ANALYSIS REPORT

(September-18 To November -18)

ON

ENVIRONMENTAL MONITORING

AT

LAKSHMIPUR GRAPHITE MINES & BENEFICIATION PLANT KORAPUT

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

E-mail : visiontekin@gmail.com, visiontek@vcspl.org,

Visit us at: www.vcspl.org

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

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METHODOLOGY OF ENVIRONMENTAL MONITORING STUDY

1.0 INTRODUCTION :

M/s Visiontek Consultancy Services Pvt. Ltd. to carried out the environmental monitoring for the Lakshmipur Graphite Beneficiation Plant, Koraput

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 SEPT-2018 to NOV-2018.

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}), µg/m^3	Gravimetric method
2.	Particulate matter (size less than 2.5 µm or $PM_{2.5}$), µg/m^3	Gravimetric method
3.	Sulphur di-oxide (SO_2), µg/m^3	Improved west & Gaeke method
4.	Oxides of Nitrogen (NO_x) µg/m^3	Jacob and Hochheiser Modified method
5.	Carbon Monoxide (CO), mg/m^3	NDIR Spectroscopy method
6.	Ozone(O3), µg/m^3	Chemical method
7.	Ammonia(NH3), µg/m^3	Indophenol blue method
8.	Benzene(C6H6), µg/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), µg/m^3	AAS method after sampling
12	Arsenic(As), µg/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	Project 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-2	Lakshimipur Village
AAQMS-3	Katrakana Village
AAQMS-4	Phunjisil Village
AAQMS-5	Matalamba Village
AAQMS-6	Bandikar
AAQMS-7	Khalakara
AAQMS-8	Dara

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.

The methodology for sample collection, preservation and analysis was as per Standard methods for the Examination of Water and Wastewater, 22nd Edition, APHA.

4.2.1 SURFACE WATER SAMPLING LOCATIONS:

Details of the sampling locations are given below:

Field ID	Location
SW-1	Godabandha Nala Near plant Site
SW-2	Godabandha Nala Near Nalachuan
SW-3	Jhanjabati Nadi nNear Rumbuli
SW-4	Jhanjabati Nadi Near Panebarhi

The Detailed Surface Water Analysis Report is Mentioned In **Annexure-3.**

4.2.2 GROUND WATER SAMPLING LOCATIONS:

Details of the sampling locations are given below:

Field ID	Location
GW-1	Open Well Near Bandikar Village
GW -2	Open Well Near Doliamba Village
GW -3	Open Well at Rajanapanasagurha Village
GW -4	Open Well at Panasgurha Village

The Detailed Drinking Water Analysis Report is mentioned in **Annexure-4.**

4.3. NOISE LEVEL MONITORING:

Noise Levels were recorded by Digital Sound Level Meter of LUTRON make at three locations within the plant premises. Monitoring was carried out once at each location during the study period for day time and night time. According to CPCB (Noise Pollution (Regulation& Control) rules, 2000 day time is considered from 6.00 am to 10.00 pm and night time is considered from 10.00 pm to 6.00 am. Locations of Noise level monitoring station are as follows:

4.3.1 NOISE LEVEL SAMPLING STATIONS:

Details of Sampling Locations are given below

Field ID	Location
N1	Project Site
N2	Lakshmipur
N3	Katrakana
N4	Phunjisil
N5	Matalamba
N6	Bandipar
N7	Khalakana
N8	Dara

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

4.4. Soil:

Composite soil sampling was done as below mentioned location. Sample was collected by trained field person and analyzed in laboratory.

4.4.1 SOIL SAMPLING STATIONS:

Details of Sampling Locations are given below

Field ID	Location
S-1	Plant Site
S-2	Sapamba
S-3	Marabaigurha
S-4	Near Minapani RF
S-5	Rumbuli

The detailed Soil 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-9312

AMBIENT AIR QUALITY MONITORING REPORT(CORE ZONE)

1. Name of Industry : **M/s Lakshmipur Graphite Beneficiation Plant , Koraput**
2. Sampling Location : **Monitoring Station No.- AAQ 1(Project 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)
04.09.2018	30.3	18.2	9.1	18.7	11.2	0.35	22.2	BDL	BDL	BDL	BDL	BDL
07.09.2018	31.8	18.0	9	18.6	11.5	0.341	20.8	BDL	BDL	BDL	BDL	BDL
11.09.2018	31.6	17.8	9.1	18.5	11.4	0.46	20.2	BDL	BDL	BDL	BDL	BDL
14.09.2018	32.2	17.2	9	18.6	11.6	0.34	<20.0	BDL	BDL	BDL	BDL	BDL
18.09.2018	34.8	17.8	9	18.4	12.3	0.35	<20.0	BDL	BDL	BDL	BDL	BDL
21.09.2018	35.2	17.5	9.1	19.1	11.5	0.38	<20.0	BDL	BDL	BDL	BDL	BDL
25.09.2018	34.2	17.1	9.2	19.5	12.3	0.46	21.2	BDL	BDL	BDL	BDL	BDL
28.09.2018	35.0	16.8	9.3	19.3	12.4	0.42	21.2	BDL	BDL	BDL	BDL	BDL
02.10.2018	35.2	16.2	9.4	19.2	11.5	0.43	21.0	BDL	BDL	BDL	BDL	BDL
06.10.2018	34.8	17.0	9.2	20.3	11.6	0.47	21.6	BDL	BDL	BDL	BDL	BDL
09.10.2018	36.0	17.4	9.3	20.4	11.4	0.43	22.0	BDL	BDL	BDL	BDL	BDL
13.10.2018	36.2	16.6	9.2	20.1	13.8	0.51	22.2	BDL	BDL	BDL	BDL	BDL
16.10.2018	35.8	17.4	9.4	20.6	12.5	0.52	21.8	BDL	BDL	BDL	BDL	BDL
20.10.2018	31.2	17.5	9.4	20.4	11.5	0.51	22.0	BDL	BDL	BDL	BDL	BDL
23.10.2018	31.8	17.4	9.3	20.3	12.3	0.56	22.4	BDL	BDL	BDL	BDL	BDL
27.10.2018	32.2	18.0	9.3	21.3	12.4	0.52	22.0	BDL	BDL	BDL	BDL	BDL
01.11.2018	30.8	18.4	9.4	22.4	12.5	0.53	21.8	BDL	BDL	BDL	BDL	BDL
04.11.2018	32.0	18.2	9.3	21.5	11.4	0.52	21.8	BDL	BDL	BDL	BDL	BDL
08.11.2018	32.2	18.0	9.2	20.3	13.5	0.53	<20.0	BDL	BDL	BDL	BDL	BDL
11.11.2018	30.4	17.6	9.4	20.5	13.1	0.52	<20.0	BDL	BDL	BDL	BDL	BDL
15.11.2018	30.2	17.2	9.3	20.4	13.6	0.51	<20.0	BDL	BDL	BDL	BDL	BDL
18.11.2018	31.2	18.0	9.4	21.3	12.4	0.59	<20.0	BDL	BDL	BDL	BDL	BDL
22.11.2018	30.8	17.8	9.3	20.4	12.6	0.61	21.4	BDL	BDL	BDL	BDL	BDL
25.11.2018	32.0	17.0	9.5	20	12.4	0.62	21.8	BDL	BDL	BDL	BDL	BDL
Monthly Average	32.83	17.50	9.25	20.00	12.20	0.48	21.61	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.

28.11.18

Plot No.-M-22&23, Chandka Industrial Estate, Patia, Bhubaneswar-751024, Dist-Khurda, Odisha Tel. : 91-674-6451781, 7752017905
E-mail : visiontekin@yahoo.co.in, visiontek@gmail.com, Visit us at: www.vcspl.org

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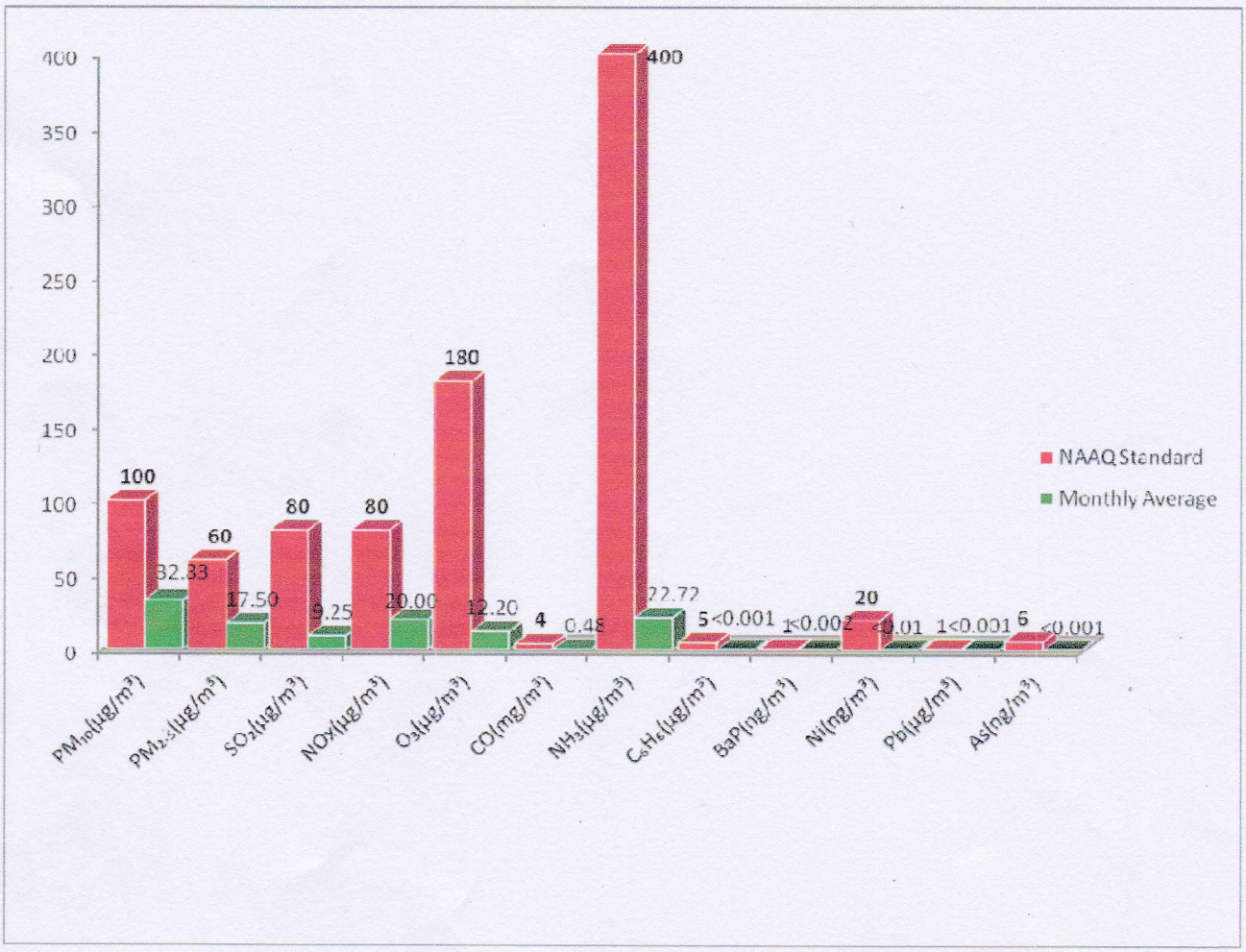
Figure-01: GRAPH SHOWING AVERAGE AAQ CONCENTRATION (AAQ-1: PROJECT SITE) FOR THE MONTH OF SEP-18 TO NOV-18



Annexure-2

AMBIENT AIR QUALITY MONITORING REPORT (BUFFER ZONE)

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

Ref.: envlab/18/R-93/3

AMBIENT AIR QUALITY MONITORING REPORT(BUFFER ZONE)

1. Name of Industry : **M/s Lakshmipur Graphite Beneficiation Plant, Koraput**
2. Sampling Locatio : **Monitoring Station No.- AAQ 2 (Lakshmipur)**
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)
04.09.2018	30.2	19.2	9.0	17.6	12.3	0.22	BDL	BDL	BDL	BDL	BDL	BDL
13.10.2018	30.6	18.8	10.2	18.9	10.6	0.21	BDL	BDL	BDL	BDL	BDL	BDL
04.11.2018	30.8	18.2	9.8	19.8	12.4	0.18	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

For Visiontek Consultancy Services Pvt.Ltd.

VISIONTEK CONSULTANCY SERVICES PVT LTD

Date: 24/11/18

Plot No.-M-22&23, Chandka Industrial Estate, Patia, Bhubaneswar-751024, Dist-Khurda, Odisha Tel. : 91-674-6451781, 7752017905
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ISO 9001 : 2008
ISO 14001 : 2004
OHSAS 18001 : 2007

Ref.: Envlab/18/R-93/M

AMBIENT AIR QUALITY MONITORING REPORT (~~BUFFER~~ ZONE)

1. Name of Industry : **M/s Lakshmipur Graphite Beneficiation Plant, Koraput**
2. Sampling Location : **Monitoring Station No.- AAQ 3 (Katrakana)**
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)
04.09.2018	30.8	17.8	5.6	16.5	9.8	0.35	BDL	BDL	BDL	BDL	BDL	BDL
13.10.2018	31.2	18.4	7.0	16.8	10.5	0.28	BDL	BDL	BDL	BDL	BDL	BDL
04.11.2018	31.8	18.2	7.5	15.6	11.4	0.6	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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Plot No.-M-22&23, Chandka Industrial Estate, Patia, Bhubaneswar-751024, Dist-Khurda, Odisha Tel. : 91-674-6451781, 7752017905
E-mail : visiontekin@yahoo.co.in, visiontek@gmail.com, Visit us at: www.vcspl.org

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

Ref.: Envlab/18/R-935

Date: 24/1/18

AMBIENT AIR QUALITY MONITORING REPORT (~~BUFFER~~ ZONE)

1.Name of Industry : **M/s Lakshmipur Graphite Beneficiation Plant , Koraput**
2.Sampling Location : **Monitoring Station No.- AAQ 4 (Phunjisil)**
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)
04.09.2018	31.2	18.8	6.2	15.2	8.6	0.36	BDL	BDL	BDL	BDL	BDL	BDL
13.10.2018	32.0	20.6	6.3	15.4	9.5	0.37	BDL	BDL	BDL	BDL	BDL	BDL
04.11.2018	31.8	18.2	6.4	15.6	8.6	0.34	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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Plot No.-M-22&23, Chandka Industrial Estate, Patia, Bhubaneswar-751024, Dist-Khurda, Odisha Tel. : 91-674-6451781, 7752017905
E-mail : visiontekin@yahoo.co.in, visiontek@gmail.com, Visit us at: www.vcspl.org

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

Ref.: Envlab/18/R-9316

Date: 24/11/18

AMBIENT AIR QUALITY MONITORING REPORT (~~BUFFER~~ZONE)

1. Name of Industry : **M/s Lakshmipur Graphite Beneficiation Plant, Koraput**
2. Sampling Location : **Monitoring Station No.- AAQ 5 (Matalamba)**
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)
04.09.2018	30.2	18.4	6.3	13.6	9.5	0.21	BDL	BDL	BDL	BDL	BDL	BDL
13.10.2018	31.4	18.2	6.4	15.4	9.6	0.18	BDL	BDL	BDL	BDL	BDL	BDL
04.11.2018	31.8	17.8	6.5	15.6	9.8	0.20	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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ISO 9001 : 2008
ISO 14001 : 2004
OHSAS 18001 : 2007

Ref.: Envlab/18/R-813

Date: 24.11.18

AMBIENT AIR QUALITY MONITORING REPORT(~~BUFFER~~ ZONE)

1.Name of Industry : **M/s Lakshmipur Graphite Beneficiation Plant , Koraput**
2. Sampling Location : **Monitoring Station No.- AAQ 6 (Bandikar)**
3.Monitoring Instrument : 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)
04.09.2018	32.2	16.2	6.8	10.2	9.5	0.21	BDL	BDL	BDL	BDL	BDL	BDL
13.10.2018	30.2	16.8	6.9	10.3	9.6	0.23	BDL	BDL	BDL	BDL	BDL	BDL
04.11.2018	31.0	17.0	6.9	10.2	9.8	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 Chromatography IS 5182 (Part-11):2006	Solvent Extraction IS 5182 (Part-12):2004

For Visiontek Consultancy Services Pvt.Ltd.

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Plot No.-M-22&23, Chandka Industrial Estate, Patia, Bhubaneswar-751024, Dist-Khurda, Odisha Tel. : 91-674-6451781, 7752017905
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ISO 9001 : 2008
ISO 14001 : 2004
OHSAS 18001 : 2007

Ref.: Envdcb/18/R-93/8

Date: 27/11/18.

AMBIENT AIR QUALITY MONITORING REPORT(~~BUFFER~~ ZONE)

1.Name of Industry : **M/s Lakshmipur Graphite Beneficiation Plant , Koraput**
2. Sampling Location : **Monitoring Station No.- AAQ 7 (Khalakara)**
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)
04.09.2018	30.4	20.0	7.1	9.8	8.6	0.22	**BDL**	BDL	BDL	BDL	BDL	BDL
13.10.2018	31.2	18.6	7	9.6	8.5	0.24	**BDL**	BDL	BDL	BDL	BDL	BDL
04.11.2018	32.0	18.2	6.9	9.5	8.6	0.28	**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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E-mail : visiontekim@yahoo.co.in, visiontek@gmail.com, Visit us at: www.vcspl.org

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

Ref: Envlab/18/R-93/9

AMBIENT AIR QUALITY MONITORING REPORT (~~BUFFER~~ ZONE)

1.Name of Industry : **M/s Lakshmipur Graphite Beneficiation Plant , Koraput**
2.Sampling Location : **Monitoring Station No.- AAQ 8 (Dara)**
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)
04.09.2018	30.6	18.1	6.3	9.6	9.2	0.24	**BDL**	BDL	BDL	BDL	BDL	BDL
13.10.2018	31.2	17.6	6.5	9.8	9.6	0.25	**BDL**	BDL	BDL	BDL	BDL	BDL
04.11.2018	31.8	18.2	6.4	9.6	9.4	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 Chromatography IS 5182 (Part-11):2006	Solvent Extraction IS 5182 (Part-12):2004

Date: 24/11/18

For Visiontek Consultancy Services Pvt.Ltd.

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E-mail : visiontekin@yahoo.co.in, visiontek@gmail.com, Visit us at: www.vcspl.org
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Annexure-3

SURFACE WATER QUALITY REPORT

Visiontek Consultancy Services Pvt. Ltd.
(An Enviro Engineering Consulting Cell)

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

Ref: Envlab/18/R-9324

SURFACE WATER QUALITY ANALYSIS REPORT

1. **Name of Industry** : **M/s Lakshmipur Graphite Beneficiation Plant , Koraput**
2. Sampling Location : **SW-1:** Godabandha Nala near Plant site
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			
					Sept-18	Oct-18	Nov-18	Averages
1.	pH Value	APHA 4500H$^+$ B	--	**6.0-9.0**	6.92	6.81	6.86	**6.86**
2.	Dissolved Oxygen (minimum)	APHA 2540 C	mg/l	**4.0**	4.9	5.1	4.7	**4.90**
3.	Total Dissolved Solids as TDS	APHA 2540 D	mg/l	**1500**	121.5	135.6	145.2	**134.10**
4.	Total Suspended Solids as TSS	APHA 2540 C	mg/l	--	6.5	6.8	8.7	**7.33**

For Visiontek Consultancy Services Pvt. Ltd.

VISIONTEK CONSULTANCY SERVICES PVT LTD

Date: 24/11/18

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E-mail : visiontekin@yahoo.co.in, visiontek@gmail.com, Visit us at: www.vcspl.org

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

Ref.: Envlab/18/R-1325

Date: 24/11/18

SURFACE WATER QUALITY ANALYSIS REPORT

1. **Name of Industry** : **M/s Lakshmipur Graphite Beneficiation Plant , Koraput**
2. Sampling Location : **SW-2:** Godabandha Nala near Nalachuan
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			
					Sept-18	Oct-18	Nov-18	Averages
1.	pH Value	APHA 4500H+ B	--	6.0-9.0	6.84	6.91	6.98	6.91
2.	Dissolved Oxygen (minimum)	APHA 2540 C	mg/l	4.0	5.9	5.8	5.6	5.77
3.	Total Dissolved Solids as TDS	APHA 2540 D	mg/l	1500	145.6	143.8	165.5	151.8
4.	Total Suspended Solids as TSS	APHA 2540 C	mg/l	--	11.6	9.8	11.6	11.0

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

Ref.: Envlab/18/R-9326

SURFACE WATER QUALITY ANALYSIS REPORT

1. **Name of Industry** : **M/s Lakshmipur Graphite Beneficiation Plant , Koraput**
2. Sampling Location : **SW-3:** Jhanjabati Nadi Near Rumbuli
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			
					Sept-18	Oct-18	Nov-18	Averages
1.	pH Value	APHA 4500H+ B	--	6.0-9.0	6.78	6.84	6.88	**6.83**
2.	Dissolved Oxygen (minimum)	APHA 2540 C	mg/l	4.0	5.2	5.4	6.1	**5.57**
3.	Total Dissolved Solids as TDS	APHA 2540 D	mg/l	1500	166.8	148.9	172.5	**162.73**
4.	Total Suspended Solids as TSS	APHA 2540 C	mg/l	--	2.1	2.3	2.4	**2.27**

For Visiontek Consultancy Services Pvt. Ltd.

VISIONTEK CONSULTANCY SERVICES PVT LTD

Date: 29/1/18

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

Ref.: Envlab/18/R-9327

SURFACE WATER QUALITY ANALYSIS REPORT

1. **Name of Industry** : **M/s Lakshmipur Graphite Beneficiation Plant , Koraput**
2. Sampling Location : **SW-4:** Jhanjabati Nadi Near Panebarhi
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			
					Sept-18	Oct-18	Nov-18	Averages
1.	pH Value	APHA 4500H+ B	--	6.0-9.0	6.91	6.84	6.88	**6.88**
2.	Dissolved Oxygen (minimum)	APHA 2540 C	mg/l	4.0	5.8	5.9	4.6	**5.43**
3.	Total Dissolved Solids as TDS	APHA 2540 D	mg/l	1500	112.0	118.0	108.0	**112.67**
4.	Total Suspended Solids as TSS	APHA 2540 C	mg/l	--	1.2	1.0	1.4	**1.20**

For Visiontek Consultancy Services Pvt. Ltd.

Date: 24/11/18

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E-mail : visiontekin@yahoo.co.in, visiontek@gmail.com, Visit us at: www.vcspl.org

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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.: CVL/ab/18/R-09320

GROUND WATER QUALITY ANALYSIS REPORT

1. Name of Industry : **M/s Lakshmipur Graphite Beneficiation Plant , Koraput**
2. Sampling Location : **GW-1: Open well at Bandikar**
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			
					Sept-18	Oct-18	Nov-18	Averages
Essential Characteristics								
1.	Colour	Hazen	APHA 2120 B, C	**5**	CL	CL	CL	**CL**
2.	Odour	--	APHA 2150 B	**Agreeable**	U/O	U/O	U/O	**U/O**
3.	Taste	--	APHA 2160 C	**Agreeable**	AL	AL	AL	**AL**
4.	Turbidity	NTU	APHA 2130 B	**1**	0.2	0.3	0.5	**0.33**
5.	pH	--	APHA 4500H^+ B	**6.5-8.5**	7.2	7	7	**7.07**
6.	Total Hardness (as $CaCO_3$)	mg/l	APHA 2340 C	**300**	45.8	40.8	46	**44.20**
7.	Iron (as Fe)	mg/l	APHA 3500Fe, B	**0.3**	0.022	0.028	0.03	**0.03**
8.	Chloride (as Cl)	mg/l	APHA 4500Cl^- B	**250**	18.2	17.8	18	**18.0**
9.	Residual Free Chlorine	mg/l	APHA 4500Cl, B	**0.2**	ND	ND	ND	**ND**
Desirable Characteristics								
10.	Total Dissolved Solids	mg/l	APHA 2540 C	**500**	80	72	82	**78.0**
11.	Calcium as Ca	mg/l	APHA 3500Ca B	**75**	25.6	26.5	23.4	**25.2**
12.	Magnesium as Mg	mg/l	APHA 3500Mg B	**30**	5.1	5.8	5.9	**5.6**
13.	Copper as Cu	mg/l	APHA 3111 B,C	**0.05**	BDL	BDL	BDL	**BDL**
14.	Manganese as Mn	mg/l	APHA 3500Mn B	**0.1**	BDL	BDL	BDL	**BDL**
15.	Sulphate as SO_4	mg/l	APHA 4500 SO_4^{2-} E	**200**	2.8	3.1	3.6	**3.2**
16.	Nitrate as NO_3	mg/l	APHA 4500 NO_3^- E	**45**	1.2	1.6	2.5	**1.8**
17.	Fluoride as F	mg/l	APHA 4500F^- C	**1.0**	0.2	0.1	0.2	**0.2**
18.	Phenolic Compounds as C_6H_5OH	mg/l	APHA 5530 B,D	**0.001**	BDL	BDL	BDL	**BDL**
19.	Mercury as Hg	mg/l	APHA 3500 Hg	**0.001**	BDL	BDL	BDL	**BDL**
20.	Cadmium as Cd	mg/l	APHA 3111 B,C	**0.003**	BDL	BDL	BDL	**BDL**
21.	Selenium as Se	mg/l	APHA 3114 B	**0.01**	BDL	BDL	BDL	**BDL**
22.	Arsenic as As	mg/l	APHA 3114 B	**0.01**	BDL	BDL	BDL	**BDL**
23.	Cyanide as CN	mg/l	APHA 4500 CN^- C,D	**0.05**	ND	ND	ND	**ND**
24.	Lead as Pb	mg/l	APHA 3111 B,C	**0.01**	BDL	BDL	BDL	**BDL**
25.	Zinc as Zn	mg/l	APHA 3111 B,C	**5**	BDL	BDL	BDL	**BDL**
26.	Anionic Detergents as MBAS	mg/l	APHA 5540 C	**0.2**	ND	ND	ND	**ND**
27.	Chromium as Cr^{+6}	mg/l	APHA 3500Cr B	--	BDL	BDL	BDL	**BDL**
28.	Mineral Oil	mg/l	APHA 5220 B	**0.5**	ND	ND	ND	**ND**
29.	Alkalinity	mg/l	APHA 2320 B	**200**	25	22	21	**22.7**
30.	Aluminium as Al	mg/l	APHA 3500Al B	**0.03**	BDL	BDL	BDL	**BDL**
31.	Boron	mg/l	APHA 4500B, B	**1**	BDL	BDL	BDL	**BDL**
32.	Poly Aromatic Hydrocarbon as PAH	mg/l	APHA 6440 B	**0.0001**	BDL	BDL	BDL	**BDL**
33.	Pesticides	µg/l	APHA 6630 B,C	**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, Cl<0.01 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.

Date:

For Visiontek Consultancy Services Pvt. Ltd

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

Ref.: Envlab/18/R-1321

GROUND WATER QUALITY ANALYSIS REPORT

1. Name of Industry : **M/s Lakshmipur Graphite Beneficiation Plant , Koraput**
2. Sampling Location : **GW-2: Open Well at Doliamba**
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			
					Sept-18	Oct-18	Nov-18	Averages
Essential Characteristics								
1.	Colour	Hazen	APHA 2120 B, C	**5**	CL	CL	CL	**CL**
2.	Odour	--	APHA 2150 B	**Agreeable**	U/O	U/O	U/O	**U/O**
3.	Taste	--	APHA 2160 C	**Agreeable**	AL	AL	AL	**AL**
4.	Turbidity	NTU	APHA 2130 B	**1**	BDL	BDL	BDL	**BDL**
5.	pH	--	APHA 4500H^+ B	**6.5-8.5**	6.9	6.92	7	**6.94**
6.	Total Hardness (as $CaCO_3$)	mg/l	APHA 2340 C	**300**	51	51.2	54	**52.07**
7.	Iron (as Fe)	mg/l	APHA 3500Fe, B	**0.3**	0.032	0.03	0.031	**0.03**
8.	Chloride (as Cl)	mg/l	APHA 4500Cl^- B	**250**	18.2	17.6	17.8	**17.87**
9.	Residual Free Chlorine	mg/l	APHA 4500Cl, B	**0.2**	ND	ND	ND	**ND**
Desirable Characteristics								
10.	Total Dissolved Solids	mg/l	APHA 2540 C	**500**	82	88	90	**86.7**
11.	Calcium as Ca	mg/l	APHA 3500Ca B	**75**	28.9	30.6	32.6	**30.7**
12.	Magnesium as Mg	mg/l	APHA 3500Mg B	**30**	5.1	5.8	6.2	**5.7**
13.	Copper as Cu	mg/l	APHA 3111 B,C	**0.05**	BDL	BDL	BDL	**BDL**
14.	Manganese as Mn	mg/l	APHA 3500Mn B	**0.1**	BDL	BDL	BDL	**BDL**
15.	Sulphate as SO_4	mg/l	APHA 4500 SO_4^{2-} E	**200**	3.5	4.6	4.3	**4.1**
16.	Nitrate as NO_3	mg/l	APHA 4500 NO_3^- E	**45**	1.2	1.3	1.1	**1.2**
17.	Fluoride as F	mg/l	APHA 4500F^- C	**1.0**	0.2	0.5	0.6	**0.4**
18.	Phenolic Compounds as C_6H_5OH	mg/l	APHA 5530 B,D	**0.001**	BDL	BDL	BDL	**BDL**
19.	Mercury as Hg	mg/l	APHA 3500 Hg	**0.001**	BDL	BDL	BDL	**BDL**
20.	Cadmium as Cd	mg/l	APHA 3111 B,C	**0.003**	BDL	BDL	BDL	**BDL**
21.	Selenium as Se	mg/l	APHA 3114 B	**0.01**	BDL	BDL	BDL	**BDL**
22.	Arsenic as As	mg/l	APHA 3114 B	**0.01**	BDL	BDL	BDL	**BDL**
23.	Cyanide as CN	mg/l	APHA 4500 CN^- C,D	**0.05**	ND	ND	ND	**ND**
24.	Lead as Pb	mg/l	APHA 3111 B,C	**0.01**	BDL	BDL	BDL	**BDL**
25.	Zinc as Zn	mg/l	APHA 3111 B,C	**5**	BDL	BDL	BDL	**BDL**
26.	Anionic Detergents as MBAS	mg/l	APHA 5540 C	**0.2**	ND	ND	ND	**ND**
27.	Chromium as Cr^{+6}	mg/l	APHA 3500Cr B	--	BDL	BDL	BDL	**BDL**
28.	Mineral Oil	mg/l	APHA 5220 B	**0.5**	ND	ND	ND	**ND**
29.	Alkalinity	mg/l	APHA 2320 B	**200**	18	16	18	**17.3**
30.	Aluminium as Al	mg/l	APHA 3500Al B	**0.03**	BDL	BDL	BDL	**BDL**
31.	Boron	mg/l	APHA 4500B, B	**1**	BDL	BDL	BDL	**BDL**
32.	Poly Aromatic Hydrocarbon as PAH	mg/l	APHA 6440 B	**0.0001**	BDL	BDL	BDL	**BDL**
33.	Pesticides	µg/l	APHA 6630 B,C	**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.

Date: 24/1/18

For Visiontek Consultancy Services Pvt.Ltd.

Plot No.-M-22&23, Chandka Industrial Estate, Patia, Bhubaneswar-751024, Dist-Khurda, Odisha Tel. : 91-674-6451781, 7752017905
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ISO 14001 : 2004
OHSAS 18001 : 2007
ISO 9001 : 2008

Ref.: Envlab/18/R-9323

GROUND WATER QUALITY ANALYSIS REPORT

1. Name of Industry : **M/s Lakshmipur Graphite Beneficiation Plant , Koraput**
2. Sampling Location : **GW-3: Open Well at Rajanapanasagurha**
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			
					Sept-18	Oct-18	Nov-18	Averages
Essential Characteristics								
1.	Colour	Hazen	APHA 2120 B, C	5	CL	CL	CL	CL
2.	Odour	--	APHA 2150 B	Agreeable	U/O	U/O	U/O	U/O
3.	Taste	--	APHA 2160 C	Agreeable	AL	AL	AL	AL
4.	Turbidity	NTU	APHA 2130 B	1	BDL	BDL	BDL	BDL
5.	pH	--	APHA 4500H^+ B	6.5-8.5	7	6.8	7.1	6.97
6.	Total Hardness (as $CaCO_3$)	mg/l	APHA 2340 C	300	60	52	50	54.00
7.	Iron (as Fe)	mg/l	APHA 3500Fe, B	0.3	0.022	0.018	0.021	0.02
8.	Chloride (as Cl)	mg/l	APHA 4500Cl^- B	250	16	20	18	18.00
9.	Residual Free Chlorine	mg/l	APHA 4500Cl, B	0.2	ND	ND	ND	ND
Desirable Characteristics								
10.	Total Dissolved Solids	mg/l	APHA 2540 C	500	80	90	86	85.3
11.	Calcium as Ca	mg/l	APHA 3500Ca B	75	24.3	25.6	28.7	26.2
12.	Magnesium as Mg	mg/l	APHA 3500Mg B	30	5.6	5.8	5.8	5.7
13.	Copper as Cu	mg/l	APHA 3111 B,C	0.05	BDL	BDL	BDL	BDL
14.	Manganese as Mn	mg/l	APHA 3500Mn B	0.1	BDL	BDL	BDL	BDL
15.	Sulphate as SO_4	mg/l	APHA 4500 SO_4^{2-} E	200	3.8	4.6	4.5	4.3
16.	Nitrate as NO_3	mg/l	APHA 4500 NO_3^- E	45	1.4	2	2.2	1.9
17.	Fluoride as F	mg/l	APHA 4500F^- C	1.0	0.13	0.25	0.13	0.2
18.	Phenolic Compounds as C_6H_5OH	mg/l	APHA 5530 B,D	0.001	BDL	BDL	BDL	BDL
19.	Mercury as Hg	mg/l	APHA 3500 Hg	0.001	BDL	BDL	BDL	BDL
20.	Cadmium as Cd	mg/l	APHA 3111 B,C	0.003	BDL	BDL	BDL	BDL
21.	Selenium as Se	mg/l	APHA 3114 B	0.01	BDL	BDL	BDL	BDL
22.	Arsenic as As	mg/l	APHA 3114 B	0.01	BDL	BDL	BDL	BDL
23.	Cyanide as CN	mg/l	APHA 4500 CN^- C,D	0.05	ND	ND	ND	ND
24.	Lead as Pb	mg/l	APHA 3111 B,C	0.01	BDL	BDL	BDL	BDL
25.	Zinc as Zn	mg/l	APHA 3111 B,C	5	BDL	BDL	BDL	BDL
26.	Anionic Detergents as MBAS	mg/l	APHA 5540 C	0.2	ND	ND	ND	ND
27.	Chromium as Cr^{+6}	mg/l	APHA 3500Cr B	--	BDL	BDL	BDL	BDL
28.	Mineral Oil	mg/l	APHA 5220 B	0.5	ND	ND	ND	ND
29.	Alkalinity	mg/l	APHA 2320 B	200	24	18	20	20.7
30.	Aluminium as Al	mg/l	APHA 3500Al B	0.03	BDL	BDL	BDL	BDL
31.	Boron	mg/l	APHA 4500B, B	1	BDL	BDL	BDL	BDL
32.	Poly Aromatic Hydrocarbon as PAH	mg/l	APHA 6440 B	0.0001	BDL	BDL	BDL	BDL
33.	Pesticides	µg/l	APHA 6630 B,C	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.

Date: 24/11/18

For Visiontek Consultancy Services Pvt. Ltd.

VISIONTEK CONSULTANCY SERVICES PVT. LTD.

Plot No.-M-22&23, Chandka Industrial Estate, Patia, Bhubaneswar-751024, Dist-Khurda, Odisha Tel. : 91-674-6451781, 7752017905
E-mail : visiontekin@yahoo.co.in, visiontek@gmail.com, Visit us at: www.vcspl.org

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(An Enviro Engineering Consulting Cell)
ISO 14001 : 2004
OHSAS 18001 : 2007
ISO 9001 : 2008

Ref.: Envlab/18/R-9323

Date: 24.11.18

GROUND WATER QUALITY ANALYSIS REPORT

1. Name of Industry : **M/s Lakshmipur Graphite Beneficiation Plant , Koraput**
2. Sampling Location : **GW-4: Open Well at Lakshmipur**
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			
					Sept-18	Oct-18	Nov-18	Averages
Essential Characteristics								
1.	Colour	Hazen	APHA 2120 B, C	**5**	CL	CL	CL	**CL**
2.	Odour	--	APHA 2150 B	**Agreeable**	U/O	U/O	U/O	**U/O**
3.	Taste	--	APHA 2160 C	**Agreeable**	AL	AL	AL	**AL**
4.	Turbidity	NTU	APHA 2130 B	**1**	BDL	BDL	BDL	**BDL**
5.	pH	--	APHA 4500H^+ B	**6.5-8.5**	7.3	7	6.94	**7.08**
6.	Total Hardness (as $CaCO_3$)	mg/l	APHA 2340 C	**300**	47	46	42	**45.00**
7.	Iron (as Fe)	mg/l	APHA 3500Fe, B	**0.3**	0.021	0.018	0.016	**0.02**
8.	Chloride (as Cl)	mg/l	APHA 4500Cl^- B	**250**	16	16.8	18	**16.93**
9.	Residual Free Chlorine	mg/l	APHA 4500Cl, B	**0.2**	ND	ND	ND	**ND**
Desirable Characteristics								
10.	Total Dissolved Solids	mg/l	APHA 2540 C	**500**	84	90	88	**87.3**
11.	Calcium as Ca	mg/l	APHA 3500Ca B	**75**	26.5	21.6	24.6	**24.2**
12.	Magnesium as Mg	mg/l	APHA 3500Mg B	**30**	4.8	4.9	5.1	**4.9**
13.	Copper as Cu	mg/l	APHA 3111 B,C	**0.05**	BDL	BDL	BDL	**BDL**
14.	Manganese as Mn	mg/l	APHA 3500Mn B	**0.1**	BDL	BDL	BDL	**BDL**
15.	Sulphate as SO_4	mg/l	APHA 4500 SO_4^{2-} E	**200**	3.5	3.8	4.1	**3.8**
16.	Nitrate as NO_3	mg/l	APHA 4500 NO_3^- E	**45**	0.9	0.8	0.9	**0.9**
17.	Fluoride as F	mg/l	APHA 4500F^- C	**1.0**	0.8	0.5	0.5	**0.6**
18.	Phenolic Compounds as C_6H_5OH	mg/l	APHA 5530 B,D	**0.001**	BDL	BDL	BDL	**BDL**
19.	Mercury as Hg	mg/l	APHA 3500 Hg	**0.001**	BDL	BDL	BDL	**BDL**
20.	Cadmium as Cd	mg/l	APHA 3111 B,C	**0.003**	BDL	BDL	BDL	**BDL**
21.	Selenium as Se	mg/l	APHA 3114 B	**0.01**	BDL	BDL	BDL	**BDL**
22.	Arsenic as As	mg/l	APHA 3114 B	**0.01**	BDL	BDL	BDL	**BDL**
23.	Cyanide as CN	mg/l	APHA 4500 CN^- C,D	**0.05**	ND	ND	ND	**ND**
24.	Lead as Pb	mg/l	APHA 3111 B,C	**0.01**	BDL	BDL	BDL	**BDL**
25.	Zinc as Zn	mg/l	APHA 3111 B,C	**5**	BDL	BDL	BDL	**BDL**
26.	Anionic Detergents as MBAS	mg/l	APHA 5540 C	**0.2**	ND	ND	ND	**ND**
27.	Chromium as Cr^{+6}	mg/l	APHA 3500Cr B	--	BDL	BDL	BDL	**BDL**
28.	Mineral Oil	mg/l	APHA 5220 B	**0.5**	ND	ND	ND	**ND**
29.	Alkalinity	mg/l	APHA 2320 B	**200**	22	18	24	**21.3**
30.	Aluminium as Al	mg/l	APHA 3500Al B	**0.03**	BDL	BDL	BDL	**BDL**
31.	Boron	mg/l	APHA 4500B, B	**1**	BDL	BDL	BDL	**BDL**
32.	Poly Aromatic Hydrocarbon as PAH	mg/l	APHA 6440 B	**0.0001**	BDL	BDL	BDL	**BDL**
33.	Pesticides	µg/l	APHA 6630 B,C	**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, 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.

For Visiontek Consultancy Services Pvt. Ltd.

Plot No.-M-22&23, Chandka Industrial Estate, Patia, Bhubaneswar-751024, Dist-Khurda, Odisha Tel. : 91-674-6451781, 7752017905
E-mail : visiontekin@yahoo.co.in, visiontek@gmail.com, Visit us at: www.vcspl.org

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Annexure-5

NOISE MONITORING REPORT

Visiontek Consultancy Services Pvt. Ltd.
(An Enviro Engineering Consulting Cell)

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

Ref.: Envlab/18/R-9828

NOISE MONITORING REPORT

1. Name of Industry : M/s Lakshmipur Graphite Beneficiation Plant , Koraput

Location ID	Monitoring Station Location	Day time Equivalent (Noise Level in dB(A) leq)			Night time Equivalent (Noise Level in dB(A) leq)		
		Sept-18	Oct-18	Nov-18	Sept-18	Oct-18	Nov-18
N-1	Project Site	56.4	62.2	70.2	55.2	56.0	61.8
N-2	Lakshmipur	52.3	53.8	55.2	54.2	58.8	45.8
N-3	Katrakana	53.8	52.7	48.2	52.8	56.6	38.8
N-4	Phunjisil	45.6	52.6	45.2	51.6	48.5	35.8
N-5	Matalamba	55.3	55.6	45.8	53.7	60.5	35.2
N-6	Bandipar	55.3	50.4	46.0	47.3	56.2	36.8
N-7	Khalakana	48.7	46.8	45.2	51.6	57.8	35.2
N-8	Dara	57.6	52.1	44.2	49.38	55.6	34.8
Standard as per CPCB		75			70		

VISIONTEK CONSULTANCY SERVICES PVT LTD

For Visiontek Consultancy Services Pvt. Ltd.

Date: 24/1/18

Plot No.-M-22&23, Chandka Industrial Estate, Patia, Bhubaneswar-751024, Dist-Khurda, Odisha Tel. : 91-674-6451781, 7752017905
E-mail : visiontekin@yahoo.co.in, visiontek@gmail.com, Visit us at: www.vcspl.org

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Annexure-6

SOIL ANALYSIS REPORT

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

Ref.: Envlab/18/R-9329

SOIL QUALITY ANALYSIS REPORT

1. Name of Industry : **M/s Lakshmipur Graphite Beneficiation Plant , Koraput**

Sl. No.	Parameters	Analysis Results				
		S-1:Plant Site	S-2:Sapamba	S-3: Marabaigurha	S-4: Near Minapani RF	S-5:Rumbuli
1	Colour	Gray	Gray	Gray-Black	Gray	Gray-Black
2	Porosity /Water holding capacity (%)	23.6	25.6	34.5	21.5	38.6
3	Moisture content (%)	6.9	7.5	6.3	7.1	7.3
4	pH	5.63	5.89	5.98	6.32	5.6
5	Type of Soil	Acidic	Acidic	Acidic	Acidic	Acidic
6	Soil Texture	Clay	Clay	Clay loamy	Clay	Clay
7	Bulk Density (gm/cc)	1.23	1.24	1.32	1.28	1.56
8	Infiltration Rate (Cm/hr)	7.3	7.2	7.6	7.3	7.2
9	Calcium as Ca (%)	0.52	0.52	0.54	0.56	0.51
10	Magnesium as Mg (%)	0.33	0.32	0.28	0.35	0.32
11	Organic Matter (%)	1.26	1.8	2.35	1.8	2.4
12	Nitrogen as N (%)	0.35	0.34	0.56	0.68	0.41
13	Phosphorus (%)	0.09	0.12	0.21	0.10	0.23
14	Potassium (%)	0.53	0.56	0.57	0.52	0.83
15	Chloride (%)	0.22	0.23	0.12	0.25	0.35
16	Sulphate (%)	0.34	0.5	0.6	0.56	0.58
17	Iron (%)	0.043	0.042	0.053	0.025	0.029

Date: 24/11/18

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Plot No.-M-22&23, Chandka Industrial Estate, Patia, Bhubaneswar-751024, Dist-Khurda, Odisha Tel. : 91-674-6451781, 7752017905
E-mail : visiontekin@yahoo.co.in, visiontek@gmail.com, Visit us at: www.vcspl.org

Visiontek Consultancy Services Pvt. Ltd

(An Enviro Engineering Consulting Cell)

Plot No.-M22&M23, Chandaka Industrial Estate, Patia,Bhubaneswar-751024, Tel.: 91-2744594, 3250790, Fax : 91-6742744594
E-mail : visiontekin@gmail.com, visiontekin@yahoo.co.in, Visit us at : www.vcspl.org

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