

ENVIRONMENTAL **STATEMENT**

OF

KHASMAHAL PROJECT

(ISO 9001:2008, ISO 14001:2004 & OHSAS 18001:2007 -CERTIFIED)

FOR

2013-14



Aug-14

CENTRAL COALFIELDS LIMITED
ENVIRONMENT DIVISION
CCL,RANCHI

EXECUTIVE SUMMARY

- E-1.** This Annual Environmental Statement has been prepared as per the Gazette Notification No. G.S.R. 329 (E) dated 13th March, 1992, the Ministry of Environment & Forests, Government of India.
- E-2.** The Khasmahal Colliery falls in B & K of Central Coalfields Limited and is situated in the Bokaro District of JHARKHAND state. The location of Khasmahal Project & other surface features are given in the surface plan as Annexure .
- E-3.** Planned capacity of Khasmahal Project is 1.5 Million Tonne/Year and present production of coal for the year 2013-14 is 1.00 MT .
- E-4.** The Environmental monitoring was carried out quarterly as per the guide lines of Ministry of Environment & Forests (MOEF). The Environmental Monitoring results for four quarter are appended as Annexures .
- E-5.** Ambient air quality is monitored to study the level of air pollution. The main pollutant is suspended particulate matter (SPM). It is difficult to quantify the amount of air pollutants generated due to opencast mining.
- E-6.** Water is not directly used during mining for coal production. It percolate into working area during mining operation. However, water is consumed for other purposes, mainly for domestic supply, industrial supply (workshop, haul road dust suppression, etc.).
- E-7.** The noise levels recorded are generally below permissible limits prescribed by Ministry of Environment & Forests (MOEF). There is no continuous high level sound frequency of impulsive nature.
- E-8.** Hazardous wastes is not being produced either from mining operation or from any pollution control facilities. Solid waste produced from the mining activities is overburden (OB) material and top soil. During 2013-14, 0.64 Million Cubic Metre of O.B .was excavated.
- E-9.** Regular Measures are being taken to control air, water and noise pollutions discussed in detail in part G, H & I of statement form.
- E-10** The Environmental Statement for Khasmahal colliery for the year 2012-13 has been presented in Form-V (Part-A to Part-I) in this report.

CHAPTER-I

PROJECT DESCRIPTION

1.0 INTRODUCTION

Khasmahal Opencast project of Central Coalfield Ltd. is located at Khasmahal, P.O. Sunday Bazar, District Bokaro in the East Bokaro Coalfield of JHARKHAND. It is situated on the Northern Bank of Konar river and North-West of Bokaro Colliery and comes under Bokaro & Kargali Area of CCL. Khasmahal opencast mine designed at a rated capacity of 1.5 Million Tonnes (MT) of Coal per annum. The total mineable reserve of the mine is 20.40 MT of coal with corresponding overburden volume of 21.40 Million cubic Metre. The life of the project is estimated 35 years. The average stripping ratio is 1.05 Cu.M/tonnes. Here grade of coal is GR`-G-7&W-IV. The mining Schemes comprises drilling and blasting operation for loosening of over-burden and coal before excavation. HEMMs (Heavy Earth Moving Machineries) has been engaged for coal production and over-burden removal.

This block is very rugged and has many hills and valleys. The height of the hills varies from 20 m to 60 m. The general elevation of the region varies from 213 m near the Konar river in the South-West to around 341 m in the north -west. the hills are separated from each other by deep Valleys. These valleys mostly are in north-south direction. The general shape of the ground is towards south. The Konar block lies in the catchment of river. Damodar. The Godonala, a tributary of the Damodar river drains the north-eastern part of the Konar block. Water sump in the mine does not exist as because the working quarry is on the higher topography. Rain water slides from the mine and joins Konar river after travelling a distance of about 2 KM.

1.1. COMMUNICATION

The block is connected well by rail and road. The Gomoh-Barkakana loop line of Eastern Railway separates the block from Bokaro and DVC collieries. The nearest railway station is Bokaro Thermal Power Railway Station. The Hazaribagh-Bermo road passes through the northern part of the block. The block is connected with Kathara and Swang collieries through a barrage road over Konar river. The block is situated at a distance of about 130 KM from Ranchi via Tenughat Dam.

1.2. DESCRIPTION OF THE PROJECT

Mineable coal reserve has been estimated 20.40 MT with corresponding over-burden volume of 21.40 M.Cu.M. This gives average stripping ratio of 1.05 Cubic Meter per tonne. The estimated life of the project is 35 years.

There are altogether eleven Karo group of Coal Seams out of which Seams - X to III are present in the area. Out of these, only the Karo Special Seam (Seam-III) contains Coal suitable for metallurgical purpose, the remaining coal seams contain inferior quality coals, mainly because of the highly interbanded and intergrown nature of dirt. Among these inferior quality coal seams, the Karo upper Major, Karo Lower Major and VII and VI are thick seams. (Seam-VIII) is comparatively thin seam. The mine is already producing coal and over-burden. Present production of Coal during 2013-14 is 1.00 MT with 0.64 Million cubic metre of O.B.

Coal of this project is linked to Jarangdih Railway siding to feed power houses and part of the Coal production is linked to road sales from project siding. O.B. dumps can be seen around the Quarry in the surface plan enclosed. Active O.B. dump is located on the western part of the quarry. Present working is on the Southern part of the quarry. Volume of total O.B. to be generated during the life span of the mine is 22.0 Million m³. Slope of the O.B. dumps confirm to natural angle of repose. Half of the abundant quarry has been filled by overburden and massive tree plantation was carried out around the same quarry. Green belt has been developed beside PWD Road near Central School and at other places also which can be seen in the surface plan.

Working collieries surrounding the Project are - Bokaro colliery, KSP / Konar Project. Coal mining is the prime industry of the region. These developments has influenced various environmental attribute e.g. air and water quality, noise level, socio-economic profile, land use pattern etc.

1.3. ENVIRONMENT MONITORING & RESULTS

To assess the present status in respect of air, water, noise etc. of the region, an Environmental Quality Monitoring work was undertaken by C.M.P.D.I. as per work order awarded by C.C.L.

The relevant parameters of air - water - noise pollution were studied and the observations were as follows :-

- i) The air quality analysis results are within prescribed limits.
- ii) Water Quality Reports shows results within permissible limits.
- iii) Noise level reading (LEQ) were within limit.

CHAPTER -II
ENVIRONMENTAL STATEMENT FOR KHAMMAHAL COLLIERY, C.C.LTD.
FOR THE YEAR 2011-12
PART -A

I. Name and Address of the Mine

NAME : Khasmahal Project

PLACE : Khasmahal,
P.O.Sunday Bazar,
Distt: Bokaro

PHONE : NIL

TELEX : NIL

II. INDUSTRY CATEGORY - PRIMARY

III.Date of last Environmental Audit Report submitted

- Environmental statement report was last submitted for the year 2013.

IV PRODUCTION CAPACITY:

Planned capacity of Khasmahal Project is 1.5 Million Tonne/Year and present production of coal for the year 2013-14 is 1.00 MT .

PART - B

WATER AND RAW MATERIAL CONSUMPTION

I. WATER CONSUMPTION (M³/ day)

1. Mining -
 - i. Haul road dust suppression : 170
 - ii. Workshop : 35
 - iii. Fire fighting : NIL
 - iv. Others(service building etc) : 5
- b. Cooling : NIL
- c. Domestic : 200

Name of raw material	Name of products	Consumption of raw materials (per unit of output)	
		During financial year (2011-12)	During financial year (2012-13)
		NIL	

However the following materials are being consumed for OB removal and coal production:

Financial Year	Coal Production	OB Removal	Materials consumed		
			Explosive	POL	HS Diesel
2012-13	1.2 M Te.	1.19 M cum	753.678 Te.	54651 Ltr.	1398020 Ltr.
2013-14	1.0 M Te.	0.64M cum	292.802Te.	50558 Ltr.	1025559 Ltr.

PART - C

POLLUTION GENERATED

(PARAMETERS SPECIFIED IN THE CONSENT ISSUED)

Pollutions	Quantity of pollution generated	Percentage variation from prescribed standards with reasons
Water	Water quality results are appended as Annexure	The analysis report reveals that parameters are within permissible limits.
Air	Khasmahal Colliery having underground and opencast mines, the quantity of air coming out from the mine cannot be worked out. The ambient air quality results are appended as Annexure .	The analysis report reveals that parameters S.P.M., SO _x , No _x are within permissible limits.
Noise	Noise generation is because of mining operation, operation of HEMMs , transportation of coal etc .Recorded noise level are are placed as Annexure .	The noise level in and around the project is under the prescribed limits.

PART - D

HAZARDOUS WASTES

(As specified under Hazardous Waste Management and Handling Rules (1989)

Hazardous Waste	Total Quantity	
	During financial year(2013-14)	During financial year (2012-13)
(a) From process	Nil	Nil
(b) From pollution control facilities	Nil	Nil

Note - The entire process of coal mining, handling and despatch do not give rise to production of any hazardous waste.

PART -E

SOLID WASTES

	Total Quantity in million cubic metre.	
	During financial year (2012-13)	During financial year (2013-14)
(a) From process (Mining) Overburden	1.19 Mm ³	0.64 Mm ³
(b) From pollution control facilities	Nil	Nil
(c) Quantity recycled or reutilised	The overburden removed from the quarry is presently accommodated in the voids of the same quarry.	

PART -F

PLEASE SPECIFY THE CHARACTERISTICS IN TERMS OF CONCENTRATION AND QUANTITY OF HAZARDOUS AS WELL AS SOLID WASTE AND INDICATE, DISPOSAL PRACTICE ADOPTED FOR BOTH THESE CATEGORIES OF WASTES

1. As already mentioned at PART-D above that the entire process of Coal mining, handling and despatch do not give rise to production of any hazardous wastes.

Coal and over-burden are excavated from the mine by drilling and blasting, out of which coal is stacked temporarily near the mine site after which it is despatched to customers or to Jarangdih Rly.siding while the over-burden forms rejects are accommodated in and around the quarry as internal dumps. To safeguard against any possible slope failures arising out of the high rising dumps as well as to safeguard against air-water pollutions and soil wash-off these dumps are given desirable shapes. All these dumps are located adjacent to the quarry as shown in the surface plan.

2. In the year 2013-14, a total 1.0 MT of coal was produced from opencast mine alongwith 0.64 M m³ of over burden removal.

3. Over-burden disposal Practice :

(a) As such there is not any external dump. At present O.B. materials is being internally dumped.

(b) **Internal Over-burden dump:**

The O.B. generated presently is being dumped internally. Active O.B. dump is located on the western part of the quarry. Present working is on the southern part of the quarry. Volume of total O.B. to be generated during the life span of the mine is 22.0 M M³. Slope of the O.B.dumps confirms to natural angle of repose. Half of the abundant quarry has been filled by over burden and tree plantation was carried out around the same quarry.

PART - G

IMPACT OF POLLUTION CONTROL MEASURES ON CONSERVATION OF NATIONAL RESOURCE AND CONSEQUENTLY ON COST OF PRODUCTION

In order to carry out mining operation in an eco-friendly manner the following pollution control measures have been adopted and proposed :

a. **Air Pollution Control Measures :**

- i. Regular sprinkling of water on haul road and other roads.
- ii. Blasting operations are carried out during congenial weather conditions e.g. avoiding temperature inversion preferably the wind velocity is high.
- iii. Dust suppression system at all transfer points.
- iv. Vegetation on external O.B. dumps immediately after it is completely formed.
- v. Plantation in all available open spaces in lease hold around the mine pit, along roads, around coal handling plant and around colony.

b. Water Pollution Control Measures :

- i. The general elevation of the region varies from 213 metre near the Konar river in the South-West to around 341 metre in the north-west. The hills are separated from each other by deep valleys. These valleys mostly are in north-south direction. The general shape of the ground is towards south. The Konar block lies in the catchment area of Konar river. This river is a tributary to river Damodar. The Godonala, a tributary to river Damodar river drains the north-eastern part of the Konar block. Water sump in the mine does not exist as because working quarry is on the higher topography. Rain water slides from the mine and join Konar river after travelling a distance of about 2 K.M.

(c) Noise Pollution Control :

It has been observed that most of the high level noise generated in the project area is equipment originated. Moreover, there is no problem of noise pollution is confined to quarry areas where HEMM, particularly drill, shovel and dumper operates. The following control measures are followed and proposed-

- i. HEMMs should be provided with sound proof cabin so that operators are not subjected to high noise levels.
- ii. Ear muffs are to be provided to each worker exposed to high noise levels.
- iii. Plantation/Vegetative barriers have been developed around noise prone areas as well as residential location.
- iv. Efforts are being made to produce least noise levels.

(d) Solid Waste Management :

The only solid waste produced in the Mining process at Khasmahal opencast project is the over-burden. These over-burdens are dumped in the internal dumps. The O.B. dump conform to natural angle of repose. Half of the abundant quarry has been filled by over-burden and massive tree plantation was done around the said quarry as shown in the surface plan. Rest part of the O.B. dumps will be planted. One active dump is there which is yet to accommodate a lot more of O.B.

**IMPACT OF POLLUTION CONTROL MEASURES ON COST OF PRODUCTION
COST OF ENVIRONMENTAL MANAGEMENT DURING 2010-11**

Consent fee ,water cess etc. are regularly deposited. Expenditure is incurred on monitoring and other pollution control measures.

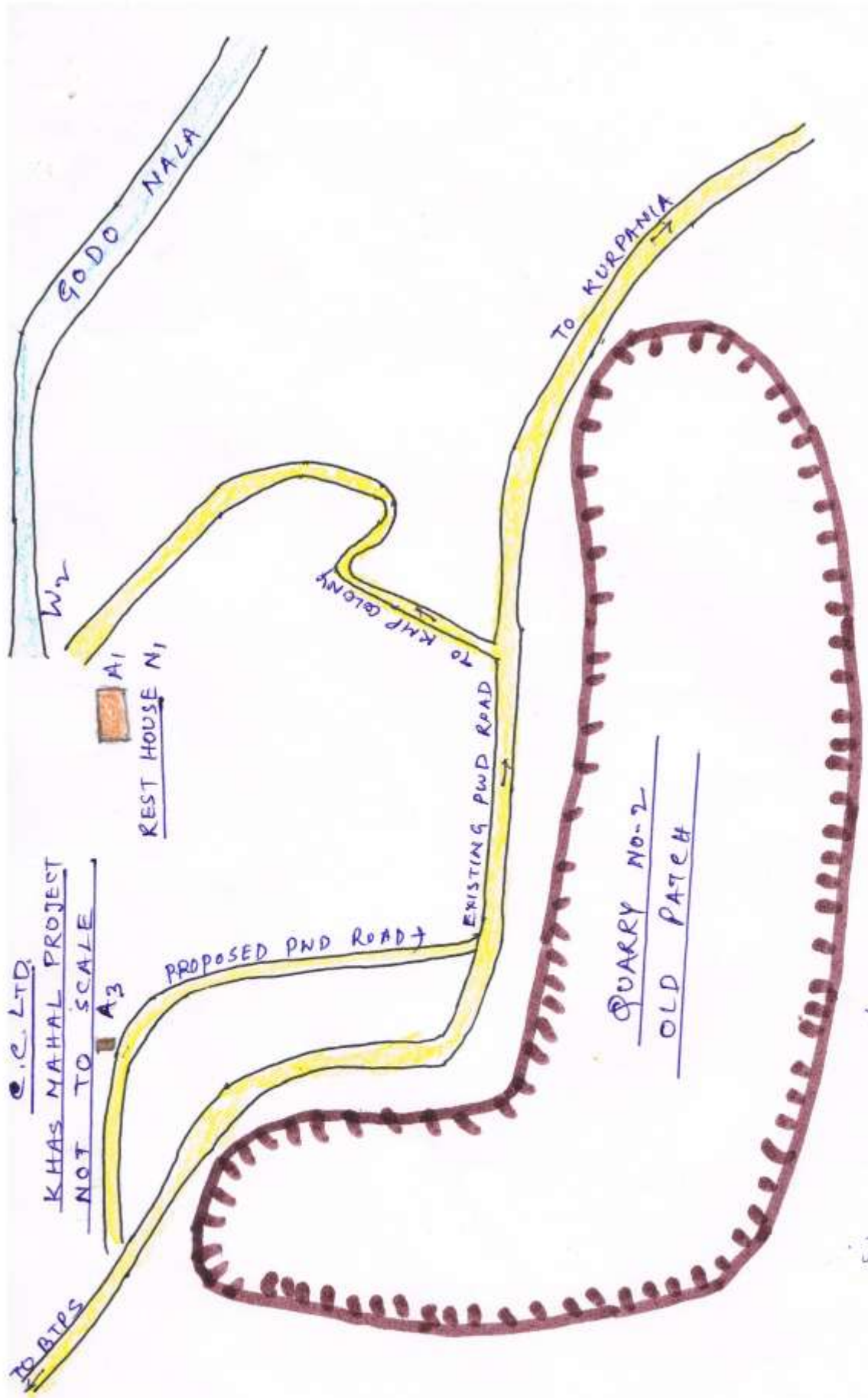
**P A R T - H
ADDITIONAL INVESTMENT PROPOSAL FOR ENVIRONMENTAL PROTECTION
INCLUDING ABATEMENT OF POLLUTION**

Additional investment proposal has not been finalised yet. However, it is proposed to install an effluent treatment plant for workshop effluent. Plantation work is to be taken up as soon as the O.B. dumps are completed. The residential location and quarry are to be provided with green barriers which will serve as dust filters and noise arrestors.

**P A R T - I
ANY OTHER PARTICULARS IN RESPECT OF ENVIRONMENTAL PROTECTION AND
ABATEMENT OF POLLUTION.**

The major problems of environmental control at Khasmahal OCP are:

- * Management of solid wastes in form of over-burden dumps.
- * Treatment and disposal of mine effluents.
- * Creation of green cover over O.B. dumps and around residential area. As stated earlier out of the aforesaid issues only the green cover - plantation work can only be taken-up after completion of dumps. Remaining items can be dealt through out the operational period of the mine. However, greening of the old O.B. dumps can be taken up.
- * A comprehensive Environmental Management Plan(EMP) for this project (0.8 MTY), formulated by RI-III of CMPDI, was approved by the MOEF vide letter No. J - 11015/217/2007 - IA.II(M) dated 02.08.10.



C.C. LTD.
KHAS MAHAL PROJECT
NOT TO SCALE

REST HOUSE N1

QUARRY NO-2
OLD PATCH

A = AIR SAMPLING STATION
N = NOISE SAMPLING STATION
W = WATER SAMPLING STATION

ALL TO BE
KMP

MANAGER
KMP

1119

12



PLANTATION AT KHAS MAHAL PROJECT

TEST REPORT

Job No. : 094313025 Date of Issue: 15/07/13
 Name of the Customer : CCL
 Customer Letter Ref. No. (if any): CCL/Env-Monitoring/13-14/ 2013/823-828 dt. 16/05/13
 Sample Description : Air
 Product Specification (BIS) : Gazette Notification no. G.S.R 742(E) dt.25th Sept.'2000
 Test Required : As per Gazette Notification no. G.S.R 742(E) dt.25th Sept.'2000
 Date of receipt of sample : 01/07/13 Date of performance of Test: 01/07/13 to 15/07/13

TEST RESULT

The sample has been tested with the following results:-

Area : *B&K* **Year** 2013
Project : *Khasmahal* **Quarter Ending June** '2013

Name of the Sampling Station *Rest House*

Date of Sampling	SPM	RPM	SO2	NOx	Remarks
26/06/2013 - 27/06/2013	235	125	10	38	

Name of the Sampling Station *P.O. Office*

Date of Sampling	SPM	RPM	SO2	NOx	Remarks
26/06/2013 - 27/06/2013	296	187	11	41	

Name of the Sampling Station *Central School*

Date of Sampling	SPM	RPM	SO2	NOx	Remarks
27/06/2013 - 28/06/2013	123	70	11	43	

Analysed By

Checked By

G.M (Chemist)
Env. Lab, CMPDI(HQ)
(Authorized Signatory)

B&k - 16

- Note:
- 1) This Report refers to the values obtained at the time of testing and results related to the items tested
 - 2) This Report cannot be reproduced in part or full without written permission of the management.
 - 3) Liability for return of samples ceases as samples cannot be retained for retests.

TEST REPORT

Job No. : 094313025 Date of Issue: 01/07/13
 Name of the Customer : CCL
 Customer Letter Ref. No. (if any): CCL/Env-Monitoring/13-14/ 2013/823-828 dt. 16/05/13
 Sample Description : Noise
 Product Specification (BIS) : Gazette Notification no. G.S.R 742(E) dt.25th Sept.'2000
 Test Required : As per Gazette Notification no. G.S.R 742(E) dt.25th Sept.'2000
 Date of receipt of sample : 01/07/13 Date of performance of Test: -

TEST RESULT

The sample has been tested with the following results:-

Area : **B&K** Year 2013
 Project : **Khasmahal** Quarter Ending June '2013

Sampling Stations 1 Rest House
 2 P.O. Office

Station Name	Date of Sampling	Noise Level
Rest House	26/06/2013	49.4
P.O.Office	26/06/2013	48.7

Permissible Limit of Noise Level vide Gazette Notification G.S.R. 742(E) Dt. 25th Sep '2K

	6.00 AM to 10.00 PM	10.00 PM to 6.00 AM
Noise Level	Leq 75 dB(A)	Leq 70 dB(A)

Checked By

G.M (Chemist)
 Env. Lab, CMPDI(HQ)
 (Authorized Signatory)

B&k – 17

- Note:
- 1) This Report refers to the values obtained at the time of testing and results related to the items tested
 - 2) This Report cannot be reproduced in part or full without written permission of the management.
 - 3) Liability for return of samples ceases as samples cannot be retained for retests.

TEST REPORT

Job No. : 094313025 Date of Issue: 15/07/13
 Name of the Customer : CCL

Customer Letter Ref. No. (if any): CCL/Env-Monitoring/13-14/ 2013/823-828 dt. 16/05/13
 Sample Description : Effluent Water
 Product Specification (BIS) : MoEF Sch VI Class 'a' std.
 Test Required : 26 items as per MoEF Sch VI Class 'a' std.
 Date of receipt of sample : 01/07/13 Date of performance of Test: 01/07/13 to 15/07/13

TEST RESULT

The sample has been tested with the following results:-

Area : B & K **Year** 2013
Project : Khasmahal **Quarter Ending June** '2013

Sampling Stations 1 Lagoon Discharge 26-June-13

All parameter are in mg/l unless specified

BDL - Below Detectable Limit

Sl.No.	Parameter	Sampling Stations			Below Detection Limit	MOEF -SCH-VI STANDARDS	Remarks
		1	2	3			
1	Colour & Odour	Acceptable			-	Acceptable	
2	Total Suspended Solids	30			5.00	100.0	
3	pH value	7.90			0.01	5.5 to 9.0	
4	Temperature (°C)	25.8			-	Shall not exceed 5 C above the receiving temp.	
5	Oil & Grease	BDL			1.00	10.0	
6	Total Residual Chlorine	BDL			0.04	1.0	
7	Ammonical Nitrogen	0.14			0.02	50.0	
8	Total Kjeldahl Nitrogen	2.60			0.02	100.0	
9	Free Ammonia	BDL			0.02	5.0	
10	B.O.D (3 days 27°C)	1.00			1.00	30.0	
11	COD	35			5.00	250.0	
12	Arsenic	BDL			0.01	0.2	
13	Lead	BDL			0.05	0.1	
14	Hexavalent Chromium	BDL			0.01	0.1	
15	Total Chromium	0.10			0.10	2.0	
16	Copper	0.03			0.02	3.0	
17	Zinc	0.02			0.02	5.0	
18	Selenium	BDL			0.01	0.05	
19	Nickel	BDL			0.10	3.0	
20	Fluoride	0.50			0.05	2.0	
21	Dissolved Phosphate	0.14			0.01	5.0	
22	Sulphide	0.04			0.01	2.0	
23	Phenolic Compounds	BDL			0.001	1.0	
24	Manganese	BDL			0.05	2.0	
25	Iron	BDL			0.05	3.0	
26	Nitrate Nitrogen	1.9			0.01	10.0	

Analysed By

Checked By

G.M (Chemist)
Env. Lab, CMPDI(HQ)
(Authorized Signatory)

B&k - 18

- Note:
- 1) This Report refers to the values obtained at the time of testing and results related to the items tested
 - 2) This Report cannot be reproduced in part or full without written permission of the management.
 - 3) Liability for return of samples ceases as samples cannot be retained for retests.

TEST REPORT

Job No. : 094313025 Date of Issue: 15/07/13
 Name of the Customer : CCL

Customer Letter Ref. No. (if any): CCL/Env-Monitoring/13-14/ 2013/823-828 dt. 16/05/13
 Sample Description : Surface Water
 Product Specification (BIS) : IS: 2296 Inland Surface Water Class 'C'
 Test Required : 18 items as per IS: 2296
 Date of receipt of sample : 01/07/13 Date of performance of Test: 01/07/13 to 15/07/13

TEST RESULT

The sample has been tested with the following results:-

Area : B & K **Year** 2013
Project : Khasmahal **Quarter Ending June** '2013

Sampling Stations 1 Goda nala D/S of Mine 26-June-13
 2 Konar River in Confluence with Bokaro River 26-June-13

All parameter are in mg/l unless specified

BDL - Below Detectable Limit

Sl.No.	Parameter	Sampling Stations			Below Detection Limit	IS : 2296 INLAND SURFACE WATER [1982] Class 'C'	Remarks
		1	2	3			
1	Colour, Hazen unit,Max	20	10		1.00	300	
2	Total Suspended Solids	98	77		5.00	\$	
3	Disolved Oxygen	4.60	4.70		0.10	4	
4	pH value	8.28	7.98		0.01	6.5-8.5	
5	Iron	0.76	BDL		0.05	5	
6	Chlorides	22	14		0.25	600	
7	BOD (3 days 27°C)	2.70	2.30		1.00	3	
8	Total Dissolved Solids	172	124		1.00	1500	
9	Copper	0.03	0.03		0.02	1.5	
10	Sulphate	34	28		1.00	400	
11	Nitrate	9.30	7.53		0.01	50	
12	Fluoride	0.37	0.42		0.05	1.5	
13	Selenium	BDL	BDL		0.01	0.05	
14	Arsenic	BDL	BDL		0.01	0.2	
15	Lead	BDL	BDL		0.05	0.1	
16	Zinc	0.03	0.09		0.02	15	
17	Hexavalent Chromium	BDL	BDL		0.01	0.05	
18	Phenolics	BDL	BDL		0.001	0.005	

*Class-C: Tolerance Limit for surface water used for drinking water source with conventional treatment followed by disinfection
 \$ represents limits not specified*

Analysed By

Checked By

G.M (Chemist)
Env. Lab, CMPDI(HQ)
(Authorized Signatory)

B&k - 19

- Note:
- 1) This Report refers to the values obtained at the time of testing and results related to the items tested
 - 2) This Report cannot be reproduced in part or full without written permission of the management.
 - 3) Liability for return of samples ceases as samples cannot be retained for retests.

TEST REPORT

Job No. : 094313025 Date of Issue: 07/10/13
 Name of the Customer : CCL
 Customer Letter Ref. No. (if any): CCL/Env-Monitoring/13-14/ 2013/823-828 dt. 16/05/13
 Sample Description : Air
 Product Specification (BIS) : Gazette Notification no. G.S.R 742(E) dt.25th Sept.'2000
 Test Required : As per Gazette Notification no. G.S.R 742(E) dt.25th Sept.'2000
 Date of receipt of sample : 23/09/13 Date of performance of Test: 23/09/13 to 07/10/13

TEST RESULT

The sample has been tested with the following results:-

Area : **B&K** Year 2013
 Project : **Khasmahal** Quarter Ending Sept. '2013

Name of the Sampling Station *Rest House*

Date of Sampling	SPM	RPM	SO2	NOx	Remarks
18/09/2013 - 19/09/2013	91	71	<25	22	

Name of the Sampling Station *P.O. Office*

Date of Sampling	SPM	RPM	SO2	NOx	Remarks
18/09/2013 - 19/09/2013	99	44	<25	24	

Name of the Sampling Station *Central School*

Date of Sampling	SPM	RPM	SO2	NOx	Remarks
18/09/2013 - 19/09/2013	132	99	<25	22	

Analysed By

Checked By

G.M (Chemist)
 Env. Lab, CMPDI(HQ)
 (Authorized Signatory)

B&k - 16

- Note: 1) This Report refers to the values obtained at the time of testing and results related to the items tested
 2) This Report cannot be reproduced in part or full without written permission of the management.
 3) Liability for return of samples ceases as samples cannot be retained for retests.

TEST REPORT

Job No. : 094313025 Date of Issue: 23/09/13
 Name of the Customer : CCL

Customer Letter Ref. No. (if any): CCL/Env-Monitoring/13-14/ 2013/823-828 dt. 16/05/13
 Sample Description : Noise
 Product Specification (BIS) : Gazette Notification no. G.S.R 742(E) dt.25th Sept.'2000
 Test Required : As per Gazette Notification no. G.S.R 742(E) dt.25th Sept.'2000
 Date of receipt of sample : 23/09/13 Date of performance of Test: -

TEST RESULT

The sample has been tested with the following results:-

Area : **B&K** Year 2013
 Project : **Khasmahal** Quarter Ending Sept. '2013

Sampling Stations
 1 Rest House
 2 P.O. Office

Station Name	Date of Sampling	Noise Level
Rest House	18/09/2013	49.0
P.O.Office	18/09/2013	48.5

Permissible Limit of Noise Level vide Gazette Notification G.S.R. 742(E) Dt. 25th Sep '2K

	6.00 AM to 10.00 PM	10.00 PM to 6.00 AM
Noise Level	Leq 75 dB(A)	Leq 70 dB(A)

Checked By

G.M (Chemist)
Env. Lab, CMPDI(HQ)
(Authorized Signatory)

B&k – 17

- Note:
- 1) This Report refers to the values obtained at the time of testing and results related to the items tested
 - 2) This Report cannot be reproduced in part or full without written permission of the management.
 - 3) Liability for return of samples ceases as samples cannot be retained for retests.

TEST REPORT

Job No. : 094313025
 Name of the Customer : CCL

Date of Issue: 04/10/13

Customer Letter Ref. No. (if any): CCL/Env-Monitoring/13-14/ 2013/823-828 dt. 16/05/13

Sample Description : Effluent Water

Product Specification (BIS) : MoEF Sch VI Class 'a' std.

Test Required : 27 items as per MoEF Sch VI Class 'a' std.

Date of receipt of sample : 23/09/13 Date of performance of Test: 23/09/13 to 04/10/13

TEST RESULT

The sample has been tested with the following results:-

Area : B & K
Project : Khasmahal

Year : 2013
Quarter Ending Sept. : '2013

Sampling Stations 1 Lagoon Discharge

20-Sept-13

All parameter are in mg/l unless specified

BDL - Below Detectable Limit

Sl.No.	Parameter	Sampling Stations			Below Detection Limit	MOEF -SCH-VI STANDARDS	Remarks
		1	2	3			
1	Colour & Odour	Acceptable			5.0 Cannot be quantified	Acceptable	
2	Total Suspended Solids	66			25.00	100.0	
3	pH value	8.08			0.01	5.5 to 9.0	
4	Temperature (° C)	25.2			-	Shall not exceed 5 C above the receiving temp.	
5	Oil & Grease	2.00			2.00	10.0	
6	Total Residual Chlorine	BDL			0.02	1.0	
7	Ammonical Nitrogen	0.28			0.01	50.0	
8	Total Kjeldahl Nitrogen	2.20			1.00	100.0	
9	Free Ammonia	BDL			0.01	5.0	
10	B.O.D (3 days 27°C)	2.00			2.00	30.0	
11	COD	70			4.00	250.0	
12	Arsenic	BDL			0.005	0.2	
13	Lead	BDL			0.005	0.1	
14	Cadmium	BDL			0.0005	2.0	
15	Hexavalent Chromium	BDL			0.01	0.1	
16	Total Chromium	BDL			0.06	2.0	
17	Copper	BDL			0.03	3.0	
18	Zinc	BDL			0.01	5.0	
19	Selenium	BDL			0.005	0.05	
20	Nickel	BDL			0.10	3.0	
21	Fluoride	0.48			0.02	2.0	
22	Dissolved Phosphate	0.30			0.30	5.0	
23	Sulphide	0.005			0.005	2.0	
24	Phenolic Compounds	BDL			0.002	1.0	
25	Manganese	BDL			0.02	2.0	
26	Iron	BDL			0.06	3.0	
27	Nitrate Nitrogen	2.5			0.50	10.0	

Analysed By

Checked By

G.M (Chemist)
Env. Lab, CMPDI(HQ)
(Authorized Signatory)

B&k - 18

- Note:
- 1) This Report refers to the values obtained at the time of testing and results related to the items tested
 - 2) This Report cannot be reproduced in part or full without written permission of the management.
 - 3) Liability for return of samples ceases as samples cannot be retained for retests.

TEST REPORT

Job No. : 094313025
 Name of the Customer : CCL

Date of Issue: 04/10/13

Customer Letter Ref. No. (if any): CCL/Env-Monitoring/13-14/ 2013/823-828 dt. 16/05/13
 Sample Description : Surface Water
 Product Specification (BIS) : IS: 2296 Inland Surface Water Class 'C'
 Test Required : 19 items as per IS: 2296
 Date of receipt of sample : 23/09/13 Date of performance of Test: 23/09/13 to 04/10/13

TEST RESULT

The sample has been tested with the following results:-

Area	: B & K	Year	2013
Project	: Khasmahal	Quarter Ending Sept.	'2013
Sampling Stations 1	Goda nala D/S of Mine		20-Sept-13
2	Konar River in Confluence with Bokaro River		20-Sept-13

All parameter are in mg/l unless specified

BDL - Below Detectable Limit

Sl.No.	Parameter	Sampling Stations			Below Detection Limit	IS : 2296 INLAND SURFACE WATER [1982] Class 'C'	Remarks
		1	2	3			
1	Colour, Hazen unit,Max	14	18		5.0	300	
2	Total Suspended Solids	72	67		25.00	\$	
3	Disolved Oxygen	5.10	4.70		0.10	4	
4	pH value	7.88	7.75		0.01	6.5-8.5	
5	Iron	BDL	BDL		0.06	5	
6	Chlorides	18	24		2.00	600	
7	BOD (3 days 27°C)	2.40	3.00		2.00	3	
8	Total Dissolved Solids	128	208		25.00	1500	
9	Copper	BDL	BDL		0.03	1.5	
10	Sulphate	24	38		2.00	400	
11	Nitrate	7.53	8.41		0.50	50	
12	Fluoride	0.33	0.35		0.02	1.5	
13	Cadmium	BDL	BDL		0.0005	0.01	
14	Selenium	BDL	BDL		0.005	0.05	
15	Arsenic	BDL	BDL		0.005	0.2	
16	Lead	BDL	BDL		5.00	0.1	
17	Zinc	BDL	BDL		0.01	15	
18	Hexavalent Chromium	BDL	BDL		0.01	0.05	
19	Phenolics	BDL	BDL		0.002	0.005	

*Class-C: Tolerance Limit for surface water used for drinking water source with conventional treatment followed by disinfection
 \$ represents limits not specified*

Analysed By

Checked By

**G.M (Chemist)
 Env. Lab, CMPDI(HQ)
 (Authorized Signatory)**

- Note:
- 1) This Report refers to the values obtained at the time of testing and results related to the items tested
 - 2) This Report cannot be reproduced in part or full without written permission of the management.
 - 3) Liability for return of samples ceases as samples cannot be retained for retests.

TEST REPORT

Job No. : 094313025
 Name of the Customer : CCL

Date of Issue: 17/01/14

Customer Letter Ref. No. (if any): CCL/DGM-HOD(E&F)/2013/1570 Dt. 22/11/13

Sample Description : Air

Product Specification (BIS) : Gazette Notification no. G.S.R 742(E) dt.25th Sept.'2000Test Required : As per Gazette Notification no. G.S.R 742(E) dt.25th Sept.'2000

Date of receipt of sample : 02/01/14 Date of performance of Test: 02/01/14 to 17/01/14

TEST RESULT

The sample has been tested with the following results:-

Area : B&K
 Project : Khasmahal

Year : 2013
 Quarter Ending Dec. : 2013

All parameters are in $\mu\text{g}/\text{m}^3$ **Name of the Sampling Station** Rest House

Date of Sampling	SPM	RPM	SO ₂	NO _x	Remarks
28/12/2013 - 29/12/2013	445	147	<25	21	

Name of the Sampling Station P.O. Office

Date of Sampling	SPM	RPM	SO ₂	NO _x	Remarks
28/12/2013 - 29/12/2013	442	126	<25	20	

Name of the Sampling Station Lodherbera Village


Date of Sampling	SPM	RPM	SO ₂	NO _x	Remarks
28/12/2013 - 29/12/2013	347	183	<25	19	

Name of the Sampling Station Barwabera Village

Date of Sampling	SPM	RPM	SO ₂	NO _x	Remarks
30/12/2013 - 31/12/2013	422	249	<25	20	


 Analysed By


 Checked By


 S.M (Chemist)
 Env. Lab, CMPDI(HQ)
 (Authorized Signatory)

B&K - 16

- Note: 1) This Report refers to the values obtained at the time of testing and results related to the items tested
 2) This Report cannot be reproduced in part or full without written permission of the management.
 3) Liability for return of samples ceases as samples cannot be retained for retests.

TEST REPORT

Job No. : 094313025
 Name of the Customer : CCL

Date of Issue: 02/01/14

Customer Letter Ref. No. (if any): CCL/DGM-HOD(E&F)/2013/1570 Dt. 22/11/13

Sample Description : Noise
 Product Specification (BIS) : Gazette Notification no. G.S.R 742(E) dt.25th Sept.'2000
 Test Required : As per Gazette Notification no. G.S.R 742(E) dt.25th Sept.'2000
 Date of receipt of sample : 02/01/14

Date of performance of Test: -

TEST RESULT

This sample has been tested with the following results:-

Area : B&K
 Project : Khasmahal

Year : 2013
 Quarter Ending Dec. : 2013

Sampling Stations
 1 Rest House
 2 P.O. Office
 3 Lodherbera Village

Station Name	Date of Sampling	Noise Level
Rest House	28/12/2013	49.2
P.O. Office	28/12/2013	40.7
Lodherbera Village	28/12/2013	47.6

Permissible Limit of Noise Level vide Gazette Notification G.S.R. 742(E) Dt. 25th Sep '2K

	6.00 AM to 10.00 PM	10.00 PM to 6.00 AM
Noise Level	Leq 75 dB(A)	Leq 70 dB(A)

[Signature]
 Checked By

B&K - 17

[Signature] 29.1.14
 G.M (Chemist)
 Env. Lab, CMPDI(HQ)
 (Authorized Signatory)

- Note:
- 1) This Report refers to the values obtained at the time of testing and results related to the items tested
 - 2) This Report cannot be reproduced in part or full without written permission of the management.
 - 3) Liability for return of samples ceases as samples cannot be retained for retests.

TEST REPORT

Date of Issue: 10/01/14

Job No. : 094313025
 Name of the Customer : CCL

Customer Letter Ref. No. (if any): CCL/DGM-HOD(E&F)/2013/1570. Dt. 22/11/13

Sample Description : Effluent Water
 Product Specification (BIS) : MoEF Sch VI Class 'a' std.
 Test Required : 27 items as per MoEF Sch VI Class 'a' std.
 Date of receipt of sample : 02/01/14

Date of performance of Test: 02/01/14 to 10/01/14

TEST RESULT

The sample has been tested with the following results:-

Area : B & K
 Project : Khasmahal

Year : 2013
 Quarter Ending Dec. : 2013

31-Dec-13

Sampling Stations : Lagoon Discharge

BDL - Below Detectable Limit

All parameter are in mg/l unless specified

Sl.No	Parameter	Sampling Stations			Below Detection Limit	MOEF -SCH-VI STANDARDS	BIS Standard	Method
		1	2	3				
1	Colour & Odour	Acceptable			5.0 Cannot be quantified	Acceptable	APHA, 22 nd Edition IS 3025/05:1983	Pt. Cobalt Physical, Qualitative
2	Total Suspended Solids	44			25.00	100.0	IS-3025/17:1984	Gravimetric
3	pH value	8.14			0.01	5.5 to 9.0	IS-3025/11:1983	Electrometric
		19.0			5.0	Shall not exceed 5 C above the receiving temp.	IS-3025/09:1984	Thermometric
5	Oil & Grease	BDL			2.00	10.0	APHA, 22 nd Edition	DPD
6	Total Residual Chlorine	BDL			0.02	1.0	IS:3025/34:1988	Nessler's
7	Ammonical Nitrogen	0.20			0.01	50.0	IS:3025/34:1988	Nessler's
8	Total Kjeldahl Nitrogen	2.20			1.00	100.0	IS:3025/34:1988	Nessler's
9	Free Ammonia	BDL			0.01	5.0	IS:3025/34:1988	Nessler's
10	B.O.D (3 days 27°C)	2.00			2.00	30.0	IS-3025/44:1993	3 day incubation at 27°C
11	COD	50			4.00	250.0	IS-3025/58:2006	Titration
12	Arsenic	BDL			0.005	0.2	APHA, 22 nd Edition	AAS-GTA
13	Lead	BDL			0.005	0.1	APHA, 22 nd Edition	AAS-GTA
14	Cadmium	BDL			0.0005	2.0	APHA, 22 nd Edition	AAS-GTA
15	Hexavalent Chromium	BDL			0.01	0.1	APHA, 22 nd Edition	Diphenylcarbohydrazide
16	Total Chromium	BDL			0.06	2.0	IS-3025/52:2003	AAS-Flame
17	Copper	BDL			0.03	3.0	IS-3025/42:1992	AAS-Flame
18	Zinc	BDL			0.01	5.0	IS-3025/49:1994	AAS-Flame
19	Selenium	BDL			0.005	0.05	APHA, 22 nd Edition	AAS-GTA
20	Nickel	BDL			0.10	3.0	IS-3025/54:2007	AAS-Flame
21	Fluoride	0.42			0.02	2.0	APHA, 22 nd Edition	SPADNS
22	Dissolved Phosphate	0.14			0.30	5.0	APHA, 22 nd Edition	Molybdovanadate
23	Sulphide	0.006			0.005	2.0	APHA, 22 nd Edition	Methylene Blue
24	Phenolic Compounds	BDL			0.002	1.0	APHA, 22 nd Edition	4-Amino Antipyrine
25	Manganese	BDL			0.02	2.0	APHA, 22 nd Edition	AAS-Flame
26	Iron	BDL			0.06	3.0	IS-3025/53:2003	AAS-Flame
27	Nitrate Nitrogen	1.4			0.50	10.0	APHA, 22 nd Edition	UV Spectrophotometric

Analysed By

Checked By

B&k - 18

20/01/14
G.M (Chemist)
 Env. Lab, CMPDI(HQ)
 (Authorized Signatory)

Note: 1) This Report refers to the values obtained at the time of testing and results related to the items tested
 2) This Report cannot be reproduced in part or full without written permission of the management.
 3) Liability for return of samples ceases as samples cannot be retained for retests.

TEST REPORT

Date of Issue: 10/01/14

Job No. : 094313025
Name of the Customer : CCL

Customer Letter Ref. No. (if any): CCL/DGM-HOD(E&F)/2013/1570 Dt. 22/11/13

Sample Description : Surface Water
Product Specification (BIS) : IS: 2296 Inland Surface Water Class 'C'

Test Required : 19 items as per IS: 2296

Date of receipt of sample : 02/01/14 Date of performance of Test: 02/01/14 to 10/01/14

TEST RESULT

The sample has been tested with the following results:

Area : B & K
Project : Khasmahal

Year : 2013
Quarter Ending Dec. : 2013

Sampling Stations 1 Goda nala D/S of Mine
2 Konar River in Confluence with Bokaro River

31-Dec-13
31-Dec-13

BDL - Below Detectable Limit

All parameter are in mg/l unless specified

Sl.No	Parameter	Sampling Stations			Below Detection Limit	IS : 2296 INLAND SURFACE WATER [1982] Class 'C'	BIS Standard	Method
		1	2	3				
1	Colour, Hazen unit, Max	20	22		5.0	300	APHA, 22 nd Edition	Platinum Cobalt
2	Total Suspended Solids	58	64		25.00	\$	IS-3025/17:1984	Gravimetric
3	Disolved Oxygen	4.40	4.70		0.10	4	IS-3025/38:1989	Winkler Azide
4	pH value	8.04	8.00		0.11		IS-3025/11:1982	Electrometric
5	Iron	BDL	BDL		0.06	5	IS-3025/53:2003	AAS-Flame
6	Chlorides	16	24		2.00	600	IS-3025/32:1988	Argentometric
7	BOD (3 days 27°C)	2.60	2.40		2.00	3	IS-3025/44:1993	3 day incubation at 27°C
8	Total Dissolved Solids	132	212		25.00	1500	IS-3025/16:1984	Gravimetric
9	Copper	BDL	BDL		0.03	1.5	IS-3025/42:1992	AAS-Flame
10	Sulphate	14	20		2.00	400	APHA, 22 nd Edition	Turbidity
11	Nitrate	6.20	6.64		0.50	50	IS-3025/34:1988	Nessler's
12	Fluoride	0.32	0.27		0.02	1.5	APHA, 22 nd Edition	SPADNS
13	Cadmium	BDL	BDL		0.0005	0.01	APHA, 22 nd Edition	AAS-GTA
14	Selenium	BDL	BDL		0.005	0.05	APHA, 22 nd Edition	AAS-GTA
15	Arsenic	BDL	BDL		0.005	0.2	APHA, 22 nd Edition	AAS-GTA
16	Lead	BDL	BDL		0.005	0.1	APHA, 22 nd Edition	AAS-GTA
17	Zinc	BDL	BDL		0.01	15	IS-3025/49:1994	AAS-Flame
18	Hexavalent Chromium	BDL	BDL		0.01	0.05	APHA, 22 nd Edition	Diphenylcarbohydrazide
19	Phenolics	BDL	BDL		0.002	0.005	APHA, 22 nd Edition	4-Amino Antipyrine

Class-C: Tolerance Limit for surface water used for drinking water source with conventional treatment followed by disinfection
\$ represents limits not specified

Analysed By

Checked By

B&k - 19

29.1.14
G.M (Chemist)
Env. Lab. CMPDI(HQ)
(Authorized Signatory)

- Note: 1) This Report refers to the values obtained at the time of testing and results related to the items tested
2) This Report cannot be reproduced in part or full without written permission of the management.
3) Liability for return of samples ceases as samples cannot be retained for retests

TEST REPORT

Lab No. T-2187	Job No. 094313025	Year	2013-14
Type of Sample:	Ambient Air	Quarter Ending	March '14
Customer / W. O. no. & Date:	CCL/DGM-HOD (E&F)/2013/ 1570 Dt. 22/11/13	Date of Receipt of Sample:	03.04.14
Mode of Receipt of Sample:	Jointly sampling with customer	Date of Analysis:	03.04.14-17.04.14
Sampling Protocol:	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution	Date of Reporting:	17.04.14
Testing Protocol:	Gazette Notification no. G.S.R 742(E) dt.25 th Sept. '2000		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results:-

Area :	B&K	Project:	Khasmahal
Stations:	1. Rest House 2. P.O. Office 3. Lodherbera Village 4. Barwabera Village		Date of Sampling: 29-29/03/2014 29-29/03/2014 29-29/03/2014 31-31/03/2014

S.No	Test Parameters	Units	Test Method	TEST RESULT			
				1	2	3	4
Stations:							
1	Total Particulate Matter (PM ₁₀ + >PM ₁₀)	µg/m ³	Lab.SOP 4 based on - IS: 5182/23, 2006	243	286	573	404
2	Particulate Matter (PM ₁₀)	µg/m ³	IS: 5182/23 2006	140	227	410	178
3	Sulphur Dioxide (SO ₂)	µg/m ³	IS: 5182 /02 2001 R-2006	<25	<25	<25	<25
4	Nitrogen Oxides (as NO _x)	µg/m ³	IS: 5182 /02 1975 R-1998	19	22	19	19

Note: Gazette Notification no. G.S.R 742(E) dt.25th Sept. '2000 is enclosed along for reference

Ramesh
Analysed By

[Signature]
Checked By

[Signature] 19.5.14
G.M (Chemist)
Env. Lab. CMPDI(HQ)
(Authorized Signatory)

B&K - 16

Note: 1) This Report refers to the values obtained at the time of testing and results related to the items tested
 2) This Report cannot be reproduced in part or full without written permission of the management.
 3) Liability for return of samples ceases as samples cannot be retained for retests.

TEST REPORT

Lab No. T-2187	Job No. 094313025	Year	2013-14
Type of Sample:	Noise	Quarter Ending	March '14
Customer / W. O. no. & Date:	CCL/DGM-HOD(E&F)/2013/ 1570 Dt. 22/11/13	Date of Receipt of Sample:	03.04.14
Mode of Receipt of Sample:	Jointly sampling with customer	Date of Analysis:	-
Testing Protocol:	Gazette Notification no. G.S.R 742(E) dt.25 th Sept.'2000	Date of Reporting:	-
Remarks:			

TEST RESULT

The sample has been tested with the following results:-

Area : **B&K** Project: **Khasmahal**

Stations:

1. Rest House
2. P.O. Office
3. Lodherbera Village
- 4.

Station Name	Date of Sampling	Noise Level
Rest House	29/03/2014	49.5
P.O. Office	29/03/2014	48.2
Lodherbera Village	29/03/2014	50.1

Permissible Limit of Noise Level vide Gazette Notification G.S.R. 742(E) Dt. 25th Sep '2K

Noise Level	6.00 AM to 10.00 PM	10.00 PM to 6.00 AM
	Leq 75 dB(A)	Leq 70 dB(A)

[Signature]
Checked By

B&K - 17

[Signature] / 9.5.14
G.M (Chemist)
Env. Lab, CMPDI(HQ)
(Authorized Signatory)

- Note.
- 1) This Report refers to the values obtained at the time of testing and results related to the items tested
 - 2) This Report cannot be reproduced in part or full without written permission of the management.
 - 3) Liability for return of samples ceases as samples cannot be retained for retests.


TEST REPORT

Lab No. T-2187	Job No. 094313025	Year - 2013-14	2013-14
Type of Sample:	Effluent Water	Quarter Ending	March '14
Customer / W. O. no. & Date:	CCL/DGM-HOD(E&F)/2013/ 1570 Dt. 22/11/13	Date of Receipt of Sample:	03.04.14
Mode of Receipt of Sample:	Picked up sample by laboratory	Date of Analysis:	03.04.14-14.04.14
Testing Protocol:	MOEF -SCH-VI STANDARDS, Class 'A'	Date of Reporting:	14.04.14
Remarks & Observation:	Samples received in 2 ltr plastic Jerri cane, Colour as observed is transparent		


TEST RESULT

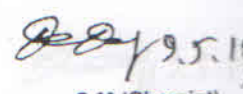
The sample has been tested with the following results:-

Area : **B&K** Project: **Khasmahal**
 Stations: 1. Lagoon Discharge Date of Sampling: 31/03/2014
 2.
 3.

Sl.No.	Parameter	Sampling Stations			Desirable Limits	MOEF -SCH-VI STANDARDS Class 'A'	BIS Standard & Method
		1	2	3			
1	Total Suspended Solids, mg/l, Max	44			25.00	100.0	IS 3025/17:1984, R:1996, Gravimetric
2	pH value	8.10			0.01	5.5 to 9.0	IS-3025/11:1983, R-1996, Electrometric
3	Temperature (°C)	24.9			5.0	Shall not exceed 5°C above the receiving temp.	IS-3025/09:1984, Thermometric
4	Oil & Grease, mg/l, Max	2.00			2.00	10.0	IS 3025/39:1991, R:2003, Partition Gravimetric
5	Total Residual Chlorine, mg/l, Max	<0.02			0.02	1.0	APHA, 22 nd Edition, DPD
6	Ammonical Nitrogen, mg/l, Max	0.10			0.01	50.0	IS 3025/34:1988, R:2009, Nessler's
7	Total Kjeldahl Nitrogen, mg/l, Max	1.10			1.00	100.0	IS:3025/34:1988, Nessler's
8	Free Ammonia, mg/l, Max	<0.01			0.01	5.0	IS:3025/34:1988, Nessler's
9	B.O.D (3 days 27°C), mg/l, Max	2.00			2.00	30.0	IS 3025 /44:1993,R:2003 3 day incubation at 27°C
10	COD, mg/l, Max	48			4.00	250.0	APHA, 22 nd Edition, Closed Reflux, Titrimetric
11	Arsenic, mg/l, Max	<0.005			0.005	0.2	IS 3025/37:1988 R:2003, AAS-VGA
12	Lead, mg/l, Max	0.02			0.005	0.1	APHA, 22 nd Edition, AAS-GTA
13	Cadmium, mg/l, Max	0.001			0.0005	2.0	APHA, 22 nd Edition, AAS-GTA
14	Hexavalent Chromium, mg/l, Max	<0.01			0.01	0.1	APHA, 22 nd Edition, Diphenylcarbohydrazide
15	Total Chromium, mg/l, Max	0.08			0.06	2.0	IS-3025/52:2003, AAS-Flame
16	Copper, mg/l, Max	<0.03			0.03	3.0	IS 3025/42:1992 R:2009, AAS-Flame
17	Zinc, mg/l, Max	<0.01			0.01	5.0	IS 3025 /49 : 1994, R : 2009, AAS-Flame
18	Selenium, mg/l, Max	<0.005			0.005	0.05	APHA, 22 nd Edition, AAS-GTA
19	Nickel, mg/l, Max	<0.10			0.10	3.0	IS-3025/54:2003, AAS-Flame
20	Fluoride, mg/l, Max	0.70			0.02	2.0	APHA, 22 nd Edition, SPADNS
21	Dissolved Phosphate, mg/l, Max	<0.30			0.30	5.0	APHA, 22 nd Edition Molybdovanadate
22	Sulphide, mg/l, Max	0.005			0.005	2.0	APHA, 22 nd Edition, Methylene Blue
23	Phenolic Compounds, mg/l, Max	<0.002			0.002	1.0	APHA, 22 nd Edition 4-Amino Antipyrine
24	Manganese, mg/l, Max	<0.02			0.02	2.0	IS-3025/59:2006, AAS-Flame
25	Iron, mg/l, Max	<0.06			0.06	3.0	IS 3025 /53 : 2003, R : 2009, AAS-Flame
26	Nitrate Nitrogen, mg/l, Max	1.3			0.50	10.0	APHA, 22 nd Edition, UV-Spectrophotometric


 Analysed By


 Checked By
 B&k - 18


 G.M (Chemist)
 Env. Lab, CMPDI(HQ)
 (Authorized Signatory)

- Note: 1) This Report refers to the values obtained at the time of testing and results related to the items tested
 2) This Report cannot be reproduced in part or full without written permission of the management.
 3) Liability for return of samples ceases as samples cannot be retained for retests.

TEST REPORT

Lab No. T-2187	Job No. 094313025	Year - 2013-14	2013-14
Type of Sample:	Surface Water	Quarter Ending	March '14
Customer / W. O. no. & Date:	CCL/DGM-HOD(E&F)/2013/ 1570 Dt. 22/11/13	Date of Receipt of Sample:	03.04.14
Mode of Receipt of Sample:	Picked up sample by laboratory	Date of Analysis:	03.04.14-14.04.14
Testing Protocol:	-	Date of Reporting:	14.04.14
Remarks & Observation:	Samples received in 2 ltr plastic Jerri cane, Colour as observed is transparent		

TEST RESULT

The sample has been tested with the following results:-

Area :

B&K

Project:

Khasmahal

Stations:

1. Goda nala D/S of Mine
2. Konar River in Confluence with Bokaro River
- 3.
- 4.

Date of Sampling:

31/03/2014

31/03/2014

Sl. No	Parameter	Sampling Stations				Desirable Limits	BIS Standard & Method
		1	2	3	4		
1	Total Suspended Solids, mg/l, Max	48	55			25.00	IS 3025 /17:1984, R :1996, Gravimetric
2	Disolved Oxygen, min.	6.70	6.40			0.10	IS 3025/381989, R : 2003, Winkler Azide
3	pH value	8.20	8.18			0.01	IS-3025/11:1983, R-1996, Electrometric
4	Iron, mg/l, Max	<0.06	<0.06			0.06	IS 3025 /53 : 2003, R : 2009 , AAS-Flame
5	Chlorides, mg/l, Max	18	26			2.00	IS-3025/32:1988, R-2007, Argentometric
6	BOD (3 days 27°C), mg/l, Max	2.00	2.40			2.00	IS 3025 /44: 1993, R : 2003 3 day incubation at 27°C
7	Dissolved Solids, mg/l, Max	122	204			25.00	IS 3025 /16:1984 R : 2006, Gravimetric
8	Copper, mg/l, Max	<0.03	<0.03			0.03	IS 3025 /42 : 1992 R : 2009, AAS-Flame
9	Sulphate, mg/l, Max	18	26			2.00	APHA, 22 nd Edition Turbidity
10	Nitrate , mg/l, Max	6.64	6.20			0.50	APHA, 22 nd Edition, UV-Spectrophotometric
11	Fluoride, mg/l, Max	0.47	0.48			0.02	APHA, 22 nd Edition SPADNS
12	Cadmium, mg/l, Max	<0.0005	<0.0005			0.0005	APHA, 22 nd Edition AAS-GTA
13	Selenium, mg/l, Max	<0.005	<0.005			0.005	APHA, 22 nd Edition AAS-GTA
14	Arsenic, mg/l, Max	<0.005	<0.005			0.005	IS 3025/37:1988 R : 2003, AAS-VGA
15	Lead, mg/l, Max	0.02	0.03			0.005	APHA, 22 nd Edition AAS-GTA
16	Zinc, mg/l, Max	<0.01	0.01			0.01	IS 3025 /49 : 1994, R : 2009, AAS-Flame
17	Hexavalent Chromium, mg/l, Max	<0.01	<0.01			0.01	APHA, 22 nd Edition, 1,5 - Diphenylcarbohydrazide
18	Phenolics, mg/l, Max	<0.002	<0.002			0.002	APHA, 22 nd Edition 4-Amino Antipyrine



Analysed By



Checked By

B&k - 19



G.M (Chemist)
Env. Lab, CMPDI(HQ)
(Authorized Signatory)

- Note: 1) This Report refers to the values obtained at the time of testing and results related to the items tested
2) This Report cannot be reproduced in part or full without written permission of the management.
3) Liability for return of samples ceases as samples cannot be retained for retests.