

ENVIRONMENTAL STATEMENT OF SIRKA COLLIERY



**FOR
2013-14
CENTRAL COALFIELDS LIMITED**



**JULY ,2014
ENVIRONMENT DIVISION
CCL,RANCHI**

EXECUTIVE SUMMARY

- E.1 This Environmental Statement Report is prepared with a view to fulfil the statutory obligations laid down by Ministry of Environment & Forest (MOEF), Government of India vide their gazette notification no. G.S.R. 329 (E) dated 13th March 1992. The '**Environmental Audit**' has been made mandatory through this notification. The 'Environmental Audit' has subsequently renamed to '**Environmental Statement**' vide MOEF gazette notification no.G.S.R 386 (E) dated 22nd April 1993.
- E.2 Sirka Project is operating in Argada Area of Central Coalfields Ltd. The capacity of the Project is to produce 0.25 M tonnes/ year of raw coal.
- E.3 The coal is being produced by using opencast mining methods. Total 0.11 M tonnes of coal were produced during year 2013-14. To produce this quantity of coal 0.52 M m³ overburden has been removed.
- E.4 The water although not used directly during the coal winning process, water is being consumed mainly for domestic purposes. Water is being consumed for industrial activities like spraying for dust suppression, washing of HEMMs and for fire fighting purpose.
- E.5 The raw material i.e High Speed Diesel and Lubricant are being used for automobiles and machines while Explosive is being used for overburden and coal removal purpose. The consumption of Explosive for the assessment year 2013-14 was 160 tonnes.
- E.6 The regular ambient air quality monitoring is being carried by the Institute of Environment CMPDI Ltd as per the guidelines of Ministry of Environment and Forest. The result reveals that concentration of parameters i.e. SPM, SO₂, NO_x in ambient air, most of the time, are within the permissible limits.
The quality of mine water at the disposal point is under the limits as prescribed.
- The noises level recorded are generally below the prescribed limits by Ministry of Environment & Forest.
- E.7 Hazardous wastes are not being produced either from mining operations or from any pollution control facilities.
- E.8 Solid waste generated during the process of coal winning is being used for physical and biological reclamation purpose.

E.9 At present following measures is being practiced for environmental management in the project:

- (i) The water sprinkling is being done regularly on the haul roads and loading points.
- (ii) The O.B. generated in the project is being reclaimed physically and biologically.
- (iii) Tree plantation has been done in the project.
- (iv) All service roads are metalled.
- (v) Workshop effluents are allowed to settle in sump before final discharge.

CHAPTER ONE

PROJECT DESCRIPTION

1.1 GENERAL

The Sirka opencast project is located in the eastern part of South Karanpura coalfields of Central Coalfield Ltd... It is one of the taken over mine and was belong to M/S Bird & Co. Ltd. at the time of nationalisation in 1973. At the time of nationalisation the production of coal was 0.30 - 0.35 Mty. About 0.25 - 0.30 Mty coal was produced by using Underground mining and rest 0.05 Mty was by Opencast mining method. The present capacity of the project is to produce 0.25 Mty of coal.

1.2 LOCATION

Sirka project is located in the eastern part of South Karanpura coalfields in Argada area and is surrounded by metamorphic rocks in the north and south. Sirka Project lies between latitudes $23^{\circ} 30'$ and $23^{\circ} 40'$ and longitude $85^{\circ} 25'$ and $85^{\circ} 28'$. It is included in the Survey of India Topo sheet no 73E/6. Argada colliery is situated in the east whereas Damodar River makes its western and southern boundaries. It is situated in the Hazaribagh district of Jharkhand state.

1.3 COMMUNICATION

Sirka Project is connected by all weather metalled road from Ramgarh on the National highway no.33 between Ranchi and Hazaribagh. It is situated at a distance of 10 km from Ramgarh. The nearest Railway station is Argada, on Gomoh - Barwadih line of Eastern Railway, within 2 km of the mine. The nearest airport is at Ranchi at a distance 80 km.

1.4 TOPOGRAPHY AND DRAINAGE

Sirka forms a part of low land between Hazaribagh plateau in the north and Ranchi plateau in the south and represents undulating sloping towards south topography. An ephemeral stream, called Parau nalla flows in the east of the property, along N-S alignment, discharging water into Damodar River. The Damodar River flows along the western and southern boundary of Sirka block.

1.5 MINING SYSTEM

Opencast mining system is being practiced in the project considering geomining conditions of the deposits namely (i) gradient of seams (ii) multiple seams (iii) the property being faulted with as many as 10 faults (iv) Sirka combined Argada and Argada A seams being already developed on semi horizon pattern. Shovel (electric), dumper mining system in combination with drill is being used for opencast mining system.

CHAPTER TWO ENVIRONMENTAL STATEMENT FOR COAL MINING PROJECT Environmental Statement for the assessment year 2013-14

PART - A

- (I) NAME AND ADDRESS OF THE PROJECT:
- | | |
|-----------|-----------------|
| Name: | Sirka Project |
| Address: | Project Officer |
| Place: | Sirka |
| District: | Ramgarh |
- (II) INDUSTRY CATEGORY: Primary
- (III) PRODUCTION CAPACITY: 0.15 Mt/y
- (IV) YEAR OF ESTABLISHMENT: 1925
- (V) DATE OF THE LAST ENVIRONMENTAL REPORT SUBMITTED:

- Last report submitted in September, 2013

PART - B
WATER AND RAW MATERIAL CONSUMPTION

(I) WATER CONSUMPTION (m³ / day)			
<u>Mining</u>		<u>2013-14</u>	<u>2012-13</u>
(a)	Haul road dust suppression	110	260
(b)	Workshop	105	120
(c)	Firefighting	-	-
			35
(d)	Others (service building etc.)	35-	
	Sub total	250	415
 <u>Domestic</u>			
(a)	Colony	1910	1930
(b)	Aboriculture	20	20
<u>Total:</u>		2180 M³ / day	2365 M³ / day

Name of Product	Water consumption m3/tonne of Coal Produce	
	2013-14	2012-13
Coal	NIL	NIL

ii) Raw Material Consumption – Nil
However following materials were used

Name of material	Consumption of material	
	2013-14	2012-13
Explosive in kg	160,000	56394
POL in litre		658168

PART - C
POLLUTION DISCHARGED TO ENVIRONMENT/UNIT OF OUTPUT
(PARAMETERS SPECIFIED IN THE CONSENT ISSUED)

Pollutants	Quantity of Pollutants Generated	% of variations from prescribed standards with reasons
<u>Water</u>		
(a) Discharge from mine	4200 m ³ / day	The results reveal that all parameters are under prescribed limit. The quality of mine water at the disposal point vis-a-vis the prescribed standards is given in Annexure.
(b) Workshop Effluent	87 M ³ /day	Quantity of effluent from the workshop is low and as such do not pose any problem.
(c) Domestic discharge	825 M ³ /day	Not Applicable
<u>Air</u>		
The SPM, SO ₂ , NO _x are being generated from coal mining projects.	The concentration of air pollutants is given in Annexure	The Ambient air quality monitoring is being carried out by CMPDI. The Air quality monitoring results reveals that all parameters are under prescribed limit.
Operation of HEMM generate noise	Recorded noise level are placed as Annexure	The noise level in around the project is under the prescribed limits.

PART - D
HAZARDOUS WASTES

(As specified under Hazardous Waste Management & Handling Rules, 1989)

Hazardous Wastes	Total Quantity	
	During the financial year (2013-14)	During the financial year (2012-13)
From Mining Process	NIL	NIL
From Material handling System	NIL	NIL

The process of Coal mining, handling and despatch do not give rise to production of any hazardous wastes.

PART - E
SOLID WASTES

	Total quantity of solid waste generated (M m ³)	
	2013-14	2012-13
(a) From process	NIL	NIL
(i) Top soil	0.0 Mm ³	
(ii) O.B.	0.52 Mm ³	0.608 Mm ³
(b) From pollution control facilities	NIL	NIL
(c) Quantity recycled or reutilized	The Overburden generated during the coal winning process is being reutilized for the reclamation physically & biologically alongwith top soil.	

PART - F
CHARACTERISTICS OF HAZARDOUS AND SOLID WASTE AND THEIR DISPOSAL PRACTICE

Hazardous wastes are not being produced or released either from mining operation or pollution control facilities. The process of coal winning by open cast mining process produced O.B and top soil as solid waste temporarily, as these materials later used for land reclamation. During the year 2013-14, 0.52 Mm³ O.B were generated.

The O.B generally consists of the following constituents:

1. Soil

2. Shale band (including carbonaceous shale)
3. Soft Sand stone

DISPOSAL PRACTICE

(i) TOP SOIL

Top soil is a precious natural resource and it loses its biological activity unless special care is taken during stripping, storage and carpeting of top soil. Land gets degraded due to mining operation which is to be reclaimed, top soil recovered is sufficient to provide a cover over the area which is being concurrently reclaimed. Top soil has not been generated in the project during 2013-14.

(ii) EXTERNAL DUMPS

Location of external dump is shown in the location plan given in **Annexure** . The overburden in the project at present is not being dumped externally.

(iii) INTERNAL DUMPS

Internal dumps and external dumps have been planned in continuity. They have been planned as one mass. Once external dumps get stabilised, they are proposed to be extended to cover the open pit by backfilling OB removed from the mine. Internal dumping of OB is in progress in the project.

PART - G

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

The main pollution control measures applied in the project have been summarised in the Tables 1.4 to 1.6.

AIR POLLUTION CONTROL MEASURES

Sl.No	Measures Suggested	Status Provided or To be Provided
1	All drills are to be provided with dust collection & extraction arrangement.	Provided
2	Biological reclamation of O.B dumps	Reclamation is being done
3	Overburden and coal piles will be wetted before loading	Continuity to be ensured
4	Blasting is to be carried out during congenial atmosphere	Being carried out
5	All transfer points to be provided with dust suppression system	To be Provided
6	All the roads used for HEMM movement to be water sprayed regularly	Being done
7	It is proposed to provide water sprinkling system for coal stock	Being done



**TABLE 1.5
WATER POLLUTION CONTROL MEASURES**

Sl. No	Measures Suggested	Status Provided or To be provided
1	Mine water is to be pumped into sedimentation lagoon created naturally in the dip side of mine. This water is then passed to natural drains through sedimentation lagoon and check dam.	Provided

TABLE 1.6
LAND RECLAMATION

Sl.No.	Land Reclamation Measures Suggested	Status Provided or To be Provided
1	Proper stripping, storage & relocation of top soil	To be taken up
2	Proper reshaping of top surface, providing drainage arrangements and top soil spreading for external and internal dumps.	Being carried out
3	Plantation of suitable species of herbs, shrubs & plants over technically reclaimed dumps.	

PART - H

ADDITIONAL INVESTMENT PROPOSAL FOR ENVIRONMENTAL PROTECTION
INCLUDING ABATEMENT OF POLLUTION

1. The Project will continue to carry regular environmental monitoring for air, water and noise pollutants as per the guidelines of Ministry of Environment & Forest.
 2. The Environmental Statement Report will be prepared for each assessment year as per the guidelines of Ministry of Environment & Forest.
 3. The project will continue to take Air & Water consent from State Pollution Control Board for each year.
 4. Water consumption for the project for each year is submitted to State Pollution Control Board in Water Cess Return Format.
- The other proposal for additional investment for environmental protection and pollution abatement in the project is under consideration.

PART - I

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

The suggestions made by different statutory agency e.g. Ministry of Environment & Forest, Central Pollution Control Board and State Pollution Control Board etc. are being implemented from time to time.

Nodal Officer
P.E. (Civil), Sirka Colliery

Project Officer
Sirka Colliery

TEST REPORT

Job No. : 094313025 Date of Issue: 10/05/13
 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 : 02/05/13 Date of performance of Test: 02/05/13 to 10/05/13

TEST RESULT

The sample has been tested with the following results:-

Area : *Argada* Year **2013**
 Project : *Sirka* Quarter Ending June **'2013**

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

Date of Sampling	SPM	RPM	SO2	NOx	Remarks
25/04/2013 - 26/04/2013	377	186	11	45	

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

Date of Sampling	SPM	RPM	SO2	NOx	Remarks
26/04/2013 - 27/04/2013	498	147	11	43	

Name of the Sampling Station *G.M. Office*

Date of Sampling	SPM	RPM	SO2	NOx	Remarks
26/04/2013 - 27/04/2013	326	145	12	43	

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: 02/05/13
 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 : 02/05/13 Date of performance of Test: -

TEST RESULT

The sample has been tested with the following results:-

Area : *Argada* **Year** **2013**
Project : *Sirka* **Quarter Ending June** **'2013**

Sampling Stations 1 P.O. Residence
 2 P.O. Office

Station Name	Date of Sampling	Noise Level
P.O. Residence	25/04/2013	46.7
P.O. Office	26/04/2013	49.5

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

<i>Noise Level</i>	<i>6.00 AM to 10.00 PM</i>	<i>10.00 PM to 6.00 AM</i>
	<i>Leq 75 dB(A)</i>	<i>Leq 70 dB(A)</i>

Checked By

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

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TEST REPORT

Job No. : 094313025 Date of Issue: 20/05/13
 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 : 02/05/13 Date of performance of Test: 02/05/13 to 20/05/13

TEST RESULT

The sample has been tested with the following results:-

Area : **Argada** **Year** **2013**
Project : **Sirka** **Quarter Ending June** **'2013**

Sampling Station : 1. Mine Water 30-April-13
 2.
 3.

All parameter are in mg/l unless specified

BDL - Below Detectable Limit

Sl.No.	Parameter	Sampling Stations			Below Detection Limit	MOEF -SCH-VI STANDARDS	Remarks
		1	2	3			
1	Colour & Odour	Acceptable			-	Acceptable	
2	Total Suspended Solids	42			5.00	100.0	
3	pH value	8.10			0.01	5.5 to 9.0	
4	Temperature (°C)	28.8			-	Shall not exceed 5 C above the receiving temp.	
5	Oil & Grease	BDL			1.00	10.0	
6	Total Residual Chlorine	BDL			0.04	1.0	
7	Ammonical Nitrogen	0.14			0.02	50.0	
8	Total Kjeldahl Nitrogen	2.35			0.02	100.0	
9	Free Ammonia	BDL			0.02	5.0	
10	B.O.D (3 days 27°C)	1.00			1.00	30.0	
11	COD	50			5.00	250.0	
13	Arsenic	BDL			0.01	0.2	
13	Lead	BDL			0.05	0.1	
14	Hexavalent Chromium	BDL			0.01	0.1	
15	Total Chromium	BDL			0.10	2.0	
16	Copper	BDL			0.02	3.0	
17	Zinc	BDL			0.02	5.0	
18	Selenium	BDL			0.01	0.05	
19	Nickel	BDL			0.10	3.0	
20	Fluoride	0.44			0.05	2.0	
21	Dissolved Phosphate	0.10			0.01	5.0	
22	Sulphide	0.04			0.01	2.0	
23	Phenolic Compounds	BDL			0.001	1.0	
24	Manganese	0.04			0.05	2.0	
25	Iron	0.06			0.05	3.0	
26	Nitrate Nitrogen	1.8			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: 20/05/13
 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 : 02/05/13 Date of performance of Test: 02/05/13 to 20/05/13

TEST RESULT

The sample has been tested with the following results:-

Area : **Argada** **Year** **2013**
Project : **Sirka** **Quarter Ending June** **'2013**

Sampling Stations 1 Damodar U/S of Effluent Discharge 30-April-13
 2 Damodar D/S of Effluent Discharge 30-April-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	22	24		1.00	300	
2	Total Suspended Solids	42	76		5.00	\$	
3	Disolved Oxygen	5.20	4.90		0.10	4	
4	pH value	7.98	8.14		0.01	6.5-8.5	
5	Iron	0.08	0.06		0.05	5	
6	Chlorides	24	28		0.25	600	
7	BOD (3 days 27°C)	2.60	2.70		1.00	3	
8	Total Dissolved Solids	160	164		1.00	1500	
9	Copper	BDL	BDL		0.02	1.5	
10	Sulphate	24	26		1.00	400	
11	Nitrate	4.87	5.31		0.01	50	
13	Fluoride	0.35	0.38		0.05	1.5	
13	Selenium	BDL	BDL		0.01	0.05	
14	Arsenic	BDL	BDL		0.01	0.2	
15	Lead	BDL	BDL		0.05	0.1	
16	Zinc	0.02	BDL		0.02	15	
17	Hexavalent Chromium	BDL	BDL		0.01	0.05	
18	Phenolics	BDL	BDL		0.001	0.005	

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

Analysed By

Checked By

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

A - 18

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TEST REPORT

Job No. : 094313025 Date of Issue: 06/08/13
 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 : 31/07/13 Date of performance of Test: 31/07/13 to 06/08/13

TEST RESULT

The sample has been tested with the following results:-

Area : *Argada* Year **2013**
 Project : *Sirka* Quarter Ending Sept. **'2013**

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

Date of Sampling	SPM	RPM	SO2	NOx	Remarks
25/07/2013 - 26/07/2013	91	58	<25	20	

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

Date of Sampling	SPM	RPM	SO2	NOx	Remarks
25/07/2013 - 26/07/2013	67	57	<25	20	

Name of the Sampling Station *G.M. Office*

Date of Sampling	SPM	RPM	SO2	NOx	Remarks
26/07/2013 - 27/07/2013	60	21	<25	21	

Analysed By

Checked By

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

A-15

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TEST REPORT

Job No. : 094313025 Date of Issue: 31/07/13
 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 : 31/07/13 Date of performance of Test: -

TEST RESULT

The sample has been tested with the following results:-

Area : **Argada** Year **2013**
 Project : **Sirka** Quarter Ending Sept. **'2013**

Sampling Stations 1 P.O. Residence
 2 P.O. Office

Station Name	Date of Sampling	Noise Level
P.O. Residence	25/07/2013	46.4
P.O. Office	25/07/2013	48.8

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)

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: 07/08/13

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 : 31/07/13 Date of performance of Test: 31/07/13 to 07/08/13

TEST RESULT

The sample has been tested with the following results:-

Area : *Argada*

Year : **2013**

Project : *Sirka*

Quarter Ending Sept. : **'2013**

Sampling Station : 1. Mine Water
 2.
 3.

27-Jul-13

All parameter are in mg/l unless specified

BDL - Below Detectable Limit

Sl.No.	Parameter	Sampling Stations			Below Detection Limit	MOEF -SCH-VI STANDARDS	Remarks
		1	2	3			
1	Colour & Odour	Acceptable			5.0 Cannot be quantified	Acceptable	
2	Total Suspended Solids	44			25.00	100.0	
3	pH value	8.07			0.01	5.5 to 9.0	
4	Temperature (°C)	26.8			-	Shall not exceed 5 C above the receiving temp.	
5	Oil & Grease	2.00			2.00	10.0	
6	Total Residual Chlorine	BDL			0.02	1.0	
7	Ammonical Nitrogen	0.15			0.01	50.0	
8	Total Kjeldahl Nitrogen	2.40			1.00	100.0	
9	Free Ammonia	BDL			0.01	5.0	
10	B.O.D (3 days 27°C)	2.00			2.00	30.0	
11	COD	55			4.00	250.0	
12	Arsenic	BDL			0.005	0.2	
13	Lead	BDL			0.005	0.1	
14	Cadmium	BDL			0.0005	2.0	
15	Hexavalent Chromium	BDL			0.01	0.1	
16	Total Chromium	BDL			0.06	2.0	
17	Copper	BDL			0.03	3.0	
18	Zinc	BDL			0.01	5.0	
19	Selenium	BDL			0.005	0.05	
20	Nickel	BDL			0.10	3.0	
21	Fluoride	0.50			0.02	2.0	
22	Dissolved Phosphate	0.14			0.30	5.0	
23	Sulphide	0.005			0.005	2.0	
24	Phenolic Compounds	BDL			0.002	1.0	
25	Manganese	BDL			0.02	2.0	
26	Iron	BDL			0.06	3.0	
27	Nitrate Nitrogen	1.5			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: 07/08/13

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

Sample Description : Surface Water

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

Test Required : 19 items as per IS: 2296

Date of receipt of sample : 31/07/13 Date of performance of Test: 31/07/13 to 07/08/13

TEST RESULT

The sample has been tested with the following results:-

Area : Argada
Project : Sirka

Year : 2013
Quarter Ending Sept. : 2013

Sampling Stations 1 Damodar U/S of Effluent Discharge 27-Jul-13
 2 Damodar D/S of Effluent Discharge 27-Jul-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	20		5.0	300	
2	Total Suspended Solids	58	68		25.00	\$	
3	Disolved Oxygen	5.20	5.10		0.10	4	
4	pH value	7.97	8.14		0.01	6.5-8.5	
5	Iron	0.39	0.81		0.06	5	
6	Chlorides	26	28		2.00	600	
7	BOD (3 days 27°C)	2.60	2.80		2.00	3	
8	Total Dissolved Solids	164	170		25.00	1500	
9	Copper	BDL	BDL		0.03	1.5	
10	Sulphate	28	30		2.00	400	
11	Nitrate	7.97	8.41		0.50	50	
12	Fluoride	0.38	0.44		0.02	1.5	
13	Cadmium	BDL	BDL		0.0005	0.01	
14	Selenium	BDL	BDL		0.005	0.05	
15	Arsenic	BDL	BDL		0.005	0.2	
16	Lead	BDL	BDL		5.00	0.1	
17	Zinc	BDL	0.02		0.01	15	
18	Hexavalent Chromium	BDL	BDL		0.01	0.05	
19	Phenolics	BDL	BDL		0.002	0.005	

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

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Checked By

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(Authorized Signatory)

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TEST REPORT

Job No. : 094313025 Date of Issue: 08/01/14
 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 : 03/01/14 Date of performance of Test: 03/01/14 to 08/01/14

TEST RESULT

The sample has been tested with the following results:-

Area : *Argada* **Year** **2013**
Project : *Sirka* **Quarter Ending Dec.** **'2013**

All parameters are in µg/m³

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

Date of Sampling	SPM	RPM	SO ₂	NO _x	Remarks
27/12/2013 - 28/12/2013	97	60	<25	19	

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

Date of Sampling	SPM	RPM	SO ₂	NO _x	Remarks
27/12/2013 - 28/12/2013	431	237	<25	21	

Name of the Sampling Station *G.M. Office*

Date of Sampling	SPM	RPM	SO ₂	NO _x	Remarks
28/12/2013 - 29/12/2013	586	557	<25	22	

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TEST REPORT

Job No. : 094313025 Date of Issue: 03/01/14
 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 : 03/01/14 Date of performance of Test: -

TEST RESULT

The sample has been tested with the following results:-

Area : *Argada* **Year** **2013**
Project : *Sirka* **Quarter Ending Dec.** **'2013**

Sampling Stations 1 P.O. Residence
 2 P.O. Office

Station Name	Date of Sampling	Noise Level
P.O. Residence	27/12/2013	47.2
P.O. Office	27/12/2013	49.5

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

<i>Noise Level</i>	<i>6.00 AM to 10.00 PM</i>	<i>10.00 PM to 6.00 AM</i>
	<i>Leq 75 dB(A)</i>	<i>Leq 70 dB(A)</i>

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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 : 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 : 03/01/14

Date of performance of Test: 03/01/14 to 10/01/14

TEST RESULT

The sample has been tested with the following results:-

Area : Argada
Project : Sirka

Year : 2013
Quarter Ending Dec. : '2013

Sampling Station : 1. Mine Water

28-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			5.0 Cannot be quantified	Acceptable	APHA, 22 nd Edition IS 3025 /05:1983	Pt.Cobalt Physical, Qualitative
2	Total Suspended Solids	52			25.00	100.0	IS-3025/17:1984	Gravimetric
3	pH value	8.07			0.01	5.5 to 9.0	IS-3025/11:1983	Electrometric
4	Temperature (°C)	18.8			5.0	Shall not exceed 5 C above the receiving temp.	IS-3025/09:1984	Thermometric
5	Oil & Grease	BDL			2.00	10.0	IS-3025/39:1991	Partition Gravimetric
6	Total Residual Chlorine	BDL			0.02	1.0	APHA, 22 nd Edition	DPD
7	Ammonical Nitrogen	0.24			0.01	50.0	IS:3025/34:1988	Nessler's
8	Total Kjeldahl Nitrogen	2.40			1.00	100.0	IS:3025/34:1988	Nessler's
9	Free Ammonia	BDL			0.01	5.0	IS:3025/34:1988	Nessler's
10	B.O.D (3 days 27°C)	2.00			2.00	30.0	IS-3025/44:1993	3 day incubation at 27°C
11	COD	60			4.00	250.0	IS-3025/58:2006	Titration
12	Arsenic	BDL			0.005	0.2	APHA, 22 nd Edition	AAS-GTA
13	Lead	BDL			0.005	0.1	APHA, 22 nd Edition	AAS-GTA
14	Cadmium	BDL			0.0005	2.0	APHA, 22 nd Edition	AAS-GTA
15	Hexavalent Chromium	BDL			0.01	0.1	APHA, 22 nd Edition	Diphenylcarbohydrazide
16	Total Chromium	BDL			0.06	2.0	IS-3025/52:2003	AAS-Flame
17	Copper	BDL			0.03	3.0	IS-3025/42:1992	AAS-Flame
18	Zinc	BDL			0.01	5.0	IS-3025/49:1994	AAS-Flame
19	Selenium	BDL			0.005	0.05	APHA, 22 nd Edition	AAS-GTA
20	Nickel	BDL			0.10	3.0	IS-3025/54:2003	AAS-Flame
21	Fluoride	0.30			0.02	2.0	APHA, 22 nd Edition	SPADNS
22	Dissolved Phosphate	BDL			0.30	5.0	APHA, 22 nd Edition	Molybdovanadate
23	Sulphide	BDL			0.005	2.0	APHA, 22 nd Edition	Methylene Blue
24	Phenolic Compounds	BDL			0.002	1.0	APHA, 22 nd Edition	4-Amino Antipyrine
25	Manganese	BDL			0.02	2.0	APHA, 22 nd Edition	AAS-Flame
26	Iron	BDL			0.06	3.0	IS-3025/53:2003	AAS-Flame
27	Nitrate Nitrogen	2.2			0.50	10.0	APHA, 22 nd Edition	UV Spectrophotometric

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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 : Surface Water

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

Test Required : 19 items as per IS: 2296

Date of receipt of sample : 03/01/14

Date of performance of Test: 03/01/14 to 10/01/14

TEST RESULT

The sample has been tested with the following results:-

Area : **Argada**
Project : **Sirka**

Year : **2013**
Quarter Ending Dec. : **'2013**

Sampling Stations 1 Damodar U/S of Effluent Discharge
 2 Damodar D/S of Effluent Discharge

28-Dec-13
 28-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	12	14		5.0	300	APHA, 22 nd Edition	Platinum Cobalt
2	Total Suspended Solids	48	54		25.00	\$	IS-3025/17:1984	Gravimetric
3	Disolved Oxygen	5.20	5.10		0.10	4	IS-3025/38:1989	Winkler Azide
4	pH value	8.10	8.14		0.01	6.5-8.5	IS-3025/11:1983	Electrometric
5	Iron	BDL	BDL		0.06	5	IS-3025/53:2003	AAS-Flame
6	Chlorides	22	26		2.00	600	IS-3025/32:1988	Argentometric
7	BOD (3 days 27°C)	2.60	2.80		2.00	3	IS-3025/44:1993	3 day incubation at 27°C
8	Total Dissolved Solids	160	174		25.00	1500	IS-3025/16:1984	Gravimetric
9	Copper	BDL	BDL		0.03	1.5	IS-3025/42:1992	AAS-Flame
10	Sulphate	12	14		2.00	400	APHA, 22 nd Edition	Turbidity
11	Nitrate	5.75	6.20		0.50	50	IS-3025/34:1988	Nessler's
12	Fluoride	0.35	0.38		0.02	1.5	APHA, 22 nd Edition	SPADNS
13	Cadmium	BDL	BDL		0.0005	0.01	APHA, 22 nd Edition	AAS-GTA
14	Selenium	BDL	BDL		0.005	0.05	APHA, 22 nd Edition	AAS-GTA
15	Arsenic	BDL	BDL		0.005	0.2	APHA, 22 nd Edition	AAS-GTA
16	Lead	BDL	BDL		0.005	0.1	APHA, 22 nd Edition	AAS-GTA
17	Zinc	BDL	BDL		0.01	15	IS-3025/49:1994	AAS-Flame
18	Hexavalent Chromium	BDL	BDL		0.01	0.05	APHA, 22 nd Edition,	Diphenylcarbohydrazide
19	Phenolics	BDL	BDL		0.002	0.005	APHA, 22 nd Edition	4-Amino Antipyrine

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

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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:	07.03.14
Mode of Receipt of Sample:	Jointly sampling with customer	Date of Analysis:	07.03.14-17.03.14
Sampling Protocol:	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution	Date of Reporting:	17.03.14
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 : **Argada** **Project:** **Sirka**

Stations:

1. P.O. Residence	Date of Sampling:
2. P.O. Office	28-28/02/2014
3. G.M. Office	28/02-01/03/2014
4.	28/02-01/03/2014

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	115	185	283	
2	Particulate Matter (PM ₁₀)	µg/m ³	IS: 5182/23 2006	45	104	250	
3	Sulphur Dioxide (SO ₂)	µg/m ³	IS: 5182 /02 2001 R-2006	<25	<25	<25	
4	Nitrogen Oxides (as NO _x)	µg/m ³	IS: 5182 /02 1975 R-1998	22	21	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:	07/03/14
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 : **Argada** **Project:** **Sirka**
Stations:
 1. P.O. Residence
 2. P.O. Office
 3.
 4.

Station Name	Date of Sampling	Noise Level
P.O. Residence	28/02/2014	47.3
P.O. Office	28/02/2014	49.4

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

<i>Noise Level</i>	<i>6.00 AM to 10.00 PM</i>	<i>10.00 PM to 6.00 AM</i>
	<i>Leq 75 dB(A)</i>	<i>Leq 70 dB(A)</i>

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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:	07.03.14
Mode of Receipt of Sample:	Picked up sample by laboratory	Date of Analysis:	07.03.14-15.03.14
Testing Protocol:	MOEF -SCH-VI STANDARDS, Class 'A'	Date of Reporting:	15.03.14
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 : **Argada** **Project:** **Sirka**

Stations: 1. Mine Water **Date of Sampling:** **04/03/2014**

2.

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	27			25.00	100.0	IS 3025/17:1984, R :1996, Gravimetric
2	pH value	8.27			0.01	5.5 to 9.0	IS-3025/11:1983, R-1996, Electrometric
3	Temperature (°C)	23.7			5.0	Shall not exceed 5 C above the receiving temp.	IS-3025/09:1984, Thermometric
4	Oil & Grease, mg/l, Max	<2.00			2.00	10.0	IS 3025/39:1991, R : 2003, Partition Gravimetric
5	Total Residual Chlorine, mg/l, Max	<0.02			0.02	1.0	APHA, 22 nd Edition, DPD
6	Ammonical Nitrogen, mg/l, Max	0.18			0.01	50.0	IS 3025/34:1988, R : 2009, Nessler's
7	Total Kjeldahl Nitrogen, mg/l, Max	1.25			1.00	100.0	IS:3025/34:1988, Nessler's
8	Free Ammonia, mg/l, Max	<0.01			0.01	5.0	IS:3025/34:1988, Nessler's
9	B.O.D (3 days 27°C), mg/l, Max	<2.00			2.00	30.0	IS 3025 /44:1993,R:2003 3 day incubation at 27°C
10	COD, mg/l, Max	32			4.00	250.0	APHA, 22 nd Edition, Closed Reflux, Titrimetric
11	Arsenic, mg/l, Max	<0.005			0.005	0.2	IS 3025/37:1988 R : 2003, AAS-VGA
12	Lead, mg/l, Max	<0.005			0.005	0.1	APHA, 22 nd Edition, AAS-GTA
13	Cadmium, mg/l, Max	<0.0005			0.0005	2.0	APHA, 22 nd Edition, AAS-GTA
14	Hexavalent Chromium, mg/l, Max	<0.01			0.01	0.1	APHA, 22 nd Edition, Diphenylcarbohydrazide
15	Total Chromium, mg/l, Max	<0.06			0.06	2.0	IS-3025/52:2003, AAS-Flame
16	Copper, mg/l, Max	<0.03			0.03	3.0	IS 3025/42: 1992 R : 2009, AAS-Flame
17	Zinc, mg/l, Max	0.02			0.01	5.0	IS 3025 /49 : 1994, R : 2009, AAS-Flame
18	Selenium, mg/l, Max	<0.005			0.005	0.05	APHA, 22 nd Edition, AAS-GTA
19	Nickel, mg/l, Max	<0.10			0.10	3.0	IS-3025/54:2003, AAS-Flame
20	Fluoride, mg/l, Max	0.54			0.02	2.0	APHA, 22 nd Edition, SPADNS
21	Dissolved Phosphate, mg/l, Max	0.35			0.30	5.0	APHA, 22 nd Edition Molybdovanadate
22	Sulphide, mg/l, Max	<0.005			0.005	2.0	APHA, 22 nd Edition, Methylene Blue
23	Phenolic Compounds, mg/l, Max	<0.002			0.002	1.0	APHA, 22 nd Edition 4-Amino Antipyrine
24	Manganese, mg/l, Max	<0.02			0.02	2.0	IS-3025/59:2006, AAS-Flame
25	Iron, mg/l, Max	<0.06			0.06	3.0	IS 3025 /53 : 2003, R : 2009 , AAS-Flame
26	Nitrate Nitrogen, mg/l, Max	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:	07.03.14
Mode of Receipt of Sample:	Picked up sample by laboratory	Date of Analysis:	07.03.14-15.03.14
Testing Protocol:	-	Date of Reporting:	15.03.14
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 :	Argada	Project:	Sirka
Stations:	1. Damodar U/S of Effluent Discharge 2. Damodar D/S of Effluent Discharge 3. 4.		Date of Sampling: 04/03/2014 04/03/2014

Sl. No	Parameter	Sampling Stations				Desirable Limits	BIS Standard & Method
		1	2	3	4		
1	Total Suspended Solids, mg/l, Max	37	48			25.00	IS 3025 /17:1984, R :1996, Gravimetric
2	Disolved Oxygen, min.	5.80	5.20			0.10	IS 3025/381989, R : 2003, Winkler Azide
3	pH value	8.14	8.22			0.01	IS-3025/11:1983, R-1996, Electrometric
4	Iron, mg/l, Max	0.11	0.08			0.06	IS 3025 /53 : 2003, R : 2009 , AAS-Flame
5	Chlorides, mg/l, Max	24	26			2.00	IS-3025/32:1988, R-2007, Argentometric
6	BOD (3 days 27°C), mg/l, Max	2.60	2.80			2.00	IS 3025 /44: 1993, R : 2003 3 day incubation at 27°C
7	Dissolved Solids, mg/l, Max	172	188			25.00	IS 3025 /16:1984 R : 2006, Gravimetric
8	Copper, mg/l, Max	<0.03	<0.03			0.03	IS 3025 /42 : 1992 R : 2009, AAS-Flame
9	Sulphate, mg/l, Max	28	32			2.00	APHA, 22 nd Edition Turbidity
10	Nitrate , mg/l, Max	5.31	6.20			0.50	APHA, 22 nd Edition, UV-Spectrophotometric
11	Fluoride, mg/l, Max	0.38	0.42			0.02	APHA, 22 nd Edition SPADNS
12	Cadmium, mg/l, Max	<0.0005	<0.0005			0.0005	APHA, 22 nd Edition AAS-GTA
13	Selenium, mg/l, Max	<0.005	<0.005			0.005	APHA, 22 nd Edition AAS-GTA
14	Arsenic, mg/l, Max	<0.005	<0.005			0.005	IS 3025/37:1988 R : 2003, AAS-VGA
15	Lead, mg/l, Max	<0.005	<0.005			0.005	APHA, 22 nd Edition AAS-GTA
16	Zinc, mg/l, Max	<0.01	<0.01			0.01	IS 3025 /49 : 1994, R : 2009, AAS-Flame
17	Hexavalent Chromium, mg/l, Max	<0.01	0.01			0.01	APHA, 22 nd Edition, 1,5 - Diphenylcarbohydrazide
18	Phenolics, mg/l, Max	<0.002	<0.002			0.002	APHA, 22 nd Edition 4-Amino Antipyrine

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

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