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ENVIRONMENTAL MONITORING REPORT BALLARPUR OC

(BALLARPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014

AN ISO 9001:2015 COMPANY

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INTRODUCTION

Location :

Ballarpur OC is located in Chandrapur district of Maharashtra State. The project is administered by Ballarpur Area of Western Coalfields Limited.

Communication :

Ballarpur OC project is situated at a distance of approximately 2 KM from Ballarpur City.

Drainage :

The Wardha River is the main drainage channel for the surrounding area.

Climate :

The climate of the area is tropical. JUNE is the hottest month with temperature rising to a maximum of 48°C. December is the coldest month when the temperature falls down to 10°C.

Other Industries :

Besides other coalmines, Ballarpur Paper Mill is the major industry in the vicinity of the project area.

Pollution due to other sources :

The above-mentioned sources and the Township are also expected to contribute a lot in increasing the load of pollution in the area.

Sampling Location :

Ambient Air Quality Monitoring Locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Manager Office – Ballarpur UG	- BBOA-1
2.	Premises of SAM Office	- BBOA-2
3.	Substation – Ballarpur OC	- BBOA-3
4.	Filter plant / Colony	- BBOA-4

Fugitive Dust Monitoring Location:

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Weigh Bridge	- BBOAF-1
2.	CHP	BBOAF-2
3.	Railway Siding	BBOAF-3

Water Quality Monitoring Location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- BBOW-1

Noise Level Monitoring Location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	CHP	- BBON-1
2.	Colony	- BBON-2

Frequency of Monitoring :

- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.


Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of

Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

Water : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Noise : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A28 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5
 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : CHANDRAPUR MONTH : JUNE
 NAME OF THE PROJECT : BALLARPUR OC

Manager office - Ballarpur UG					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO_x	SO_x
14/06/2019	136	65	36	20	11
25/06/2019	101	48	25	11	10
TLV	600	300	60	120	120
Premises of Sub area office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO_x	SO_x
14/06/2019	210	86	41	30	10
25/06/2019	222	82	32	22	11
TLV	600	300	60	120	120
Substation- Ballarpur OC					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	No_x	SO_x
14/06/2019	136	81	33	28	20
25/06/2019	201	129	44	25	21
TLV	600	300	60	120	120

Filter plant/ colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	Nox	SO _x
14/06/2019	144	70	32	21	22
25/06/2019	134	81	36	14	7
TLV	200	100	60	80	80

Above Std. Value.

FUGITIVE DUST MONITORING DATA

WEIGHT BRIDGE.			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
15/06/2019	378	178	65


CHP/ Coal Moni. Point			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
15/06/2019	182	77	55

Rly Sidding.			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
15/06/2019	476	187	76

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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3) * - Test parameter not under NABL scope.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/W28 DATE OF ISSUE: 05.08.2019
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: WATER SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 1

EFFLUENT WATER QUALITY REPORT

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : BALLARPUR MONTH : JUNE
 NAME OF THE PROJECT : BALLARPUR OC

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
13/06/2019	7.60	40	44	<2
24/06/2019	7.30	40	42	<2
TLV	5.5 - 9.0	250	100	10
E.T.P. (Workshop) Treated Water				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
13/06/2019	7.50	28	34	<2
24/06/2019	7.40	36	48	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : BALLARPUR MONTH : JUNE
NAME OF THE PROJECT : BALLARPUR OCP

Name of the Location : CHP - BBON-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	14/06/2019	63.4	62.3
JUNE.2019	22/06/2019	63.3	63.1
TLV		75	70

Name of the Location : Colony - BBON-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	14/06/2019	42.6	42.4
JUNE.2019	22/06/2019	42.5	42.3
TLV		55	45

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ENVIRONMENTAL MONITORING REPORT

BALLARPUR. UG

(BALLARPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE - 2019

Environment Laboratory
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INTRODUCTION

Location :

Ballarpur - III & IV UG is located in Chandrapur district of Maharashtra state. The project is administered by Ballarpur Area of Western Coalfields Limited.

Communication :

Ballarpur - III & IV UG is at a distance of approximately 1.5 KM from Ballarpur City

Drainage : The Wardha river is the main drainage channel for the surrounding area.

Climate :

The climate of the area is tropical. JUNE is the hottest month with temperature rising to a maximum of 48°C. December is the coldest month when the temperature falls down to 10°C.

Other Industries :

Besides other coalmines, Ballarpur Paper Mill is the major industry in the vicinity of the project area.

Pollution due to other sources :

The above-mentioned sources and the Township are also expected to contribute a lot in increasing the load of pollution in the area.

Sampling Location :

Ambient Air Quality Monitoring Locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Manager Office – Ballarpur UG	-	BBUA-1
2.	Substation - Ballarpur OC	-	BBUA-2
3.	Filter plant/ Colony/ Guest House	-	BBUA-3
4.	Premises of SAM Office	-	BBUA-4

Water Quality Monitoring Station :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	BBUW-1

Noise Level Monitoring Station :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Near Fan house	-	BBUN-1
2.	Colony	-	BBUN-2

Frequency of Monitoring :

Air : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.


Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.

- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

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 NO. OF PAGES: 2
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 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : CHANDRAPUR MONTH : JUNE
 NAME OF THE PROJECT : BALLARPUR UG

Manager office - Ballarpur UG					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
14/06/2019	136	65	36	20	11
25/06/2019	101	48	25	11	10
TLV	600	300	60	120	120
Substation- Ballarpur OC					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
14/06/2019	136	81	33	28	20
25/06/2019	201	129	44	25	21
TLV	600	300	60	120	120
Filter plant/ colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
14/06/2019	144	70	32	21	22
25/06/2019	134	81	36	14	7
TLV	200	100	60	80	80
# Above Std. Value					


Premises of Sub area office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SO_x
14/06/2019	210	86	41	30	10
25/06/2019	222	82	32	22	11
TLV	600	300	60	120	120

Above Std. Value

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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<p>Environment Laboratory CMPDI, RI IV, Nagpur</p>	<p>Test Report</p>	
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TEST REPORT NO. : RIN/TR/JUNE-19/W29 DATE OF ISSUE: 05.08.2019
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: WATER SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 1

EFFLUENT WATER QUALITY REPORT

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : BALLARPUR MONTH : JUNE
 NAME OF THE PROJECT : BALLARPUR UG

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
13/06/2019	7.20	36	40	<2
24/06/2019	7.60	32	46	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : BALLARPUR MONTH : JUNE
NAME OF THE PROJECT : BALLARPUR-III & IV UG

Name of the Location : Near Fan House - BBUN-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	14/06/2019	70.6	67.3
JUNE.2019	22/06/2019	70.4	68.2
TLV		75	70

Name of the Location : Colony - BBUN-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	14/06/2019	42.6	42.4
JUNE.2019	22/06/2019	42.5	42.3
TLV		55	45

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INTRODUCTION

Location:

Gouri I & II (A) OC is located in Chandrapur district of Maharashtra state. The project is administered by Ballarpur Area of Western Coalfields Limited.

Communication: The project is at a distance of approximately 24 km from Ballarpur City.

Drainage: The Wardha river is the main drainage channel for the surrounding area.

Climate : The climate of the area is tropical. JUNE is the hottest month with temperature rising to a maximum of 48°C. December is the coldest month when the temperature falls down to 10°C.

Other Industries :

Besides other coal mines , there is no other major industries nearby the project area. Vehicular traffic and local coal burning for domestic purposes are other source of pollution.

Sampling Location :

Ambient Air Quality Monitoring Locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Manager Office - Gouri-I OC	-	BGOA-1
2.	Gouri village	-	BGOA-2
3.	SAM Office – Gouri Sub Area	-	BGOA-3
4.	Gouri Colony/ Filter Plant	-	BGOA-4

Fugitive Dust Monitoring Location:

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	CHP	-	BGOAF-1
2.	Weigh Bridge		BGOAF-2

Water Quality Monitoring Location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge- Gouri I OC	-	BGOW-1
2.	ETP Workshop discharge- Gouri I OC	-	BGOW-2

Noise Level Monitoring Location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	CHP	-	BGON-1
2.	Gouri Colony	-	BGON-2

Frequency of Monitoring :


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- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM/
PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment

Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Noise : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A30 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5
 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : BALLARPUR MONTH : JUNE
 NAME OF THE PROJECT : GOURI-I & II (A) OCP

Manager Office - Gouri -I O/C					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
10/06/2019	513	207	59	37	24
22/06/2019	122	68	22	18	11
TLV	600	300	60	120	120
Gouri Village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
10/06/2019	345	135	59	16	7
23/06/2019	78	46	22	14	12
TLV	200	100	60	80	80
SAM office – Gouri sub area					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
09/06/2019	372	164	33	18	12
22/06/2019	252	96	27	19	20
TLV	600	300	60	120	120
#Above Std. Value					

Gouri colony/ Filter plant					
	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SO _x
11/06/2019	281	202	58	14	11
23/06/2019	77	68	13	9	8
TLV	200	100	60	80	80

#Above Std. Value

FUGITIVE DUST MONITORING DATA


CHP/coal unloading point			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
10/06/2019	1156	391	106

WEIGHT BRIDGE.			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
10/06/2019	1398	565	77

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/W31

DATE OF ISSUE: 05.08.2019

NAME OF CUSTOMER: WCL, NAGPUR

SAMPLE DESCRIPTION: WATER SAMPLE

CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19

NO. OF PAGES: 1

EFFLUENT WATER QUALITY REPORT

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : BALLARPUR MONTH : JUNE
 NAME OF THE PROJECT : GOURI-I & II (A) OCP

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
09/06/2019	7.80	32	42	<2
23/06/2019	7.80	44	52	<2
TLV	5.5 - 9.0	250	100	10
E.T.P.(Workshop)Treated Water				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
09/06/2019	7.60	36	44	<2
23/06/2019	7.20	48	58	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : BALLARPUR MONTH : JUNE
NAME OF THE PROJECT : GOURI - I & II (A) OCP

Name of the Location : CHP - BGON-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	10/06/2019	64.2	63.2
JUNE.2019	22/06/2019	64.1	64.0
TLV		75	70

Name of the Location : Gouri Colony - BGON-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	14/06/2019	41.6	41.3
JUNE.2019	21/06/2019	41.6	41.4
TLV		55	45

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ENVIRONMENTAL MONITORING REPORT

GOURI DEEP. OC

(BALLARPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014

AN ISO 9001:2015 COMPANY

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2.	AIR QUALITY MONITORING DATA	3-4
3.	EFFLUENT WATER QUALITY MONITORING DATA	5
4.	NOISE LEVEL DATA	6

INTRODUCTION

Location :

Gouri Deep OC is located in Chandrapur district of Maharashtra state. The project is administered by Ballarpur Area of Western Coalfields Limited.

Communication : The project is at a distance of approximately 25 km from Ballarpur City.

Drainage : The Wardha river is the main drainage channel for the surrounding area.

Climate : The climate of the area is tropical. JUNE is the hottest month with temperature rising to a maximum of 48°C. December is the coldest month when the temperature falls down to 10°C.

Other Industries :

Besides other coal mines , there is no other major industries nearby the project area.

Sampling Location :

Ambient Air Quality Monitoring Locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Manager Office	- BG _D OA-1
2.	Mutra village	- BG _D OA-2
3.	Goyegaon Village	- BG _D OA-3
4.	Antragaon Village	- BG _D OA-4

Water Quality Monitoring Location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- BG _D OW-1

Noise Level Monitoring Location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Manager Office	- BG _D ON-1

Frequency of Monitoring :

Air : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.


Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.

SPM/ : Ambient air laden with suspended particulates enters the Respirable Dust Sampler

- PM-10** : through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A31 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5
 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : BALLARPUR MONTH : JUNE
 NAME OF THE PROJECT : GOURI-DEEP OCP

Manager office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO_x	SO_x
07/06/2019	83	46	22	11	14
20/06/2019	298	130	56	11	11
TLV	600	300	60	120	120
Mutra village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO_x	SO_x
07/06/2019	229	71	58	23	24
20/06/2019	235	121	57	24	13
TLV	200	100	60	80	80
Goyegaon village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO_x	SO_x
07/06/2019	144	49	28	14	17
20/06/2019	81	46	21	15	11
TLV	200	100	60	80	80
# Above Std. Value					

Antargaon village


DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
07/06/2019	191	75	45	31	12
20/06/2019	179	65	41	25	16
TLV	200	100	60	80	80

Above Std. Value

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

-
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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/W31 DATE OF ISSUE: 05.08.2019
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION:
 WATER SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 1

EFFLUENT WATER QUALITY REPORT

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : BALLARPUR MONTH : JUNE
 NAME OF THE PROJECT : GOURI DEEP OC

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
07/06/2019	7.60	36	38	<2
20/06/2019	7.20	32	38	<2
TLV	5.5 - 9.0	250	100	10

E.T.P.(Workshop)Treated Water				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
07/06/2019	7.80	40	42	<2
20/06/2019	7.30	36	44	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : BALLARPUR MONTH : JUNE
NAME OF THE PROJECT : GOURI - DEEP OCP

Name of the Location : Manager Office - BG_DON-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	10/06/2019	53.4	53.2
JUNE.2019	22/06/2019	53.2	53.1
TLV		75	70

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ENVIRONMENTAL MONITORING REPORT

PAUNI OC

(BALLARPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

**REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014**

AN ISO 9001:2015 COMPANY

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3.	EFFLUENT WATER QUALITY MONITORING DATA	5
4.	NOISE LEVEL DATA	6

INTRODUCTION

Location :

Pauni OC is located in Chandrapur district of Maharashtra state. The project is administered by Ballarpur Area of Western Coalfields Limited.

Communication : The project is at a distance of approximately 24 km from Ballarpur City .

Drainage : The Wardha river is the main drainage channel for the surrounding area.

Climate :

The climate of the area is tropical. JUNE is the hottest month with temperature rising to a maximum of 48°C. December is the coldest month when the temperature falls down to 10°C.

Other Industries :

Besides other coal mines , there is no major industries nearby the project area.

Sampling Location :

Ambient Air Quality Monitoring Locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Manager Office - Pauni OC	-	BPOA-1
2.	Pauni village	-	BPOA-2
3.	Gouri village	-	BPOA-3
4.	Workshop – Pauni OC	-	BPOA-4

Water Quality Monitoring Location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	BPOW-1
2.	ETP Effluent discharge	-	BPOW-2

Noise Level Monitoring Location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Near Manager Office	-	BPON-1
2.	Gouri colony	-	BPON-2

Frequency of Monitoring :

Air : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.


Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.

SPM/ PM-10 : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust

(size > 10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size < 10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration ($\mu\text{g}/\text{m}^3$) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.

- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations ($\mu\text{g}/\text{m}^3$) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium (Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

<p>Environment Laboratory CMPDI, RI IV, Nagpur</p>	<p>Test Report</p>	 <p>TC - 7102</p>
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TEST REPORT NO. : RIN/TR/JUNE-19/A33 DATE OF ISSUE: 05.08.19
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 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5
 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : BALLARPUR MONTH : JUNE
 NAME OF THE PROJECT : PAUNI OCP

Manager Office - Pauni O/C					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
08/06/2019	587	271	71	20	10
21/06/2019	178	75	43	13	13
TLV	600	300	60	120	120
Pauni Village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
08/06/2019	404	171	59	26	24
21/06/2019	261	112	25	17	18
TLV	200	100	60	80	80

Gouri Village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SO _x
10/06/2019	345	135	59	16	7
23/06/2019	78	46	22	14	12
TLV	200	100	60	80	80
#-Above Std. Value					
Workshop- Pauni OC					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SO _x
08/06/2019	196	146	52	21	10
21/06/2019	108	90	48	30	20
TLV	600	300	60	120	120


FUGITIVE DUST MONITORING DATA

WEIGHT BRIDGE.			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
08/06/2019	1365	532	88

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/W33 DATE OF ISSUE: 05.08.2019
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: WATER SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 1

EFFLUENT WATER QUALITY REPORT

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : BALLARPUR MONTH : JUNE
 NAME OF THE PROJECT : PAUNI OCP

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
07/06/2019	7.40	40	46	<2
21/06/2019	7.50	40	44	<2
TLV	5.5 - 9.0	250	100	10
E.T.P.(Workshop)Treated Water				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
07/06/2019	7.30	44	48	<2
21/06/2019	7.60	36	42	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

- Note: 1) This Report refers to the values related to the items tested as received.
 4) This Report cannot be reproduced in part or full without written permission of the management.
 5) * - Test parameter not under NABL scope

NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : BALLARPUR MONTH : JUNE
NAME OF THE PROJECT : PAUNI OCP

Name of the Location : Near Manager Office - BPON-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night time
JUNE.2019	10/06/2019	52.4	51.6
JUNE.2019	22/06/2019	52.1	51.4
TLV		75	70

Name of the Location : Gouri Colony - BPON-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night time
JUNE.2019	14/06/2019	41.6	41.3
JUNE.2019	21/06/2019	41.6	41.4
TLV		55	45

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ENVIRONMENTAL MONITORING REPORT

PAUNI II OC

(BALLARPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

**REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014**

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4.	NOISE LEVEL DATA	6

INTRODUCTION

Location :

Pauni-II OC is located in Chandrapur district of Maharashtra state. The project is administered by Ballarpur Area of Western Coalfields Limited.

Communication : The project is at a distance of approximately 24 km from Ballarpur City .

Drainage : The Wardha river is the main drainage channel for the surrounding area.

Climate :

The climate of the area is tropical. JUNE is the hottest month with temperature rising to a maximum of 48°C. December is the coldest month when the temperature falls down to 10°C.

Other Industries :

Besides other coal mines , there is no major industries nearby the project area.

Sampling Location :

Ambient Air Quality Monitoring Locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine office - Pauni- II OC	-	BP ₂ OA-1
2.	Substation - Pauni- II OC	-	BP ₂ OA-2
3.	Workshp	-	BP ₂ OA-3
4.	Sakhari village	-	BP ₂ OA-4

Water Quality Monitoring Location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	BP ₂ OW-1

Noise Level Monitoring Location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Near Manager Office	-	BP ₂ ON-1

Frequency of Monitoring :

- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size>10 μ) is separated from the air stream by centrifugal forces acting on the

solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size $<10\ \mu$) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration ($\mu\text{g}/\text{m}^3$) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.

PM2.5 : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations ($\mu\text{g}/\text{m}^3$) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.


Heavy Metals : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.

NO_x : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.

SO₂ : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

Water : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Noise : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A32 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : BALLARPUR MONTH : JUNE
 NAME OF THE PROJECT : PAUNI II OCP

Mine Office – Pauni II OC					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
09/06/2019	179	82	53	22	22
21/06/2019	326	158	40	20	16
TLV	600	300	60	120	120
Substation Pauni II OC					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
09/06/2019	387	217	56	23	24
22/06/2019	319	257	49	24	25
TLV	600	300	60	120	120
Workshop					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
08/06/2019	196	146	52	21	10
21/06/2019	108	90	48	30	20
TLV	600	300	60	120	120

Sakhari Village


DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
09/06/2019	162	89	56	22	21
22/06/2019	76	42	24	19	14
TLV	200	100	60	80	80

#-Above Std.Value

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/W32 DATE OF ISSUE: 05.08.2019
NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: WATER SAMPLE
CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
NO. OF PAGES: 1

EFFLUENT WATER QUALITY REPORT

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : BALLARPUR MONTH : JUNE
NAME OF THE PROJECT : PAUNI II OCP

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
08/06/2019	7.50	40	46	<2
20/06/2019	7.40	44	56	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : BALLARPUR MONTH : JUNE
NAME OF THE PROJECT : PAUNI II OCP

Name of the Location : Near Manager Office - BP₂ON-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	10/06/2019	53.2	52.4
JUNE.2019	22/06/2019	53.4	52.9
TLV		75	70

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ENVIRONMENTAL MONITORING REPORT

DHOPTALA OC

(BALLARPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE- 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

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2.	AIR QUALITY MONITORING DATA	3-4
3.	NOISE LEVEL DATA	5

INTRODUCTION

Location :

New Dhoptala OC is located in Chandrapur district of Maharashtra state. The project is administered by Ballarpur Area of Western Coalfields Limited.

Communication : The project is at a distance of approximately 20 KM from Ballarpur City.

Drainage : The Wardha river is the main drainage channel for the surrounding area.

Climate :

The climate of the area is tropical. JUNE is the hottest month with temperature rising to a maximum of 48°C. December is the coldest month when the temperature falls down to 10°C.

Other Industries :

Besides other coal mines, there is no other major industries nearby the project area.

Sampling Location :

Ambient Air Quality Monitoring Locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Manager Office – Dhoptala OC	- BDOA-1
2.	SAM office – Dhoptala Sub Area	- BDOA-2
3.	Sasti Colony	- BDOA-3
4.	Sasti Village	- BDOA-4

Fugitive Dust Monitoring Location:

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	CHP	- BDOAF-1
2.	Weight Bridge	- BDOAF-2

Water Quality Monitoring Location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- BDOW-1

Noise Level Monitoring Location :


<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near CHP	- BDON-1
2.	Colony	- BDON-2

Frequency of Monitoring :

- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc
- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size > 10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size < 10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sample
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium (Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A27 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5
 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : BALLARPUR MONTH : JUNE
 NAME OF THE PROJECT : NEW DHOPTALA OC

Manager office - Dhoptala OC					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO_x	SO_x
13/06/2019	341	103	52	21	11
24/06/2019	176	82	37	15	11
TLV	600	300	60	120	120
SAM office – Dhoptala sub area					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	No_x	SO_x
13/06/2019	221	119	32	14	14
24/06/2019	133	71	20	11	12
TLV	600	300	60	120	120
Sasti colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO_x	SO_x
12/06/2019	283	115	56	23	11
24/06/2019	82	56	33	23	7
TLV	200	100	60	80	80
# Above Std. Value.					

Sasti village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
12/06/2019	294	123	59	19	7
24/06/2019	81	65	47	39	24
TLV	200	100	60	80	80

Above Std. Value.

FUGITIVE DUST MONITORING DATA

CHP/coal unloading point			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
13/06/2019	319	149	45

WEIGHT BRIDGE.			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
13/06/2019	397	145	84

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : BALLARPUR MONTH : JUNE
NAME OF THE PROJECT : NEW DHOPTALA OCP

Name of the Location : CHP - BDON-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	14/06/2019	60.5	60.4
JUNE.2019	21/06/2019	60.4	60.2
TLV		75	70

Name of the Location : Sasti Colony - BDON-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	14/06/2019	43.4	42.4
JUNE.2019	21/06/2019	43.5	43.5
TLV		55	45

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ENVIRONMENTAL MONITORING REPORT SASTI EXPN. OC

(BALLARPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE - 2019

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INTRODUCTION

Location :

Sasti Opencast Project is located in Chandrapur district of Maharashtra State and is administered by Ballarpur Area of Western Coalfields Limited.

Communication :

The Sasti opencast project can be approached by road from south from Rajura town, which is 172 km from Nagpur. The distance between Sasti OC and Rajura town is about 13 km. Ballarshah railway junction on the Nagpur - Khazipet line of Central Railway is about 12 km by road from Rajura.

Drainage : The Wardha river is the main drainage channel for the surrounding area.

Climate :

The climate of the area is tropical. JUNE is the hottest month with temperature rising to a maximum of 48°C. December is the coldest month when the temperature falls down to 10°C.

Other Industries :

Besides other coal mines viz. Gouri OC, Pauni OC, Dhuptala OC, Ballarpur OC & Ballarpur UG, the major industry i.e. Ballarpur Paper Mill is falling within the 10 kms radius of the Sasti OCP.

Pollution due to other sources :

The above mentioned sources are expected to contribute in increasing the load of pollution in the area. Domestic coal burning in the village area also contributes to a lot in increasing the air pollution.

Sampling Locations :

Ambient Air Quality Monitoring Locations :

<u>S.No.</u>	<u>Details of Location</u>	<u>Code No.</u>
1.	Gouri Colony / Filter Plant	: BSOA-1
2.	Sasti village	: BSOA-2
3.	SAM Office - Sasti OC	: BSOA-3
4.	Area Store Premises	: BSOA-4

Fugitive Dust Monitoring Location:

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Weigh Bridge	- BSOAF-1
2.	Mine CHP	BSOAF-2
3.	Railway Siding	BSOAF-3

Water Quality Monitoring Locations :

<u>S.No.</u>	<u>Details of Location</u>	<u>Code No.</u>
1.	Mine water discharge	BSOW-1
2.	ETP (Workshop) treated water	BS(ETP)W-2
3.	STP (Domestic Effluent) treated water	BS(STP)W-3

Noise Level Monitoring Locations :

<u>S.No.</u>	<u>Details of Location</u>	<u>Code No.</u>
1.	CHP	- BSON-1
2.	Gouri Colony	- BSON-2

Frequency of Monitoring :

- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :


- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size > 10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size < 10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium (Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of

Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.

SO₂ : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

Water : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Noise : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A34 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5
 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : BALLARPUR MONTH : APRIL
 NAME OF THE PROJECT : SASTI OCP

Gouri colony/ Filter plant					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
11/06/2019	281	202	58	14	11
23/06/2019	77	68	13	9	8
TLV	200	100	60	80	80
Sasti village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
12/06/2019	294	123	59	19	7
24/06/2019	81	65	47	39	24
TLV	200	100	60	80	80
SAM Office- Sasti OC					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
12/06/2019	352	93	40	21	14
23/06/2019	158	68	21	15	10
TLV	600	300	60	120	120
#-Above Std Value.					

Area store					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SO _x
12/06/2019	574	268	59	21	14
23/06/2019	148	80	25	14	14
TLV	600	300	60	120	120

FUGITIVE DUST MONITORING DATA

Weigh Bridge			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
11/06/2019	578	237	39


Main CHP			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
11/06/2019	2407	751	57

Rly Siding			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
11/06/2019	636	312	72

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/W34 DATE OF ISSUE: 05.08.2019
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: WATER SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 1

EFFLUENT WATER QUALITY REPORT

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : BALLARPUR MONTH : JUNE
 NAME OF THE PROJECT : SASTI OCP

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
10/06/2019	7.40	28	32	<2
23/06/2019	7.80	32	34	<2
TLV	5.5 - 9.0	250	100	10
E.T.P.(Workshop)Treated Water				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
10/06/2019	7.30	32	34	<2
23/06/2019	7.60	40	48	<2
TLV	5.5 - 9.0	250	100	10

S.T.P. (Domestic Effluent) - Treated Water		
Date of Sample Collection	Analysis Results	
	TSS (mg/l) IS-3025/17:1984	BOD (3 days 27°C) mg/l
Below Detection Limit	10	2
10/06/2019	56	11.2
23/06/2019	60	10.6
TLV	100	30

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL
NAME OF THE AREA : BALLARPUR
NAME OF THE PROJECT : SASTI OCP
YEAR : 2019
MONTH : JUNE

Name of the Location : **CHP - BSON-1**

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	14/06/2019	64.4	63.5
JUNE.2019	21/06/2019	64.5	63.4
TLV		75	70

Name of the Location : **Gouri Colony - BSON-2**

Month	Date of Data Collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	14/06/2019	41.6	41.3
JUNE.2019	21/06/2019	41.6	41.4
TLV		55	45

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ENVIRONMENTAL MONITORING REPORT

SASTI UG

(BALLARPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014

AN ISO 9001:2015 COMPANY

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4.	NOISE LEVEL DATA TER	6

INTRODUCTION

Location :

Sasti UG is located in Chandrapur district of Maharashtra state. The project is administered by Ballarpur Area of Western Coalfields Limited.

Communication : The project is at a distance of approximately 20 KM from Ballarpur City.

Drainage : The Wardha river is the main drainage channel for the surrounding area.

Climate :

The climate of the area is tropical. JUNE is the hottest month with temperature rising to a maximum of 48°C. December is the coldest month when the temperature falls down to 10°C.

Other Industries :

Besides other coal mines, there is no other major industries nearby the project area.

Sampling Location :

Ambient Air Quality Monitoring Locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	SAM office – Dhoptala Sub Area	- BSUA-1
2.	Sasti Colony	- BSUA-2
3.	Sasti Village	- BSUA-3
4.	Manager Office – Dhoptala OC	- BSUA-4

Fugitive Dust Monitoring Location:

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Main CHP	- BSUF-1

Water Quality Monitoring Location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- BSUW-1

Noise Level Monitoring Location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near Fan house	- BSUN-1
2.	Colony	- BSUN-2

Frequency of Monitoring :


- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of

nitrogen (NO_x) etc.

- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

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TEST REPORT NO. : RIN/TR/JUNE-19/A35 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5
 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : BALLARPUR MONTH : JUNE
 NAME OF THE PROJECT : SASTI UG


SAM office - Dhoptala sub area					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
13/06/2019	221	119	32	14	14
24/06/2019	133	71	20	11	12
TLV	600	300	60	120	120
#Above Std .Value					
Sasti colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
12/06/2019	283	115	56	23	11
24/06/2019	82	56	33	23	7
TLV	200	100	60	80	80
#Above Std .Value					
Sasti village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
12/06/2019	294	123	59	19	7
24/06/2019	81	65	47	39	24
TLV	200	100	60	80	80
#Above Std .Value					

Manager office – Dhoptala OC					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
13/06/2019	341	103	52	21	11
24/06/2019	176	82	37	15	11
TLV	600	300	60	120	120

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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TEST REPORT NO. : RIN/TR/JUNE-19/W35 DATE OF ISSUE: 05.08.2019
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: WATER SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 1

EFFLUENT WATER QUALITY REPORT

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : BALLARPUR MONTH. : JUNE
 NAME OF THE PROJECT : SASTI UG

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
11/06/2019	7.20	36	38	<2
23/06/2019	7.50	36	40	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : BALLARPUR MONTH : JUNE
 NAME OF THE PROJECT : SASTI UG

Name of the Location : Near Fan House - BSUN-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	14/06/2019	71.5	69.3
JUNE.2019	21/06/2019	71.3	69.2
TLV		75	70

Name of the Location : SASTI Colony - BSUN-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	14/06/2019	43.4	42.4
JUNE.2019	21/06/2019	43.5	43.5
TLV		55	45

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ENVIRONMENTAL MONITORING REPORT

BHATADI OC EXPN.

(CHANDRAPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014

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3.	EFFLUENT WATER QUALITY MONITORING DATA	5
4.	NOISE LEVEL DATA	6

INTRODUCTION

Location :

Bhatadi Opencast Project is located in Chandrapur district of Maharashtra State and is administered by Chandrapur Area of Western Coalfields Limited.

Climate :

The climate of the area is dry to moist tropical. In summer, the temperature generally goes to a maximum of 48°C whereas in winter, it generally falls to a minimum of 10°C. The average annual rainfall is about 1200 mm.

Industry :

Besides other coalmines, Maharashtra Electros melt and twin Super Thermal Power Stations operated by MSEB falls in the vicinity of project area.

Pollution due to other sources :

The above-mentioned industries are also likely to contribute in increasing the pollution load of the area.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Bhatadi village	-	CBOA-1
2.	Bhatadi Manager office	-	CBOA-2
3.	Security check post	-	CBOA-3
4.	Kitadi village	-	CBOA-4

Fugitive Dust Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	CHP /MRG loading point	-	CBOAF-1
2.	Weigh Bridge	-	CBOAF-2

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	CBOW-1
2.	Workshop (ETP) water discharge	-	CBOW-2
3.	STP (Domestic Effluent) treated water-		CBOW-3

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Near CHP	-	CBON-1
2.	Colony	-	CBON-2

Frequency of Monitoring :

Air : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.


Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc
- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sample
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly

for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Noise : Noise level data are recorded fortnightly.

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 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5
 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : CHANDRAPUR MONTH : JUNE
 NAME OF THE PROJECT : BHATADI OCP

Bhatadi village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
13/06/2019	260	111	46	20	16
14/06/2019	233	113	56	21	10
30/06/2019	82	55	20	15	18
TLV	200	100	60	80	80
Bhatadi Manager office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
15/06/2019	357	252	57	23	16
30/06/2019	87	54	40	22	12
TLV	600	300	60	120	120

Bhatadi Security post					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NOx	SO _x
15/06/2019	574	295	55	20	13
30/06/2019	89	54	30	11	12
Permissible Limits	600	300	60	120	120
# Above Std .value					
Kitadi village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NOx	SO _x
15/06/2019	310	149	69	26	24
30/06/2019	128	94	48	15	10
TLV	200	100	60	80	80
# Above Std .value					

FUGITIVE DUST MOITORING DATA

1. CHP/MRG loading point

(24 hourly values in µg/m³)

Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
-	-	-	-

2. Weigh Beidge


(24 hourly values in µg/m³)

Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
-	-	-	-

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/W22 DATE OF ISSUE: 05.08.2019
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: WATER SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 1

EFFLUENT WATER QUALITY REPORT

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : CHANDRAPUR MONTH : JUNE
 NAME OF THE PROJECT : BHATADI OC

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
14/06/2019	7.40	36	32	<2
29/06/2019	7.20	48	40	<2
TLV	5.5 - 9.0	250	100	10
ETP (Workshop) - Treated water sample				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
14/06/2019	7.80	44	34	<2
29/06/2019	7.60	32	26	<2
TLV	5.5 - 9.0	250	100	10
S.T.P. (Domestic Effluent) - Treated Water				
Date of Sample Collection	Analysis Results			
	TSS (mg/l) IS-3025/17:1984	BOD (3 days 27°C) mg/l		
Below Detection Limit	10	2		
14/06/2019	36	10.2		
29/06/2019	32	12..6		
TLV	100	30		

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

Note: 1) This Report refers to the values related to the items tested as received.
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 3) * - Test parameter not under NABL s

NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : CHANDRAPUR MONTH : JUNE
 NAME OF THE PROJECT : BHATADI OC

Name of the Location CHP - CBON-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	14/06/2019	62.5	62.4
JUNE.2019	28/06/2019	62.3	61.5
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75	70

Name of the Location : Colony - CBON-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	14/06/2019	42.3	42.2
JUNE.2019	28/06/2019	43.3	42.2
Permissible Limit		55	45

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ENVIRONMENTAL MONITORING REPORT

CHANDA RAYATWARI UG

(CHANDRAPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014

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2.	AIR QUALITY MONITORING DATA	3-4
3.	EFFLUENT WATER QUALITY MONITORING DATA	5
4.	NOISE LEVEL DATA	6

INTRODUCTION

Location :

Chanda-Rayatwari Colliery is located in the Chandrapur district of Maharashtra State and is administered by Chandrapur Area of Western Coalfields Limited.

Communication : Chanda-Rayatwari Colliery is very close to the Chandrapur city.

Climate :

The climate of the area is dry to moist tropical with well-defined summer from JUNE to June, rainy season from July to September and winter from December to MARuary. In summer, the temperature generally goes to a maximum of 48°C whereas in winter, it generally falls to a minimum of 10°C. The average annual rainfall is about 1200 mm.

Industry :

Besides other coalmines, Maharashtra Electros melt and twin Super Thermal Power Stations operated by MSEB falls in the vicinity of project area.

Pollution due to other sources :

The above-mentioned industries are also likely to contribute in increasing the pollution load of the area.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Manager Office (Mahakali UG)	-	CC _R UA-1
2.	Substation - CRC	-	CC _R UA-2
3.	Colony	-	CC _R UA-3
4.	Jatwara milk scheme	-	CC _R UA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	CC _R UW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	CHP	-	CC _R UN-1
2.	Colony	-	CC _R UN-2


Frequency of Monitoring :

- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc
- SPM/** Ambient air laden with suspended particulates enters the Respirable Dust Sampler

- PM-10** : through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sample
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet : designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A23 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5
 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : CHANDRAPUR MONTH : JUNE
 NAME OF THE PROJECT : CHANDA RAYATWARI UG

Manager's office- Mahakali UG					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
14/06/2019	254	177	53	12	20
29/06/2019	122	84	39	23	15
TLV	600	300	60	120	120
CRC Substation / Filter plant					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
13/06/2019	348	132	58	12	10
29/06/2019	76	41	29	17	17
TLV	600	300	60	120	120
Colony (Mahakali)					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
14/06/2019	298	165	56	13	16
30/06/2019	194	138	29	18	15
TLV	200	100	60	80	80
#-Above std.value					


Jatwara milk scheme					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
14/06/2019	67	31	20	10	16
29/06/2019	98	51	33	24	18
TLV	600	300	60	120	120

#-Above std.value

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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<p>Environment Laboratory CMPDI, RI IV, Nagpur</p>	<p>Test Report</p>	 <p>TC - 7102</p>
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TEST REPORT NO. : RIN/TR/JUNE-19/W23 DATE OF ISSUE: 05.08.2019
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: WATER SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 1

EFFLUENT WATER QUALITY REPORT

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : CHANDRAPUR MONTH : JUNE
 NAME OF THE PROJECT : CRC UG

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
14/06/2019	7.20	32	24	<2
28/06/2019	7.60	40	30	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : CHANDRAPUR MONTH : JUNE
NAME OF THE PROJECT : CHANDA-RAYATWARI UG

Name of the Location :CHP --: CC_RUN-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	13/06/2019	62.7	62.3
JUNE.2019	28/06/2019	62.7	61.2
TLV		75	70

Name of the Location :Colony - CC_RUN-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	14/06/2019	42.5	42.3
JUNE.2019	28/06/2019	42.5	42.1
TLV		55	70

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ENVIRONMENTAL MONITORING REPORT

DURGAPUR RAYATWARI UG

(CHANDRAPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE - 2019

Environment Laboratory

NABL Accredited vide Cert. No. TC-7102

CMPDI

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4.	NOISE LEVEL DATA	6

INTRODUCTION

Location :

Durgapur-Rayatwari Underground Project is located in Chandrapur District of Maharashtra State and is administered by Chandrapur Area of Western Coalfields Limited.

Communication :

Durgapur-Rayatwari Underground Project is situated on bye-pass link road at a distance of 4 Kms (approx) from Chandrapur city.

Drainage :

The drainage of the area is controlled by Erai River, which flows from North to South.

Climate : The climate of the area is dry to moist tropical. In summer, the temperature generally goes to a maximum of 48°C whereas in winter, it generally falls to a minimum of 10°C. The average annual rainfall is about 1200 mm.

Industry : Other than the coal mines, Chandrapur Super Thermal Power Station and Maharashtra Electrosmelt Limited are the major industries, which fall in the vicinity of Durgapur Rayatwari Underground Project.

Pollution due to other sources :

The above-mentioned industries are also likely to contribute in increasing the pollution load of the area.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Pit office, DRC-III UG	-	CD _R UA-1
2.	DRC-V colony	-	CD _R UA-2
3.	Nehru Nagar-Substation	-	CD _R UA-3
4.	Filter plant DOC/POC Colony		

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	CD _R UW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Pit office of DRC-III UG	-	CD _R UN-1
2.	Colony (Durgapur)		CD _R UN-2


Frequency of Monitoring :

- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of

- nitrogen (NO_x) etc
- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sample
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A18 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5
 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : CHANDRAPUR MONTH : JUNE
 NAME OF THE PROJECT : DRC UG

Pit office - DRC - III UG					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
12/06/2019	395	196	53	7	21
28/06/2019	253	133	40	28	15
Permissible Limits	600	300	60	120	120
DRC - V colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
13/06/2019	113	52	21	7	15
28/06/2019	190	95	29	17	21
TLV	200	100	60	80	80

Nehru nagar / Substation					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOX
13/06/2019	324	156	44	39	21
29/06/2019	132	59	20	19	11
TLV	600	300	60	120	120

Above Std. value


Pit office - DRC - IV UG					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOX
28/06/2019	197	55	32	23	18
Permissible Limits	600	300	60	120	120

Above Std. value

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/W18 DATE OF ISSUE: 05.08.2019
NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: WATER SAMPLE
CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
NO. OF PAGES: 1

EFFLUENT WATER QUALITY REPORT

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : CHANDRAPUR MONTH : JUNE
NAME OF THE PROJECT : DRC UG

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
12/06/2019	6.80	36	28	<2
28/06/2019	7.40	36	32	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : CHANDRAPUR MONTH : JUNE
NAME OF THE PROJECT : DURGAPUR-RAYATWARI UG

Name of the Location : Pit office of DRC-III UG : CD_RUN-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	13/06/2019	70.5	70.4
JUNE.2019	28/06/2019	70.2	70.1
TLV		75	70

Name of the Location :Durgapur Colony - CD_RUN-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	12/06/2019	42.5	42.4
JUNE.2019	25/06/2019	42.9	42.7
TLV		55	45

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ENVIRONMENTAL MONITORING REPORT

DURGAPUR OC EXPN.

(CHANDRAPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE - 2019

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DURGAPUR OCP

Location :

The Durgapur opencast project is located in Chandrapur district of Maharashtra State and is administered by Chandrapur area of Western Coalfields Limited.

Communication :

Chandrapur town, the district headquarter of Chandrapur district, is only 6 km south of the project. The project is approachable via Chandrapur - Tadoba road and also Chandrapur - Mul road. The Chandrapur railway station is about 5 km from this project, which lies on Nagpur-Chennai broad gauge line of Central Railway.

Drainage :

The drainage of the area is controlled by two seasonal tributaries (Motaghat nalla and Upasa nalla) of Erai river, which flows west of the area.

Climate :

Climate of the area is dry to moist tropical with well-defined summer from JUNE to June, rainy season from July to September and winter from December to MARuary. In summer temperature goes up to a maximum of 48°C whereas in winter temperature generally falls to a minimum of 10°C. Average annual rainfall is about 1200mm.

Industry :

Padmapur OCP, Chandrapur STPS and Maharashtra Electro Smelter are the major industries, which fall in the vicinity of the Durgapur OCP.

Pollution due to other sources :

The above-mentioned industries specially the Super Thermal Power Station are likely to contribute in increasing the air pollution of nearby villages. Durgapur village has been affected maximum due to proximity of the thermal powerhouse.

Sampling Locations :

Ambient Air Quality Monitoring Locations :

<u>S.No.</u>	<u>Details of Location</u>		<u>Code No.</u>
1.	Durgapur village	-	CDOA-1
2.	Filter plant DOC/ POC	-	CDOA-2
3.	Sinhala village	-	CDOA-3
4.	Manager Office, Sec- V	-	CDOA-4

Fugitive Dust Monitoring Locations :

<u>S.No.</u>	<u>Details of Location</u>		<u>Code No.</u>
1.	Checkpoint/ Ayyappa mandir	-	CDOA-1
2.	CHP	-	CDOA-2

Water Quality Monitoring Locations :

<u>S.No.</u>	<u>Details of Location</u>	<u>Code No.</u>
1.	Mine water discharge- Q-IV	- CDOW-1
2.	Mine water discharge – Q-II	- CDOW-2
3.	ETP (Workshop) treated water	- CD(ETP)W-3
4.	STP (Domestic Effluent) treated water	- CD(STP)W-4

Noise Level Monitoring Locations :

<u>S.No.</u>	<u>Details of Location</u>	<u>Code No.</u>
1.	CHP	- CDON-1
2.	Durgapur Colony	- CDON-2

Frequency of Monitoring :

- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :


- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc
- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sample
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the

field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.

SO₂ : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

Water : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Noise : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A17 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5
 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : CHANDRAPUR MONTH : JUNE
 NAME OF THE PROJECT : DURGAPUR OCP

Durgapur village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
02/06/2019	312	208	48	15	20
19/06/2019	321	164	41	27	17
TLV	200	100	60	80	80
Filter plant DOC/POC Colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
02/06/2019	348	139	37	14	15
19/06/2019	255	122	52	25	12
TLV	200	100	60	80	80
Manager office Q-IV					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
15/06/2019	246	157	56	17	5
30/06/2019	95	62	23	18	13
TLV	600	300	60	120	120
#-Above Std.Value					

Manager's office-Sector V					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NOx	SO _x
02/06/2019	401	284	65	11	17
19/06/2019	238	157	53	12	8
TLV	600	300	60	120	120

FUGITIVE DUST MOITORING DATA

1. Check post / Ayyappa Mandir

(24 hourly values in µg/m³)

Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
-	-	-	-
-	-	-	-

2. CHP

(24 hourly values in µg/m³)

Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
-	-	-	-
-	-	-	-

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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3) * - Test parameter not under NABL scope.
-

S.T.P. (Domestic Effluent) - Treated Water		
Date of Sample Collection	Analysis Results	
	TSS (mg/l) IS-3025/17:1984	BOD (3 days 27°C) mg/l
Below Detection Limit	10	2
18/06/2019	28	10.8
21/06/2019	40	12
TLV	100	30

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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3) * - Test parameter not under NABL scope.
-

NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : CHANDRAPUR MONTH. : JUNE
 NAME OF THE PROJECT : DURGAPUR OCP

Name of the Location		CHP	CDON 1	
Month	Date of Data collection	Noise Level in dB(A)		
		Day Time	Night Time	
JUNE.2019	12/06/2019	64.3	63.4	
JUNE.2019	25/06/2019	65.5	65.3	
TLV		75	70	

Name of the Location :Durgapur Colony - CDON-2			
Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	12/06/2019	42.5	42.4
JUNE.2019	25/06/2019	42.9	42.7
TLV		55	45

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The information given in this report is not to be communicated either directly or indirectly to the press or to any person not holding an official position in the CIL / Government

ENVIRONMENTAL MONITORING REPORT
HINDUSTAN LALPETH I & III UG
(CHANDRAPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014

AN ISO 9001:2015 COMPANY

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2.	AIR QUALITY MONITORING DATA	3-4
3.	EFFLUENT WATER QUALITY MONITORING DATA	5
4.	NOISE LEVEL DATA	6

INTRODUCTION

Location :

Hindustan Lalpeth -I & III Underground Projects are located in Chandrapur district of Maharashtra State and are administered by Chandrapur Area of Western Coalfields Limited.

Communication : The projects are situated near bye-pass link road in Chandrapur city.

Drainage :

Erai river acts as the main drainage of the area which flows from North to South and meets Wardha river.

Climate :

The climate of the area is dry to moist tropical. In summer, the temperature generally goes to a maximum of 48°C whereas in winter, it generally falls to a minimum of 10°C. The average annual rainfall is about 1200 mm.

Industry :

Besides other coal mines, Maharashtra Electroselt and twin Super Thermal Power Stations operated by MSEB falls in the vicinity of Hindustan Lalpeth UG Project.

Pollution due to other sources :

The above-mentioned industries are also likely to contribute in increasing the pollution load of the area.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Sub-station - Hindustan Lalpeth Colliery-I UG	- CHUA-1
2.	Pit office HLC – I Incline	- CHUA-2
3.	HLC III Colony	- CHUA-3
4.	Babupeth Area / Rajiv Gandhi Engg. College	- CHUA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge – HLP I UG	- CHUW-1
2.	Mine water discharge – HLP III UG	- CHUW-2

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near Fan House– HLP I UG	- CHUN-1
2.	Colony	- CHUN-2


Frequency of Monitoring :

- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM),

- Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc
- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sample
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A24 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NOx (06:2006), SO2 (02:2001)], SPM*, PM-2.5
 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : CHANDRAPUR MONTH : JUNE
 NAME OF THE PROJECT : HINDUSTAN LALPETH-I & III UG

Substation- HLC I UG					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
02/06/2019	436	165	33	12	13
19/06/2019	583	260	58	20	12
TLV	600	300	60	120	120
Pit office - HLC-I incline					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
03/06/2019	209	129	54	29	24
26/06/2019	145	73	32	16	18
TLV	600	300	60	120	120
HLC - III colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
12/06/2019	188	89	49	32	25
27/06/2019	81	54	39	19	17
TLV	200	100	60	80	80


Rajiv Gandhi Engg. College					
DATE OF SAMPLING	Parameters (24 hourly values in $\mu\text{g}/\text{m}^3$)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
12/06/2019	184	95	42	15	21
28/06/2019	118	82	45	20	22
TLV	200	100	60	80	80

Above Std. value.

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/W24
 NAME OF CUSTOMER: WCL, NAGPUR
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 1

DATE OF ISSUE: 05.08.19
 SAMPLE DESCRIPTION: WATER SAMPLE

EFFLUENT WATER QUALITY REPORT

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : CHANDRAPUR MONTH : JUNE
 NAME OF THE PROJECT : HLP-I & III UG

Mine water discharge HLP I UG				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
11/06/2019	7.40	32	24	<2
18/06/2019	7.10	32	30	<2
TLV	5.5 - 9.0	250	100	10
Mine water discharge HLP III UG				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
03/06/2019	7.80	40	36	<2
26/06/2019	6.80	36	28	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : CHANDRAPUR MONTH : JUNE
NAME OF THE PROJECT : HLP I & III UG

Name of the Location :Near Fan House – HLP I UG : CHUN 1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	12/06/2019	68.5	68.4
JUNE.2019	25/06/2019	67.5	67.4
TLV		75	70

Name of the Location :Colony - CHUN-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	12/06/2019	42.4	41.2
JUNE.2019	25/06/2019	42.5	42.2
TLV		55	45

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**ENVIRONMENTAL MONITORING REPORT
EXPN OF HINDUSTAN LALPETH OC
(CHANDRAPUR AREA)**

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014

AN ISO 9001:2015 COMPANY

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4.	NOISE LEVEL DATA	6

INTRODUCTION

Location :

Hindustan Lalpeth Opencast Project is located in Chandrapur district of Maharashtra State and is administered by Chandrapur Area of Western Coalfields Limited.

Communication : This project is situated in the Municipal Area of Chandrapur city.

Drainage :

Erai river acts as the main drainage of the area which flows from North to South and meets Wardha river.

Climate :

The climate of the area is dry to moist tropical. In summer, the temperature generally goes to a maximum of 48°C whereas in winter, it generally falls to a minimum of 10°C. The average annual rainfall is about 1200 mm.

Industry :

Besides other coal mines, Maharashtra Electroselt and twin Super Thermal Power Stations operated by MSEB falls in the vicinity of Hindustan Lalpeth Opencast Project.

Pollution due to other sources :

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.The above-mentioned industries are also likely to contribute in increasing the pollution load of the area.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	VTC	-	CHOA-1
2.	Between phase I & II seasonal mine	-	CHOA-2
3.	Colony (Nandgaon)	-	CHOA-3
4.	Mana Village	-	CHOA-4

Fugitive Dust Monitoring Location:

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Weigh Beidge	-	CHOAF-1
2.	Main CHP	-	CHOAF-2
3.	RLY Siding	-	CHOAF-3

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	CHOW-1
2.	Workshop (ETP) water discharge	-	CHO(ETP)W-2

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	CHP	-	CHON-1
2.	Colony	-	CHON-2

Frequency of Monitoring :

- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.


Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc
- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sample
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of

absorbance at 560 nm in the Spectrophotometer.

Water : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Noise : Noise level data are recorded fortnightly.

<p>Environment Laboratory CMPDI, RI IV, Nagpur</p>	<p>Test Report</p>	 <p>TC - 7102</p>
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 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : CHANDRAPUR MONTH : JUNE
 NAME OF THE PROJECT : HINDUSTAN LALPETH OCP

HLOC- Manager office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO_x	SO_x
04/06/2019	298	170	53	11	17
27/06/2019	105	78	38	12	17
TLV	600	300	60	120	120
# Above Std .value					
Manager office (Nandgaon)					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO_x	SO_x
04/06/2019	739	528	79	29	20
27/06/2019	135	86	51	21	11
TLV	600	300	60	120	120

Above Std .value

Colony(Nandgaon)					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOX
04/06/2019	259	159	58	8	16
27/06/2019	168	88	47	17	11
TLV	200	100	60	80	80

Mana village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOX
03/06/2019	195	98	52	33	23
26/06/2019	96	74	23	18	18
TLV	200	100	60	80	80

Above Std .val

FUGITIVE DUST MONITORING DATA

1. Weigh Bridge

(24 hourly values in µg/m³)

Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
04/06/2019	692	532	164
30/06/2019	133	82	22

2. Main CHP

(24 hourly values in µg/m³)

Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
12/06/2019	754	338	39

3. Rly Siding

(24 hourly values in µg/m³)

Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
-	-	-	-

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

Note: 1) This Report refers to the values related to the items tested as received.
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3) * - Test parameter not under NABL scope

NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : CHANDRAPUR MONTH : JUNE
NAME OF THE PROJECT : HLP OCP

Name of the Location : CHP : CHON 1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	12/06/2019	64.6	64.3
JUNE.2019	25/06/2019	63.5	62.9
TLV		75	70

Name of the Location : Colony - CHON-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	
JUNE.2019	12/06/2019	42.7	42.2
JUNE.2019	25/06/2019	43.2	43.1
TLV		55	45

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ENVIRONMENTAL MONITORING REPORT

MAHAKALI UG

(CHANDRAPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014

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MAHAKALI UNDERGROUND PROJECT

Location :

Mahakali Underground Project is located in Chandrapur District of Maharashtra State and is administered by Chandrapur Area of Western Coalfields Limited.

Climate :

The climate of the area is dry to moist tropical with well-defined summer from JUNE to June, rainy season from July to September and winter from December to MARuary. In summer, the temperature generally goes to a maximum of 48°C whereas in winter, it generally falls to a minimum of 10°C. The average annual rainfall is about 1200 mm.

Industry :

Besides other coalmines, Maharashtra Electroselt and twin Super Thermal Power Stations operated by MSEB falls in the vicinity of project area.

Pollution due to other sources :

The above-mentioned industries are also expected to contribute in increasing the pollution load of the area.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Manager Office (Mahakali UG)	- CMUA- 1
2.	Substation - CRC	- CMUA- 2
3.	Colony	- CMUA- 3
4.	Jatwara milk scheme	- CMUA- 4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- CMUW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	CHP	- CMUN-1
2.	Colony	- CMUN-2


Frequency of Monitoring :

- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc
- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5

- m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sample
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

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TEST REPORT NO. : RIN/TR/JUNE-19/A25 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5
 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : CHANDRAPUR MONTH : JUNE
 NAME OF THE PROJECT : MAHAKALI UG

Manager's office- Mahakali UG					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
14/06/2019	254	177	53	12	20
29/06/2019	122	84	39	23	15
TLV	600	300	60	120	120
CRC Substation / Filter plant					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
13/06/2019	348	132	58	12	10
29/06/2019	76	41	29	17	17
TLV	600	300	60	120	120
Colony (Mahakali)					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
14/06/2019	298	165	56	13	16
30/06/2019	194	138	29	18	15
TLV	200	100	60	80	80
#-Above std.value					

Jatwara milk scheme

DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
14/06/2019	67	31	20	10	16
29/06/2019	98	51	33	24	18
TLV	600	300	60	120	120

#-Above std.value

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : CHANDRAPUR MONTH : JUNE
NAME OF THE PROJECT : MAHAKALI UG

Name of the Location :Near Fan House -: CMUN 1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	13/06/2019	68.4	68.3
JUNE.2019	28/06/2019	66.5	66.9
TLV		75	70

Name of the Location :Colony - CMUN-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	13/06/2019	43.3	42.4
JUNE.2019	28/06/2019	54	42
TLV		55	45

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ENVIRONMENTAL MONITORING REPORT

MANA UG
(CHANDRAPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

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4.	NOISE LEVEL DATA	6

INTRODUCTION

Location :

Mana Underground Project is located in Chandrapur district of Maharashtra State and is administered by Chandrapur Area of Western Coalfields Limited.

Climate :

The climate of the area is dry to moist tropical with well-defined summer from JUNE to June, rainy season from July to September and winter from December to March. In summer, the temperature generally goes to a maximum of 48°C whereas in winter, it generally falls to a minimum of 10°C. The average annual rainfall is about 1200 mm.

Industry :

Besides other coalmines, Maharashtra Electroselt and twin Super Thermal Power Stations operated by MSEB falls in the vicinity of project area.

Pollution due to other sources :

The above-mentioned industries are also likely to contribute in increasing the pollution load of the area.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Manager's office	- CM _N UA-1
2.	Sub-station of Manna Incline	- CM _N UA-2
3.	Colony (Nandgaon)	- CM _N UA-3
4.	Manna village	- CM _N UA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- CM _N UW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Fan house	- CM _N UN-1
2.	Colony (HLOC)	- CM _N UN-2


Frequency of Monitoring :

- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc
- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust

- (size > 10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size < 10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration ($\mu\text{g}/\text{m}^3$) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sample
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations ($\mu\text{g}/\text{m}^3$) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium (Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

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TEST REPORT NO. : RIN/TR/JUNE-19/A20 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : CHANDRAPUR MONTH : JUNE
 NAME OF THE PROJECT : MANA UG


Manager's office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
03/06/2019	205	108	59	33	23
16/06/2019	87	52	21	16	14
TLV	600	300	60	120	120
Substation - Mana incline					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
03/06/2019	356	228	54	34	20
26/06/2019	104	52	16	13	11
TLV	600	300	60	120	120
Colony(Nandgaon)					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
04/06/2019	259	159	58	8	16
27/06/2019	168	88	47	17	11
TLV	200	100	60	80	80
# Above Std .value					

Mana village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	Nox	SOX
03/06/2019	195	98	52	33	23
26/06/2019	96	74	23	18	18
TLV	200	100	60	80	80

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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TEST REPORT NO. : RIN/TR/JUNE-19/W20 DATE OF ISSUE: 20.08.2019
NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: WATER SAMPLE
CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
NO. OF PAGES: 1

EFFLUENT WATER QUALITY REPORT

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : CHANDRAPUR MONTH : JUNE
NAME OF THE PROJECT : MANNA UG

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
13/06/2019	6.90	36	30	<2
26/06/2019	8.20	24	16	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : CHANDRAPUR MONTH : JUNE
NAME OF THE PROJECT : MANNA UG

Name of the Location :Near Fan House -: CM_NUN 1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	12/06/2019	67.5	67.4
JUNE.2019	25/06/2019	66.5	65.9
TLV		75	70

Name of the Location :Colony - CM_NUN-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	13/06/2019	43.3	42.4
JUNE.2019	28/06/2019	51.4	47.2
TLV		55	45

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ENVIRONMENTAL MONITORING REPORT

NANDGAON UG

(CHANDRAPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE - 2019

Environment Laboratory
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4.	NOISE LEVEL DATA	6

INTRODUCTION

Location :

Nandgaon Underground Project is located in Chandrapur district of Maharashtra State and is administered by Chandrapur Area of Western Coalfields Limited.

Climate :

The climate of the area is dry to moist tropical with well-defined summer from JUNE to June, rainy season from July to September and winter from December to MARuary. In summer, the temperature generally goes to a maximum of 48°C whereas in winter, it generally falls to a minimum of 10°C. The average annual rainfall is about 1200 mm.

Industry :

Besides other coalmines, Maharashtra Electros melt and twin Super Thermal Power Stations operated by MSEB falls in the vicinity of project area.

Pollution due to other sources :

The above-mentioned industries are also likely to contribute in increasing the pollution load of the area.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Manager office – Nandgaon UG	-	CNUA-1
2.	Colony	-	CNUA-2
3.	Sub-station - Manna Incline	-	CNUA-3
4.	Mana Village	-	CNUA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	CNUW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Fan house	-	CNUN-1
2.	Colony (HLOC)	-	CNUN-2


Frequency of Monitoring :

- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc
- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust

- (size > 10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size < 10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration ($\mu\text{g}/\text{m}^3$) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sample
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations ($\mu\text{g}/\text{m}^3$) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium (Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A21 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : CHANDRAPUR MONTH : JUNE
 NAME OF THE PROJECT : NANDGAON UG

Manager's office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
04/06/2019	739	528	79	9	20
27/06/2019	135	86	51	21	11
TLV	600	300	60	120	120
Colony(Nandgaon)					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
04/06/2019	259	159	58	8	16
27/06/2019	168	88	47	17	11
TLV	200	100	60	80	80
Substation - Mana incline					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
03/06/2019	356	228	54	34	20
26/06/2019	104	52	16	13	11
TLV	600	300	60	120	120
# Above Std .value					


Mana village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SO _x
03/06/2019	195	98	52	33	23
26/06/2019	96	74	23	18	18
TLV	200	100	60	80	80

Above Std .value

(Scientific Assistant)

Deepanshu Sahu
(Authorised signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/W21 DATE OF ISSUE: 05.08.2019
NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: WATER SAMPLE
CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
NO. OF PAGES: 1

EFFLUENT WATER QUALITY REPORT

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : CHANDRAPUR MONTH : JUNE
NAME OF THE PROJECT : NANDGAON UG

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
02/06/2019	6.70	32	22	<2
26/06/2019	7.90	48	36	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : CHANDRAPUR MONTH : JUNE
NAME OF THE PROJECT : NANDGAON UG

Name of the Location :Near Fan House --: CNUN 1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	12/06/2019	70.4	70.6
JUNE.2019	25/06/2019	70.2	69.9
TLV		75	70

Name of the Location :Colony - CNUN-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	13/06/2019	43.3	42.4
JUNE.2019	28/06/2019	54	43
TLV		55	45

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ENVIRONMENTAL MONITORING REPORT

PADMAPUR OC EXPN.

(CHANDRAPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE - 2019

Environment Laboratory

NABL Accredited vide Cert. No. TC-7102

CMPDI

**REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014**

AN ISO 9001:2015 COMPANY

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1.	INTRODUCTION	1-3
2.	AIR QUALITY MONITORING DATA	4-5
3.	EFFLUENT WATER QUALITY MONITORING DATA	6
4.	NOISE LEVEL DATA	7

INTRODUCTION

Location

Padmapur opencast project is located in Chandrapur district of Maharashtra state and is administered by Chandrapur area of Western Coalfields Limited.

Communication :

The project is situated 8 km away from Chandrapur city. The nearest railway station is Chandrapur (on Chennai-Delhi line about 7 km from the project).

Drainage :

The drainage of the area is controlled by Erairiver, (which flows to the west of the project) and Motaghatnalla, a seasonal tributary of Erai river, (which flows across the central part of the leasehold area of the project).

Climate :

Climate of the area is dry to moist tropical, temperature rising to a maximum of 48°C. during summer and falling to a minimum of 10°C during winter. Average annual rainfall is about 1200mm.

Other Industry :

Durgapur opencast project, Chandrapur Super Thermal Power Station (STPS) and Maharashtra Electro Smelter (MES) are the major industry, which fall in the vicinity of the project area.

Pollution due to other sources :

The above-mentioned industries viz; STPS and MES are likely to contribute in increasing the pollution load of area. Roadway dust is also causing lot of pollution in village area.

Sampling Locations:

Ambient Air Quality Monitoring Locations :

<u>S.No.</u>	<u>Details of Location</u>	<u>Code No.</u>
1.	Manager's office	- CPOA-1
2.	Filter plant DOC / POC	- CPOA-2
3.	Kitadi village	- CPOA-3
4.	Manager Office, Sec- V	- CPOA-4

Fugitive Dust Monitoring Locations :

<u>S.No.</u>	<u>Details of Location</u>	<u>Code No.</u>
1.	CHP/MGR loadingpoint	- CPOAF-1
2.	Weigh Bridge	- CPOAF-2

Water Quality Monitoring Locations :

<u>S.No.</u>	<u>Details of Location</u>	<u>Code No.</u>
1.	Mine water discharge - Q –IV	- CPOW-1
2.	Mine water discharge- Q –III	- CPOW-2
3.	ETP (Workshop) treated water	- CP(ETP)W-3

Noise Level Monitoring Locations :

<u>S.No.</u>	<u>Details of Location</u>	<u>Code No.</u>
1.	CHP	- CPON-1
2.	Colony (Durgapur)	- CPON-2


Frequency of Monitoring :

- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc
- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sample
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.

- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

<p>EnvironmentLaboratory CMPDI, RI IV, Nagpur</p>	<p>Test Report</p>	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A26 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED:IS-5182 [PM-10(04:1999), NOx (06:2006), SO2 (02:2001)], SPM*, PM-2.5
 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : CHANDRAPUR MONTH : JUNE
 MNAME OF THE PROJECT : PADMAPUR OCP

Manager office/Substation Q-IV					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOX
15/06/2019	246	157	56	17	5
30/06/2019	95	62	23	18	13
TLV	600	300	60	120	120
Filter plant DOC/POC Colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOX
02/06/2019	348	139	37	14	15
19/06/2019	255	122	52	25	12
TLV	200	100	60	80	80
#-Above Std. Valu					

Kitadi village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOX
15/06/2019	310	149	69	26	24
30/06/2019	128	94	48	15	10
TLV	200	100	60	80	80
#-Above Std. Value					
Manager's office-Sector V					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOX
02/06/2019	401	284	65	11	17
19/06/2019	238	157	53	12	8
TLV	600	300	60	120	120

FUGITIVE DUST MOITORING DATA

1. CHP/MRG loading point

(24 hourly values in µg/m³)

Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
-	-	-	-

2. Weigh Beidge


(24 hourly values in µg/m³)

Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
-	-	-	-

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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TEST REPORT NO. : RIN/TR/JUNE-19/W26 DATE OF ISSUE: 05.08.2019
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: WATER SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 1

EFFLUENT WATER QUALITY REPORT

NAME OF THE COMPANY : WCL YEAR: 2019
 NAME OF THE AREA : CHANDRAPUR MONTH : JUNE
 NAME OF THE PROJECT : PADMAPUR OC

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
14/06/2019	7.90	36	32	<2
30/06/2019	7.50	36	18	<2
TLV	5.5 - 9.0	250	100	10
ETP (Workshop) - Treated water sample				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
02/06/2019	7.60	24	32	<2
30/06/2019	7.60	40	38	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : CHANDRAPUR MONTH. : JUNE
 NAME OF THE PROJECT : PADMAPUR OCP

Name of the Location : CHP CPON 1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	12/06/2019	63.7	63.4
JUNE.2019	25/06/2019	62.8	62.5
TLV		75	70

Name of the Location :Durgapur Colony- CPON-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	12/06/2019	42.5	42.4
JUNE.2019	25/06/2019	42.9	42.7
TLV		55	45

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ENVIRONMENTAL MONITORING REPORT

DHORWASA OC EXPN.

(MAJRI AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102
CMPDI
REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014

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2.	AIR QUALITY MONITORING DATA	3-4
3.	EFFLUENT WATER QUALITY MONITORING DATA	5
4.	NOISE LEVEL DATA	6

INTRODUCTION

Location :

Dhorwasa OC is located in Chandrapur district of Maharashtra state. The project is administered by Majri Area of Western Coalfields Limited.

Communication :

The Project is well connected by rail & road communications. The nearest railway station is Bandak on Nagpur - Chandrapur sector of Central Railway main line about 6 kms away from the project.

Drainage :

The Wardha River is the main drainage channel for the surrounding area. A few seasonal nullahs drain the rainwater from the Area into Wardha River.

Climate :

The climate of the area is tropical. JUNE is the hottest month with temperature rising to a maximum of 48°C. December is the coldest month when the temperature falls down to 10°C.

Other Sources of Pollution :

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Telwasa security office	- MDOA-1
2.	Dhorwasa village	- MDOA-2
3.	Ekta Nagar Colony	- MDOA-3
4.	R.C. Office	- MDOA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- MDOW-1
2	DETP(Ekta Nagar) water discharge	- MDOW-2

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near Project Office	- MDON-1
2.	Ekta Nagar Colony	- MDON-2


Frequency of Monitoring :

- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.

- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5
 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : MAJRI MONTH : JUNE
 NAME OF THE PROJECT : DHORWASA OC


Telwasa security office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
09/06/2019	185	64	28	20	15
24/06/2019	80	55	32	21	14
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Dhorwasa village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
10/06/2019	188	92	47	20	13
23/06/2019	87	69	32	21	19
Permissible Limits	200	100	60	80	80
Ekta Nagar colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
08/06/2019	170	77	42	21	15
24/06/2019	88	61	23	22	17
Permissible Limits	200	100	60	80	80
#-Above Std. Value					

RC office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
10/06/2019	454	138	32	24	19
23/06/2019	117	95	35	21	16
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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3) * - Test parameter not under NABL scope.
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<p>Environment Laboratory CMPDI, RI IV, Nagpur</p>	<p>Test Report</p>	 <p>TC - 7102</p>
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TEST REPORT NO. : RIN/TR/JUNE-19/W55 DATE OF ISSUE: 05.08.2019
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: WATER SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 1

EFFLUENT WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : MAJRI MONTH : JUNE
 NAME OF THE PROJECT : DHORWASA OC

S.T.P. (Domestic Effluent) - Treated Water		
Date of Sample Collection	Analysis Results	
	TSS (mg/l) IS-3025/17:1984	BOD (3 days 27°C) mg/l
Below Detection Limit	10	2
07/06/2019	38	11
25/06/2019	42	10
TLV as per Env.(Protection) Amendment rule 2000	100	30

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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 3) * - Test parameter not under NABL scope.
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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : MAJRI MONTH : JUNE
 NAME OF THE PROJECT : DHORWASA OCP
Name of the Location : Near Manager Office – MDON-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	
JUNE.2019	07/06/2019	44.6	43.2
JUNE.2019	22/06/2019	45.0	44.3
TLV		75	70

Name of the Location : Ekta Nagar Colony - MDON-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	
JUNE.2019	07/06/2019	42.7	41.3
JUNE.2019	22/06/2019	43.4	42.6
TLV		55	45

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ENVIRONMENTAL MONITORING REPORT

JUNA KUNADA OCP

(MAJRI AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014

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2.	AIR QUALITY MONITORING DATA	3-4
3.	NOISE LEVEL DATA	5

INTRODUCTION

Location :

Juna Kunada OC is located in Chandrapur district of Maharashtra state. The project is administered by Majri Area of Western Coalfields Limited.

Communication :

Juna Kunada OC Project is well connected by both rail & road communications. The nearest railway station is Bandak on Nagpur - Chandrapur sector of Central Railway main line.

Drainage :

The Wardha River is the main drainage channel for the surrounding area.

Climate :

The climate of the area is tropical. JUNE is the hottest month with temperature rising to a maximum of 48°C. December is the coldest month when the temperature falls down to 10°C.

Other Sources of Pollution :

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Pit Office– Juna Kunada OC	MJOA-1
2.	Ekta Nagar Colony	MJOA-2
3.	Chargaon Intake Well	MJOA-3
4.	Chargaon SAM Office	MJOA-4

Fugitive Dust Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Rly siding	MJOAF-1

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	MJOW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near Project Office	MJON-1
2.	Ekta Nagar Colony	MJON-2

Frequency of Monitoring :

Air : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.

SPM/ PM-10 : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust

(size > 10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size < 10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration ($\mu\text{g}/\text{m}^3$) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.

PM2.5 : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations ($\mu\text{g}/\text{m}^3$) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.

Heavy Metals : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium (Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.

NO_x : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.

SO₂ : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

Water : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Noise : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A50 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*,
 PM-2.5 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : MAJRI MONTH : JUNE
 NAME OF THE PROJECT : JUNA KUNADA OCP

Pit Office JKOC					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
09/06/2019	254	113	51	22	17
25/06/2019	73	58	29	21	18
TLV	600	300	60	120	120
Ekta Nagar colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
08/06/2019	170	77	42	21	15
24/06/2019	88	61	23	22	17
TLV	200	100	60	80	80
SAM office Chargaon					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
09/06/2019	335	149	54	20	15
25/06/2019	95	64	27	12	11
TLV	600	300	60	120	120
<i># Above Std. value.</i>					

Chargaon Intake well					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
08/06/2019	181	107	43	21	19
25/06/2019	89	62	25	22	17
TLV	600	300	60	120	120

Above Std. value.

FUGITIVE DUST MONITORING DATA

Chargaon CHP			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
09/06/2019	905	404	79

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : MAJRI MONTH : JUNE
 NAME OF THE PROJECT : JUNA KUNADA OCP

Name of the Location : Manager office - MJON-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	07/06/2019	45.2	44.5
JUNE.2019	22/06/2019	44.6	43.2
TLV		75	70

Name of the Location : Ekta Nagar Colony - MJON-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	07/06/2019	42.7	41.3
JUNE.2019	22/06/2019	43.4	42.6
TLV		55	45

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ENVIRONMENTAL MONITORING REPORT

NAVIN KUNADA EXPN. OC
(MAJRI AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

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1.	INTRODUCTION	1-2
2.	AIR QUALITY MONITORING DATA	3-4
3.	NOISE LEVEL DATA	5

INTRODUCTION

Location :

Navin Kunada OC is located in Chandrapur district of Maharashtra state. The project is administered by Majri Area of Western Coalfields Limited.

Communication :

Navin Kunada OC Project is well connected by both rail & road communications. The nearest railway station is Bandak on Nagpur - Chandrapur sector of Central Railway main line.

Drainage :

The Wardha River is the main drainage channel for the surrounding area.

Climate :

The climate of the area is tropical. JUNE is the hottest month with temperature rising to a maximum of 48°C. December is the coldest month when the temperature falls down to 10°C.

Other Sources of Pollution :

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Chargaon Intake well Near	MNOA-1
2.	Ekta Nagar colony	MNOA-2
3.	Near Deulwada village	MNOA-3
4.	Chargaon SAM Office	MNOA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	MNOW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near Project Office/CHP	MNON-1
2.	Ekta Nagar Colony	MNON-2

Frequency of Monitoring :

Air : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.


Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.

SPM/ PM-10 : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust

(size > 10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size < 10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration ($\mu\text{g}/\text{m}^3$) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.

- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations ($\mu\text{g}/\text{m}^3$) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium (Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A51 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NOx (06:2006), SO2 (02:2001)], SPM*, PM-2.5 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : MAJRI MONTH : JUNE
 NAME OF THE PROJECT : NAVIN-KUNADA OCP

Chargaon Intake well					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
08/06/2019	181	107	43	21	19
25/06/2019	89	62	25	22	17
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Ekta Nagar colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
08/06/2019	170	77	42	21	15
24/06/2019	88	61	23	22	17
Permissible Limits	200	100	60	80	80
Near Deulwada village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
08/06/2019	190	96	46	20	7
25/06/2019	92	75	45	18	10
Permissible Limits	200	100	60	80	80

#-Above Std Value.

SAM Office Chargaon					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
09/06/2019	335	149	54	20	15
25/06/2019	95	64	27	12	11
Permissible Limits	600	300	60	120	120

#-Above Std Value.

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : MAJRI MONTH : JUNE
NAME OF THE PROJECT : NAVIN-KUNADA OCP

Name of the Location : Chargaon CHP - MNON-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	07/06/2019	48.5	47.6
JUNE.2019	25/06/2019	55.4	54.1
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75	70

Name of the Location : Ekta Nagar Colony- MNON-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	07/06/2019	42.7	41.3
JUNE.2019	22/06/2019	43.4	42.6
Noise Level Standard as per Env. (Protection) Amendment rule 2000		55	45

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ENVIRONMENTAL MONITORING REPORT

NEW MAJRI UG to OC

(MAJRI AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

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3.	EFFLUENT WATER QUALITY MONITORING DATA	5
5.	NOISE LEVEL DATA	6

INTRODUCTION

Location :

New Majri UG to OC Project is located in Chandrapur district of Maharashtra state. The project is administered by Majri Area of Western Coalfields Limited.

Communication :

Project is well connected by both rail & road communications. New Majri railway station is the nearest railway station.

Drainage :

The Wardha river is the main drainage channel for the surrounding area.

Climate :

The climate of the area is tropical. JUNE is the hottest month with temperature rising to a maximum of 48°C. December is the coldest month when the temperature falls down to 10°C.

Other Sources of Pollution :

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	NMOC Substation	-	MMUA-1
2.	Kuchana Colony	-	MMUA-2
3.	Patala Magazine	-	MMUA-3
4.	Manager Office- UG to OC	-	MMUA-4

Fugitive Dust Monitoring locations :

1.	Rly. Siding	-	MMUAF-1
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Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	MMUW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Fan house, New Majri UG	-	MMUN-1
2.	Colony	-	MMUN-2

Frequency of Monitoring :

Air : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of

nitrogen (NO_x) etc.

SPM/ PM-10 : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.

PM2.5 : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.


Heavy Metals : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.

NO_x : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.

SO₂ : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

Water : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Noise : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A53 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NOx (06:2006), SO2 (02:2001)], SPM*, PM-2.5 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : MAJRI MONTH : JUNE
 NAME OF THE PROJECT : NEW MAJRI-UG to OC

NMOC Substation					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
07/06/2019	295	140	26	21	15
27/06/2019	92	57	25	22	17
TLV	600	300	60	120	120
Kuchana Colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
07/06/2019	193	97	48	21	10
21/06/2019	91	75	33	18	10
23/06/2019	149	97	16	11	12
26/06/2019	83	50	35	21	15
27/06/2019	75	45	20	12	13
Permissible Limits	200	100	60	80	80
Patala Magazine					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
07/06/2019	311	146	56	20	15
26/06/2019	129	79	38	21	13
TLV	600	300	60	120	120

# Above Std. Value.					
New Majri UG to OC- Manager Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
08/06/2019	401	246	56	21	17
26/06/2019	154	86	41	21	10
TLV	600	300	60	120	120

Above Std. Value


FUGITIVE DUST MONITORING DATA

1.Rly. Siding			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
-	-	-	-

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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- Note: 1) This Report refers to the values related to the items tested as received.
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 3) * - Test parameter not under NABL scope.
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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/W53 DATE OF ISSUE: 05.08.2019
NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: WATER SAMPLE
CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
NO. OF PAGES: 1

EFFLUENT WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : MAJRI MONTH : JUNE
NAME OF THE PROJECT : NEW MAJRI UG to OC

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
07/06/2019	7.60	40	38	<2
24/06/2019	7.50	32	40	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : MAJRI MONTH : JUNE
NAME OF THE PROJECT : NEW MAJRI UG TO OC
Name of the Location : Fan House (New Majri UG) - MMUN-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	08/06/2019	49.7	48.5
JUNE.2019	25/06/2019	43.2	42.0
TLV		75	70

Name of the Location : Colony

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	-	-	-
JUNE.2019	25/06/2019	42.8	41.2
TLV		55	45

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ENVIRONMENTAL MONITORING REPORT

TELWASA OC EXPN.

(MAJRI AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014

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3.	EFFLUENT WATER QUALITY MONITORING DATA	5-6
4.	NOISE LEVEL DATA	7

INTRODUCTION

Location :

Telwasa OC is located in Chandrapur district of Maharashtra state. The project is administered by Majri Area of Western Coalfields Limited.

Communication :

The Telwasa OC Project is well connected by rail & road communications. The nearest railway station is Bandak on Nagpur - Chandrapur sector of Central Railway main line about 6 kms away from the project.

Drainage :

The Wardha River is the main drainage channel for the surrounding area. A few seasonal nullahs drain the rainwater from the Area into Wardha River.

Climate :

The climate of the area is tropical. JUNE is the hottest month with temperature rising to a maximum of 48°C. December is the coldest month when the temperature falls down to 10°C.

Other Sources of Pollution :

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Telwasa security Office	-	MTOA-1
2.	SAM Office	-	MTOA-2
3.	Chargaon village	-	MTOA-3
4.	Ekta Nagar Colony	-	MTOA-4

Fugitive Dust Monitoring Location:

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1	Ground StockYard	-	MTOA-1
2.	Weigh Bridge	-	MTOA-2

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	MTOW-1
2.	Workshop (ETP) water discharge	-	MTOW-2

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Near Project Office	-	MTON-1
2.	Ekta Nagar Colony	-	MTON-2

Frequency of Monitoring :

Air : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.


Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected

- locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A54 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5
 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : MAJRI MONTH : JUNE
 NAME OF THE PROJECT : TELWASA OC

Telwasa security office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
09/06/2019	185	64	28	20	15
24/06/2019	80	55	32	21	14
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
SAM Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
10/06/2019	192	103	56	21	10
24/06/2019	88	64	33	22	13
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Chargaon village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
10/06/2019	185	94	43	22	17
26/06/2019	80	50	27	21	11
Permissible Limits	200	100	60	80	80

#-Above Std.Value

Ekta Nagar colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NOx	SOx
08/06/2019	170	77	42	21	15
24/06/2019	88	61	23	22	17
Permissible Limits	200	100	60	80	80

#-Above Std.Value

FUGITIVE DUST MONITORING DATA

1. Ground stock yard

(24 hourly values in µg/m³)

Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
-	-	-	-

2. Weigh Bridge

(24 hourly values in µg/m³)

Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
24/06/2019	90	50	26

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2018
 NAME OF THE AREA : MAJRI MONTH : JUNE
 NAME OF THE PROJECT : TELWASA OCP

Name of the Location : Pit office - MTON-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	07/06/2019	45.2	44.7
JUNE.2019	22/06/2019	51.7	50.4
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75	70

Name of the Location : Ekta Nagar Colony - MTON-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	07/06/2019	42.7	41.3
JUNE.2019	22/06/2019	43.4	42.6
Permissible Limit		55	45

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ENVIRONMENTAL MONITORING REPORT

YEKONA I & II OC .

(MAJRI AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE-2019

Environment Laboratory
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4.	NOISE LEVEL DATA	8

INTRODUCTION

Location :

Yekona I & II OC is located in Chandrapur district of Maharashtra state. The project is administered by Majri Area of Western Coalfields Limited.

Communication :

The Project is well connected by rail & road communications. The nearest railway station is Bandak on Nagpur - Chandrapur sector of Central Railway main line.

Drainage :

The Wardha River is the main drainage channel for the surrounding area. A few seasonal nullahs drain the rainwater from the Area into Wardha River.

Climate :

The climate of the area is tropical. JUNE is the hottest month with temperature rising to a maximum of 48°C. December is the coldest month when the temperature falls down to 10°C.

Other Sources of Pollution :

Transportation roads, agricultural and local activities, vehicular traffic etc also contributes to the pollution.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Panzurni Village	- MYOA-1
2.	Ashti village	- MYOA-2
3.	Sansakar Bharti School	- MYOA-3
4.	Pit Office	- MYOA-4

Water Quality Monitoring location:

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- MYOW-1

Noise Level Monitoring location:

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near Pit Office	- MYON-1

Frequency of Monitoring :

Air : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.


Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.

SPM/ PM-10 : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust

(size > 10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size < 10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration ($\mu\text{g}/\text{m}^3$) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.

- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations ($\mu\text{g}/\text{m}^3$) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A56 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5
 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : MAJRI MONTH : JUNE
 NAME OF THE PROJECT : YEKONA I & II OC

Penzurni Village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
11/06/2019	368	240	53	21	16
23/06/2019	96	56	31	19	17
TLV	200	100	60	80	80
#-Above Std. Value.					
Ashti Village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
11/06/2019	104	77	41	20	20
21/06/2019	85	54	35	17	10
TLV	200	100	60	80	80
Sanskar Bharti					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
11/06/2019	195	98	47	21	25
21/06/2019	101	82	32	22	17
TLV	200	100	60	80	80
#-Above Std. Value.					


Pit Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
11/06/2019	280	144	51	22	16
21/06/2019	88	52	29	21	14
TLV	600	300	60	120	120

Above Std. Value.

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 T - 2969
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TEST REPORT NO. : RIN/TR/JUNE-19/W56 DATE OF ISSUE: 05.08.2019
NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: WATER SAMPLE
CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
NO. OF PAGES: 1

EFFLUENT WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : MAJRI MONTH : JUNE
NAME OF THE PROJECT :YEKONA I & II OC

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
10/06/2019	8.30	32	34	<2
20/06/2019	7.90	40	48	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : MAJRI MONTH : JUNE
NAME OF THE PROJECT : YEKONA I & II OC

Name of the Location : Pit Office MYON-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	08/06/2019	54.3	52.6
JUNE.2019	22/06/2019	55.4	54.6
TLV		75	70

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ENVIRONMENTAL MONITORING REPORT

NEW MAJRI-II(A) OC EXPN.

(MAJRI AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE - 2019

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INTRODUCTION

Location :

New Majri (A) OC is located in Chandrapur district of Maharashtra state. The project is administered by Majri Area of Western Coalfields Limited.

Communication :

The Project is well connected by both rail & road communication. New Majri railway station, about 2 kms away is the nearest railway station. Project is about 175 km away from Nagpur, on Wardha - Kazipeth line of Central Railway.

Drainage :

The Wardha river is the main drainage channel for the surrounding area. The Konda and Sirna nalla flowing to the North and East of the New Majri area discharge into the Wardha River.

Climate :

The climate of the area is tropical. JUNE is the hottest month with temperature rising to a maximum of 48°C. December is the coldest month when the temperature falls down to 10°C.

Other Sources of Pollution :

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	NMOC Substation	-	MMOA-1
2.	Patala Magazine	-	MMOA-2
3.	Kuchna colony	-	MMOA-3
4.	Majri Basti	-	MMOA-4

Fugitive Dust Monitoring locations :

1.	Field Maint.Shed at Sec	-	MMOAF-1	
2.	NMOC CHP	-		MMOAF-2

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	MMOW-1
2.	Workshop (ETP) water discharge	-	MMOW-2

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Field main. Shed	-	MMON-1
2.	Colony	-	MMON-2

Frequency of Monitoring :

Air : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.


Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.

- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A52 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5
 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : MAJRI MONTH : JUNE
 NAME OF THE PROJECT : NEW MAJRI (A) OCP

NMOC Substation					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO_x	SO_x
07/06/2019	295	140	26	21	15
27/06/2019	92	57	25	22	17
TLV	600	300	60	120	120
Patala Magazine					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO_x	SO_x
07/06/2019	311	146	56	20	15
26/06/2019	129	79	38	21	13
TLV	600	300	60	120	120
Kuchana Colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO_x	SO_x
07/06/2019	193	97	48	21	10
21/06/2019	91	75	33	18	10
23/06/2019	149	97	16	11	12
26/06/2019	83	50	35	21	15
27/06/2019	75	45	20	12	13
TLV	200	100	60	80	80

Primary Health Center, Majri Basti					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
07/06/2019	98	49	25	17	9
27/06/2019	95	72	39	22	20
TLV	200	100	60	80	80

Above Std. Value

FUGITIVE DUST MONITORING DATA


1. Field Maint. Shed at Sec			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
-	-	-	-

2. NMOC CHP.			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
-	-	-	-

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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 3) * - Test parameter not under NABL scope.
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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	
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TEST REPORT NO. : RIN/TR/JUNE-19/W52 DATE OF ISSUE: 05.08.2019
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: WATER SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19

EFFLUENT WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : MAJRI MONTH : JUNE
 NAME OF THE PROJECT : NEW MAJRI(A) OC

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
06/06/2019	8.10	12	68	<2
24/06/2019	8.00	20	70	<2
TLV	5.5 - 9.0	250	100	10
E.T.P.(Workshop)Treated Water				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
06/06/2019	7.80	36	40	<2
24/06/2019	7.60	56	52	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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ENVIRONMENTAL MONITORING REPORT

ADASA UG EXPN.

(NAGPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014

AN ISO 9001:2015 COMPANY

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2.	AIR QUALITY MONITORING DATA	4-5
3.	EFFLUENT WATER QUALITY MONITORING DATA	6
4.	NOISE LEVEL DATA	7

INTRODUCTION

Location :

Adasa UG mine is situated in Nagpur District of Maharashtra State and is administered by the Nagpur area of the Western Coalfields Limited.

Communication :

The project area is well connected by all weathered metalled road both to the nearest tahsil town Saoner and district headquarter Nagpur. Saoner railway station, situated on the Nagpur – Chhindawara narrow gauge railway line is at a distance of about 8 Kms. from the block.

Drainage :

The drainage of the project area is controlled by the easterly flowing Kolar and Chandrabhaga Rivers.

Climate :

The area has tropical climate with very hot summer. The temperature rises as high as 48°C in summer. The average annual rainfall is about 1050 mm. The monsoon period is between June to Sept.

Pollution due to other sources :

There are a few small industries near the town. There is no major industry, other than Saoner coal mines, near to the project. The state highway and road to Kalmeshwar, which is very busy due to vehicular movement, produce lot of dust. Transportation roads, agricultural and local activities, vehicular traffic etc also contributes to the pollution.

The above-mentioned industries are also expected to contribute in increasing the pollution load of the area. The air pollution due to working of the UG mine is insignificant.

Sampling Location :

Ambient Air Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	At Pathakhedi GP Office	- NAUA-1
2.	Project Manager office	- NAUA-2
3.	Colony (W.T.Plant)	- NAUA-3
4.	Kotodi village	- NAUA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- NAUW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near Fan House	- NAUN-1
2.	Manager Office	- NAUN-2
3.	Colony (Saoner)	- NAUN-3

Frequency of Monitoring :

Air : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	<h1>Test Report</h1>	 TC-7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A1 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : NAGPUR MONTH. : JUNE
 NAME OF THE PROJECT : ADASA UG

At Pathakhedi GP Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
08/06/2019	195	155	57	17	28
26/06/2019	61	20	12	22	21
TLV	200	100	80	80	60
Project Manager office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
08/06/2019	147	114	54	25	24
26/06/2019	84	52	21	28	25
TLV	600	300	120	120	60
# - Above std. value.					
Colony –Water filter plant					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
07/06/2019	276	102	41	36	21
25/06/2019	109	75	30	27	22
TLV	200	100	80	80	60
#-Above Std. Value					


Kotodi village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SO _x
08/06/2019	348	157	48	26	26
26/06/2019	110	85	41	36	16
TLV	200	100	80	80	60

- Above std. value.

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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TEST REPORT NO. : RIN/TR/JUNE-19/W1 DATE OF ISSUE: 05.08.19
NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: WATER SAMPLE
CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
NO. OF PAGES: 1

EFFLUENT WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR 2019
NAME OF THE AREA : NAGPUR MONTH JUNE
NAME OF THE PROJECT : ADASA UG

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
08/06/2019	7.30	24	14	<2
25/06/2019	8.70	32	22	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY: WCL
NAME OF THE AREA : NAGPUR
NAME OF THE PROJECT : ADASA UG

YEAR : 2019
MONTH : JUNE

Name of the Location : Near Fan House - NAUN-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	08/06/2019	68.7	67.6
JUNE.2019	24/06/2019	70.2	68.4
TLV		75	70

Name of the Location : Near Manager Office – NAUN-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	08/06/2019	54.2	53.4
JUNE.2019	24/06/2019	50.6	49.1
TLV		75	70

Name of the Location : Colony (Saoner) - NAUN-4

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	08/06/2019	42.4	41.2
JUNE.2019	24/06/2019	44.2	43.1
TLV		55	45

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**ENVIRONMENTAL MONITORING REPORT
BHANEGAON OCP
(NAGPUR AREA)
WESTERN COALFIELDS LTD.**

(JOB No. 8000002)



JUNE - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014

AN ISO 9001:2015 COMPANY

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INTRODUCTION

Location :

The Bhanegaon opencast project is located in Nagpur district of Maharashtra state and administered by Nagpur area of Western Coalfields Ltd.

Communication :

The mine is situated in Kamptee coalfield adjoining GondegaonOC. This area is approachable by all weather road. Kanhan is the nearest railway station which is on Howrah-Mumbai main line of South Eastern Railway.

Drainage : Kanhan river acts as the main drainage channel of the area.

Climate :

The climate of the area is tropical. The temperature rises as high as 47°C in summer. In winter temperature is ranging about 22°C. Monsoon period is generally from June to September. Annual rainfall is about 1000mm.

Other Industry/Coal Mines :

Besides other coal mines viz. Kamptee OC, Inder OC, Gondegaon OC, Ferro Alloys Plants are the major industries in the vicinity of the project area.

Pollution due to other sources:

The above-mentioned industries are also expected to contribute in increasing the pollution load of the area. Transportation road, Vehicular traffic, Agricultural and local activities etc., also contribute to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Bina Village	- NBOA-1
2.	Dorli Village	- NBOA-2
3.	Near Manager Office	- NBOA-3
4.	Near Mandir -Sangam	- NBOA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- NBOW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near Contractor Camp	- NBON-1

Frequency of Monitoring :

Air : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

Water : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Noise : Noise level data are recorded fortnightly.


Near Mandir -Sangam					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SO _x
04/06/2019	275	152	59	34	17
28/06/2019	75	37	21	24	21
TLV	200	100	60	80	80

- Above Std. Value.

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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TEST REPORT NO. : RIN/TR/JUNE-19/W2 DATE OF ISSUE: 05.08.2019
NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: WATER SAMPLE
CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
NO. OF PAGES: 1

EFFLUENT WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR 2019
NAME OF THE AREA : NAGPUR MONTH JUNE
NAME OF THE PROJECT : BHANEGAON OC

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
03/06/2019	8.20	32	22	<2
27/06/2019	8.50	24	16	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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2) This Report cannot be reproduced in part or full without written permission of the management.
3) * - Test parameter not under NABL scope.

NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : NAGPUR MONTH : JUNE
NAME OF THE PROJECT : BHANEGAON OC

Name of the Location : Contractor camp - NBON-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	10/06/2019	53.6	52.4
JUNE.2019	26/06/2019	54.2	53.4
TLV		75	70

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The information given in this report is not to be communicated either directly or indirectly to the press or to any person not holding an official position in the CIL / Government

**ENVIRONMENTAL MONITORING REPORT
GONDEGAON EXTN. OC**

(NAGPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014

AN ISO 9001:2015 COMPANY

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4.	NOISE LEVEL DATA	9

INTRODUCTION

Location :

The Gondegaon opencast mine is located in Nagpur district of Maharashtra state and administered by Nagpur area of Western Coalfields Ltd.

Communication :

The mine is situated in Kamptee coalfield adjoining Inder Colliery and Kanhan river. This area is approachable by all weather road. Kanhan is the nearest railway station which is on Howrah-Mumbai main line of South Eastern Railway.

Drainage : Kanhan river acts as the main drainage channel of the area.

Climate :

The climate of the area is tropical. The temperature rises as high as 47°C in summer. In winter temperature is ranging about 22°C. Monsoon period is generally from June to September. Annual rainfall is about 1000mm.

Other Industry/Coal Mines :

Besides other coal mines viz. Kamptee OC, Inder OC, Ferro Alloys Plants are the major industries in the vicinity of the project area.

Pollution due to other sources :

The above-mentioned industries are also expected to contribute in increasing the pollution load of the area. The air pollution due to working of the UG mine is insignificant. Transportation road, Vehicular traffic, Agricultural and local activities etc., also contribute to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Colony/ Guest house	- NGOA-1
2.	Ghatrohna village	- NGOA-2
3.	Gondegaon village school	- NGOA-3
4.	Near Substation	- NGOA-4

Fugitive Dust Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Security Check Post / W Bridge	- NGOAF-1

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- NGOW-1
2.	Workshop water (treated) discharge	- NGOW-2

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	CHP	- NGON-1

- | | |
|----------------------------|----------|
| 2. Colony/Gondegao Village | - NGON-2 |
| 3. Ghatrohna Village | - NGON-3 |
| 4. Juni Kamptee Village | - NGON-4 |

Frequency of Monitoring :

- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :


- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size > 10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size < 10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated

by converting it to Sulphuric acid with Hydrogen peroxide before analysis.

SO₂ : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

Water : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Noise : Noise level data are recorded fortnightly.

<p>Environment Laboratory CMPDI, RI IV, Nagpur</p>	<p>Test Report</p>	 TC-7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A3 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : NAGPUR MONTH : JUNE
 NAME OF THE PROJECT : GONDEGAON OC

Colony/ Guest house						
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)					
	SPM*	PM-10	PM-2.5	NO _x	SO _x	
04/06/2019	192	94	43	30	22	
27/06/2019	125	83	49	35	15	
TLV	200	100	60	80	80	
# - Above Std. value.						
Ghatrohna village						
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)					
	SPM*	PM-10	PM-2.5	NO _x	SO _x	
04/06/2019	348	221	47	39	15	
26/06/2019	229	92	43	28	16	
TLV	200	100	60	80	80	
# - Above Std. value						
Gondegaon village school						
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)					
	SPM*	PM-10	PM-2.5	NO _x	SO _x	
04/06/2019	253	173	58	42	17	
27/06/2019	350	188	47	35	17	
TLV	200	100	60	80	80	
# - Above Std. value						

Near Substation					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NOx	SOx
04/06/2019	571	286	58	29	20
26/06/2019	193	85	28	29	17
TLV	600	300	60	100	100

FUGITIVE DUS MONITORING DATA

1. Security check post/ W.Bridge


(24 hourly values in µg/m³)

Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
27/06/2019	795	347	39

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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Test Report NO : RIN/TR/JUNE'19/W3 Date of Issue : 05/08/2019
 Name of the Customer: WCL, Nagpur Sampling method : IS-5182
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-522 Sample Description :water
 DATED-18.04.19 sample
 No. of pages :1

EFFLUENT WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR 2019
 NAME OF THE AREA : NAGPUR MONTH JUNE
 NAME OF THE PROJECT : GONDEGAON OC

Mine Water Discharge				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
03/06/2019	7.60	28	18	<2
25/06/2019	8.50	36	28	<2
TLV	5.5 – 9.0	250	100	10

Workshop Effluent (WETP) Water discharge				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
02/06/2019	8.10	36	26	<2
25/06/2019	8.80	28	18	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : NAGPUR MONTH : JUNE
 NAME OF THE PROJECT : GONDEGAON OCP

Name of the Location : CHP - NGON-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	10/06/2019	66.4	65.6
JUNE.2019	26/06/2019	66.2	65.4
TLV		75	70

Name of the Location : Gondegaon Village /Colony- NGON-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	10/06/2019	41.3	40.4
JUNE.2019	26/06/2019	42.6	41.7
TLV		55	45

Name of the Location : Ghatrohna Village- NGON-3

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	10/06/2019	43.6	42.7
JUNE.2019	26/06/2019	40.4	40.6
TLV		55	45

Name of the Location : Juni Kamptee Village - NGON-4

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	10/06/2019	42.2	41.4
JUNE.2019	26/06/2019	43.2	42.3
TLV		55	45

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ENVIRONMENTAL MONITORING REPORT

INDER UG TO OC EXPN.

(NAGPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE- 2019

Environment Laboratory

NABL Accredited vide Cert. No. TC-7102

CMPDI

**REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014**

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4.	NOISE LEVEL DATA	7

INTRODUCTION

Location :

Inder UG to OC Project is situated about 35 kms from Nagpur in Maharashtra State and is administered by the Nagpur Area of the Western Coalfields Limited.

Communication :

This area is approachable by all weather road. Nagpur – Jabalpur State highway is about 5 km from the Colliery. Kanhan is the nearest Railway Station, which is on Howrah - Mumbai main line of South Eastern railway.

Drainage : Kanhan river acts as the main drainage channel of the area.

Climate :

The climate of this area is tropical. The temperature rises as high as 47°C in summer. Winter is mild with temperature ranging about 22°C. Monsoon period is generally from June to September. Annual rainfall is about 1000 mm.

Industry/Coal Mines :

Khandelwal tube and Khandelwal Ferro Alloys are about 8 kms from the mine. Kamptee OC mine and Gondegaon OC mine are near to this project.

Pollution due to other sources :

The above-mentioned industries are also expected to contribute in increasing the pollution load of the area. The air pollution due to working of the UG mine is insignificant. Transportation road, Vehicular traffic, Agricultural and local activities etc., also contribute to the pollution load of the area.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	CMPDI Tekadi Camp	-	NIOA-1
2.	Near pit no. 6/ Manager office	-	NIOA-2
3.	G.P. office- Kandri	-	NIOA-3
4.	Colony-Water treatment plant	-	NIOA-3

Fugitive Dust Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	W Bridge	-	NIOAF-1
2.	Near Coal Stock Yard	-	NIOAF-2

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	NIOW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Project Office	-	NION-1


Frequency of Monitoring :

Air : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

- Water** : Water quality is monitored on fortnightly basis.
Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler and Fine Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x), PM-2.5 etc.
- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fibre Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- PM-2.5** Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N (1-naphthyl) ethylenediaminedihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A4 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. :WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED:IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : NAGPUR MONTH : JUNE
 NAME OF THE PROJECT : INDER OC

CMPDI Tekadi Camp					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
02/06/2019	492	236	58	35	26
25/06/2019	98	56	31	30	16
TLV	600	300	60	120	120
Near pit no. 6/ Manager office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
02/06/2019	472	288	58	32	16
25/06/2019	163	129	18	32	25
TLV	600	300	60	120	120
G.P. office- Kandri					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
03/06/2019	99	64	30	28	21
25/06/2019	340	163	44	38	18
TLV	200	100	60	80	80
# - Above Std. value.					

Colony-Water treatment plant					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
03/06/2019	119	67	35	34	16
26/06/2019	328	217	49	35	21
TLV	200	100	60	80	80

- Above Std. value.

FUGITIVE DUST MONITORING DATA

1. Weigh Bridge

(24 hourly values in µg/m³)

Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
03/06/2019	1747	954	41

2. Inder near coal stock yard


(24 hourly values in µg/m³)

Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
02/06/2019	2164	1349	64

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	
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TEST REPORT NO. : RIN/TR/JUNE-19/W4 DATE OF ISSUE : 05.08.19
NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: WATER SAMPLE
CUSTOMER LETTER REF. NO. :WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
NO. OF PAGES: 1

EFFLUENT WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR 2019
NAME OF THE AREA : NAGPUR MONTH JUNE
NAME OF THE PROJECT : INDER OC

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
02/06/2019	7.90	24	14	<2
25/06/2019	8.20	20	12	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : NAGPUR MONTH. : JUNE.
NAME OF THE PROJECT : INDER UG TO OC

Name of the Location : R.C. Office - NION-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	10/06/2019	52.7	53.8
JUNE.2019	26/06/2019	54.6	53.7
TLV		75	70

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ENVIRONMENTAL MONITORING REPORT

KAMPTEE UG TO OC

(NAGPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE- 2019

Environment Laboratory

NABL Accredited vide Cert. No. TC-7102

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INTRODUCTION

Location :

The Kamptee UG to OC Project is located in Nagpur district of Maharashtra state and administered by Nagpur area of Western Coalfields Ltd.

Communication :The mine is situated to the west of National Highway No.7, connecting Nagpur with Jabalpur. The distance by road from Nagpur is about 25 km and the nearest railway station is Kanhan, which is an industrial township on Nagpur-Howrah broad-gauge line of South Eastern Railway.

Drainage :The drainage of the area is controlled by Kanhan River, which flows in the north east direction about 1 km south of the mine.

Climate :The climate of the area is tropical. The region experiences dry hot summer from JUNE to June with relative humidity falling below 20%. The temperature rises to a maximum of 47°C. during JUNE. The winter is mild with temperature ranging about 22°C. The rainy season is between mid July and September and the annual rainfall is about 1000mm.

Other Industry/Coal Mines : Besides other coal mines viz. Inder UG to OC, Gondagaon OC, Khandelwal tube and Ferro Alloys Plants are the major industries, which fall in the vicinity of the Kamptee Opencast Project.

Pollution due to other sources:The above-mentioned industries are also expected to contribute in increasing the pollution load of the area.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Colony-Water treatment plant	- NKcOA-1
2.	G.P. office- Kandri	- NKcOA-2
3.	JuniKamptee Village	- NKcOA-3
4.	Substation- Kamptee	- NKcOA-4

Fugitive Dust Monitoring Location:

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1	Railway siding	- NKcOAF-1
2.	CHP	- NKcOAF-2

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- NKcOW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	CHP	- NKcON-1
2.	Colony	- NKcON-2

Frequency of Monitoring :

- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM),

Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.

SPM/ PM-10 : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.

PM2.5 : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.


Heavy Metals Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.

NO_x : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediaminedihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.

SO₂ : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

Water : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Noise : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A5 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. :WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED:IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5
 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : NAGPUR MONTH : JUNE
 NAME OF THE PROJECT : KAMPTEE OC

Colony-Water treatment plant					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
03/06/2019	119	67	35	34	16
26/06/2019	328	217	49	35	21
TLV	200	100	60	80	80
# - Above Std. value.					
G.P. office- Kandri					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
03/06/2019	99	64	30	28	21
25/06/2019	340	163	44	38	18
TLV	200	100	60	80	80

Juni Kamptee Village					
DATE OF SAMPLING	Parameters (24 hourly values in $\mu\text{g}/\text{m}^3$)				
	SPM*	PM-10	PM-2.5	NOx	SOx
04/06/2019	163	83	43	29	23
26/06/2019	357	116	45	35	17
TLV	200	100	60	80	80
# - Above Std. value.					
Substation- Kamptee					
DATE OF SAMPLING	Parameters (24 hourly values in $\mu\text{g}/\text{m}^3$)				
	SPM*	PM-10	PM-2.5	NOx	SOx
02/06/2019	533	289	52	32	17
25/06/2019	374	182	39	36	26
TLV	600	300	60	120	120

- Above Std. value.

FUGITIVE DUS MONITORING DATA

1. CHP

(24 hourly values in $\mu\text{g}/\text{m}^3$)

Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
03/06/2019	136	102	53

2. RIY. Siding


(24 hourly values in $\mu\text{g}/\text{m}^3$)

Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
11/06/2019	114	89	50

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	
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TEST REPORT NO. : RIN/TR/JUNE-19/W5 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: WATER SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 1

EFFLUENT WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : NAGPUR MONTH : JUNE
 NAME OF THE PROJECT : KAMPTEE OC

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
02/06/2019	7.70	20	12	<2
25/06/2019	8.30	24	14	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : NAGPUR MONTH. : JUNE
NAME OF THE PROJECT : KAMPTEE UG TO OC

Name of the Location :CHP

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	10/06/2019	65.8	64.7
JUNE.2019	26/06/2019	65.4	64.8
TLV		75	70

Name of the Location: Colony

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	10/06/2019	41.4	40.3
JUNE.2019	26/06/2019	42.4	41.6
TLV		55	45

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**ENVIRONMENTAL MONITORING REPORT
PATANSAONGI UG EXPN.**

(NAGPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102
CMPDI
REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014

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2.	AIR QUALITY MONITORING DATA	3
3.	EFFLUENT WATER QUALITY MONITORING DATA	4
4.	NOISE LEVEL DATA	5

INTRODUCTION

Location :

Patansaongi UG project is located in Nagpur district of Maharashtra state and is administered by Nagpur area of Western Coalfields Limited.

Communication :

The project is situated at a distance of about 22 km from Nagpur on Nagpur-Chhindwara road. Nagpur-Chhindwara narrow gauge rail line passes through the northern part of the project area.

Drainage : The drainage of the area is controlled by Kolar river.

Climate :

The climate of the area is tropical. JUNE is the hottest month with temperature touching 47°C. The coldest month is December, when temperature falls to 10°C. Average annual rainfall is 1050 mm.

Other Industries/Coal Mines :

Silewara, Pipla and Saoner underground projects and Khaparkheda Thermal Power Station are the major industries which fall within the 10 km radius of the project area.

Pollution due to other sources :

State highway is adjacent to the project. State highway and Khaparkheda Thermal Power Station are also expected to contribute in increasing the air pollution load of the area. The air pollution due to working of the UG mine is insignificant. Transportation road, Vehicular traffic, Agricultural and local activities etc., also contribute to the pollution load of the area.

Sampling location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Colliery Manager office /Near CHP	- NPUA-1
2.	Near LCH Qr.	- NPUA-2
3.	Sadbhavna Nagar(filter plant)	- NPUA-3

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- NPUW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	CHP	- NPUN-1
2.	Colony	- NPUN-2

Frequency of Monitoring :

- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM),

Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.

SPM/ PM-10 : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.

PM2.5 : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.


Heavy Metals : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.

NO_x : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.

SO₂ : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

Water : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Noise : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A6 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5
 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : NAGPUR MONTH. : JUNE
 NAME OF THE PROJECT : PATANSAONGI UG

Colliery Manager office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
08/06/2019	436	169	43	38	16
26/06/2019	177	90	37	36	25
TLV	600	300	60	120	120
Near LCH Qr.					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
09/06/2019	160	87	52	25	23
27/06/2019	84	44	35	25	18
TLV	200	100	60	80	80
Sadbhavna Nagar(filter plant)					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
09/06/2019	107	40	24	26	20
27/06/2019	86	48	33	22	21
TLV	200	100	60	80	80

- Above std. value

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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TEST REPORT NO. : RIN/TR/JUNE-19/W6 DATE OF ISSUE: 05.08.19
NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: WATER SAMPLE
CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
NO. OF PAGES: 1

EFFLUENT WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR 2019
NAME OF THE AREA : NAGPUR MONTH JUNE
NAME OF THE PROJECT : PATANSAONGI UG

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
09/06/2019	7.80	24	14	<2
25/06/2019	8.50	36	26	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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3) * - Test parameter not under NABL Scope.
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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : NAGPUR MONTH. : JUNE
NAME OF THE PROJECT : PATANSAONGI UG

Name of the Location : CHP - NPUN-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	08/06/2019	66.7	65.6
JUNE.2019	24/06/2019	61.5	58.6
TLV		75	70

Name of the Location : Colony (Sadbhavna Nagar) - NPUN-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	08/06/2019	42.6	41.7
JUNE.2019	24/06/2019	44.3	42.8
TLV		55	45

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ENVIRONMENTAL MONITORING REPORT

PIPLA UG

(NAGPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014

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1.	INTRODUCTION	1-3
2.	AIR QUALITY MONITORING DATA	4-5
3.	NOISE LEVEL DATA	6

INTRODUCTION

Location :

Pipla Colliery is situated in the West of Silewara Colliery in Nagpur District of Maharashtra State. It is under the administrative control of Nagpur Area of Western Coalfields Limited.

Communication :

The project area is about 2 km from Nagpur-Chhindwara State Highway. It is also connected to Silewara colliery. The Nagpur-Chhindwara narrow gauge railway line of SE Railway passes immediate south of the colliery property.

Drainage :

The drainage of the area is principally controlled by Kolar-Pimpri river in the South and Kanhan river in the North. There are a number of small seasonal nallahs which traverse over the area and discharge the water during rainy season into these two rivers.

Climate :

The climate of this area is tropical. The temperature rises as high as 47°C in summer. Monsoon period is generally from June to September.

Industry/Coal Mines :

Khaparkheda and Koradi Thermal Power Stations of MSEB lies at a distance of 6 kms and 7 kms respectively. Patansaongi UG and Silewara UG mines of WCL are also near to this mine.

Pollution due to other sources :

Nagpur - Chhindwara State highway is about 2 kms from the project. Road traffic is also likely to contribute to the air pollution in the surrounding area.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Filter plant	- NPLUA-1
2.	In zone -4	- NPLUA-2
3.	Near Magazine/Manager office	- NPLUA-3
4.	Shiv Mandir	- NPLUA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- NPLUW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Fan House	- NPLUN-1

Frequency of Monitoring :


- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is

transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Noise : Day time and Night time Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A7 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NOx (06:2006), SO2 (02:2001)], SPM*, PM-2.5 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : NAGPUR MONTH : JUNE
 NAME OF THE PROJECT : PIPLA UG

Filter plant					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
10/06/2019	327	155	116	36	24
28/06/2019	82	49	35	27	21
TLV	200	100	60	80	80
# - Above Std. value.					
In zone -4					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
10/06/2019	221	87	51	26	17
28/06/2019	68	41	21	18	14
TLV	600	300	60	120	120
Near Magazine/Manager office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
09/06/2019	311	137	46	29	16
27/06/2019	63	42	21	21	25
TLV	600	300	60	120	120

Shiv Mandir					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
09/06/2019	217	117	290	19	16
27/06/2019	51	39	25	23	18
TLV	200	100	60	80	80

- Above Std. value.

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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3) * - Test parameter not under NABL scope
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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : NAGPUR MONTH : JUNE
NAME OF THE PROJECT : PIPLA UG

Name of the Location : Near Fan House - NPLUN-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	08/06/2019	69.6	68.7
JUNE.2019	28/05/2019	66.6	64.2
TLV		75	70

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ENVIRONMENTAL MONITORING REPORT SAONER UG EXPN.

(NAGPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE -2019

**Environment Laboratory
NABL Accredited vide Cert. No. TC-7102**

CMPDI

**REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014**

AN ISO 9001:2015 COMPANY

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INTRODUCTION

Location :

SaonerUG mine is situated in Nagpur District of Maharashtra State and is administered by the Nagpur area of the Western Coalfields Limited. There are three projects - Saoner-I UG, Saoner -II UG and Saoner -III UG.

Communication :

These projects are well connected by all-weather metalled road. These projects are about 40 kms away from Nagpur city. Nagpur - Chhindwara road is about 5 km from the mines. Saoner - Kalmeshwar road is also very near to the projects. Saoner railway station of S.E. Railway is the nearest rail head.

Drainage : The drainage is principally controlled by Kolar river.

Climate : The area has tropical climate with very hot summer. The temperature rises as high as 46°C in summer. The average annual rainfall is about 1050 mm. The monsoon period is between June to Sept.

Industry/Coal Mines :

There are a few small industries near the town. There is no major industry near to the project. The state highway and road to Kalmeshwar, which is very busy due to vehicular movement, produce lot of dust.

Pollution due to other sources :

The above-mentioned industries are also expected to contribute in increasing the pollution load of the area. The air pollution due to working of the UG mine is insignificant.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Colliery Manager Office, Saoner UG-I	-	NSUA-1
2.	Colliery Manager office, Saoner UG-II	-	NSUA-2
3.	Water Treatment Plant	-	NSUA-3
4.	Kotodi village	-	NSUA-4

Fugitive Dust Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	CHP	-	NSUAF-1
2.	Rly. Siding	-	NSUAF-2

Water Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge - Saoner - I UG	-	NSUW-1
2.	Mine water discharge - Saoner - II UG	-	NSUW-2
3.	Mine water discharge - Saoner - III UG	-	NSUW-3

Noise Level Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near CHP - Saoner - I UG	- NSUN-1
2.	Near CHP - Saoner - II UG	- NSUN-2
3.	Near CHP – Saoner - III UG	- NSUN-3
4.	Colony	- NSUN-4

Frequency of Monitoring :

- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.

SPM/ PM-10 : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.

PM2.5 : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.

Heavy Metals : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.


NO_x : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite

ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.

SO₂ : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

Water : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Noise : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A8 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5
 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2018
 NAME OF THE AREA : NAGPUR MONTH. : JUNE
 NAME OF THE PROJECT : SAONER UG

C.M. Office- Saoner -I UG					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO_x	SO_x
07/06/2019	116	82	32	31	30
25/06/2019	125	95	46	34	26
TLV	600	300	60	120	120
C.M. Office- Saoner -II UG					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO_x	SO_x
07/06/2019	404	181	46	24	24
25/06/2019	88	44	28	24	21
TLV	600	300	60	120	120
Colony -Water filter plant					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO_x	SO_x
07/06/2019	276	102	41	36	21
25/06/2019	109	75	30	27	22
TLV	200	100	60	80	80
#-Above Std. Value					

Kotodi village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
08/06/2019	348	157	48	26	26
26/06/2019	110	85	41	36	16
TLV	200	100	60	80	80

#-Above Std. Value

FUGITIVE DUST MONITORING DATA

1. CHP

(24 hourly values in µg/m³)

Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
07/06/2019	673	275	55

2. Railway Siding


(24 hourly values in µg/m³)

Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
25/06/2019	105	61	45

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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Test Report NO : RIN/TR/JUNE-19/W8 Date of Issue : 05/08/2019
 Name of the Customer: WCL, Nagpur
 Customer letter Ref. No. : WCL/HQ/ENV/17-K/520-
 522 DATED -18.04.19 Sample Description : Water sample
 No. of pages : 2

EFFLUENT WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR 2019
 NAME OF THE AREA : NAGPUR MONTH. JUNE
 NAME OF THE PROJECT : SAONER UG

Mine water discharge (Saoner I)				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
08/06/2019	7.30	20	12	<2
25/06/2019	8.70	28	18	<2
TLV	5.5 - 9.0	250	100	10
Mine water discharge (Saoner II)				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
08/06/2019	7.10	36	28	<2
25/06/2019	8.30	24	14	<2
TLV	5.5 - 9.0	250	100	10

Mine water discharge (Saoner III)				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
08/06/2019	6.90	32	24	<2
25/06/2019	8.40	20	12	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : NAGPUR MONTH. : JUNE
 NAME OF THE PROJECT : SAONER UG

Name of the Location : Near Fan House (Saoner – I UG) - NSUN-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	08/06/2019	69.2	68.6
JUNE.2019	24/06/2019	69.7	68.4
TLV		75	70

Name of the Location : Near Fan House (Saoner – II UG) - NSUN-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	08/06/2019	68.7	67.8
JUNE.2019	24/06/2019	68.5	67.2
TLV		75	70

Name of the Location : Near Fan House (Saoner – III UG) - NSUN-3

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	08/06/2019	69.4	68.4
JUNE.2019	24/06/2019	70.1	68.7
TLV		75	70

Name of the Location : Colony (Saoner) - NSUN-4

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	08/06/2019	42.4	41.2
JUNE.2019	24/06/2019	44.2	43.1
TLV		55	45

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ENVIRONMENTAL MONITORING REPORT

SILEWARA UG

(NAGPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE- 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014

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4.	NOISE LEVEL DATA	7

INTRODUCTION

Location :

The Silewara UG project is located in the Nagpur district of Maharashtra state and is administered by Nagpur Area of Western Coalfields Limited.

Communication :

The project is approachable by an all weather Nagpur-Chhindwara State Highway from Khaparkheda Thermal Power Station. Nagpur-Chhindwara narrow gauge railway line of South-Eastern Railways passes through south of this area.

Drainage :

The drainage of the area is controlled by Kolar river to the south and Kanhan river in the north.

Climate :

The climate of the area is tropical. The temperature falls down to 7.°C in winter and rises as high as 47°C in summer. The annual rainfall is about 1050mm and it normally occurs between June and September.

Other Industries/Coal Mines :

Besides other coal mines viz. Pipla UG, Patansaongi UG, Koradi TPS and Kaparkheda TPS are the main industries which fall within 10 km radius of the Silewara UG Project.

Pollution due to the sources :

The above-mentioned industries are also expected to contribute in increasing the pollution load of the area.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near Chankapur Pump house	- NSLUA-1
2.	Mandir (Near Kanhan river)	- NSLUA-2
3.	V.T.C. – Silewara	- NSLUA-3
4.	Water filter plant	- NSLUA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- NSLUW-1

Noise Level Monitoring location :

<u>S. No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Fan house	- NSLUN-1
2.	Colony	- NSLUN-2

Frequency of Monitoring :


- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of "West and Gaeke method". Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate

solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A9 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : NAGPUR MONTH. : JUNE
 NAME OF THE PROJECT : SILEWARA UG

Chankapur pump house/Colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
10/06/2019	394	144	56	24	14
29/06/2019	82	50	21	12	18
TLV	200	100	60	80	80
Mandir (near Kanhan river)					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	Pm-10	PM-2.5	NO _x	SO _x
10/06/2019	198	89	45	27	21
28/06/2019	80	35	28	22	21
TLV	200	100	60	80	80
V.T.C. – Silewara					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
10/06/2019	217	144	59	19	16
29/06/2019	89	57	34	30	21
TLV	600	300	60	120	120
#-Above std. value					


Water filter plant

DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
10/06/2019	235	90	45	30	20
28/06/2019	98	57	31	26	14
TLV	600	300	60	120	120

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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TEST REPORT NO. : RIN/TR/JUNE-19/W9 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: WATER SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 1

EFFLUENT WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR 2019
 NAME OF THE AREA : NAGPUR MONTH JUNE
 NAME OF THE PROJECT : SILEWARA UG

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
10/06/2019	7.50	28	18	<2
27/06/2019	8.20	32	22	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : NAGPUR MONTH.: JUNE
NAME OF THE PROJECT : SILEWARA UG

Name of the Location : Near Fan House - NSLUN-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	08/06/2019	68.2	68.6
JUNE.2019	28/06/2019	69.7	68.6
TLV		75	70

Name of the Location : Colony - NSLUN-2

Month	Date of Data Collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	08/06/2019	41.3	40.4
JUNE.2019	28/06/2019	43.5	42.8
TLV		55	45

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ENVIRONMENTAL MONITORING REPORT SINGORI OC

(NAGPUR AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

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INTRODUCTION

Location :

Singori OC mine is situated in Nagpur District of Maharashtra State and is administered by the Nagpur area of the Western Coalfields Limited.

Communication :

These projects are well connected by all weathermetalled road. These projects are about 40 kms away from Nagpur city. Nagpur - Chhindwara road is about 5 km from the mines. Saoner - Kalmeshwar road is also very near to the projects. Saoner railway station of S.E. Railway is the nearest rail head.

Drainage : The drainage is principally controlled by Kolar river.

Climate : The area has tropical climate with very hot summer. The temperature rises as high as 46°C in summer. The average annual rainfall is about 1050 mm. The monsoon period is between June to Sept.

Industry/Coal Mines :

There are a few small industries near the town. There is no major industry near to the project. The state highway and road to Kalmeshwar, which is very busy due to vehicular movement, produce lot of dust.

Pollution due to other sources :

The above-mentioned industries are also expected to contribute in increasing the pollution load of the area. The air pollution due to working of the UG mine is insignificant.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Contactor Camp	-	NSOA-1
2.	Soholi Village	-	NSOA-2
3.	Doroli Village	-	NSOA-3
4.	Hingana village	-	NSOA-4

Fugitive Dust Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Coal Stock Yard	-	NSOAF-1
2.	Weigh Bridge	-	NSOAF-2

Water Quality Monitoring location

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	NSOAW-1

Noise Level Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Contactor Camp	-	NSON-1
2.	Soholi Village	-	NSON-2

Frequency of Monitoring :


- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate

solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

<p>Environment Laboratory CMPDI, RI IV, Nagpur</p>	<p>Test Report</p>	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A10 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NOx (06:2006), SO2 (02:2001)], SPM*, PM-2.5 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : NAGPUR MONTH : JUNE
 NAME OF THE PROJECT : SINGORI OC

(24 hourly values in $\mu\text{g}/\text{m}^3$)

Contactor Camp					
DATE OF SAMPLING	Parameters (24 hourly values in $\mu\text{g}/\text{m}^3$)				
	SPM*	PM-10	PM-2.5	NOx	SOx
07/06/2019	550	325	52	35	25
28/06/2019	127	80	47	31	24
TLV	600	300	60	120	120
Soholi Village					
DATE OF SAMPLING	Parameters (24 hourly values in $\mu\text{g}/\text{m}^3$)				
	SPM*	PM-10	PM-2.5	NOx	SOx
04/06/2019	320	110	51	34	24
29/06/2019	82	53	39	35	19
TLV	200	100	60	80	80

Doroli Village					
DATE OF SAMPLING	Parameters (24 hourly values in $\mu\text{g}/\text{m}^3$)				
	SPM*	PM-10	PM-2.5	NOx	SOx
04/06/2019	192	130	51	31	30
28/06/2019	83	52	26	19	17
TLV	200	100	60	80	80

Hingana Village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NOx	SO _x
04/06/2019	313	120	46	27	28
29/06/2019	91	47	23	12	11
TLV	200	100	60	80	80

Above Std. Value

FUGITIVE DUST MONITORING DATA

1. Weigh Bridge

(24 hourly values in µg/m³)

Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
07/06/2019	2093	1629	74

2. Coal Stock

(24 hourly values in µg/m³)

Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
07/06/2019	1316	831	71

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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 2) This Report cannot be reproduced in part or full without written permission of the management.
 3) * - Test parameter not under NABL scope.

NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : NAGPUR MONTH. : JUNE
NAME OF THE PROJECT : SINGORI OC

Name of the Location: Contractor Camp

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	10/06/2019	55.2	54.6
JUNE.2019	26/06/2019	55.2	54.4
TLV		75	70

Name of the Location: Sohali Village

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	10/06/2019	42.4	41.7
JUNE.2019	26/06/2019	41.6	40.7
TLV		55	45

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ENVIRONMENTAL MONITORING REPORT DINESH / MAKARDHOKRA-III OC

(UMRER AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

**REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014**

AN ISO 9001:2015 COMPANY

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3.	EFFLUENT WATER QUALITY MONITORING DATA	6
4.	NOISE LEVEL DATA	7

INTRODUCTION

Location :

The Dinesh/ Makardhokra- III OC project is located in Nagpur district of Maharashtra State and is administered by the Umrer area of Western Coalfields Limited.

Communication :

The project is connected by road with Nagpur city. It is about 55 km south west of Nagpur and 10 km west of Umrer. The nearest railway station is Umrer on the Nagpur-Nagbhid-Chandrapur Fort (Narrow gauge) of SE railway.

Drainage :

The drainage of the area is controlled by Amb river which flows in the east of the area.

Climate :

The climate of the area is generally dry and hot. JUNE is the hottest month and the temperature rises to 47°C. December is the coldest month with temperature falling to 7°C. Average annual rainfall in this area is around 1200 mm.

Other Industries/Coal Mines :

Umrer opencast project falls within 10 km radius of the Makardhokra OC project. There is no other major industry in the vicinity of the project area.

Pollution due to other sources :

As there is no other major industry nearby the project area, only road transport is the other source, which JUNE contribute to the air pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

S.No.	Location Details		Location Code
1.	Manger Office/	-	UM ₃ OA-1
2.	Near Railway in motion weigh Bridge	-	UM ₃ OA-2
3.	Sirpur Village	-	UM ₃ OA-3
4.	Kanwa village	-	UM ₃ OA-4

Water Quality Monitoring location :

S.No.	Location Details		Location Code
1.	Mine Water Discharge	-	UM ₃ OW-1
2.	ETP (Workshop) - treated water sample-		UM ₃ OW-2

Noise Level Monitoring location :

S.No.	Location Details	Location Code
1.	Near Pit office	UM ₃ ON-1

Frequency of Monitoring :

- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :


- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size > 10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size < 10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium (Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium

hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.

SO₂ : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

Water : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Noise : Noise level data are recorded fortnightly.

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TEST REPORT NO. : RIN/TR/JUNE-19/A11 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : UMRER MONTH : JUNE
 NAME OF THE PROJECT : MAKARDHOKRA - III OC

Manger Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
15/06/2019	88	73	21	7	10
20/06/2019	263	198	25	6	19
TLV	600	300	60	120	120
Near Railway in motion weigh Bridge					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
15/06/2019	141	86	41	7	11
19/06/2019	98	59	32	7	13
TLV	600	300	60	120	120
Sirpur Village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
15/06/2019	137	84	41	8	12
29/06/2019	96	54	35	7	12
19/06/2019	95	59	33	6	11
20/06/2019	191	73	45	7	13
29/06/2019	87	48	30	8	12
TLV	200	100	60	80	80
# Above Std. Value					


Kanwa village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m³)				
	SPM*	PM-10	PM-2.5	NOx	SOx
11/06/2019	89	64	33	6	10
21/06/2019	149	75	43	8	12
TLV	200	100	60	80	80

Above Std. Value

(Scientific Assistant)

DeepanshuSahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/ DATE OF ISSUE:
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: WATER SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 1
 TEST REQUIRED:IS-

EFFLUENT WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR 2019
 NAME OF THE AREA : UMRER MONTH JUNE
 NAME OF THE PROJECT : MAKARDHOKRA-III OC

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
14/06/2019	7.80	40	34	<2
29/06/2019	7.00	40	26	<2
TLV	5.5 - 9.0	250	100	10
ETP (Workshop) - Treated water sample				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
29/06/2019	7.30	52	32	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : UMRER MONTH : JUNE
NAME OF THE PROJECT : MAKARDHOKRA - III OC

Name of the Location : Pit Office - UM₃ON-I

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night TIME
JUNE.2019	14/06/2019	54.8	53.6
JUNE.2019	29/06/2019	54.6	55.7
TLV		75	70

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ENVIRONMENTAL MONITORING REPORT

GOKUL OC

(UMRER AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE - 2019

Environment Laboratory

NABL Accredited vide Cert. No. TC-7102

CMPDI

**REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014**

AN ISO 9001:2015 COMPANY

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3.	EFFLUENT WATER QUALITY MONITORING DATA	6
4.	NOISE LEVEL DATA	7

INTRODUCTION

Location :

The Gokul OC project is located in Nagpur district of Maharashtra State and is administered by the Umrer area of Western Coalfields Limited.

Communication :

The project is connected by road with Nagpur city. The nearest railway station is Umrer on the Nagpur-Nagbhid-Chandrapur Fort (Narrow gauge) of SE railway.

Drainage :

The drainage of the area is controlled by Amb river which flows in the east of the area.

Climate :

The climate of the area is generally dry and hot. May is the hottest month and the temperature rises to 47°C. December is the coldest month with temperature falling to 7°C. Average annual rainfall in this area is around 1200 mm.

Other Industries/Coal Mines :

Umrer opencast project falls within 10 km radius of the Makardhokra OC project. There is no other major industry in the vicinity of the project area.

Pollution due to other sources :

As there is no other major industry nearby the project area, only road transport is the other source, which may contribute to the air pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

S.No.	Location Details		Location Code
1.	Besur Village	-	UGOA-1
2.	Contractor Camp	-	UGOA-2
3.	Nand Village	-	UGOA-3
4.	Polgaon	-	UGOA-4

Water Quality Monitoring location :

S.No.	Location Details		Location Code
1.	Mine water discharge	-	UGOW-1
2.	ETP (Workshop) water discharge	-	UGOW-2

Noise Level Monitoring location :

S.No.	Location Details	Location Code
1.	Contractor Camp	UGON-1

Frequency of Monitoring :

- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :


- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
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- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium (Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
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by converting it to Sulphuric acid with Hydrogen peroxide before analysis.

SO₂ : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

Water : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Noise : Noise level data are recorded fortnightly.

<p>Environment Laboratory CMPDI, RI IV, Nagpur</p>	<p>Test Report</p>	 <p>TC - 7102</p>
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TEST REPORT NO. : RIN/TR/MAY-19/A12 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NOx (06:2006), SO2 (02:2001)], SPM*, PM-2.5
 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : UMRER MONTH : JUNE
 NAME OF THE PROJECT : GOKUL OC

Besur Village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
13/06/2019	137	77	48	7	11
30/06/2019	171	88	45	8	12
TLV	200	100	60	80	80
Contractor Camp					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
13/06/2019	241	191	52	6	18
28/06/2019	179	88	57	7	13
20/06/2019	149	73	40	6	13
19/06/2019	240	134	21	6	11
29/06/2019	135	79	34	8	15
TLV	600	300	60	120	120


Nand Village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
13/06/2019	157	88	46	7	10
30/06/2019	160	70	48	6	14
19/06/2019	191	93	47	6	12
20/06/2019	180	76	25	6	12
29/06/2019	103	65	24	6	13
TLV	200	100	60	80	80
# Above Std. Value					
Polgaon Village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
13/06/2019	140	107	29	6	12
30/06/2019	186	74	45	8	15
TLV	200	100	60	80	80

Above Std. Value.

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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 3) * - Test parameter not under NABL scope.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC- 7102
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TEST REPORT NO. : RIN/TR/MAY-19/W12

DATE OF ISSUE: 05.08.19

NAME OF CUSTOMER: WCL, NAGPUR

SAMPLE DESCRIPTION: WATER
SAMPLE

CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19

NO. OF PAGES: 1

EFFLUENT WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL
NAME OF THE AREA : UMRER
NAME OF THE PROJECT : GOKUL OC

YEAR : 2019
MONTH : JUNE

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
13/06/2019	8.10	40	30	<2
18/06/2019	7.20	52	30	<2
TLV	5.5 - 9.0	250	100	10

ETP (Workshop) water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
13/06/2019	8.30	44	34	<2
18/06/2019	7.00	40	26	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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3) * - Test parameter not under NABL

NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : UMRER MONTH. : JUNE
NAME OF THE PROJECT : GOKUL OC

Name of the Location : Contractor Camp - UGON-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	14/06/2019	53.2	52.4
JUNE.2019	29/06/2019	54.8	53.7
TLV		75	70

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ENVIRONMENTAL MONITORING REPORT MAKARDHOKRA – II OC

(UMRER AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014

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4.	NOISE LEVEL DATA	7

INTRODUCTION

Location :

The Makardhokra- II OC project is located in Nagpur district of Maharashtra State and is administered by the Umrer area of Western Coalfields Limited.

Communication :

The project is connected by road with Nagpur city. It is about 55 km south west of Nagpur and 10 km west of Umrer. The nearest railway station is Umrer on the Nagpur-Nagbhid-Chandrapur Fort (Narrow gauge) of SE railway.

Drainage :

The drainage of the area is controlled by Amb river which flows in the east of the area.

Climate :

The climate of the area is generally dry and hot. JUNE is the hottest month and the temperature rises to 47°C. December is the coldest month with temperature falling to 7°C. Average annual rainfall in this area is around 1200 mm.

Other Industries/Coal Mines :

Umrer opencast project falls within 10 km radius of the Makardhokra OC project. There is no other major industry in the vicinity of the project area.

Pollution due to other sources :

As there is no other major industry nearby the project area, only road transport is the other source, which JUNE contribute to the air pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

S.No.	Location Details		Location Code
1.	SAM office	-	UMOA-1
2.	Near Manager office	-	UMOA-2
3.	Kanwa village	-	UMOA-3
4.	Colony (Near Pump House	-	UMOA-4

Water Quality Monitoring location :

S.No.	Location Details		Location Code
1.	Mine water discharge	-	UMOW-1
2.	ETP (Workshop) - treated water sample	-	UM(ETP)OW-2

Noise Level Monitoring location :

S.No.	Location Details		Location Code
1.	Near Pit office	-	UMON-1
2.	Colony (Umrer)	-	UMON-2

Frequency of Monitoring :

- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :


- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size > 10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size < 10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium (Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a

Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.

SO₂ : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

Water : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Noise : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A14 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : UMRER MONTH : JUNE
 NAME OF THE PROJECT : MAKARDHOKRA - II OC

SAM Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO_x	SO_x
14/06/2019	125	89	57	7	12
29/06/2019	271	119	55	7	13
TLV	600	300	60	120	120
Near Manager office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO_x	SO_x
14/06/2019	226	121	73	7	10
29/06/2019	423	223	63	7	11
TLV	600	300	120	120	60
Kanwa village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO_x	SO_x
11/06/2019	89	64	33	6	10
21/06/2019	149	75	43	8	12
TLV	200	100	60	80	80
#-above Std.Value					


Near pump house/Colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
14/06/2019	98	62	39	8	12
29/06/2019	188	84	45	6	19
TLV	200	100	60	80	80

- Above Std. value.

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/W14 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: WATER SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 1

EFFLUENT WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR 2019
 NAME OF THE AREA : UMRER MONTH JUNE
 NAME OF THE PROJECT : MAKARDHOKRA-II OC

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
14/06/2019	7.90	40	32	<2
TLV	5.5 - 9.0	250	100	10
ETP (Workshop) water discharge				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
14/06/2019	7.70	44	30	<2
29/06/2019	7.30	56	34	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : UMRER MONTH.: JUNE
NAME OF THE PROJECT : MAKARDHOKRA - II OC

Name of the Location : Near Pit Office - UMON-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	14/06/2019	54.6	53.7
JUNE.2019	29/06/2019	54.4	54.6
TLV		75	70

Name of the Location : Colony - UMON-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	14/06/2019	42.4	41.2
JUNE.2019	29/06/2019	42.3	41.7
TLV		55	45

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ENVIRONMENTAL MONITORING REPORT MAKARDHOKRA – I OC

(UMRER AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

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REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014

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4.	NOISE LEVEL DATA	6

INTRODUCTION

Location :

The Makardhokra- I OC project is located in Nagpur district of Maharashtra State and is administered by the Umrer area of Western Coalfields Limited.

Communication :

The project is connected by road with Nagpur city. It is about 55 km south west of Nagpur and 10 km west of Umrer. The nearest railway station is Umrer on the Nagpur-Nagbhid-Chandrapur Fort (Narrow gauge) of SE railway.

Drainage :

The drainage of the area is controlled by Amb river which flows in the east of the area.

Climate :

The climate of the area is generally dry and hot. JUNE is the hottest month and the temperature rises to 47°C. December is the coldest month with temperature falling to 7°C. Average annual rainfall in this area is around 1200 mm.

Other Industries/Coal Mines :

Umrer opencast project falls within 10 km radius of the Makardhokra OC project. There is no other major industry in the vicinity of the project area.

Pollution due to other sources :

As there is no other major industry nearby the project area, only road transport is the other source, which JUNE contribute to the air pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

S.No.	Location Details		Location Code
1.	Pit office	-	UM ₁ OA-1
2.	Sirpur village	-	UM ₁ OA-2
3.	Near Kanwa Village)	-	UM ₁ OA-3
4.	Near pump house/Colony	-	UM ₁ OA-4

Water Quality Monitoring locations :

S.No.	Location Details		Location Code
1.	Mine Water Discharge	-	UM ₁ OW-1

Noise Level Monitoring location :


S.No.	Location Details		Location Code
1.	Near Pit office	-	UM ₁ ON-1

Frequency of Monitoring :

- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A13 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : UMRER MONTH. : JUNE
 NAME OF THE PROJECT : **MAKARDHOKRA - I OC**

Pit office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
15/06/2019	270	161	68	7	10
30/06/2019	327	177	69	8	12
TLV	600	300	60	120	120
Sirpur Village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	Sox
15/06/2019	137	84	41	8	12
29/06/2019	96	54	35	7	12
19/06/2019	95	59	33	6	11
20/06/2019	191	73	45	7	13
29/06/2019	87	48	30	8	12
TLV	200	100	60	80	80
# - Above Std. value.					


Kanwa village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	Sox
11/06/2019	89	64	33	6	10
21/06/2019	149	75	43	8	12
TLV	200	100	60	80	80
# - Above Std. value.					
Near pump house/Colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	Nox	Nox	Sox
14/06/2019	98	62	39	8	12
29/06/2019	188	84	45	6	19
TLV	200	100	60	80	80

- Above Std. value.

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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<p>Environment Laboratory CMPDI, RI IV, Nagpur</p>	<p>Test Report</p>	 <p>TC - 7102</p>
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TEST REPORT NO. : RIN/TR/JUNE-19/W13 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: WATER SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 1

EFFLUENT WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR 2019
 NAME OF THE AREA : UMRER MONTH APRIL
 NAME OF THE PROJECT : MAKARDHOKRA-I OC

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
14/06/2019	7.90	52	34	<2
26/06/2019	7.00	14	28	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : UMRER MONTH. : JUNE
NAME OF THE PROJECT : MAKARDHOKRA - I OC

Name of the Location : Near Pit Office - UM₁ON-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	14/06/2019	55.4	54.2
JUNE.2019	29/06/2019	55.6	54.8
TLV		75	70

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ENVIRONMENTAL MONITORING REPORT

MURPAR UG

(UMRER AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE - 2019

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4.	NOISE LEVEL DATA	8

INTRODUCTION

Location :

Murpar Underground Project is located in Chandrapur district of Maharashtra State and is administered by Umrer Area of Western Coalfields Limited.

Communication :

This project is situated on Warora - Wani State High Way. Chimur, a small block town is situated about 8 Kms from the project. Warora is the nearest Railway Station about 43 Kms away from the project, located in Chennai - Nagpur C. R. Line.

Drainage : Drainage of the area is controlled by Gani nalla, which flows through central part of the project area.

Climate : The climate of the area is tropical with well-defined summer from JUNE to June, rainy season from July to September and winter from December to JUNEuary. In summer, the temperature generally goes to a maximum of 47°C whereas in winter, it generally falls to a minimum of 7°C. The average annual rainfall is about 1200 mm.

Other Industries : There is no other major industries in the vicinity of the project area.

Pollution due to other sources : As there is no other major industry nearby the project area, only road transport is the other source, which JUNE contribute to the air pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		
1.	Colony	-	UMUA-1
2.	Morpar village	-	UMUA-2
3.	Near magazine building	-	UMUA-3
4.	Near pit house	-	UMUA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	UMUW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Fan house	-	UMUN-1
2.	Colony	-	UMUN-2

Frequency of Monitoring :

Air : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM),

Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.

SPM/ PM-10 : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.

PM2.5 : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.


Heavy Metals : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.

NO_x : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.

SO₂ : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

Water : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Noise : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A15 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NOx (06:2006), SO2 (02:2001)], SPM*, PM-2.5
 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : UMRER MONTH : JUNE
 NAME OF THE PROJECT : MURPAR UG


Colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
12/06/2019	77	49	33	6	13
27/06/2019	107	78	49	6	15
TLV	200	100	60	80	80
Morpar village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
12/06/2019	106	73	40	6	10
28/06/2019	86	46	27	7	19
TLV	200	100	60	80	80
Near magazine building					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
12/06/2019	114	78	47	7	9
28/06/2019	76	57	39	8	12
TLV	600	300	60	120	120

#-Above Std.Value					
Near pit house					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
12/06/2019	589	254	51	6	13
28/06/2019	187	108	47	6	13
TLV	600	300	60	120	120

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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<p>Environment Laboratory CMPDI, RI IV, Nagpur</p>	<p>Test Report</p>	 <p>TC - 7102</p>
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TEST REPORT NO. : RIN/TR/JUNE-19/W15 DATE OF ISSUE : 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: WATER SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 1

EFFLUENT WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : UMRER MONTH : JUNE
 NAME OF THE PROJECT : MURPAR UG

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
13/06/2019	8.30	48	36	<2
18/06/2019	7.10	44	28	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : UMRER MONTH : JUNE
NAME OF THE PROJECT : MURPAR UG

Name of the Location : Near Fan House - UMUN-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	11/06/2019	68.6	67.8
JUNE.2019	25/06/2019	63.5	62.4
TLV		75	70

Name of the Location : Colony - UMUN-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	11/06/2019	41.7	40.4
JUNE.2019	25/06/2019	42.9	41.6
TLV		55	45

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**ENVIRONMENTAL MONITORING REPORT
UMRER OC**

(UMRER AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE - 2019

**Environment Laboratory
NABL Accredited vide Cert. No. TC-7102**

CMPDI

**REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014**

AN ISO 9001:2015 COMPANY

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2.	AIR QUALITY MONITORING DATA	4-5
3.	EFFLUENT WATER QUALITY MONITORING DATA	6-8
4.	NOISE LEVEL DATA	9

INTRODUCTION

Location :

Umrer opencast project falls in the Nagpur district of Maharashtra state and is administered by Umrer Area of Western Coalfields Limited.

Communication :

This area is approachable by an all weather road Nagpur - Umrer state Highway. The distance of the project is about 45 km from Nagpur city.

Drainage : The drainage of the area is controlled by Amb river.

Climate :

The climate of the area is tropical. In summer the temperature rises as high as 46°C. The average annual rainfall is 1200 mm. Monsoon period normally occurs between June and September. In summer relative humidity goes down as low as 18%.

Industry :

There is no major industry near the project. Makardhokra opencast mine has been working about 4 km from the project.

Pollution due to other source :

The state highway roads which are adjacent to the project produce lot of dust due to heavy vehicular traffic.

Sampling Locations :

Ambient Air Quality Monitoring Locations :

S.No.	<u>Details of Location</u>	<u>Code No.</u>
1.	Near pump house/Colony	- UUOA-1
2.	Near Kanwa village	- UUOA-2
3.	Near Workshop	- UUOA-3
4.	Colony (Pump house)	- UUOA-4

Fugitive Dust Monitoring Locations :

S.No.	<u>Details of Location</u>	<u>Code No.</u>
1.	Weigh Bridge	- UUOAF-1
2.	CHP	- UUOAF-2
3.	Rly Siding	- UUOAF-3

Water Quality Monitoring Locations :

S.No.	<u>Details of Location</u>	<u>Code No.</u>
1.	Mine water discharge	- UUOW-1
2.	ETP (Workshop) - treated water sample	- UU(ETP)W-2

Noise Level Monitoring Locations :

S.No.	<u>Details of Location</u>	<u>Code No.</u>
1.	CHP	- UUON-1
2.	Colony	- UUON-2

Frequency of Monitoring :

- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :


- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of

Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.

SO₂ : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

Water : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Noise : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A16 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NOx (06:2006), SO2 (02:2001)], SPM*, PM-2.5 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : UMRER MONTH : JUNE
 NAME OF THE PROJECT : UMRER OC

Near pump house/Colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
14/06/2019	98	62	39	8	12
29/06/2019	188	84	45	6	19
TLV	200	100	60	80	80
Kanwa village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
11/06/2019	89	64	33	6	10
21/06/2019	149	75	43	8	12
TLV	200	100	60	80	80
Near Workshop					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
14/06/2019	161	121	55	6	18
21/06/2019	359	175	49	6	20
TLV	600	300	60	120	120

#-above Std.Value.					
Umrer Manager Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
11/06/2019	120	51	37	7	9
21/06/2019	131	68	39	7	13
TLV	600	300	60	120	120

#-above Std.Value

FUGITIVE DUST MONITORING DATA

1.Rly Siding

(24 hourly values in µg/m³)

Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
-	-	-	-

2. CHP

Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
11/06/2019	58	36	110

3.Weigh Bridge


(24 hourly values in µg/m³)

Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
-	-	-	-

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/W16 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: WATER SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 1

EFFLUENT WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR 2019
 NAME OF THE AREA : UMRER MONTH JUNE
 NAME OF THE PROJECT : UMRER OC

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
14/06/2019	8.20	36	30	<2
20/06/2019	7.20	48	30	<2
TLV	5.5 - 9.0	250	100	10
ETP (Workshop) - Treated water sample				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
14/06/2019	8.00	36	28	<2
20/06/2019	7.30	56	32	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : UMRER MONTH : JUNE
NAME OF THE PROJECT : UMRER OCP

Name of the Location : CHP - UUON-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	14/06/2019	69.2	68.6
JUNE.2019	29/06/2019	67.3	66.6
TLV		75	70

Name of the Location : Colony - UUON-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	14/06/2019	42.4	41.2
JUNE.2019	29/06/2019	42.3	41.7
TLV		55	45

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ENVIRONMENTAL MONITORING REPORT

EXPN. OF GHUGUS OC

(WANI AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014

AN ISO 9001:2015 COMPANY

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2.	AIR QUALITY MONITORING DATA	3-4
3.	NOISE LEVEL DATA	5

INTRODUCTION

Location :

Ghugus Opencast Project is located in Chandrapur district of Maharashtra State. It is administered by Wani Area of Western Coalfields Limited.

Communication :

The approach road to the project is connected to Nagpur-Chandrapur highway roughly at a distance of 28 km from Chandrapur city by a 20 km long road branching off westward. The project is also well connected by Tadali-Ghugus branch line of Central railway.

Drainage : Wardha river and its tributaries serve as the main drainage of the area.

Climate :

The climate of this area is tropical with maximum and minimum temperature 48°C in summer and 10°C in winter respectively. The average annual rainfall is about 1200 mm.

Industry :

Besides other coal mines, ACC Cement Factory and Sindhale Limestone mines are the major industries nearby the project area.

Pollution due to other sources :

The above-mentioned industries and the busy road traffic are also expected to contribute in increasing the pollution load of the area.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	ACC patch / Manager office	-	WGOA-1
2.	Ramnagar colony	-	WGOA-2
3.	SAM Office	-	WGOA-3
4.	Ghugus village	-	WGOA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	WGOW-1
2.	Workshop water discharge	-	WGOW-2

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	CHP	-	WGON-1
2.	Colony	-	WGON-2

Frequency of Monitoring :

Air : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of

nitrogen (NO_x) etc.

SPM/ PM-10 : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.

PM2.5 : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.


Heavy Metals Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.

NO_x : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.

SO₂ : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

Water : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Noise : Noise level data are recorded fortnightly.

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 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5
 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : WANI MONTH. : JUNE
 NAME OF THE PROJ T : GHUGUS OCP

ACC Patch Near ACC Colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
02/06/2019	580	172	47	23	18
28/06/2019	85	44	25	13	16
TLV	600	300	60	120	120
Ram Nagar Colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
02/06/2019	313	220	44	24	14
28/06/2019	114	88	31	25	17
TLV	200	100	60	80	80
SAM Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
03/06/2019	394	226	25	24	18
29/06/2019	84	43	26	13	11
TLV	600	300	60	120	120

#-Above std.value

Ghugus village (GP Office)					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
02/06/2019	349	217	57	23	15
29/06/2019	106	89	43	15	10
TLV	200	100	60	80	80

#-Above std.value

FUGITIVE DUST MONITORING DATA

CHP			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
-	-	-	-
Rly. Sidding			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
-	-	-	-

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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 2) This Report cannot be reproduced in part or full without written permission of the management.
 3) * - Test parameter not under NABL scope.
-

NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : WANI MONTH. : JUNE
NAME OF THE PROJECT : GHUGUS OC

Name of the Location : CHP - WGON-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	01/06/2019	65.6	65.4
JUNE.2019	29/06/2019	60.7	58.4
TLV		75	70

Name of the Location : Colony - WGON-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	01/06/2019	44.5	43.7
JUNE.2019	29/06/2019	44.9	42.6
TLV		55	45

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ENVIRONMENTAL MONITORING REPORT

KOLGAON OC EXPN.

(WANI AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014

AN ISO 9001:2015 COMPANY

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3.	NOISE LEVEL DATA	6

INTRODUCTION

Location :

Kolgaon Opencast Project is located in Wani Tahsil of Yeotmal district of Maharashtra State. It is administered by Wani Area of Western Coalfields Limited.

Communication :

The project is well connected by all weather road with Wani and also approachable by fair weather road from Ghugus.

Drainage :

Drainage of the area is controlled by Wardha river in North and Penganga river in South.

Climate :

The climate of this area is tropical with maximum and minimum temperature 48°C in summer and 10°C in winter respectively. The average annual rainfall is about 1200 mm.

Industry :

Besides other coal mines, ACC Cement Factory and Sindhale Limestone mines are the major industries nearby the project area.

Pollution due to other sources :

The above mentioned industries and the busy road traffic are also expected to contribute in increasing the pollution load of the area.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Manager Office	- WKOA-1
2.	Kolgaon village	- WKOA-2
3.	Kailash Nagar township near Filter Plant	- WKOA-3
4.	SAM Office (Mugoli)	- WKOA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- WKOW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	CHP	- WKON-1
2.	Colony(Mugoli)	- WKON-2


Frequency of Monitoring :

- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.

- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A36 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NOx (06:2006), SO2 (02:2001)], SPM*, PM-2.5
 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : WANI MONTH. : JUNE
 NAME OF THE PROJECT : KOLGAON OCP

Manager Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
14/06/2019	356	155	55	23	19
29/06/2019	60	38	21	12	13
TLV	600	300	60	120	120
Kolgaon Village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
15/06/2019	216	188	59	22	12
29/06/2019	80	52	24	20	8
TLV	200	100	60	80	80
Kailashnagar Township -F.Plant					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
14/06/2019	216	110	51	22	17
30/06/2019	64	40	23	11	14
TLV	200	100	60	80	120
# - Above Std. Value					


SAM Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
03/06/2019	333	220	52	23	18
28/06/2019	96	77	37	24	14
TLV	600	300	60	120	120

- Above Std. Value

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/W36 DATE OF ISSUE: 05.08.2019
NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION:
WATER SAMPLE

CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
NO. OF PAGES: 1

EFFLUENT WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : WANI MONTH. : JUNE
NAME OF THE PROJECT : KOLGAON OCP

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
13/06/2019	8.20	40	44	<2
28/06/2019	7.90	32	30	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : WANI MONTH. : JUNE
NAME OF THE PROJECT : KOLGAON OC

Name of the Location : Manager's Office - WKON-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
10/05/2019	13/06/2019	55.7	54.9
25/05/2019	29/06/2019	49.9	47.7
TLV		75	70

Name of the Location : Colony (Mugoli) - WKON-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	13/06/2019	42.9	41.6
JUNE.2019	29/06/2019	45.7	42.8
TLV		55	45

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ENVIRONMENTAL MONITORING REPORT

MUGOLI OC EXPN.

(WANI AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

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4 .	NOISE LEVEL DATA	7

INTRODUCTION

Location :

Mugoli Opencast Project is located in Wani Tahsil of Yeotmal district of Maharashtra State. It is administered by Wani Area of Western Coalfields Limited.

Communication :

The project is well connected by all weather road with Wani and also approachable by fair weather road from Ghughus.

Drainage :

Drainage of the area is controlled by Wardha river in North and Penganga river in South.

Climate :

The climate of this area is tropical with maximum and minimum temperature 48°C in summer and 10°C in winter respectively. The average annual rainfall is about 1200 mm.

Industry :

Besides other coal mines, ACC Cement Factory and Sindhale Limestone mines are the major industries nearby the project area.

Pollution due to other sources :

The above mentioned industries and the busy road traffic are also expected to contribute in increasing the pollution load of the area.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Sub-station	-	WMOA-1
2.	Kailash Nagar township (Filter Plant)	-	WMOA-2
3.	Tube well near Sakhara village	-	WMOA-3
4.	SAM Office	-	WMOA-4

Fugitive Dust Monitoring locations :

<u>S NO</u>	<u>Location Details</u>		
1.	Security Check post	-	WMOAF-1

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	WMOW-1
2.	WETP water discharge	-	WMOW-2
3.	DETP water discharge	-	WMOW-3

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	CHP	-	WMON-1
2.	Colony	-	WMON-2

Frequency of Monitoring :

Air : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.


Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
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- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment

Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Noise : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A37 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NOx (06:2006), SO2 (02:2001)], SPM*, PM-2.5 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : WANI MONTH. : JUNE
 NAME OF THE PROJECT : MUGOLI OCP

SAM Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
14/06/2019	108	76	40	23	19
30/06/2019	79	45	22	18	16
TLV	600	300	60	120	120
Kailash nagar Township - F. Plant					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
14/06/2019	216	110	51	22	17
30/06/2019	64	40	23	11	14
TLV	200	100	60	80	80
Tube well Near Sakhara Village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
14/06/2019	178	92	55	22	20
30/06/2019	75	61	46	17	9
TLV	200	100	60	80	80
# - Above std. value					

Sub – Station					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
13/06/2019	222	143	46	23	20
30/06/2019	130	70	31	21	9
TLV	600	300	60	120	120

- Above std. value.


FUGITIVE DUST MONITORING DATA

Security check post			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
-	-	-	-

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/W38 DATE OF ISSUE: 05.08.2019
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: WATER SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 1

EFFLUENT WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : WANI MONTH : JUNE
 NAME OF THE PROJECT : MUGOLI OC

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
13/06/2019	7.80	44	48	<2
28/06/2019	7.60	36	40	<2
TLV	5.5 - 9.0	250	100	10
E.T.P.(Workshop)Treated Water				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
13/06/2019	7.60	32	34	<2
28/06/2019	7.90	28	26	<2
TLV	5.5 - 9.0	250	100	10
S.T.P. (Domestic Effluent) - Treated Water				
Date of Sample Collection	Analysis Results			
	TSS (mg/l) IS-3025/17:1984		BOD (3 days 27°C) mg/l	
Below Detection Limit	10		2	
-	-		-	
TLV	100		30	

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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 3) * - Test parameter not und

NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : WANI MONTH. : JUNE
NAME OF THE PROJECT : MUGOLI OC

Name of the Location : CHP - WMON-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	13/06/2019	65.4	64.9
JUNE.2019	29/06/2019	62.4	59.1
TLV		75	70

Name of the Location : Colony - WMON-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	13/06/2019	42.9	41.6
JUNE.2019	29/06/2019	45.7	42.8
TLV		55	45

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ENVIRONMENTAL MONITORING REPORT
BELLORA-NAIGAON DEEP EXPN. OC
(WANI AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014

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INTRODUCTION

Location :

Bellora-Naigaon Opencast Project is located in Wani Tahsil of Yeotmal district of Maharashtra State. It is administered by Wani Area of Western Coalfields Limited.

Communication :

The approach road to the project is connected to Nagpur-Chandrapur highway roughly at a distance of 28 km from Chandrapur city by a 20 km long road branching off westward. The project is also well connected by Tadali-Ghughus branch line of Central railway.

Drainage :

Drainage of the area is controlled by Wardha River in North and Penganga River in South.

Climate :

The climate of this area is tropical with maximum and minimum temperature 48°C in summer and 10°C in winter respectively. The average annual rainfall is about 1200 mm.

Industry :

Besides other coal mines, ACC Cement Factory and Sindhale Limestone mines are the major industries nearby the project area.

Pollution due to other sources :

The above-mentioned industries and busy road traffic are also expected to contribute in increasing the pollution load of the area.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	SAM Office	- WN _G OA-1
2.	Bellora Rehabilitation	- WN _G OA-2
3.	Filter plant near VIP guest house	- WN _G OA-3
4.	Workshop (ETP) NOCM - I	- WN _G OA-4

Fugitive Dust Monitoring Location:

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Weight Bridge	- WN _G OAF-1

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- WN _G OW-1
2.	ETP discharge	- WN _G OW-2

Noise Level Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	CHP	- WN _G ON-1
2.	Colony (Ghughus)	- WN _G ON-2

Frequency of Monitoring :


- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is

transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Noise : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A39 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED:IS-5182 [PM-10(04:1999), NOx (06:2006), SO2 (02:2001)], SPM*, PM-2.5 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : WANI MONTH : JUNE
 NAME OF THE PROJECT : BELLORA-NAIGAON OCP

SAM Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
03/06/2019	333	220	52	23	18
28/06/2019	96	77	37	24	14
TLV	600	300	60	120	120
Bellora Rehabilittation Village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
03/06/2019	244	144	53	21	17
27/06/2019	127	85	43	25	17
TLV	200	100	60	80	80

Filter plant near VIP guest house					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
03/06/2019	364	243	55	25	14
28/06/2019	173	92	40	22	12
TLV	200	100	60	80	80
# - Above Std. Value					
Workshop ETP NOCM – I					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
04/06/2019	211	150	40	18	14
27/06/2019	305	139	40	24	14
TLV	600	300	60	120	120

- Above Std. Value

FUGITIVE DUST MONITORING DATA

WEIGHT BRIDGE.			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
27/06/2019	461	160	58

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

- Note: 1) This Report refers to the values related to the items tested as received.
2) This Report cannot be reproduced in part or full without written permission of the management.
3) * - Test parameter not under NABL scope.

NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : WANI MONTH : JUNE
NAME OF THE PROJECT : BELLORA-NAIGAON OC

Name of the Location : CHP - WN_GON-1

Month	Date of Data Collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	02/06/2019	65.6	64.9
JUNE.2019	29/06/2019	62.7	60.6
TLV		75	70

Name of the Location : Colony(Ghugus) - WN_GON-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	01/06/2019	44.5	43.7
JUNE.2019	29/06/2019	44.9	42.6
TLV		55	45

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ENVIRONMENTAL MONITORING REPORT

NILJAI OC

(WANI AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014

AN ISO 9001:2015 COMPANY

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2.	AIR QUALITY MONITORING DATA	4-5
3.	EFFLUENT WATER QUALITY MONITORING DATA	6
4.	NOISE LEVEL DATA	7

INTRODUCTION

Location :

Niljai opencast project is administered by Wani Area of Western Coalfields Limited. It falls in Wani Tahsil of Yeotmal district of Maharashtra state.

Communication :

The nearest rail head is Ghugus Rly. Station on Tadali-Ghugus branch line of Central Railway. The project is connected by road with Ghugus and Wani.

Drainage : Wardha River serves as the main drainage during rainy season.

Climate :

The climate of this area is tropical. In summer the temperature goes up as high as 46°C. to 47°C. and relative humidity goes down as low as 18%.

Industry :

Within a range of 10 km there are number of major industries viz; (1) ACC (2) Lloyed Steel (3) Coal mines viz - Naigaon OC, Ghugus OC etc.

Pollution due to other sources :

The industries like Cement Plant, Lloyed Steel, and Brick Kiln are also likely to contribute in increasing the pollution in nearby villages/colony.

Sampling Locations :

Ambient Air Quality Monitoring Locations :

S.No.	<u>Details of Location</u>		<u>Code No.</u>
1.	Niljai Colony	-	WNOA-1
2.	Taroda village	-	WNOA-2
3.	Civil Office	-	WNOA-3
4.	Workshop (ETP) of NOCM - I	-	WNOA-4

Fugitive Dust Monitoring Locations :

S.No.	<u>Details of Location</u>		<u>Code No.</u>
1.	Weigh Bridge	-	WNOAF-1
2.	CHP	-	WNOAF-2

Water Quality Monitoring Locations :

S.No.	<u>Details of Location</u>		<u>Code No.</u>
1.	Mine water discharge, Niljai-I	-	WNOW-1
2.	Mine water discharge, Niljai-II	-	WNOW-2
3.	ETP (Niljai) treated water	-	WN(ETP)W-3
4.	ETP (Niljai - S) treated water	-	WN(ETP)W-4
5.	STP (Domestic Effluent) - treated water	-	WN(STP)W-5

Noise Level Monitoring Locations (with Location Code) :

S.No.	<u>Details of Location</u>		<u>Code No.</u>
1.	CHP (Niljai OC)	-	WNON-1
2.	CHP (Niljai – S OC)	-	WNON-2
3.	Colony	-	WNON-3

Frequency of Monitoring :

- Air** : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.


Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected once in each fortnight in a month with APM 451 Respirable dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended Particulate Matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM** : Ambient air laden with suspended particulates enters the Respirable dust sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size > 10 micron) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass micro fiber filter paper. The Respirable dust (**PM-10**) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- PM-2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of Oxides of Nitrogen is based on the procedure of "**Jacobs and Hochheiser method**". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of "**West and Gaeke method**". Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphito-mercurate. The amount of

Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

Water : Water samples are collected from prefixed locations in plastic zaricanes and are transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Noise : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A40 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NOx (06:2006), SO2 (02:2001)], SPM*, PM-2.5 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : WANI MONTH : JUNE
 NAME OF THE PROJECT : NILJAI OCP

Niljai colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
04/06/2019	466	183	47	30	17
19/06/2019	97	52	35	20	7
TLV	200	100	60	80	80
Taroda Village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
04/06/2019	387	123	55	34	26
19/06/2019	348	104	31	21	10
TLV	200	100	60	80	80
Civil office -Niljai					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
04/06/2019	289	117	54	14	10
27/06/2019	174	101	36	23	12
TLV	600	300	60	120	120
# - Above Std. Value.					

Workshop (ETP) of NOCM - I					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
04/06/2019	211	150	40	18	14
27/06/2019	305	139	40	24	14
TLV	600	300	60	120	120

- Above Std. Value.

FUGITIVE DUST MONITORING DATA


WEIGHT BRIDGE.			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
19/06/2019	619	446	85

CHP			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
19/06/2019	306	126	54

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/W40 DATE OF ISSUE: 05.08.2019
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: WATER SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 1

EFFLUENT WATER QUALITY MONITORING DATA

1NAME OF THE COMPANY : WCL YEAR 2019
 NAME OF THE AREA : WANI MONTH : JUNE
 NAME OF THE PROJECT : NILJAI OC

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
03/06/2019	7.80	40	38	<2
19/06/2019	7.50	32	28	<2
TLV	5.5 - 9.0	250	100	10
E.T.P.(Workshop)Treated Water				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
03/06/2019	8.20	36	32	<2
19/06/2019	8.00	28	30	<2
TLV	5.5 - 9.0	250	100	10
S.T.P. (Domestic Effluent) - Treated Water				
Date of Sample Collection	Analysis Results			
	TSS (mg/l) IS-3025/17:1984		BOD (3 days 27°C) mg/l	
Below Detection Limit	10		2	
03/06/2019	50		12	
19/06/2019	34		8	
TLV	100		30	

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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 3) * - Test parameter not under NABL sc

NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : WANI MONTH : JUNE
 NAME OF THE PROJECT : NILJAI OC

Name of the Location : CHP – Niljai OC - WNON-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	03/06/2019	65.9	64.7
JUNE.2019	29/06/2019	61.9	58.7
TLV		75	70

Name of the Location : CHP – Niljai (S) OC - WNON-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	03/06/2019	64.9	64.5
JUNE.2019	29/06/2019	60.7	58.2
TLV		75	70

Name of the Location : Colony - WNON-3

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	03/06/2019	44.5	43.8
JUNE.2019	29/06/2019	45.4	41.9
		55	45

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ENVIRONMENTAL MONITORING REPORT

PENGANGA OC

(WANI AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

**REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014**

AN ISO 9001:2015 COMPANY

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INTRODUCTION

Location :

Penganga Opencast Project is located in Wani Tahsil of Yeotmal district of Maharashtra State. It is administered by Wani Area of Western Coalfields Limited.

Communication :

The project is well connected by all weather road with Wani and also approachable by fair weather road from Ghugus.

Drainage :

Drainage of the area is controlled by Wardhariver and Penganga river.

Climate :

The climate of this area is tropical with maximum and minimum temperature 48°C in summer and 10°C in winter respectively. The average annual rainfall is about 1200 mm.

Industry :

Besides other coal mines, ACC Cement Factory and Sindhale Limestone mines are the major industries nearby the project area.

Pollution due to other sources :

The above mentioned industries and the busy road traffic are also expected to contribute in increasing the pollution load of the area.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
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Fugitive Dust Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	WrokShop	WPOAF-1

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	WPOW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Workshop	WPON-1


Frequency of Monitoring :

- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.

- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A41 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NOx (06:2006), SO2 (02:2001)], SPM*, PM-2.5 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : WANI MONTH : JUNE
 NAME OF THE PROJECT : PENGANGA OCP

Gadegaon Village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
13/06/2019	171	80	43	18	16
30/06/2019	91	60	32	18	8
TLV	200	100	60	80	80
Manager Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
02/06/2019	355	222	55	23	16
30/06/2019	84	56	29	23	17
TLV	600	300	60	120	120
# - Above Std. Value					

Near Mine					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
13/06/2019	112	83	32	16	10
30/06/2019	88	48	24	11	13
TLV	600	300	60	120	120
Virur Village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
13/06/2019	122	58	25	12	15
30/06/2019	84	55	28	20	13
TLV	200	100	60	80	80

- Above Std. Value

FUGITIVE DUST MONITORING DATA

1. Workshop

(24 hourly values in µg/m³)

Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
-	-	-	-

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

-
- Note: 1) This Report refers to the values related to the items tested as received.
 2) This Report cannot be reproduced in part or full without written permission of the management.
 3) * - Test parameter not under NABL scope

NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : WANI MONTH : JUNE
NAME OF THE PROJECT : PENGANGA OC

Name of the Location : Workshop - WPON-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	12/06/2019	56.6	55.8
JUNE.2019	29/06/2019	49.9	47.7
TLV		75	70

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The information given in this report is not to be communicated either directly or indirectly to the press or to any person not holding an official position in the CIL / Government

ENVIRONMENTAL MONITORING REPORT

KOLAR PIMPRI EXTN. OC

(WANI NORTH AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014

AN ISO 9001:2015 COMPANY

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INTRODUCTION

Location :

Kolar-Pimpri Opencast Project is located on the right bank of Wardha river in Wani Tahsil of Yeotmal district of Maharashtra State. It is administered by Wani North Area of Western Coalfields Limited.

Communication :

The project is connected by a fair weathered road with Wani town via Bhalar village in North-west and Ghughus colliery via Ukni village in south. Wani is connected to state highway 84 via Warora. Ghughus railway station is 12 km away and Wani railway station is 14 km away from the project.

Drainage : Wardha river serves as the main drainage of the area.

Climate :

The climate of this area is tropical with maximum and minimum temperature 48°C in summer and 10°C in winter respectively. The average annual rainfall is about 1200 mm.

Industry :

Besides other coalmines, there are a lot of lime kiln and fire bricks industries near the project area. Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Pollution due to other sources :

The above-mentioned industries are also expected to contribute in increasing the pollution load of the area.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Pimpri village	-	W _N KOA-1
2.	Rest Shelter	-	W _N KOA-2
3.	Substation-Kolarpimpri	-	W _N KOA-3
4.	Water filter plant - Pragati nagar	-	W _N KOA-4

Fugitive Dust Monitoring Location:

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Weigh Bridge	-	W _N KOAF-1
2.	CHP		W _N KOAF-2
3.	Wani Rly. Sidding		W _N KOAF-3

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	W _N KOW-1
2.	Workshop water discharge	-	W _N KOW-2

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	CHP	- W _N KON-1
2.	Colony (Pragati Nagar)	- W _N KON-2

Frequency of Monitoring :

- Air** : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.


Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (TPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.
- PM-2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline

hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

Water : Water samples are collected on fortnightly basis in plastic zaricane and are transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Noise : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A44 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NOx (06:2006), SO2 (02:2001)], SPM*, PM-2.5
 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : WANI NORTH MONTH. : JUNE
 NAME OF THE PROJECT : KOLAR-PIMPRI OCP

Pimpri village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
10/06/2019	262	182	55	17	18
21/06/2019	222	83	25	19	19
Permissible Limits	200	100	60	80	80
Rest shelter					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
10/06/2019	152	98	41	20	24
24/06/2019	87	40	35	21	22
TLV	600	300	60	120	120
Substation-Kolarpimpri					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
10/06/2019	131	112	27	19	21
22/06/2019	173	131	52	19	12
TLV	600	300	60	120	120
# - Above Std. Value					

Water filter plant - Pragati nagar					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
08/06/2019	361	229	58	21	16
23/06/2019	146	59	37	23	30
Permissible Limits	200	100	60	80	80

- Above Std. Value

FUGITIVE DUST MONITORING DATA

WEIGHT BRIDGE.			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
22/06/2019	697	385	84


CHP.			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
22/06/2019	435	125	52

Wani Rly. Siding			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
20/06/2019	530	268	86

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/W44 DATE OF ISSUE: 05.08.2019
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: WATER SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 1

EFFLUENT WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : WANI NORTH MONTH : JUNE
 NAME OF THE PROJECT : KOLAR-PIMPRI OC

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
09/06/2019	6.40	28	20	<2
21/06/2019	7.10	32	24	<2
TLV	5.5 - 9.0	250	100	10

E.T.P.(Workshop)Treated Water				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
09/06/2019	7.30	40	28	<2
21/06/2019	6.40	24	18	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : WANI NORTH MONTH : JUNE
NAME OF THE PROJECT : KOLAR-PIMRPI OCP

Name of the Location : CHP - W_NKON-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	09/06/2019	64.9	64.2
JUNE.2019	19/06/2019	65.3	64.8
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75	70

Name of the Location : Colony (Pragati Nagar) - W_NKON-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	07/06/2019	44.6	43.8
JUNE.2019	19/06/2019	42.6	41.6
Permissible Limit		55	45

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ENVIRONMENTAL MONITORING REPORT

KUMBHARKHANI UG EXPN.

(WANI NORTH AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014

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3.	NOISE LEVEL DATA	5

KUMBHARKHANI UG

Location :

Kumbarkhani UG Project is located in Wani Tahsil of Yeotmal district of Maharashtra State. It is administered by Wani North Area of Western Coalfields Limited.

Communication :

The project is located at a distance of nearly 18 km SW of Wani township. It is approachable from Wani by a metalled, motorable road (Wani – Patan road). The nearest railway station is Wani on Majri-Rajur branch line of Central Railway.

Drainage : Vidarbha river serves as the main drainage of the area during rainy season.

Climate :

The climate of this area is tropical with maximum and minimum temperature 48°C in summer and 10°C in winter respectively. The average annual rainfall is about 1200 mm.

Pollution due to other Sources:

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Locations :

Ambient Air Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Ghonsa village	- W _N KUA-1
2.	SAM office/ Canteen	- W _N KUA-2
3.	Guest house/ Colony	- W _N KUA-3
4.	Project Manager Office	- W _N KUA-4

Water Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- W _N KUW-1

Noise Level Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Fan house	- W _N KUN-1
2.	Colony	- W _N KUN-2

Frequency of Monitoring :


- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5

m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.

- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A45 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5
 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : WANI NORTH MONTH. : JUNE
 NAME OF THE PROJECT : KUMBARKHANI UG

Ghonsa village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
11/06/2019	173	67	28	12	15
19/06/2019	61	38	15	9	7
TLV	200	100	60	80	80
SAM office/ Canteen					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
11/06/2019	112	58	34	19	13
19/06/2019	161	129	35	24	19
TLV	600	300	60	120	120
Guest house/ Colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
11/06/2019	107	68	39	21	16
19/06/2019	119	68	34	24	21
TLV	200	100	60	80	80
# - Above Std. Value					

Project Manager Office

DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
10/06/2019	160	86	44	21	16
26/06/2019	216	180	52	26	17
TLV	600	300	60	120	120

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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3) * - Test parameter not under NABL scope.
-

NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : WANI NORTH MONTH.: JUNE
 NAME OF THE PROJECT : KUMBHARKHANI UG

Name of the Location : Near Fan House - W_NKUN-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	10/06/2019	46.8	45.6
JUNE.2019	24/06/2019	42.1	41.2
TLV		75	70

Name of the Location : Colony -W_NKUN-2

Month	Date of Data Collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	10/06/2019	43.7	42.5
JUNE.2019	24/06/2019	41.1	40.2
TLV		55	45

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ENVIRONMENTAL MONITORING REPORT

PIMPALGAON OC

(WANI NORTH AREA)

WESTERN COALFIELDS LTD.

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JUNE-2019

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1.	INTRODUCTION	1-3
2.	AIR QUALITY MONITORING DATA	4-5
3.	NOISE LEVEL DATA	6

Introduction

Location :

Pimpalgaon Opencast Project is located in Wani Tahsil of Yeotmal district of Maharashtra State. It is administered by Wani North Area of Western Coalfields Limited.

Communication :

The project is connected by a fair weathered road with Wani town via Bhalar village in North-west and Ghughus colliery via Ukni village in south. Wani is connected to state highway 84 via Warora. Ghughus railway station is 12 km away and Wani railway station is 14 km away from the project.

Drainage :

Wardha river which flows from North to west acts as the main drainage of the area and is about 2.5 km to 3 km from Pimpalgaon.

Climate :

The climate of this area is tropical with maximum and minimum temperature 48°C in summer and 10°C in winter respectively. The average annual rainfall is about 1200 mm.

Industry :

Besides other coal mines, there exist lime kiln and fire bricks industries also located around the project area. Transportation roads, agricultural and local activities, vehicular traffic etc also contributes to the pollution.

Pollution due to other sources :

The above-mentioned industries are also expected to contribute in increasing the pollution load of the area.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	SAM Office	-	W _N POA-1
2.	Water Filter Plant – Pragati Nagar	-	W _N POA-2
3.	Workshop	-	W _N POA-3
4.	Borgaon Village	-	W _N POA-4

Fugitive Dust Monitoring Location:

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Weigh Bridge	-	W _N POAF-1
2.	CHP	-	W _N POAF-2

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	W _N POW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	CHP	-	W _N PON-1
2.	Colony (Pragati Nagar)	-	W _N PON-2


Frequency of Monitoring :

- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.

- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A46 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : WANI NORTH MONTH : JUNE
 NAME OF THE PROJECT : PIMPALGAON OCP

Water filter plant - Pragati nagar					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
08/06/2019	361	229	58	21	16
23/06/2019	146	59	37	23	30
Permissible Limits	200	100	60	80	80
SAM office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
08/06/2019	173	117	46	22	20
23/06/2019	96	65	38	25	20
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Workshop					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
08/06/2019	281	151	51	25	22
23/06/2019	119	55	24	20	24
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120

Borgaon village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
07/06/2019	257	119	77	25	8
24/06/2019	79	57	64	21	16
Permissible Limits	200	100	60	80	80

- Above Std. Value

FUGITIVE DUST MONITORING DATA

WEIGHT BRIDGE.			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
-	-	-	-

CHP.			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
09/06/2019	345	232	108

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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3) * - Test parameter not under NABL scope.

NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : WANI NORTH MONTH : JUNE
NAME OF THE PROJECT : PIMPALGAON OCP

Name of the Location : **CHP** - **W_NPON-1**

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	07/06/2019	65.8	64.9
JUNE.2019	19/06/2019	66.2	65.8
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75	70

Name of the Location : **Colony (Pragati Nagar) - W_NPON-1**

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	07/06/2019	44.6	43.8
JUNE.2019	19/06/2019	42.6	41.6
Permissible Limit		55	45

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ENVIRONMENTAL MONITORING REPORT

RAJUR UG/ BHANDEWADA INCLINE

(WANI NORTH AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014

AN ISO 9001:2015 COMPANY

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3.	EFFLUENT WATER QUALITY MONITORING DATA	5
4.	NOISE LEVEL DATA	6

INTRODUCTION

Location :

Rajur Underground Project is located in Wani Tahsil of Yeotmal district of Maharashtra State. It is administered by Wani North Area of Western Coalfields Limited.

Communication :

The project is connected by all weathered road with Wani-Yeotmal road State Highway.

Drainage :

Wardha river serves as the main drainage of the area.

Climate :

The climate of this area is tropical with maximum and minimum temperature 48°C in summer and 10°C in winter respectively. The average annual rainfall is about 1200 mm.

Industry :

Besides other coal mines, there are a lot of lime kiln and fire bricks industries near the project area. Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Pollution due to other sources :

The above-mentioned industries are also expected to contribute in increasing the pollution load of the area.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Hutment / Substation	-	W _N RUA-1
2.	Near Bandewada incline	-	W _N RUA-2
3.	Pit office	-	W _N RUA-3
4.	SAM Office	-	W _N RUA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	W _N RUW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Fan house	-	W _N RUN-1
2.	Colony	-	W _N RUN-2

Frequency of Monitoring :


- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of

nitrogen (NO_x) etc.

- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A47 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : WANI NORTH MONTH. : JUNE
 NAME OF THE PROJECT : RAJUR UG

Hutment					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
12/06/2019	84	40	23	21	19
20/06/2019	64	45	26	22	8
TLV	200	100	60	80	80
Near Bandewada incline					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
12/06/2019	153	83	55	25	20
20/06/2019	95	59	29	24	21
TLV	600	300	60	120	120
Pit office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
12/06/2019	182	137	56	20	14
20/06/2019	86	59	33	22	14
TLV	600	300	60	120	120
#-Above std.value					

SAM Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
12/06/2019	107	76	34	27	16
20/06/2019	58	35	19	16	13
TLV	600	300	60	120	120

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : WANI NORTH MONTH: JUNE
NAME OF THE PROJECT : RAJUR UG

Name of the Location : Near Fan House - W_NRUN-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	11/06/2019	68.9	67.8
JUNE.2019	19/06/2019	65.6	64.8
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75	70

Name of the Location : Colony - W_NRUN-2

Month	Date of Data Collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	11/06/2019	43.8	42.5
JUNE.2019	24/06/2019	46.7	44.9
Permissible Limit		55	45

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ENVIRONMENTAL MONITORING REPORT

UKNI DEEP OCP

(WANI NORTH AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

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3.	EFFLUENT WATER QUALITY MONITORING DATA	6-7
4.	NOISE LEVEL DATA	8

INTRODUCTION

Location : Ukni Opencast Project is located in Wani Tahsil of Yeotmal district of Maharashtra State. It is administered by Wani North Area of Western Coalfields Limited.

Communication :

The project is connected by fair weathered road with Wani town in the North-west and Ghughus Colliery in the South. The Ghughus and Wani railway stations are located about 10 km away on the East bank and West bank respectively. Wani is connected to New Majri railway station (on Delhi-Madras line) by a rail bridge across the Wardha river.

Drainage : Wardha river serves as the main drainage of the area during rainy season.

Climate : The climate of this area is tropical with maximum and minimum temperature 48°C in summer and 10°C in winter respectively. The average annual rainfall is about 1200 mm.

Industry :

Besides other coalmines, there are a lot of lime kiln and fire bricks industries near the project area. Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Pollution due to other sources :

The above-mentioned industries are also expected to contribute in increasing the pollution load of the area.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Bhalar township	-	W _N UOA-1
2.	Ukni village	-	W _N UOA-2
3.	Workshop premises	-	W _N UOA-3
4.	Pimpri Village	-	W _N UOA-4

Fugitive Dust Monitoring Location:

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Weigh Bridge	-	W _N UOAF-1
2.	CHP		W _N UOAF-2

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	W _N UOW-1
2.	Workshop (ETP) water discharge	-	W _N UOW-2
3.	DETP water discharge	-	W _N UOW-3

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	CHP	-	W _N UON-1
2.	Bhalar Colony	-	W _N UON-2

Frequency of Monitoring :

Air : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.

SPM/ PM-10 : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.

PM2.5 : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.


Heavy Metals : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.

NO_x : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.

SO₂ : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

Water : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Noise : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A48 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NOx (06:2006), SO2 (02:2001)], SPM*, PM-2.5 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : WANI NORTH MONTH : JUNE
 NAME OF THE PROJECT : UKNI OCP

Bhalar township					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
07/06/2019	88	50	31	22	28
24/06/2019	87	48	32	19	11
TLV	200	100	60	80	80
Ukni village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
07/06/2019	86	53	21	11	6
24/06/2019	84	40	24	12	13
TLV	200	100	60	80	80
Workshop premises					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
07/06/2019	127	74	47	16	16
24/06/2019	123	72	58	20	25
TLV	600	300	60	120	120
# - Above Std. Value					

Pimpri village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
10/06/2019	262	182	55	17	18
21/06/2019	222	83	25	19	19
TLV	200	100	60	80	80

- Above Std. Value

FUGITIVE DUST MONITORING DATA


WEIGHT BRIDGE.			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
-	-	-	-

CHP.			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
-	-	-	-

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/W48 DATE OF ISSUE: 05.08.2019
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: WATER SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 1

EFFLUENT WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : WANI NORTH MONTH : JUNE
 NAME OF THE PROJECT : UKNI OCP

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
07/06/2019	7.10	44	28	<2
23/06/2019	5.50	48	50	<2
TLV	5.5 - 9.0	250	100	10
E.T.P.(Workshop)Treated Water				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
07/06/2019	6.70	32	24	<2
23/06/2019	6.80	40	28	<2
TLV	5.5 - 9.0	250	100	10

S.T.P. (Domestic Effluent) - Treated Water		
Date of Sample Collection	Analysis Results	
	TSS (mg/l) IS-3025/17:1984	BOD (3 days 27°C) mg/l
Below Detection Limit	10	2
07/06/2019	46	12
23/06/2019	52	14
TLV	100	30

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL
NAME OF THE AREA : WANI NORTH
NAME OF THE PROJECT : UKNI OCP
YEAR : 2019
MONTH: JUNE

Name of the Location : CHP W_NUON-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	06/06/2019	65.7	64.6
JUNE.2019	19/06/2019	64.8	63.2
TLV		75	70

Name of the Location : Colony (Bhalar)

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	06/06/2019	43.5	42.9
JUNE.2019	19/06/2019	41.5	40.3
TLV		55	45

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ENVIRONMENTAL MONITORING REPORT

WANI RAILWAY SIDING

(WANI NORTH AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102
CMPDI
REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014

AN ISO 9001:2015 COMPANY

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2.	AIR QUALITY MONITORING DATA	3-4
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Introduction

Location :

Wani Railway Siding is located in Wani Tahsil of Yavatmal district of Maharashtra State. It is administered by Wani North Area of Western Coalfields Limited.

Communication :

The project is connected by road with Wani town via SH 233 in North-east and Ghughus colliery via Ukni village in south-east. Wani railway siding is connected via MSH 6 to Ghughus railway station which is 24 km away from the project.

Drainage :

Wardha river which flows from North to west acts as the main drainage of the area and is about 7.5 km to 8 km from Wani Railway Siding.

Climate :

The climate of this area is tropical with maximum and minimum temperature 48°C in summer and 10°C in winter respectively. The average annual rainfall is about 1200 mm.

Industry :

Besides other coal mines, there exist market place which is also located around the project area. Transportation roads, agricultural and local activities, vehicular traffic etc also contributes to the pollution.

Pollution due to other sources :

The above-mentioned industries are also expected to contribute in increasing the pollution load of the area.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Farm House Nr. MSH6 Highway	-	W _N RSA-1
2.	Shethsri Bazar	-	W _N RSA-2
3.	Residential House Vittalwadi	-	W _N RSA-3

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Coal Stock yard	-	W _N RSN-1
2.	Nr. In charge Office	-	W _N RSN-2

Frequency of Monitoring :

- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM),

Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.

SPM/ PM-10 : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.

PM2.5 : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.


Heavy Metals : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.

NO_x : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.

SO₂ : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

Water : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Noise : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A49 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5
 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : WANI NORTH MONTH : JUNE
 NAME OF THE PROJECT : WANI RAILWAY SIDING OC

Farm House Nr. MSH6 Highway					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
09/06/2019	211	147	35	19	11
20/06/2019	356	164	54	20	13
21/06/2019	140	83	58	20	7
25/06/2019	171	88	42	20	15
26/06/2019	100	66	31	21	23
TLV	600	300	60	120	120
Shethsri Bazar					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
09/06/2019	138	91	52	24	21
20/06/2019	124	67	38	25	24
21/06/2019	150	86	43	24	19
25/06/2019	76	36	15	11	13
26/06/2019	129	70	38	24	19
TLV	200	100	60	80	80
#-Above Std. Value					

Residential House Vittalwadi					
DATE OF SAMPLING	Parameters (24 hourly values in $\mu\text{g}/\text{m}^3$)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
09/06/2019	190	89	56	21	16
20/06/2019	89	54	30	22	11
21/06/2019	92	40	30	22	17
25/06/2019	195	85	53	21	12
26/06/2019	110	63	34	22	17
TLV	200	100	60	80	80

FUGITIVE DUST MONITORING DATA

Wani Rly. Siding			
DATE OF SAMPLING	Parameters (24 hourly values in $\mu\text{g}/\text{m}^3$)		
	SPM*	PM-10	PM2.5
25/06/2019	101	67	41

(Scientific Assistant)

*Deepanshu Sahu
(Authorized Signatory)*

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- Note: 1) This Report refers to the values related to the items tested as received.
 2) This Report cannot be reproduced in part or full without written permission of the management.
 3) * - Test parameter not under NABL scope.

NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : WANI NORTH MONTH : JUNE
 NAME OF THE PROJECT : WANI RLY. SIDING OC

Name of the Location : Coal Stock Yard - W_NRSN-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	08/06/2019	44.7	43.6
JUNE.2019	24/06/2019	42.6	41.7
TLV		75	70

Name of the Location : In charge Office - W_NRSN-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	08/06/2019	52.8	42.9
JUNE.2019	24/06/2019	53.6	44.7
TLV		55	45

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ENVIRONMENTAL MONITORING REPORT

GHONSA OC EXPN.

(WITHIN EXISTING LAND)

(WANI NORTH AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014

AN ISO 9001:2015 COMPANY

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3.	EFFLUENT WATER QUALITY MONITORING DATA	6
4.	NOISE LEVEL DATA	7

INTRODUCTION

Location :

Ghonsa Open Cast Project is located in Wani Tahsil of Yeotmal district of Maharashtra State. It is administered by Wani North Area of Western Coalfields Limited.

Communication :

The project is located at a distance of nearly 18 km SW of Wani township. It is approachable from Wani by a metalled, motorable road (Wani – Patan road). The nearest railway station is Wani on Majri-Rajur branch line of Central Railway.

Drainage : Vidarbha river serves as the main drainage of the area during rainy season.

Climate :

The climate of this area is tropical with maximum and minimum temperature 48°C in summer and 10°C in winter respectively. The average annual rainfall is about 1200 mm.

Pollution due to other Sources:

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Locations :

Ambient Air Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Manager Office	- W _N GOA-1
2.	Ghonsa village	-- W _N GOA-2
3.	SAM Office/ canteen	- W _N GOA-3
4.	Guest house/ Colony	- W _N GOA-4

Water Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- W _N GOW-1

Noise Level Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near Manager Office	-- W _N GON-1

Frequency of Monitoring :

- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.
- SPM/
PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size > 10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size < 10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium (Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of "West and Gaeke method". Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

Water : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Noise : Noise level data are recorded fortnightly.


Guest house/ Colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
11/06/2019	107	68	39	21	16
19/06/2019	119	68	34	24	21
TLV	200	100	60	80	80

- Above Std. Value

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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3) * - Test parameter not under NABL scope.
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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/W42 DATE OF ISSUE: 05.08.2019
NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: WATER SAMPLE
CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
NO. OF PAGES: 1

EFFLUENT WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : WANI NORTH MONTH : JUNE
NAME OF THE PROJECT : GHONSA OCP

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
16/06/2019	6.30	36	24	<2
18/06/2019	6.00	48	36	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2098
NAME OF THE AREA : WANI NORTH MONTH.: JUNE
NAME OF THE PROJECT : GHONSA OC

Name of the Location : Manager Office - W_NGON-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	10/06/2019	54.9	54.3
JUNE.2019	24/06/2019	52.9	51.1
TLV		75	70

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ENVIRONMENTAL MONITORING REPORT

EXPN. OF JUNAD OC

(WANI NORTH AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE- 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102
CMPDI
REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014

AN ISO 9001:2015 COMPANY

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3.	EFFLUENT WATER QUALITY MONITORING DATA	5
4.	NOISE LEVEL DATA	6

INTRODUCTION

Location : Junad Opencast Project is located in Wani Tahsil of Yeotmal district of Maharashtra State. It is administered by Wani North Area of Western Coalfields Limited.

Communication :The project is located at east of Ukni / Pimpalgaon project across Wardha river. It is connected by road from Wani town. The nearest railway head is Wani.

Drainage : The drainage of the area is controlled by Wardha river.

Climate :The climate of this area is tropical with maximum and minimum temperature 48°C in summer and 10°C in winter respectively. The average annual rainfall is about 1200 mm.

Industry :Besides other coal mines, there are a lot of lime kiln and fire bricks industries near the project area. Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Pollution due to other sources :The above-mentioned industries are also expected to contribute in increasing the pollution load of the area.

Sampling Locations :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Borgaon village	-	W _N JOA-1
2.	SAM office	-	W _N JOA-2
3.	Bhalar township	-	W _N JOA-3
4.	Ukni village	-	W _N JOA-4

Fugitive Dust Monitoring Location:

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Security Post	-	W _N JOAF-1

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	W _N JOW-1
2.	Workshop water discharge	-	W _N JOW-2

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Near Manager Office	-	W _N JON-1
2.	Colony (Bhalar)	-	W _N JON-2

Frequency of Monitoring :

Air : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.


Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.

- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

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TEST REPORT NO. : RIN/TR/JUNE-19/A43 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5
 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : WANI NORTH MONTH : JUNE
 NAME OF THE PROJECT : JUNAD OCP

Borgaon village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
07/06/2019	257	119	77	25	8
24/06/2019	79	57	64	21	16
TLV	200	100	60	80	80
SAM office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
08/06/2019	386	227	57	21	19
23/06/2019	94	66	28	21	12
TLV	600	300	60	120	120
Bhalar township					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
07/06/2019	88	50	31	22	28
24/06/2019	87	48	32	19	11
TLV	200	100	60	80	80

- Above Std. Value

Ukni village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
07/06/2019	86	53	21	11	6
24/06/2019	84	40	24	12	13
TLV	200	100	60	80	80

- Above Std. Value


FUGITIVE DUST MONITORING DATA

Security Post			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM-2.5
-	-	--	-

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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- Note: 1) This Report refers to the values related to the items tested as received.
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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/W43 DATE OF ISSUE: 05.08.2019
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: WATER SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 1

EFFLUENT WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : WANI NORTH MONTH : JUNE
 NAME OF THE PROJECT : JUNAD OC

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
07/06/2019	7.60	32	22	<2
22/06/2019	7.60	28	22	<2
TLV	5.5 - 9.0	250	100	10
E.T.P.(Workshop)Treated Water				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
07/06/2019	6.20	28	20	<2
22/06/2019	6.40	24	18	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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 3) * - Test parameter not under NABL scope.

NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : WANI NORTH MONTH. : JUNE
 NAME OF THE PROJECT : JUNAD OCP

Name of the Location : Near Manager Office - W_NJON-1

Month	Date of Data Collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	07/06/2019	55.7	54.9
JUNE.2019	24/06/2019	45.8	44.3
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75	70

Name of the Location : Colony (Bhalar)

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	06/06/2019	43.5	42.9
JUNE.2019	19/06/2019	41.5	40.3
Permissible Limit		55	45

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ENVIRONMENTAL MONITORING REPORT

AMBARA OC

(KANHAN AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014

AN ISO 9001:2015 COMPANY

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3.	NOISE LEVEL DATA	6

INTRODUCTION

Location :

Ambara OC Project is located in Chhindwara district of Madhya Pradesh. The project is administered by Kanhan Area of Western Coalfields Limited.

Communication :

The Project is connected with Chhindwara by State Highway. Nearest railway station is Junardeo on the Amla - Parasia broad gauge branch of Central Railway. The Project is about 5 kms from Junardeo station.

Climate :

The climate of the area is tropical. The maximum and minimum temperature range during Summer is 45°C to 27°C and during Winter is 25°C to 4°C. Annual rainfall varies from 1000 mm to 1400 mm.

Other Sources of Pollution :

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Manager Office	- KAOA – 1
2.	Pit Office (Mohan)	- KAOA – 2
3.	Colony	- KAOA – 3
4.	Ambara village	- KAOA -- 4

Fugitive Dust Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	CHP	- KGOAF-1

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- KMUW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near Manager Office	- KAON-1
2.	Colony (Mohan)	- KAON-2

Frequency of Monitoring :

- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected

- locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc
- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sample
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Ambara village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
15/06/2019	186	89	38	17	14
30/06/2019	64	49	23	18	10
Permissible Limits	200	100	60	80	80

- Above Std. Value

FUGITIVE DUST MONITORING DATA

CHP.			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
15/06/2019	802	242	74

(Scientific Assistant)

*Deepanshu Sahu
 (Authorized Signatory)*

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : KANHAN MONTH : JUNE
NAME OF THE PROJECT : AMBARA OC

Name of the Location : Manager Office - KAON-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	11/06/2019	52.6	46.3
JUNE.2019	24/06/2019	53.6	46.7
TLV		75	70

Name of the Location : Colony (Mohan) - KAON-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	11/06/2019	48.7	46.2
JUNE.2019	24/06/2019	47.6	45.2
TLV		55	45

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ENVIRONMENTAL MONITORING REPORT

AMBARA UG

(KANHAN AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
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3.	NOISE LEVEL DATA	5

INTRODUCTION

Location :

Ambara UG is located in Chhindwara district of Madhya Pradesh. The project is administered by Kanhan Area of Western Coalfields Limited.

Communication :

Ambara UG Project is connected by road with Chhindwara State highway. Nearest railway station is Junardeo on the Amla - Parasia broad gauge branch of Central Railway. The Project is about 12 kms from Junardeo station.

Climate :

The climate of the area is tropical. The maximum and minimum temperature range during Summer is 45°C to 27°C and during Winter is 25°C to 4°C. Annual rainfall varies from 1000 mm to 1400 mm.

Other Sources of Pollution :

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	SAM Office - Ambara	-	KAUA-1
2.	Pit Office (Mohan)	-	KAUA-2
3.	Colony	-	KAUA-3
4.	Ambara village	-	KAUA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	KAUW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Fan house	-	KAUN-1
2.	Colony	-	KAUN-2

Frequency of Monitoring :

Air : Frequency of monitoring is as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (TPM), Respirable Particulate Matter (RPM), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.

SPM : Ambient air laden with suspended particulates enters the Respirable Dust

Sampler through the inlet pipe of sampler by means of a high flow rate blower. As the air passes through the cyclone, coarse, non-respirable dust (size $>10 \mu$) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size $<10 \mu$) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (RPM) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration ($\mu\text{g}/\text{m}^3$) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter in the ambient air is computed by measuring the mass of collected particulates and the volume of air sampled.

NO_x : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.

SO₂ : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

Water : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are collected and analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Due to non-availability, mine water discharge could not be monitored during this month.

Noise : Noise level data are recorded fortnightly.

Ambara village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
15/06/2019	186	89	38	17	14
30/06/2019	64	49	23	18	10
Permissible Limits	200	100	60	80	80

- Above Std. Value

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : KANHAN MONTH : JUNE
NAME OF THE PROJECT : AMBARA UG

Name of the Location : Colony - KAUN-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	11/06/2019	48.7	46.2
JUNE.2019	24/06/2019	47.6	45.2
Permissible Limit		55	45

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ENVIRONMENTAL MONITORING REPORT

AREA WORKSHOP

(KANHAN AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014

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INTRODUCTION

Location :

Area Workshop is located in Chhindwara district of Madhya Pradesh state. The project is administered by Kanhan Area of Western Coalfields Limited.

Climate :

The climate of the area is tropical. The maximum and minimum temperature range during Summer is 45°C to 27°C and during Winter is 25°C to 4°C. Annual rainfall varies from 1000 mm to 1400 mm.

Other Sources of Pollution :

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near Workshop Premises	- KAWN-1

Frequency of Monitoring :


- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc
- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size>10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sample
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet : designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm

diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations ($\mu\text{g}/\text{m}^3$) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.

- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A75
NAME OF CUSTOMER: WCL, NAGPUR

DATE OF ISSUE: 05.08.19
SAMPLE DESCRIPTION: AIR SAMPLE

CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19

NO. OF PAGES: 2

TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5 & SPM*.
(USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : KANHAN MONTH : JUNE
NAME OF THE PROJECT : AREA WORKSHOP

Area Workshop					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
14/06/2019	122	61	35	18	12
29/06/2019	223	134	53	18	10
TLV	600	300	60	120	120

#-Above Std. value.

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : KANHAN MONTH : JUNE
NAME OF THE PROJECT : AREA WORKSHOP
Name of the Location : Workshop Premises - KAWN-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	11/06/2019	56.2	47.3
JUNE.2019	22/06/2019	57.6	48.8
TLV		75	70

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ENVIRONMENTAL MONITORING REPORT

DAMUA OC

(KANHAN AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

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INTRODUCTION

Location :

Damua OC Project is located in Chhindwara district of Madhya Pradesh. The project is administered by Kanhan Area of Western Coalfields Limited.

Communication :

The Project is connected with Chhindwara by State Highway. Nearest railway station is Junardeo on the Amla - Parasia broad gauge branch of Central Railway. The Project is about 5 kms from Junardeo station.

Drainage :

Drainage of the area is mainly controlled by Kanhan river and Bhor nalla (a tributary of Kanhan river).

Climate :

The climate of the area is tropical. The maximum and minimum temperature range during Summer is 45°C to 27°C and during Winter is 25°C to 4°C. Annual rainfall varies from 1000 mm to 1400 mm.

Other Sources of Pollution :

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	SAM Office (Damua)	-	KDOA-1
2.	OC Office	-	KDOA-2
3.	Rescue Station (Near Incline 24 & 25)	-	KDOA-3
4.	Nandora village	-	KDOA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	KDOW-1

Noise Level Monitoring Data

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Near Manager office	-	KDON-1

Frequency of Monitoring :


Air : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc
- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sample
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A76 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NOx (06:2006), SO2 (02:2001)], SPM*, PM-2.5
 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : KANHAN MONTH : JUNE
 NAME OF THE PROJECT : DAMUA OC

SAM Office- Damua					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
12/06/2019	372	114	51	18	15
27/06/2019	115	82	46	17	15
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
OC office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
12/06/2019	130	104	51	21	15
27/06/2019	85	56	39	20	14
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
Rescue station(near incline 24 & 25)					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
12/06/2019	200	81	47	21	19
28/06/2019	117	62	43	16	8
TLV as per Env.(Protection) Amendment Rule 2000	600	300	60	120	120
#-Above std.value					

Nandora Village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO_x	SO_x
12/06/2019	348	87	43	22	14
2/06/2019	238	125	57	17	10
Permissible Limits	200	100	60	80	80

#-Above std.value

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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- Note: 1) This Report refers to the values related to the items tested as received.
2) This Report cannot be reproduced in part or full without written permission of the management.
3) * - Test parameter not under NABL scope.
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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL
NAME OF THE AREA : KANHAN
NAME OF THE PROJECT : DAMUA OC
YEAR : 2019
MONTH. : JUNE

Near Manager Office -

KDON-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night time
JUNE.2019	11/06/2019	43.6	40.2
JUNE.2019	24/06/2019	44.3	42.8
Permissible Limit		55	45

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ENVIRONMENTAL MONITORING REPORT

DAMUA UG

(KANHAN AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014

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1.	INTRODUCTION	1-2
2.	AIR QUALITY MONITORING DATA	3
3.	NOISE LEVEL DATA	4

INTRODUCTION

Location :

Damua UG is located in Chhindwara district of Madhya Pradesh. The project is administered by Kanhan Area of Western Coalfields Limited.

Communication :

The Project is connected with Chhindwara by State Highway. Nearest railway station is Junardeo on the Amla - Parasia broad gauge branch of Central Railway. The Project is about 5 kms from Junardeo station.

Drainage :

Drainage of the area is mainly controlled by Kanhan river and Bhor nalla (a tributary of Kanhan river).

Climate :

The climate of the area is tropical. The maximum and minimum temperature range during Summer is 45°C to 27°C and during Winter is 25°C to 4°C. Annual rainfall varies from 1000 mm to 1400 mm.

Other Sources of Pollution :

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	SAM Office (Damua)	-	KDUA-1
2.	Rescue Station (Near Incline 24 & 25)	-	KDUA-2
3.	Nandora village	-	KDUA-3

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	KDUW-1

Noise Level Monitoring location :


<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Fan House	-	KDUN-1
2.	Colony	-	KDUN-2

Frequency of Monitoring :

- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc
- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sample
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A77 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5 & SPM*.
 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : KANHAN MONTH : JUNE
 NAME OF THE PROJECT : DAMUA UG

SAM Office- Damua					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
12/06/2019	372	114	51	18	15
27/06/2019	115	82	46	17	15
TLV	600	300	60	120	120
Rescue station(near incline 24 & 25)					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
12/06/2019	200	81	47	21	19
28/06/2019	117	62	43	16	8
TLV	600	300	60	120	120
Nandora Village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
12/06/2019	348	87	43	22	14
2/06/2019	238	125	57	17	10
TLV	200	100	60	80	80

#-Above Std. Value.

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

Note: 1) This Report refers to the values related to the items tested as received.
 2) This Report cannot be reproduced in part or full without written permission of the management.
 3) * - Test parameter not under NABL scope.

NOISE LEVEL DATA

NAME OF THE COMPANY : WCL
NAME OF THE AREA : KANHAN
NAME OF THE PROJECT : DAMUA UG
YEAR : 2019
MONTH. : JUNE

Colony - KDUN-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	10/06/2019	45.8	42.3
JUNE.2019	24/06/2019	46.7	43.4
TLV		55	45

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ENVIRONMENTAL MONITORING REPORT

GHORAWARI OC

(KANHAN AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014

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2.	AIR QUALITY MONITORING DATA	3-4
3.	NOISE LEVEL DATA	5

INTRODUCTION

Location :

Ghorawadi OC Project is located in Chhindwara district of Madhya Pradesh state. The project is administered by Kanhan Area of Western Coalfields Limited.

Climate :

The climate of the area is tropical. The maximum and minimum temperature range during Summer is 45°C to 27°C and during Winter is 25°C to 4°C. Annual rainfall varies from 1000 mm to 1400 mm.

Other Sources of Pollution :

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Manager Office-Ghorawadi OC	- KGOA-1
2.	SAM Office (Ghorawari)	- KGOA-2
3.	Colony	- KGOA-3
4.	Panara village	- KGOA-4

Fugitive Dust Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Palachauri siding	- KGOA-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near Manager Office	- KGON-1
2.	Colony	- KGON-2

Frequency of Monitoring :

Air : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.


Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc

- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sample
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium (Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic jar and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A71
NAME OF CUSTOMER: WCL, NAGPUR

DATE OF ISSUE: 05.08.19
SAMPLE DESCRIPTION: AIR SAMPLE

CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
NO. OF PAGES: 2

TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5 & SPM*.
(USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL	YEAR : 2019
NAME OF THE AREA : KANHAN	MONTH : JUNE
NAME OF THE PROJECT : GHORAWADI OC	

Manager Office -OC					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
14/06/2019	89	52	18	10	8
28/06/2019	90	66	14	9	8
TLV	600	300	60	120	120
SAM Office - Ghorawari					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
13/06/2019	161	131	58	23	11
29/06/2019	114	87	56	20	10
TLV	600	300	120	120	60
Colony- Health Center Jharna					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
13/06/2019	141	78	41	17	13
28/06/2019	79	49	24	17	15
TLV	200	100	60	80	80

Panara village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SO _x
13/06/2019	161	81	43	17	17
29/06/2019	114	64	38	16	10
TLV	200	100	60	80	80

FUGITIVE DUST MONITORING DATA

Palachauri Siding.			
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)		
	SPM*	PM-10	PM2.5
30/06/2019	179	84	59

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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 3) * - Test parameter not under NABL scope.
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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : KANHAN MONTH. : JUNE
NAME OF THE PROJECT : GHORAWARI OC

Name of the Location : Manager Office - KGON-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	11/06/2019	53.6	46.2
JUNE.2019	24/06/2019	50.2	45.6
TLV		75	70

Name of the Location : Colony - KGON-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	10/06/2019	44.9	42.6
JUNE.2019	24/06/2019	45.3	41.2
TLV		55	45

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ENVIRONMENTAL MONITORING REPORT

JHARNA UG

(KANHAN AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE-2019

Environment Laboratory
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5.	NOISE LEVEL DATA	6

INTRODUCTION

Location :

Jharna / Ghorawadi UG Project is located in Chhindwara district of Madhya Pradesh state. The project is administered by Kanhan Area of Western Coalfields Limited.

Climate :

The climate of the area is tropical. The maximum and minimum temperature range during Summer is 45°C to 27°C and during Winter is 25°C to 4°C. Annual rainfall varies from 1000 mm to 1400 mm.

Other Sources of Pollution :

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Manager Office - Jharna UG	-	KJUA-1
2.	SAM Office (Ghorawari)	-	KJUA-2
3.	Colony	-	KJUA-3
4.	Panara village	-	KJUA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	KJUW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Fan house	-	KJUN-1
2.	Colony	-	KJUN-2

Frequency of Monitoring :

Air : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.


Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc

SPM/ PM-10 : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust

- (size > 10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size < 10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration ($\mu\text{g}/\text{m}^3$) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sample
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations ($\mu\text{g}/\text{m}^3$) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium (Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A78 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NOx (06:2006), SO2 (02:2001)], SPM*, PM-2.5 & SPM*.
 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : KANHAN MONTH : JUNE
 NAME OF THE PROJECT : JHARNA UG

Manager Office - Jharna UG					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM2.5	NOx	SOx
13/06/2019	180	82	41	21	18
29/06/2019	181	93	56	20	14
TLV	600	300	60	120	120
SAM Office – Ghorawari					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM2.5	NOx	SOx
13/06/2019	161	131	58	23	11
29/06/2019	114	87	56	20	10
TLV	600	300	60	120	120
Colony- Health Center Jharna					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM2.5	NOx	SOx
13/06/2019	141	78	41	17	13
28/06/2019	79	49	24	17	15
TLV	200	100	60	80	80
#-Above std.value					

Panara village					
DATE OF SAMPLING	Parameters (24 hourly values in $\mu\text{g}/\text{m}^3$)				
	SPM*	PM-10	PM2.5	NOx	SOx
13/06/2019	161	81	43	17	17
29/06/2019	114	64	38	16	10
TLV	200	100	60	80	80

#-Above std.value

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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3) * - Test parameter not under NABL scope.

NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : KANHAN MONTH : JUNE
NAME OF THE PROJECT : JHARNA UG

Name of the Location : Near Fan House - KJUN-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	10/06/2019	69.9	67.6
JUNE.2019	24/06/2019	69.6	67.8
TLV		75	70

Name of the Location : Colony - KJUN-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	10/06/2019	44.9	42.6
JUNE.2019	24/06/2019	45.3	41.2
TLV		55	45

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ENVIRONMENTAL MONITORING REPORT

MOHAN (MAORI) UG

(KANHAN AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE -2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014

AN ISO 9001:2015 COMPANY

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2.	AIR QUALITY MONITORING DATA	3-4
3.	EFFLUENT WATER QUALITY MONITORING DATA	5
4.	NOISE LEVEL DATA	6

INTRODUCTION

Location :

Mohan / Maori UG is located in Chhindwara district of Madhya Pradesh. The project is administered by Kanhan Area of Western Coalfields Limited.

Communication :

The Project is connected with Chhindwara by State Highway. Nearest railway station is Junardeo on the Amla - Parasia broad gauge branch of Central Railway. The Project is about 5 kms from Junardeo station.

Climate :

The climate of the area is tropical. The maximum and minimum temperature range during Summer is 45°C to 27°C and during Winter is 25°C to 4°C. Annual rainfall varies from 1000 mm to 1400 mm.

Other Sources of Pollution :

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	SAM Office - Ambara	-	KMUA – 1
2.	Pit Office (Mohan)	-	KMUA – 2
3.	Colony	-	KMUA – 3
4.	Ambara village	-	KMUA - 4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	KMUW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Fan house	-	KMUN-1
2.	Colony	-	KMUN-2

Frequency of Monitoring :

Air : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.


Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of

- nitrogen (NO_x) etc
- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sample
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

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TEST REPORT NO. : RIN/TR/JUNE-19/A79 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5 & SPM*.
 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : KANHAN MONTH : JUNE
 NAME OF THE PROJECT : MOHAN / MAORI UG

SAM Office- Ambara					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
15/06/2019	273	133	54	18	16
30/06/2019	106	78	29	13	11
TLV	600	300	60	120	120
Pit Office - Mohan					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
15/06/2019	216	115	35	19	17
30/06/2019	251	148	51	18	15
TLV	600	300	60	120	120
Colony- Health Center					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
14/06/2019	130	69	45	22	13
30/06/2019	328	245	62	18	9
TLV	200	100	60	80	80
#-Above std.value					


Ambara village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
15/06/2019	186	89	38	17	14
30/06/2019	64	49	23	18	10
TLV	200	100	60	80	80

#-Above std. value

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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<p>Environment Laboratory CMPDI, RI IV, Nagpur</p>	<p>Test Report</p>	 <p>TC-7102</p>
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TEST REPORT NO. : RIN/TR/JUNE-19/W79 DATE OF ISSUE: 05.08.2019
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: WATER SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 1
 TEST REQUIRED:IS-

EFFLUENT WATER QUALITY REPORT

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : KANHAN MONTH : JUNE
 NAME OF THE PROJECT : MOHAN / MAORI UG

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
13/06/2019	2.90	24	26	<2
29/06/2019	3.10	28	30	<2
TLV	5.5 - 9.0	250	100	10

- Below Std. Value

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : KANHAN MONTH : JUNE
NAME OF THE PROJECT : MOHAN / MAORI UG

Name of the Location : Near Fan House - KMUN-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	11/06/2019	70.1	68.6
JUNE.2019	24/06/2019	69.6	67.3
TLV		75	70

Name of the Location : Colony - KMUN-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	11/06/2019	48.7	46.2
JUNE.2019	24/06/2019	47.6	45.2
TLV		55	45

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ENVIRONMENTAL MONITORING REPORT

NANDAN UG

(KANHAN AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

**REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014**

AN ISO 9001:2015 COMPANY

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3.	EFFLUENT WATER QUALITY MONITORING DATA	5
4.	NOISE LEVEL DATA	6

INTRODUCTION

Location :

Nandan UG Project is located in Chhindwara district of Madhya Pradesh state. The project is administered by Kanhan Area of Western Coalfields Limited.

Communication :

The area is served by an all weather metalled road from the distt. Headquarter at Chhindwara. The nearest rail head is Hirdagarh broad gauge branch line at a distance of 15-16 km.

Climate :

The climate of the area is tropical. The maximum and minimum temperature range during Summer is 45°C to 27°C and during Winter is 25°C to 4°C. Annual rainfall varies from 1000 mm to 1400 mm.

Other Sources of Pollution :

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	SAM Office (Nandan-I UG)	-	KNUA-1
2.	Pit Office (Nandan-II UG)	-	KNUA-2
3.	Health center (Nandan UG)	-	KNUA-3
4.	Nandan Water Filter Plant	-	KNUA-4

Water Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge (Nandan UG-II)	-	KNUW-1

Noise Level Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Fan house (Nandan-II UG)	-	KNUN-1
2.	Colony	-	KNUN-2

Frequency of Monitoring :

Air : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.


Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of

- nitrogen (NO_x) etc
- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sample
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A80 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NOx (06:2006), SO2 (02:2001)], SPM*, PM-2.5 & SPM*.
 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : KANHAN MONTH : JUNE
 NAME OF THE PROJECT : NANDAN UG

SAM Office- Nandan I UG					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
11/06/2019	108	79	49	21	18
27/06/2019	88	53	31	20	13
TLV	600	300	60	120	120
Pit Office- Nandan II UG					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
11/06/2019	270	102	48	18	14
27/06/2019	222	159	36	21	17
TLV	600	300	60	120	120
Health center – Nandan UG					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
11/06/2019	450	174	35	20	16
26/06/2019	71	53	29	19	16
TLV	200	100	60	80	80
# Above Std. Value.					


Nandan water filter plant					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
11/06/2019	196	83	49	23	14
26/06/2019	111	73	37	18	17
TLV	200	100	60	80	80

- Above std. value

(Scientific Assistant)

*Deepanshu Sahu
(Authorized Signatory)*

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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TEST REPORT NO. : RIN/TR/JUNE-19/W80 DATE OF ISSUE: 05.08.19
NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: WATER SAMPLE
CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
NO. OF PAGES: 1

EFFLUENT WATER QUALITY REPORT

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : KANHAN MONTH : JUNE
NAME OF THE PROJECT : NANDAN UG

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
10/06/2019	7.10	32	26	<2
26/06///2019	7.20	40	28	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : KANHAN MONTH : JUNE
NAME OF THE PROJECT : NANDAN UG

Name of the Location : Fan house-Nandan-II UG - KNUN-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	10/06/2019	67.9	62.6
JUNE2019	24/06/2019	65.6	60.7
Noise Level Standard as per Env. (Protection) Amendment rule 2000		75	70

Name of the Location : Colony - KNUN-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	10/06/2019	43.7	41.9
JUNE2019	24/06/2019	44.7	40.5
Permissible Limit		55	45

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ENVIRONMENTAL MONITORING REPORT

NANDAN WASHERY

(KANHAN AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014

AN ISO 9001:2015 COMPANY

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INTRODUCTION

Location :

Nandan Washery is located in Chhindwara district of Madhya Pradesh state. The project is administered by Kanhan Area of Western Coalfields Limited.

Communication :

The area is served by an all weather metalled road from the distt. headquarter at Chhindwara. The nearest rail head is Hirdagarh broad gauge branch line at a distance of 15-16 km.

Climate :

The climate of the area is tropical. The maximum and minimum temperature range during Summer is 45°C to 27°C and during Winter is 25°C to 4°C. Annual rainfall varies from 1000 mm to 1400 mm.

Other Sources of Pollution :

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Sub-station	- KNWA-1
2.	Guest House	- KNWA-2
3.	SAM Office - Nandan – I UG	- KNWA-3
4.	Nandan – Water Filter Plant	- KNWA-4

Water Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	
1.	Effluent Treatment Plant	- KNWW-1

Noise Level Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near Washery	- KNWN-1
2.	Colony	- KNWN-2


Frequency of Monitoring :

- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc
- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5

- m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sample
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A72

DATE OF ISSUE: 05.08.19

NAME OF CUSTOMER: WCL, NAGPUR

SAMPLE DESCRIPTION: AIR SAMPLE

CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19

NO. OF PAGES: 2

TEST REQUIRED:IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)],SPM*,PM-2.5 & SPM*.
(USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY	: WCL	YEAR	: 2019
NAME OF THE AREA	: KANHAN	MONTH	: JUNE
NAME OF THE PROJECT	: NANDAN WASHERY		

Substation					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
10/06/2019	145	60	26	22	18
26/06/2019	85	62	31	18	15
TLV	600	300	60	120	120
Guest House					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
10/06/2019	180	81	40	21	17
26/06/2019	82	45	18	9	8
TLV	200	100	60	80	80
SAM Office- Nandan I UG					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
11/06/2019	108	79	49	21	18
27/06/2019	88	53	31	20	13
TLV	600	300	60	120	120


Nandan water filter plant					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
11/06/2019	196	83	49	23	14
26/06/2019	111	73	37	18	17
TLV	200	100	60	80	80

- Above Std. Value

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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3) * - Test parameter not under NABL scope.
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TEST REPORT NO. : RIN/TR/JUNE-19/W-84 DATE OF ISSUE: 10.07.2019
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: WATER SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 1

EFFLUENT WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR 2019
 NAME OF THE AREA : KANHAN MONTH JUNE
 NAME OF THE PROJECT : NANDAN WASHERY

Effluent Treatment Plant				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
09/06/2019	7.30	44	50	<2
26/06/2019	7.40	32	36	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : KANHAN MONTH : JUNE
NAME OF THE PROJECT : NANDAN WASHERY

Name of the Location : Washery - KNWN-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	10/06/2019	48.8	42.3
JUNE.2019	24/06/2019	45.2	41.6
TLV		75	70

Name of the Location : Colony - KNWN-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	10/06/2019	56.2	48.7
JUNE.2019	24/06/2019	55.4	46.3
TLV		55	45

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ENVIRONMENTAL MONITORING REPORT

TANDSI UG

(KANHAN AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

**REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014**

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INTRODUCTION

Location :

Tandsi UG is located in Chhindwara district of Madhya Pradesh state. The project is administered by Kanhan Area of Western Coalfields Limited.

Communication :

The project is connected by 3 kms of Forest road to Rampur-Bhata village, then by 22 kms of fair weather road to Damua and further by 16 kms of metalled road to Dungaria, head quarter of Kanhan area of WCL. Nearest railway station is Nanegaon at a distance of 19 kms from Tandsi block on broad gauge branch line of Central Railway.

Climate :

The climate of the area is tropical. The maximum and minimum temperature range during Summer is 45°C to 27°C and during Winter is 25°C to 4°C. Annual rainfall varies from 1000 mm to 1400 mm.

Other Sources of Pollution :

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Workshop	-	KTUA-1
2.	JET Hostel	-	KTUA-2
3.	Lamp Room	-	KTUA-3
4.	Colony	-	KTUA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	KTUW-1

Noise Level Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Fan house	-	KTUN-1
2.	Colony	-	KTUN-2

Frequency of Monitoring :

- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc
- SPM/** Ambient air laden with suspended particulates enters the Respirable Dust Sampler

- PM-10** : through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sample
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet : designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

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TEST REPORT NO. : RIN/TR/JUNE-19/A81 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5
 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : KANHAN MONTH : JUNE
 NAME OF THE PROJECT : TANDSI UG

Workshop					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
09/06/2019	413	292	59	17	8
25/06/2019	72	51	39	21	14
TLV	600	300	60	120	120
Jet Hostel					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
10/06/2019	100	54	33	18	13
25/06/2019	94	49	25	19	15
TLV	200	100	60	80	80
Lamp Room					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
10/06/2019	488	117	53	15	13
25/06/2019	172	89	47	19	17
TLV	600	300	60	120	120


Colony-Near Health Center					
DATE OF SAMPLING	Parameters (24 hourly values in $\mu\text{g}/\text{m}^3$)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
09/06/2019	198	92	51	24	16
25/06/2019	133	83	38	17	12
TLV	200	100	60	80	80

#- Above Std. Value.

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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TEST REPORT NO. : RIN/TR/JUNE-19/W81 DATE OF ISSUE: 05.08.2019
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: WATER SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 1

EFFLUENT WATER QUALITY REPORT

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : KANHAN MONTH : JUNE
 NAME OF THE PROJECT : TANDSI UG

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
09/06/2019	6.90	32	24	<2
24/06/2019	7.00	36	22	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : KANHAN MONTH : JUNE
NAME OF THE PROJECT : TANDSI UG

Name of the Location : Near Fan House - KTUN-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	10/06/2019	69.6	67.8
JUNE.2019	24/06/2019	68.9	67.8
TLV		75	70

Name of the Location : Colony - KTUN-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	10/06/2019	46.7	42.3
JUNE.2019	24/06/2019	45.7	42.2
TLV		55	45

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ENVIRONMENTAL MONITORING REPORT

SARNI UG

(PATHAKHERA AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

**REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
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INTRODUCTION

Location : SarniUG Project is located in Betul district of Madhya Pradesh. The project is administered by Pathakhera Area of Western Coalfields Limited.

Communication : The Project is connected by an all weathermetalled road with Ghoradongri railway station of Central Railway. It is on the Nagpur-Itarasi section of Delhi - Chennai G.T.road.

Drainage : The drainage of the area is mainly controlled by Tawariver.

Climate : The climate of the area is tropical. The temperature varies from is 41°C to 24°C in Summer and 24°C to 8°C in Winter. Annual rainfall varies from 1200 mm to 1600 mm in this area.

Other Industries : Besides other coalmines, other major industry in the vicinity of the project site is Satpura Thermal Power Station (STPS) of MPEB, which is expected to influence the pollution level of the area.

Other Sources of Pollution:

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	CGM Office (Near entrance gate room) -	P _k SUA-1
2.	Near Dy. CME Office) -	P _k SUA-2
3.	Pathakhera Colony -	P _k SUA-3
4.	Substation Sarni UG -	P _k SUA-4

Fugitive Dust Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	CHP =	P _k SUAF-1

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge -	P _k SUW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near Fan House -	P _k SUN-1
2.	Colony -	P _k SUN-2

Frequency of Monitoring :

Air : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.


Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.

- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
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- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A83 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NOx (06:2006), SO2 (02:2001)], SPM*, PM-2.5 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : PATHAKHERA MONTH : JUNE
 NAME OF THE PROJECT : SARNI UG

CGM Office(near entrance gate room)					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
03/06/2019	260	121	57	21	11
23/06/2019	123	62	40	17	22
TLV	600	300	60	120	120
Near Dy. CME Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
04/06/2019	332	108	51	26	13
22/06/2019	162	113	57	24	17
TLV	600	300	60	120	120
Pathakhera Colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
03/06/2019	197	98	59	24	21
22/06/2019	98	52	33	26	20
TLV	200	100	60	80	80

-Above Std Value

Substation Sarni UG					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NOx	SOx
03/06/2019	261	190	53	31	14
22/06/2019	167	64	51	27	15
TLV	200	100	60	80	80

#-Above Std. Value

FUGITIVE DUST MONITORING DATA

1. CHP


(24 hourly values in µg/m³)

Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
03/06/2019	213	117	48

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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 3) * - Test parameter not under NABL scope.
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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/W83 DATE OF ISSUE: 05.08.2019
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: WATER SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 1

EFFLUENT WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR: 2019
 NAME OF THE AREA : PATHAKHERA MONTH: JUNE
 NAME OF THE PROJECT : SARNI UG

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
02/06/2019	8.10	28	18	<2
21/06/2019	7.20	44	28	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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 3) * - Test parameter not under NABL scope.

NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : PATHAKHERA MONTH. : JUNE
NAME OF THE PROJECT : SARNI UG

Name of the Location : Near Fan House- P_KSUN-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day time	Night Time
JUNE.2019	08/06/2019	69.7	67.6
JUNE.2019	22/06/2019	68.4	67.1
TLV		75	70

Name of the Location : Colony- P_KSUN-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day time	Night Time
JUNE.2019	08/06/2019	46.6	44.5
JUNE.2019	22/06/2019	45.7	43.2
TLV		55	45

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ENVIRONMENTAL MONITORING REPORT

SHOBHAPUR UG

(PATHAKHERA AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014

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2.	AIR QUALITY MONITORING DATA	3-4
3.	EFFLUENT WATER QUALITY MONITORING DATA	5
4.	NOISE LEVEL DATA	6

INTRODUCTION

Location :

Shobhapur UG Project is located in Betul district of Madhya Pradesh. The project is administered by Pathakheda Area of Western Coalfields Limited.

Communication :

The Project is connected by an all weather metal road from Nagpur which is at a distance of 240 km. Betul, District head quarter, lies 60 kms, away from this project. Ghoradongri is the nearest railway station, about 20 kms from this project.

Drainage :

The drainage of the area is mainly controlled by Tawa River. RET nalla is the most important drainage course running through the area flowing into Tawa river. A no. of small nalla and gullies connect RET nalla.

Climate :

The climate of the area is tropical. The temperature varies from is 41°C to 24°C in Summer and 24°C to 8°C in Winter. Annual rainfall varies from 1200 mm to 1600 mm in this area.

Other Industries :

Besides other coal mines, other major industries in the vicinity of the project site is Satpura Thermal Power Station (STPS) of MPEB, which is expected to influence the pollution level of the area.

Other Sources of Pollution:

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	SAM Office	-	P _K S _B UA-1
2.	Shobhapur Colony	-	P _K S _B UA-2
3.	ShobhapurVillageh	-	P _K S _B UA-3
4.	Substation	-	P _K S _B UA-4

Fugitive Dust Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	CHP	-	P _K S _B UAF-1

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	P _K S _B UW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Near Fan House	-	P _K S _B UN-1
2.	Colony	-	P _K S _B UN-2

Frequency of Monitoring :

- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.

SPM/ PM-10 : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size > 10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size < 10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.

PM2.5 : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.

Heavy Metals : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium (Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.


NO_x : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed

absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.

SO₂ : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

Water : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Noise : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A84 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : PATHAKHERA MONTH. : JUNE
 NAME OF THE PROJECT : SHOBHAPUR UG

SAM Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
04/06/2019	239	149	55	18	13
23/06/2019	78	48	22	15	19
TLV	600	300	60	120	120
Shobhapur Colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
04/06/2019	254	112	56	19	7
23/06/2019	137	88	45	22	21
TLV	200	100	60	80	80
Shobhapur Village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
09/06/2019	326	98	59	18	22
21/06/2019	370	87	42	20	10
TLV	200	100	60	80	80

- Above Std. Value

Substation					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
09/06/2019	322	111	58	23	20
23/06/2019	124	75	49	18	10
TLV	600	300	60	120	120

FUGITIVE DUST MONITORING DATA

1. CHP


(24 hourly values in µg/m³)

Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
04/06/2019	715	275	114

(Scientific Assistant)

***Deepanshu Sahu
(Authorized Signatory)***

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/W84

DATE OF ISSUE: 05.08.2019

NAME OF CUSTOMER: WCL, NAGPUR

SAMPLE DESCRIPTION:
WATER SAMPLE

CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522

DATED-18.04.19

EFFLUENT WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL

YEAR:

2019

NAME OF THE AREA : PATHAKHERA

MONTH

JUNE

NAME OF THE PROJECT : SHOBHAPUR UG

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
03/06/2019	8.40	24	20	<2
22/06/2019	8.20	40	30	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : PATHAKHERA MONTH: JUNE
NAME OF THE PROJECT : SHOBHAPUR UG

Name of the Location : Near Fan house - P_KS_BUN-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	08/06/2019	70.8	69.6
JUNE.2019	22/06/2019	68.6	67.1
TLV		75	70

Name of the Location : Colony - P_KS_BUN-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	08/06/2019	45.9	42.3
JUNE.2019	22/06/2019	46.2	43.3
TLV		55	45

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ENVIRONMENTAL MONITORING REPORT

TAWA-II UG EXPN.

(PATHAKHERA AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
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3.	EFFLUENT WATER QUALITY MONITORING DATA	5
4.	NOISE LEVEL DATA	6

INTRODUCTION

Location :

Tawa - II UG Project is located in Betul district of Madhya Pradesh. The project is administered by Pathakhera Area of Western Coalfields Limited.

Communication :

The Project is at a distance of about 30 kms from Baretha which lies on Nagpur - Bhopal road. The nearest railway station is Ghoradongri on New Delhi - Madras branch of Central Railway which is about 26 km from the Project.

Drainage :

The drainage of the area is mainly controlled by Tawa river. A number of seasonal nullahs also flow through the area

Climate :

The climate of the area is tropical. The temperature varies from is 41°C to 24°C in Summer and 24°C to 8°C in Winter. Annual rainfall varies from 1200 mm to 1600 mm in this area.

Other Industries :

Besides other coalmines, other major industries in the vicinity of the project site are Satpura Thermal Power Station (STPS) of MPEB, which is expected to influence the pollution level of the area.

Other Sources of Pollution:

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Manager Office – Tawa – II UG	-	P _K T ₂ UA-1
2.	Hira palla/Bhgaikhaapa village	-	P _K T ₂ UA-2
3.	MPEB colony	-	P _K T ₂ UA-3
4.	SAM Office	-	P _K T ₂ UA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	P _K T ₂ UW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Fan house	-	P _K T ₂ UN-1
2.	Colony	-	P _K T ₂ UN-2

Frequency of Monitoring :

- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM),

Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.

SPM/ PM-10 : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.

PM2.5 : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.


Heavy Metals : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.

NO_x : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.

SO₂ : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

Water : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Noise : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A85 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5
 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : PATHAKHERA MONTH. : JUNE
 NAME OF THE PROJECT : TAWA -II UG


Manager office- Tawa II					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
02/06/2019	197	113	85	20	16
21/06/2019	313	198	30	15	18
TLV	600	300	60	120	120
Hira palla/Bhgaikhaapa village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
02/06/2019	305	148	47	18	15
21/06/2019	330	78	36	20	19
TLV	200	100	60	80	80

MPEB Colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
02/06/2019	389	144	56	36	20
22/06/2019	283	182	52	24	13
TLV	200	100	60	80	80
SAM Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
02/06/2019	300	204	50	30	17
21/06/2019	475	291	49	21	21
TLV	600	300	60	120	120

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/W85

DATE OF ISSUE: 05.08.2019

NAME OF CUSTOMER: WCL, NAGPUR

SAMPLE DESCRIPTION: WATER SAMPLE

CUSTOMER LETTER REF. NO. :

NO. OF PAGES: 1

WCL/HQ/ENV/17-K/520-522 DATED-18.04.19

EFFLUENT WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL

YEAR 2019

NAME OF THE AREA : PATHAKHERA

MONTH JUNE

NAME OF THE PROJECT : TAWA-II UG

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
02/06/2019	7.70	36	16	<2
26/06/2019	7.20	32	28	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : PATHAKHERA MONTH.: JUNE
 NAME OF THE PROJECT : TAWA-II UG

Name of the Location : Near Fan House - P_KT₂UN-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day time	Night Time
JUNE.2019	08/06/2019	70.6	68.1
JUNE.2019	22/06/2019	69.2	68.9
TLV		75	70

Name of the Location : Colony - P_KT₂UN-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day time	Night Time
JUNE.2019	08/06/2019	44.9	42.6
JUNE.2019	22/06/2019	45.6	43.2
TLV		55	45

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ENVIRONMENTAL MONITORING REPORT

TAWA UG

(PATHAKHERA AREA)

WESTERN COALFIELDS LTD.

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JUNE - 2019

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CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014

AN ISO 9001:2015 COMPANY

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INTRODUCTION

Location :Tawa UG Project is located in Betul district of Madhya Pradesh. The project is administered by Pathakhera Area of Western Coalfields Limited.

Communication :

The Project is at a distance of about 30 kms from Baretha which lies on Nagpur - Bhopal road. The nearest railway station is Ghoradongri on New Delhi - Chennai branch of Central Railway which is about 26 km from the Project.

Drainage : The drainage of the area is mainly controlled by Tawa river. A number of seasonal nallahs also flow through the area

Climate : The climate of the area is tropical. The temperature varies from is 41°C to 24°C in Summer and 24°C to 8°C in Winter. Annual rainfall varies from 1200 mm to 1600 mm in this area.

Other Industries :

Besides other coalmines, other major industries in the vicinity of the project site are Satpura Thermal Power Station (STPS) of MPEB, which is expected to influence the pollution level of the area.

Other Sources of Pollution:

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Manager Office- Tawa II	-	P _K TUA-1
2.	Hirapalla/Bhgaikhapa village	-	P _K TUA-2
3.	MPEB colony	-	P _K TUA-3
4.	SAM Office	-	P _K TUA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	P _K TUW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Fan house	-	P _K TUN-1
2.	Colony	-	P _K TUN-2

Frequency of Monitoring :

Air : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.


Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc.

SPM/ : Ambient air laden with suspended particulates enters the Respirable Dust Sampler

- PM-10** : through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A86 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5
 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : PATHAKHERA MONTH : JUNE.
 NAME OF THE PROJECT : TAWA UG

Manager office- Tawa II					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
02/06/2019	197	113	85	20	16
21/06/2019	313	198	30	15	18
TLV	600	300	60	120	120
Hira palla/ Bhgaikhaapa village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
02/06/2019	305	148	47	18	15
21/06/2019	330	78	36	20	19
TLV	200	100	60	80	80
MPEB Colony					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
02/06/2019	389	144	56	36	20
22/06/2019	283	182	52	24	13
TLV	200	100	60	80	80


SAM Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
02/06/2019	300	204	50	30	17
21/06/2019	475	291	49	21	21
TLV	600	300	60	120	120

- Above Std. Value

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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3) * - Test parameter not under NABL scope.
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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/W86

DATE OF ISSUE: 05.08.2019

NAME OF CUSTOMER: WCL, NAGPUR

SAMPLE DESCRIPTION: WATER SAMPLE

CUSTOMER LETTER REF. NO. :

NO. OF PAGES: 1

WCL/HQ/ENV/17-K/520-522 DATED-18.04.19

EFFLUENT WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL

YEAR 2019

NAME OF THE AREA : PATHAKHERA

MONTH JUNE

NAME OF THE PROJECT : TAWA-I UG

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
20/06/2019	7.40	36	22	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : PATHAKHERA MONTH : JUNE
NAME OF THE PROJECT : TAWA UG

Name of the Location : Near Fan House - P_KTUN-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day time	Night Time
JUNE.2019	08/06/2019	68.9	67.8
JUNE.2019	22/06/2019	69.5	67.3
TLV		75	70

Name of the Location : Colony - P_KTUN-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day time	Night Time
JUNE.2019	08/06/2019	44.9	42.6
JUNE.2019	22/06/2019	45.6	43.2
TLV		55	45

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ENVIRONMENTAL MONITORING REPORT

CHATTARPUR-I & II UG

(PATHAKHERA AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE- 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014

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INTRODUCTION

Location :

Chattarpur - I & II UG Project is located in Betul district of Madhya Pradesh. The project is administered by Pathekhera Area of Western Coalfields Limited.

Communication :

Ghoradongri is the nearest railway station at 71 km South of Itarsi junction. The project can be approached by road of about 16 km from Ghoradongri railway station.

Drainage :

Drainage is mainly controlled by two / three drains, which drains into the Tawa river.

Climate :

The climate of the area is tropical. The temperature varies from is 41°C to 24°C in Summer and 24°C to 8°C in Winter. Annual rainfall varies from 1200 mm to 1600 mm in this area.

Other Sources of Pollution:

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Chattarpur village	-	P _K CUA-1
2.	SAM Office	-	P _K CUA-2
3.	Substation- Chattarpur I UG	-	P _K CUA-3
4.	Substation- Chattarpur II UG	-	P _K CUA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge- Chattarpur-I UG	-	P _K CUW-1
2.	Mine water discharge- Chattarpur-II UG	-	P _K CUW-2

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Near Fan House- Chattarpur-I UG	-	P _K CUN-1
2.	Near Fan House- Chattarpur-II UG	-	P _K CUN-2
3.	Colony	-	P _K CUN-3

Frequency of Monitoring :

Air : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of

nitrogen (NO_x) etc.

SPM/ PM-10 : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.

PM2.5 : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.


Heavy Metals : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.

NO_x : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.

SO₂ : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.

Water : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.

Noise : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A82 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NOx (06:2006), SO2 (02:2001)], SPM*, PM-2.5 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : PATHAKHERA MONTH : JUNE
 NAME OF THE PROJECT : CHATTARPUR-I & II UG

Chattarpur village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
08/06/2019	180	93	51	22	12
24/06/2019	97	56	35	22	21
TLV	200	100	60	80	80
SAM Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
08/06/2019	450	258	69	44	20
24/06/2019	179	83	46	32	11
TLV	600	300	60	120	120
Substation- Chattarpur I UG					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
08/06/2019	557	283	59	33	12
24/06/2019	110	75	43	17	20
TLV	600	300	60	120	120

#Above Std. value


Substation- Chattarpur II UG					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
08/06/2019	498	212	55	18	12
24/06/2019	139	69	24	17	16
TLV	600	300	60	120	120

#Above Std.value

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC - 7102
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TEST REPORT NO. : RIN/TR/JUNE-19/W82 DATE OF ISSUE: 05.08.2019
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: WATER SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 1

EFFLUENT WATER QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR 2019
 NAME OF THE AREA : PATHAKHERA MONTH. JUNE
 NAME OF THE PROJECT : CHATTARPUR-I & II UG

Mine water discharge (Chattarpur I UG)				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
03/06/2019	7.80	36	26	<2
23/06/2019	7.40	36	28	<2
TLV	5.5 - 9.0	250	100	10
Mine water discharge (Chattarpur II UG)				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
03/06/2019	8.20	40	30	<2
23/06/2019	8.30	44	32	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : PATHAKHERA MONTH: JUNE
 NAME OF THE PROJECT : CHATTARPUR-I & II UG
Name of the Location : Fan House (Chattarpur I UG) - P_KCUN-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day time	Night Time
JUNE.2019	08/06/2019	70.2	68.9
JUNE.2019	22/06/2019	69.6	68.2
TLV		75	70

Name of the Location : Fan House (Chattarpur II UG) - P_KCUN-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day time	Night Time
JUNE.2019	08/06/2019	69.6	67.9
JUNE.2019	22/06/2019	69.8	67.2
TLV		75	70

Name of the Location : Colony - P_KCUN-3

Month	Date of Data collection	Noise Level in dB(A)	
		Day time	Night Time
JUNE.2019	08/06/2019	46.3	43.4
JUNE.2019	22/06/2019	45.9	42.6
TLV		55	45

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ENVIRONMENTAL MONITORING REPORT

BARKUHI OC

(PENCH AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014

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3.	NOISE LEVEL DATA	5

INTRODUCTION

Location :

Barkuhi OC is located in Chhindwara district of Madhya Pradesh. The project is administered by Pench Area of Western Coalfields Limited.

Communication :

The Project is connected by road with Parasia town. Parasia is linked with Chhindwara through a narrow gauge railway line of South Eastern Railway.

Drainage :

Drainage of the area is mainly controlled by Penchrivier.

Climate :

The climate of the area is tropical. The maximum and minimum temperature range during Summer is 45°C to 27°C and during Winter is 25°C to 4°C. Annual rainfall varies from 1000 mm to 1400 mm.

Other Sources of Pollution:

Transportation roads, agricultural and local activities, vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near Central school	- PBOA-1
2.	Manager Office	- PBOA-2
3.	SAM Office	- PBOA-3
4.	Chandameta Workshop	- PBOA-4

Water Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- PBOW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near Barkuhi hospital	- PBON-1

Frequency of Monitoring :


Air : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc
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- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium (Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A67 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : PENCH MONTH : JUNE
 NAME OF THE PROJECT : BARKUHI OC

Central school					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
15/06/2019	88	51	21	20	14
24/06/2019	70	46	26	12	10
TLV	200	100	60	120	120
Manager Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
15/06/2019	168	118	52	32	15
24/06/2019	371	252	50	30	17
TLV	600	300	60	120	120
SAM Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
15/06/2019	121	86	50	33	20
24/06/2019	128	93	46	30	21
TLV	600	300	60	120	120
# Above Std, value					

Chandameta Workshop

DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
15/06/2019	112	55	31	24	14
24/06/2019	143	49	25	14	16
TLV	600	300	60	120	120

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

- Note: 1) This Report refers to the values related to the items tested as received.
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3) * - Test parameter not under NABL scope.

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ENVIRONMENTAL MONITORING REPORT

CHANDAMETA WORKSHOP

(PENCH AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014

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2.	AIR QUALITY MONITORING DATA	3
3.	NOISE LEVEL DATA	4

INTRODUCTION

Location :

Chandameta Workshop is located in Chhindwara district of Madhya Pradesh. The project is administered by Pench Area of Western Coalfields Limited.

Communication :

The Project is connected by road with Parasia town. Parasia is linked with Chhindwara through a narrow gauge railway line of South Eastern Railway.

Drainage :

Drainage of the area is mainly controlled by Pench river.

Climate :

The climate of the area is tropical. The maximum and minimum temperature range during Summer is 45°C to 27°C and during Winter is 25°C to 4°C. Annual rainfall varies from 1000 mm to 1400 mm.

Other Sources of Pollution:

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Chandameta workshop	- PCMWA-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near Workshop Premises	- PCMWN-1

Frequency of Monitoring :

- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc
- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size>10 μ) is separated from the air stream by centrifugal forces acting on the

- solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size $<10\ \mu$) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration ($\mu\text{g}/\text{m}^3$) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sample
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations ($\mu\text{g}/\text{m}^3$) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : PENCH MONTH.:JUNE
NAME OF THE PROJECT : CHANDAMETA WORKSHOP
Name of the Location : Near Chandameta Workshop - PCMWN-1

Month	Date of Data Collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	06/06/2019	49.5	47.6
JUNE.2019	21/06/2019	49.7	48.2
TLV		75	70

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ENVIRONMENTAL MONITORING REPORT

CHHINDA OC

(PENCH AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014

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3.	EFFLUENT WATER QUALITY MONITORING DATA	4
4.	NOISE LEVEL DATA	5

INTRODUCTION

Location :

Chinda OC is located in Chhindwara district of Madhya Pradesh. The project is administered by Pench Area of Western Coalfields Limited.

Communication :

The Project is connected by road with Parasia town. Parasia is linked with Chhindwara through a narrow gauge railway line of South Eastern Railway.

Drainage :

Drainage of the area is mainly controlled by Pench river.

Climate :

The climate of the area is tropical. The maximum and minimum temperature range during Summer is 45°C to 27°C and during Winter is 25°C to 4°C. Annual rainfall varies from 1000 mm to 1400 mm.

Other Sources of Pollution:

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Chinda OC site office	- PCOA-1
2.	SAM Office	- PCOA-2
3.	Chinda village	- PCOA-3
4.	Colony - Chinda	- PCOA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- PCOW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near Manager Office	- PCON-1
2.	Colony	- PCON-2


Frequency of Monitoring :

- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc

- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sample
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

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TEST REPORT NO. : RIN/TR/JUNE-19/A58 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : PENCH MONTH : JUNE
 NAME OF THE PROJECT : CHINDA OC


Chinda OC Site					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
08/06/2019	156	95	42	37	20
23/06/2019	305	252	58	31	24
TLV	600	300	60	120	120
SAM Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
08/06/2019	257	176	47	32	26
23/06/2019	297	154	45	31	26
TLV	600	300	60	120	120
Chinda village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
09/06/2019	158	83	43	30	19
22/06/2019	188	99	54	33	29
TLV	200	100	60	80	80
Colony – Chinda					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
09/06/2019	154	119	44	35	22
22/06/2019	319	126	53	32	19
TLV	200	100	60	80	80

#-Above std.value

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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TEST REPORT NO. : RIN/TR/JUNE-19/58 DATE OF ISSUE: 05.08.2019
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: WATER SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 1

EFFLUENT WATER QUALITY REPORT

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : PENCH MONTH : JUNE
 NAME OF THE PROJECT : CHINDA OC

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
08/06/2019	7.80	28	18	<2
22/06/2019	7.70	32	22	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

Note: 1) This Report refers to the values related to the items tested as received.
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 3) * - Test parameter not under NABL scope

NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : PENCH MONTH.: JUNE
NAME OF THE PROJECT : CHINDA OC

Name of the Location : Near Manager Office - PCON-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	08/06/2019	49.4	46.3
JUNE.2019	21/06/2019	49.7	48.9
TLV		75	70

Name of the Location : Colony (Chinda) - PCON-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	08/06/2019	44.1	43.8
JUNE.2019	21/06/2019	45.2	44.6
TLV		55	45

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ENVIRONMENTAL MONITORING REPORT

GANAPATI UG

(PENCH AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014

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2.	AIR QUALITY MONITORING DATA	3-4
3.	NOISE LEVEL DATA	5

INTRODUCTION

Location :Ganpati UG is located in Chhindwara district of Madhya Pradesh state. The project is administered by Pench Area of Western Coalfields Limited.

Climate :The climate of the area is tropical. The maximum and minimum temperature range during Summer is 45°C to 27°C and during Winter is 25°C to 4°C. Annual rainfall varies from 1000 mm to 1400 mm.

Other Sources of Pollution:

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Parasia Guest House	-	PGUA-1
2.	Manager office – Mahadeopuri UG	-	PGUA-2
3.	Colony –EDC Dispensary	-	PGUA-3
4.	Lamp Room	-	PGUA-3

FugitiveDust Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	B.G Siding	-	PGUAF-1

Water Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	PGUW-1

Noise Level Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Near Fan house	-	PGUN-1
2.	Colony	-	PGUN-2

Frequency of Monitoring :

Air : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.


Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc

SPM/ PM-10 : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size>10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the

- respirable fraction (size $<10 \mu$) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration ($\mu\text{g}/\text{m}^3$) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sample
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations ($\mu\text{g}/\text{m}^3$) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A69 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5
 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : PENCH MONTH. : JUNE
 NAME OF THE PROJECT : GANPATI UG

Guest House- Parasia					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
08/06/2019	391	173	53	31	16
23/06/2019	145	94	48	31	22
TLV	200	100	60	80	80
# - Above Std. value					
Manager Office- Mahadeopuri UG					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
08/06/2019	170	129	51	34	20
23/06/2019	99	69	47	34	18
TLV	600	300	60	120	120

Colony –EDC Dispensary					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
09/06/2019	114	94	45	16	18
22/06/2019	254	157	51	33	19
TLV	200	100	60	80	80

- Above Std. value

Lamp Room					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NOX	SO _x
14/06/2019	114	61	46	20	13
21/06/2019	129	56	29	17	10
TLV	600	300	60	120	120

FUGITIVE DUST MONITORING DATA

1. BG siding

(24 hourly values in µg/m³)

Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
14/06/2019	105	48	60

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

-
- Note: 1) This Report refers to the values related to the items tested as received.
 2) This Report cannot be reproduced in part or full without written permission of the management.
 3) * - Test parameter not under NABL scope.

NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : PENCH MONTH.: JUNE
NAME OF THE PROJECT : GANPATI UG

Name of the Location :Near Fan house PGUN-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	06/06/2019	48.9	44.5
JUNE.2019	21/06/2019	44.5	42.6
TLV		75	70

Name of the Location : Colony - PGUN-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	07/06/2019	44.2	43.2
JUNE.2019	21/06/2019	44.9	42.8
TLV		55	45

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ENVIRONMENTAL MONITORING REPORT

JAMUNIYA UG

(PENCH AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014

AN ISO 9001:2015 COMPANY

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3.	EFFLUENT WATER QUALITY MONITORING DATA	4
4.	NOISE LEVEL DATA	5

INTRODUCTION

Location :

Jamuniya UG is located in Chhindwara district of Madhya Pradesh. The project is administered by Pench Area of Western Coalfields Limited.

Communication :

The Project is connected by road with Parasia town. It is at a distance of 1/2 km before Parasia .

Climate :

The climate of the area is tropical. The maximum and minimum temperature range during Summer is 45°C to 27°C and during Winter is 25°C to 4°C. Annual rainfall varies from 1000 mm to 1400 mm.

Other Sources of Pollution:

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Manager Office	-	PJUA-1
2	Substation	-	PJUA-2
3.	Jamuniya Village	-	PJUA-3

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	PJUW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Manager Office	-	PJUN-1
		-	


Frequency of Monitoring :

- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc
- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size>10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper

- and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size $<10\ \mu$) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration ($\mu\text{g}/\text{m}^3$) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sample
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations ($\mu\text{g}/\text{m}^3$) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

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TEST REPORT NO. : RIN/TR/JUNE-19/A59 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NOx (06:2006), SO2 (02:2001)], SPM*, PM-2.5
 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : PENCH MONTH : JUNE
 NAME OF THE PROJECT : JAMUNIYA UG


Manager office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
12/06/2019	265	103	47	30	22
20/06/2019	97	42	29	25	22
TLV	600	300	60	120	120
Substation					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
12/06/2019	179	74	37	26	13
20/06/2019	120	89	38	21	17
TLV	600	300	60	120	120
Jamuniya village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
12/06/2019	117	78	51	36	17
20/06/2019	185	95	43	36	21
TLV	200	100	60	80	80

#-Above std. value.

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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TEST REPORT NO. : RIN/TR/JUNE-19/59 DATE OF ISSUE: 05.08.2019
NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: WATER SAMPLE
CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
NO. OF PAGES: 1

EFFLUENT WATER QUALITY REPORT

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : PENCH MONTH. : JUNE
NAME OF THE PROJECT : JUMUNIYA UG

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
12/06/2019	7.30	32	22	<2
19/06/2019	8.30	24	14	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

Note: 1) This Report refers to the values related to the items tested as received.
4) This Report cannot be reproduced in part or full without written permission of the management.
5) * - Test parameter not under NABL scope.

NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : PENCH MONTH: JUNE
NAME OF THE PROJECT : JUMUNIYA UG
Name of the Location : Manager Office-PJUN-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	11/06/2019	49.6	41.6
JUNE.2019	18/06/2019	46.2	43.5
TLV		75	70

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ENVIRONMENTAL MONITORING REPORT

MAHADEVPURI UG

(PENCH AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

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4.	NOISE LEVEL DATA	6

INTRODUCTION

Location :

Mahadeopuri UG is located in Chhindwara district of Madhya Pradesh. The project is administered by Pench Area of Western Coalfields Limited.

Communication :

The Project is connected by road with Parasia town. It is at a distance of 1/2 km before Parasia .

Climate :

The climate of the area is tropical. The maximum and minimum temperature range during Summer is 45°C to 27°C and during Winter is 25°C to 4°C. Annual rainfall varies from 1000 mm to 1400 mm.

Other Sources of Pollution:

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Parasia Guest House	-	PMUA-1
2.	Manager Office	-	PMUA-2
3.	Lamp room (Ganapati)	-	PMUA-3
4.	Colony	-	PMUA-4

Fugitive Dust Monitoring Location:

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	EDC Siding	-	PMUAF-1

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	PMUW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Fan house	-	PMUN-1
2.	Colony	-	PMUN-2


Frequency of Monitoring :

- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of

-
- nitrogen (NO_x) etc
- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sample
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.
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TEST REPORT NO. : RIN/TR/JUNE-19/A70 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5
 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : PENCH MONTH : JUNE
 NAME OF THE PROJECT : MAHADEOPURI UG

Guest House- Parasia					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO_x	SO_x
08/06/2019	391	173	53	31	16
23/06/2019	145	94	48	31	22
TLV	200	100	60	80	80
# - Above Std. value					
Manager Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO_x	SO_x
08/06/2019	170	129	51	34	20
23/06/2019	99	69	47	34	18
TLV	600	300	60	120	120

Lamp Room					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
14/06/2019	114	61	46	20	13
21/06/2019	129	56	29	17	10
TLV	600	300	60	120	120
# - Above Std. value					
Colony-EDC Dispensary					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
09/06/2019	114	94	45	16	18
22/06/2019	254	157	51	33	19
TLV	200	100	60	80	120
# - Above Std. value					

FUGITIVE DUST MONITORING DATA

1.EDC siding

(24 hourly values in µg/m³)

Dates of Sampling	Parameters		
	SPM	PM-10	PM-2.5
21/06/2019	346	137	32

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : PENCH MONTH: JUNE
NAME OF THE PROJECT : MAHADEOPURI UG

Name of the Location : Fan house - PMUN-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	06/06/2019	71.7	66.5
JUNE.2019	21/06/2019	69.8	68.6
TLV		75	70

Name of the Location : Colony - PMUN-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	06/06/2019	43.9	42.6
JUNE.2019	21/06/2019	43.2	42.5
TLV		55	45

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ENVIRONMENTAL MONITORING REPORT

NAHERIA UG

(PENCH AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE - 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

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3.	EFFLUENT WATER QUALITY MONITORING DATA	5
4.	NOISE LEVEL DATA	6

INTRODUCTION

Location :

Naheria UG project is located in Chhindwara district of Madhya Pradesh. The project is administered by Pench Area of Western Coalfields Limited.

Communication :

Naheria UG Project is situated in East of Parasia town. The convenient rail heads for the project is Parasia (45 km) located on the narrow gauge line of South-Eastern Railway.

Drainage :

The drainage of area is mainly controlled by the Perennial Gunor river and Dhankasa nullah.

Climate :

The climate of the area is tropical. The maximum and minimum temperature range during Summer is 45° C to 27° C and during Winter is 25°C to 4°C. Annual rainfall varies from 1000 mm to 1400 mm.

Other Sources of Pollution:

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Bokai Township	-	PNUA-1
2.	Naheria villege	-	PNUA-2
3.	Lamp Room / Sub-station	-	PNUA-3
4.	SAM Office	-	PNUA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	PNUW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Near Fan house	-	PNUN-1
2.	Colony	-	PNUN-2


Frequency of Monitoring :

- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of

- nitrogen (NO_x) etc
- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sample
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

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TEST REPORT NO. : RIN/TR/JUNE-19/A60 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : PENCH MONTH : JUNE
 NAME OF THE PROJECT : NAHERIA UG

Bokai township					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
11/06/2019	181	83	47	39	16
19/06/2019	196	66	24	16	13
TLV	200	100	60	80	80
Neharia village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
11/06/2019	235	114	57	30	16
19/06/2019	185	130	56	32	25
TLV	200	100	60	80	80
Lamp Room / Substation					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
11/06/2019	101	62	25	17	8
19/06/2019	159	121	28	15	10
TLV	600	300	60	120	120
#-AboveStd.Value					


SAM Office					
DATE OF SAMPLING	Parameters (24 hourly values in $\mu\text{g}/\text{m}^3$)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
11/06/2019	161	89	47	18	17
19/06/2019	95	64	39	20	22
TLV	600	300	60	120	120

#-AboveStd.Value

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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TEST REPORT NO. : RIN/TR/JUNE-19/60 DATE OF ISSUE: 05.08.2019
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: WATER SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 1

EFFLUENT WATER QUALITY REPORT

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : PENCH MONTH : JUNE
 NAME OF THE PROJECT : NAHERIA UG

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
10/06/2019	8.10	28	18	<2
19/06/2019	7.80	20	12	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : PENCH MONTH.: JUNE
NAME OF THE PROJECT : NAHERIA UG

Name of the Location : Fan house - PNUN-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	11/06/2019	66.4	65.2
JUNE.2019	18/06/2019	69.2	68.4
TLV		75	70

Name of the Location : Colony - PNUN-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	11/06/2019	44.4	43.8
JUNE.2019	18/06/2019	45.4	43.2
TLV		55	45

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ENVIRONMENTAL MONITORING REPORT

NEW SETHIA OC

(PENCH AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

**REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014**

AN ISO 9001:2015 COMPANY

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1.	INTRODUCTION	1-2
2.	AIR QUALITY MONITORING DATA	3
3.	EFFLUENT WATER QUALITY MONITORING DATA	4
4.	NOISE LEVEL DATA	5

INTRODUCTION

Location :

New Sethia OC is located in Chhindwara district of Madhya Pradesh. The project is administered by Pench Area of Western Coalfields Limited.

Communication :

The Project is connected by road with Parasia town. Parasia is linked with Chhindwara through a narrow gauge railway line of South Eastern Railway.

Drainage :

Drainage of the area is mainly controlled by Pench river.

Climate :

The climate of the area is tropical. The maximum and minimum temperature range during Summer is 45°C to 27°C and during Winter is 25°C to 4°C. Annual rainfall varies from 1000 mm to 1400 mm.

Other Sources of Pollution:

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Chinda village	- PSOA-1
2.	Colony (Chinda)	- PSOA-2
3.	New Sethia OC Site	- PSOA-3
4.	SAM Office	- PSOA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- PSOW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near Manager Office	- PERSON-1
2.	Colony (Chinda)	- PERSON-2

Frequency of Monitoring :

Air : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.


Water : Water quality is monitored on fortnightly basis.

Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected

- locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc
- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sample
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

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TEST REPORT NO. : RIN/TR/JUNE-19/W61 DATE OF ISSUE: 05.08.2019
NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: WATER SAMPLE
CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
NO. OF PAGES: 1

EFFLUENT WATER QUALITY REPORT

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : PENCH MONTH : JUNE
NAME OF THE PROJECT : NEW SETHIA OC

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS-3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS-3025/17:1984	O & G (mg/l) IS-3025/39:1991
Below Detection Limit	0.2	4	10	2
08/06/2019	7.90	20	12	<2
22/06/2019	7.50	28	18	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : PENCH MONTH.: JUNE
NAME OF THE PROJECT : NEW SETHIA OC

Name of the Location : Near Manager Office - PSON-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	08/06/2019	49.2	48.3
JUNE.2019	21/06/2019	52.4	50.5
TLV		75	70

Name of the Location : Colony (Chinda) - PSON-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	08/06/2019	44.1	43.8
JUNE.2019	21/06/2019	45.2	44.6
TLV		55	45

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ENVIRONMENTAL MONITORING REPORT

SHIVPURI OC

(PENCH AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE- 2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

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3.	EFFLUENT QUALITY MONITORING DATA	5
4.	NOISE LEVEL DATA	6

INTRODUCTION

Location :

Shivpuri OC is located in Chhindwara district of Madhya Pradesh. The project is administered by Pench Area of Western Coalfields Limited.

Communication :

The Project is connected by road with Parasia town. Parasia is linked with Chhindwara through a narrow gauge railway line of South Eastern Railway.

Drainage :

Drainage of the area is mainly controlled by Pench river.

Climate :

The climate of the area is tropical. The maximum and minimum temperature range during Summer is 45°C to 27°C and during Winter is 25°C to 4°C. Annual rainfall varies from 1000 mm to 1400 mm.

Other Sources of Pollution:

Transportation roads, agricultural and local activities, vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Site Office	- PSPOA-1
2.	Chinda village	- PSPOA-2
3.	Colony-Guest House Shivpuri	- PSPOA-3
4.	Substation	- PSPOA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge	- PSPOW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near Manager Office	- PSPON-1
2.	Colony (V.Puri)	- PSPON-2

Frequency of Monitoring :

Air : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.

Water : Water quality is monitored on fortnightly basis.


Noise : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

Air : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc

SPM/ Ambient air laden with suspended particulates enters the Respirable Dust Sampler

- PM-10** : through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sample
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

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TEST REPORT NO. : RIN/TR/JUNE-19/A62 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5
 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : PENCH MONTH : JUNE
 NAME OF THE PROJECT : SHIVPURI OC

Site office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m³)				
	SPM*	PM-10	PM-2.5	NO_x	SO_x
13/06/2019	139	84	43	38	20
20/06/2019	114	83	31	24	25
TLV	600	300	60	120	120
Chinda village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m³)				
	SPM*	PM-10	PM-2.5	NO_x	SO_x
09/06/2019	158	83	43	30	19
22/06/2019	188	99	54	33	29
TLV	200	100	60	80	80
Colony-Guest House Shivpuri					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m³)				
	SPM*	PM-10	PM-2.5	NO_x	SO_x
13/06/2019	166	80	40	33	17
20/06/2019	172	93	46	34	20
TLV	200	100	60	80	80
# - Above Std. value					

Substation					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SO _x
14/06/2019	174	80	43	37	21
21/06/2019	199	95	58	36	22
TLV	600	300	60	120	120

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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3) * - Test parameter not under NABL scope
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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : PENCH MONTH: JUNE
NAME OF THE PROJECT : SHIVPURI OC

Name of the Location : Near Manager Office - PS_pON-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	07/06/2019	49.5	48.5
JUNE.2019	21/06/2019	50.6	48.7
TLV		75	70

Name of the Location : Colony - PS_pON-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	08/06/2019	44.3	43.9
JUNE.2019	21/06/2019	45.3	44.2
TLV		55	45

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ENVIRONMENTAL MONITORING REPORT

THESGORA & MATHANI UG

(PENCH AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

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3.	EFFLUENT WATER QUALITY MONITORING DATA	5
4.	NOISE LEVEL DATA	6

INTRODUCTION

Location :

Thesgora & Mathani UG projects are located in Chhindwara district of Madhya Pradesh. The projects are administered by Pench Area of Western Coalfields Limited.

Communication :

The Projects are about 27 km East of Parasia town.

Drainage :

A no. of seasonal nallas flow through the area, which finally drain into Pench river and Gunar nadi.

Climate :

The climate of the area is tropical. The maximum and minimum temperature range during Summer is 45°C to 27°C and during Winter is 25°C to 4°C. Annual rainfall varies from 1000 mm to 1400 mm.

Other Sources of Pollution:

Transportation roads, agricultural and local activities ,vehicular traffic etc contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Jhure Colony- F.Plant	- PTUA-1
2.	Manager Office-(Thesgora)	- PTUA-2
3.	SAM Office	- PTUA-3
4.	Manager Office-(Mathani UG)	- PTUA-4
5.	Mathani village	- PTUA-5

Water Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge (Mathani UG)	- PTUW-1

Noise Level Monitoring locations :


<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Fan house (Mathani UG)	- PTUN-2
2.	Colony	- PTUN-3

Frequency of Monitoring :

- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

-
- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc
- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size > 10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size < 10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sample
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium (Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.
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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A63 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5
 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : PENCH MONTH : JUNE
 NAME OF THE PROJ : THESGORA & MATHANI UG

Jhure Colony- F. Plant					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
10/06/2019	155	85	34	20	22
19/06/2019	183	67	33	22	20
TLV	200	100	60	80	80
Manager Office- Thesgora					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
13/06/2019	112	79	44	33	25
20/06/2019	139	60	40	27	18
TLV	600	300	60	120	120
SAM Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
10/06/2019	84	35	26	16	17
20/06/2019	157	92	35	31	21
TLV	600	300	60	120	120
<i>#-Above Std. Value</i>					


Manager Office- Mathani UG					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
10/06/2019	507	199	58	25	19
19/06/2019	200	158	33	23	18
TLV	600	300	60	120	120
Mathani village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SOx
10/06/2019	367	112	53	38	18
19/06/2019	171	82	47	26	17
TLV	200	100	60	80	80

#-Above Std. Value

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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 3) * - Test parameter not under NABL scope.
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Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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TEST REPORT NO. : RIN/TR/JUNE-19/63
NAME OF CUSTOMER: WCL, NAGPUR

DATE OF ISSUE: 05.08.2019
SAMPLE DESCRIPTION:
WATER SAMPLE

CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
NO. OF PAGES: 1

EFFLUENT WATER QUALITY REPORT

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : PENCH MONTH : JUNE
NAME OF THE PROJECT : THESGORA & MATHANI UG

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
09/06/2019	8.20	24	16	<2
19/06/2019	7.60	24	16	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : PENCH MONTH: JUNE
NAME OF THE PROJECT : THESGORA & MATHANI UG

Name of the Location : Fan house (Mathani UG) - PTUN-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	11/06/2019	67.4	66.9
JUNE.2019	18/06/2019	68.7	67.5
TLV		75	70

Name of the Location : Colony - PTUN-2

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	08/06/2019	45.9	43.2
JUNE.2019	18/06/2019	45.6	44.2
TLV		55	45

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ENVIRONMENTAL MONITORING REPORT

URDHAN OC

(PENCH AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014

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2.	AIR QUALITY MONITORING DATA	3-4
3.	EFFLUENT WATER QUALITY MONITORING DATA	5
4.	NOISE LEVEL DATA	6

INTRODUCTION

Location :

UrdhanOC project is located in Chhindwara district of Madhya Pradesh. The project is administered by Pench Area of Western Coalfields Limited.

Communication :

The Project is situated in East of Parasia town. The convenient rail heads for the project is Parasia(approx. 45 km) located on the narrow gauge line of South-Eastern Railway.

Drainage :

The drainage of area is mainly controlled by the Perennial Gunorrivver and Dhankasanullah.

Climate :

The climate of the area is tropical. The maximum and minimum temperature range during Summer is 45°C to 27°C and during Winter is 25°C to 4°C. Annual rainfall varies from 1000 mm to 1400 mm.

Other Sources of Pollution:

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Urdhan Manager Office	-	PUOA-1
2.	Urdhan Village	-	PUOA-2
3.	BokaiTownship	-	PUOA-3
4.	Naheriavillage	-	PUOA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Mine water discharge	-	PUOW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>		<u>Location Code</u>
1.	Near Manager Office	-	PUON-1


Frequency of Monitoring :

- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of nitrogen (NO_x) etc

-
- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sample
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

<p>Environment Laboratory CMPDI, RI IV, Nagpur</p>	<p>Test Report</p>	 <p>TC-7102</p>
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TEST REPORT NO. : RIN/TR/JUNE-19/A64 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NOx (06:2006), SO2 (02:2001)], SPM*, PM-2.5
 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : PENCH MONTH : JUNE
 NAME OF THE PROJECT : URDHAN OC

Urdhan Manager Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SO _x
12/06/2019	131	94	49	30	20
19/06/2019	98	46	25	16	10
TLV	600	300	60	120	120
Urdhan village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SO _x
13/06/2019	164	117	48	22	21
20/06/2019	299	134	57	36	24
TLV	200	100	60	80	80


Bokai township					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SO_x
11/06/2019	181	83	47	39	16
19/06/2019	196	66	24	16	13
TLV	200	100	60	80	80
#-Above Std. Value					
Neharia village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SO_x
11/06/2019	235	114	57	30	16
19/06/2019	185	130	56	32	25
TLV	200	100	60	80	80

#-AboveStd.Value

(Scientific Assistant)

*Deepanshu Sahu
 (Authorized Signatory)*

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TEST REPORT NO. : RIN/TR/JUNE-19/W64 DATE OF ISSUE: 05.08.2019
NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: WATER SAMPLE
CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
NO. OF PAGES: 1

EFFLUENT WATER QUALITY REPORT

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : PENCH MONTH : JUNE
NAME OF THE PROJECT : URDHAN OC

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA-Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
11/06/2019	7.60	36	24	<2
19/06/2019	8.10	28	18	<2
TLV	5.5 - 9.0	250	100	10

- Below Std. value

(Scientific Assistant)

**DeepanshuSahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : PENCH MONTH. : JUNE
NAME OF THE PROJECT : URDHAN OC
Name of the Location : Manager Office - PUON-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	11/06/2019	51.6	48.7
JUNE.2019	18/06/2019	48.8	47.3
TLV		75	70

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ENVIRONMENTAL MONITORING REPORT

VISHNUPURI-II UG

(PENCH AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE-2019

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440014

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4.	NOISE LEVEL DATA	6

INTRODUCTION

Location :

Vishnupuri – II UG is located in Chhindwara district of Madhya Pradesh. The project is administered by Pench Area of Western Coalfields Limited.

Communication :

The Project is connected by road with Parasia town. It is 15 km east of Parasia Town. Parasia is linked with Chhindwara through a narrow gauge railway line of South Eastern Railway.

Drainage :

Drainage of the area is controlled by Pench river. There are some seasonal nalla also flowing through the area.

Climate :

The climate of the area is tropical. The maximum and minimum temperature range during Summer is 45°C to 27°C and during Winter is 25°C to 4°C. Annual rainfall varies from 1000 mm to 1400 mm.

Other Sources of Pollution:

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Chinda village Substation	- PV ₂ UA-1
2.	Shivpuri guest house	- PV ₂ UA-2
3.	Substation	- PV ₂ UA-3
4.	SAM Office	- PV ₂ UA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge – Vishnupuri II UG	- PV ₂ UW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near Fan house	- PV ₂ UN-1
2.	Colony	- PV ₂ UN-2


Frequency of Monitoring :

- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of

-
- nitrogen (NO_x) etc
- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sample
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.
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<p>Environment Laboratory CMPDI, RI IV, Nagpur</p>	<p>Test Report</p>	 <p>TC-7102</p>
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TEST REPORT NO. : RIN/TR/JUNE-19/A66

DATE OF ISSUE: 05.08.19

NAME OF CUSTOMER: WCL, NAGPUR

SAMPLE DESCRIPTION: AIR SAMPLE

CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19

NO. OF PAGES: 2

TEST REQUIRED:IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : PENCH MONTH : JUNE
 NAME OF THE PROJECT : VISHNUPURI - II UG


Chinda village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
09/06/2019	158	83	43	30	19
22/06/2019	188	99	54	33	29
TLV	200	100	80	80	60
Colony-Guest House Shivpuri					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
13/06/2019	166	80	40	33	17
20/06/2019	172	93	46	34	20
TLV	200	100	80	80	60
Substation - Above Std. value					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
14/06/2019	174	80	43	37	21
21/06/2019	199	95	58	36	22
TLV	600	300	60	120	120

SAM Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NOx	SO _x
14/06/2019	179	124	43	33	15
21/06/2019	93	51	29	18	11
TLV	600	300	60	120	120

(Scientific Assistant)

*Deepanshu Sahu
(Authorized Signatory)*

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<p>Environment Laboratory CMPDI, RI IV, Nagpur</p>	<p>Test Report</p>	 <p>TC-7102</p>
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TEST REPORT NO. : RIN/TR/JUNE-19/W66 DATE OF ISSUE: 05.08.2019
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: WATER SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 1

EFFLUENT WATER QUALITY REPORT

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : PENCH MONTH. : JUNE
 NAME OF THE PROJECT : VISHNUPURI - II UG

Mine water discharge				
Date of Sample Collection	Analysis Results			
	pH IS- 3025/11:1983	COD (mg/l) APHA- Closed reflux	TSS (mg/l) IS- 3025/17:1984	O & G (mg/l) IS- 3025/39:1991
Below Detection Limit	0.2	4	10	2
13/06/2019	6.50	36	26	<2
22/06/2019	7.10	28	18	<2
TLV	5.5 - 9.0	250	100	10

(Scientific Assistant)

**Deepanshu Sahu
(Authorized Signatory)**

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NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
NAME OF THE AREA : PENCH MONTH.: JUNE
NAME OF THE PROJECT : VISHNUPURI-II UG

Name of the Location : Fan house UG-II PV₂UN-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	07/06/2019	68.4	67.5
JUNE.2019	21/06/2019	69.9	67.2
TLV		75	70

Name of the Location : Colony PV₂UN-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	07/06/2019	45.4	44.9
JUNE.2019	21/06/2019	44.5	43.6
TLV		55	45

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ENVIRONMENTAL MONITORING REPORT

VISHNUPURI-I UG

(PENCH AREA)

WESTERN COALFIELDS LTD.

(JOB No. 8000002)



JUNE-2019

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4.	NOISE LEVEL DATA	7

INTRODUCTION

Location :

Vishnupuri – I UG is located in Chhindwara district of Madhya Pradesh. The project is administered by Pench Area of Western Coalfields Limited.

Communication :

The Project is connected by road with Parasia town. It is 15 km east of Parasia Town. Parasia is linked with Chhindwara through a narrow gauge railway line of South Eastern Railway.

Drainage :

Drainage of the area is controlled by Pench river. There are some seasonal nalla also flowing through the area.

Climate :

The climate of the area is tropical. The maximum and minimum temperature range during Summer is 45°C to 27°C and during Winter is 25°C to 4°C. Annual rainfall varies from 1000 mm to 1400 mm.

Other Sources of Pollution:

Transportation roads, agricultural and local activities ,vehicular traffic etc also contributes to the pollution.

Sampling Location :

Ambient Air Quality Monitoring locations :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Chinda village	- PV ₁ UA-1
2.	Shivpuri guest house	- PV ₁ UA-2
3.	Substation	- PV ₁ UA-3
4.	SAM Office	- PV ₁ UA-4

Water Quality Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Mine water discharge – Vishnupuri I UG	- PV ₁ UW-1

Noise Level Monitoring location :

<u>S.No.</u>	<u>Location Details</u>	<u>Location Code</u>
1.	Near Fan house	- PV ₁ UN-1
2.	Colony	- PV ₁ UN-2


Frequency of Monitoring :

- Air** : Frequency of monitoring is fortnightly as per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000.
- Water** : Water quality is monitored on fortnightly basis.
- Noise** : Noise level is monitored on fortnightly basis.

Methodology of Sampling and Analysis :

- Air** : 24 hourly air samples are collected with Respirable Dust Sampler at selected locations to monitor ambient air quality w.r.t. Suspended particulate matter (SPM), Respirable Particulate Matter (PM-10), Sulphur di-oxide (SO₂) and Oxides of

- nitrogen (NO_x) etc
- SPM/ PM-10** : Ambient air laden with suspended particulates enters the Respirable Dust Sampler through the inlet pipe of sampler by means of a high flow rate blower (1.1 to 1.5 m³/min.). As the air passes through the cyclone, coarse, non-respirable dust (size >10 μ) is separated from the air stream by centrifugal forces acting on the solid particles. These separated particles fall through the cyclone's conical hopper and collect in the sampling bottle placed at bottom. The fine dust forming the respirable fraction (size <10 μ) of the Total Suspended Particulates passes through the cyclone and is carried by the air stream to the Glass Micro Fiber Filter Paper. The Respirable dust (PM-10) is retained by the filter and the carrier air exhausted from the system through the blower. The mass concentration (μg/m³) of Suspended Particulate Matter (non-respirable dust and respirable dust) and Respirable Particulate Matter (PM-10) in the ambient air are computed by measuring the mass of collected particulates and the volume of air sample
- PM2.5** : Ambient air enters the Fine dust sampler through an omni-directional air inlet designed to provide a clear aerodynamic cut point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM 2.5 impactor are passed through a 47 mm diameter Teflon filter membrane that retains the PM-2.5. The mass concentrations (μg/m³) of PM-2.5 in the ambient air are computed by measuring the mass of collected particulates and the volume of air sampled.
- Heavy Metals** : Heavy Metals in Air Samples like Arsenic (As), Lead (Pb), Nickel (Ni), Chromium(Cr) and Cadmium (Cd) are analysed twice a year as per CPCB's guidelines after digestion of samples in microwave digester, with the help of Atomic Absorption Spectrophotometer (AAS) with Hydride generation system and Graphite furnace.
- NO_x** : Determination of oxides of Nitrogen is based on the procedure of "Jacobs and Hochheiser method". In this method the air sample is collected 24 hourly in the field and analysed in the laboratory using spectronic 20 D+ Spectrophotometer. Nitrogen oxides as Nitrogen di-oxide are collected by bubbling air through a Sodium hydroxide solution to form a stable solution of Sodium nitrite. The nitrite ion produced during sampling is determined colorimetrically (with the help of Spectrophotometer, measuring absorbance at 540 nm) by reacting the exposed absorbing reagent with Phosphoric acid, Sulphanilamide and N(1-naphthyl) ethylenediamine dihydrochloride. The interference of Sulphur di-oxide is eliminated by converting it to Sulphuric acid with Hydrogen peroxide before analysis.
- SO₂** : Determination of SO₂ is based on the procedure of West and Gaeke method. Sulphur di-oxide from the air stream is absorbed in a Sodium tetrachloromercurate solution to form a stable solution of Dichlorosulphitomercurate. The amount of Sulphur dioxide is then estimated by the colour produced when P-Rosaniline hydrochloride is added to the solution. The colour is estimated by a reading of absorbance at 560 nm in the Spectrophotometer.
- Water** : Mine water discharge is collected on fortnightly basis in plastic zaricane and is transported to the laboratory for analysis. As per the Env. (Protection) Amendment Rules published vide Gazette dt. 25.9.2000, water samples are analysed fortnightly for the parameters - pH, TSS, Oil & Grease and COD and once in a year for all parameters as per Schedule VI, Env. Protection rule.
- Noise** : Noise level data are recorded fortnightly.

Environment Laboratory CMPDI, RI IV, Nagpur	Test Report	 TC-7102
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TEST REPORT NO. : RIN/TR/JUNE-19/A65 DATE OF ISSUE: 05.08.19
 NAME OF CUSTOMER: WCL, NAGPUR SAMPLE DESCRIPTION: AIR SAMPLE
 CUSTOMER LETTER REF. NO. : WCL/HQ/ENV/17-K/520-522 DATED-18.04.19
 NO. OF PAGES: 2
 TEST REQUIRED: IS-5182 [PM-10(04:1999), NO_x (06:2006), SO₂ (02:2001)], SPM*, PM-2.5
 (USEPA METHOD)

AIR QUALITY MONITORING DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : PENCH MONTH : JUNE
 NAME OF THE PROJECT : VISHNUPURI - I UG

Chinda village					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
09/06/2019	158	83	43	30	19
22/06/2019	188	99	54	33	29
TLV	200	100	60	80	80
Colony-Guest House Shivpuri					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
13/06/2019	166	80	40	33	17
20/06/2019	172	93	46	34	20
TLV	200	100	60	80	80
Substation					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m ³)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
14/06/2019	174	80	43	37	21
21/06/2019	199	95	58	36	22
TLV	600	300	60	120	120
# - Above Std. value					

SAM Office					
DATE OF SAMPLING	Parameters (24 hourly values in µg/m3)				
	SPM*	PM-10	PM-2.5	NO _x	SO _x
14/06/2019	179	124	43	33	15
21/06/2019	93	51	29	18	11
TLV	600	300	60	120	120

- Above Std. value

(Scientific Assistant)

Deepanshu Sahu
(Authorized Signatory)

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- Note: 1) This Report refers to the values related to the items tested as received.
2) This Report cannot be reproduced in part or full without written permission of the management.
3) * - Test parameter not under NABL scope.

NOISE LEVEL DATA

NAME OF THE COMPANY : WCL YEAR : 2019
 NAME OF THE AREA : PENCH MONTH: JUNE
 NAME OF THE PROJECT : VISHNUPURI-I UG

Name of the Location : Fan house UG-I PV₁UN-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	07/06/2019	45.8	44.5
JUNE.2019	21/06/2019	47.1	45.5
TLV		75	70

Name of the Location : Colony PV₁UN-1

Month	Date of Data collection	Noise Level in dB(A)	
		Day Time	Night Time
JUNE.2019	07/06/2019	45.4	44.9
JUNE.2019	21/06/2019	44.5	43.6
TLV		55	45