.S.R No. 386 (E) Dtd.22nd April'93 reads as follows.

"Every person carrying on an industry, operation or process requiring consent under section 25 of the Water Act, 1974 or under section 21 of the Air Act, 1981 or both or authorisation under the Hazardous Waste Rules, 1989 issued under the Environmental Protection Act, 1986 shall submit an Environmental Audit Report for the year ending 31st March in Form V to the concerned State Pollution Control Board on or before the 30th day of September every year."

In compliance with the above, the work of Environmental Statement for Cluster No. 9 was entrusted to CMPDI by GM (Environment and Forest), Eastern Coalfields Limited.

1.2 PROJECT DESCRIPTION:

Prior to 2014 – 15, a large number of taken over mines from pre – nationalization period, mostly underground mines, in the old coalfields of Raniganj and Jharia did not have environmental clearance from the MoEF&CC and were operating on the basis of 'Consents' received from the respective PCBs. It was felt that if these mines could be brought under the ambit of EC, several measures for environmental protection and pollution control could be put in place. However, the work of obtaining EC for such mines, individually, would have taken a lot of time. To circumvent the problem, it was mooted that since the environmental problems being faced were of regional nature and not confined to individual mines alone, cluster/groups of such mines could be identified for preparing cluster-wise integrated EIA & EMPs, addressing such environmental concerns comprehensively and ensuring effective co-ordination of environmental control measures within each cluster. 13 such clusters were identified in the Raniganj Coalfield of ECL and EC has been obtained on the cluster approach for 12 such clusters.

Cluster of Mines No. 9 is one of the clusters for which EC has been granted vide letter no. J-11015/38/2011-IA-II.(M) dated 23rd January, 2015 for a combined peak capacity of 8.0 MTY and within a ML area of 7145.40 Ha.

In the meanwhile, a re-assessment of mine capacities has been carried out for the cluster while keeping the overall cluster capacity and area unchanged. This re-assessment / rationalization has been done based on present condition and capability of the mines for achieving optimum production levels. The re-organization of UG and OC mining has been planned with due regard to environment. Hence, the amended EC was awarded vide letter no. J-11015/38/2011-IA-II.(M) dated 23rd March, 2017.

In view of the production target set by CIL, a re-assessment of mine capacities has again been carried out for the cluster while keeping the overall cluster capacity and area unchanged. This re-assessment / rationalization has been done based on present condition and capability of the mines for achieving optimum production levels. The proposed changes are in line with the supplementary note to mining plan for the cluster, duly approved by the Board of Directors of ECL on 10.01.2018. EC Amendment was granted vide even letter no. dated 30.05.2018.

Cluster No. 9 is located in the south-central part of Raniganj Coalfield in the Burdwan district of West Bengal between latitudes 23^0, 34′, 55″ N & 23^0, 34′, 55″ N and longitudes 86^0, 59′, 05″ E & 87^0, 07′, 50″ E. The mines within the cluster are situated towards east of Asansol Township. Eastern Railway grand chord line traverses the cluster from east to west and G.T.Road runs along the cluster boundary on the north side. Damodar River forms the boundary of the cluster on the south. The mines are administratively under Satgram, Sripur and Kunustoria Areas of ECL.

Location of cluster – 9 is shown in plate no. – 1.

The composition of the cluster is tabulated as under:

Sl No.	Name of the Mine	Lease Area (Ha)	Peak Production Capacity (MTY)	Mine Life (Years)	Production during 2018-19 (MT)
1	Ratibati UG	249.0	0.04	> 40	0.0
2	Chapuikhas UG & OC	412.0	0.06	> 50	0.03
3	Amritnagar UG	279.0	0.60	> 50	0.11
4	Tirat & Kuardih UG & OC	829.50	0.15	> 10	0.0
5	Nimcha UG & Amkola/Nimcha OC Patch	890.20	1.43	> 40	0.53
6	Ghusick-Muslia UG & OC	1548.0	1.93	> 25	0.0
7	Kalipahari UG & OC	299.50	0.40	> 50	0.15
8	Jemehari UG	118.0	0.04	> 10	0.0
9	J K Nagar UG & OC	1237.0	0.42	> 50	0.20
10	Damra UG	249.0	0.05	> 10	0.0
11	Mahabir UG & Egara OC	241.20	0.38	> 25	0.36
12	Narainkuri OCP	793.0	2.50	> 25	0.72
		7145.40	**8.00**		**2.10**

1. Ratibati UG

There was no production from the mine during 2018-19.

2. Chapuikhas UG & OC

At present (R-VI) Seam is being worked in the mine. The seam is being developed by manual Bord & Pillar method of mining. It is proposed to deploy SDLs in the near future. An opencast patch measuring 7 Ha is also proposed to be worked within the mine leasehold to prevent illegal mining.

The proposed OC patch will deploy shovel-dumper combination for coal and OB.

3. Amritnagar UG

At present, Bogra (R-VI) seam is being worked in the mine. The method of mining adopted is Bord & Pillar. Mine is presently under development phase wherein coal is loaded into mine tubs by SDLs. Depillaring in conjunction with hydraulic stowing would be taken up in future subject to permission from DGMS for the purpose.

4. Tirat & Kuardih UG and OC

At present, there is no production from the mine.

The proposed OC patch will deploy shovel-dumper combination for coal and OB.

5. Nimcha UG and Amkola/Nimcha OC Patch

Nimcha Colliery consists of two units- (i) Nimcha 3 & 4 pit, (ii) Amkola 7 & 8 pit. Gradient of the seams varies from 1 in 25 to 1 in 27. Coal seams are of Degree-II gassiness.

At Nimcha unit, R-IX seam is split into R-IX Top and R-IX bottom seam. R-IX top is burnt. R-IX bottom is virgin. Present working seam of Nimcha unit is R-VIII. Bogra (R-VI) and Satgram (R-V) seams are virgin in this unit. At Amkola unit, R-IX combined is virgin. Present working seams are R-VIII and R-VII.

Amkola/Nimcha OC patch has deployed shovel-dumper combination for coal extraction and OB removal.

6. Ghusick-Muslia UG & OC

At present, there is no production from the mine.

7. Kalipahari UG & OC

At present Kushadanga and Nega (Top) seams are being depillared in the mine in conjunction with hydraulic sand stowing. Coal is loaded into mine tubs manually.

The OC patches have deployed shovel-dumper combination for coal extraction and OB removal.

8. Jemehari UG

Bogra (R-VI) seam is being worked in the mine. The seam was being developed by manual Bord& Pillar method of mining. Due to some project specific problems, there has been a slump in production since 2009-10. However, it is proposed to deploy SDLs in the near future to ensure higher productivity.

9. J K Nagar UG & OC

At present two seams are being worked in the mine, namely R-VI and R-V seams. The method of mining adopted is Bord & Pillar development with SDL and LHD. Seam R – VII is being worked at Pure Searsole by manual Bord & Pillar method.

The OC patch will deploy shovel-dumper combination for coal and OB.

10. Damra UG

There was no production in the mine during 2018-19.

11. Mahabir UG & Egara OC

There was no production of coal from the mine during 2018-19.

Shovel dumper combination is used for coal extraction and OB removal in Narainkuri OC Patch.

12. Narainkuri OC

At present, mine is producing coal by opencast method in a small patch. The larger mine is yet to start production.

1.3 ENVIRONMENTAL SCENARIO:

CMPDI has been engaged to carry out routine Environmental monitoring of the clusters. The monitoring is carried out every fortnight by collecting 24 – hour samples for ambient air at 4 Nos. all - weather stations, 3 pre-monsoon stations and 3 post-monsoon stations (based on local meteorology) and compared with the standards for quality. The details of the sampling locations are given below:

Cluster 9		
Station Code	**Type of Station**	**Name of Station**
9A1	Permanent Air Station	In Kurtidanga village
9A2	Permanent Air Station	In Jamari village Near Satgram Railway siding
9A3	Permanent Air Station	In Amritnagar village
9A4	Permanent Air Station	Near Raniganj RS
9A5	Post monsoon Air Station	In Bakulia village
9A6	Post monsoon Air Station	In Kalikapur village
9A7	Post monsoon Air Station	In Mejia village
9A8	Pre monsoon Air Station	In Murgachori village
9A9	Pre monsoon Air Station	In Chanda village
9A10	Pre monsoon Air Station	In Mithapur village

9 nos. of samples of mine water are also collected and analysed every fortnight and compared with the MoEF Schedule – VI for discharge of effluents into land / streams. A complete analysis of the mine discharge samples which includes heavy metals and salts is carried out twice in a year. Day time workplace noise level is recorded at 9 locations from the mine pit top (in case of UG mine) and workshops (in case of OC mine) present within the cluster. Groundwater level in the cluster area is monitored by taking measurements at 8 earmarked dugwells in the months of January, May, August and November every year. Samples of groundwater from these wells, which are also utilized by the local population for drinking and other domestic purposes, are analysed once in a year during May and compared with the IS 10500:2012 standards for drinking water quality.

Location of the monitoring stations of air, noise & water are shown in Plate- II.

The environmental monitoring results for 24 fortnights ending 31st March, 2019 are appended as Annexures – I, II, III & IV. The environmental monitoring results for the year 2018-19 are summarized below:

AMBIENT AIR QUALITY

The PM_{10} concentration was found in the range of of 73.7 to 91.9 µg/m^3 and are within the limits as per the standards. The $PM_{2.5}$ concentration was found in the range of 29.2 to 54.7 µg/m^3 and are within the limits as per NAAQS, 2009. The SO_2 concentration remained below 10.0 µg/m^3 and NO_X concentration was in the range of 12.6 to 25.4 µg/m^3 and was well within the limits as per the standards.

ENVIRONMENTAL STANDARDS:

Environmental Standards for Ambient Air Quality (AAQ):

Station Category	*Environmental standard for Raniganj Coalfield vide MOEF, Govt. of India, Gazette Notification No. GSR 742 (E) dated 25.09.2000 for 24 hourly samples at 500 meters from dust generating point*			*National Ambient Air Quality Standards (NAAQS), 2009 for industrial, residential and rural areas for 24 hours samples*
	Pollutant Concentration (µg/m^3)			
	PM_{10}	**SO_2**	**NO_x**	**$PM_{2.5}$**
Industrial	300.0	120.0	120.0	60.0
Residential	100.00	80.0	80.0	

WATER QUALITY

Ground water percolates into working area from the surrounding aquifers which have been exposed due to opencast mining. The mine is dewatered regularly to maintain dry working conditions. This mine discharge water is partly utilized for dust suppression by sprinkling at coal faces and on haul roads and the remainder is discharged onto adjoining cultivable lands for irrigation purposes. Part-B of the Environmental Statement proforma contains the detailed break-up of water consumption.

The analysis results for the mine discharge water reveal that most of the parameters are within permissible limits prescribed by MoEF&CC as General Standards Schedule – VI for Class-'A' effluent (Effluent discharged into inland surface water) and IS 10500:2012 for groundwater standards.

In order to assess the impact of mining on the groundwater level, a network of 8 dugwells has been identified for monitoring of groundwater level in the months of January, May, August and November every year. Samples from these wells are collected and analysed during twice in a year and compared with IS 10500:2012 standards for drinking water.

Mine water and ground water analysis results are given in Annexure-III.

Well water level results are given in Annexure – IV.

NOISE LEVEL

The day time workplace noise level was found in the range of 60.2 to 71.5 dB(A). The noise level recorded is below permissible limit prescribed by MoEF&CC.

Noise Level Standard as per Noise Pollution (Regulation and Control) Rules, 2000 for different station categories is given below:

Station Category	Limits for noise (Leq dB (A))	
	Day Time (6am-10pm)	Night Time (10pm-6am)
Industrial	75.0	70.0
Commercial	65.0	55.0
Residential	55.0	45.0

CHAPTER - II
ENVIRONMENTAL STATEMENT FORM– V

Environmental statement for the financial year ending March, 2019

PART – A

SL. NO.	HEADING	PARTICULARS
(I)	**NAME AND ADDRESS OF THE PROJECT**	CLUSTER NO. – 9 (GROUP OF MINES)
i	Ratibati UG	Ratibati Colliery, Satgram Area, PO – Kalipahari, Burdwan, West Bengal
ii	Chapuikhas UG & OC	Chapuikhas Colliery, Satgram Area, PO – Kalipahari, Burdwan, West Bengal
iii	Amritnagar UG	Amritnagar Colliery, Kunustoria Area, PO – Raniganj, Burdwan, West Bengal
iv	Tirat UG	Tirat Colliery, Satgram Area, PO – Kalipahari, Burdwan, West Bengal
v	Kuardih UG & OC	Kuardih Colliery, Satgram Area, PO – Kalipahari, Burdwan, West Bengal
vi	Nimcha UG & OC	Nimcha Colliery, Satgram Area, PO – Raniganj, Burdwan, West Bengal
vii	Ghusick UG	Ghusick Colliery, Sripur Area, PO – Kalipahari, Burdwan, West Bengal
viii	Kalipahari UG & OC	Kalipahari Colliery, Sripur Area, PO – Kalipahari, Burdwan, West Bengal
ix	Muslia UG & OC	Muslia Colliery, Sripur Area, PO – Damra, Burdwan, West Bengal
x	New Ghusick UG	New Ghusick Colliery, Sripur Area, PO – Kalipahari, Burdwan, West Bengal
xi	Jemehari UG	Jemehari Colliery, Satgram Area, PO – Satgram, Burdwan, West Bengal
xii	J K Nagar UG & OC	J K Nagar Colliery, Satgram Area, PO – Bidhan Nagar, Burdwan, West Bengal
xiii	Damra UG	Damra Colliery, Sripur Area, PO – Kalipahari, Burdwan, West Bengal
xiv	Mahabir UG & OC	Mahabir Colliery, Kunustoria Area, PO – Raniganj, Burdwan, West Bengal
xv	Narainkuri UG	Narainkuri Colliery, Kunustoria Area, PO – Raniganj, Burdwan, West Bengal
(II)	**INDUSTRY CATEGORY**	All mines in the cluster falls in red category
(III)	**PRODUCTION CAPACITY**	8.0 MTY
(IV)	**YEAR OF ESTABLISHMENT**	Most of the mines within the cluster are taken over mines from pre-nationalisation period. Narainkuri UG is a proposed project.
(V)	**DATE OF THE LAST ENVIRONMENTAL STATEMENT SUBMITTED**	28.09.2018

PART – B
WATER AND RAW MATERIAL CONSUMPTION

(I) WATER CONSUMPTION (Cu.m/day)

1. Chapuikhas UG & OC

Sl. No.	Particulars	2017-18	2018-19
A.	**MINING** (Dust suppression, Firefighting, Others)	80.0	80.0
B.	**COOLING** (in radiators of trucks/HEMM/workshop)	0.0	0.0
C.	**DOMESTIC** (Mine Water)	0.0	0.0
TOTAL		**80.0**	**80.0**

Name of Product	Process water consumption per unit of product output (l/day/te)	
	2017-18	**2018-19**
Coal	2.99	2.28

2. Amritnagar UG

Sl. No.	Particulars	2017-18	2018-19
A.	**MINING** (Dust suppression, Firefighting, Others)	70.0	70.0
B.	**COOLING** (in radiators of trucks/HEMM/workshop)	0.0	0.0
C.	**DOMESTIC** (Mine Water)	502.0	502.0
TOTAL		**572.0**	**572.0**

Name of Product	Process water consumption per unit of product output (l/day/te)	
	2017-18	**2018-19**
Coal	0.58	0.60

3. Nimcha UG & Amkola/Nimcha OC Patch

Sl. No.	Particulars	2017-18	2018-19
A.	**MINING** (Dust suppression, Firefighting, Others)	80.0	80.0
B.	**COOLING** (in radiators of trucks/HEMM/workshop)	0.0	0.0
C.	**DOMESTIC** (Mine Water)	1755.0	1755.0
TOTAL		**1835.0**	**1835.0**

Name of Product	Process water consumption per unit of product output (l/day/te)	
	2017-18	**2018-19**
Coal	0.19	0.15

4. Kalipahari UG & OC

Sl. No.	Particulars	2017-18	2018-19
A.	**MINING** (Dust suppression, Firefighting, Others)	140.0	140.0
B.	**COOLING** (in radiators of trucks/HEMM/workshop)	0.0	0.0
C.	**DOMESTIC** (Mine Water and PHED supply)	590.0	660.0
TOTAL		**730.70**	**800.0**

Name of Product	Process water consumption per unit of product output (l/day/te)	
	2017-18	**2018-19**
Coal	1.56	0.94

5. J K Nagar UG & OC

Sl. No.	Particulars	2017-18	2018-19
A.	**MINING** (Dust suppression, Firefighting, Others)	80.0	80.0
B.	**COOLING** (in radiators of trucks/HEMM/workshop)	0.0	0.0
C.	**DOMESTIC** (Mine Water and PHED supply)	435.5	435.50
TOTAL		**515.5**	**515.50**

Name of Product	Process water consumption per unit of product output (l/day/te)	
	2017-18	**2018-19**
Coal	0.54	0.40

6. Mahabir UG & Egara OC

Sl. No.	Particulars	2017-18	2018-19
A.	**MINING** (Dust suppression, Firefighting, Others)	115.0	110.0
B.	**COOLING** (in radiators of trucks/HEMM/workshop)	0.0	0.0
C.	**DOMESTIC** (Mine Water)	0.0	0.0
TOTAL		**115.0**	**110.0**

Name of Product	Process water consumption per unit of product output (l/day/te)	
	2017-18	2018-19
Coal	0.27	0.30

(II) RAW MATERIAL CONSUMPTION :

1. Chapuikhas UG & OC

Name of raw material	Name of products	Consumption of raw material per unit of output	
		During previous financial year (2017-18)	During current financial year (2018-19)
1. Explosive	Coal	0.43 kg/te	0.34 kg/te
2. Diesel		0.10 l/te	0.46 l/te
3. Lubricants		-	-

2. Amritnagar UG

Name of raw material	Name of products	Consumption of raw material per unit of output	
		During previous financial year (2017-18)	During current financial year (2018-19)
1. Explosive	Coal	0.97 kg/te	1.35 kg/te
2. Diesel		0.19 l/te	0.05 l/te
3. Lubricants		0.02 l/te	0.01 l/te

3. Nimcha UG

Name of raw material	Name of products	Consumption of raw material per unit of output	
		During previous financial year (2017-18)	During current financial year (2018-19)
1. Explosive	Coal	0.39 kg/te	0.39 kg/te
2. Diesel		0.05 l/te	0.34 l/te
3. Lubricants		-	-

Amkola/Nimcha OC Patch

Name of raw material	Name of products	Consumption of raw material per unit of output	
		During previous financial year (2017-18)	During current financial year (2018-19)
1. Explosive	Coal	3.26 kg/te	1.78 kg/te
2. Diesel		4.42 l/te	3.15 l/te
3. Lubricants		0.22 l/te	0.16 l/te

4. Kalipahari UG & OC

Name of raw material	Name of products	Consumption of raw material per unit of output	
		During previous financial year (2017-18)	During current financial year (2018-19)
1. Explosive	Coal	0.95 kg/te	0.94 kg/te
2. Diesel		0.06 l/te	-
3. Lubricants		0.02 l/te	-

5. J K Nagar UG & OC

Name of raw material	Name of products	Consumption of raw material per unit of output	
		During previous financial year (2017-18)	During current financial year (2018-19)
1. Explosive	Coal	0.25 kg/te	0.16 kg/te
2. Diesel		0.11 l/te	0.13 l/te
3. Lubricants		-	-

6. Mahabir UG & Egara OC

Name of raw material	Name of products	Consumption of raw material per unit of output	
		During previous financial year (2017-18)	During current financial year (2018-19)
1. Explosive	Coal	3.76 kg/te	1.04 kg/te
2. Diesel		1.68 l/te	0.76 l/te
3. Lubricants		0.02 l/te	0.02 l/te

7. Narainkuri OCP

Name of raw material	Name of products	Consumption of raw material per unit of output	
		During previous financial year (2017-18)	During current financial year (2018-19)
1. Explosive	Coal	-	1.94 kg/te
2. Diesel		-	1.16 l/te
3. Lubricants		-	0.02 l/te

PART – C
POLLUTION GENERATED

Mine	Pollution	Quantity of pollutants discharged (mass/day)	Concentrations of Pollutants in discharges (mass/volume)	Percentage variation from prescribed standards with reasons
Chapuikhas UG & OC	WATER*	-	1. Mine water discharge Analysis results are given in Annexure-III. 2. The main air pollutant is suspended PM_{10} and $PM_{2.5}$. The air quality results are appended as Annexure-I.	1. The analysis results reveal that most of the parameters are below permissible limits prescribed by MOEF as General Standards for class 'A' effluent (Effluent discharged into inland surface water.) 2. Ambient air quality results show that the values of PM_{10}, $PM_{2.5}$, SO_2 and NO_x are within the prescribed standards as per GSR 742 (E) dated 25.09.2000 and NAAQS, 2009.
	AIR**	Total pollutant load of PM_{10} is 5.72 kg/day while it is 1.20 kg/day for $PM_{2.5}$.		
Amritnagar UG	WATER*	-		
	AIR**	Total pollutant load of PM_{10} is 49.11 kg/day while it is 10.31 kg/day for $PM_{2.5}$.		
Nimcha UG & OC	WATER*	-		
	AIR**	Total pollutant load of PM_{10} is 80.09 kg/day while it is 16.82 kg/day for $PM_{2.5}$.		
Kalipahari UG & OC Patches	WATER*	Average concentration of 21.36 mg/l. Mine water discharged is 7212.0 KL/day. Hence, total load is 154.04 kg/day.		
	AIR**	Total pollutant load of PM_{10} is 154.96 kg/day while it is 32.54 kg/day for $PM_{2.5}$.		
J K Nagar UG & OC Patches	WATER*	-		
	AIR**	Total pollutant load of PM_{10} is 9.36 kg/day while it is 1.97 kg/day for $PM_{2.5}$.		
Mahabir UG & OC Patch	WATER*	-		
	AIR**	Total pollutant load of PM_{10} is 327.21 kg/day while it is 68.72 kg/day for $PM_{2.5}$.		
Narainkuri OC	WATER*	-		
	AIR**	Total pollutant load of PM_{10} is 1409.02 kg/day while it is 295.90 kg/day for $PM_{2.5}$.		

*Water discharged from the mine contains pollutants in the form of suspended solids (mostly fine coal dust).
**PM_{10} and $PM_{2.5}$ estimation has been done using empirical formula by using Emission Factors derived from S&T studies done by CMPDI.

PART – D
HAZARDOUS WASTE
(As specified under Hazardous Waste (Management and Handling) Rules, 1989)

1. Chapuikhas UG & OC

Hazardous waste	Total quantity		Disposal method
	During previous financial year (2017-18)	During current financial year (2018-19)	
A) From process			Dealt in Part – F
i)Used oil	400 litres	400 litres	
ii)Lead-Acid Batteries			
a. Automobile batteries	nil	Nil	
b. Cap-lamp batteries	300 nos.	Nil	
iii) Used Cotton waste	10 kg	10 kg	
iv) Metal Scrap	-	-	

2. Amritnagar UG

Hazardous waste	Total quantity		Disposal method
	During previous financial year (2017-18)	During current financial year (2018-19)	
A) From process i)Used oil ii)Lead-Acid Batteries a. Automobile batteries b. Cap-lamp batteries iii) Used Cotton waste iv) Metal Scrap	6010 litres Nil 469 nos. 24 kg -	5590 litres 3 Nos. 250 nos. Nil -	Dealt in Part – F

3. Nimcha UG & Amkola/Nimcha OC Patch

Hazardous waste	Total quantity		Disposal method
	During previous financial year (2017-18)	During current financial year (2018-19)	
A) From process i)Used oil ii)Lead-Acid Batteries a. Automobile batteries b. Cap-lamp batteries iii) Used Cotton waste iv) Metal Scrap	16970 litres nil 300 nos. 50 kg nil	554 litres Nil 300 nos. 150 kg Nil	Dealt in Part – F

4. Kalipahari UG & OC

Hazardous waste	Total quantity		Disposal method
	During previous financial year (2017-18)	During current financial year (2018-19)	
A) From process i)Used oil ii)Lead-Acid Batteries a. Automobile batteries b. Cap-lamp batteries iii) Used Cotton waste iv) Metal Scrap	1800 litres Nil 201 nos. - 5000 kg	-	Dealt in Part – F

5. J K Nagar UG & OC

Hazardous waste	Total quantity		Disposal method
	During previous financial year (2017-18)	During current financial year (2018-19)	
A) From process i)Used oil ii)Lead-Acid Batteries a. Automobile batteries b. Cap-lamp batteries iii) Used Cotton waste iv) Metal Scrap	400 litres nil 300 nos. 50 kg -	400 litres Nil Nil 50 kg -	Dealt in Part – F

6. Mahabir UG & Egara OC

Hazardous waste	Total quantity		Disposal method
	During previous financial year (2017-18)	During current financial year (2018-19)	
A) From process			
i)Used oil	6120 litres	5170 litres	
ii)Lead-Acid Batteries			
a. Automobile batteries	-	-	Dealt in Part – F
b. Cap-lamp batteries	-	-	
iii) Used Cotton waste	600 kg	-	
iv) Metal Scrap	-	-	

7. Narainkuri OCP

Hazardous waste	Total quantity		Disposal method
	During previous financial year (2017-18)	During current financial year (2018-19)	
A) From process			
i)Used oil		10460 litres	
ii)Lead-Acid Batteries			
c. Automobile batteries	-	-	Dealt in Part – F
d. Cap-lamp batteries		-	
iii) Used Cotton waste		-	
iv) Metal Scrap		-	

Approximate values may be given where actual values are not available.

Note: a) The detail of used oil is to be given to concerned Pollution Control Board in Form-13 as per time mentioned in HW (M & H), Amendment Rules, 2003.

b) The detail of disposal of Lead Acid batteries is to be given to concerned State Pollution Control Board in Form-VIII as per time mentioned in Batteries (M&H) Rules, 2001.

PART – E
SOLID WASTE

Particulars	Name of Mine/OC Patch	Total quantity (In Million Cu.m)	
		During previous financial year (2017-18)	During current financial year (2018-19)
a) From process (Mining)	Nimcha/Amkola	1.92	0.14
	Kalipahari	0.37	0.46
	Egara	-	0.58
	Narainkuri	2.01	2.17
b) From pollution control facilities		-	
c) Quantity recycled or reutilized back filled	Amkola	-	0.66
	Kalipahari	-	0.46
	Egara	-	-
	Narainkuri	2.01	2.17

PART – F

PLEASE SPECIFY THE CHARACTERISTICS (IN TERMS OF CONCENTRATION AND QUANTUM) OF HAZARDOUS AS WELL AS SOLID WASTE AND INDICATE THE DISPOSAL PRACTICE ADOPTED FOR BOTH THESE CATEGORIES OF WASTE.

Hazardous waste generated is given in the table PART-D which has been deposited at area store disposal stock yard.

Used oil is stored in HDPE container and reused as lubricant. Cap lamp batteries, HEMM batteries and metal scrap are stored at area store and auctioned to Authorized Recyclers for reuse.

Metal scraps are declared and report is sent to HQ. The scraps are then auctioned and sold through HQ.

Cotton waste generated is burned under control environment.

PART – G

IMPACT OF POLLUTION CONTROL MEASURES ON CONSERVATION OF NATURAL RESOURCES AND CONSEQUENTLY ON COST OF PRODUCTION.

In order to carry out mining in an eco-friendly manner following pollution control measures have been implemented.

1. AIR POLLUTION CONTROL MEASURES:

a) Mobile water tankers are used for water spraying in mine periphery. Mine water is used for this purpose.
b) Wet coal transport, road maintenance is being done.
c) Trucks carrying coal to the railway sidings are covered with tarpaulin to avoid spillage.
d) Regular sprinkling of water at coal loading & discharge points with the help of stand post at Railway siding.
e) Plantation has been carried out at subsided lands and other ML places within the cluster.
f) Plantation will also be carried out as per proposed plan in future.

2. WATER POLLUTION CONTROL MEASURES:

a) Filtration of mine water is done and the filtered water is being supplied to colonies in Nimcha Colliery, Jemehari Colliery, J K Nagar Colliery and Amritnagar Colliery.
b) Sedimentation tank has been provided at Nimcha colliery, Amritnagar colliery, Jemehari colliery and J K Nagar colliery which is used for sedimentation of water before being discharged to local nallahs and ponds, if required.

3. NOISE POLLUTION CONTROL MEASURES:

a) Regular maintenance of machines and other equipment at Bunker and workshop including mine fan.
b) Providing green belt around core activity area, along road side in colony and in other vacant space.
c) Non-electric delay detonators are used in place of detonating fuse to eliminate noise pollution during blasting.
d) All HEMM & light vehicle are provided with silencers.
e) Noise monitoring is being carried out regularly.

4. LAND RESOURCE MANAGEMENT:

a) Around 3.35 Mm^3 of OB was generated during 2018-19 from different opencast projects of the cluster out of which 3.29 Mm^3 OB have been rehandled and backfilled in the quarried area. After technical reclamation, biological reclamation will be followed as per the proposed plan.

PART – H

ADDITIONAL INVESTMENT PROPOSAL FOR ENVIRONMENTAL PROTECTION INCLUDING ABATEMENT OF POLLUTION.

a) Plantation will be carried out as per proposed plan in future.
b) The Environmental monitoring of the cluster will be continued fortnightly as per the guidelines of Ministry of Environment, Forests & Climate Change (MoEF & CC).
c) Different activities have been done under CSR for the benefit of local communities.

PART – I

ANY OTHER PARTICULAR IN RESPECTOF ENVIRONMENTAL PROTECTION AND ABATMENT OF POLLUTION.

The Environmental Monitoring is carried out fortnightly for the project by CMPDI, RI-I as per the guideline of Ministry of Environment and Forest (MOEF) and based on the result thereof; colliery takes necessary action if needed.

Annexure – I

AMBIENT AIR QUALITY

Cluster No	Station No	Station Name	Month	Fortnight	Date of Sampling	PM_{10}	$PM_{2.5}$	SO_2	NO_X
9	9A1	In Kurtidanga village	April	First	06-Apr-18	80.2	29.6	<10.0	16.3
9	9A1	In Kurtidanga village	April	Second	21-Apr-18	81.1	30.2	<10.0	16.8
9	9A1	In Kurtidanga village	May	First	07-May-18	84.7	30.1	<10.0	17.2
9	9A1	In Kurtidanga village	May	Second	18-May-18	85.2	30.3	<10.0	16.8
9	9A1	In Kurtidanga village	June	First	12-Jun-18	85.2	31.1	<10.0	17.3
9	9A1	In Kurtidanga village	June	Second	22-Jun-18	86.2	32.6	<10.0	18.1
9	9A1	In Kurtidanga village	July	First	11-Jul-18	86.1	31.6	<10.0	17.7
9	9A1	In Kurtidanga village	July	Second	19-Jul-18	88.9	34.6	<10.0	18.9
9	9A1	In Kurtidanga village	August	First	10-Aug-18	91.1	35.7	<10.0	17.6
9	9A1	In Kurtidanga village	August	Second	27-Aug-18	91.5	36.2	<10.0	17.8
9	9A1	In Kurtidanga village	September	First	07-Sep-18	91.1	35.7	<10.0	17.6
9	9A1	In Kurtidanga village	September	Second	26-Sep-18	89.9	34.2	<10.0	16.2
9	9A1	In Kurtidanga village	October	First	09-Oct-18	88.2	32.1	<10.0	17.9
9	9A1	In Kurtidanga village	October	Second	30-Oct-18	87.4	32	<10.0	17.3
9	9A1	In Kurtidanga village	November	First	14-Nov-18	86.2	31.7	<10.0	17.1
9	9A1	In Kurtidanga village	November	Second	17-Nov-18	86.7	31.2	<10.0	16.8
9	9A1	In Kurtidanga village	December	First	04-Dec-18	87.1	33.7	<10.0	17.7
9	9A1	In Kurtidanga village	December	Second	17-Dec-18	87.5	33.9	<10.0	17.9
9	9A1	In Kurtidanga village	January	First	02-Jan-19	87.8	39.8	<10.0	19.5
9	9A1	In Kurtidanga village	January	Second	29-Jan-19	88.1	39.8	<10.0	18.7
9	9A1	In Kurtidanga village	February	First	01-Feb-19	88.4	40.7	<10.0	19.5
9	9A1	In Kurtidanga village	February	Second	27-Feb-19	88.2	38.4	<10.0	19.4
9	9A1	In Kurtidanga village	March	First	15-Mar-19	89.8	51.7	<10.0	24.5
9	9A1	In Kurtidanga village	March	Second	28-Mar-19	90.3	54.6	<10.0	22.8
9	9A10	In Mithapur village	April	First	11-Apr-18	84.4	32.6	<10.0	14.7
9	9A10	In Mithapur village	April	Second	21-Apr-18	83.7	31.9	<10.0	15.1
9	9A10	In Mithapur village	May	First	07-May-18	87.9	31.9	<10.0	15.7
9	9A10	In Mithapur village	May	Second	16-May-18	88.3	30.8	<10.0	16.3
9	9A10	In Mithapur village	June	First	11-Jun-18	88.4	35.2	<10.0	16.6
9	9A10	In Mithapur village	June	Second	19-Jun-18	88.1	35.6	<10.0	16.9
9	9A10	In Mithapur village	July	First	02-Jul-18	87.5	34.6	<10.0	16.3
9	9A10	In Mithapur village	July	Second	24-Jul-18	88.9	35.5	<10.0	17.1
9	9A10	In Mithapur village	August	First	06-Aug-18	90.6	37.2	<10.0	16.7
9	9A10	In Mithapur village	August	Second	31-Aug-18	89.7	36.5	<10.0	16.2
9	9A10	In Mithapur village	September	First	11-Sep-18	90.6	37.2	<10.0	16.7
9	9A10	In Mithapur village	September	Second	26-Sep-18	89.1	35.6	<10.0	15.9
9	9A2	In Jamari village	April	First	10-Apr-18	79.4	29.2	<10.0	14.1
9	9A2	In Jamari village	April	Second	21-Apr-18	80.3	30.6	<10.0	15.4
9	9A2	In Jamari village	May	First	15-May-18	81.2	31.2	<10.0	15.3
9	9A2	In Jamari village	May	Second	18-May-18	84.3	30.9	<10.0	15.1
9	9A2	In Jamari village	June	First	12-Jun-18	82.4	31.9	<10.0	16.4
9	9A2	In Jamari village	June	Second	28-Jun-18	83.6	31.9	<10.0	16.7
9	9A2	In Jamari village	July	First	07-Jul-18	83.2	31.7	<10.0	16.1
9	9A2	In Jamari village	July	Second	25-Jul-18	85.5	32.8	<10.0	17.3
9	9A2	In Jamari village	August	First	14-Aug-18	88.4	33.9	<10.0	16.2
9	9A2	In Jamari village	August	Second	22-Aug-18	87.9	34.3	<10.0	16.5
9	9A2	In Jamari village	September	First	07-Sep-18	88.4	33.9	<10.0	16.2
9	9A2	In Jamari village	September	Second	20-Sep-18	87.8	31.7	<10.0	15.2
9	9A2	In Jamari village	October	First	06-Oct-18	86.1	31.8	<10.0	21.2

Cluster No	Station No	Station Name	Month	Fortnight	Date of Sampling	PM_{10}	$PM_{2.5}$	SO_2	NO_X
9	9A2	In Jamari village	October	Second	29-Oct-18	85.5	30.9	<10.0	20.7
9	9A2	In Jamari village	November	First	14-Nov-18	83.7	29.5	<10.0	19.2
9	9A2	In Jamari village	November	Second	17-Nov-18	84.2	30.2	<10.0	19.5
9	9A2	In Jamari village	December	First	05-Dec-18	84.5	39.9	<10.0	18.2
9	9A2	In Jamari village	December	Second	17-Dec-18	84.9	30.7	<10.0	18.1
9	9A2	In Jamari village	January	First	02-Jan-19	85.3	36.4	<10.0	18.7
9	9A2	In Jamari village	January	Second	29-Jan-19	85.5	37.4	<10.0	19.6
9	9A2	In Jamari village	February	First	13-Feb-19	85.8	41.6	<10.0	18.7
9	9A2	In Jamari village	February	Second	26-Feb-19	85.6	39.6	<10.0	18.6
9	9A2	In Jamari village	March	First	14-Mar-19	86.4	54.3	<10.0	23.6
9	9A2	In Jamari village	March	Second	28-Mar-19	87.1	53.8	<10.0	21.6
9	9A3	In Amritnagar village	April	First	10-Apr-18	82.5	30.6	<10.0	12.6
9	9A3	In Amritnagar village	April	Second	27-Apr-18	83.4	31.2	<10.0	13.7
9	9A3	In Amritnagar village	May	First	11-May-18	83.3	33.8	<10.0	13.6
9	9A3	In Amritnagar village	May	Second	16-May-18	84.7	32.6	<10.0	14.2
9	9A3	In Amritnagar village	June	First	01-Jun-18	84.5	34.2	<10.0	14.3
9	9A3	In Amritnagar village	June	Second	28-Jun-18	85.7	34.5	<10.0	15.7
9	9A3	In Amritnagar village	July	First	10-Jul-18	84.1	33.7	<10.0	13.9
9	9A3	In Amritnagar village	July	Second	25-Jul-18	86.6	34.7	<10.0	15.3
9	9A3	In Amritnagar village	August	First	04-Aug-18	89.2	34.2	<10.0	14.6
9	9A3	In Amritnagar village	August	Second	22-Aug-18	90.3	35.9	<10.0	14.9
9	9A3	In Amritnagar village	September	First	07-Sep-18	89.2	34.2	<10.0	14.6
9	9A3	In Amritnagar village	September	Second	22-Sep-18	89.1	34.4	<10.0	14.9
9	9A3	In Amritnagar village	October	First	11-Oct-18	87.6	33.1	<10.0	19.3
9	9A3	In Amritnagar village	October	Second	20-Oct-18	88.7	33.4	<10.0	19.6
9	9A3	In Amritnagar village	November	First	14-Nov-18	87.5	32.7	<10.0	19
9	9A3	In Amritnagar village	November	Second	20-Nov-18	87.1	32.3	<10.0	18.7
9	9A3	In Amritnagar village	December	First	05-Dec-18	87.8	34.2	<10.0	19.1
9	9A3	In Amritnagar village	December	Second	26-Dec-18	88.2	34.7	<10.0	18.4
9	9A3	In Amritnagar village	January	First	04-Jan-19	88.4	40.5	<10.0	18.2
9	9A3	In Amritnagar village	January	Second	29-Jan-19	88.6	41.8	<10.0	17.4
9	9A3	In Amritnagar village	February	First	12-Feb-19	88.9	41.3	<10.0	16.4
9	9A3	In Amritnagar village	February	Second	26-Feb-19	88.6	37.8	<10.0	17.3
9	9A3	In Amritnagar village	March	First	14-Mar-19	89.5	51.2	<10.0	25.4
9	9A3	In Amritnagar village	March	Second	28-Mar-19	90.2	54.7	<10.0	23.4
9	9A4	Near Raniganj RS	April	First	05-Apr-18	73.7	29.4	<10.0	14.2
9	9A4	Near Raniganj Railway siding	April	Second	27-Apr-18	79.9	30.2	<10.0	14.7
9	9A4	Near Raniganj RS	May	First	10-May-18	80.9	29.7	<10.0	15.2
9	9A4	Near Raniganj Railway siding	May	Second	16-May-18	81.5	30.2	<10.0	15.7
9	9A4	Near Raniganj RS	June	First	01-Jun-18	82.8	30.9	<10.0	15.4
9	9A4	Near Raniganj Railway siding	June	Second	28-Jun-18	82.7	31.2	<10.0	16.1
9	9A4	Near Raniganj RS	July	First	10-Jul-18	83.3	31.4	<10.0	14.9
9	9A4	Near Raniganj Railway siding	July	Second	25-Jul-18	84.4	32.3	<10.0	15.1
9	9A4	Near Raniganj RS	August	First	04-Aug-18	86.7	33.4	<10.0	15.2
9	9A4	Near Raniganj Railway siding	August	Second	18-Aug-18	87.5	34.4	<10.0	15.7
9	9A4	Near Raniganj RS	September	First	07-Sep-18	86.7	33.4	<10.0	15.2
9	9A4	Near Raniganj Railway siding	September	Second	22-Sep-18	84.8	33.7	<10.0	15.3
9	9A4	Near Raniganj Railway siding	October	First	11-Oct-18	87.2	32.3	<10.0	21.2
9	9A4	Near Raniganj Railway siding	October	Second	22-Oct-18	87.7	31.9	<10.0	20.8
9	9A4	Near Raniganj Railway siding	November	First	02-Nov-18	85.9	30.8	<10.0	19.1
9	9A4	Near Raniganj Railway siding	November	Second	20-Nov-18	86.6	31.2	<10.0	19.5

Cluster No	Station No	Station Name	Month	Fortnight	Date of Sampling	PM_{10}	$PM_{2.5}$	SO_2	NO_X
9	9A4	Near Raniganj Railway siding	December	First	07-Dec-18	86.2	31.7	<10.0	18.1
9	9A4	Near Raniganj Railway siding	December	Second	26-Dec-18	86.7	31.9	<10.0	17.9
9	9A4	Near Raniganj Railway siding	January	First	03-Jan-19	86.9	39.3	<10.0	17.5
9	9A4	Near Raniganj Railway siding	January	Second	30-Jan-19	87.2	42.6	<10.0	16.5
9	9A4	Near Raniganj Railway siding	February	First	01-Feb-19	87.6	39.8	<10.0	18.2
9	9A4	Near Raniganj Railway siding	February	Second	26-Feb-19	87.7	36.4	<10.0	19.8
9	9A4	Near Raniganj Railway siding	March	First	11-Mar-19	88.3	43.2	<10.0	18.7
9	9A4	Near Raniganj Railway siding	March	Second	28-Mar-19	88.7	42.6	<10.0	19.7
9	9A5	In Bakulia village	October	First	04-Oct-18	86.5	29.4	<10.0	17.7
9	9A5	In Bakulia village	October	Second	23-Oct-18	86.2	30.1	<10.0	17.9
9	9A5	In Bakulia village	November	First	09-Nov-18	85.7	29.8	<10.0	17.3
9	9A5	In Bakulia village	November	Second	17-Nov-18	84.9	29.3	<10.0	17.1
9	9A5	In Bakulia village	December	First	07-Dec-18	86.4	30.9	<10.0	16.2
9	9A5	In Bakulia village	December	Second	26-Dec-18	86.8	32.2	<10.0	16.5
9	9A5	In Bakulia village	January	First	05-Jan-19	87.2	42.5	<10.0	16.7
9	9A5	In Bakulia village	January	Second	30-Jan-19	87.4	41.4	<10.0	19.8
9	9A5	In Bakulia village	February	First	05-Feb-19	87.5	37.5	<10.0	17.5
9	9A5	In Bakulia village	February	Second	26-Feb-19	87.3	39.8	<10.0	17.3
9	9A5	In Bakulia village	March	First	11-Mar-19	88	40.9	<10.0	20.6
9	9A5	In Bakulia village	March	Second	26-Mar-19	88.5	41.3	<10.0	18.3
9	9A6	In Kalikapur village	October	First	05-Oct-18	87.4	33.4	<10.0	19.1
9	9A6	In Kalikapur village	October	Second	27-Oct-18	87.7	33.9	<10.0	19.5
9	9A6	In Kalikapur village	November	First	09-Nov-18	86.1	32.3	<10.0	18.2
9	9A6	In Kalikapur village	November	Second	20-Nov-18	86.3	32.6	<10.0	19.2
9	9A6	In Kalikapur village	December	First	07-Dec-18	86.9	32.5	<10.0	17.4
9	9A6	In Kalikapur village	December	Second	26-Dec-18	87.3	33.7	<10.0	17.9
9	9A6	In Kalikapur village	January	First	03-Jan-19	87.6	40.7	<10.0	18.2
9	9A6	In Kalikapur village	January	Second	30-Jan-19	87.8	38.7	<10.0	17.3
9	9A6	In Kalikapur village	February	First	05-Feb-19	88.1	38.2	<10.0	18.3
9	9A6	In Kalikapur village	February	Second	26-Feb-19	88.4	36.8	<10.0	16.4
9	9A6	In Kalikapur village	March	First	11-Mar-19	89.3	40.1	<10.0	17.9
9	9A6	In Kalikapur village	March	Second	26-Mar-19	90.3	42.8	<10.0	20.2
9	9A7	In Mejia village	October	First	09-Oct-18	89.2	34.1	<10.0	20.5
9	9A7	In Mejia village	October	Second	25-Oct-18	90.3	34.7	<10.0	21.2
9	9A7	In Mejia village	November	First	09-Nov-18	89.1	33.6	<10.0	20.8
9	9A7	In Mejia village	November	Second	20-Nov-18	88.4	33.1	<10.0	20.1
9	9A7	In Mejia village	December	First	07-Dec-18	89.8	34.5	<10.0	18.8
9	9A7	In Mejia village	December	Second	31-Dec-18	90.2	35.2	<10.0	19.2
9	9A7	In Mejia village	January	First	03-Jan-19	90.4	38.2	<10.0	17.3
9	9A7	In Mejia village	January	Second	30-Jan-19	90.6	39.5	<10.0	18.6
9	9A7	In Mejia village	February	First	05-Feb-19	90.8	36.9	<10.0	17.5
9	9A7	In Mejia village	February	Second	26-Feb-19	90.6	38.3	<10.0	19.2
9	9A7	In Mejia village	March	First	11-Mar-19	91.4	40.1	<10.0	18.3
9	9A7	In Mejia village	March	Second	26-Mar-19	91.9	41.4	<10.0	17.6
9	9A8	In Murgachori village	April	First	06-Apr-18	83.5	31.7	<10.0	17.9
9	9A8	In Murgachori village	April	Second	27-Apr-18	83.1	31.2	<10.0	17.1
9	9A8	In Murgachori village	May	First	11-May-18	86.6	32.4	<10.0	18.5
9	9A8	In Murgachori village	May	Second	21-May-18	85.6	33.1	<10.0	18.9
9	9A8	In Murgachori village	June	First	01-Jun-18	87.7	34.5	<10.0	18.1
9	9A8	In Murgachori village	June	Second	19-Jun-18	87.1	34.3	<10.0	17.4
9	9A8	In Murgachori village	July	First	02-Jul-18	87.1	35.3	<10.0	17.8

Cluster No	Station No	Station Name	Month	Fortnight	Date of Sampling	PM_{10}	$PM_{2.5}$	SO_2	NO_X
9	9A8	In Murgachori village	July	Second	27-Jul-18	89.2	35.6	<10.0	18.6
9	9A8	In Murgachori village	August	First	10-Aug-18	89.9	35.6	<10.0	17.7
9	9A8	In Murgachori village	August	Second	31-Aug-18	90.3	35.7	<10.0	17.9
9	9A8	In Murgachori village	September	First	11-Sep-18	89.9	35.6	<10.0	17.7
9	9A8	In Murgachori village	September	Second	26-Sep-18	88.5	34.2	<10.0	16.7
9	9A9	In Chanda village	April	First	10-Apr-18	83.1	31.9	<10.0	18.7
9	9A9	In Chanda village	April	Second	21-Apr-18	82.5	31.3	<10.0	18.2
9	9A9	In Chanda village	May	First	11-May-18	85.8	34.1	<10.0	19.5
9	9A9	In Chanda village	May	Second	18-May-18	86.2	33.9	<10.0	18.5
9	9A9	In Chanda village	June	First	07-Jun-18	86.6	34.1	<10.0	19.7
9	9A9	In Chanda village	June	Second	19-Jun-18	86.2	33.9	<10.0	19.2
9	9A9	In Chanda village	July	First	02-Jul-18	86.4	34.7	<10.0	19.3
9	9A9	In Chanda village	July	Second	27-Jul-18	88.5	34.1	<10.0	19.2
9	9A9	In Chanda village	August	First	07-Aug-18	88.7	35.3	<10.0	19.1
9	9A9	In Chanda village	August	Second	31-Aug-18	88.1	34.9	<10.0	18.6
9	9A9	In Chanda village	September	First	11-Sep-18	88.7	35.3	<10.0	19.1
9	9A9	In Chanda village	September	Second	26-Sep-18	88.3	34.7	<10.0	18.1

AIR QUALITY METAL ANALYSIS

Station No	Station Name	Month	Fortnight	Date of Sampling	Arsenic (ng/m^3)	Cadmium (µg/m^3)	Chromium (µg/m^3)	Mercury (µg/m^3)	Nickel (ng/m^3)	Lead (µg/m^3)
9A1	In Kurtidanga village	Sept	First	07-Sep-18	<1.0	<0.001	<0.01	<0.001	<0.10	<0.005
9A1	In Kurtidanga village	Sept	Second	26-Sep-18	<1.0	<0.001	<0.01	<0.001	<0.10	<0.005
9A1	In Kurtidanga village	March	First	15-Mar-19	<0.005	<0.001	<0.01	<0.001	<0.10	<0.005
9A10	In Mithapur village	Sept	First	11-Sep-18	<1.0	<0.001	<0.01	<0.001	<0.10	<0.005
9A10	In Mithapur village	Sept	Second	26-Sep-18	<1.0	<0.001	<0.01	<0.001	<0.10	<0.005
9A2	In Jamari village	Sept	First	07-Sep-18	<1.0	<0.001	<0.01	<0.001	<0.10	<0.005
9A2	In Jamari village	Sept	Second	20-Sep-18	<1.0	<0.001	<0.01	<0.001	<0.10	<0.005
9A2	In Jamari village	March	First	14-Mar-19	<0.005	<0.001	<0.01	<0.001	<0.10	<0.005
9A3	In Amritnagar village	Sept	First	07-Sep-18	<1.0	<0.001	<0.01	<0.001	<0.10	<0.005
9A3	In Amritnagar village	Sept	Second	22-Sep-18	<1.0	<0.001	<0.01	<0.001	<0.10	<0.005
9A3	In Amritnagar village	March	First	14-Mar-19	<0.005	<0.001	<0.01	<0.001	<0.10	<0.005
9A4	Near Raniganj RS	Sept	First	07-Sep-18	<1.0	<0.001	<0.01	<0.001	<0.10	<0.005
9A4	Near Raniganj Railway siding	Sept	Second	22-Sep-18	<1.0	<0.001	<0.01	<0.001	<0.10	<0.005
9A4	Near Raniganj Railway siding	March	First	11-Mar-19	<0.005	<0.001	<0.01	<0.001	<0.10	<0.005
9A5	In Bakulia village	March	First	11-Mar-19	<0.005	<0.001	<0.01	<0.001	<0.10	<0.005
9A6	In Kalikapur village	March	First	11-Mar-19	<0.005	<0.001	<0.01	<0.001	<0.10	<0.005
9A7	In Mejia village	March	First	11-Mar-19	<0.005	<0.001	<0.01	<0.001	<0.10	<0.005
9A8	In Murgachori village	Sept	First	11-Sep-18	<1.0	<0.001	<0.01	<0.001	<0.10	<0.005
9A8	In Murgachori village	Sept	Second	26-Sep-18	<1.0	<0.001	<0.01	<0.001	<0.10	<0.005
9A9	In Chanda village	Sept	First	11-Sep-18	<1.0	<0.001	<0.01	<0.001	<0.10	<0.005
9A9	In Chanda village	Sept	Second	26-Sep-18	<1.0	<0.001	<0.01	<0.001	<0.10	<0.005

Environmental standards:

National Ambient Air Quality Standards (NAAQS), 2009 for residential, industrial and rural areas for 24 hourly/yearly samples:

Heavy Metal	Arsenic (As) (ng/m^3)	Cadmium (Cd) (µg/m^3)	Chromium (Cr) (µg/m^3)	Mercury (Hg) (µg/m^3)	Nickel (Ni) (ng/m^3)	Lead (Pb) (µg/m^3)
Concentration	6	Not specified	Not specified	Not specified	20	0.5

Annexure – II

NOISE LEVEL

Cluster No	Station No	Station Name	Month	Fortnight	Date of Sampling	Noise Level dB(A)
9	9N1	Pit-top Ratibati UG	April	First	06-Apr-18	67.2
9	9N1	Pit-top Ratibati UG	April	Second	21-Apr-18	61.2
9	9N1	Pit-top Ratibati UG	August	First	14-Aug-18	66.8
9	9N1	Pit-top Ratibati UG	November	First	09-Nov-18	69.5
9	9N1	Ratibati Workshop (Eng)	February	First	12-Feb-19	71.3
9	9N10	jamehari UG	February	First	05-Feb-19	70.3
9	9N11	Pure Searsole UG	February	First	05-Feb-19	65.9
9	9N12	Egra OC Patch	February	First	05-Feb-19	71.5
9	9N13	Naryankuri OCP	February	First	12-Feb-19	67.8
9	9N2	Pit-top Chapuikhas UG	April	First	06-Apr-18	69.4
9	9N2	Pit-top Chapuikhas UG	April	Second	27-Apr-18	68.8
9	9N2	Pit-top Chapuikhas UG	August	First	14-Aug-18	67.4
9	9N2	Pit-top Chapuikhas UG	November	First	09-Nov-18	68.2
9	9N2	Pit-top Chapuikhas UG	February	First	12-Feb-19	69.4
9	9N3	Pit-top Amritnagar UG	April	First	11-Apr-18	66.3
9	9N3	Pit-top Amritnagar UG	April	Second	27-Apr-18	60.2
9	9N3	Pit-top Amritnagar UG	August	First	14-Aug-18	69.3
9	9N3	Pit-top Amritnagar UG	November	First	09-Nov-18	71.3
9	9N3	Pit-top Amritnagar UG	February	First	05-Feb-19	70.6
9	9N4	Pit-top Kuardih UG	April	First	06-Apr-18	62.4
9	9N4	Pit-top Kuardih UG	April	Second	21-Apr-18	63.1
9	9N4	Pit-top Kuardih UG	August	First	10-Aug-18	64.2
9	9N4	Pit-top Kuardih UG	November	First	02-Nov-18	66.5
9	9N4	Pit-top Kuardih UG	February	First	05-Feb-19	68.3
9	9N5	Pit-top Nimcha UG	April	First	11-Apr-18	66.8
9	9N5	Pit-top Nimcha UG	April	Second	21-Apr-18	69.5
9	9N5	Pit-top Nimcha UG	August	First	10-Aug-18	68.3
9	9N5	Pit-top Nimcha UG	November	First	02-Nov-18	69.5
9	9N5	Pit-top Nimcha UG	February	First	05-Feb-19	71.3
9	9N6	Pit-top Kalipahari UG	April	First	10-Apr-18	67.2
9	9N6	Pit-top Kalipahari UG	April	Second	21-Apr-18	61.6
9	9N6	Pit-top Kalipahari UG	August	First	07-Aug-18	65.4
9	9N6	Pit-top Kalipahari UG	November	First	02-Nov-18	66.5
9	9N6	Pit-top Kalipahari UG	February	First	05-Feb-19	68.7
9	9N7	Pit-top Muslia UG	April	First	10-Apr-18	68.9
9	9N7	Pit-top Muslia UG	April	Second	27-Apr-18	65.4
9	9N7	Pit-top Muslia UG	August	First	07-Aug-18	65.9
9	9N7	Pit-top Muslia UG	November	First	02-Nov-18	66.3
9	9N7	Kalipahari OCP	February	First	05-Feb-19	65.9
9	9N8	Pit-top New Ghusick UG	April	First	12-Apr-18	67.5
9	9N8	Pit-top New Ghusick UG	April	Second	27-Apr-18	69.2
9	9N8	Pit-top New Ghusick UG	August	First	07-Aug-18	68.3
9	9N8	Pit-top New Ghusick UG	November	First	14-Nov-18	69.5
9	9N8	Amkola / Nimcha OCP	February	First	05-Feb-19	70.5
9	9N9	Pit-top J K Nagar UG	April	First	12-Apr-18	62.8
9	9N9	Pit-top J K Nagar UG	April	Second	27-Apr-18	60.2
9	9N9	Pit-top J K Nagar UG	August	First	07-Aug-18	61.7
9	9N9	Pit-top J K Nagar UG	November	First	14-Nov-18	63.5
9	9N9	Pit-top J K Nagar UG	February	First	12-Feb-19	69.5

Annexure – III

EFFLUENT WATER QUALITY (5 PARAMETERS)

Cluster No	Station No	Station Name	Month	Fortnight	Date of Sampling	pH	TSS	TDS	O&G	COD
9	9MW2	Chapuikhas UG	April	First	06-Apr-18	8.41	16	726	<2.0	20
9	9MW2	Chapuikhas UG	April	Second	27-Apr-18	8.31	18	700	<2.0	20
9	9MW2	Chapuikhas UG	MAY	First	11-May-18	8.22	12	764	<2.0	16
9	9MW2	Chapuikhas UG	MAY	Second	18-May-18	8.52	10	738	<2.0	12
9	9MW2	Chapuikhas UG	June	First	14-Jun-18	8.34	20	718	<2.0	24
9	9MW2	Chapuikhas UG	June	Second	22-Jun-18	8.28	12	734	<2.0	32
9	9MW2	Chapuikhas UG	July	First	10-Jul-18	8.23	18	764	<2.0	44
9	9MW2	Chapuikhas UG	July	Second	31-Jul-18	8.06	14	738	<2.0	36
9	9MW2	Chapuikhas UG	August	First	14-Aug-18	8.23	16	740	<2.0	28
9	9MW2	Chapuikhas UG	August	Second	22-Aug-18	8.24	28	782	<2.0	32
9	9MW2	Chapuikhas UG	September	Second	22-Aug-18	8.23	14	780	<2.0	24
9	9MW2	Chapuikhas UG	October	First	11-Oct-18	8.41	18	772	<2.0	12
9	9MW2	Chapuikhas UG	October	Second	20-Oct-18	8.40	20	744	<2.0	16
9	9MW2	Chapuikhas UG	November	First	05-Nov-18	8.32	20	732	<2.0	12
9	9MW2	Chapuikhas UG	November	Second	29-Nov-18	8.22	16	748	<2.0	20
9	9MW2	Chapuikhas UG	December	Second	25-Dec-18	8.43	22	754	<2.0	32
9	9MW2	Chapuikhas UG	January	First	01-Jan-19	8.29	30	790	<2.0	36
9	9MW2	Chapuikhas UG	January	Second	24-Jan-19	7.45	22	810	<2.0	32
9	9MW2	Chapuikhas UG	February	First	02-Feb-19	4.47	30	790	<2.0	28
9	9MW2	Chapuikhas UG	February	Second	26-Feb-19	8.72	32	780	<2.0	36
9	9MW2	Chapuikhas UG	March	Second	19-Mar-19	8.37	36	820	<2.0	16
9	9MW3	Amritnagar UG	April	First	11-Apr-18	8.36	18	742	<2.0	12
9	9MW3	Amritnagar UG	April	Second	27-Apr-18	8.56	20	774	<2.0	16
9	9MW3	Amritnagar UG	MAY	First	11-May-18	8.37	16	722	<2.0	32
9	9MW3	Amritnagar UG	MAY	Second	18-May-18	8.17	14	746	<2.0	24
9	9MW3	Amritnagar UG	June	First	12-Jun-18	8.00	10	716	<2.0	12
9	9MW3	Amritnagar UG	June	Second	22-Jun-18	8.02	16	648	<2.0	16
9	9MW3	Amritnagar UG	July	First	10-Jul-18	8.29	16	660	<2.0	24
9	9MW3	Amritnagar UG	July	Second	31-Jul-18	8.23	16	670	<2.0	32
9	9MW3	Amritnagar UG	August	First	04-Aug-18	8.07	20	638	<2.0	32
9	9MW3	Amritnagar UG	August	Second	23-Aug-18	8.18	20	608	<2.0	24
9	9MW3	Amritnagar UG	September	Second	21-Sep-18	8.03	16	604	<2.0	20
9	9MW3	Amritnagar UG	October	First	11-Oct-18	8.29	18	612	<2.0	28
9	9MW3	Amritnagar UG	October	Second	25-Oct-18	8.32	22	628	<2.0	24
9	9MW3	Amritnagar UG	November	First	01-Nov-18	8.29	26	584	<2.0	16
9	9MW3	Amritnagar UG	November	Second	29-Nov-18	7.94	22	602	<2.0	16
9	9MW3	Amritnagar UG	December	First	07-Dec-18	7.84	12	670	<2.0	16
9	9MW3	Amritnagar UG	December	Second	25-Dec-18	7.32	18	608	<2.0	12
9	9MW3	Amritnagar UG	January	First	01-Jan-19	8.87	20	644	<2.0	24
9	9MW3	Amritnagar UG	January	Second	24-Jan-19	8.25	18	624	<2.0	16
9	9MW3	Amritnagar UG	February	First	02-Feb-19	7.73	22	640	<2.0	20
9	9MW3	Amritnagar UG	February	Second	26-Feb-19	7.51	24	656	<2.0	12
9	9MW3	Amritnagar UG	March	Second	19-Mar-19	7.49	28	710	<2.0	16
9	9MW4	Kuardih UG	April	First	06-Apr-18	7.58	14	800	<2.0	24
9	9MW4	Kuardih UG	April	Second	21-Apr-18	7.28	16	786	<2.0	24
9	9MW4	Kuardih UG	MAY	First	12-May-18	7.40	12	802	<2.0	20
9	9MW4	Kuardih UG	MAY	Second	19-May-18	7.65	10	780	<2.0	16
9	9MW4	Kuardih UG	June	First	12-Jun-18	7.84	24	754	<2.0	20
9	9MW4	Kuardih UG	June	Second	28-Jun-18	7.43	20	688	<2.0	24

Cluster No	Station No	Station Name	Month	Fortnight	Date of Sampling	pH	TSS	TDS	O&G	COD
9	9MW4	Kuardih UG	July	First	10-Jul-18	8.16	18	644	<2.0	16
9	9MW4	Kuardih UG	July	Second	31-Jul-18	8.27	18	664	<2.0	20
9	9MW4	Kuardih UG	August	First	04-Aug-18	7.81	12	616	<2.0	16
9	9MW4	Kuardih UG	August	Second	22-Aug-18	7.61	16	638	<2.0	12
9	9MW4	Kuardih UG	September	Second	21-Sep-18	7.87	18	694	<2.0	08
9	9MW4	Kuardih UG	October	First	04-Oct-18	7.82	20	644	<2.0	16
9	9MW4	Kuardih UG	October	Second	25-Oct-18	7.64	24	672	<2.0	8
9	9MW4	Kuardih UG	November	First	15-Nov-18	7.94	22	632	<2.0	8
9	9MW4	Kuardih UG	November	Second	29-Nov-18	7.38	18	548	<2.0	8
9	9MW4	Kuardih UG	December	First	05-Dec-18	7.58	14	738	<2.0	12
9	9MW4	Kuardih UG	December	Second	22-Dec-18	7.60	16	662	<2.0	8
9	9MW4	Kuardih UG	January	First	02-Jan-19	8.22	14	630	<2.0	12
9	9MW4	Kuardih UG	January	Second	21-Jan-19	8.42	12	616	<2.0	8
9	9MW4	Kuardih UG	February	First	01-Feb-19	8.95	20	646	<2.0	12
9	9MW4	Kuardih UG	February	Second	26-Feb-19	8.38	22	628	<2.0	8
9	9MW4	Kuardih UG	March	Second	19-Mar-19	8.21	24	718	<2.0	08
9	9MW5	Nimcha UG	April	First	11-Apr-18	7.62	18	712	<2.0	32
9	9MW5	Nimcha UG	April	Second	21-Apr-18	7.44	22	752	<2.0	32
9	9MW5	Nimcha UG	MAY	First	12-May-18	7.52	16	766	<2.0	28
9	9MW5	Nimcha UG	MAY	Second	19-May-18	7.81	18	776	<2.0	36
9	9MW5	Nimcha UG	June	First	11-Jun-18	7.93	30	764	<2.0	32
9	9MW5	Nimcha UG	June	Second	28-Jun-18	7.54	24	702	<2.0	28
9	9MW5	Nimcha UG	July	First	10-Jul-18	7.57	22	732	<2.0	32
9	9MW5	Nimcha UG	July	Second	16-Jul-18	7.91	20	714	<2.0	24
9	9MW5	Nimcha UG	August	First	04-Aug-18	8.00	18	736	<2.0	24
9	9MW5	Nimcha UG	August	Second	17-Aug-18	8.00	20	690	<2.0	28
9	9MW5	Nimcha UG	September	Second	26-Sep-18	8.15	20	702	<2.0	36
9	9MW5	Nimcha UG	October	First	04-Oct-18	8.33	22	708	<2.0	32
9	9MW5	Nimcha UG	October	Second	29-Oct-18	8.10	26	728	<2.0	28
9	9MW5	Nimcha UG	November	Second	29-Nov-18	8.16	16	712	<2.0	16
9	9MW5	Nimcha UG	December	First	04-Dec-18	8.26	16	764	<2.0	24
9	9MW5	Nimcha UG	December	Second	22-Dec-18	8.22	22	624	<2.0	28
9	9MW5	Nimcha UG	January	First	02-Jan-19	7.31	30	608	<2.0	36
9	9MW5	Nimcha UG	January	Second	21-Jan-19	8.59	22	592	<2.0	28
9	9MW5	Nimcha UG	February	First	01-Feb-19	8.19	24	620	<2.0	32
9	9MW5	Nimcha UG	February	Second	28-Feb-19	8.15	28	642	<2.0	24
9	9MW5	Nimcha UG	March	Second	19-Mar-19	8.29	32	772	<2.0	24
9	9MW6	Kalipahari UG	April	First	10-Apr-18	7.51	22	830	<2.0	24
9	9MW6	Kalipahari UG	April	Second	21-Apr-18	7.39	24	800	<2.0	20
9	9MW6	Kalipahari UG	MAY	First	12-May-18	7.27	20	782	<2.0	36
9	9MW6	Kalipahari UG	MAY	Second	16-May-18	7.99	22	780	<2.0	28
9	9MW6	Kalipahari UG	June	First	11-Jun-18	7.55	22	802	<2.0	24
9	9MW6	Kalipahari UG	June	Second	28-Jun-18	7.59	26	722	<2.0	12
9	9MW6	Kalipahari UG	July	First	05-Jul-18	8.27	24	616	<2.0	20
9	9MW6	Kalipahari UG	July	Second	31-Jul-18	8.20	22	600	<2.0	16
9	9MW6	Kalipahari UG	August	First	07-Aug-18	8.59	28	570	<2.0	32
9	9MW6	Kalipahari UG	August	Second	22-Aug-18	8.21	18	542	<2.0	16
9	9MW6	Kalipahari UG	September	Second	26-Sep-18	8.32	22	560	<2.0	24
9	9MW6	Kalipahari UG	October	First	04-Oct-18	8.21	20	594	<2.0	12
9	9MW6	Kalipahari UG	October	Second	30-Oct-18	8.22	22	580	<2.0	20
9	9MW6	Kalipahari UG	November	First	15-Nov-18	8.26	22	546	<2.0	28

Cluster No	Station No	Station Name	Month	Fortnight	Date of Sampling	pH	TSS	TDS	O&G	COD
9	9MW6	Kalipahari UG	November	Second	29-Nov-18	8.37	14	532	<2.0	20
9	9MW6	Kalipahari UG	December	First	03-Dec-18	8.66	18	618	<2.0	20
9	9MW6	Kalipahari UG	December	Second	22-Dec-18	8.13	24	580	<2.0	16
9	9MW6	Kalipahari UG	January	First	02-Jan-19	8.63	12	634	<2.0	8
9	9MW6	Kalipahari UG	January	Second	21-Jan-19	7.78	14	666	<2.0	12
9	9MW6	Kalipahari UG	February	First	01-Feb-19	8.33	22	682	<2.0	16
9	9MW6	Kalipahari UG	February	Second	28-Feb-19	7.28	24	718	<2.0	20
9	9MW6	Kalipahari UG	March	Second	19-Mar-19	7.54	28	602	<2.0	32
9	9MW7	Muslia UG	April	First	10-Apr-18	8.44	24	775	<2.0	16
9	9MW7	Muslia UG	April	Second	27-Apr-18	8.22	26	748	<2.0	12
9	9MW7	Muslia UG	MAY	First	12-May-18	8.10	22	718	<2.0	24
9	9MW7	Muslia UG	MAY	Second	17-May-18	8.13	24	684	<2.0	40
9	9MW7	Muslia UG	June	First	07-Jun-18	8.19	38	632	<2.0	44
9	9MW7	Muslia UG	June	Second	19-Jun-18	8.16	22	600	<2.0	36
9	9MW7	Muslia UG	July	First	05-Jul-18	8.21	20	640	<2.0	44
9	9MW7	Muslia UG	July	Second	31-Jul-18	8.18	24	622	<2.0	40
9	9MW7	Muslia UG	August	First	06-Aug-18	8.29	34	595	<2.0	48
9	9MW7	Muslia UG	August	Second	18-Aug-18	8.43	28	550	<2.0	40
9	9MW7	Muslia UG	September	Second	26-Sep-18	8.11	20	570	<2.0	32
9	9MW7	Muslia UG	October	First	05-Oct-18	8.28	22	576	<2.0	36
9	9MW7	Muslia UG	October	Second	30-Oct-18	8.27	24	594	<2.0	44
9	9MW7	Muslia UG	November	First	01-Nov-18	8.31	24	528	<2.0	32
9	9MW7	Muslia UG	November	Second	29-Nov-18	8.12	12	568	<2.0	24
9	9MW7	Muslia UG	December	First	03-Dec-18	8.21	20	570	<2.0	16
9	9MW7	Muslia UG	December	Second	22-Dec-18	8.25	26	510	<2.0	20
9	9MW7	Muslia UG	January	First	02-Jan-19	8.37	14	538	<2.0	12
9	9MW7	Muslia UG	January	Second	21-Jan-19	8.51	16	500	<2.0	20
9	9MW7	Muslia UG	February	First	01-Feb-19	7.41	28	520	<2.0	28
9	9MW7	Muslia UG	February	Second	28-Feb-19	8.09	30	544	<2.0	36
9	9MW7	Muslia UG	March	Second	20-Mar-19	8.06	32	576	<2.0	36
9	9MW8	New Ghusick UG	April	First	12-Apr-18	7.31	26	728	<2.0	28
9	9MW8	New Ghusick UG	April	Second	27-Apr-18	7.46	28	762	<2.0	28
9	9MW8	New Ghusick UG	MAY	First	11-May-18	7.38	20	660	<2.0	44
9	9MW8	New Ghusick UG	MAY	Second	17-May-18	7.63	16	684	<2.0	32
9	9MW8	New Ghusick UG	June	First	07-Jun-18	7.98	30	644	<2.0	36
9	9MW8	New Ghusick UG	June	Second	19-Jun-18	7.46	18	596	<2.0	28
9	9MW8	New Ghusick UG	July	First	07-Jul-18	7.73	22	572	<2.0	28
9	9MW8	New Ghusick UG	July	Second	31-Jul-18	7.87	26	598	<2.0	36
9	9MW8	New Ghusick UG	August	First	06-Aug-18	7.85	20	617	<2.0	28
9	9MW8	New Ghusick UG	August	Second	31-Aug-18	8.84	16	648	<2.0	24
9	9MW8	New Ghusick UG	September	Second	26-Sep-18	7.67	18	682	<2.0	20
9	9MW8	New Ghusick UG	October	First	05-Oct-18	7.65	16	604	<2.0	12
9	9MW8	New Ghusick UG	October	Second	22-Oct-18	7.96	18	616	<2.0	8
9	9MW8	New Ghusick UG	November	First	12-Nov-18	7.59	26	594	<2.0	8
9	9MW8	New Ghusick UG	November	Second	29-Nov-18	7.83	14	608	<2.0	16
9	9MW8	New Ghusick UG	December	First	07-Dec-18	8.51	22	680	<2.0	24
9	9MW8	New Ghusick UG	December	Second	25-Dec-18	8.34	28	622	<2.0	24
9	9MW8	New Ghusick UG	January	First	03-Jan-19	7.89	16	668	<2.0	20
9	9MW8	New Ghusick UG	January	Second	21-Jan-19	7.40	30	696	<2.0	32
9	9MW8	New Ghusick UG	February	First	01-Feb-19	8.62	22	674	<2.0	20
9	9MW8	New Ghusick UG	February	Second	28-Feb-19	8.65	24	640	<2.0	28

Cluster No	Station No	Station Name	Month	Fortnight	Date of Sampling	pH	TSS	TDS	O&G	COD
9	9MW8	New Ghusick UG	March	Second	20-Mar-19	8.34	22	648	<2.0	24
9	9MW9	J K Nagar UG	April	First	12-Apr-18	8.47	28	768	<2.0	44
9	9MW9	J K Nagar UG	April	Second	21-Apr-18	8.24	30	744	<2.0	36
9	9MW9	J K Nagar UG	MAY	First	11-May-18	8.07	22	702	<2.0	32
9	9MW9	J K Nagar UG	MAY	Second	17-May-18	8.09	18	722	<2.0	24
9	9MW9	J K Nagar UG	June	First	14-Jun-18	8.26	20	588	<2.0	24
9	9MW9	J K Nagar UG	June	Second	19-Jun-18	8.00	12	620	<2.0	16
9	9MW9	J K Nagar UG	July	First	07-Jul-18	8.23	24	646	<2.0	24
9	9MW9	J K Nagar UG	July	Second	31-Jul-18	8.15	28	630	<2.0	28
9	9MW9	J K Nagar UG	August	First	14-Aug-18	8.49	18	614	<2.0	20
9	9MW9	J K Nagar UG	August	Second	31-Aug-18	8.12	28	656	<2.0	32
9	9MW9	J K Nagar UG	September	Second	26-Sep-18	8.44	20	674	<2.0	16
9	9MW9	J K Nagar UG	October	First	05-Oct-18	8.14	20	700	<2.0	24
9	9MW9	J K Nagar UG	October	Second	22-Oct-18	8.12	22	678	<2.0	16
9	9MW9	J K Nagar UG	November	First	14-Nov-18	8.22	30	642	<2.0	16
9	9MW9	J K Nagar UG	November	Second	29-Nov-18	8.22	12	668	<2.0	12
9	9MW9	J K Nagar UG	December	First	07-Dec-18	7.92	18	710	<2.0	16
9	9MW9	J K Nagar UG	December	Second	25-Dec-18	7.88	22	614	<2.0	12
9	9MW9	J K Nagar UG	January	First	03-Jan-19	7.11	12	644	<2.0	8
9	9MW9	J K Nagar UG	January	Second	21-Jan-19	8.87	18	670	<2.0	16
9	9MW9	J K Nagar UG	February	First	01-Feb-19	8.49	28	648	<2.0	24
9	9MW9	J K Nagar UG	February	Second	28-Feb-19	8.74	30	598	<2.0	32
9	9MW9	J K Nagar UG	March	Second	20-Mar-19	8.62	32	750	<2.0	28

Note: All parameters in mg/l unless otherwise specified

Effluent Water Quality Standards (MoEF Schedule – VI Standards)

Parameters	pH	TSS	TDS	Oil & Grease	COD
Limit	5.5-9.0	100	Not Specified	10	250

EFFLUENT QUALITY (29 PARAMETERS) September, 2018

Cluster	9	9	9	9	9	9	9	9	9	**Effluent Water (MOEF Schedule-VI Standard)**
Station No	9MW4	9MW3	9MW2	9MW1	9MW8	9MW6	9MW5	9MW7	9MW9	
Station Name	Kuardih UG	Amritnagar UG	Chapui khas UG	Ratibati UG	New Ghusick UG	Kalipahari UG	Nimcha UG	Muslia UG	J K Nagar UG	
Month	September	September	September	September	September	September	September	September	September	
Fortnight	First	First	First	First	First	First	First	First	First	
Date of Sampling	04-Sep-18	04-Sep-18	04-Sep-18	04-Sep-18	05-Sep-18	05-Sep-18	05-Sep-18	05-Sep-18	06-Sep-18	
Colour	3	3	4	3	4	3	4	3	3	Unobjectionable
Odour	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable
TSS	16	14	22	20	16	22	18	20	20	100.0
pH	7.54	8.37	8.00	7.43	7.90	8.42	8.29	8.37	8.25	5.5-9.0
Temperature(Deg C)	29.3	29.6	30.2	30.8	29.7	30.2	28.1	30.5	29.8	Shall not exceed 5^0C above the receiving water temp
Oil & Grease	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	10.0
Total Residual Chlorine	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	1.0
Ammonical Nitrogen	0.48	0.39	0.58	0.72	0.48	0.46	0.52	0.38	0.52	50.0
Total Kjeldahi Nitrogen	1.46	1.72	1.68	1.72	1.68	1.59	1.59	1.64	1.79	100.0
Free Amonia	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	5.0
BOD	6	8	5	8	5	6	13	6	6	30.0
COD	12	28	16	24	16	20	32	28	24	250.0
Arsenic	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.2
Lead	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.1
Hexavalent Chromium	0.04	0.03	0.03	0.04	0.03	0.04	0.03	0.02	0.02	0.1
Total Chromium	0.06	0.07	0.09	0.08	0.07	0.07	0.07	0.06	0.08	2.0
Copper	0.03	0.03	0.03	0.03	0.03	0.04	0.03	0.03	0.04	3.0
Zinc	0.06	0.03	0.05	0.04	0.02	0.04	0.04	0.03	0.05	5.0
Selenium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.05
Nickel	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	3.0
Fluoride	0.34	0.38	0.46	0.34	0.34	0.34	0.26	0.46	0.38	2.0
Dissolved Phosphate	1.38	1.42	1.52	1.64	1.74	1.64	1.26	1.24	1.26	5.0
Sulphide	0.014	0.012	0.009	0.008	0.014	0.009	0.008	0.016	0.012	2.0
Phenolics	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	1.0
Manganese	0.38	0.46	0.24	0.36	0.46	0.26	0.24	0.54	0.38	2.0
Iron	0.18	0.14	0.12	0.14	0.12	0.14	0.14	0.16	0.17	3.0
Nitrate Nitrogen	4.6	3.4	4.8	3.8	2.8	2.8	3.8	3.6	4.4	10.0
Cadmium	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	2.0
Total Dissolved Solids	670	638	804	624	644	578	728	582	676	Not Specified

EFFLUENT QUALITY (29 PARAMETERS) March, 2019

Cluster	9	9	9	9	9	9	9	9	9	**Effluent Water (MOEF Schedule-VI Standard)**
Station No	9MW8	9MW7	9MW6	9MW5	9MW4	9MW3	9MW1	9MW9	9MW2	
Station Name	New Ghusick UG	Muslia UG	Kalipahari UG	Nimcha UG	Kuardih UG	Amritnagar UG	Ratibati UG	J K Nagar UG	Chapuikhas UG	
Month	March	March	March	March	March	March	March	March	March	
Fortnight	First	First	First	First	First	First	First	First	First	
Date of Sampling	07-Mar-19	07-Mar-19	07-Mar-19	07-Mar-19	07-Mar-19	07-Mar-19	07-Mar-19	07-Mar-19	07-Mar-19	
Colour	4	5	3	3	4	5	3	4	4	Unobjectionable
Odour	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable
TSS	34	32	28	26	24	38	30	30	32	100.0
pH	7.36	7.94	8.52	8.37	8.24	7.76	8.40	8.81	7.53	5.5-9.0
Temperature(Deg C)	28.7	29.8	30.9	30.2	29.2	30.7	30.6	30.8	31.4	Shall not exceed 5^0C above the receiving water temp
Oil & Grease	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	10.0
Total Residual Chlorine	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	1.0
Ammonical Nitrogen	0.48	0.58	0.68	0.62	0.59	0.58	0.58	0.64	0.56	50.0
Total Kjeldahi Nitrogen	1.64	1.52	1.42	1.38	1.68	1.82	1.38	1.72	1.74	100.0
Free Amonia	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	5.0
BOD	2	2	4	6	2	2	4	2	4	30.0
COD	16	44	28	20	12	16	32	20	24	250.0
Arsenic	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.2
Lead	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.1
Hexavalent Chromium	0.03	0.03	0.04	0.04	0.03	0.03	0.04	0.04	0.03	0.1
Total Chromium	0.07	0.07	0.08	0.08	0.07	0.06	0.06	0.08	0.05	2.0
Copper	0.03	0.03	0.04	0.03	0.04	0.03	0.04	0.04	0.03	3.0
Zinc	0.03	0.04	0.03	0.04	0.03	0.04	0.04	0.03	0.04	5.0
Selenium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.05
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	3.0
Fluoride	0.30	0.42	0.38	0.30	0.38	0.32	0.30	0.32	0.42	2.0
Dissolved Phosphate	1.82	1.36	1.50	1.34	1.28	1.32	1.72	1.10	1.42	5.0
Sulphide	0.012	0.012	0.008	0.007	0.011	0.010	0.007	0.009	0.008	2.0
Phenolics	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	1.0
Manganese	0.34	0.32	0.28	0.26	0.30	0.32	0.30	0.30	0.26	2.0
Iron	0.14	0.16	0.14	0.14	0.16	0.16	0.16	0.16	0.12	3.0
Nitrate Nitrogen	3.0	3.8	2.6	4.0	4.3	3.2	4.1	4.1	4.4	10.0
Cadmium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	2.0
Total Dissolved Solids	670	594	630	790	708	682	696	738	802	Not Specified

Note: All parameters in mg/l unless otherwise specified

Annexure – III

GROUNDWATER QUALITY

Cluster No	9	9	9	9	9	9	9	9	Indian Drinking Water Standard (IS-10500:2012)	
Station No	9GW8	9GW2	9GW3	9GW4	9GW5	9GW1	9GW6	9GW7		
Station Name	Dugwell at backside of Ghusik colliery Mandir	Dugwell at Perabad Kalikapur village	Dugwell at Majia forest departme nt	Dugwell at northside of Institute of Mining Raniganj	Dugwell at NHS Qtrs backside Nageswar Manager office, Mithapur village	Dugwell at Bakulia High School	Dugwell at J K Nagar old Miners colony	Dugwell near Manager's Bungalow of Amritnagar UGP		
Month	May'18	May'18	May'18	May'18	May'18	May'18	May'18	May'18		
Fortnight	Second	Second	Second	Second	Second	Second	Second	Second		
Date of sampling	07-May-18	09-May-18	09-May-18	09-May-18	09-May-18	09-May-18	28-May-18	28-May-18	**Acceptable Limit**	**Permissible Limit**
Colour, Hazen unit Max	4	4	3	3	2	3	4	5	5.0	15.0
Odour	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Agreeable	Agreeable
Taste	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
Turbidity, NTU Max	2	1	1	2	3	2	1	2	1.0	5.0
pH	8.68	8.14	8.36	8.28	7.49	6.29	8.89	8.23	6.5-8.5	No relaxation
Total Hardness	226	98	118	424	380	384	250	328	200.0	600.0
Iron	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	0.30	No relaxation
Chlorides	50	16	31	192	75	102	55	29	250.0	1000.0
Res Free chlorine	0.03	0.04	0.05	0.03	0.06	0.07	0.04	0.06	0.20	1.0
Dissolved Solids	504	180	224	988	884	896	496	732	500.0	2000.0
Calcium	116	52	60	192	156	156	112	140	75.0	200.0
Copper	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.05	1.5
Manganese	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.1	0.3
Sulphate	41	18	26	94	138	65	49	164	200.0	400.0
Nitrate	10.20	10.60	8.10	5.40	11.80	9.60	6.40	14.80	45.0	No relaxation
Fluoride	0.62	0.05	0.16	0.22	0.44	0.48	0.96	0.98	1.0	1.5
Selenium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.01	No relaxation
Total Arsenic	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.01	0.05
Lead	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.01	No relaxation
Zinc	0.03	0.01	0.02	0.14	0.03	0.02	0.03	0.04	5.0	15.0
Total Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.05	No relaxation
Boron	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.5	1.0
Coliforms (MPN)	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Shall not be detectable in any 100 ml sample	
Phenolics	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.002
Total Alkalinity	240	128	160	232	308	232	228	320	200.0	600.0
Cadmium (Cd)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.003	No relaxation

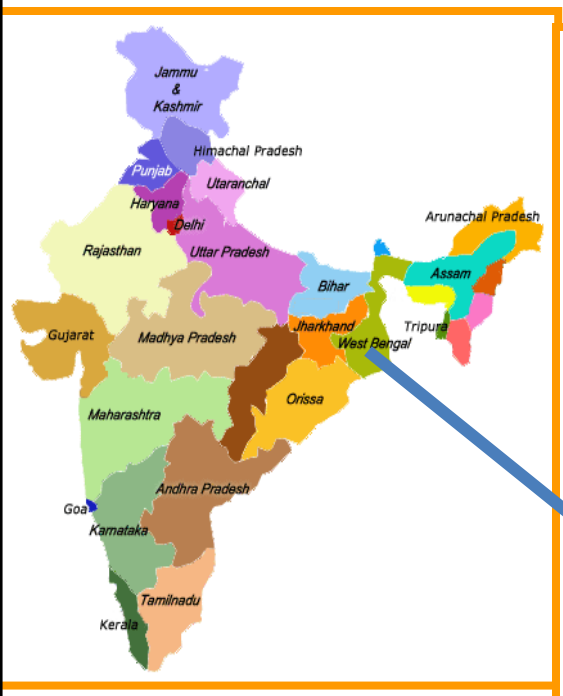
Annexure – IV

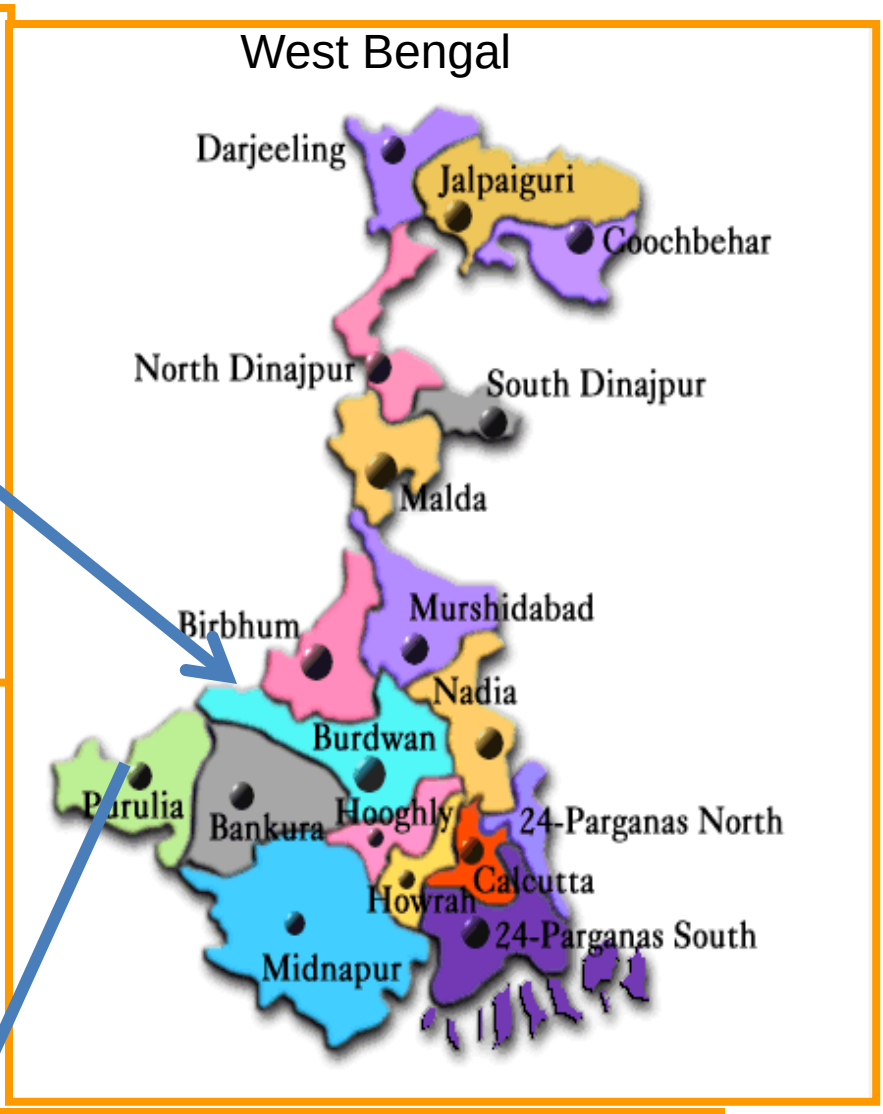
GROUNDWATER LEVEL

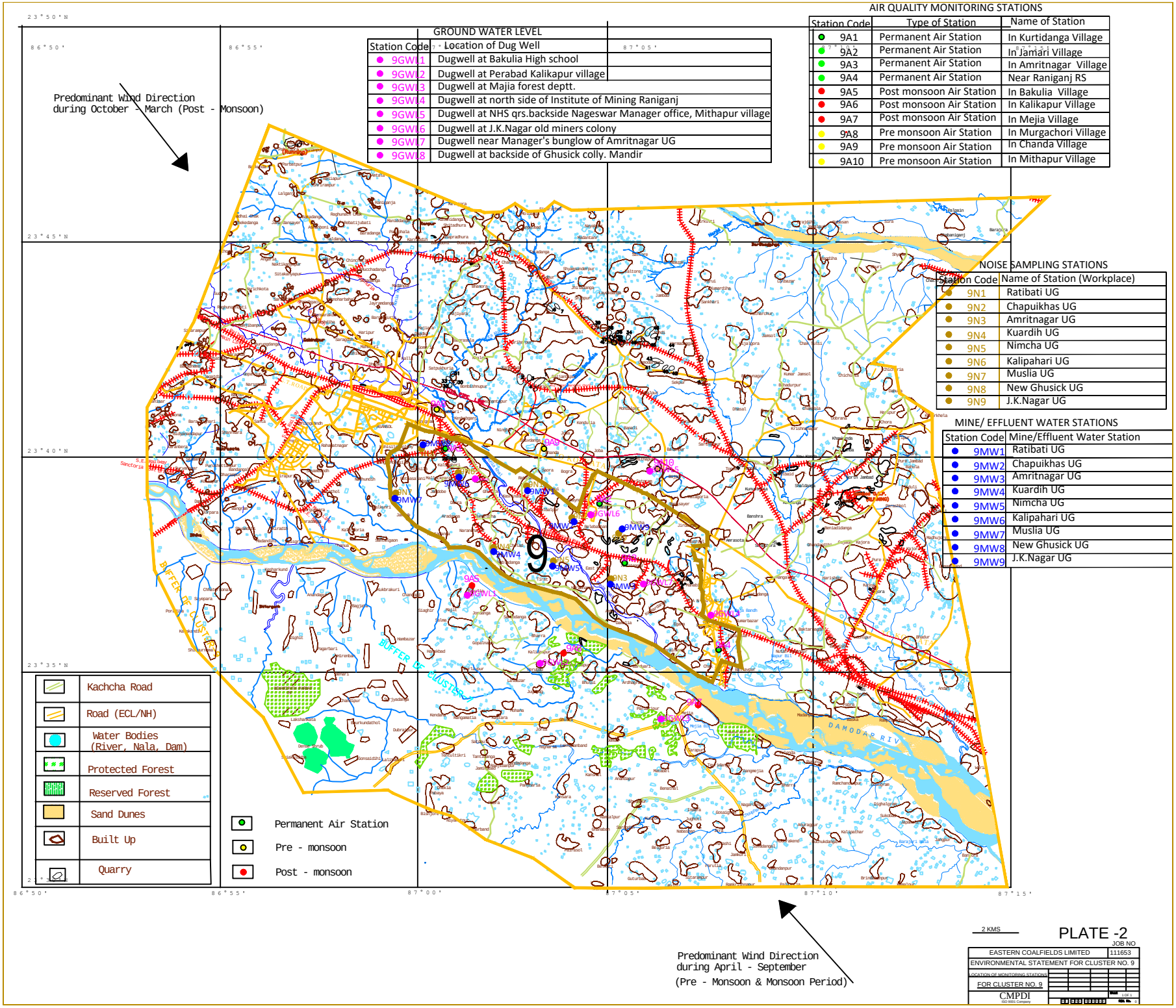
Cluster No	Station No	Station Name	Month	Fortnight	Date of Sampling	Ground Water Level BGL (mtr)
9	9GW1	Dugwell at Bakulia High School	August	First	18-Aug-18	1.3
9	9GW1	Dugwell at Bakulia High School	November	First	12-Nov-18	3
9	9GW1	Dugwell at Bakulia High School	January	First	05-Jan-19	1.70
9	9GW2	Dugwell at Perabad Kalikapur village	August	First	18-Aug-18	1.46
9	9GW2	Dugwell at Perabad Kalikapur village	November	First	12-Nov-18	2.7
9	9GW2	Dugwell at Perabad Kalikapur village	January	First	05-Jan-19	1.65
9	9GW3	Dugwell at Majia forest department	August	First	18-Aug-18	2.42
9	9GW3	Dugwell at Majia forest department	November	First	05-Nov-18	2.95
9	9GW3	Dugwell at Majia forest department	January	First	05-Jan-19	2.60
9	9GW4	Dugwell at northside of Institute of Mining Raniganj	August	First	18-Aug-18	2.3
9	9GW4	Dugwell at northside of Institute of Mining Raniganj	November	First	01-Nov-18	8.5
9	9GW4	Dugwell at northside of Institute of Mining Raniganj	January	First	05-Jan-19	2.55
9	9GW5	Dugwell at NHS Qtrs backside Nageswar Manager office, Mithapur village	August	First	14-Aug-18	7.07
9	9GW5	Dugwell at NHS Qtrs backside Nageswar Manager office, Mithapur village	November	First	01-Nov-18	8.6
9	9GW5	Dugwell at NHS Qtrs backside Nageswar Manager office, Mithapur village	January	First	05-Jan-19	7.25
9	9GW6	Dugwell at J K Nagar old Miners colony	August	First	17-Aug-18	1.28
9	9GW6	Dugwell at J K Nagar old Miners colony	November	First	01-Nov-18	2.7
9	9GW6	Dugwell at J K Nagar old Miners colony	January	First	04-Jan-19	1.48
9	9GW7	Dugwell near Manager's Bungalow of Amritnagar UGP	August	First	23-Aug-18	0.45
9	9GW7	Dugwell near Manager's Bungalow of Amritnagar UGP	November	First	15-Nov-18	2.8
9	9GW7	Dugwell near Manager's Bungalow of Amritnagar UGP	January	First	04-Jan-19	0.90
9	9GW8	Dugwell at backside of Ghusik colliery Mandir	August	First	23-Aug-18	1.05
9	9GW8	Dugwell at backside of Ghusik colliery Mandir	November	First	15-Nov-18	2.8
9	9GW8	Dugwell at backside of Ghusik colliery Mandir	January	First	04-Jan-19	1.15

Plate – 1 Location Plan Cluster No. 9

Job No. 111653






GROUND WATER LEVEL
Station Code | Location of Dug Well
9GWL1 | Dugwell at Bakulia High school
9GWL2 | Dugwell at Perabad Kalikapur village
9GWL3 | Dugwell at Majia forest deptt.
9GWL4 | Dugwell at north side of Institute of Mining Raniganj
9GWL5 | Dugwell at NHS qrs.backside Nageswar Manager office, Mithapur village
9GWL6 | Dugwell at J.K.Nagar old miners colony
9GWL7 | Dugwell near Manager's bunglow of Amritnagar UG
9GWL8 | Dugwell at backside of Ghusick colly. Mandir
AIR QUALITY MONITORING STATIONS
Station Code | Type of Station | Name of Station
9A1 | Permanent Air Station | In Kurtidanga Village
9A2 | Permanent Air Station | In Jamari Village
9A3 | Permanent Air Station | In Amritnagar Village
9A4 | Permanent Air Station | Near Raniganj RS
9A5 | Post monsoon Air Station | In Bakulia Village
9A6 | Post monsoon Air Station | In Kalikapur Village
9A7 | Post monsoon Air Station | In Mejia Village
9A8 | Pre monsoon Air Station | In Murgachori Village
9A9 | Pre monsoon Air Station | In Chanda Village
9A10 | Pre monsoon Air Station | In Mithapur Village
NOISE SAMPLING STATIONS
Station Code | Name of Station (Workplace)
9N1 | Ratibati UG
9N2 | Chapuikhas UG
9N3 | Amritnagar UG
9N4 | Kuardih UG
9N5 | Nimcha UG
9N6 | Kalipahari UG
9N7 | Muslia UG
9N8 | New Ghusick UG
9N9 | J.K.Nagar UG
MINE/ EFFLUENT WATER STATIONS
Station Code | Mine/Effluent Water Station
9MW1 | Ratibati UG
9MW2 | Chapuikhas UG
9MW3 | Amritnagar UG
9MW4 | Kuardih UG
9MW5 | Nimcha UG
9MW6 | Kalipahari UG
9MW7 | Muslia UG
9MW8 | New Ghusick UG
9MW9 | J.K.Nagar UG
Predominant Wind Direction during October - March (Post - Monsoon)
Predominant Wind Direction during April - September (Pre - Monsoon & Monsoon Period)
Kachcha Road
Road (ECL/NH)
Water Bodies (River, Nala, Dam)
Protected Forest
Reserved Forest
Sand Dunes
Built Up
Quarry
Permanent Air Station
Pre - monsoon
Post - monsoon
BUFFER OF CLUSTER
DAMODAR RIV
9
2 KMS
PLATE -2
JOB NO 111653
EASTERN COALFIELDS LIMITED
ENVIRONMENTAL STATEMENT FOR CLUSTER NO. 9
LOCATION OF MONITORING STATIONS
FOR CLUSTER NO. 9
CMPDI