

ENVIRONMENTAL STATEMENT

OF

KARGALI OPENCAST PROJECT

FOR

2013-14



CENTRAL COALFIELDS LIMITED

JUNE "2014"

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 **Kargali Opencast Project** comes under Bokaro & Kargali Area of **Central Coalfields Limited**. It is situated in Bokaro District of Jharkhand state. This is a very old Project started in 1914 with underground mining method. This Project produces Washery Grade coal only.
- The Kargali O.C.P. is connected by rail and road both. Barkakana-Gomoh Railway line runs East- West on the southern side of the Project and the nearest railway station Bermo is about 1.5 Km. away from the project. The project location and other surface features are given in the plan annexed as **ANNEXURE** .
- E-3.** The planned capacity of the project is 0.050 million tonnes.. The present (2013 - 14) production of the project is 0.065580 M T .
- 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 quarters of 2013 -14 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 quantify 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, workshop, fire fighting etc.
- E-7.** The noise levels recorded are generally below permissible limits prescribed by the Ministry of Environment & Forests (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 pollution discussed in detail in part-G,H & I of Environmental Statement Form.

CHAPTER-1

INTRODUCTION

1.1 GENERAL:

Kargali Opencast project of **Central Coalfield Ltd.** is located at Kargali, P.O.- Bermo, District - Bokaro in the East Bokaro Coalfield of Jharkhand. It is situated on the Northern side of the Barkkana - Gomoh Railway line west of Dhori Colliery and comes under Bokaro & Kargali Area of CCL.

This is a very old colliery. Development of Kargali seam by shaft was started in the year 1918. All production of this mine was consumed by the owner Great Indian Peninsula Railway (G.I.S.R.). Later the colliery was renamed as B.N.R. Joint Railway after the changing of owner of the Railway system. The ownership was continued upto 1.4.1944. After this date the ownership was changed as Ministry of Supply and continued upto 1.10.1956 when it was named as N.C.D.C.

1.2 COMMUNICATION

Kargali O.C.P. is well connected by rail and road. The Gomoh-Barkakana loop line of Eastern Railway runs East - West on the southern side of the Project. Nearest Railway Station Bermo is about 1.5 Km. away from the Project.

The Hazaribagh - Bermo road runs East-West on the southern side of the Project. The block is situated at a distance of about 140 KM from Ranchi via Tenughat Dam.

1.3 DESCRIPTION OF THE PROJECT:

This opencast mine is designed at a **rated capacity of 0.10 million Tonnes (MT)** of Coal per annum. The total mineable reserve of the mine is 33.93 MT of coal with corresponding overburden volume of 0.50 Million cubic Meter (M.Cu.M). The life of the project is estimated 49 years. The average stripping ratio is 1:4. Here grade of coal is W-III . The mining Schemes comprises drilling and blasting operation for loosening of over - burden and coal before excavation. HEMMs (Heavy Earth Moving Machinery) have been engaged for coal production and over-burden removal.

The longitude and latitude of this colliery falls within 85⁰-58' and 28⁰- 48 / respectively. Mineable coal reserve has been estimated 34.00 MT with This Kargali Opencast started with opencast method in the year 1920 by manual means.

Rain water and make of water of the mine gets collected in the water sump made in the quarry. This sump water is used for Fire Fighting, dust suppression of Haul Road and other works. The sump gets filled with water, and during Monsoon the water reaches a certain height in the sump at which a natural outlet is present. Through this outlet water overflows and joins Baid Karo Nala which ultimately joins Damodar river. Present production of coal during 2013 - 14 is 65580 tes MTe with **0.254410 Million** cubic metre of over burden. The coal of this project is directly sent to Kargali Washery & Swang Washery for washing.

O.B. dumps can be seen in and around the quarry as shown in the surface plan. Backfilling has been started and is being done as face advances. Present working is on the southern part of the quarry. Slope of O.B. confirms natural angle of repose. Baid Karo Nala passes near the quarry. Working collieries surrounding this project is Bokaro Colliery, Kargali Washery, Dhori colliery etc. Coal mining is the prime industry of this region. These developments have influenced various environmental attributes e.g. air and water quality, noise level, socio- economic profile, land use pattern etc.

1.4 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. under request from 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 Result of mine discharge was found within permissible limits.
- iii) Noise level reading (LEQ) were also within limit.

CHAPTER-II

ENVIRONMENTAL STATEMENT FOR KARGALI OCP, C.C. LTD. FOR THE YEAR 2013 - 14

P A R T -A

I. Name and Address of the Mine

NAME	: Kargali O.C.P.
PLACE	: Kargali, P.O. - Bermo,
Distt	: Bokaro
PHONE/TELEX	: 8987784748

II. INDUSTRY CATEGORY - PRIMARY

III. Date of last Environmental Audit Report submitted

Environmental Statement Report was last submitted for the year 2012 - 13

IV. PRODUCTION CAPACITY:

Planned Capacity of coal is 0.050 million Tonne and present production of coal for the year 2013-14 is 0.065580 Million Tonne.

PART – B

WATER AND RAW MATERIAL CONSUMPTION

I. WATER CONSUMPTION (M³/day)

- a. Mining : **95**
- .i. Haul road dust suppression
- ii. Workshop :
- iii. Fire fighting :
- iv. Others(service building etc) :
- b. Cooling :
- c. Domestic : **133**

Name of product	Water consumption per unit of product	
	During financial year (2013-14)	During financial year (2012-13)
1. ROM coal	0.52 M³/te	0.77 M³/te

Note : There is no direct relation between water consumption and coal production.

3.RAW MATERIAL CONSUMPTION :

Name of raw material	Name of products	Consumption of raw materials (per unit of output)	
		During financial year (2013-14)	During financial year (2012-13)
Explosive	Coal	2.10	3.28KG/Tes.
P.O.L.	Coal	1.40	0.86 Ltr/Tes.

PART – C

POLLUTION GENERATED 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 inland surface water).
Air	It is difficult to quantify the amount of air pollutants. The main air pollutant is suspended particulate matter (SPM). The air quality results are appended as 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(2013-14)	During financial year (2012-13)
(a) From mining process	7.005 KL	5.59 KL
(b) From Material handling System lities	12 v Battery, 30 Nos.	12 v Battery, 18 Nos.

PART - E
SOLID WASTES

	Total Quantity in million cubic metre.	
	During financial year (2013-14)	During financial year (2012-13)
(a) From process .	0.254 M m ³	0.327 Mm ³
(b) From pollution control facilities	Nil	Nil
(c) Quantity recycled or reutilised	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

1. HAZARDOUS WASTES :

Hazardous wastes is not being produced either from mining operation or from any pollution control facilities.

2. SOLID WASTES :

During opencast mining, overburden produced as solid wastes temporarily as these materials are used for land reclamation. During the year 2013-14, 0.254 Million cubic meter of overburden was generated. The overburden material are more or less homogeneous comprising mainly shale, sand, silt and clay, & gravel.

3. DISPOSAL PRACTICE

Presently, the O.B. material is being suitably disposed off.

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 MEASURES :

The following measures has been taken to control air pollution:

- (i) Regular sprinkling of water on haul roads and other roads.**
- (ii) Water sprinkling on coal stock.**
- (iii) Plantation along the haul road and in other vacant space.**



Plantation along the haul road



Plantation along the haul road

- (iv) All necessary precautions will be taken during drilling, blasting, loading & transporting operations.**

2.0 WATER POLLUTION CONTROL MEASURES :

There are four central water sumps in the mines This acts as sedimentation lagoon for mine water. A major portion of suspended solids are separated here. Sump water is being utilised for water spraying on haul roads for dust suppression, Kargali Washery, Workshop, fire fighting etc .and part of the water is being discharged to a local nala which ultimately joins Damodar River.

(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. Oil and Grease trap and settling ponds are proposed in the workshop to prevent water pollution. Colony and other service buildings are provided with septic tanks and soakpits. A garland drain is provided around the quarry to collect the surface run off. This also prevents storm water to enter into the quarry area.

3.0. NOISE POLLUTION CONTROL MEASURES :

(i) Blasting operation is carried out between 12.30 PM to 3.00 PM.

(ii) Regular maintenance of HEMMs , CHP , and other equipment.

(iii) Use of HEMMs with sound proof cabin.

(iv) Providing green belt around noise generating centres.

4.0. MEASURES FOR RECLAMATION OF LAND

At present overburden generated during mining is being used as re-filling material in de-coaled area of quarry. As soon as the dumps reaches to its final stage, it is proposed to start technical and biological reclamation of the dumps. At the end of mining operation, some decoaled 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 COST OF ENVIRONMENTAL MANAGEMENT DURING 2013 - 14

The actual impact of pollution control measures on cost of production is being assessed.

PART - H
ADDITIONAL INVESTMENT PROPOSAL FOR ENVIRONMENTAL PROTECTION INCLUDING ABATEMENT OF POLLUTION

Additional investment proposal has not been finalised 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.
- (iv) Afforestation is being done/ started for 2014 Monsoon (4.2 Hact.).

PART – I
ANY OTHER PARTICULARS IN RESPECT OF ENVIRONMENTAL PROTECTION AND ABATEMENT OF POLLUTION

The major problems of environmental control of Kargali OCP are:

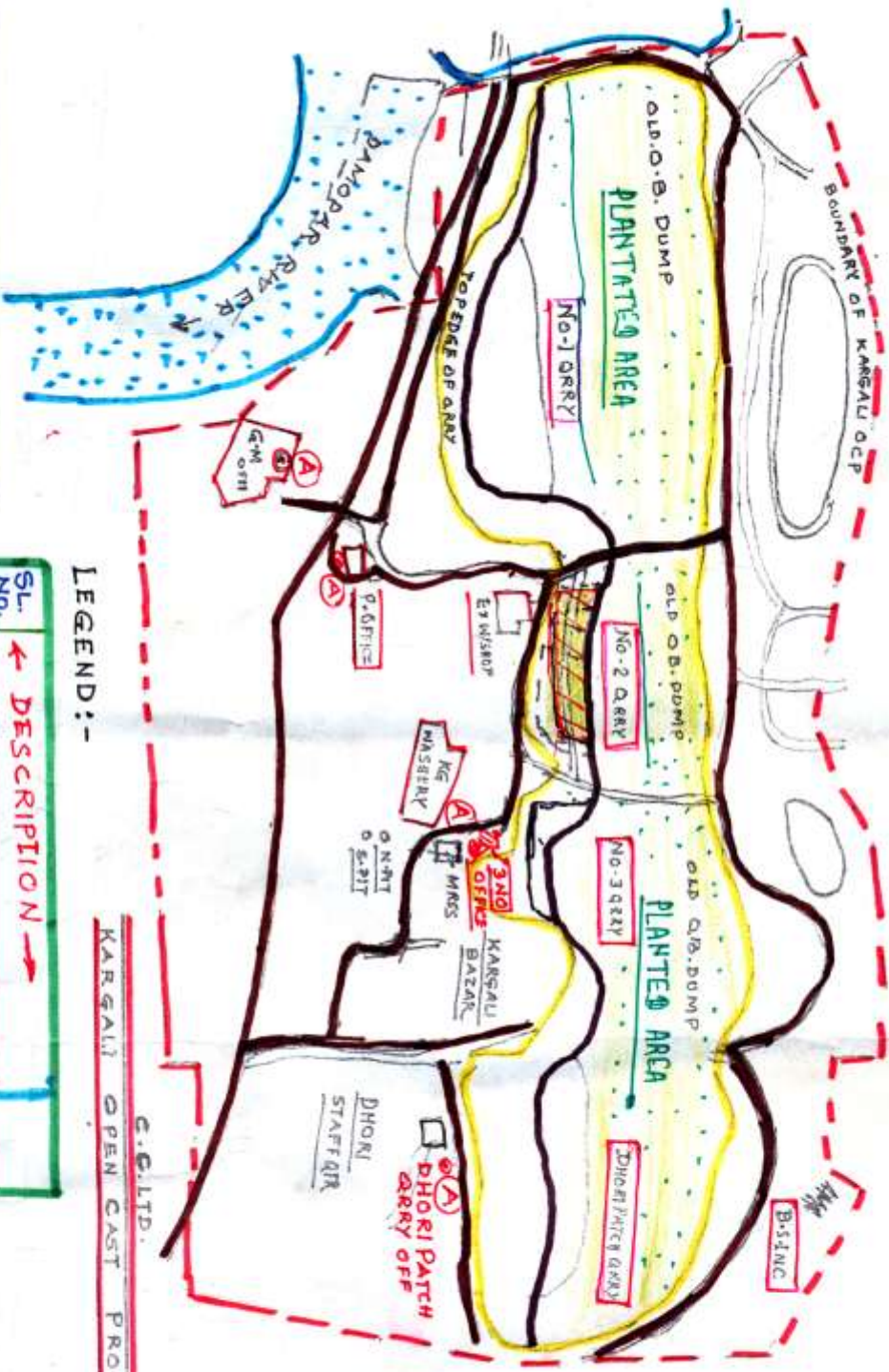
- *Management of solid wastes in form of overburden dumps.
- *Treatment and disposal of mine effluents including dump lechates.
- *Control of mine fire.
- * Creation of green covers of OB dumps, fire control area and around residential area.
- *Treatment of workshop effluent.

As stated earlier, out of the aforesaid issues, the green cover/plantation work can only be dealt throughout the operational period of the mine. However, greening of the old OB dumps can be taken up.

**Nodal Officer
P.E. (Civil)
Kargali OCP.**

**Project Officer
Kargali OCP.**

SURFACE-PLAN (ENVIRONMENT)



LEGEND:-

SL. NO.	DESCRIPTION	
1)	PRESENT WORKING (14-15)	
2)	AIR MONITORING STN	
3)	RECLAIMED & PLANTATED AREA	

G.E.LTD.
KARGALI OPEN CAST PROJECT

ENV-DETAILS &
NOT TO SCALE

Surveyor
 K90CP
 of 2/14
 P.E.C.
 K90CP

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 : **Kargali OCP** Quarter Ending June '2013

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

Date of Sampling	SPM	RPM	SO2	NOx	Remarks
21/06/2013 - 22/06/2013	240	145	11	42	

Name of the Sampling Station *Rest House*

Date of Sampling	SPM	RPM	SO2	NOx	Remarks
21/06/2013 - 22/06/2013	197	101	11	41	

Name of the Sampling Station *I W S P Kargali*

Date of Sampling	SPM	RPM	SO2	NOx	Remarks
21/06/2013 - 22/06/2013	344	251	10	40	

Name of the Sampling Station *Phusro Workshop*

Date of Sampling	SPM	RPM	SO2	NOx	Remarks
22/06/2013 - 23/06/2013	228	131	10	39	

Analysed By

Checked By

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

B&K-1

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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 : **Kargali OCP** **Quarter Ending June** : **'2013**

Sampling Stations
 1 P.O. Office
 2 Rest House

Station Name	Date of Sampling	Noise Level
P.O.Office	21/06/2013	49.8
Rest House	21/06/2013	48.2

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)

Checked By

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

B&k - 2

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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 : **Kargali OCP** **Quarter Ending June** '2013

Sampling Stations 1. Lagoon Discharge 24-June-13
 2. Phusro OC Lagoon Discharge 24-June-13

All parameter are in mg/l unless specified

BDL - Below Detectable Limit

SI.No.	Parameter	Sampling Stations			Below Detection Limit	MOEF -SCH-VI STANDARDS	Remarks
		1	2	3			
1	Colour & Odour	Acceptable	Acceptable		-	Acceptable	
2	Total Suspended Solids	34	28		5.00	100.0	
3	pH value	8.08	8.10		0.01	5.5 to 9.0	
4	Temperature (°C)	25.9	25.9		-	Shall not exceed 5 C above the receiving temp.	
5	Oil & Grease	BDL	BDL		1.00	10.0	
6	Total Residual Chlorine	BDL	BDL		0.04	1.0	
7	Ammonical Nitrogen	0.14	0.12		0.02	50.0	
8	Total Kjeldahl Nitrogen	2.20	2.40		0.02	100.0	
9	Free Ammonia	BDL	BDL		0.02	5.0	
10	B.O.D (3 days 27°C)	1.00	1.00		1.00	30.0	
11	COD	40	35		5.00	250.0	
12	Arsenic	BDL	BDL		0.01	0.2	
13	Lead	BDL	BDL		0.05	0.1	
14	Hexavalent Chromium	BDL	BDL		0.01	0.1	
15	Total Chromium	0.08	BDL		0.10	2.0	
16	Copper	0.03	0.03		0.02	3.0	
17	Zinc	0.08	0.04		0.02	5.0	
18	Selenium	BDL	BDL		0.01	0.05	
19	Nickel	BDL	BDL		0.10	3.0	
20	Fluoride	0.42	0.38		0.05	2.0	
21	Dissolved Phosphate	0.14	0.10		0.01	5.0	
22	Sulphide	0.04	0.03		0.01	2.0	
23	Phenolic Compounds	BDL	BDL		0.001	1.0	
24	Manganese	BDL	BDL		0.05	2.0	
25	Iron	BDL	0.20		0.05	3.0	
26	Nitrate Nitrogen	1.7	1.5		0.01	10.0	

Analysed By

Checked By

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

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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 : Kargali OCP **Quarter Ending June** '2013

Sampling Stations 1 Baid Karo Nala before Damodar 24-June-13
 2 Damodar after conf. Of BK Nala 24-June-13
 3 Raw water Damodar River, Kargali End 24-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	14	18	14	1.00	300	
2	Total Suspended Solids	92	42	110	5.00	\$	
3	Disolved Oxygen	4.60	4.90	4.60	0.10	4	
4	pH value	8.20	7.88	8.08	0.01	6.5-8.5	
5	Iron	0.22	0.06	BDL	0.05	5	
6	Chlorides	18	20	16	0.25	600	
7	BOD (3 days 27°C)	2.40	2.70	2.70	1.00	3	
8	Total Dissolved Solids	134	156	136	1.00	1500	
9	Copper	0.03	0.04	0.04	0.02	1.5	
10	Sulphate	28	38	32	1.00	400	
11	Nitrate	9.30	8.41	7.53	0.01	50	
12	Fluoride	0.37	0.40	0.48	0.05	1.5	
13	Selenium	BDL	BDL	BDL	0.01	0.05	
14	Arsenic	BDL	BDL	BDL	0.01	0.2	
15	Lead	BDL	BDL	BDL	0.05	0.1	
16	Zinc	0.02	0.02	0.02	0.02	15	
17	Hexavalent Chromium	BDL	BDL	BDL	0.01	0.05	
18	Phenolics	BDL	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)

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TEST REPORT

Job No. : 094313025
 Name of the Customer : CCL

Date of Issue: 15/07/13

Customer Letter Ref. No. (if any): CCL/Env-Monitoring/13-14/ 2013/823-828 dt. 16/05/13
 Sample Description : Drinking Water
 Product Specification (BIS) : IS: 10500 Drinking Water Standards
 Test Required : 23 items as per IS: 10500
 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**
Project : **Kargali OCP**

Year : 2013
Quarter Ending June : '2013

Sampling Stations 1 Treated Water from IWSP

24-June-13

All Parameters are in mg/l unless specified

BDL- Below Detectable Limit

Sl.No.	Parameter	Sampling Stations			Below Detection Limit	IS:10500 Drinking Water Standards	Remarks
		1	2	3			
1	Colour, Hazen unit.Min.	2			1.0	5	
2	Odour	Unobj.			--	Unobjectionable	
3	Turbidity, NTU, Max	3			1.0	5	
4	pH value	7.90			0.01	6.5-8.5	
5	Alkalinity	64			0.50	200	
6	Total Hardness (CaCO ₃)	76			0.50	300	
7	Iron	0.06			0.05	0.3	
8	Chlorides	20			0.25	250	
9	Residual Free chlorine, Min.	0.12			0.04	0.2	
10	Total Dissolved Solids	134			1.00	500	
11	Calcium	33.6			0.02	75	
12	Copper	0.04			0.02	0.05	
13	Manganese	BDL			0.05	0.1	
14	Sulphate	34			1.00	200	
15	Nitrate	2.65			0.01	45	
16	Fluoride	0.43			0.05	1.0	
17	Selenium	BDL			0.01	0.01	
18	Arsenic	BDL			0.01	0.05	
19	Lead	BDL			0.05	0.05	
20	Zinc	0.02			0.02	5	
21	Hexavalent Chromium	BDL			0.01	0.05	
22	Boron	BDL			0.01	1	
23	Phenolics	BDL			0.001	0.001	

Analysed By

Checked By

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

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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 : **Kargali OCP** Quarter Ending Sept. '2013

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

Date of Sampling	SPM	RPM	SO2	NOx	Remarks
10/09/2013 - 11/09/2013	95	44	<25	20	

Name of the Sampling Station *Rest House*

Date of Sampling	SPM	RPM	SO2	NOx	Remarks
10/09/2013 - 11/09/2013	233	88	<25	22	

Name of the Sampling Station *I W S P Kargali*

Date of Sampling	SPM	RPM	SO2	NOx	Remarks
10/09/2013 - 11/09/2013	56	33	<25	20	

Name of the Sampling Station *Phusro Workshop*

Date of Sampling	SPM	RPM	SO2	NOx	Remarks
11/09/2013 - 12/09/2013	191	163	<25	21	

Analysed By

Checked By

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

B&K-1

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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 : **Kargali OCP** Quarter Ending Sept. '2013

Sampling Stations
 1 P.O. Office
 2 Rest House

Station Name	Date of Sampling	Noise Level
P.O.Office	10/09/2013	48.9
Rest House	10/09/2013	48.0

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)

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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 : Kargali OCP

Year : 2013
Quarter Ending Sept. : '2013

Sampling Stations 1. Lagoon Discharge 19-Sept-13
 2. Phusro OC Lagoon Discharge 19-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	Acceptable		5.0 Cannot be quantified	Acceptable	
2	Total Suspended Solids	44	38		25.00	100.0	
3	pH value	7.92	8.10		0.01	5.5 to 9.0	
4	Temperature (°C)	25.2	25.2		-	Shall not exceed 5 C above the receiving temp.	
5	Oil & Grease	2.00	2.00		2.00	10.0	
6	Total Residual Chlorine	BDL	BDL		0.02	1.0	
7	Ammonical Nitrogen	0.18	0.14		0.01	50.0	
8	Total Kjeldahl Nitrogen	2.40	2.60		1.00	100.0	
9	Free Ammonia	BDL	BDL		0.01	5.0	
10	B.O.D (3 days 27°C)	2.00	2.00		2.00	30.0	
11	COD	50	45		4.00	250.0	
12	Arsenic	BDL	BDL		0.005	0.2	
13	Lead	BDL	BDL		0.005	0.1	
14	Cadmium	BDL	BDL		0.0005	2.0	
15	Hexavalent Chromium	BDL	BDL		0.01	0.1	
16	Total Chromium	BDL	BDL		0.06	2.0	
17	Copper	BDL	BDL		0.03	3.0	
18	Zinc	BDL	BDL		0.01	5.0	
19	Selenium	BDL	BDL		0.005	0.05	
20	Nickel	BDL	BDL		0.10	3.0	
21	Fluoride	0.35	0.42		0.02	2.0	
22	Dissolved Phosphate	0.28	0.24		0.30	5.0	
23	Sulphide	BDL	BDL		0.005	2.0	
24	Phenolic Compounds	BDL	BDL		0.002	1.0	
25	Manganese	BDL	BDL		0.02	2.0	
26	Iron	BDL	0.20		0.06	3.0	
27	Nitrate Nitrogen	2.4	1.8		0.50	10.0	

Analysed By

Checked By

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

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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 : 18 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
Project : Kargali OCP

Year : 2013
Quarter Ending Sept. : '2013

Sampling Stations

1	Baid Karo Nala before Damodar	19-Sept-13
2	Damodar after conf. Of BK Nala	19-Sept-13
3	Raw water Damodar River, Kargali End	19-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	18	14	20	5.0	300	
2	Total Suspended Solids	44	52	64	25.00	\$	
3	Disolved Oxygen	4.70	4.80	4.50	0.10	4	
4	pH value	7.94	7.88	8.05	0.01	6.5-8.5	
5	Iron	BDL	BDL	BDL	0.06	5	
6	Chlorides	20	16	22	2.00	600	
7	BOD (3 days 27°C)	2.40	2.80	2.50	2.00	3	
8	Total Dissolved Solids	138	158	184	25.00	1500	
9	Copper	BDL	BDL	BDL	0.03	1.5	
10	Sulphate	24	34	44	2.00	400	
11	Nitrate	8.86	7.97	6.20	0.50	50	
12	Fluoride	0.40	0.43	0.38	0.02	1.5	
	Cadmium	BDL	BDL	BDL	0.0005	0.01	
13	Selenium	BDL	BDL	BDL	0.005	0.05	
14	Arsenic	BDL	BDL	BDL	0.005	0.2	
15	Lead	BDL	BDL	BDL	5.00	0.1	
16	Zinc	BDL	BDL	BDL	0.01	15	
17	Hexavalent Chromium	BDL	BDL	BDL	0.01	0.05	
18	Phenolics	BDL	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)

B&k - 4

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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 : Drinking Water

Product Specification (BIS) : IS: 10500 Drinking Water Standards

Test Required : 24 items as per IS: 10500

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 : Kargali OCP

Year : 2013
Quarter Ending Sept. : '2013

Sampling Stations 1 Treated Water from IWSP

19-Sept-13

All Parameters are in mg/l unless specified

BDL- Below Detectable Limit

Sl.No.	Parameter	Sampling Stations			Below Detection Limit	IS:10500 Drinking Water Standards	Remarks
		1	2	3			
1	Colour, Hazen unit.Min.	4			5.0	5	
2	Odour	Unobj.			--	Unobjectionable	
3	Turbidity, NTU, Max	5			1.0	5	
4	pH value	7.90			0.01	6.5-8.5	
5	Alkalinity	68			4.00	200	
6	Total Hardness (c _a CO ₃)	80			4.00	300	
7	Iron	BDL			0.06	0.3	
8	Chlorides	24			2.00	250	
9	Residual Free chlorine, Min.	0.14			0.02	0.2	
10	Total Dissolved Solids	138			25.00	500	
11	Calcium	22.4			1.60	75	
12	Copper	BDL			0.03	0.05	
13	Manganese	BDL			0.02	0.1	
14	Sulphate	30			2.00	200	
15	Nitrate	3.10			0.5	45	
16	Fluoride	0.42			0.02	1.0	
17	Cadmium	BDL			0.0005		
18	Selenium	BDL			0.005	0.01	
19	Arsenic	BDL			0.005	0.05	
20	Lead	BDL			0.005	0.05	
21	Zinc	BDL			0.01	5	
22	Hexavalent Chromium	BDL			0.01	0.05	
23	Boron	BDL			0.02	1	
24	Phenolics	BDL			0.002	0.001	

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G.M (Chemist)
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B&k - 5

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TEST REPORT

Job No. : 094313025 Date of Issue: 17/01/14
 Name of the Customer : CCL
 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.'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: 02/01/14 to 17/01/14

TEST RESULT

The sample has been tested with the following results:-

Area : **B&K** Year 2013
 Project : **Kargali OCP** Quarter Ending Dec. '2013

All parameters are in $\mu\text{g}/\text{m}^3$

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

Date of Sampling	SPM	RPM	SO ₂	NO _x	Remarks
20/12/2013 - 21/12/2013	343	165	<25	22	

Name of the Sampling Station *Rest House*

Date of Sampling	SPM	RPM	SO ₂	NO _x	Remarks
20/12/2013 - 21/12/2013	255	144	<25	22	

Name of the Sampling Station *I W S P Kargali*

Date of Sampling	SPM	RPM	SO ₂	NO _x	Remarks
20/12/2013 - 21/12/2013	256	144	<25	24	

Name of the Sampling Station *Phusro Workshop*

Date of Sampling	SPM	RPM	SO ₂	NO _x	Remarks
23/12/2013 - 24/12/2013	405	279	<25	23	

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B&K – 1

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TEST REPORT

Job No. : 094313025 Date of Issue: 02/01/14
 Name of the Customer : CCL
 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

The sample has been tested with the following results:-

Area : **B&K** **Year** : 2013
Project : **Kargali OCP** **Quarter Ending Dec.** : **'2013**
Sampling Stations : 1 P.O. Office
 2 Rest House

Station Name	Date of Sampling	Noise Level
P.O.Office	20/12/2013	48.7
Rest House	20/12/2013	48.2

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)

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B&K – 2

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TEST REPORT

Job No. : 094313025 Date of Issue: 10/01/14
 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** **Year** : 2013
Project : **Kargali OCP** **Quarter Ending Dec.** : '2013

Sampling Stations 1. Lagoon Discharge 30-Dec-13
 2. Phusro OC Lagoon Discharge 30-Dec-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	BIS Standard	Method
		1	2	3				
1	Colour & Odour	Acceptable	Acceptable		5.0 Cannot be quantified	Acceptable	APHA, 22 nd Edition IS 3025 /05:1983	Pt.Cobalt Physical, Qualitative
2	Total Suspended Solids	38	42		25.00	100.0	IS-3025/17:1984	Gravimetric
3	pH value	8.04	8.10		0.01	5.5 to 9.0	IS-3025/11:1983	Electrometric
4	Temperature (°C)	18.9	18.9		5.0	Shall not exceed 5 C above the receiving temp.	IS-3025/09:1984	Thermometric
5	Oil & Grease	BDL	BDL		2.00	10.0	IS-3025/39:1991	Partition Gravimetric
6	Total Residual Chlorine	BDL	BDL		0.02	1.0	APHA, 22 nd Edition	DPD
7	Ammonical Nitrogen	0.20	0.14		0.01	50.0	IS:3025/34:1988	Nessler's
8	Total Kjeldahl Nitrogen	2.20	1.80		1.00	100.0	IS:3025/34:1988	Nessler's
9	Free Ammonia	BDL	BDL		0.01	5.0	IS:3025/34:1988	Nessler's
10	B.O.D (3 days 27°C)	2.00	2.00		2.00	30.0	IS-3025/44:1993	3 day incubation at 27°C
11	COD	45	50		4.00	250.0	IS-3025/58:2006	Titration
12	Arsenic	BDL	BDL		0.005	0.2	APHA, 22 nd Edition	AAS-GTA
13	Lead	BDL	BDL		0.005	0.1	APHA, 22 nd Edition	AAS-GTA
14	Cadmium	BDL	BDL		0.0005	2.0	APHA, 22 nd Edition	AAS-GTA
15	Hexavalent Chromium	BDL	BDL		0.01	0.1	APHA, 22 nd Edition	Diphenylcarbohydrazide
16	Total Chromium	BDL	BDL		0.06	2.0	IS-3025/52:2003	AAS-Flame
17	Copper	BDL	BDL		0.03	3.0	IS-3025/42:1992	AAS-Flame
18	Zinc	BDL	BDL		0.01	5.0	IS-3025/49:1994	AAS-Flame
19	Selenium	BDL	BDL		0.005	0.05	APHA, 22 nd Edition	AAS-GTA
20	Nickel	BDL	BDL		0.10	3.0	IS-3025/54:2003	AAS-Flame
21	Fluoride	0.40	0.37		0.02	2.0	APHA, 22 nd Edition	SPADNS
22	Dissolved Phosphate	0.24	0.22		0.30	5.0	APHA, 22 nd Edition	Molybdovanadate
23	Sulphide	BDL	BDL		0.005	2.0	APHA, 22 nd Edition	Methylene Blue
24	Phenolic Compounds	BDL	BDL		0.002	1.0	APHA, 22 nd Edition	4-Amino Antipyrine
25	Manganese	BDL	BDL		0.02	2.0	APHA, 22 nd Edition	AAS-Flame
26	Iron	BDL	BDL		0.06	3.0	IS-3025/53:2003	AAS-Flame
27	Nitrate Nitrogen	1.6	1.3		0.50	10.0	APHA, 22 nd Edition	UV Spectrophotometric

Analysed By

Checked By

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

B&K – 3

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TEST REPORT

Job No. : 094313025 Date of Issue: 10/01/14
 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 : 18 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** **Year** 2013
Project : **Kargali OCP** **Quarter Ending Dec.** '2013

Sampling Stations 1 Baid Karo Nala before Damodar 30-Dec-13
 2 Damodar after conf. Of BK Nala 30-Dec-13
 3 Raw water Damodar River, Kargali End 30-Dec-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'	BIS Standard	Method
		1	2	3				
1	Colour, Hazen unit,Max	14	12	16	5.0	300	APHA, 22 nd Edition	Platinum Cobalt
2	Total Suspended Solids	38	44	58	25.00	\$	IS-3025/17:1984	Gravimetric
3	Disolved Oxygen	4.80	4.90	4.70	0.10	4	IS-3025/38:1989	Winkler Azide
4	pH value	7.97	8.04	7.98	0.01	6.5-8.5	IS-3025/11:1983	Electrometric
5	Iron	BDL	BDL	BDL	0.06	5	IS-3025/53:2003	AAS-Flame
6	Chlorides	18	20	24	2.00	600	IS-3025/32:1988	Argentometric
7	BOD (3 days 27°C)	2.40	2.60	2.40	2.00	3	IS-3025/44:1993	3 day incubation at 27°C
8	Total Dissolved Solids	144	154	180	25.00	1500	IS-3025/16:1984	Gravimetric
9	Copper	BDL	BDL	BDL	0.03	1.5	IS-3025/42:1992	AAS-Flame
10	Sulphate	18	22	24	2.00	400	APHA, 22 nd Edition	Turbidity
11	Nitrate	6.20	5.75	7.08	0.50	50	IS-3025/34:1988	Nessler's
12	Fluoride	0.35	0.42	0.28	0.02	1.5	APHA, 22 nd Edition	SPADNS
13	Cadmium	BDL	BDL	BDL	0.0005	0.01	APHA, 22 nd Edition	AAS-GTA
14	Selenium	BDL	BDL	BDL	0.005	0.05	APHA, 22 nd Edition	AAS-GTA
15	Arsenic	BDL	BDL	BDL	0.005	0.2	APHA, 22 nd Edition	AAS-GTA
16	Lead	BDL	BDL	BDL	0.005	0.1	APHA, 22 nd Edition	AAS-GTA
17	Zinc	BDL	BDL	BDL	0.01	15	IS-3025/49:1994	AAS-Flame
18	Hexavalent Chromium	BDL	BDL	BDL	0.01	0.05	APHA, 22 nd Edition	Diphenylcarbohydrazide
19	Phenolics	BDL	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 - 4

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

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TEST REPORT

Job No. : 094313025
 Name of the Customer : CCL

Date of Issue: 10/01/14

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

Sample Description : Drinking Water

Product Specification (BIS) : IS: 10500 Drinking Water Standards

Test Required : 24 items as per IS: 10500

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 : Kargali OCP

Year : 2013
Quarter Ending Dec. : '2013

Sampling Stations 1 Treated Water from IWSP

30-Dec-13

All Parameters are in mg/l unless specified

BDL - Below Detectable Limit

Sl.No	Parameter	Sampling Stations			Below Detection Limit	IS:10500 Drinking Water Standards	BIS Standard	Method
		1	2	3				
1	Colour, Hazen unit.Min.	4			5.0	5	APHA, 22 nd Edition	Platinum Cobalt
2	Odour	Unobj.			--	Unobj.	IS 3025 /05:1983	Physical, Qualitative
3	Turbidity, NTU, Max	5			1.0	5	IS-3025/10:1984	Nephelometric
4	pH value	7.97			0.01	6.5-8.5	IS-3025/11:1983	Electrometric
5	Alkalinity	68			4.00	200	IS-3025/23:1986	Titration
6	Total Hardness (c _a CO ₃)	76			4.00	300	IS-3025/21:1983	EDTA
7	Iron	BDL			0.06	0.3	IS-3025/53:2003	AAS-Flame
8	Chlorides	18			2.00	250	IS-3025/32:1988	Argentometric
9	Residual Free chlorine, Min.	0.09			0.02	0.2	APHA, 22 nd Edition	DPD
10	Total Dissolved Solids	144			25.00	500	IS-3025/16:1984	Gravimetric
11	Calcium	33.6			1.60	75	IS-3025/40:1991	EDTA
12	Copper	BDL			0.03	0.05	IS-3025/42:1992	AAS-Flame
13	Manganese	BDL			0.02	0.1	APHA, 22 nd Edition	AAS-Flame
14	Sulphate	18			2.00	200	APHA, 22 nd Edition	Turbidity
15	Nitrate	2.65			0.5	45	IS-3025/34:1988	Nessler's
16	Fluoride	0.44			0.02	1.0	APHA, 22 nd Edition	SPADNS
17	Cadmium	BDL			0.0005	0.01	APHA, 22 nd Edition	AAS-GTA
18	Selenium	BDL			0.005	0.01	APHA, 22 nd Edition	AAS-GTA
19	Arsenic	BDL			0.005	0.05	APHA, 22 nd Edition	AAS-GTA
20	Lead	BDL			0.005	0.05	APHA, 22 nd Edition	AAS-GTA
21	Zinc	BDL			0.01	5	IS-3025/49:1994	AAS-Flame
22	Hexavalent Chromium	BDL			0.01	0.05	APHA, 22 nd Edition	Diphenylcarbohydrazide
23	Boron	BDL			0.20	1.0	APHA, 22 nd Edition	Carmine
24	Phenolics	BDL			0.002	0.001	APHA, 22 nd Edition	4-Amino Antipyrine

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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:	Kargali OC
Stations:	<ol style="list-style-type: none"> 1. P.O. Office 2. Rest House 3. I W S P Kargali 4. Phusro Workshop 	Date of Sampling:	24-24/03/2014 24-24/03/2014 24-24/03/2014 24-24/03/2014

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	217	391	175	679
2	Particulate Matter (PM ₁₀)	µg/m ³	IS: 5182/23 2006	131	159	55	242
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	20	21	23	20

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

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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:** **Kargali OC**

Stations:

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

Station Name	Date of Sampling	Noise Level
P.O.Office	24/03/2014	48.2
Rest House	24/03/2014	49.5

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)

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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:** **Kargali OCP**

Stations: **Date of Sampling:**

1. Lagoon Discharge 29/03/2014

2. Phusro OC Lagoon Discharge 29/03/2014

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	38	40		25.00	100.0	IS 3025/17:1984, R :1996, Gravimetric
2	pH value	8.05	7.98		0.01	5.5 to 9.0	IS-3025/11:1983, R-1996, Electrometric
3	Temperature (°C)	24.8	24.8		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		2.00	10.0	IS 3025/39:1991, R : 2003, Partition Gravimetric
5	Total Residual Chlorine, mg/l, Max	<0.02	<0.02		0.02	1.0	APHA, 22 nd Edition, DPD
6	Ammonical Nitrogen, mg/l, Max	0.08	0.10		0.01	50.0	IS 3025/34:1988, R : 2009, Nessler's
7	Total Kjeldahl Nitrogen, mg/l, Max	<1.00	1.10		1.00	100.0	IS:3025/34:1988, Nessler's
8	Free Ammonia, mg/l, Max	<0.01	<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		2.00	30.0	IS 3025 /44:1993,R:2003 3 day incubation at 27°C
10	COD, mg/l, Max	44	48		4.00	250.0	APHA, 22 nd Edition, Closed Reflux, Titrimetric
11	Arsenic, mg/l, Max	<0.005	<0.005		0.005	0.2	IS 3025/37:1988 R : 2003, AAS-VGA
12	Lead, mg/l, Max	0.01	0.03		0.005	0.1	APHA, 22 nd Edition, AAS-GTA
13	Cadmium, mg/l, Max	0.001	0.002		0.0005	2.0	APHA, 22 nd Edition, AAS-GTA
14	Hexavalent Chromium, mg/l, Max	<0.01	<0.01		0.01	0.1	APHA, 22 nd Edition, Diphenylcarbohydrazide
15	Total Chromium, mg/l, Max	0.06	0.11		0.06	2.0	IS-3025/52:2003, AAS-Flame
16	Copper, mg/l, Max	<0.03	<0.03		0.03	3.0	IS 3025/42: 1992 R : 2009, AAS-Flame
17	Zinc, mg/l, Max	<0.01	0.02		0.01	5.0	IS 3025 /49 : 1994, R : 2009, AAS-Flame
18	Selenium, mg/l, Max	<0.005	<0.005		0.005	0.05	APHA, 22 nd Edition, AAS-GTA
19	Nickel, mg/l, Max	<0.10	<0.10		0.10	3.0	IS-3025/54:2003, AAS-Flame
20	Fluoride, mg/l, Max	0.58	0.60		0.02	2.0	APHA, 22 nd Edition, SPADNS
21	Dissolved Phosphate, mg/l, Max	<0.30	<0.30		0.30	5.0	APHA, 22 nd Edition Molybdovanadate
22	Sulphide, mg/l, Max	<0.005	0.005		0.005	2.0	APHA, 22 nd Edition, Methylene Blue
23	Phenolic Compounds, mg/l, Max	<0.002	<0.002		0.002	1.0	APHA, 22 nd Edition 4-Amino Antipyrine
24	Manganese, mg/l, Max	<0.02	<0.02		0.02	2.0	IS-3025/59:2006, AAS-Flame
25	Iron, mg/l, Max	<0.06	<0.06		0.06	3.0	IS 3025 /53 : 2003, R : 2009 , AAS-Flame
26	Nitrate Nitrogen, mg/l, Max	1.8	2.0		0.50	10.0	APHA, 22 nd Edition, UV-Spectrophotometric

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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:	Kargali OCP
Stations:	1. Baid Karo Nala before Damodar 2. Damodar after conf. Of BK Nala 3. Raw water Damodar River, Kargali End 4.		Date of Sampling: 29/03/2014 29/03/2014 29/03/2014

Sl. No	Parameter	Sampling Stations				Desirable Limits	BIS Standard & Method
		1	2	3	4		
1	Total Suspended Solids, mg/l, Max	25	32	28		25.00	IS 3025 /17:1984, R :1996, Gravimetric
2	Disolved Oxygen, min.	5.40	5.20	6.70		0.10	IS 3025/381989, R : 2003, Winkler Azide
3	pH value	7.88	7.92	7.77		0.01	IS-3025/11:1983, R-1996, Electrometric
4	Iron, mg/l, Max	<0.06	<0.06	<0.06		0.06	IS 3025 /53 : 2003, R : 2009 , AAS-Flame
5	Chlorides, mg/l, Max	18	20	22		2.00	IS-3025/32:1988, R-2007, Argentometric
6	BOD (3 days 27°C), mg/l, Max	2.80	2.60	2.40		2.00	IS 3025 /44: 1993, R : 2003 3 day incubation at 27°C
7	Dissolved Solids, mg/l, Max	138	160	174		25.00	IS 3025 /16:1984 R : 2006, Gravimetric
8	Copper, mg/l, Max	<0.03	<0.03	<0.03		0.03	IS 3025 /42 : 1992 R : 2009, AAS-Flame
9	Sulphate, mg/l, Max	24	22	26		2.00	APHA, 22 nd Edition Turbidity
10	Nitrate , mg/l, Max	6.20	6.64	5.75		0.50	APHA, 22 nd Edition, UV-Spectrophotometric
11	Fluoride, mg/l, Max	0.50	0.48	0.55		0.02	APHA, 22 nd Edition SPADNS
12	Cadmium, mg/l, Max	<0.0005	0.001	<0.0005		0.0005	APHA, 22 nd Edition AAS-GTA
13	Selenium, mg/l, Max	<0.005	<0.005	<0.005		0.005	APHA, 22 nd Edition AAS-GTA
14	Arsenic, mg/l, Max	<0.005	<0.005	<0.005		0.005	IS 3025/37:1988 R : 2003, AAS-VGA
15	Lead, mg/l, Max	0.03	0.02	0.02		0.005	APHA, 22 nd Edition AAS-GTA
16	Zinc, mg/l, Max	0.01	<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		0.01	APHA, 22 nd Edition, 1,5 - Diphenylcarbohydrazide
18	Phenolics, mg/l, Max	<0.002	<0.002	<0.002		0.002	APHA, 22 nd Edition 4-Amino Antipyrine

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TEST REPORT

Lab No. T-2187	Job No. 094313025	Year	2013-14
Type of Sample:	Drinking 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:	IS:10500 Drinking Water Standards	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:** **Kargali OCP**
Stations: **Date of Sampling:**
 1. Treated Water from IWSP
 2.
 3. 31/03/2014

SLNo	Parameter	Sampling Stations			Desirable Limits	IS:10500 Drinking Water Standards	Standard / Test Method
		1	2	3			
1	Odour	Agree.			--	Agreeable	IS 3025 /05:1983, R-2012, Qualitative
2	Turbidity, NTU, Max	5			1.0	1	IS-3025/10:1984 R-1996, Nephelometric
3	pH value	7.95			0.01	6.5 to 8.5	IS-3025/11:1983, R-1996, Electrometric
4	Alkalinity, mg/l, Max	56			4.00	200	IS-3025/23:1986, Titration
5	Total Hardness (ca ₂ CO ₃), mg/l, Max	84			4.00	200	IS-3025/21:1983, R-2002, EDTA
6	Iron (as Fe), mg/l, Max	<0.06			0.06	0.3	IS 3025 /53 : 2003, R : 2009 , AAS-Flame
7	Chlorides (as Cl), mg/l, Max	20			2.00	250	IS-3025/32:1988, R-2007, Argentometric
8	Residual Free chlorine, Min.	0.08			0.02	0.2	APHA 22 nd Edition, DPD
9	Total Dissolved Solids, mg/l, Max	158			25.00	500	IS 3025 /16:1984 R : 2006, Gravimetric
10	Calcium(as Ca), mg/l, Max	22.4			1.60	75	IS-3025/40:1991,EDTA
11	Copper (as Cu), mg/l, Max	<0.03			0.03	0.05	IS 3025/42 : 1992 R : 2009, AAS-Flame
12	Manganese (as Mn), mg/l, Max	<0.02			0.02	0.1	IS-3025/59:2006,AAS-Flame
13	Sulphate (as SO ₄), mg/l, Max	24			2.00	200	APHA 22 nd Edition. Turbidity
14	Nitrate (as NO ₃), mg/l, Max	3.54			0.5	45	APHA, 22 nd Edition, UV-Spectrophotometric
15	Fluoride (as F), mg/l, Max	0.42			0.02	1.0	APHA 22 nd Edition , SPADNS
16	Cadmium (as Cd), µg/l, Max	0.001			0.0005	0.003	APHA 22 nd Edition, AAS-GTA
17	Selenium (as Se), mg/l, Max	<0.005			0.005	0.01	APHA, 22 nd Edition, AAS-GTA
18	Arsenic (as As), µg/l, Max	<0.005			0.005	0.01	IS 3025/ 37:1988 R : 2003, AAS-VGA
19	Lead (as Pb), mg/l, Max	0.04			0.005	0.01	APHA 22 nd Edition, AAS-GTA
20	Zinc (as Zn), mg/l, Max	<0.01			0.01	5.0	IS 3025/ 49 : 1994, R : 2009, AAS-Flame
21	Hexavalent Chromium, mg/l, Max,	<0.01			0.01	-	APHA 22 nd Edition, Diphenylcarbohydrazide
22	Boron (as B), mg/l, Max	<0.20			0.20	0.5	APHA 22 nd Edition Carmine
23	Phenolics, mg/l, Max	<0.002			0.002	0.001	APHA 22 nd Edition, 4-Amino Autipyrine

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