ANALYSIS REPORT

(JULY-18 To OCT-18)

ON

ENVIRONMENTAL MONITORING

AT

BANDHAMADI GRAPHITE MINES & BENEFICIATION PLANT
(M/s PRADHAN INDUSTRY)

Village– Bandhamadi
Tulashi- kKashipur,Po– Godibali
Rayagada,ODISHA, INDIA.

Prepared by:-

VISIONTEK CONSULTANCY SERVICES PVT. LTD.
(An Enviro Engineering Consulting Cell)

Plot No.-M22&M23, Chandaka Industrial Estate, Patia, Bhubaneswar-751024,
Tel. : 91-674-2744594, 3250790

ISO 14001:2004
ISO 9001: 2008
OHSAS 18001:2007

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ANNEXURE

METHODOLOGY OF ENVIRONMENTAL MONITORING STUDY

1.0 INTRODUCTION :

M/s Visiontek Consultancy Services Pvt. Ltd. to carried out the environmental monitoring for the Bandhamadi Graphite Mines & Beneficiation Plant M/S Pradhan Industry

Environmental monitoring was carried out at various locations in and around the plant premises. The Monitoring was carried out with respect to the qualities of Ambient Air, Water (Surface & Ground), Noise .

2.0 STUDY PERIOD:

The monitoring was carried out to study the present environmental condition at the locations from july-18 to oct-18.

3.0 METHODOLOGY:

The environmental monitoring was carried out as per the standard methodology of Bureau of Indian Standard (IS: 5182), American Public Health Association (APHA).

4.0 SELECTION OF MONITORING LOCATIONS:

The location for Ambient Air Quality, Water (Surface & Drinking) has been selected by **VISIONTEK representative.**

4.1 AMBIENT AIR QUALITY:

The ambient air quality of the study region was monitored at four locations selected within the plant premises. The parameters monitored were Particulate Matter (size less than 10 µm or PM_{10}), Particulate matter (size less than 2.5 µm or $PM_{2.5}$), Sulphur di-oxide (SO_2), Oxides of Nitrogen (NO_x) & Carbon Monoxide (CO), Ozone(O_3), Ammonia(NH_3),Nickel(Ni), Lead(Pb), Arsenic(As),Benzene(C6H6), Benzo(a)Pyrene(BaP), Respirable Dust Sampler (APM 460BL) of ENVIROTECH make, FPS (APM) of ENVIROTECH make & CO Meter were used for monitoring of ambient air quality at all the identified locations. The sampling method was

carried out as per the guidelines for planning IS: 5182 (part 14): 2000. And the analysis methods are outlined in the table as shown below:

AMBIENT AIR QUALITY ANALYSIS METHOD

SL. NO.	PARAMETER	ANALYSIS METHOD
1.	Particulate Matter (size less than 10 µm or PM_{10}), $\mu g/m^3$	Gravimetric method
2.	Particulate matter (size less than 2.5 µm or $PM_{2.5}$), $\mu g/m^3$	Gravimetric method
3.	Sulphur di-oxide (SO_2), $\mu g/m^3$	Improved west & Gaeke method
4.	Oxides of Nitrogen (NO_x) $\mu g/m^3$	Jacob and Hochheiser Modified method
5.	Carbon Monoxide (CO), mg/m^3	NDIR Spectroscopy method
6.	Ozone(O3), $\mu g/m^3$	Chemical method
7.	Ammonia(NH3), $\mu g/m^3$	Indophenol blue method
8.	Benzene(C6H6), $\mu g/m^3$	Absorption & Desorption followed by GC analysis.
9	Benzo(a)Pyrene(BaP), ng/m^3	Solvent Extraction followed by GC analysis.
10	Nickel(Ni), ng/m^3	AAS method after sampling
11	Lead(Pb), $\mu g/m^3$	AAS method after sampling
12	Arsenic(As), $\mu g/m^3$	AAS method after sampling

4.1.1 AMBIENT AIR QUALITY SAMPLING STATIONS (CORE ZONE):

Details of the sampling locations are given below.

Field ID	Location
AAQMS-1	At Mine Office
AAQMS-2	At Mine Face
AAQMS-3	At Dump Site
AAQMS-4	At Plant Site

The detailed air quality report is given in the **Annexure-1.**

4.1.2. AMBIENT AIR QUALITY SAMPLING STATIONS (BUFFER ZONE):

Details of the sampling locations are given below.

Field ID	Location
AAQMS-1	Bandhamandi Village
AAQMS-2	Kachama Village
AAQMS-3	Podeng Village
AAQMS-4	Bartibali Village

The detailed air quality report is given in the **Annexure-2.**

4.2 WATER QUALITY:

Water quality monitoring was carried out at nine locations out of which four were of surface water & five of ground water. Samples were collected manually during study period. Considering several possibilities of interference the polytetrafluoroethylene (**PTFE**) samples bottles were used. These bottles were sterilized properly before being used for water collection.

4.3.1 NOISE LEVEL SAMPLING STATIONS:

Details of Sampling Locations are given below

Field ID	Location
N1	Mining Quarry
N2	Dump Site
N3	Residential Area

The Detailed Noise Level Analysis Report is mentioned in **Annexure-5.**

4.4. GROUND WATER LEVEL:

Ground Water level was measured by piezeometer.

4.4.1 GROUND WATER LEVEL SAMPLING STATIONS:

Details of Sampling Locations are given below

Field ID	Location
GWL-1	Open Well Near Bhitardarba Village
GWL -2	Open Well at Bandhamandi Village
GWL -3	Open Well at Panasgurha Village
GWL -4	Open Well at Birda Village
GWL-5	Open Well at Baligruha Village

The detailed Ground Water Level Analysis Report is mentioned in Annexure-6

Annexure-1

AMBIENT AIR QUALITY MONITORING REPORT (CORE ZONE)

Visiontek Consultancy Services Pvt. Ltd.
(An Enviro Engineering Consulting Cell)
ISO 9001 : 2008
ISO 14001 : 2004
OHSAS 18001 : 2007

Ref.: Envlab/18/R-9272

Date: 05/11/18

AMBIENT AIR QUALITY MONITORING REPORT(CORE ZONE)

1. Name of Industry : **M/s Bandhamandi Graphite Mines & Beneficiation Plant,Rayagada**
2. Sampling Location : **Monitoring Station No.- AAQ 1(Mine Office)**
3. Monitoring Instruments : RDS (APM 460 BL), FPS (APM 550) Envirotech, CO Analyzer.
4. Sample Collected By : VCSPL representative in presence of Client's representative

Date	PARAMETERS											
	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NOx ($\mu g/m^3$)	O_3 ($\mu g/m^3$)	CO (mg/m^3)	NH_3 ($\mu g/m^3$)	Pb ($\mu g/m^3$)	Ni (ng/m^3)	As (ng/m^3)	C_6H_6 ($\mu g/m^3$)	BaP (ng/m^3)
02.07.2018	41.7	26.2	4.6	11.2	6.3	0.35	20.2	BDL	BDL	BDL	BDL	BDL
06.07.2018	42.3	26.0	4.2	11.4	6.8	0.31	20.6	BDL	BDL	BDL	BDL	BDL
09.07.2018	40.2	25.6	4.3	11.4	7.0	0.30	21.1	BDL	BDL	BDL	BDL	BDL
13.07.2018	38.6	24.2	4.0	11.2	7.2	0.29	21.0	BDL	BDL	BDL	BDL	BDL
16.07.2018	38.2	26.8	5.2	11.2	7.2	0.35	21.4	BDL	BDL	BDL	BDL	BDL
20.07.2018	38.6	26.2	5.1	10.8	6.4	0.34	20.8	BDL	BDL	BDL	BDL	BDL
23.07.2018	37.6	26.2	5.3	11.1	6.4	0.31	20.8	BDL	BDL	BDL	BDL	BDL
27.07.2018	39.2	27.1	4.9	10.2	7.0	0.31	20.2	BDL	BDL	BDL	BDL	BDL
30.07.2018	40.1	27.0	4.6	10.6	7.2	0.26	20.7	BDL	BDL	BDL	BDL	BDL
03.08.2018	42.2	26.1	4.0	10.6	7.1	0.29	21.8	BDL	BDL	BDL	BDL	BDL
06.08.2018	40.4	25.8	4.0	10.4	7.1	0.28	22.0	BDL	BDL	BDL	BDL	BDL
10.08.2018	42.2	25.2	4.3	10.4	7.4	0.27	21.6	BDL	BDL	BDL	BDL	BDL
13.08.2018	40.6	25.2	4.9	11.1	7.4	0.26	20.5	BDL	BDL	BDL	BDL	BDL
17.08.2018	44.1	24.6	4.2	11.1	7.2	0.31	21.1	BDL	BDL	BDL	BDL	BDL
20.08.2018	42.2	21.8	4.1	11.0	7.2	0.28	20.8	BDL	BDL	BDL	BDL	BDL
24.08.2018	40.6	22.2	4.1	10.6	7.1	0.29	20.2	BDL	BDL	BDL	BDL	BDL
27.08.2018	38.4	22.6	4.5	10.8	7.0	0.24	20.2	BDL	BDL	BDL	BDL	BDL
31.08.2018	39.2	27.0	4.2	10.2	6.9	0.28	21.4	BDL	BDL	BDL	BDL	BDL
03.09.2018	35.2	27.2	4.3	10.8	6.2	0.31	20.8	BDL	BDL	BDL	BDL	BDL
07.09.2018	36.8	28.1	4.9	10.4	6.6	0.30	20.5	BDL	BDL	BDL	BDL	BDL
10.09.2018	38.4	28.2	4.8	10.2	6.4	0.26	20.5	BDL	BDL	BDL	BDL	BDL
14.09.2018	39.2	26.2	4.6	10.2	6.2	0.35	20.4	BDL	BDL	BDL	BDL	BDL
17.09.2018	39.2	26.2	4.8	10.0	6.0	0.31	21.1	BDL	BDL	BDL	BDL	BDL
21.09.2018	40.2	25.8	4.3	11.2	6.6	0.28	21.8	BDL	BDL	BDL	BDL	BDL
24.09.2018	40.6	25.4	4.1	11.6	6.2	0.26	22.2	BDL	BDL	BDL	BDL	BDL
28.09.2018	41.2	26.0	4.2	10.8	6.6	0.29	22.4	BDL	BDL	BDL	BDL	BDL
01.10.2018	40.8	25.2	4.4	11.2	6.4	0.26	22.2	BDL	BDL	BDL	BDL	BDL
06.10.2018	40.2	25.6	4.2	11.2	6.2	0.24	21.0	BDL	BDL	BDL	BDL	BDL
08.10.2018	41.1	25.6	4.2	11.4	6.6	0.29	20.6	BDL	BDL	BDL	BDL	BDL

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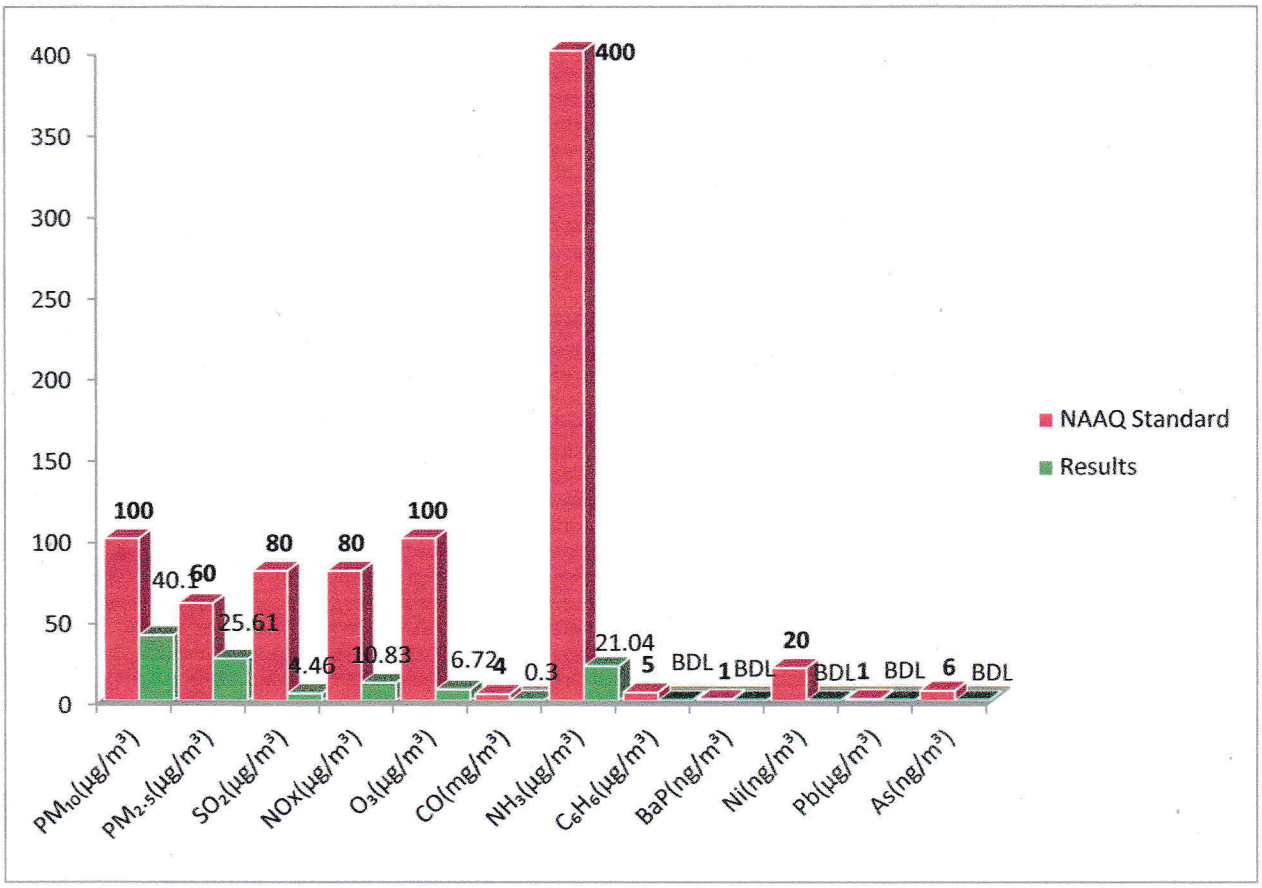
Ref.: Envlab/18/R-9273

Date: 05/11/18

13.10.2018	41.2	24.8	4.4	10.8	6.8	0.32	20.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
15.10.2018	40.6	25.0	4.4	10.2	6.8	0.33	20.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
20.10.2018	40.2	25.4	4.6	10.6	6.2	0.34	21.6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
22.10.2018	39.2	25.2	4.4	11.0	6.6	0.35	22.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
27.10.2018	39.8	25.2	4.6	11.2	6.2	0.36	21.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Monthly Average	**40.01**	**25.61**	**4.46**	**10.83**	**6.72**	**0.30**	**21.04**	**BDL**	**BDL**	**BDL**	**BDL**	**BDL**	**BDL**	**BDL**	**BDL**
CPCB, New Delhi AAQ Standard	100	60	80	80	100	4	400	1	20	6	AAS Method USEPA/ IO3.2	5	Gas Chromatography IS 5182 (Part-11):2006	1	Solvent Extraction IS 5182 (Part-12):2004
Testing Method	Gravimetric IS 5182: Part 23	Gravimetric EPA CFR-40 (pt 50) Appendix-1	Improved West & Geake Method IS 5182 (Part-2) RA2006	Modified Jacob & Hochheiser Method IS 5182 (Part-6) RA2006	Chemical Method IS 5182 (Part-9) RA2006	Non Dispersive Infrared Method IS 5182 (Part-10):1999	Indo Phenol Blue Method Air Sampling, 3rd Edn.By James P. Lodge (Method-401)	AAS Method IS 5182(Part - 22):2004	AAS Method USEPA/ IO3.2						

For Visiontek Consultancy Services Pvt.Ltd

Figure-01: GRAPH SHOWING AVERAGE AAQ CONCENTRATION (AAQ-1: MINE OFFICE) FOR THE MONTH OF JULY-18 TO OCT-18



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ISO 9001 : 2008
ISO 14001 : 2004
OHSAS 18001 : 2007

Ref.: envlab/18/R-987

Date: 05/11/18

AMBIENT AIR QUALITY MONITORING REPORT(CORE ZONE)

1. Name of Industry : **M/s Bandhamandi Graphite Mines & Beneficiation Plant, Rayagada**
2. Sampling Location : **Monitoring Station No.- AAQ 2 (Mine Face)**
3. Monitoring Instruments : RDS (APM 460 BL), FPS (APM 550) Envirotech, CO Analyzer.
4. Sample Collected By : VCSPL representative in presence of Client's representative

Date	PARAMETERS											
	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NOx ($\mu g/m^3$)	O_3 ($\mu g/m^3$)	CO (mg/m^3)	NH_3 ($\mu g/m^3$)	Pb ($\mu g/m^3$)	Ni (ng/m^3)	As (ng/m^3)	C_6H_6 ($\mu g/m^3$)	BaP (ng/m^3)
02.07.2018	41.4	27.2	4.4	12.8	10.8	0.26	25.8	BDL	BDL	BDL	BDL	BDL
06.07.2018	41.8	27.6	4.6	13.0	11.2	0.26	25.8	BDL	BDL	BDL	BDL	BDL
09.07.2018	42.0	28.2	4.2	13.2	11.8	0.30	26.4	BDL	BDL	BDL	BDL	BDL
13.07.2018	42.2	28.0	4.4	13.8	12.0	0.28	26.2	BDL	BDL	BDL	BDL	BDL
16.07.2018	42.4	27.8	4.5	14.0	12.2	0.29	27.0	BDL	BDL	BDL	BDL	BDL
20.07.2018	40.8	27.2	4.0	14.1	11.8	0.28	26.8	BDL	BDL	BDL	BDL	BDL
23.07.2018	41.1	28.0	4.2	14.2	11.6	0.31	26.2	BDL	BDL	BDL	BDL	BDL
27.07.2018	41.4	28.4	4.4	13.6	11.6	0.31	26.6	BDL	BDL	BDL	BDL	BDL
30.07.2018	41.4	28.2	4.4	13.6	12.0	0.30	27.1	BDL	BDL	BDL	BDL	BDL
03.08.2018	40.8	27.6	4.6	14.1	12.2	0.29	27.2	BDL	BDL	BDL	BDL	BDL
06.8.2018	40.8	28.4	4.2	14.2	12.4	0.29	27.8	BDL	BDL	BDL	BDL	BDL
10.08.2018	40.2	28.4	4.4	14.2	12.8	0.27	28.0	BDL	BDL	BDL	BDL	BDL
13.08.2018	40.6	27.1	4.6	14.5	13.0	0.22	27.1	BDL	BDL	BDL	BDL	BDL
17.08.2018	40.6	26.6	4.8	13.8	13.1	0.26	27.4	BDL	BDL	BDL	BDL	BDL
20.08.2018	40.2	26.8	5.0	13.8	12.4	0.28	26.6	BDL	BDL	BDL	BDL	BDL
24.08.2018	40.4	27.0	5.2	13.2	12.8	0.27	26.2	BDL	BDL	BDL	BDL	BDL
27.08.2018	41.8	25.2	5.2	13.8	12.8	0.30	26.1	BDL	BDL	BDL	BDL	BDL
31.08.2018	41.2	25.8	5.6	14.1	13.0	0.31	27.0	BDL	BDL	BDL	BDL	BDL
03.09.2018	42.0	26.0	4.9	14.2	12.6	0.30	27.1	BDL	BDL	BDL	BDL	BDL
07.09.2018	42.6	26.2	4.8	14.8	12.8	0.25	27.4	BDL	BDL	BDL	BDL	BDL
10.09.2018	42.6	26.8	4.9	15.2	12.2	0.24	27.2	BDL	BDL	BDL	BDL	BDL
14.09.2018	42.4	27.0	4.8	15.2	12.2	0.24	26.9	BDL	BDL	BDL	BDL	BDL
17.09.2018	43.0	27.1	4.8	15.6	12.8	0.22	26.9	BDL	BDL	BDL	BDL	BDL
21.09.2018	43.1	27.4	4.6	15.6	13.1	0.26	26.4	BDL	BDL	BDL	BDL	BDL
24.09.2018	43.2	28.0	4.6	15.0	13.2	0.22	26.6	BDL	BDL	BDL	BDL	BDL
28.09.2018	42.8	28.4	4.2	15.0	12.8	0.24	27.1	BDL	BDL	BDL	BDL	BDL
01.10.2018	43.0	28.6	4.2	14.9	12.6	0.24	27.4	BDL	BDL	BDL	BDL	BDL
06.10.2018	43.0	28.6	4.4	14.2	12.2	0.22	27.6	BDL	BDL	BDL	BDL	BDL
08.10.2018	43.1	28.2	4.4	14.8	10.8	0.18	26.8	BDL	BDL	BDL	BDL	BDL
13.10.2018	43.2	28.2	4.6	14.0	11.2	0.18	26.6	BDL	BDL	BDL	BDL	BDL
15.10.2018	44.0	28.0	5.2	13.8	11.6	0.20	27.0	BDL	BDL	BDL	BDL	BDL
20.10.2018	44.1	28.0	4.8	13.4	12.1	0.20	26.9	BDL	BDL	BDL	BDL	BDL
22.10.2018	42.6	27.8	5.0	14.0	12.2	0.21	27.1	BDL	BDL	BDL	BDL	BDL
27.10.2018	42.8	27.2	5.2	14.1	11.9	0.19	27.4	BDL	BDL	BDL	BDL	BDL

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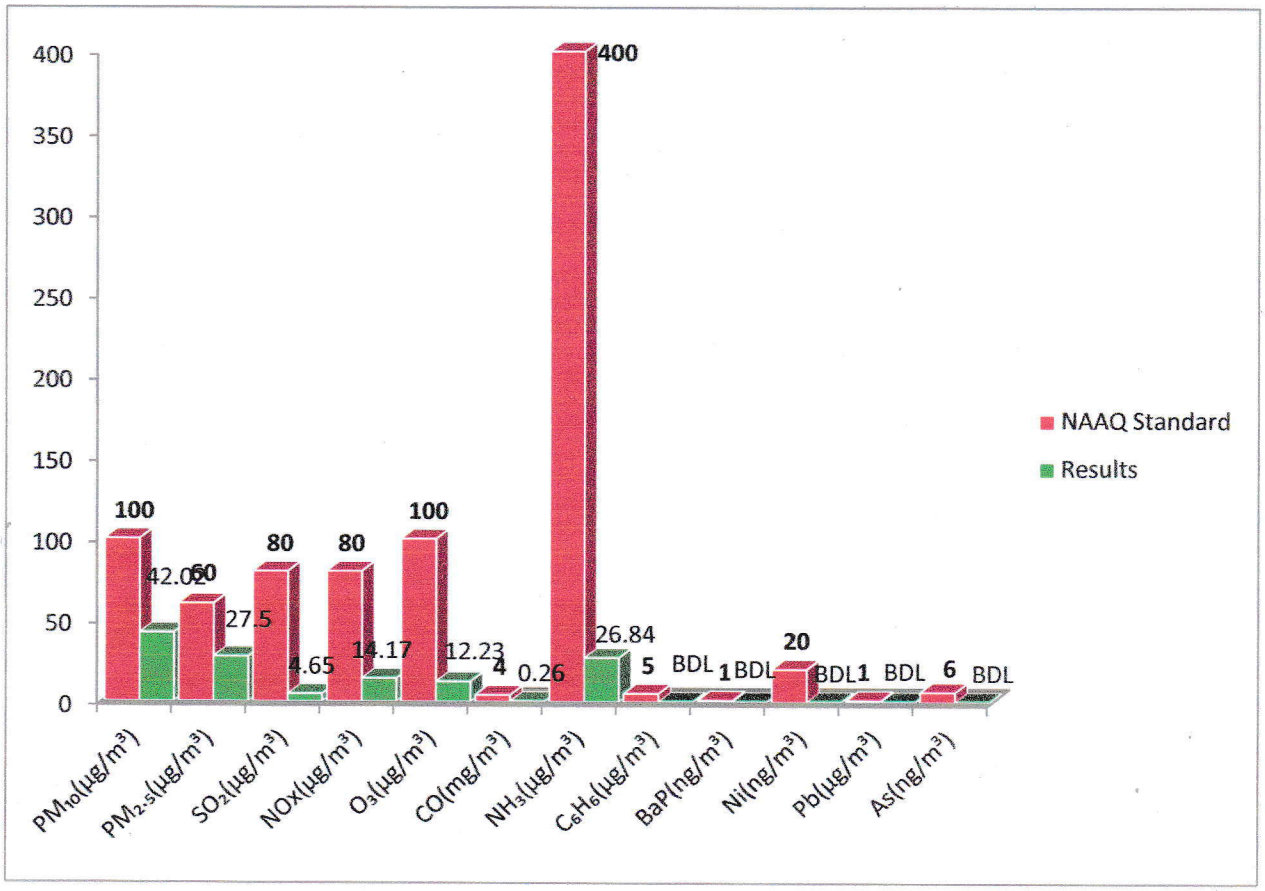
Ref.: Envlab/18/R-9274

Date: 05/11/18

Monthly Average	42.02	27.50	4.65	14.17	12.23	0.26	26.87	BDL	BDL	BDL	BDL	BDL
CPCB, New Delhi AAQ Standard	100	60	80	80	100	4	400	1	20	6	5	1
Testing Method	Gravimetric IS 5182: Part 23	Gravimetric EPA CFR-40 (pt 50) Appendix-1	Improved West & Geake Method IS 5182 (Part-2) RA2006	Modified Jacob & Hochheiser Method IS 5182 (Part-6) RA2006	Chemical Method IS 5182 (Part-9) RA2006	Non Dispersive Infrared Method IS 5182 (Part-10):1999	Indo Phenol Blue Method Air Sampling , 3rd Edn.By James P. Lodge (Method-401)	AAS Method IS 5182(Part - 22):2004	AAS Method USEPA/ IO3.2	AAS Method USEPA/ IO3.2	Gas Chromatography IS 5182 (Part-11):2006	Solvent Extraction IS 5182 (Part-12):2004

For Visiontek Consultancy Services Pvt.Ltd.

Figure-02: GRAPH SHOWING AVERAGE AAQ CONCENTRATION (AAQ-2: MINE FACE) FOR THE MONTH OF JULY-18 TO OCT-18



Visiontek Consultancy Services Pvt. Ltd.
(An Enviro Engineering Consulting Cell)
ISO 9001 : 2008
ISO 14001 : 2004
OHSAS 18001 : 2007

Ref.: Env/Lab/18/R-0275 Date: 05/11/18

AMBIENT AIR QUALITY MONITORING REPORT(CORE ZONE)

1.Name of Industry : **M/s Bandhamandi Graphite Mines & Beneficiation Plant, Rayagada**
2. Sampling Location : **Monitoring Station No.- AAQ 3 (Dump Site)**
3. Monitoring Instruments : RDS (APM 460 BL), FPS (APM 550) Envirotech, CO Analyzer.
4. Sample Collected By : VCSPL representative in presence of Client's representative

Date	PARAMETERS											
	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NOx ($\mu g/m^3$)	O_3 ($\mu g/m^3$)	CO (mg/m^3)	NH_3 ($\mu g/m^3$)	Pb ($\mu g/m^3$)	Ni (ng/m^3)	As (ng/m^3)	C_6H_6 ($\mu g/m^3$)	BaP (ng/m^3)
02.07.2018	40.6	24.4	4.9	15.8	12.4	0.29	22.2	BDL	BDL	BDL	BDL	BDL
06.07.2018	41.1	24.2	4.6	15.2	12.0	0.29	22.8	BDL	BDL	BDL	BDL	BDL
09.07.2018	41.9	24.2	4.6	15.6	11.6	0.28	23.0	BDL	BDL	BDL	BDL	BDL
13.07.2018	42.2	24.1	4.5	16.0	11.8	0.26	23.2	BDL	BDL	BDL	BDL	BDL
16.07.2018	42.6	24.0	4.5	16.2	11.9	0.24	22.9	BDL	BDL	BDL	BDL	BDL
20.07.2018	44.0	24.0	4.8	16.4	12.4	0.21	22.6	BDL	BDL	BDL	BDL	BDL
23.07.2018	44.2	24.0	4.2	16.0	12.7	0.22	23.0	BDL	BDL	BDL	BDL	BDL
27.07.2018	44.6	24.0	4.2	16.0	12.6	0.24	23.4	BDL	BDL	BDL	BDL	BDL
30.07.2018	44.0	23.9	4.2	15.2	10.6	0.25	24.2	BDL	BDL	BDL	BDL	BDL
03.08.2018	44.2	23.2	4.0	15.4	10.9	0.25	24.2	BDL	BDL	BDL	BDL	BDL
06.08.2018	43.8	23.6	4.0	15.8	11.5	0.22	25.1	BDL	BDL	BDL	BDL	BDL
10.08.2018	43.6	23.2	4.0	16.1	12.3	0.21	25.2	BDL	BDL	BDL	BDL	BDL
13.08.2018	44.2	22.9	4.4	16.4	11.9	0.24	24.8	BDL	BDL	BDL	BDL	BDL
17.08.2018	44.8	22.8	4.2	16.2	12.7	0.23	25.4	BDL	BDL	BDL	BDL	BDL
20.08.2018	45.2	22.8	4.8	16.0	11.5	0.26	25.9	BDL	BDL	BDL	BDL	BDL
24.08.2018	45.2	22.8	4.8	16.1	13.5	0.25	26.2	BDL	BDL	BDL	BDL	BDL
27.08.2018	46.2	22.2	5.2	16.1	12.4	0.25	26.8	BDL	BDL	BDL	BDL	BDL
31.08.2018	45.8	22.0	5.1	16.2	12.6	0.26	27.1	BDL	BDL	BDL	BDL	BDL
03.09.2018	45.8	22.0	5.8	16.4	11.8	0.28	27.2	BDL	BDL	BDL	BDL	BDL
07.09.2018	46.0	22.2	6.1	16.8	13.5	0.29	27.8	BDL	BDL	BDL	BDL	BDL
10.09.2018	46.2	22.6	6.0	16.0	10.2	0.26	28.0	BDL	BDL	BDL	BDL	BDL
14.09.2018	45.2	23.2	6.0	15.9	12.5	0.26	26.4	BDL	BDL	BDL	BDL	BDL
17.09.2018	45.6	23.8	5.6	15.8	13.7	0.27	26.8	BDL	BDL	BDL	BDL	BDL
21.09.2018	44.9	24.0	5.2	16.0	12.5	0.28	27.0	BDL	BDL	BDL	BDL	BDL
24.09.2018	45.1	24.2	5.4	16.2	11.4	0.26	27.2	BDL	BDL	BDL	BDL	BDL
28.09.2018	45.6	23.6	5.4	16.4	12.0	0.26	26.8	BDL	BDL	BDL	BDL	BDL
01.10.2018	45.2	23.8	5.6	15.2	11.8	0.24	26.2	BDL	BDL	BDL	BDL	BDL
06.10.2018	44.8	24.1	5.2	15.2	11.2	0.24	27.1	BDL	BDL	BDL	BDL	BDL
08.10.2018	44.2	24.2	5.2	15.8	11.0	0.26	26.0	BDL	BDL	BDL	BDL	BDL
13.10.2018	43.9	23.9	4.9	16.0	11.4	0.26	25.2	BDL	BDL	BDL	BDL	BDL
15.10.2018	43.2	23.6	4.8	16.1	11.6	0.22	25.2	BDL	BDL	BDL	BDL	BDL

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Date: 05/11/18

20.10.2018	44.0	24.2	5.0	15.1	11.8	0.21	24.8	BDL	BDL	BDL	BDL	BDL
22.10.2018	43.6	23.9	5.2	15.2	12.0	0.25	25.9	BDL	BDL	BDL	BDL	BDL
27.10.2018	42.9	23.2	4.9	14.9	11.6	0.24	26.2	BDL	BDL	BDL	BDL	BDL
Monthly Average	**44.25**	**23.49**	**4.92**	**15.87**	**11.98**	**0.25**	**25.35**	**BDL**	**BDL**	**BDL**	**BDL**	**BDL**
CPCB, New Delhi AAQ Standard	100	60	80	80	100	4	400	1	20	6	5	1
Testing Method	**Gravimetric IS 5182: Part 23**	**Gravimetric EPA CFR-40 (pt 50) Appendix-1**	**Improved West & Geake Method IS 5182 (Part-2) RA2006**	**Modified Jacob & Hochheiser Method IS 5182 (Part-6) RA2006**	**Chemical Method IS 5182 (Part-9) RA2006**	**Non Dispersive Infrared Method IS 5182 (Part-10):1999**	**Indo Phenol Blue Method Air Sampling , 3rd Edn.By James P. Lodge (Method -401)**	**AAS Method IS 5182(Part - 22):2004**	**AAS Method USEPA/ IO3.2**	**AAS Method USEPA/ IO3.2**	**Gas Chromatography IS 5182 (Part-11):2006**	**Solvent Extraction IS 5182 (Part-12):2004**

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For **Visiontek Consultancy Services Pvt.Ltd.**

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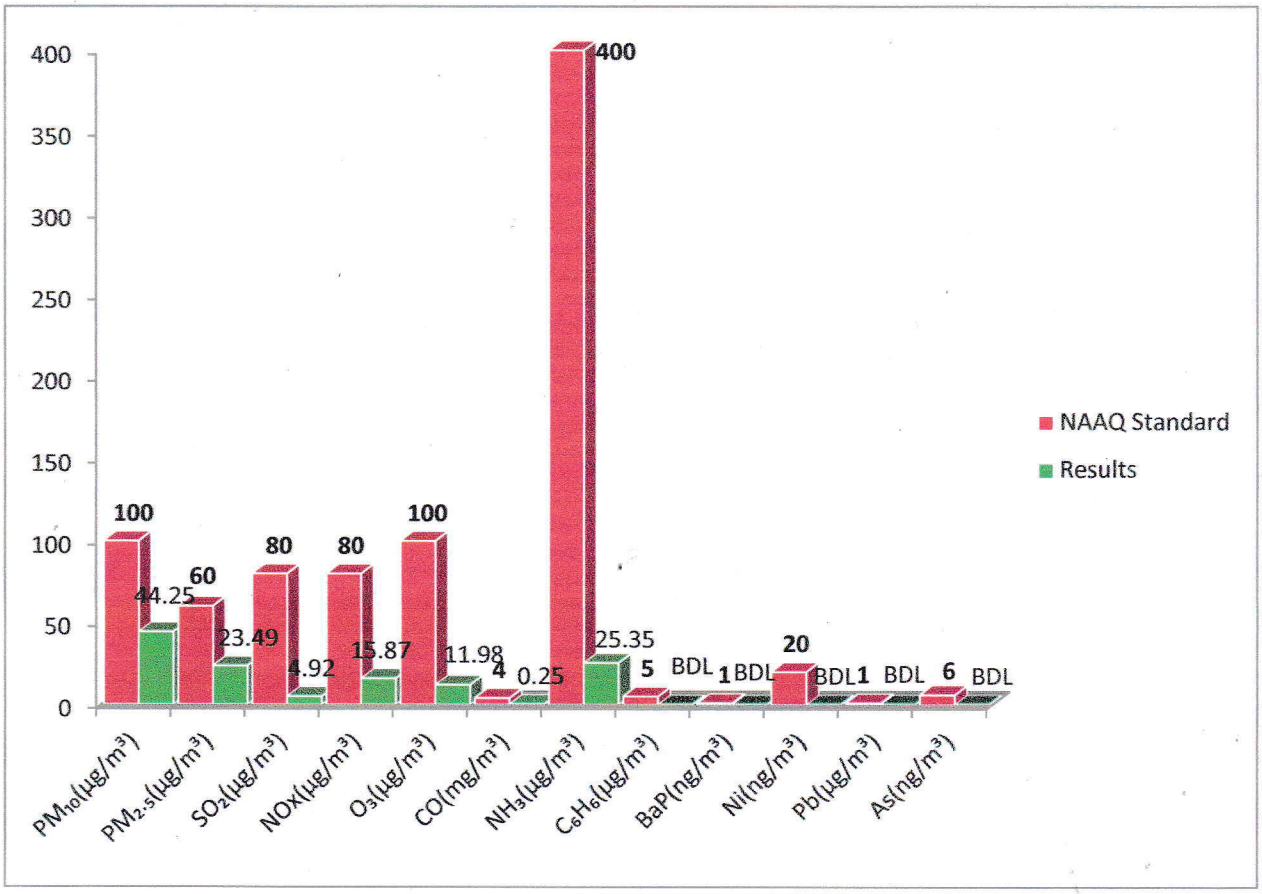
Figure-03: GRAPH SHOWING AVERAGE AAQ CONCENTRATION (AAQ-3: DUMP SITE) FOR THE MONTH OF JULY-18 TO OCT-18



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Ref.: Envlab/18R - 9276

Date: 05/11/18

AMBIENT AIR QUALITY MONITORING REPORT(CORE ZONE)

1.Name of Industry : **M/s Bandhamandi Graphite Mines & Beneficiation Plant, Rayagada**
2.Sampling Location : **Monitoring Station No.- AAQ 4 (Plant Site)**
3.Monitoring Instruments : RDS (APM 460 BL), FPS (APM 550) Envirotech, CO Analyzer.
4.Sample Collected By : VCSPL representative in presence of Client's representative

Date	PARAMETERS											
	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NOx ($\mu g/m^3$)	O_3 ($\mu g/m^3$)	CO (mg/m^3)	NH_3 ($\mu g/m^3$)	Pb ($\mu g/m^3$)	Ni (ng/m^3)	As (ng/m^3)	C_6H_6 ($\mu g/m^3$)	BaP (ng/m^3)
02.07.2018	33.2	20.8	5.2	14.8	11.8	0.28	21.2	BDL	BDL	BDL	BDL	BDL
06.07.2018	32.2	20.2	5.1	15.2	11.2	0.29	21.2	BDL	BDL	BDL	BDL	BDL
09.07.2018	34.2	21.9	5.4	15.6	10.8	0.26	21.8	BDL	BDL	BDL	BDL	BDL
13.07.2018	30.2	22.1	5.2	16.0	11.2	0.31	20.9	BDL	BDL	BDL	BDL	BDL
16.07.2018	32.3	22.4	5.3	16.2	11.9	0.30	20.2	BDL	BDL	BDL	BDL	BDL
20.07.2018	34.4	23.2	5.0	15.9	12.1	0.21	21.0	BDL	BDL	BDL	BDL	BDL
23.07.2018	32.3	23.8	4.9	15.4	12.2	0.30	21.2	BDL	BDL	BDL	BDL	BDL
27.07.2018	36.1	24.0	4.6	14.8	12.5	0.35	21.2	BDL	BDL	BDL	BDL	BDL
30.07.2018	35.0	24.2	4.2	15.0	12.8	0.31	21.8	BDL	BDL	BDL	BDL	BDL
03.08.2018	34.0	25.0	4.1	15.2	12.2	0.32	22.0	BDL	BDL	BDL	BDL	BDL
06.08.2018	39.3	25.0	4.4	14.9	11.8	0.31	21.8	BDL	BDL	BDL	BDL	BDL
10.08.2018	40.8	24.8	4.8	14.6	12.0	0.34	22.2	BDL	BDL	BDL	BDL	BDL
13.08.2018	41.3	24.2	5.1	14.8	11.9	0.25	22.4	BDL	BDL	BDL	BDL	BDL
17.08.2018	41.8	25.1	5.2	15.2	11.8	0.28	22.8	BDL	BDL	BDL	BDL	BDL
20.08.2018	42.1	25.2	5.4	15.2	11.6	0.29	23.1	BDL	BDL	BDL	BDL	BDL
24.08.2018	43.0	25.4	5.0	16.1	12.0	0.31	23.2	BDL	BDL	BDL	BDL	BDL
27.08.2018	43.4	24.9	4.9	15.8	12.4	0.36	23.8	BDL	BDL	BDL	BDL	BDL
31.08.2018	43.8	24.2	4.4	15.2	12.2	0.3	24.0	BDL	BDL	BDL	BDL	BDL
03.09.2018	44.0	25.0	4.8	15.0	12.9	0.31	24.2	BDL	BDL	BDL	BDL	BDL
07.09.2018	44.2	25.2	5.0	14.9	13.0	0.29	24.8	BDL	BDL	BDL	BDL	BDL
10.09.2018	43.8	24.1	5.0	15.1	12.1	0.31	25.0	BDL	BDL	BDL	BDL	BDL
14.09.2018	43.2	23.8	5.1	15.4	12.4	0.28	25.2	BDL	BDL	BDL	BDL	BDL
17.09.2018	44.0	23.2	5.2	15.4	11.9	0.29	24.9	BDL	BDL	BDL	BDL	BDL
21.09.2018	44.2	22.8	5.3	15.8	11.6	0.31	25.0	BDL	BDL	BDL	BDL	BDL
24.09.2018	43.9	22.6	5.0	15.2	12.2	0.30	25.2	BDL	BDL	BDL	BDL	BDL
28.09.2018	41.2	23.1	5.0	14.9	11.8	0.29	24.8	BDL	BDL	BDL	BDL	BDL
01.10.2018	42.4	23.8	4.8	15.0	12.0	0.26	24.2	BDL	BDL	BDL	BDL	BDL
06.10.2018	42.0	24.1	4.8	14.9	12.0	0.22	23.6	BDL	BDL	BDL	BDL	BDL
08.10.2018	42.8	24.4	4.6	14.2	12.0	0.26	23.2	BDL	BDL	BDL	BDL	BDL
13.10.2018	42.2	24.8	4.4	14.8	11.9	0.26	22.8	BDL	BDL	BDL	BDL	BDL
15.10.2018	41.6	25.2	4.2	14.6	11.6	0.28	22.4	BDL	BDL	BDL	BDL	BDL
20.10.2018	41.2	25.2	4.9	15.0	11.5	0.32	21.9	BDL	BDL	BDL	BDL	BDL

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Date: 05/11/18

22.10.2018	40.8	24.8	4.6	15.2	12.4	0.31	21.8	BDL	BDL	BDL	BDL	BDL	BDL
27.10.2018	41.0	24.8	4.6	14.9	12.4	0.30	20.9	BDL	BDL	BDL	BDL	BDL	BDL
Monthly Average	**39.76**	**23.92**	**4.87**	**15.18**	**12.00**	**0.29**	**22.81**	**BDL**	**BDL**	**BDL**	**BDL**	**BDL**	**BDL**
CPCB, New Delhi AAQ Standard	100	60	80	80	100	4	400	1	20	6	5	1	
Testing Method	**Gravimetric IS 5182: Part 23**	**Gravimetric EPA CFR-40 (pt 50) Appendix-1**	**Improved West & Geake Method IS 5182 (Part-2) RA2006**	**Modified Jacob & Hochheiser Method IS 5182 (Part-6) RA2006**	**Chemical Method IS 5182 (Part-9) RA2006**	**Non Dispersive Infrared Method IS 5182 (Part-10):1999**	**Indo Phenol Blue Method Air Sampling, 3rd Edn.By James P. Lodge (Method-401)**	**AAS Method IS 5182(Part-22):2004**	**AAS Method USEPA/ IO3.2**	**AAS Method USEPA/ IO3.2**	**Gas Chromatography IS 5182 (Part-11):2006**	**Solvent Extraction IS 5182 (Part-12):2004**	

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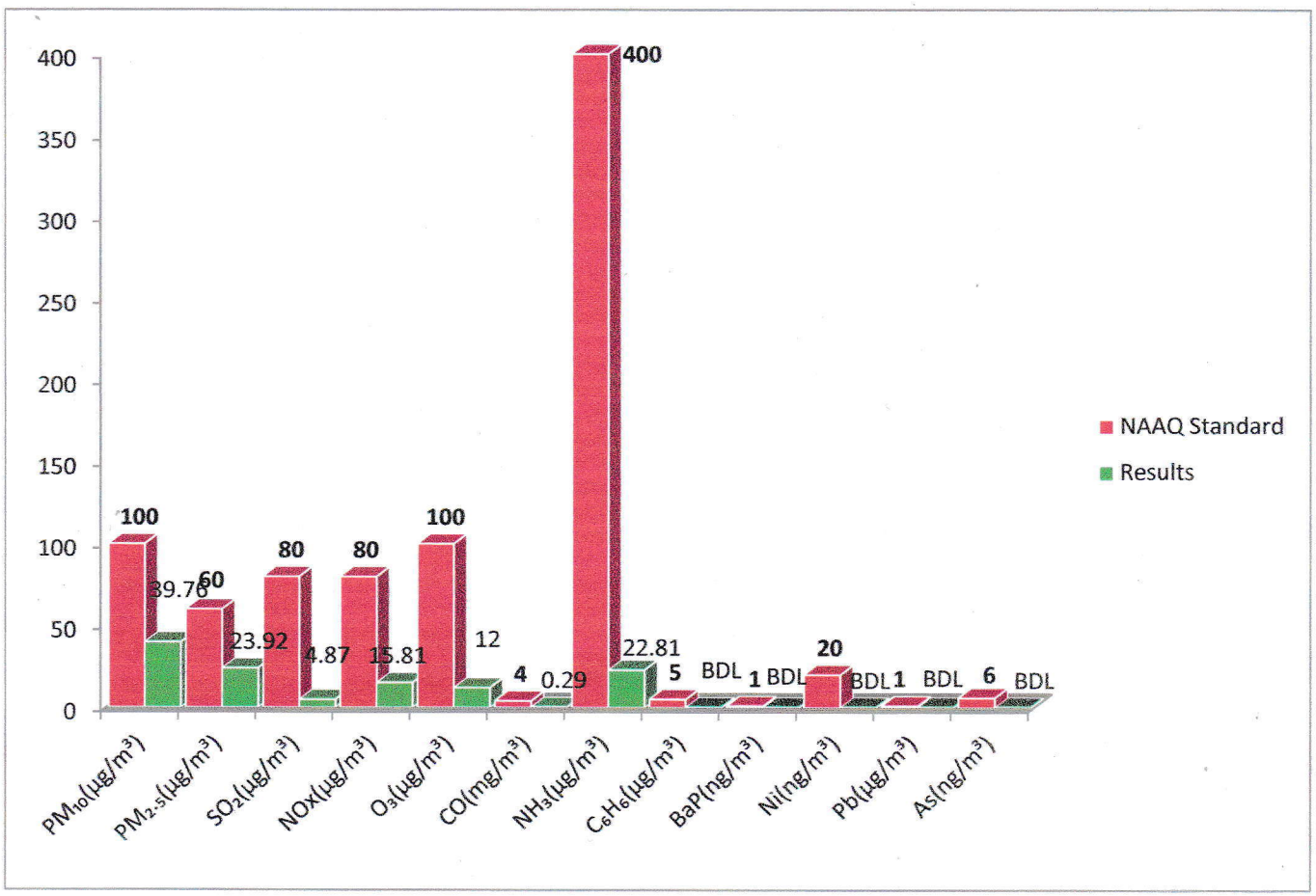
Figure-04: GRAPH SHOWING AVERAGE AAQ CONCENTRATION (AAQ-4: PLANT SITE) FOR THE MONTH OF JULY-18 TO OCT-18



Annexure-2

AMBIENT AIR QUALITY MONITORING REPORT (BUFFER ZONE)

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ISO 9001 : 2008
ISO 14001 : 2004
OHSAS 18001 : 2007

Ref.: Envlab/18/R-9878

Date: 08/11/18

AMBIENT AIR QUALITY MONITORING REPORT (BUFFER ZONE)

1.Name of Industry : **M/s Bandhamandi Graphite Mines & Beneficiation Plant,Rayagada**
2.Sampling Location : **Monitoring Station No.- AAQ 1 (Bandhamandi Village)**
3. Monitoring Instruments : RDS (APM 460 BL), FPS (APM 550) Envirotech, CO Analyzer.
4. Sample Collected By : VCSPL representative in presence of Client's representative

Date	PARAMETERS											
	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NOx ($\mu g/m^3$)	O_3 ($\mu g/m^3$)	CO (mg/m^3)	NH_3 ($\mu g/m^3$)	Pb ($\mu g/m^3$)	Ni (ng/m^3)	As (ng/m^3)	C_6H_6 ($\mu g/m^3$)	BaP (ng/m^3)
02.07.2018	36.2	18.2	4.2	12.1	12.2	0.28	BDL	BDL	BDL	BDL	BDL	BDL
06.08.2018	35.8	18.0	4.1	11.8	12.2	0.29	BDL	BDL	BDL	BDL	BDL	BDL
03.09.2018	34.2	20.0	4.2	11.2	11.9	0.31	BDL	BDL	BDL	BDL	BDL	BDL
13.10.2018	34.8	18.2	4.1	11.2	12.0	0.29	BDL	BDL	BDL	BDL	BDL	BDL
CPCB, New Delhi AAQ Standard	**100**	**60**	**80**	**80**	**100**	**4**	**400**	**1**	**20**	**6**	**5**	**1**
Testing Method	Gravimetric **IS 5182: Part 23**	Gravimetric **EPA CFR-40 (pt 50) Appendix-1**	Improved West & Geake Method **IS 5182 (Part-2) RA2006**	Modified Jacob & Hochheiser Method **IS 5182 (Part-6) RA2006**	Chemical Method **IS 5182 (Part-9) RA2006**	Non Dispersive Infrared Method **IS 5182 (Part-10):1999**	Indo Phenol Blue Method **Air Sampling , 3rd Edn.By James P. Lodge (Method-401)**	AAS Method **IS 5182(Part -22):2004**	AAS Method **USEPA /IO3.2**	AAS Method **USEPA/ IO3.2**	Gas Chroma tography **IS 5182 (Part-11):2006**	Solvent Extraction **IS 5182 (Part-12):2004**

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ISO 14001 : 2004
OHSAS 18001 : 2007

Ref.: Envlab/18/R-9879

AMBIENT AIR QUALITY MONITORING REPORT (BUFFER ZONE)

1.Name of Industry : **M/s Bandhamandi Graphite Mines & Beneficiation Plant ,Rayagada**
2.Sampling Location : **Monitoring Station No.- AAQ 2 (Kachama Village)**
3. Monitoring Instruments : RDS (APM 460 BL), FPS (APM 550) Envirotech, CO Analyzer.
4. Sample Collected By : VCSPL representative in presence of Client's representative

Date	PARAMETERS											
	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NOx ($\mu g/m^3$)	O_3 ($\mu g/m^3$)	CO (mg/m^3)	NH_3 ($\mu g/m^3$)	Pb ($\mu g/m^3$)	Ni (ng/m^3)	As (ng/m^3)	C_6H_6 ($\mu g/m^3$)	BaP (ng/m^3)
02.07.2018	30.2	20.2	4.2	12.2	10.2	0.26	BDL	BDL	BDL	BDL	BDL	BDL
06.08.2018	31.4	21.4	4.1	12.0	10.8	0.28	BDL	BDL	BDL	BDL	BDL	BDL
03.09.2018	31.8	20.8	4.0	11.8	10.4	0.26	BDL	BDL	BDL	BDL	BDL	BDL
13.10.2018	30.8	20.4	4.4	11.4	10.6	0.26	BDL	BDL	BDL	BDL	BDL	BDL
CPCB, New Delhi AAQ Standard	**100**	**60**	**80**	**80**	**100**	**4**	**400**	**1**	**20**	**6**	**5**	**1**
Testing Method	Gravimetric **IS 5182: Part 23**	Gravimetric **EPA CFR-40 (pt 50) Appendix-1**	Improved West & Geake Method **IS 5182 (Part-2) RA2006**	Modified Jacob & Hochheiser Method **IS 5182 (Part-6) RA2006**	Chemical Method **IS 5182 (Part-9) RA2006**	Non Dispersive Infrared Method **IS 5182 (Part-10):1999**	Indo Phenol Blue Method **Air Sampling , 3rd Edn.By James P. Lodge (Method-401)**	AAS Method **IS 5182(Part -22):2004**	AAS Method **USEPA /IO3.2**	AAS Method **USEPA/ IO3.2**	Gas Chroma tography **IS 5182 (Part-11):2006**	Solvent Extraction **IS 5182 (Part-12):2004**

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For **Visiontek Consultancy Services Pvt.Ltd.**

Date: 05/11/18

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ISO 14001 : 2004
OHSAS 18001 : 2007

Ref.: Envlab/18/R-1080

Date: 05/11/18

AMBIENT AIR QUALITY MONITORING REPORT (BUFFER ZONE)

1. Name of Industry : **M/s Bandhamandi Graphite Mines & Beneficiation Plant, Rayagada**
2. Sampling Location : **Monitoring Station No.- AAQ 3 (Podeng Village)**
3. Monitoring Instruments : RDS (APM 460 BL), FPS (APM 550) Envirotech, CO Analyzer.
4. Sample Collected By : VCSPL representative in presence of Client's representative

Date	PARAMETERS											
	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NOx ($\mu g/m^3$)	O_3 ($\mu g/m^3$)	CO (mg/m^3)	NH_3 ($\mu g/m^3$)	Pb ($\mu g/m^3$)	Ni (ng/m^3)	As (ng/m^3)	C_6H_6 ($\mu g/m^3$)	BaP (ng/m^3)
02.07.2018	30.4	18.2	4.6	11.8	10.8	0.29	BDL	BDL	BDL	BDL	BDL	BDL
06.08.2018	31.2	19.0	4.8	12.2	11.2	0.30	BDL	BDL	BDL	BDL	BDL	BDL
03.09.2018	31.8	18.8	5.1	12.4	11.2	0.31	BDL	BDL	BDL	BDL	BDL	BDL
13.10.2018	30.8	18.6	4.9	12.6	10.6	0.31	BDL	BDL	BDL	BDL	BDL	BDL
CPCB, New Delhi AAQ Standard	**100**	**60**	**80**	**80**	**100**	**4**	**400**	**1**	**20**	**6**	**5**	**1**
Testing Method	Gravimetric **IS 5182: Part 23**	Gravimetric **EPA CFR-40 (pt 50) Appendix-1**	Improved West & Geake Method **IS 5182 (Part-2) RA2006**	Modified Jacob & Hochheiser Method **IS 5182 (Part-6) RA2006**	Chemical Method **IS 5182 (Part-9) RA2006**	Non Dispersive Infrared Method **IS 5182 (Part-10):1999**	Indo Phenol Blue Method **Air Sampling , 3rd Edn.By James P. Lodge (Method-401)**	AAS Method **IS 5182(Part -22):2004**	AAS Method **USEPA /IO3.2**	AAS Method **USEPA/ IO3.2**	Gas Chroma tography **IS 5182 (Part-11):2006**	Solvent Extraction **IS 5182 (Part-12):2004**

For **Visiontek Consultancy Services Pvt.Lt**

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ISO 9001 : 2008
ISO 14001 : 2004
OHSAS 18001 : 2007

Ref: tvlab/18/R-928

AMBIENT AIR QUALITY MONITORING REPORT (BUFFER ZONE)

1.Name of Industry : **M/s Bandhamandi Graphite Mines & Beneficiation Plant, Rayagada**
2.Sampling Location : **Monitoring Station No.- AAQ 4 (Bartibali Village)**
3. Monitoring Instruments : RDS (APM 460 BL), FPS (APM 550) Envirotech, CO Analyzer.
4. Sample Collected By : VCSPL representative in presence of Client's representative

Date	PARAMETERS											
	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NOx ($\mu g/m^3$)	O_3 ($\mu g/m^3$)	CO (mg/m^3)	NH_3 ($\mu g/m^3$)	Pb ($\mu g/m^3$)	Ni (ng/m^3)	As (ng/m^3)	C_6H_6 ($\mu g/m^3$)	BaP (ng/m^3)
02.07.2018	33.2	19.8	5.0	18.6	9.6	0.22	BDL	BDL	BDL	BDL	BDL	BDL
06.08.2018	33.8	20.2	4.6	17.5	10.2	0.24	BDL	BDL	BDL	BDL	BDL	BDL
03.09.2018	34.2	20.6	4.8	18.0	10.6	0.30	BDL	BDL	BDL	BDL	BDL	BDL
13.10.2018	34.0	21.0	5.1	17.4	10.8	0.32	BDL	BDL	BDL	BDL	BDL	BDL
CPCB, New Delhi AAQ Standard	**100**	**60**	**80**	**80**	**100**	**4**	**400**	**1**	**20**	**6**	**5**	**1**
Testing Method	Gravimetric **IS 5182: Part 23**	Gravimetric **EPA CFR-40 (pt 50) Appendix-1**	Improved West & Geake Method **IS 5182 (Part-2) RA2006**	Modified Jacob & Hochheiser Method **IS 5182 (Part-6) RA2006**	Chemical Method **IS 5182 (Part-9) RA2006**	Non Dispersive Infrared Method **IS 5182 (Part-10):1999**	Indo Phenol Blue Method **Air Sampling , 3rd Edn.By James P. Lodge (Method-401)**	AAS Method **IS 5182(Part-22):2004**	AAS Method **USEPA /IO3.2**	AAS Method **USEPA/ IO3.2**	Gas Chroma tography **IS 5182 (Part-11):2006**	Solvent Extraction **IS 5182 (Part-12):2004**

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Ref: Envfab/18/R-9202

AMBIENT AIR QUALITY MONITORING REPORT (BUFFER ZONE)

1. Name of Industry : **M/s Bandhamandi Graphite Mines & Beneficiation Plant, Rayagada**
2. Monitoring Instruments : RDS (APM 460 BL), FPS (APM 550) Envirotech, CO Analyzer.
3. Sample Collected By : VCSPL representative in presence of Client's representative

Date	Sampling Locations	Parameters
		Silica (%)
02.07.2018	AAQ1: Bandhamandi Village	7.8
06.08.2018	AAQ2: Kachama Village	8.2
03.09.2018	AAQ3: Podeng Village	8.0
13.10.2018	AAQ4:Bartibali Village	8.2

For **Visiontek Consultancy Services Pvt.Ltd.**

VISIONTEK CONSULTANCY SERVICES PVT LTD

Date: 05/11/18

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Annexure-3

SURFACE WATER QUALITY REPORT

Visiontek Consultancy Services Pvt. Ltd.
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ISO 9001 : 2008
ISO 14001 : 2004
OHSAS 18001 : 2007

Ref: tcs/lab/18/R-9288

Date: 05/11/18

SURFACE WATER QUALITY ANALYSIS REPORT

1. **Name of Industry** : **M/s Bandhamandi Graphite Mines & Beneficiation Plant, Rayagada**
2. Sampling Location : **SW-1:** Dalakona Nala Near Panasagurha Upstream
5. Sample Collected By : VCSPL Representative in presence of Clients Representative

Sl. No.	Parameter	Testing Methods	Unit	Standards as per IS-2296:1992 Class –'C'	Analysis Results				Averages
					July-18	Aug-18	Sept-18	Oct-18	
1.	pH Value	APHA 4500H^+ B	--	**6.0-9.0**	7.1	7.06	7.08	7.12	**7.09**
2.	Dissolved Oxygen (minimum)	APHA 2540 C	mg/l	**4.0**	3.4	3.2	2.8	3.0	**3.1**
3.	Total Dissolved Solids as TDS	APHA 2540 D	mg/l	**1500**	266.0	288.0	325.0	280.0	**289.75**
4.	Total Suspended Solids as TSS	APHA 2540 C	mg/l	--	50.6	48.0	46.0	44.0	**47.15**

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For ***Visiontek Consultancy Services Pvt. Ltd.***

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ISO 9001 : 2008
ISO 14001 : 2004
OHSAS 18001 : 2007

Ref.: Lab/18/R-9289

Date: 05/11/18

SURFACE WATER QUALITY ANALYSIS REPORT

1. **Name of Industry** : **M/s Bandhamandi Graphite Mines & Beneficiation Plant, Rayagada**
2. Sampling Location : **SW-2:** Dalakona Nala Near Panasagurha Downstream
3. Sample Collected By : VCSPL Representative in presence of JCPL Representative

Sl. No.	Parameter	Testing Methods	Unit	Standards as per IS-2296:1992 Class –'C'	Analysis Results				Averages
					July-18	Aug-18	Sept-18	Oct-18	
1.	pH Value	APHA 4500H$^+$ B	--	**6.0-9.0**	7.0	6.96	6.90	7.1	**6.99**
2.	Dissolved Oxygen (minimum)	APHA 2540 C	mg/l	4.0	4.6	4.1	3.7	4.2	**4.15**
3.	Total Dissolved Solids as TDS	APHA 2540 D	mg/l	**1500**	275.0	264.0	294.0	280.0	**278.25**
4.	Total Suspended Solids as TSS	APHA 2540 C	mg/l	--	58.0	56.0	52.0	50.0	**54**

VISIONTEK CONSULTANCY SERVICES PVT LTD

For ***Visiontek Consultancy Services Pvt. Ltd.***

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ISO 9001 : 2008
ISO 14001 : 2004
OHSAS 18001 : 2007

Ref.: Envlab/18/R-990

Date: 05/11/18

SURFACE WATER QUALITY ANALYSIS REPORT

1. **Name of Industry** : **M/s Bandhamandi Graphite Mines & Beneficiation Plant, Rayagada**
2. Sampling Location : **SW-3:** Water from Settling Pond
3. Sample Collected By : VCSPL Representative in presence of Clients Representative

Sl. No.	Parameter	Testing Methods	Unit	Standards as per IS-2296:1992 Class –'C'	Analysis Results				Averages
					July-18	Aug-18	Sept-18	Oct-18	
1.	pH Value	APHA 4500H$^+$ B	--	**6.0-9.0**	7.1	7.43	7.26	7.26	**7.26**
2.	Dissolved Oxygen (minimum)	APHA 2540 C	mg/l	4.0	3.4	3.8	3.1	4.2	**3.63**
3.	Total Dissolved Solids as TDS	APHA 2540 D	mg/l	**1500**	152.0	140.0	142.0	154.0	**147.0**
4.	Total Suspended Solids as TSS	APHA 2540 C	mg/l	--	64.0	55.0	45.0	42.0	**51.5**

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*For **Visiontek Consultancy Services Pvt. Ltd.***

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ISO 14001 : 2004
OHSAS 18001 : 2007

Ref.: Envlab/18/R-9292

SURFACE WATER QUALITY ANALYSIS REPORT

1. **Name of Industry** : **M/s Bandhamandi Graphite Mines & Beneficiation Plant, Rayagada**
2. Sampling Location : **SW-4:** Uagarh Nadi Near Bandhamandi Upstream
3. Sample Collected By : VCSPL Representative in presence of Clients Representative

Sl. No.	Parameter	Testing Methods	Unit	Standards as per IS-2296:1992 Class –'C'	Analysis Results				Averages
					July-18	Aug-18	Sept-18	Oct-18	
1.	pH Value	APHA 4500H^+ B	--	**6.0-9.0**	7.3	7.22	7.31	7.34	**7.29**
2.	Dissolved Oxygen (minimum)	APHA 2540 C	mg/l	4.0	3.0	2.8	2.4	3.6	**2.95**
3.	Total Dissolved Solids as TDS	APHA 2540 D	mg/l	**1500**	118.0	120.0	122.0	116.0	**119.00**
4.	Total Suspended Solids as TSS	APHA 2540 C	mg/l	--	40.0	38.0	42.0	41.0	**40.25**

For *Visiontek Consultancy Services Pvt. Ltd.*

Date: 05.11.18

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Annexure-4

GROUND WATER QUALITY REPORT

Visiontek Consultancy Services Pvt. Ltd.
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ISO 9001 : 2008
ISO 14001 : 2004
OHSAS 18001 : 2007

Ref.: Envlab/167/R-928 Date: 05.11.18

GROUND WATER QUALITY ANALYSIS REPORT

1. Name of Industry : **M/s Bandhamandi Graphite Mines & Beneficiation Plant, Rayagada**
2. Sampling Location : **GW-1: Open Well Near Bhitardarba**
3. Sample Collected By : VCSPL Representative in presence of Client's Representative

Sl.No.	Parameter	Unit	Testing Methods	Standard as per IS:10500:2012	Analysis Results				
					July-18	Aug-18	Sept-18	Oct-18	Averages
Essential Characteristics									
1.	Colour	Hazen	APHA 2120 B, C	**5**	CL	CL	CL	CL	**CL**
2.	Odour	--	APHA 2150 B	**Agreeable**	U/O	U/O	U/O	U/O	**U/O**
3.	Taste	--	APHA 2160 C	**Agreeable**	AL	AL	AL	AL	**AL**
4.	Turbidity	NTU	APHA 2130 B	**1**	Nil	Nil	Nil	Nil	**Nil**
5.	pH	--	APHA 4500H^+ B	**6.5-8.5**	7.41	7.68	7.46	7.48	**7.51**
6.	Total Hardness (as $CaCO_3$)	mg/l	APHA 2340 C	**300**	56.0	58.0	46.0	42.0	**50.5**
7.	Iron (as Fe)	mg/l	APHA 3500Fe, B	**0.3**	0.12	0.14	0.10	0.10	**0.12**
8.	Chloride (as Cl)	mg/l	APHA 4500Cl^- B	**250**	18.0	16.0	21.0	18.0	**18.25**
9.	Residual Free Chlorine	mg/l	APHA 4500Cl, B	**0.2**	ND	ND	ND	ND	**ND**
Desirable Characteristics									
10.	Total Dissolved Solids	mg/l	APHA 2540 C	**500**	70.0	72.0	66.0	68.0	**69.0**
11.	Calcium as Ca	mg/l	APHA 3500Ca B	**75**	16.0	18.0	16.0	16.2	**16.6**
12.	Magnesium as Mg	mg/l	APHA 3500Mg B	**30**	4.8	5.2	4.6	4.6	**4.8**
13.	Copper as Cu	mg/l	APHA 3111 B,C	**0.05**	BDL	BDL	BDL	BDL	**BDL**
14.	Manganese as Mn	mg/l	APHA 3500Mn B	**0.1**	BDL	BDL	BDL	BDL	**BDL**
15.	Sulphate as SO_4	mg/l	APHA 4500 SO_4^{2-} E	**200**	2.6	2.2	2.4	2.4	**2.4**
16.	Nitrate as NO_3	mg/l	APHA 4500 NO_3^- E	**45**	0.30	0.28	0.27	0.26	**0.28**
17.	Fluoride as F	mg/l	APHA 4500F^- C	**1.0**	0.003	0.008	0.004	0.006	**0.01**
18.	Phenolic Compounds as C_6H_5OH	mg/l	APHA 5530 B,D	**0.001**	BDL	BDL	BDL	BDL	**BDL**
19.	Mercury as Hg	mg/l	APHA 3500 Hg	**0.001**	BDL	BDL	BDL	BDL	**BDL**
20.	Cadmium as Cd	mg/l	APHA 3111 B,C	**0.003**	BDL	BDL	BDL	BDL	**BDL**
21.	Selenium as Se	mg/l	APHA 3114 B	**0.01**	BDL	BDL	BDL	BDL	**BDL**
22.	Arsenic as As	mg/l	APHA 3114 B	**0.01**	BDL	BDL	BDL	BDL	**BDL**
23.	Cyanide as CN	mg/l	APHA 4500 CN^- C,D	**0.05**	ND	ND	ND	ND	**ND**

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Ref.: Envlab/18/R-9282

Date: 05.11.18

24.	Lead as Pb	mg/l	APHA 3111 B,C	**0.01**	BDL	BDL	BDL	BDL	**BDL**
25.	Zinc as Zn	mg/l	APHA 3111 B,C	**5**	BDL	BDL	BDL	BDL	**BDL**
26.	Anionic Detergents as MBAS	mg/l	APHA 5540 C	**0.2**	ND	ND	ND	ND	**ND**
27.	Chromium as Cr^{+6}	mg/l	APHA 3500Cr B	**--**	BDL	BDL	BDL	BDL	**BDL**
28.	Mineral Oil	mg/l	APHA 5220 B	**0.5**	ND	ND	ND	ND	**ND**
29.	Alkalinity	mg/l	APHA 2320 B	**200**	30.2	32.0	32.6	32.0	**31.7**
30.	Aluminium as Al	mg/l	APHA 3500Al B	**0.03**	BDL	BDL	BDL	BDL	**BDL**
31.	Boron	mg/l	APHA 4500B, B	**1**	BDL	BDL	BDL	BDL	**BDL**
32.	Poly Aromatic Hydrocarbon as PAH	mg/l	APHA 6440 B	**0.0001**	Absent	Absent	Absent	Absent	**Absent**
33.	Pesticides	µg/l	APHA 6630 B,C	**Absent**	Absent	Absent	Absent	Absent	**Absent**

Note: CL: Colourless, AL: Agreeable, U/O: Unobjectionable, ND: Not Detected. BDL (Below Detection Limits) Values: Turbidity<2 NTU, Cu<0.05 mg/l, Mn<0.005 mg/l, F<0.05 mg/l, C_6H_5OH<0.001 mg/l, Hg<0.001 mg/l, Cd<0.001 mg/l, Se<0.001 mg/l, As<0.001 mg/l, Pb<0.01 mg/l, Zn<0.05 mg/l, Cr^{+6}<0.05 mg/l, Al<0.001 mg/l, B<0.01 mg/l, PAH<0.0001 µg/l.

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For Visiontek Consultancy Services Pvt. Ltd

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ISO 14001 : 2004
OHSAS 18001 : 2007

Ref: Envlab/19/R-9283

GROUND WATER QUALITY ANALYSIS REPORT

1. Name of Industry : **M/s Bandhamandi Graphite Mines & Beneficiation Plant, Rayagada**
2. Sampling Location : **GW-2: Open Well at Bandhamandi Village**
3. Sample Collected By : VCSPL Representative in presence of Client's Representative

Sl.No.	Parameters	Unit	Testing Methods	Standard as per IS:10500:2012	Analysis Results				
					July-18	Aug-18	Sept-18	Oct-18	Averages
Essential Characteristics									
1.	Colour	Hazen	APHA 2120 B, C	**5**	CL	CL	CL	CL	**CL**
2.	Odour	--	APHA 2150 B	**Agreeable**	U/O	U/O	U/O	U/O	**U/O**
3.	Taste	--	APHA 2160 C	**Agreeable**	AL	AL	AL	AL	**AL**
4.	Turbidity	NTU	APHA 2130 B	**1**	Nil	Nil	Nil	Nil	**Nil**
5.	pH	--	APHA 4500H^+ B	**6.5-8.5**	6.86	6.81	7.12	7.0	**6.95**
6.	Total Hardness (as $CaCO_3$)	mg/l	APHA 2340 C	**300**	41.0	40.6	40.2	36.0	**39.45**
7.	Iron (as Fe)	mg/l	APHA 3500Fe, B	**0.3**	0.22	0.17	0.16	0.18	**0.18**
8.	Chloride (as Cl)	mg/l	APHA 4500Cl^- B	**250**	12.8	12.2	14.2	14.8	**13.5**
9.	Residual Free Chlorine	mg/l	APHA 4500Cl, B	**0.2**	ND	ND	ND	ND	**ND**
Desirable Characteristics									
10.	Total Dissolved Solids	mg/l	APHA 2540 C	**500**	60.0	62.0	64.0	60.0	**61.5**
11.	Calcium as Ca	mg/l	APHA 3500Ca B	**75**	11.2	10.8	11.2	11.8	**11.3**
12.	Magnesium as Mg	mg/l	APHA 3500Mg B	**30**	2.0	1.42	1.8	2.1	**1.83**
13.	Copper as Cu	mg/l	APHA 3111 B,C	**0.05**	BDL	BDL	BDL	BDL	**BDL**
14.	Manganese as Mn	mg/l	APHA 3500Mn B	**0.1**	BDL	BDL	BDL	BDL	**BDL**
15.	Sulphate as SO_4	mg/l	APHA 4500 SO_4^{2-} E	**200**	2.1	2.6	2.1	2.0	**2.2**
16.	Nitrate as NO_3	mg/l	APHA 4500 NO_3^- E	**45**	0.37	0.35	0.32	0.36	**0.35**
17.	Fluoride as F	mg/l	APHA 4500F^- C	**1.0**	0.001	0.004	0.006	0.008	**0.00**
18.	Phenolic Compounds as C_6H_5OH	mg/l	APHA 5530 B,D	**0.001**	BDL	BDL	BDL	BDL	**BDL**
19.	Mercury as Hg	mg/l	APHA 3500 Hg	**0.001**	BDL	BDL	BDL	BDL	**BDL**
20.	Cadmium as Cd	mg/l	APHA 3111 B,C	**0.003**	BDL	BDL	BDL	BDL	**BDL**
21.	Selenium as Se	mg/l	APHA 3114 B	**0.01**	BDL	BDL	BDL	BDL	**BDL**
22.	Arsenic as As	mg/l	APHA 3114 B	**0.01**	BDL	BDL	BDL	BDL	**BDL**

Date: 05.11.18

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Ref.: Envlab/18/R-9283

23.	Cyanide as CN	mg/l	APHA 4500 CN^- C,D	**0.05**	ND	ND	ND	ND	**ND**
24.	Lead as Pb	mg/l	APHA 3111 B,C	**0.01**	BDL	BDL	BDL	BDL	**BDL**
25.	Zinc as Zn	mg/l	APHA 3111 B,C	**5**	BDL	BDL	BDL	BDL	**BDL**
26.	Anionic Detergents as MBAS	mg/l	APHA 5540 C	**0.2**	ND	ND	ND	ND	**ND**
27.	Chromium as Cr^{+6}	mg/l	APHA 3500Cr B	**--**	BDL	BDL	BDL	BDL	**BDL**
28.	Mineral Oil	mg/l	APHA 5220 B	**0.5**	ND	ND	ND	ND	**ND**
29.	Alkalinity	mg/l	APHA 2320 B	**200**	30.2	31.8	32.2	32.0	**31.55**
30.	Aluminium as Al	mg/l	APHA 3500Al B	**0.03**	BDL	BDL	BDL	BDL	**BDL**
31.	Boron	mg/l	APHA 4500B, B	**1**	BDL	BDL	BDL	BDL	**BDL**
32.	Poly Aromatic Hydrocarbon as PAH	mg/l	APHA 6440 B	**0.0001**	Absent	Absent	Absent	Absent	**Absent**
33.	Pesticides	µg/l	APHA 6630 B,C	**Absent**	Absent	Absent	Absent	Absent	**Absent**

Note: ***CL: Colourless, AL: Agreeable, U/O: Unobjectionable, ND: Not Detected. BDL (Below Detection Limits) Values: Turbidity<2 NTU, Cu<0.05 mg/l, Mn<0.005 mg/l, F<0.05 mg/l, C6H5OH<0.001 mg/l, Hg<0.001 mg/l, Cd<0.001 mg/l, Se<0.001 mg/l, As<0.001 mg/l, Pb<0.01 mg/l, Zn<0.05 mg/l, Cr+6<0.05 mg/l, Al<0.001 mg/l, B<0.01 mg/l, PAH<0.0001 µg/l.***

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For ***Visiontek Consultancy Services Pvt.Ltd.***

Date: 05.11.18

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ISO 14001 : 2004
OHSAS 18001 : 2007

Ref.: Envlab/18/R-9284

Date: 05.11.18

GROUND WATER QUALITY ANALYSIS REPORT

1. Name of Industry : **M/s Bandhamandi Graphite Mines & Beneficiation Plant, Rayagada**
2. Sampling Location : **GW-3: Open Well at Panasgurha Village**
3. Sample Collected By : VCSPL Representative in presence of Client's Representative

Sl.No.	Parameter	Unit	Testing Methods	Standard as per IS:10500:2012	Analysis Results				
					July-18	Aug-18	Sept-18	Oct-18	Average
Essential Characteristics									
1.	Colour	Hazen	APHA 2120 B, C	**5**	CL	CL	CL	CL	**CL**
2.	Odour	--	APHA 2150 B	**Agreeable**	U/O	U/O	U/O	U/O	**U/O**
3.	Taste	--	APHA 2160 C	**Agreeable**	AL	AL	AL	AL	**AL**
4.	Turbidity	NTU	APHA 2130 B	**1**	Nil	Nil	Nil	Nil	**Nil**
5.	pH	--	APHA 4500H^+ B	**6.5-8.5**	7.3	6.9	7.1	6.8	**7.03**
6.	Total Hardness (as $CaCO_3$)	mg/l	APHA 2340 C	**300**	44.0	46.0	40.8	42.0	**43.2**
7.	Iron (as Fe)	mg/l	APHA 3500Fe, B	**0.3**	0.19	0.21	0.22	0.24	**0.22**
8.	Chloride (as Cl)	mg/l	APHA 4500Cl^- B	**250**	16.0	15.8	16.2	16.0	**16.0**
9.	Residual Free Chlorine	mg/l	APHA 4500Cl, B	**0.2**	ND	ND	ND	ND	**ND**
Desirable Characteristics									
10.	Total Dissolved Solids	mg/l	APHA 2540 C	**500**	60.0	62.0	58.0	56.0	**59.0**
11.	Calcium as Ca	mg/l	APHA 3500Ca B	**75**	16.0	18.0	16.2	15.8	**16.5**
12.	Magnesium as Mg	mg/l	APHA 3500Mg B	**30**	2.4	2.6	2.2	2.1	**2.325**
13.	Copper as Cu	mg/l	APHA 3111 B,C	**0.05**	BDL	BDL	BDL	BDL	**BDL**
14.	Manganese as Mn	mg/l	APHA 3500Mn B	**0.1**	BDL	BDL	BDL	BDL	**BDL**
15.	Sulphate as SO_4	mg/l	APHA 4500 SO_4^{2-} E	**200**	3.0	2.4	2.6	2.2	**2.55**
16.	Nitrate as NO_3	mg/l	APHA 4500 NO_3^- E	**45**	0.22	0.31	0.28	0.26	**0.27**
17.	Fluoride as F	mg/l	APHA 4500F^- C	**1.0**	0.003	0.008	0.004	0.006	**0.01**
18.	Phenolic Compounds as C_6H_5OH	mg/l	APHA 5530 B,D	**0.001**	BDL	BDL	BDL	BDL	**BDL**
19.	Mercury as Hg	mg/l	APHA 3500 Hg	**0.001**	BDL	BDL	BDL	BDL	**BDL**
20.	Cadmium as Cd	mg/l	APHA 3111 B,C	**0.003**	BDL	BDL	BDL	BDL	**BDL**
21.	Selenium as Se	mg/l	APHA 3114 B	**0.01**	BDL	BDL	BDL	BDL	**BDL**
22.	Arsenic as As	mg/l	APHA 3114 B	**0.01**	BDL	BDL	BDL	BDL	**BDL**
23.	Cyanide as CN	mg/l	APHA 4500 CN^- C,D	**0.05**	ND	ND	ND	ND	**ND**
24.	Lead as Pb	mg/l	APHA 3111 B,C	**0.01**	BDL	BDL	BDL	BDL	**BDL**
25.	Zinc as Zn	mg/l	APHA 3111 B,C	**5**	BDL	BDL	BDL	BDL	**BDL**
26.	Anionic Detergents as MBAS	mg/l	APHA 5540 C	**0.2**	ND	ND	ND	ND	**ND**

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Ref.: Envlab/18/R-9284

Date: 05.11.18

27.	Chromium as Cr^{+6}	mg/l	APHA 3500Cr B	--	BDL	BDL	BDL	BDL	BDL
28.	Mineral Oil	mg/l	APHA 5220 B	**0.5**	ND	ND	ND	ND	ND
29.	Alkalinity	mg/l	APHA 2320 B	**200**	30.0	32.0	34.0	32..0	**32.0**
30.	Aluminium as Al	mg/l	APHA 3500Al B	**0.03**	BDL	BDL	BDL	BDL	BDL
31.	Boron	mg/l	APHA 4500B, B	**1**	BDL	BDL	BDL	BDL	BDL
32.	Poly Aromatic Hydrocarbon as PAH	mg/l	APHA 6440 B	**0.0001**	Absent	Absent	Absent	Absent	Absent
33.	Pesticides	µg/l	APHA 6630 B,C	**Absent**	Absent	Absent	Absent	Absent	Absent

Note: CL: Colourless, AL: Agreeable, U/O: Unobjectionable, ND: Not Detected. BDL (Below Detection Limits) Values: Turbidity<2 NTU, Cu<0.05 mg/l, Mn<0.005 mg/l, F<0.05 mg/l, C6H5OH<0.001 mg/l, Hg<0.001 mg/l, Cd<0.001 mg/l, Se<0.001 mg/l, As<0.001 mg/l, Pb<0.01 mg/l, Zn<0.05 mg/l, Cr+6<0.05 mg/l, Al<0.001 mg/l, B<0.01 mg/l, PAH<0.0001 µg/l.

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Ref.: Envlab/19/R-9285 Date: 05.11.18

GROUND WATER QUALITY ANALYSIS REPORT

1. Name of Industry : **M/s Bandhamandi Graphite Mines & Beneficiation Plant, Rayagada**
2. Sampling Location : **GW-4: Open Well at Birda**
3. Sample Collected By : VCSPL Representative in presence of Client's Representative

Sl.No.	Parameter	Unit	Testing Methods	Standard as per IS:10500:2012	Analysis Results				
					July-18	Aug-18	Sept-18	Oct-18	Averages
Essential Characteristics									
1.	Colour	Hazen	APHA 2120 B, C	**5**	CL	CL	CL	CL	**CL**
2.	Odour	--	APHA 2150 B	**Agreeable**	U/O	U/O	U/O	U/O	**U/O**
3.	Taste	--	APHA 2160 C	**Agreeable**	AL	AL	AL	AL	**AL**
4.	Turbidity	NTU	APHA 2130 B	**1**	Nil	Nil	Nil	Nil	**Nil**
5.	pH	--	APHA 4500H^+ B	**6.5-8.5**	6.96	7.19	7.12	6.91	**7.05**
6.	Total Hardness (as $CaCO_3$)	mg/l	APHA 2340 C	**300**	43.2	46.1	41.6	40.8	**42.93**
7.	Iron (as Fe)	mg/l	APHA 3500Fe, B	**0.3**	0.21	0.20	0.22	0.22	**0.21**
8.	Chloride (as Cl)	mg/l	APHA 4500Cl^- B	**250**	14.0	14.0	14.8	15.2	**14.5**
9.	Residual Free Chlorine	mg/l	APHA 4500Cl, B	**0.2**	ND	ND	ND	ND	**ND**
Desirable Characteristics									
10.	Total Dissolved Solids	mg/l	APHA 2540 C	**500**	52.0	54.0	50.0	56.0	**53.0**
11.	Calcium as Ca	mg/l	APHA 3500Ca B	**75**	15.8	18.0	16.0	16.2	**16.5**
12.	Magnesium as Mg	mg/l	APHA 3500Mg B	**30**	2.1	2.8	2.1	2.0	**2.25**
13.	Copper as Cu	mg/l	APHA 3111 B,C	**0.05**	BDL	BDL	BDL	BDL	**BDL**
14.	Manganese as Mn	mg/l	APHA 3500Mn B	**0.1**	BDL	BDL	BDL	BDL	**BDL**
15.	Sulphate as SO_4	mg/l	APHA 4500 SO_4^{2-} E	**200**	2.4	2.1	2.6	2.4	**2.375**
16.	Nitrate as NO_3	mg/l	APHA 4500 NO_3^- E	**45**	0.32	0.30	0.26	0.28	**0.29**
17.	Fluoride as F	mg/l	APHA 4500F^- C	**1.0**	0.003	0.002	0.007	0.006	**0.00**
18.	Phenolic Compounds as C_6H_5OH	mg/l	APHA 5530 B,D	**0.001**	BDL	BDL	BDL	BDL	**BDL**
19.	Mercury as Hg	mg/l	APHA 3500 Hg	**0.001**	BDL	BDL	BDL	BDL	**BDL**
20.	Cadmium as Cd	mg/l	APHA 3111 B,C	**0.003**	BDL	BDL	BDL	BDL	**BDL**
21.	Selenium as Se	mg/l	APHA 3114 B	**0.01**	BDL	BDL	BDL	BDL	**BDL**
22.	Arsenic as As	mg/l	APHA 3114 B	**0.01**	BDL	BDL	BDL	BDL	**BDL**
23.	Cyanide as CN	mg/l	APHA 4500 CN^- C,D	**0.05**	ND	ND	ND	ND	**ND**
24.	Lead as Pb	mg/l	APHA 3111 B,C	**0.01**	BDL	BDL	BDL	BDL	**BDL**
25.	Zinc as Zn	mg/l	APHA 3111 B,C	**5**	BDL	BDL	BDL	BDL	**BDL**
26.	Anionic Detergents as MBAS	mg/l	APHA 5540 C	**0.2**	ND	ND	ND	ND	**ND**

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27.	Chromium as Cr^{+6}	mg/l	APHA 3500Cr B	--	BDL	BDL	BDL	BDL	BDL
28.	Mineral Oil	mg/l	APHA 5220 B	0.5	ND	ND	ND	ND	ND
29.	Alkalinity	mg/l	APHA 2320 B	200	32.0	30.6	30.8	32.0	31.35
30.	Aluminium as Al	mg/l	APHA 3500Al B	0.03	BDL	BDL	BDL	BDL	BDL
31.	Boron	mg/l	APHA 4500B, B	1	BDL	BDL	BDL	BDL	BDL
32.	Poly Aromatic Hydrocarbon as PAH	mg/l	APHA 6440 B	0.0001	Absent	Absent	Absent	Absent	Absent
33.	Pesticides	µg/l	APHA 6630 B,C	Absent	Absent	Absent	Absent	Absent	Absent

Note: CL: Colourless, AL: Agreeable, U/O: Unobjectionable, ND: Not Detected. BDL (Below Detection Limits) Values: Turbidity<2 NTU, Cu<0.05 mg/l, Mn<0.005 mg/l, F<0.05 mg/l, C6H5OH<0.001 mg/l, Hg<0.001 mg/l, Cd<0.001 mg/l, Se<0.001 mg/l, As<0.001 mg/l, Pb<0.01 mg/l, Zn<0.05 mg/l, Cr+6<0.05 mg/l, Al<0.001 mg/l, B<0.01 mg/l, PAH<0.0001 µg/l.

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For Visiontek Consultancy Services Pvt. Ltd.

Date: 05.11.18

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Eqnlab/18/R-9246

Ref.:

GROUND WATER QUALITY ANALYSIS REPORT

1. Name of Industry : **M/s Bandhamandi Graphite Mines & Beneficiation Plant, Rayagada**
2. Sampling Location : **GW-5: Open Well at Baligurha**
3. Sample Collected By : VCSPL Representative in presence of Client's Representative

Sl.No.	Parameter	Unit	Testing Methods	Standard as per IS:10500:2012	Analysis Results				
					July-18	Aug-18	Sept-18	Oct-18	Averages
Essential Characteristics									
1.	Colour	Hazen	APHA 2120 B, C	5	CL	CL	CL	CL	**CL**
2.	Odour	--	APHA 2150 B	Agreeable	U/O	U/O	U/O	U/O	**U/O**
3.	Taste	--	APHA 2160 C	Agreeable	AL	AL	AL	AL	**AL**
4.	Turbidity	NTU	APHA 2130 B	1	Nil	Nil	Nil	Nil	**Nil**
5.	pH	--	APHA 4500H^+ B	6.5-8.5	7.1	7.20	7.21	7.18	**7.17**
6.	Total Hardness (as $CaCO_3$)	mg/l	APHA 2340 C	300	42.0	46.0	42.0	44.0	**43.5**
7.	Iron (as Fe)	mg/l	APHA 3500Fe, B	0.3	0.22	0.21	0.22	0.21	**0.22**
8.	Chloride (as Cl)	mg/l	APHA 4500Cl^- B	250	14.2	14.0	14.8	15.0	**14.5**
9.	Residual Free Chlorine	mg/l	APHA 4500Cl, B	0.2	ND	ND	ND	ND	**ND**
Desirable Characteristics									
10.	Total Dissolved Solids	mg/l	APHA 2540 C	500	50.0	56.0	58.0	62.0	**56.5**
11.	Calcium as Ca	mg/l	APHA 3500Ca B	75	11.2	11.8	12.2	12.0	**11.8**
12.	Magnesium as Mg	mg/l	APHA 3500Mg B	30	4.6	4.8	5.0	5.2	**4.9**
13.	Copper as Cu	mg/l	APHA 3111 B,C	0.05	BDL	BDL	BDL	BDL	**BDL**
14.	Manganese as Mn	mg/l	APHA 3500Mn B	0.1	BDL	BDL	BDL	BDL	**BDL**
15.	Sulphate as SO_4	mg/l	APHA 4500 SO_4^{2-} E	200	3.2	2.1	2.9	2.4	**2.65**
16.	Nitrate as NO_3	mg/l	APHA 4500 NO_3^- E	45	0.3	0.29	0.26	0.21	**0.27**
17.	Fluoride as F	mg/l	APHA 4500F^- C	1.0	0.003	0.002	0.007	0.006	**0.00**
18.	Phenolic Compounds as C_6H_5OH	mg/l	APHA 5530 B,D	0.001	BDL	BDL	BDL	BDL	**BDL**
19.	Mercury as Hg	mg/l	APHA 3500 Hg	0.001	BDL	BDL	BDL	BDL	**BDL**
20.	Cadmium as Cd	mg/l	APHA 3111 B,C	0.003	BDL	BDL	BDL	BDL	**BDL**
21.	Selenium as Se	mg/l	APHA 3114 B	0.01	BDL	BDL	BDL	BDL	**BDL**
22.	Arsenic as As	mg/l	APHA 3114 B	0.01	BDL	BDL	BDL	BDL	**BDL**
23.	Cyanide as CN	mg/l	APHA 4500 CN^- C,D	0.05	ND	ND	ND	ND	**ND**
24.	Lead as Pb	mg/l	APHA 3111 B,C	0.01	BDL	BDL	BDL	BDL	**BDL**
25.	Zinc as Zn	mg/l	APHA 3111 B,C	5	BDL	BDL	BDL	BDL	**BDL**
26.	Anionic Detergents as MBAS	mg/l	APHA 5540 C	0.2	ND	ND	ND	ND	**ND**

Date: 05.11.18

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27.	Chromium as Cr^{+6}	mg/l	APHA 3500Cr B	--	BDL	BDL	BDL	BDL	BDL
28.	Mineral Oil	mg/l	APHA 5220 B	**0.5**	ND	ND	ND	ND	ND
29.	Alkalinity	mg/l	APHA 2320 B	**200**	32.0	34.0	34.2	32.0	**33.05**
30.	Aluminium as Al	mg/l	APHA 3500Al B	**0.03**	BDL	BDL	BDL	BDL	BDL
31.	Boron	mg/l	APHA 4500B, B	**1**	BDL	BDL	BDL	BDL	BDL
32.	Poly Aromatic Hydrocarbon as PAH	mg/l	APHA 6440 B	**0.0001**	Absent	Absent	Absent	Absent	Absent
33.	Pesticides	µg/l	APHA 6630 B,C	**Absent**	Absent	Absent	Absent	Absent	Absent

Note: CL: Colourless, AL: Agreeable, U/O: Unobjectionable, ND: Not Detected. BDL (Below Detection Limits) Values: Turbidity<2 NTU, Cu<0.05 mg/l, Mn<0.005 mg/l, F<0.05 mg/l, C_6H_5OH<0.001 mg/l, Hg<0.001 mg/l Cd<0.001 mg/l, Se<0.001 mg/l, As<0.001 mg/l, Pb<0.01 mg/l, Zn<0.05 mg/l, Cr^{+6}<0.05 mg/l, Al<0.001 mg/l, B<0.01 mg/l, PAH<0.0001 µg/l.

Ref.: Envlab/18/R-9286

Date: 05.11.18

*For **Visiontek Consultancy Services Pvt.Ltd.***

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Annexure-5

NOISE MONITORING REPORT

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ISO 9001 : 2008
ISO 14001 : 2004
OHSAS 18001 : 2007

Ref.: Env/lab/18/R-9898

Date: 05/11/18

NOISE MONITORING REPORT

1. **Name of Industry : M/s Bandhamandi Graphite Mines & Beneficiation Plant, Rayagada**

Location ID	Monitoring Station Location	Day time Equivalent (Noise Level in dB(A) leq)				Night time Equivalent (Noise Level in dB(A) leq)			
		July-18	Aug-18	Sept-18	Oct-18	July-18	Aug-18	Sept-18	Oct-18
N-1	Mining Quarry	62.0	65.0	67.0	66.0	56.0	57.0	53.0	54.2
N-2	Dump Site	59.0	61.0	63.0	61.0	51.0	55.0	50.0	51.0
N-3	Residential Area	52.0	49.0	50.0	42.0	45.0	43.0	40.0	42.0
Standard as per CPCB		75				70			

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Annexure-6

GROUND WATER LEVEL ANALYSIS REPORT

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ISO 9001 : 2008
ISO 14001 : 2004
OHSAS 18001 : 2007

Ref.: Envlab/18/R-9287

Date: 05.11.18

GROUND WATER LEVEL ANALYSIS REPORT

1. **Name of Industry** : **M/s Bandhamandi Graphite Mines & Beneficiation Plant, Rayagada**
2. Sample Collected By : VCSPL Representative in presence of Clients Representative

Sl. No.	Sampling Location	Date of Sampling	Analysis Results
1.	**GWL1: Openwell at Bhitardarba Village**	26.09.2018	5.2
2.	**GWL2: Open well at Bandhamandi Village**	26.09.2018	5.6
3.	**GWL3: Openwell at Panasgruha Village**	27.10.2018	6.0
4.	**GWL4: Open Well at Birda Village**	27.10.2018	5.8
5.	**GWL5: Open Well at Baligruha Village**	27.10.2018	5.2

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