ENVIRONMENTAL STATEMENT

OF BOKARO COLLIERY OPENCAST PROJECT

FOR 2015-16

CENTRAL COALFIELDS LIMITED

ENVIRONMENT DIVISION

CCL,RANCHI

E X E C U T I V E S U M M A R Y

E-1. This Annual Environmental Statement has been prepared as per the Gazette Notification No. G.S.R. 329(E) dated 13th March'92, the Ministry of Environment & Forests, Government of India.

E-2 **Bokaro Opencast Project** of Central Coalfields Limited is located in the East-Bokaro Coalfields of Bokaro Distt. of Jharkhand state. The mine block is situated on the north of Damodar river after railway line. The total area of the block is about 7 sq.Km.The project location and other surface features are given in the plan annexed as **ANNEXURE**.

E-3 The annual target of production for the year 2015-16 is 70000 Tes. The project has achieved the production during 2015-16 is 84113 Tes.

E-4 The Environmental Monitoring was carried out quarterly as per the guide lines of Ministry of Environment & Forest(MOEF).The Environmental Monitoring results for four quarters of 2015-16 are appended as **ANNEXURE.**

E-5 Ambient air quality is monitored to study the level of air pollution. The main air pollutant is suspended particulate matter(SPM).It is difficult to quantity the amount of air pollutants generated due to opencast mining.

E-6 Water is not directly used during mining for coal production. It percolates into working area during mining operation. However ,water is consumed for other purposes ,mainly for dust suppression.

E-7 The noise levels recorded are generally below permissible limits prescribed by the Ministry of Environment & Forest s(MoEF).There is no continuous high level sound frequency of impulsive nature.

E-8 Raw material used in coal mining activities are explosive and POL for machines and automobiles. The consumption is detailed in Part-B of Statement Form.

E-9 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.

E-10 Regular measures are being taken to control air, water and noise pollutions discussed in detail in part G,H & I of Environmental Statement Form.

CHAPTER-1

PROJECT DESCRIPTION

1.1 INTRODUCTION:

The Bokaro colliery of Central Coalfields Limited is located in East –Bokaro Coalfield of Jharkhand,designed for a rated capacity of 0.5 million tones of coal per annum .The mine block is situated to the North of river Damodar after railway line.Godo nallah flowing across the Western section of this colliery joins with Damodar river.On the Eastern side of the quarry surface is Baidkaro nallah.Lease hold area of the project is 607.80 Ha.

The O.B generated is presently being dumped nearby the quarry OB dumps can be seen in the around the quarry.At present situation/area is not making external OB dumping,internal OB dumping during 2015-16 is 0.124 MM^3.All the dumps are located within 0.5 Km distance from the working quarry. Characteristics of the overburden is sand stone and shale band mostly, OB dumps can be seen in the surface plan enclosed. some of the OB dumps will be disturbed again for mining of lower Bermo seam. Half of the abundant quarry has been filled by OB and massive plantation was carried out. Massive plantation is proposed in next year.Slope of the reclaimed dumps is 1 in1 .Working collieries surrounding this project are Bermo mine,Kargali colliery etc.Coal mining is the prime,industry of the region.These developments have influenced various environmental attributes e.g. air and water quality,noise leel,Socio-economic profile,land use pattern etc.

1.2 LOCATION:

The project comes under Bokaro & Kargali area of Central Coalfields Ltd. Total area of the block is about 7 Sq. Km. The colliery is connected by Fair Weather Road with Bermo Hazaribagh road. The nearest railway station is Bermo on Gomoh-Barkakana loop line of Eastern Railway.

1.3 MINING METHOD:

Considering the geo-mining condition of the deposit namely

(i) Moderate gradient (7-9),

(ii) Volume of OB during 2015-16 is 0.124 MM^3

(iii) Short life of the project:T he shovel-dumper system of mining is applied. Drilling blasting operation for loosening of coal and overburden is necessary before excavation by shovel.

1.4 Drainage pattern:

There are control sumps in the pit. This acts as sedimentation lagoon for the sump water.A major portion of suspended solids are separated here before it is pumped out to natural drains,Godonallah flows on the western part of the quarry and Baidkaro nallah flows on the eastern part of the quarry.Sumps water is used for domestic purpose & partly used for dust suppression.

ENVIRONMENT MONITORING RESULTS:-

To assess the present status in respect of air,water,noise of the region on Environmental quality monitoring work was undertaken by CMPDI under request from CCL.The relevant parameter of air-water-noise pollutions were studied by CMPDI.

i. Ambient air quality parameters are within prescribed limits.

ii. Mine water quality parameters were within the limits prescribed under MOEF.

iii. Noise level readings(LEQ) were also within the limit.

CH A P T E R-II

ENVIRONMENTAL STATEMENT FOR BOKARO COLLIERY ,C.C.LTD.FOR THE YEAR 2014-15

P A R T – A

a. I Name and Address of the Mine

NAME: Bokaro Colliery

Place :Bokaro Colliery,PO:Sunday Bazar

Dist:Bokaro

TELEX: Nil

II. **INDUSTRY CATEGORY- PRIMARY**

iii. **Date of last Environmental Audit Report submitted**

Environmental statement report was last submitted for the year 2014-15

IV. **PRODUCTION CAPACITY**:

Planned capacity of the Project for 2015-16 was 70,000 tes and production of coal for the Year(2015-16) 84,113 tes

PART-B

WATER AND RAW MATERIAL CONSUMPTION

WATER CONSUMPTION (M3/day)

a. Mining

b. Haul road dust suppression : 90

ii. Workshop :

iii. Fire fighting :

c. Cooling :Nil

Domestic :329

Name of product	Water consumption per unit of production	
	During financial year 2014-15	During financial year 2015-16
ROM Coal	0.21 KL/Te	0.22 KL/Te

RAW MATERIAL CONSUMPTION:- 2013-14 2014-15

Nil Nil

However the following materials are being consumed for O.B removal & Coal production

S.No.	name of raw material	Nameof product	Consumption of raw material (Per unit of output)	
			During financial yr 2014-15	During financial yr 15-16
1	Explosive	Coal	0.22 Kg/te	0.58 Kg/te
2.	POL		0.08 Kg/te	1.46 Kg/te
3	HSD		1.16 lit/te	0.08 lit/te

PART-C

POLLUTION DISCHARGED TO ENVIRONMENT/UNIT OF OUTPUT

(PARAMETERS/SPECIFIED IN THE CONSENT ISSUED)

POLLUTION	Quantity of pollution generated	Percentage variation from prescribed standards with reasons
Water	The analysis results are given in Annexure	The analysis results reveal that most of the parameters are below permissible limits prescribed by MoEF as General Standards for Class 'A' effluent(Effluent discharged into land surface water.)
Air	It is difficult to quantity the amount of air pollutants.The main air pollutant is suspended particulate matter(SPM).The air quality results are appended a Annexure.	Ambient air quality results show that values were within prescribed limits.
Noise	The high noise in mining areas owes its origin in and around excavation and material handling sites. There is no continuous sound frequency of impulsive nature. Ambient Noise Quality reports are appended as Annexure.	Noise quality reports shows the results are within permissible limits.

PART-D

HAZARDOUS WASTES

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

Hazardous Waste	Total Quantity	
	During financial year 2014-15	During financial year 2015-16
(a)From mining process	0.58 KL	0.58KL
(b)From materials handling system lities	12 V Battery,09 nos	12 Battery,08 nos

PART-E

SOLID WASTES

	Total quantity in million cubic meter	
	During financial 2014-15	During financial year 15-16
(a)From process	0.083 MM^3	0.124 MM^3
(b)From pollution control facilities	Nil	Nil
©Quantity recycled of reutilized	During both financial year, the entire volume of Ob has been used for refilling the decoaled area of the quarry.	

PART-F

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

HAZARDOUS WASTES

1. Hazardous wastes is not being produced either from mining operation or from any pollution control facilities.
2. **SOLID WASTES.**
3. During opencast mining, overburden produced as soild wastes temporarily as these materials are used for reclamation. During the year 2015-16, 0.124 Million cubic meter of overburden was generated. The overburden material are more or less homogeneous comprising mainly shale, sand, silt and clay & gravel.
4. **DISPOSAL PRACTICE**
5. Presently the O.B material is being filled in de-coaled area.

PART-G

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

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

Implemented.

1.0 **AIR POLLUTION CONTROL MEASURE.**

The following measures have been taken to control air pollution.

(i) Regular sprinkling of water on haul road and other road.
(ii) Water sprinkling on coal stock.
(iii) Plantation along the vacant space.
(iv) All necessary precautions will be taken during drilling ,blasting, loading & transporting operations.

2.0 **WATER POLLUTION CONTROL MEASURES.**

(I) The mine water is allowed to settle in sump before pumping to natural drains. Sump water is being utilized for water spraying on haul roads for dust suppression and for domestic purpose.

(ii)The catch drains have been constructed around the foot of the OB dumps in order to collect surface run off water from the dumps and convey them to the settling ponds.

(iii) A oil grease trap and settling ponds are proposed in the workshop to prevent water pollution.

(iv)Colony and other service building are provided with septic tanks and soak pits.

(v)A garland drain is provided around the quarry to collect the surface run off .This also prevent storm water to enter into the quarry area.

3.0 **NOISE POLLUTION CONTROL MEASURE**.

(i)Blasting operation is carried out between 1.00 PM to 3.00 P.M

(ii) Regulars maintenance of HEMMs and other equipment.

(iii)Use of HEMMs with sound proof cabin.

(v) Providing green belt around noise generating centers.

4.0 **MEASURES FOR RECLAMATION OF LAND**

At present OB generated during mining is being used as refilling material in de coaled area of quarry. As soon as the dumps reaches to its final stage, it is proposal to start technical and biological

Reclamation of the dumps .At the end of mining operations, some de coaled area will remain empty, which would be used for storing rain water. The presence of such a water body will help in increasing the moisture content of soil of adjacent area and ultimately it would promote the growth of vegetation.

IMPACT OF POLLUTION CONTROL MEASURES ON COST OF PRODUCTION OF ENVIRONMENTAL MANAGEMENT.

Consent fee, watercess etc. are regularly deposited. Expenditure in incurred on monitoring and other pollution control measures.

PART-H

ADDITIONAL INVESTMENT PROPOSAL FOR ENVIRONMENTAL/MENTAL PROTECTION INCLUDING ABATEMENT OF POLLUTION

Additional investment proposal has not been finalized yet. However, it is proposed to construct an effluent treatment plant for workshop effluent and plantation in vacant spaces. Other investment proposals are:

(i) The environmental monitoring of the project will be continued quarterly as per the guidelines of Ministry of Environment & Forests(MoEF).

(ii) Environmental statement report will be prepared or each financial year ending 31st march.

(iii) The air & water consent will be taken from Jharkhand State Pollution Control Board, Ranchi each year.

Part-I

ANY OTHER PARTICULARS IN RESPECT OF ENVIRONMENTAL PROTECTION AND ABATEMENT OF POLLUTION.

The major problem of environmental control of Bokaro OCP.

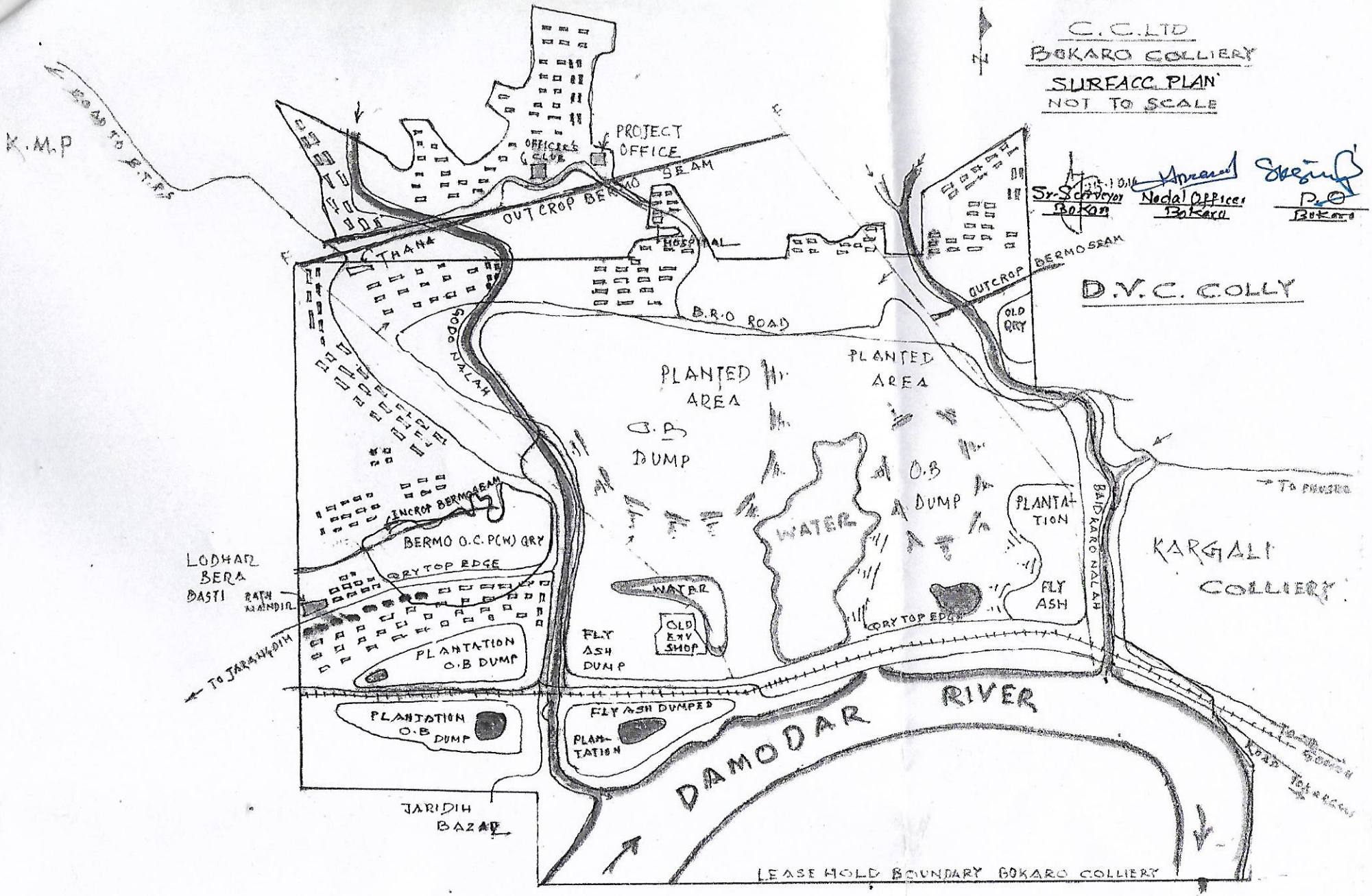
- Management of solid wastes in form of O.B dumps.
- Treatment and disposal of mine effluents including dump lechates
- Control of mine fire.
- Creation of green cover of OB dumps, fire control area and around residential area .
- Treatment of workshop effluent.

BOKARO COLLIERY

YEAR-WISE PLANTATION

Area in Hectare

Year	1997	1998	2000	2002	2004	2005	2008	2009	2010	2011	2012	2013	2014	2015	2016	Total
Reclamed Area (HA)	64.20	0.15	10.00	58.00	53.36	38.00	12.56	NIL	NIL	NIL	5.02	10.23	3.36	6.79	NIL	261.67
Over Back-field (External area) (HA)	NIL	NIL	NIL	NIL	4.64	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	4.64


C.C.LTD
BOKARO COLLIERY
SURFACE PLAN
NOT TO SCALE
K.M.P
ROAD TO BTPS
PROJECT OFFICE
OFFICERS CLUB
SEAM
OUT CROP BERMO SEAM
HOSPITAL
THANA
B.R.O ROAD
GODO NALAH
PLANTED AREA
PLANTED AREA
O.B DUMP
WATER
O.B DUMP
OUTCROP BERMO SEAM
OLD QRY
D.V.C. COLLY
INCROP BERMO SEAM
BERMO O.C.P(W) QRY
QRY TOP EDGE
LODHAR BERA BASTI
RATH MANDIR
TO JARANGDIH
PLANTATION O.B DUMP
FLY ASH DUMP
WATER
OLD ENV SHOP
QRY TOP EDGE
PLANTATION
FLY ASH
BAIDKARO NALAH
TO PHUSRO
KARGALI COLLIERY
PLANTATION O.B DUMP
FLY ASH DUMPED
PLANTATION
DAMODAR RIVER
JARIDIH BAZAR
LEASE HOLD BOUNDARY BOKARO COLLIERY
Sr. Surveyor Bokaro
Nodal Officer Bokaro
P.O Bokaro

TEST REPORT

Test Report No. 192	Job No. 094315007	Year	2015-16
Type of Sample:	Ambient Air	Quarter Ending	June 15
Customer / W. O. no. & Date:	CCL	Date of Receipt of Sample:	01.06.15
Mode of Receipt of Sample:	Joint sampling with customer	Date of Analysis:	01.06.15-17.06.15
Sampling Protocol:	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution	Date of Reporting:	17.06.15
Testing Protocol:	Gazette Notification no. G.S.R 742(E) dt. 25th Sept.'2000	Date of Issue:	As in the signature of Dy.Technical Manager below
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:** Bokaro OCP

Stations:

1. Hind Strip Colony
2. Rest House
3. Gandhinagar Colony
4.

Date of Sampling:
21-22/05/2015
21-22/05/2015
21-22/05/2015

S.No	Test Parameters	Units	Test Method	TEST RESULT			
Stations:				1	2	3	4
1	*Total Particulate Matter (PM_{10}+ >PM_{10})	$\mu g/m^3$	Lab.SOP 4 based on – IS: 5182/23, 2006	487	545	354	
2	Particulate Matter (PM_{10})	$\mu g/m^3$	IS: 5182/23 2006	195	215	194	
3	*Particulate Matter ($PM_{2.5}$)	$\mu g/m^3$	-	-	-	-	
4	Sulphur Dioxide (SO_2)	$\mu g/m^3$	IS: 5182 /02 2001 R-2006	<25	<25	<25	
5	Nitrogen Oxides (as NO_x)	$\mu g/m^3$	IS: 5182 /06 1975 R-1998	22	20	19	

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

Analysed By

12/6/15
Dy.Technical Manager
Env. Lab, CMPDI(HQ)
(Authorized Signatory)

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TEST REPORT

2015/6/Test Report No. 193	Job No. 094315007	Year	2015-16
Type of Sample:	Noise	Quarter Ending	June 15
Customer / W. O. no. & Date:	CCL	Date of Receipt of Sample:	01.06.15
Mode of Receipt of Sample:	Jointly sampling with customer	Date of Analysis:	-
Testing Protocol:	Gazette Notification no. G.S.R 742(E) dt.25th Sept.'2000	Date of Reporting:	-
Remarks:			

TEST RESULT

The sample has been tested with the following results:-

Area : **B&K** **Project:** **Bokaro OCP**

Stations:

1. Hindstrip Colony
2. Rest House
3.
4.

Station Name	Date of Sampling	Noise Level
Hindstrip Colony	21/05/2015	49.3
Rest House	21/05/2015	48.4

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)

Dy.Technical Manager
Env. Lab, CMPDI(HQ)
(Authorized Signatory)

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TEST REPORT

2015-6/Test Report No. 194	Job No. 094315007	Year	2015-16
Type of Sample:	Effluent Water	Quarter Ending	June 15
Customer / W. O. no. & Date:	CCL	Date of Receipt of Sample:	01.06.15
Mode of Receipt of Sample:	Picked up sample by laboratory	Date of Analysis:	01.06.15-13.06.15
Testing Protocol:	MOEF -SCH-VI STANDARDS, Class 'a'	Date of Reporting:	13.06.15
Remarks & Observation:	Samples received in 2 ltr plastic Jerri cane, Colour as observed is transparent	Date of Issue:	As in the signature of Dy.Technical Manager below

TEST RESULT

The sample has been tested with the following results:-

Area : B&K **Project:** Bokaro OCP

Stations:
1. Lagoon Discharge
2.
3.

Date of Sampling: 28/05/2015

Sl.No.	Parameter	Sampling Stations			Detection Limit	MOEF -SCH-VI STANDARDS Class 'A'	BIS Standard & Method
		1	2	3			
1	Ammonical Nitrogen, mg/l, Max	0.08			0.02	50.0	IS 3025/34:1988, R : 2009, Nessler's
2	Arsenic (as As), mg/l, *Max*	<0.002			0.002	0.2	IS 3025/37:1988 R : 2003, AAS-VGA
3	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
4	Cadmium(as Cd), mg/l, Max	<0.0005			0.0005	2.0	APHA, 22nd Edition, AAS-GTA
5	COD, mg/l, Max	36			4.00	250.0	APHA, 22nd Edition, Closed Reflux, Titrimetric
6	Copper (as Cu), mg/l, *Max*	<0.03			0.03	3.0	IS 3025/42: 1992 R : 2009, AAS-Flame
7	Dissolved Phosphate, mg/l, Max	<0.30			0.30	5.0	APHA, 22nd Edition Molybdovanadate
8	Fluoride (as F) mg/l, *Max*	0.73			0.02	2.0	APHA, 22nd Edition, SPADNS
9	Free Ammonia, mg/l, Max	<0.01			0.01	5.0	IS:3025/34:1988, Nesseler's
10	Hexavalent Chromium, mg/l, Max	<0.01			0.01	0.1	APHA, 22nd Edition, Diphenylcarbohydrazide
11	Iron (as Fe), mg/l, *Max*	0.06			0.06	3.0	IS 3025 /53 : 2003, R : 2009 , AAS-Flame
12	Lead (as Pb), mg/l, *Max*	<0.005			0.005	0.1	APHA, 22nd Edition, AAS-GTA
13	Manganese(as Mn), mg/l, Max	0.03			0.02	2.0	IS-3025/59:2006, AAS-Flame
14	Nickel (as Ni), mg/l, *Max*	<0.10			0.10	3.0	IS-3025/54:2003, AAS-Flame
15	Nitrate Nitrogen, mg/l, *Max*	1.2			0.50	10.0	APHA, 22nd Edition, UV-Spectrphotometric
16	Oil & Grease, mg/l, Max	<2.00			2.00	10.0	IS 3025/39:1991, R : 2003, Partition Gravimetric
17	pH value	7.60			2.5	5.5 to 9.0	IS-3025/11:1983, R-1996, Electrometric
18	Phenolic compounds (as C_6H_5OH),mg/l, *Max*	<0.002			0.002	1.0	APHA, 22nd Edition 4-Amino Antipyrine
19	Selenium (as Se), mg/l, *Max*	<0.002			0.002	0.05	APHA, 22nd Edition, AAS-GTA
20	Sulphide (as SO_3), mg/l, Max	<0.005			0.005	2.0	APHA, 22nd Edition Methylene Blue
21	Temperature (°C)	37.2			Shall not exceed 5° C above the receiving temp.		IS-3025/09:1984, Thermometeric
22	Total Chromium (as Cr), mg/l, *Max*	<0.06			0.06	2.0	IS-3025/52:2003, AAS-Flame
23	Total Kjeldahl Nitrogen, mg/l, Max	1.10			1.00	100.0	IS:3025/34:1988, Nesseler's
24	Total Residual Chlorine, mg/l, Max	<0.02			0.02	1.0	APHA, 22nd Edition, DPD
25	Total Suspended Solids, mg/l, Max	20			10.00	100.0	IS 3025/17:1984, R :1996, Gravimetric
26	Zinc (as Zn), mg/l, *Max*	<0.01			0.01	5.0	IS 3025 /49 : 1994, R : 2009, AAS-Flame

Analysed By

Dy.Technical Manager
Env. Lab, CMPDI(HQ)
(Authorized Signatory

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TEST REPORT

2015/6/Test Report No. 195	Job No. 094315007	Year	2015-16
Type of Sample:	Surface Water	Quarter Ending	June 15
Customer / W. O. no. & Date:	CCL	Date of Receipt of Sample:	01.06.15
Mode of Receipt of Sample:	Picked up sample by laboratory	Date of Analysis:	01.06.15-13.06.15
Testing Protocol:	-	Date of Reporting:	13.06.15
Remarks & Observation:	Samples received in 2 ltr plastic Jerri cane, Colour as observed is transparent	Date of Issue:	As in the signature of Dy.Technical Manager below

TEST RESULT

The sample has been tested with the following results:-

Area : **B&K** **Project:** **Bokaro OCP**

Stations:

1. Goda Nala before Damodar
2. Damodar before Goda Nala
3. Damodar after Goda Nala
4.

Date of Sampling:
28/05/2015
28/05/2015
28/05/2015

Sl. No	Parameter	Sampling Stations				Detection Limit	BIS Standard & Method
		1	2	3	4		
1	Arsenic (as As), mg/l, Max	<0.002	<0.002	<0.002		0.002	IS 3025/37:1988 R : 2003, AAS-VGA
2	BOD (3 days 27°C), mg/l, Max	2.80	2.40	2.80		2.00	IS 3025 /44: 1993, R : 2003 3 day incubation at 27°C
3	Cadmium(as Cd), mg/l, Max	<0.0005	<0.0005	<0.0005		0.0005	APHA, 22nd Edition AAS-GTA
4	Chlorides (as Cl), mg/l, Max	22	32	30		2.00	IS-3025/32:1988, R-2007, Argentometric
5	Copper (as Cu), mg/l, Max	<0.03	<0.03	<0.03		0.03	IS 3025 /42 : 1992 R : 2009, AAS-Flame
6	Disolved Oxygen, min.	4.20	4.60	4.40		0.10	IS 3025/381989, R : 2003, Winkler Azide
7	Fluoride (as F) mg/l, Max	0.82	0.77	0.88		0.02	APHA, 22nd Edition SPADNS
8	Hexavalent Chromium, mg/l, Max	<0.01	<0.01	<0.01		0.01	APHA, 22nd Edition, 1,5 - Diphenylcarbohydrazide
9	Iron (as Fe), mg/l, Max	0.07	<0.06	<0.06		0.06	IS 3025 /53 : 2003, R : 2009 , AAS-Flame
10	Lead (as Pb), mg/l, Max	<0.005	<0.005	<0.005		0.005	APHA, 22nd Edition AAS-GTA
11	Nitrate (as NO_3), mg/l, Max	7.08	6.20	6.64		0.50	APHA, 22nd Edition, UV-Spectrphotometric
12	pH value	8.24	7.70	7.35		2.5	IS-3025/11:1983, R-1996, Electrometric
13	Phenolic compounds (as C_6H_5OH), mg/l, Max	<0.002	<0.002	<0.002		0.002	APHA, 22nd Edition 4-Amino Antipyrine
14	Selenium (as Se), mg/l, Max	<0.002	<0.002	<0.002		0.002	APHA, 22nd Edition AAS-GTA
15	Sulphate (as SO_4) mg/l, Max	18	16	24		2.00	APHA, 22nd Edition Turbidity
16	Total Dissolved Solids, mg/l, Max	188	244	256		25.00	IS 3025 /16:1984 R : 2006, Gravimetric
17	Total Suspended Solids, mg/l, Max	22	32	40		10.00	IS 3025 /17:1984, R :1996, Gravimetric
18	Zinc (as Zn), mg/l, Max	<0.01	0.02	<0.01		0.01	IS 3025 /49 : 1994, R : 2009, AAS-Flame

Analysed By

Dy.Technical Manager
Env. Lab, CMPDI(HQ)
(Authorized Signatory)

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TEST REPORT

2015/9/Test Report No. 206	Job No. 094315007		Year	2015-16
Type of Sample:	Ambient Air		Quarter Ending	Sept. 15
Customer / W. O. no. & Date:	CCL		Date of Receipt of Sample:	31.08.15
Mode of Receipt of Sample:	Joint sampling with customer		Date of Analysis:	31.08.15-15.09.15
Sampling Protocol:	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution		Date of Reporting:	15.09.15
Testing Protocol:	Gazette Notification no. G.S.R 742(E) dt. 25th Sept.'2000			As in the signature of Dy.Technical Manager below
Remarks & Observation:	All samplers placed 1.5 m above ground level		Date of Issue:	
Environmental Conditions at the time of installation of sampler	Predominate Wind Direction – East to West (1), Calm (2,3)			
	Weather	✓(1) Rainy	✓(1) Cloudy	✓ (2,3) Sunny / Dust storm

TEST RESULT

The sample has been tested with the following results:-

Area : B&K **Project:** Bokaro OCP

Stations:

1. Hind Strip Colony
2. Rest House
3. Gandhinagar Colony
4.

Date of Sampling:
20-21/08/2015
20-21/08/2015
21-22/08/2015

S.No	Test Parameters	Units	Test Method	TEST RESULT			
Stations:				1	2	3	4
1	*Total Particulate Matter (PM_{10}+ >PM_{10})	µg/m³	Lab.SOP 4 based on – IS: 5182/23, 2006	164	137	190	
2	Particulate Matter (PM_{10})	µg/m³	IS: 5182/23 2006	92	83	80	
3	*Particulate Matter ($PM_{2.5}$)	µg/m³	-	-	-	-	
4	Sulphur Dioxide (SO_2)	µg/m³	IS: 5182 /02 2001 R-2006	<25	<25	<25	
5	Nitrogen Oxides (as NO_x)	µg/m³	IS: 5182 /06 1975 R-1998	22	20	21	

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

Analysed By

16/9/15
Dy.Technical Manager
Env. Lab, CMPDI(HQ)
(Authorized Signatory)

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TEST REPORT

2015/9/Test Report No. 207	**Job No. 094315007**	**Year**	**2015-16**
Type of Sample:	Noise	Quarter Ending	**Sept. 15**
Customer / W. O. no. & Date:	CCL	Date of Receipt of Sample:	31.08.15
Mode of Receipt of Sample:	Jointly sampling with customer	Date of Analysis:	-
Testing Protocol:	Gazette Notification no. G.S.R 742(E) dt.25th Sept.'2000	Date of Reporting:	-
Remarks:		Date of Issue:	As in the signature of Dy.Technical Manager below

TEST RESULT

The sample has been tested with the following results:-

Area : **B&K** **Project:** **Bokaro OCP**

Stations:

1. Hindstrip Colony
2. Rest House
3.
4.

Station Name	Date of Sampling	Noise Level
Hindstrip Colony	20/08/2015	43.5
Rest House	20/08/2015	43.2

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)*

16/10/15

Dy.Technical Manager
Env. Lab, CMPDI(HQ)
(Authorized Signatory)

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TEST REPORT

2015/9/Test Report No. 208	Job No. 094315007	Year	2015-16
Type of Sample:	Effluent Water	Quarter Ending	Sept. 15
Customer / W. O. no. & Date:	CCL	Date of Receipt of Sample:	31.08.15
Mode of Receipt of Sample:	Picked up sample by laboratory	Date of Analysis:	31.08.15-12.09.15
Testing Protocol:	MOEF -SCH-VI STANDARDS, Class 'a'	Date of Reporting:	12.09.15
Remarks & Observation:	Samples received in 2 ltr plastic Jerri cane, Colour as observed is transparent	Date of Issue:	As in the signature of Dy.Technical Manager below

TEST RESULT

The sample has been tested with the following results:-

Area : **B&K** **Project:** **Bokaro OCP**

Stations:

1. Lagoon Discharge
2.
3.

Date of Sampling: 28/08/2015

Sl.No.	Parameter	Sampling Stations			Detection Limit	MOEF -SCH-VI STANDARDS Class 'A'	BIS Standard & Method
		1	2	3			
1	Ammonical Nitrogen, mg/l, Max	0.18			0.02	50.0	IS 3025/34:1988, R : 2009, Nessler's
2	Arsenic (as As), mg/l, *Max*	<0.002			0.002	0.2	IS 3025/37:1988 R : 2003, AAS-VGA
3	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
4	Cadmium(as Cd), mg/l, Max	<0.0005			0.0005	2.0	APHA, 22nd Edition, AAS-GTA
5	COD, mg/l, Max	52			4.00	250.0	APHA, 22nd Edition, Closed Reflux, Titrimetric
6	Copper (as Cu), mg/l, *Max*	<0.03			0.03	3.0	IS 3025/42: 1992 R : 2009, AAS-Flame
7	Dissolved Phosphate, mg/l, Max	0.32			0.30	5.0	APHA, 22nd Edition Molybdovanadate
8	Fluoride (as F) mg/l, *Max*	0.62			0.02	2.0	APHA, 22nd Edition, SPADNS
9	Free Ammonia, mg/l, Max	<0.01			0.01	5.0	IS:3025/34:1988, Nesseler's
10	Hexavalent Chromium, mg/l, Max	<0.01			0.01	0.1	APHA, 22nd Edition, Diphenylcarbohydrazide
11	Iron (as Fe), mg/l, *Max*	<0.06			0.06	3.0	IS 3025 /53 : 2003, R : 2009 , AAS-Flame
12	Lead (as Pb), mg/l, *Max*	<0.005			0.005	0.1	APHA, 22nd Edition, AAS-GTA
13	Manganese(as Mn), mg/l, Max	<0.02			0.02	2.0	IS-3025/59:2006, AAS-Flame
14	Nickel (as Ni), mg/l, *Max*	<0.10			0.10	3.0	IS-3025/54:2003, AAS-Flame
15	Nitrate Nitrogen, mg/l, *Max*	1.4			0.50	10.0	APHA, 22nd Edition, UV-Spectrphotometric
16	Oil & Grease, mg/l, Max	<2.00			2.00	10.0	IS 3025/39:1991, R : 2003, Partition Gravimetric
17	pH value	7.55			2.5	5.5 to 9.0	IS-3025/11:1983, R-1996, Electrometric
18	Phenolic compounds (as C_6H_5OH),mg/l, *Max*	<0.002			0.002	1.0	APHA, 22nd Edition 4-Amino Antipyrine
19	Selenium (as Se), mg/l, *Max*	<0.002			0.002	0.05	APHA, 22nd Edition, AAS-GTA
20	Sulphide (as SO_3), mg/l, Max	<0.005			0.005	2.0	APHA, 22nd Edition Methylene Blue
21	Temperature (°C)	28.8			Shall not exceed 5° C above the receiving temp.		IS-3025/09:1984, Thermometeric
22	Total Chromium (as Cr), mg/l, *Max*	<0.06			0.06	2.0	IS-3025/52:2003, AAS-Flame
23	Total Kjeldahl Nitrogen, mg/l, Max	1.68			1.00	100.0	IS:3025/34:1988, Nesseler's
24	Total Residual Chlorine, mg/l, Max	<0.02			0.02	1.0	APHA, 22nd Edition, DPD
25	Total Suspended Solids, mg/l, Max	44			10.00	100.0	IS 3025/17:1984, R :1996, Gravimetric
26	Zinc (as Zn), mg/l, *Max*	0.02			0.01	5.0	IS 3025 /49 : 1994, R : 2009, AAS-Flame

Analysed By

16/10/15

Dy.Technical Manager
Env. Lab, CMPDI(HQ)
(Authorized Signatory

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TEST REPORT

2015/9/Test Report No. 209	Job No. 094315007	Year	2015-16
Type of Sample:	Surface Water	Quarter Ending	Sept. 15
Customer / W. O. no. & Date:	CCL	Date of Receipt of Sample:	31.08.15
Mode of Receipt of Sample:	Picked up sample by laboratory	Date of Analysis:	31.08.15-12.09.15
Testing Protocol:	-	Date of Reporting:	12.09.15
Remarks & Observation:	Samples received in 2 ltr plastic Jerri cane, Colour as observed is transparent	Date of Issue:	As in the signature of Dy.Technical Manager below

TEST RESULT

The sample has been tested with the following results:-

Area : **B&K** **Project:** **Bokaro OCP**

Stations:

1. Goda Nala before Damodar
2. Damodar before Goda Nala
3. Damodar after Goda Nala
4.

Date of Sampling:
28/08/2015
28/08/2015
28/08/2015

Sl. No	Parameter	Sampling Stations				Detection Limit	BIS Standard & Method
		1	2	3	4		
1	Arsenic (as As), mg/l, Max	<0.002	<0.002	<0.002		0.002	IS 3025/37:1988 R : 2003, AAS-VGA
2	BOD (3 days 27°C), mg/l, Max	3.00	2.80	3.00		2.00	IS 3025 /44: 1993, R : 2003 3 day incubation at 27°C
3	Cadmium(as Cd), mg/l, Max	<0.0005	<0.0005	<0.0005		0.0005	APHA, 22nd Edition AAS-GTA
4	Chlorides (as Cl), mg/l, Max	22	28	30		2.00	IS-3025/32:1988, R-2007, Argentometric
5	Copper (as Cu), mg/l, Max	<0.03	<0.03	<0.03		0.03	IS 3025 /42 : 1992 R : 2009, AAS-Flame
6	Disolved Oxygen, min.	4.00	4.70	4.40		0.10	IS 3025/381989, R : 2003, Winkler Azide
7	Fluoride (as F) mg/l, Max	0.66	0.48	0.54		0.02	APHA, 22nd Edition SPADNS
8	Hexavalent Chromium, mg/l, Max	<0.01	<0.01	<0.01		0.01	APHA, 22nd Edition, 1,5 - Diphenylcarbohydrazide
9	Iron (as Fe), mg/l, Max	<0.06	<0.06	1.75		0.06	IS 3025 /53 : 2003, R : 2009 , AAS-Flame
10	Lead (as Pb), mg/l, Max	<0.005	<0.005	<0.005		0.005	APHA, 22nd Edition AAS-GTA
11	Nitrate (as NO_3), mg/l, Max	7.75	6.64	7.08		0.50	APHA, 22nd Edition, UV-Spectrphotometric
12	pH value	8.15	7.70	7.30		2.5	IS-3025/11:1983, R-1996, Electrometric
13	Phenolic compounds (as C_6H_5OH), mg/l, Max	<0.002	<0.002	<0.002		0.002	APHA, 22nd Edition 4-Amino Antipyrine
14	Selenium (as Se), mg/l, Max	<0.002	<0.002	<0.002		0.002	APHA, 22nd Edition AAS-GTA
15	Sulphate (as SO_4) mg/l, Max	22	22	34		2.00	APHA, 22nd Edition Turbidity
16	Total Dissolved Solids, mg/l, Max	188	228	232		25.00	IS 3025 /16:1984 R : 2006, Gravimetric
17	Total Suspended Solids, mg/l, Max	42	38	44		10.00	IS 3025 /17:1984, R :1996, Gravimetric
18	Zinc (as Zn), mg/l, Max	<0.01	<0.01	0.04		0.01	IS 3025 /49 : 1994, R : 2009, AAS-Flame

Analysed By

16/10/15
Dy.Technical Manager
Env. Lab, CMPDI(HQ)
(Authorized Signatory)

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TEST REPORT

2015/12/Test Report No. 208	**Job No. 094315007**			**Year**	**2015-16**
Type of Sample:	Ambient Air			Quarter Ending	**Dec. 15**
Customer / W. O. no. & Date:	CCL			Date of Receipt of Sample:	19.12.15
Mode of Receipt of Sample:	Joint sampling with customer			Date of Analysis:	19.12.15-30.12.15
Sampling Protocol:	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution			Date of Reporting:	30.12.15
Testing Protocol:	Gazette Notification no. G.S.R 742(E) dt. 25th Sept.'2000				As in the signature of Dy.Technical Manager below
Remarks & Observation:	All samplers placed 1.5 m above ground level			Date of Issue:	
Environmental Conditions at the time of installation of sampler	Predominate Wind Direction – West to East				
	Weather	Rainy	Cloudy	✓ Sunny	Dust storm

TEST RESULT

The sample has been tested with the following results:-

Area : **B&K** **Project:** **Bokaro OCP**

Stations:

1. Hind Strip Colony
2. Rest House
3. Gandhinagar Colony
4.

Date of Sampling:
15-16/12/2015
16-17/12/2015
15-16/12/2015

S.No	Test Parameters	Units	Test Method	TEST RESULT			
Stations:				1	2	3	4
1	*Total Particulate Matter (PM_{10}+ >PM_{10})	$\mu g/m^3$	Lab.SOP 4 based on – IS: 5182/23, 2006	201	204	163	
2	Particulate Matter (PM_{10})	$\mu g/m^3$	IS: 5182/23 2006	97	99	90	
3	*Particulate Matter ($PM_{2.5}$)	$\mu g/m^3$	-	33	55	39	
4	Sulphur Dioxide (SO_2)	$\mu g/m^3$	IS: 5182 /02 2001 R-2006	<25	<25	<25	
5	Nitrogen Oxides (as NO_x)	$\mu g/m^3$	IS: 5182 /06 1975 R-1998	20	21	19	

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

Analysed By

15/12/16
Dy.Technical Manager
Env. Lab, CMPDI(HQ)
(Authorized Signatory)

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TEST REPORT

2015/12/Test Report No. 209	**Job No. 094315007**	**Year**	**2015-16**
Type of Sample:	Noise	Quarter Ending	**Dec. 15**
Customer / W. O. no. & Date:	CCL	Date of Receipt of Sample:	19.12.15
Mode of Receipt of Sample:	Jointly sampling with customer	Date of Analysis:	-
Testing Protocol:	Gazette Notification no. G.S.R 742(E) dt.25th Sept.'2000	Date of Reporting:	-
Remarks:		Date of Issue:	As in the signature of Dy.Technical Manager below

TEST RESULT

The sample has been tested with the following results:-

Area : **B&K** **Project:** **Bokaro OCP**

Stations:

1. Hindstrip Colony
2. Rest House
3.
4.

Station Name	Date of Sampling	Noise Level
Hindstrip Colony	15/12/2015	42.9
Rest House	16/12/2015	42.7

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)*

15/1/16

Dy.Technical Manager
Env. Lab, CMPDI(HQ)
(Authorized Signatory)

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TEST REPORT

2015/12/Test Report No. 210	**Job No. 094315007**	**Year**	**2015-16**
Type of Sample:	**Effluent Water**	Quarter Ending	**Dec. 15**
Customer / W. O. no. & Date:	CCL	Date of Receipt of Sample:	19.12.15
Mode of Receipt of Sample:	Picked up sample by laboratory	Date of Analysis:	19.12.15-05.01.16
Testing Protocol:	**MOEF -SCH-VI STANDARDS, Class 'a'**	Date of Reporting:	05.01.16
Remarks & Observation:	Samples received in 2 ltr plastic Jerri cane, Colour as observed is transparent	Date of Issue:	As in the signature of Dy.Technical Manager below

TEST RESULT

The sample has been tested with the following results:-

Area : **B&K** **Project:** **Bokaro OCP**

Stations:

1. Lagoon Discharge
2.
3.

Date of Sampling: 17/12/2015

Sl.No.	Parameter	Sampling Stations			Detection Limit	MOEF -SCH-VI STANDARDS Class 'A'	BIS Standard & Method
		1	2	3			
1	Ammonical Nitrogen, mg/l, Max	0.12			0.02	50.0	IS 3025/34:1988, R : 2009, Nessler's
2	Arsenic (as As), mg/l, *Max*	<0.002			0.002	0.2	IS 3025/37:1988 R : 2003, AAS-VGA
3	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
4	Cadmium(as Cd), mg/l, Max	<0.0005			0.0005	2.0	APHA, 22nd Edition, AAS-GTA
5	COD, mg/l, Max	36			4.00	250.0	APHA, 22nd Edition, Closed Reflux, Titrimetric
6	Copper (as Cu), mg/l, *Max*	<0.03			0.03	3.0	IS 3025/42: 1992 R : 2009, AAS-Flame
7	Dissolved Phosphate, mg/l, Max	<0.30			0.30	5.0	APHA, 22nd Edition Molybdovanadate
8	Fluoride (as F) mg/l, *Max*	0.78			0.02	2.0	APHA, 22nd Edition, SPADNS
9	Free Ammonia, mg/l, Max	<0.01			0.01	5.0	IS:3025/34:1988, Nesseler's
10	Hexavalent Chromium, mg/l, Max	<0.01			0.01	0.1	APHA, 22nd Edition, Diphenylcarbohydrazide
11	Iron (as Fe), mg/l, *Max*	<0.06			0.06	3.0	IS 3025 /53 : 2003, R : 2009 , AAS-Flame
12	Lead (as Pb), mg/l, *Max*	<0.005			0.005	0.1	APHA, 22nd Edition, AAS-GTA
13	Manganese(as Mn), mg/l, Max	<0.02			0.02	2.0	IS-3025/59:2006, AAS-Flame
14	Nickel (as Ni), mg/l, *Max*	<0.10			0.10	3.0	IS-3025/54:2003, AAS-Flame
15	Nitrate Nitrogen, mg/l, *Max*	1.5			0.50	10.0	APHA, 22nd Edition, UV-Spectrphotometric
16	Oil & Grease, mg/l, Max	<2.00			2.00	10.0	IS 3025/39:1991, R : 2003, Partition Gravimetric
17	pH value	7.94			2.5	5.5 to 9.0	IS-3025/11:1983, R-1996, Electrometric
18	Phenolic compounds (as C_6H_5OH),mg/l, *Max*	<0.002			0.002	1.0	APHA, 22nd Edition 4-Amino Antipyrine
19	Selenium (as Se), mg/l, *Max*	<0.002			0.002	0.05	APHA, 22nd Edition, AAS-GTA
20	Sulphide (as SO_3), mg/l, Max	<0.005			0.005	2.0	APHA, 22nd Edition Methylene Blue
21	Temperature (°C)	20.1			Shall not exceed 5° C above the receiving temp		IS-3025/09:1984, Thermometeric
22	Total Chromium (as Cr), mg/l, *Max*	<0.06			0.06	2.0	IS-3025/52:2003, AAS-Flame
23	Total Kjeldahl Nitrogen, mg/l, Max	1.20			1.00	100.0	IS:3025/34:1988, Nesseler's
24	Total Residual Chlorine, mg/l, Max	<0.02			0.02	1.0	APHA, 22nd Edition, DPD
25	Total Suspended Solids, mg/l, Max	28			10.00	100.0	IS 3025/17:1984, R :1996, Gravimetric
26	Zinc (as Zn), mg/l, *Max*	<0.01			0.01	5.0	IS 3025 /49 : 1994, R : 2009, AAS-Flame

Analysed By

Dy.Technical Manager
Env. Lab, CMPDI(HQ)
(Authorized Signatory

B&K – 11

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TEST REPORT

2015/12/Test Report No. 211	**Job No. 094315007**	**Year**	**2015-16**
Type of Sample:	**Surface Water**	Quarter Ending	**Dec. 15**
Customer / W. O. no. & Date:	CCL	Date of Receipt of Sample:	19.12.15
Mode of Receipt of Sample:	Picked up sample by laboratory	Date of Analysis:	19.12.15-05.01.16
Testing Protocol:	-	Date of Reporting:	05.01.16
Remarks & Observation:	Samples received in 2 ltr plastic Jerri cane, Colour as observed is transparent	Date of Issue:	As in the signature of Dy.Technical Manager below

TEST RESULT

The sample has been tested with the following results:-

Area : **B&K** **Project:** **Bokaro OCP**

Stations:

1. Goda Nala before Damodar
2. Damodar before Goda Nala
3. Damodar after Goda Nala
4.

Date of Sampling:
17/12/2015
17/12/2015
17/12/2015

Sl. No	Parameter	Sampling Stations 1	2	3	4	Detection Limit	BIS Standard & Method
1	Arsenic (as As), mg/l, Max	<0.002	<0.002	<0.002		0.002	IS 3025/37:1988 R : 2003, AAS-VGA
2	BOD (3 days 27°C), mg/l, Max	3.00	2.40	3.00		2.00	IS 3025 /44: 1993, R : 2003 3 day incubation at 27°C
3	Cadmium(as Cd), mg/l, Max	<0.0005	<0.0005	<0.0005		0.0005	APHA, 22nd Edition AAS-GTA
4	Chlorides (as Cl), mg/l, Max	16	30	22		2.00	IS-3025/32:1988, R-2007, Argentometric
5	Copper (as Cu), mg/l, Max	<0.03	<0.03	<0.03		0.03	IS 3025 /42 : 1992 R : 2009, AAS-Flame
6	Disolved Oxygen, min.	3.40	4.40	3.40		0.10	IS 3025/381989, R : 2003, Winkler Azide
7	Fluoride (as F) mg/l, Max	0.82	0.66	0.82		0.02	APHA, 22nd Edition SPADNS
8	Hexavalent Chromium, mg/l, Max	<0.01	<0.01	<0.01		0.01	APHA, 22nd Edition, 1,5 - Diphenylcarbohydrazide
9	Iron (as Fe), mg/l, Max	<0.06	<0.06	<0.06		0.06	IS 3025 /53 : 2003, R : 2009 , AAS-Flame
10	Lead (as Pb), mg/l, Max	<0.005	<0.005	<0.005		0.005	APHA, 22nd Edition AAS-GTA
11	Nitrate (as NO_3), mg/l, Max	5.75	5.31	5.75		0.50	APHA, 22nd Edition, UV-Spectrphotometric
12	pH value	7.88	8.02	7.65		2.5	IS-3025/11:1983, R-1996, Electrometric
13	Phenolic compounds (as C_6H_5OH), mg/l, Max	<0.002	<0.002	<0.002		0.002	APHA, 22nd Edition 4-Amino Antipyrine
14	Selenium (as Se), mg/l, Max	<0.002	<0.002	<0.002		0.002	APHA, 22nd Edition AAS-GTA
15	Sulphate (as SO_4) mg/l, Max	16	40	20		2.00	APHA, 22nd Edition Turbidity
16	Total Dissolved Solids, mg/l, Max	134	272	162		25.00	IS 3025 /16:1984 R : 2006, Gravimetric
17	Total Suspended Solids, mg/l, Max	38	22	40		10.00	IS 3025 /17:1984, R :1996, Gravimetric
18	Zinc (as Zn), mg/l, Max	<0.01	0.02	<0.01		0.01	IS 3025 /49 : 1994, R : 2009, AAS-Flame

Analysed By

Dy.Technical Manager
Env. Lab, CMPDI(HQ)
(Authorized Signatory)

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TEST REPORT

2016/03/Test Report No. 171	**Job No. 094315007**			**Year**	**2015-16**
Type of Sample:	Ambient Air			Quarter Ending	**March '16**
Customer / W. O. no. & Date:	CCL			Date of Receipt of Sample:	02.03.16
Mode of Receipt of Sample:	Joint sampling with customer			Date of Analysis:	02.03.16-11.03.16
Sampling Protocol:	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution			Date of Reporting:	11.03.16
Testing Protocol:	Gazette Notification no. G.S.R 742(E) dt. 25th Sept.'2000				As in the signature of Dy.Technical Manager below
Remarks & Observation:	All samplers placed 1.5 m above ground level			Date of Issue:	
Environmental Conditions at the time of installation of sampler	Predominate Wind Direction – East to West				
	Weather		✓		
		Rainy	Cloudy	Sunny	Dust storm

TEST RESULT

The sample has been tested with the following results:-

Area : **B&K** **Project:** **Bokaro OCP**

Stations:

1. Hind Strip Colony — **Date of Sampling:** 19-20/02/2016
2. Rest House — 19-20/02/2016
3. Gandhinagar Colony — 22-23/02/2016
4.

S.No	Test Parameters	Units	Test Method	TEST RESULT			
Stations:				1	2	3	4
1	*Total Particulate Matter (PM_{10}+ >PM_{10})	µg/m^3	Lab.SOP 4 based on – IS: 5182/23, 2006	266	284	276	
2	Particulate Matter (PM_{10})	µg/m^3	IS: 5182/23 2006	87	96	98	
3	*Particulate Matter ($PM_{2.5}$)	µg/m^3	-	39	54	47	
4	Sulphur Dioxide (SO_2)	µg/m^3	IS: 5182 /02 2001 R-2006	<25	<25	<25	
5	Nitrogen Oxides (as NO_x)	µg/m^3	IS: 5182 /06 1975 R-1998	20	19	21	

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

Analysed By

Dy.Technical Manager
Env. Lab, CMPDI(HQ)
(Authorized Signatory)

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TEST REPORT

2016/03/Test Report No. 172	Job No. 094315007	Year	2015-16
Type of Sample:	Noise	Quarter Ending	March '16
Customer / W. O. no. & Date:	CCL	Date of Receipt of Sample:	02.03.16
Mode of Receipt of Sample:	Jointly sampling with customer	Date of Analysis:	-
Testing Protocol:	Gazette Notification no. G.S.R 742(E) dt.25th Sept.'2000	Date of Reporting:	-
Remarks:		Date of Issue:	As in the signature of Dy.Technical Manager below

TEST RESULT

The sample has been tested with the following results:-

Area : **B&K** **Project:** **Bokaro OCP**

Stations:

1. Hindstrip Colony
2. Rest House
3.
4.

Station Name	Date of Sampling	Noise Level
Hindstrip Colony	19/02/2016	42.8
Rest House	19/02/2016	42.9

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)

Dy.Technical Manager
Env. Lab, CMPDI(HQ)
(Authorized Signatory)

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TEST REPORT

2016/03/Test Report No. 173	**Job No. 094315007**	**Year**	**2015-16**
Type of Sample:	**Effluent Water**	Quarter Ending	**March '16**
Customer / W. O. no. & Date:	CCL	Date of Receipt of Sample:	02.03.16
Mode of Receipt of Sample:	Picked up sample by laboratory	Date of Analysis:	02.03.16-12.03.16
Testing Protocol:	**MOEF -SCH-VI STANDARDS, Class 'a'**	Date of Reporting:	12.03.16
Remarks & Observation:	Samples received in 2 ltr plastic Jerri cane, Colour as observed is transparent	Date of Issue:	As in the signature of Dy.Technical Manager below

TEST RESULT

The sample has been tested with the following results:-

Area : **B&K** **Project:** **Bokaro OCP**

Stations:

1. Lagoon Discharge
2.
3.

Date of Sampling: 24/02/2016

Sl.No.	Parameter	Sampling Stations			Detection Limit	MOEF -SCH-VI STANDARDS Class 'A'	BIS Standard & Method
		1	2	3			
1	Ammonical Nitrogen, mg/l, Max	0.08			0.02	50.0	IS 3025/34:1988, R : 2009, Nessler's
2	Arsenic (as As), mg/l, *Max*	<0.002			0.002	0.2	IS 3025/37:1988 R : 2003, AAS-VGA
3	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
4	Cadmium(as Cd), mg/l, Max	<0.0005			0.0005	2.0	APHA, 22nd Edition, AAS-GTA
5	COD, mg/l, Max	36			4.00	250.0	APHA, 22nd Edition, Closed Reflux, Titrimetric
6	Copper (as Cu), mg/l, *Max*	<0.03			0.03	3.0	IS 3025/42: 1992 R : 2009, AAS-Flame
7	Dissolved Phosphate, mg/l, Max	<0.30			0.30	5.0	APHA, 22nd Edition Molybdovanadate
8	Fluoride (as F) mg/l, *Max*	0.88			0.02	2.0	APHA, 22nd Edition, SPADNS
9	Free Ammonia, mg/l, Max	<0.02			0.02	5.0	IS:3025/34:1988, Nesseler's
10	Hexavalent Chromium, mg/l, Max	<0.01			0.01	0.1	APHA, 22nd Edition, Diphenylcarbohydrazide
11	Iron (as Fe), mg/l, *Max*	<0.06			0.06	3.0	IS 3025 /53 : 2003, R : 2009 , AAS-Flame
12	Lead (as Pb), mg/l, *Max*	<0.005			0.005	0.1	APHA, 22nd Edition, AAS-GTA
13	Manganese(as Mn), mg/l, Max	<0.02			0.02	2.0	IS-3025/59:2006, AAS-Flame
14	Nickel (as Ni), mg/l, *Max*	<0.01			0.01	3.0	IS-3025/54:2003, AAS-Flame
15	Nitrate Nitrogen, mg/l, *Max*	1.7			0.50	10.0	APHA, 22nd Edition, UV-Spectrphotometric
16	Oil & Grease, mg/l, Max	<2.00			2.00	10.0	IS 3025/39:1991, R : 2003, Partition Gravimetric
17	pH value	7.65			0.2	5.5 to 9.0	IS-3025/11:1983, R-1996, Electrometric
18	Phenolic compounds (as C_6H_5OH),mg/l, *Max*	<0.001			0.001	1.0	APHA, 22nd Edition 4-Amino Antipyrine
19	Selenium (as Se), mg/l, *Max*	<0.002			0.002	0.05	APHA, 22nd Edition, AAS-GTA
20	Sulphide (as SO_3), mg/l, Max	<0.005			0.005	2.0	APHA, 22nd Edition Methylene Blue
21	Temperature (°C)	25.5			Shall not exceed 5° C above the receiving temp.		IS-3025/09:1984, Thermometeric
22	Total Chromium (as Cr), mg/l, *Max*	<0.04			0.04	2.0	IS-3025/52:2003, AAS-Flame
23	Total Kjeldahl Nitrogen, mg/l, Max	1.40			1.00	100.0	IS:3025/34:1988, Nesseler's
24	Total Residual Chlorine, mg/l, Max	<0.02			0.02	1.0	APHA, 22nd Edition, DPD
25	Total Suspended Solids, mg/l, Max	28			10.00	100.0	IS 3025/17:1984, R :1996, Gravimetric
26	Zinc (as Zn), mg/l, *Max*	<0.01			0.01	5.0	IS 3025 /49 : 1994, R : 2009, AAS-Flame

Analysed By

Dy.Technical Manager
Env. Lab, CMPDI(HQ)
(Authorized Signatory

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TEST REPORT

2016/03/Test Report No. 174	**Job No. 094315007**	**Year**	**2015-16**
Type of Sample:	**Surface Water**	Quarter Ending	**March '16**
Customer / W. O. no. & Date:	CCL	Date of Receipt of Sample:	02.03.16
Mode of Receipt of Sample:	Picked up sample by laboratory	Date of Analysis:	02.03.16-12.03.16
Testing Protocol:	-	Date of Reporting:	12.03.16
Remarks & Observation:	Samples received in 2 ltr plastic Jerri cane, Colour as observed is transparent	Date of Issue:	As in the signature of Dy.Technical Manager below

TEST RESULT

The sample has been tested with the following results:-

Area : **B&K** **Project:** **Bokaro OCP**

Stations:

1. Goda Nala before Damodar — **Date of Sampling:** 24/02/2016
2. Damodar before Goda Nala — 24/02/2016
3. Damodar after Goda Nala — 24/02/2016
4.

Sl. No	Parameter	Sampling Stations				Detection Limit	BIS Standard & Method
		1	2	3	4		
1	Arsenic (as As), mg/l, Max	<0.002	<0.002	<0.002		0.002	IS 3025/37:1988 R : 2003, AAS-VGA
2	BOD (3 days 27°C), mg/l, Max	3.00	2.40	2.80		2.00	IS 3025 /44: 1993, R : 2003 3 day incubation at 27°C
3	Cadmium(as Cd), mg/l, Max	<0.0005	<0.0005	<0.0005		0.0005	APHA, 22nd Edition AAS-GTA
4	Chlorides (as Cl), mg/l, Max	22	26	30		2.00	IS-3025/32:1988, R-2007, Argentometric
5	Copper (as Cu), mg/l, Max	<0.03	<0.03	<0.03		0.03	IS 3025 /42 : 1992 R : 2009, AAS-Flame
6	Disolved Oxygen, min.	4.20	4.80	5.20		0.10	IS 3025/381989, R : 2003, Winkler Azide
7	Fluoride (as F) mg/l, Max	0.84	0.73	0.54		0.02	APHA, 22nd Edition SPADNS
8	Hexavalent Chromium, mg/l, Max	<0.01	<0.01	<0.01		0.01	APHA, 22nd Edition, 1,5 - Diphenylcarbohydrazide
9	Iron (as Fe), mg/l, Max	<0.06	<0.06	<0.06		0.06	IS 3025 /53 : 2003, R : 2009 , AAS-Flame
10	Lead (as Pb), mg/l, Max	<0.005	<0.005	<0.005		0.005	APHA, 22nd Edition AAS-GTA
11	Nitrate (as NO_3), mg/l, Max	5.75	4.87	5.75		0.50	APHA, 22nd Edition, UV-Spectrphotometric
12	pH value	8.04	7.88	7.37		0.2	IS-3025/11:1983, R-1996, Electrometric
13	Phenolic compounds (as C_6H_5OH), mg/l, Max	<0.001	<0.001	<0.001		0.001	APHA, 22nd Edition 4-Amino Antipyrine
14	Selenium (as Se), mg/l, Max	<0.002	<0.002	<0.002		0.002	APHA, 22nd Edition AAS-GTA
15	Sulphate (as SO_4) mg/l, Max	34	40	32		2.00	APHA, 22nd Edition Turbidity
16	Total Dissolved Solids, mg/l, Max	178	224	228		25.00	IS 3025 /16:1984 R : 2006, Gravimetric
17	Total Suspended Solids, mg/l, Max	44	28	36		10.00	IS 3025 /17:1984, R :1996, Gravimetric
18	Zinc (as Zn), mg/l, Max	<0.01	<0.01	<0.01		0.01	IS 3025 /49 : 1994, R : 2009, AAS-Flame

Analysed By

Dy.Technical Manager
Env. Lab, CMPDI(HQ)
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