CENTRAL COALFIELDS LIMITED

(A MINIRATNA CAT-1 COMPANY)

(GOVT. OF INDIA UNDERTAKING)

OFFICE OF THE PROJECT OFFICER
JARANGDIH COLLIERY, KATHARAAREA
PO:-JARANGDIH, BOKARO,JHARKHAND-829113

Ref:PO/JRD/ENV/2023/1168 Date:- 01/08/2023

Registered Post

To,

The Member Secretary
State Pollution Control Board
T.A. Bhawan, HEC Campus, Dhurwa,
Ranchi-834004, Jharkhand

Sub: Submission of Annual Environmental Statement Report for the year 2022-23 of Jarangdih Opencast Mine of Kathara Area, CCL.

Respected Sir,

Please find herewith the copy of Annual Environmental Statement Report which is prepared as per statutory requirement for the year 2022-23 of Jarangdih Opencast Mine,Kathara Area, CCL.

This is for your kind information.

Yours faithfully

Project Officer
Jarangdih Colliery

Copy for Kind Information-

1. The Regional Officer, JSPCB HIG-1, Sardar Patel Nagar, Dhanbad, 826001
2. The General Manager, Kathara Area
3. The S.O.(Env.), Kathara Area
4. The Office copy

ENVIRONMENTAL STATEMENT

OF

JARANGDIH OC

FOR

2022-23

CENTRAL COALFIELDS LIMITED

EXECUTIVE SUMMARY

E-1 This Environmental Statement Report has been prepared as per gazette notification no. G.S.R. 329 (E) dated 13th March 1992 laid down by Ministry of Environment& Forest. The Environmental Audit has been subsequently renamed to "Environmental Statement" vide MOEF gazette notification no. G.S.R. 386 (E) dated 22nd April 1993.

E-2 The Jarangdih OCP of Central Coalfields Limited is situated in the East Bokaro Coalfields in Bokaro dist. of Jharkhand State.

E-3 The Environmental Monitoring is carried out as per the guide lines of Ministry of Environment &Forest (MOEF).

E-4 The quality of Ambient air, effluent water, surface water and noise is monitored to study the level of pollution. The main air pollutant is Suspended Particulate Matter (SPM). It is difficult to quantify the amount of air pollutants generated due to mining. However, the results show that SPM, SOx, NOx and heavy metal values which are generally below permissible limits prescribed by Ministry of Environment & Forest (MOEF).

E-5 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 agriculture purpose and dust suppression.

E-6 The noise levels recorded are generally below permissible limits prescribed by Ministry of Environment & Forest (MOEF). There is no continuous high level sound frequency of impulsive nature.

E-7 PM10 analyzer has been installed at the Jarangdih Railway siding and CAAQMS is installed at the gate of GM office, Kathara. Both are connected to JSPCBand CPCB server for uninterruptedly data transmission of environmental quality parameters.

E-8 Raw materials used in coal mining activities are explosives, diesel and POL for machines and automobiles. The consumption is detailed in part-B of Statement Form.

E-9 Hazardous waste is not being produced either from mining operations or from any pollution control facilities except for Over Burden in case of OCP.

Regular measures are being taken to control air, water & noise pollutions discussed in detail in parts-G, H & I of the Statement Form.

E-10 Also, measures are taken for implementation of the Environmental Management Plan for the project as per project report.

E-11 This Annual Environmental Statement Report for the year 2022-23, has been prepared as per statutory requirement.

CHAPTER –1

PROJECT DESCRIPTION

1.1 INTRODUCTION

The Jarangdih OC of Central Coalfields limited is located in the East Bokaro district of Jharkhand state. The EC/CTO capacity of the project is 0.88 MTY. At present planned production of Jarangdih OC is 0.872 MTY.

1.2 LOCATION & COMMUNICATION :

Jarangdih colliery is situated in the East Bokaro Coalfield in the Bokaro District of Jharkhand State. Latitude: $23^0$47'31" & $23^0$47'53"N Longitude: $85^0$54'14" & $85^0$55'14" E Area of the Block-1.36Sqkm Strike-Strike of the formation is E-W to NE-SW Dip-The direction of dip is southerly and its amount varies from 5 degree to 45 degree. East Bokaro Coalfield is known to be the most important source of medium coking coal in the country. Even before the nationalisation of coal industry, the coalfield was under active exploitation by the then NCDC and the private owners. The Jarangdih block is located in the central part of the coalfield. This is one of the several blocks notified by the NCDC for detail exploration and exploitation in the East Bokaro Coalfield.

The Jarangdih opencast block is well connected by both rail and road. The Gomoh-Barkakana loop line of the Eastern railway passes along the northern bank of the Konar River adjoining Jarangdih Opencast Block. The Jarangdih Railway Station is located within 1km from the block. Another feeder line connecting Kathara from Jarangdih passes about 1km from the eastern and southern boundaries of the block. The block is well connected by black tar road to different areas of East Bokaro Coalfield and in turn to major cities around the block. The block is about 90kms from Hazaribagh and 120kms from Ranchi via Tenughat Dam. The nearest Air strip connected by the regular airlines is at Ranchi. Another private air strip belonging to IEL is located near Sawang colliery at about 15 km from block.

1.3 SALIENT FEATURES :

At present planned production capacity of Jarangdih OC is 0.872 MTY. The mine is operated with shovel-dumper mechanism.

CHAPTER – II

ENVIRONMENTAL STATEMENT FORM -V

Environmental Statement for the financial year ending March'2022

PART – A

(i) Name and Address of the mine.	:	JARANGDIH OCP Place : Jarangdih colliery Post : Jarangdih colliery Distt : Bokaro, JHARKHAND
(ii) Industry Category	:	Primary
(iii) Production Capacity	:	OC - 0.88MTY as per EC J-11015/502/2008-IA-II(M) dated 01.03.2012 for a capacity 0.88MTPA Production during year 2022-23 is 0.872 MTPA
(iv) Date of last Env. Statement Report:		The last Env. Statement Report was submitted by for the year 2021-22

PART – B

WATER AND RAW MATERIAL CONSUMPTION

I. Water consumption (M^3/ day)

Mining		
a	Transportation Road and Haul road dust suppression	362
b	Workshop	12
c	Fire fighting	Nil
d	Others (service, building, siding etc.)	975
Domestic		
a	Domestic including service and welfare building	2264

WATER CONSUMPTION PER UNIT OF PRODUCT

Name of Product	Water Consumption per Unit of Product (coal)	
	During financial year (2022-23)	During financial year (2021-22)
Coal	1.512 cum/tonne	2.215 cum/tonne

II. RAW MATERIAL CONSUMPTION :

Sl.No.	Name of raw material	Name of products	Consumption of raw material per Unit of Product (coal)	
			During the financial year (2022-23)	During the financial year (2021-22)
1.	Explosives		1.308 Kg/tonne	0.610 Kg/tonne

PART - C
POLLUTION GENERATED
(PARAMETERS SPECIFIED IN THE CONSENT ISSUED)

Pollutions	Quantity of pollution generated	Percentage variation from prescribed standards with reasons	
WATER	Water discharged from: (a)Mine-2211 cum /day (b)Workshop- 00 cum /day (c)Colony-2264 cum /day It is difficult to quantify the amount of pollutants.	The analysis results reveal that all of the parameters are below the limits prescribed by MOEF.	Analysis report for the qtr ending –Mar 2023 is attached as **Annexure-I.**
AIR	It is difficult to quantify the amount of air pollutants. The main air pollutant is suspended particulate matter (SPM).	Ambient air quality analysis results shows that SO2, NOx, heavy metals & SPM level are well within prescribed standards.	

PART - D
HAZARDOUS WASTES

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

Hazardous Wastes	**Total quantity**	
	During the financial year (2022-23)	**During financial year (2021-22)**
a) From process	Used oil-8.848KL Used Led Acid batteries-18 Nos Filter used – 146 Nos	Used oil-13.25 KL Used Led Acid batteries-17 Nos Filter used – 360 Nos
b) From pollution control facilities	Nil	Nil

PART – E

SOLID WASTES

	Total Quantity (in M m^3)	
	During the previous financial year (2022-23)	During the previous financial year (2021-22)
a) **From process (Mining)**Overburden	1.283878 Mm3	0.249948 Mm3
b) **From pollution control facilities**	Nil	Nil
c) **Quantity recycled or reutilized**	The entire volume of O.B. material is being used as external dump.	The entire volume of O.B. material is being used as external dump

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.Landfill Site: OB used as a landfill site for burying of filters.
2.Regional Store: Burnt Oil and Batteries are transported to the Regional Store.
3.ETP at workshop: Advance treatment of Oil and Grease and zero liquid discharge.

Hazardous waste is not being produced either from mining operation or from any pollution control facilities. During opencast mining, overburden and top soil are produced as solid wastes temporarily as these materials are used for land reclamation.
The overburden material is more or less homogeneous comprising mainly sand, silt, clay and gravel. Overburden generated during 2022-23 was 1.283878 Million cubic meter.

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 have been taken to control air pollution:

(i) Wind Barriers/Screen is installed along the periphery of railway siding.

(ii) Increase of massive 3-tier plantation is practised.

(iii) Vehicular emissions is kept under control and regularly monitored. Record of PUC certificates is maintained.

(iv) Vehicles used for transporting the mineral is covered with tarpaulins and optimally loaded.

(v) Tyre Washing facility is provided for all vehicles at the exit pointof the Opencast Mine.

(vi) Regularly sprinkling is being done by using Mobile water sprinkler. Fixed water sprinklers are installed along the platform and HMB road near the entrance of siding to crusher the weighbridge. Overhead fixed sprinkles already installed at weighbridge.

(vii) Water Jet spray system installed at crusher and fully closed to control fugitive emission.

(viii) Blasting operations are carried out under congenial weather condition, i.e. Avoiding temperature inversion,etc.

(ix) Plantation along the haul road and in other vacant spaces.

(x) Water sprinkling on coal stock.

(xi) All drills are wet operated.

(xii) All necessary precautions are taken during drilling, blasting, loading and transporting operations.

(xiii) Regular road seeping is done on HMB road.

(xiv) Approach roads and roads of colonies are black topped with revenue plantation.

(xv) PM10 analyzer has been installed at the Jarangdih Railway siding and CAAQMS is installed at the gate of GM office, Kathara. Both are connected to JSPCBand CPCB server for uninterruptedly data transmission of environmental quality parameters.

(xvi) Monitoring of Air quality parameters and its analysis is being done by CMPDI which is equipped NABL accredited laboratory.

2.0 WATER POLLUTION CONTROL MEASURES :

The following measures have been taken to control water pollution from the mine:

(i) Mine Sumps have been provided for collection and treatment of Mine Seepage water.

(ii) The mine water is discharged on wasteland after passing through a tank which acts as a settling pond. Finally; mine water reaches to Konar River flowing in the project area. Construction of Siltation pond is also at execution phase. Major portion of mine water is used dust suppression in mines and transportation roads.

(iii) A system of open drain exists within the leasehold area to collect the storm runoff from paved area, road, roof top,etc.& lead them to natural drains directly.

(iv) Garland drain is provided around the quarry to collect the surface run-off .This also prevents storm water to enter into the quarry area.

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

(vi) Colony and other service buildings are provided with septic tank and soak pit. Also, water is supplied after filtration and disinfection for domestic use.

(vii) Proposal for construction of STP is in tendering process.

(viii) 100 KLD ETP is constructed at the Workshop of Jarangdih OCP. Treated waste water is being reused.

(ix) Toe-wall with catch drain and settling tank is provided along OB Dump to arrest the silt flowing into water.

(x) Monitoring of Surface water and Effluent water quality parameters and its analysis is being done by CMPDI which is equipped NABL accredited laboratory.

3.0 NOISE POLLUTION CONTROL MEASURES:

(i) Plantation barriers have been developed around residential locations & are proposed around other noise prone area.

(ii) Efforts are being made to keep HEMMs properly maintained so as to produce least noise.

(iii) Control blasting with the use of electronic detonators is carried out between 2 PM to 4.00 PM.

(iv) Use of HEMMs with sound proof cabin.

(v) Ear plugs/muffs are provided to workers engaged in blasting and drilling operations etc. as per requirement.

(vi) Monitoring of Noise quality parameters and its analysis is being done by CMPDI which is equipped NABL accredited laboratory.

4.0. MEASURES FOR RECLAMATION OF LAND

(i) After the back-filling and external dump reaches its final stage, it is proposed to start technical and biological reclamation of the external dumps. At the end of mining operation, some de-coaled area will remain empty, which would be used for storing rain water.

(ii) 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.

(iii) Final reclamation will be done as per Project Report of in consultation with the local DFO/Agricultural department.

PART – H

ADDITIONAL INVESTMENT PROPOSAL FOR ENVIRONMENTAL PROTECTION INCLUDING ABATEMENT OF POLLUTION

The following are the additional investment proposal for environmental protection:

i. The environmental monitoring of the project will be continued as per guidelines of MOEF.

ii. All residential quarters constructed for the Project has been provided with septic latrines and effluents are disposed off in soak pits. Proposal for construction of STP in colonies is in tendering process.

iii. The air and water consent is taken from Jharkhand State Pollution Control Board, Ranchi each year.

iv. Environmental statement report is prepared for each financial year ending 31'st March.

v. Progressive plantation is done as per requirement.

vi. Installation of Digital Water Level Recorder for the piezometer is tendering process.

vii. A time series of land use maps of Jarangdih OCP, based on satellite imagery is prepared in every 3 years.

viii. An ESCROW account for the Mine closure of Jarangdih OCP has been opened.

ix. Settling tank with drain will be installed at Jarangdih siding.

x. Plantation over an area of 16.77 Ha is in process over transportation road and OB dump with consultation of DFO, Hazaribagh.

xi. Seed Ball plantation is in process over an area of 15 Ha over at OB dump.

xii. Toe wall with catch drain all along OB dump will be constructed.

xiii. Modification of Tyre washing facility is in tendering process..

xiv. Rooftop rain water harvesting system proposed at Workshop, Filter plant and other service buildings

xv. Fixed sprinklers to be installed at Coal Stock of OCP and Rly. Siding.

Item wise expenditure on Environment protection measure for Jarangdih Project

Sl. No.	Item			Expenditure (lakh)			
			23-2022	2021-22	2020-21	2019-20	2018-19
1.	Seed Ball					2.065	
2.	Controlled Blasting	1. Wire Net			1.06	1.06	2.85
		2. Sake/Jute bag				0.61	2.43
3.	Water sprinkler on public road				2.67		13.86
4.	Fixed Sprinklers at Siding along the weighbridge				5		
5.	Tyre washing platform at Exit point of Mine				4.14		
6.	Wind Breaking Mesh along the railway siding			35	16.36		
7.	Distribution of Saplings to the Employees				0.90		
8.	Earth Cutting and dressing for covering of Fly Ash/coal dust				2.77		
9.	Peizometer			2.50			
10.	Siltation pond			2.96			
11.	Construction of 2 nos. silt settling tank with drain for drainage of Railway siding.			11.77			
12.	Installation of PM10 analyzer			9			
13.	Toe wall 225m at dump			7.30			
14.	Bamboo and other plantation			10			
15.	ETP at workshop		19				
16.	Fixed sprinklers along Jarangdih HMB Road near Siding		11.90				
17.	Plantation of Polyalthia longifolia (Ashok) along Railway Siding, Jarangdih OCP		11.37				
18.	Toe wall 250m at dump		15.59				
	Total		**57.86**	**78.53**	**32.90**	**3.735**	**19.14**

Proposed Capital budget of Jarangdih Project

Sl. No.	FY	Item	Expenditure(lakh)	Remarks
1.	2023-24	Plantation with 3 years of maintenance	80	Award of work has been done
2.	2023-24	STP at Colony	200	Approval phase
3.	2024-25	Delivery of Pipeline from Mine sump to Filter Plant Jarangdih for mine water utilization	100	FY 2024-25
4.	2024-25	Toe-wall, Garland Drains, Settling ponds etc. to environmental measures	100	FY 2024-25
5.	2024-25	Mist Fogger Machine to control dust	100	FY 2024-25
6.	2024-25	Perforated Wind Screen	60	FY 2024-25
7.	2024-25	Toe-wall, Garland Drains, Settling ponds etc. to environmental measures	60	FY 2024-25
		Total	**700**	

PART - I

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

1. The Environmental monitoring is carried out for the project by CMPDI as per the guide lines of the Ministry of Environment & Forest(MOEF). Ambient air quality, quality of effluent discharged from the mine, surface water and noise level all conform to the prescribed limits.
2. Environmental Impact Assessment and Environmental Management Plan has been prepared for Jarangdih OCP as per EIA Notification, 2006 and will be followed accordingly.
3. The Environmental Statement for the project is prepared yearly.

PE(EXCV.)
Jarangdih Colliery

Nodal Officer(ENV)
Jarangdih Colliery

Officer(Survey)
Jarangdih Colliery

PE(E&M)
Jarangdih Colliery

Manager
Jarangdih OCP

Project Officer
Jarangdih Colliery

TEST REPORT

03/23 Test Report No. 1914	Job No. 094322160	Year	FY2022-23
Type of Sample	Ambient Air	Quarter Ending	Mar-23
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol:	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results:-

Area : **Kathara** **Project:** **Jarangdih OC** **Stations:** Gayatri Colony

Month	Date of Sampling	Date of receipt of sample	Date of analysis	Parameters (in µg/m³)					Wind Direction (from) & Weather
				Total Particulate Matter (PM_{10}+ >PM_{10})TPM	Particulate Matter (PM_{10})	Particulate Matter ($PM_{2.5}$)	Sulphur Dioxide (SO_2)	Nitrogen Oxides (as NO_x)	
Jan-23 1st FN	04/01/23-05/01/23	16-01-2023	16/01/23-27/01/23	429	121	69	< 25	< 6	East Sunny
Jan-23 2nd FN	18/01/23-19/01/23	01-02-2023	01/02/23-10/02/23	179	72	30	< 25	< 6	East Sunny
Feb-23 3rd FN	05/02/23-06/02/23	16-02-2023	16/02/23-27/02/23	190	82	47	< 25	< 6	East Sunny
Feb-23 4th FN	19/02/23-20/02/23	01-03-2023	01/03/23-16/03/23	130	53	22	< 25	< 6	East Sunny
Mar-23 5th FN	03/03/23-04/03/23	16-03-2023	16/03/23-31/03/23	141	79	48	< 25	< 6	East Sunny
Mar-23 6th FN	18/03/23-19/03/23	01-04-2023	01/04/23-13/04/23	141	68	39	< 25	< 6	East Sunny

Note:
1. Gazette Notification No. G.S.R 742(E) dt.25th Sept.'2000 is applicable in core zone.
2. Gazette Notification No. G.S.R 826 (E) dt.Nov.'2009 is applicable in buffer zone.

Analysed By

Authorized Signatory

TEST REPORT

03/23 Test Report No. 1915	Job No. 094322160	Year	FY2022-23
Type of Sample	Ambient Air	Quarter Ending	Mar-23
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol:	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results:-

Area : **Kathara** **Project:** **Jarangdih OC** **Stations:** **Jarangdih Colony**

Month	Date of Sampling	Date of receipt of sample	Date of analysis	Parameters (in µg/m³)					Wind Direction (from) & Weather
				Total Particulate Matter (PM_{10}+ >PM_{10})TPM	Particulate Matter (PM_{10})	Particulate Matter ($PM_{2.5}$)	Sulphur Dioxide (SO_2)	Nitrogen Oxides (as NO_x)	
Jan-23 1st FN	04/01/23-05/01/23	16-01-2023	16/01/23-27/01/23	174	87	42	< 25	< 6	North Sunny
Jan-23 2nd FN	18/01/23-19/01/23	01-02-2023	01/02/23-10/02/23	205	81	44	< 25	< 6	East Sunny
Feb-23 3rd FN	05/02/23-06/02/23	16-02-2023	16/02/23-27/02/23	174	79	37	< 25	< 6	East Sunny
Feb-23 4th FN	19/02/23-20/02/23	01-03-2023	01/03/23-16/03/23	182	73	37	< 25	< 6	East Sunny
Mar-23 5th FN	03/03/23-04/03/23	16-03-2023	16/03/23-31/03/23	135	65	35	< 25	< 6	East Sunny
Mar-23 6th FN	18/03/23-19/03/23	01-04-2023	01/04/23-13/04/23	172	76	35	< 25	< 6	East Sunny

Note:

1. Gazette Notification No. G.S.R 742(E) dt.25th Sept.'2000 is applicable in core zone.
2. Gazette Notification No. G.S.R 826 (E) dt.Nov.'2009 is applicable in buffer zone.

Analysed By Authorized Signatory

TEST REPORT

03/23 Test Report No. 1916	Job No. 094322160	Year	FY2022-23
Type of Sample	Ambient Air	Quarter Ending	Mar-23
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol:	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results:-

Area : **Kathara** **Project:** **Jarangdih OC** **Stations:** **P.O.Office**

Month	Date of Sampling	Date of receipt of sample	Date of analysis	Parameters (in µg/m³)					Wind Direction (from) & Weather
				Total Particulate Matter (PM_{10}+ >PM_{10})TPM	Particulate Matter (PM_{10})	Particulate Matter ($PM_{2.5}$)	Sulphur Dioxide (SO_2)	Nitrogen Oxides (as NO_x)	
Jan-23 1st FN	04/01/23-05/01/23	16-01-2023	16/01/23-27/01/23	201	101	51	< 25	< 6	North Sunny
Jan-23 2nd FN	18/01/23-19/01/23	01-02-2023	01/02/23-10/02/23	241	113	55	< 25	< 6	East Sunny
Feb-23 3rd FN	05/02/23-06/02/23	16-02-2023	16/02/23-27/02/23	263	157	74	< 25	< 6	East Sunny
Feb-23 4th FN	19/02/23-20/02/23	01-03-2023	01/03/23-16/03/23	250	106	47	< 25	< 6	East Sunny
Mar-23 5th FN	03/03/23-04/03/23	16-03-2023	16/03/23-31/03/23	219	92	67	< 25	< 6	East Sunny
Mar-23 6th FN	18/03/23-19/03/23	01-04-2023	01/04/23-13/04/23	185	75	44	< 25	< 6	East Sunny

Note:

1. Gazette Notification No. G.S.R 742(E) dt.25th Sept.'2000 is applicable in core zone.
2. Gazette Notification No. G.S.R 826 (E) dt.Nov.'2009 is applicable in buffer zone.

Analysed By

Authorized Signatory

TEST REPORT

03/23 Test Report No. 1917	Job No. 094322160	Year	FY2022-23
Type of Sample	Ambient Air	Quarter Ending	Mar-23
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol:	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results:-

Area : **Kathara** **Project:** **Jarangdih OC** **Stations:** **Guest House**

Month	Date of Sampling	Date of receipt of sample	Date of analysis	Parameters (in µg/m³)					Wind Direction (from) & Weather
				Total Particulate Matter (PM_{10}+ >PM_{10})TPM	Particulate Matter (PM_{10})	Particulate Matter ($PM_{2.5}$)	Sulphur Dioxide (SO_2)	Nitrogen Oxides (as NO_x)	
Jan-23 1st FN	05/01/23-06/01/23	16-01-2023	16/01/23-27/01/23	140	64	31	< 25	< 6	North Sunny
Jan-23 2nd FN	19/01/23-20/01/23	01-02-2023	01/02/23-10/02/23	145	77	32	< 25	< 6	East Sunny
Feb-23 3rd FN	07/02/23-08/02/23	16-02-2023	16/02/23-27/02/23	117	67	31	< 25	< 6	East Sunny
Feb-23 4th FN	20/02/23-21/02/23	01-03-2023	01/03/23-16/03/23	214	81	41	< 25	< 6	East Sunny
Mar-23 5th FN	04/03/23-05/03/23	16-03-2023	16/03/23-31/03/23	122	54	25	< 25	< 6	East Sunny
Mar-23 6th FN	19/03/23-20/03/23	01-04-2023	01/04/23-13/04/23	198	85	47	< 25	< 6	East Sunny

Note:

1. Gazette Notification No. G.S.R 742(E) dt.25th Sept.'2000 is applicable in core zone.
2. Gazette Notification No. G.S.R 826 (E) dt.Nov.'2009 is applicable in buffer zone.

Analysed By

Authorized Signatory

TEST REPORT

03/23 Test Report No. 1918	Job No. 094322160	Year	FY2022-23
Type of Sample:	Noise	Quarter Ending	Mar-23
Customer	CCL		
Testing/ Sampling Protocol:	*'The noise pollution (Regulation and Control), Rules,2000, LQR 34*		
Remarks:			

TEST RESULT

The sample has been tested with the following results:-

Area : **Kathara** **Project:** **Jarangdih OC**

Station Name	Noise Level dB(A) Leq					
	Jan-23 1st FN	Jan-23 2nd FN	Feb-23 3rd FN	Feb-23 4th FN	Mar-23 5th FN	Mar-23 6th FN
	Day/Night	Day/Night	Day/Night	Day/Night	Day/Night	Day/Night
Date of recording	04-01-2023	18-01-2023	05-02-2023	19-02-2023	03-03-2023	18-03-2023
1. Gyatri Colony	47.6/37.3	50.2/46.1	51.6/49.9	51.3/49.7	50.2/46.1	51.1/45.1
Date of recording	04-01-2023	18-01-2023	05-02-2023	19-02-2023	03-03-2023	18-03-2023
2. Jarangdih Colony	48.4/38.2	47.2/45.4	51.8/49.2	51.6/49.2	47.2/45.4	50.1/45.1
Date of recording	04-01-2023	18-01-2023	05-02-2023	19-02-2023	03-03-2023	18-03-2023
3. P.O.Office	52.8/42.4	50.1/48.3	50.3/48.5	50.9/48.5	50.1/48.3	50.1/45.1
Date of recording	05-01-2023	19-01-2023	07-02-2023	20-02-2023	04-03-2023	19-03-2023
4. Guest House	50.2/40.1	46.2/45.3	50.7/48.2	50.6/48.2	47.2/45.3	50.1/45.1

Ambient Air Quality Standards in respect of Noise as per 'The noise pollution (Regulation and Control), Rules,2000		
Time Frame	*Limits in dB(A) Leq*	
	Day Time 6.00 AM to 10.00 PM	*Night Time 10.00 PM to 6.00 AM*
Industrial Area	*75*	*70*
Commercial Area	*65*	*55*
Residential area	*55*	*45*
Silence Zone	*50*	*40*

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TEST REPORT

03/23 Test Report No. 1919	Job No. 094322160	Year	FY2022-23
Type of Sample:	**Effluent Water**	Quarter Ending	Mar-23
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol:	**MOEF -SCH-VI STANDARDS, Class 'A', LQR 33**		
Remarks & Observation:	Samples received in 5 ltrs plastic Jerri cane, Colour as observed is transparent		

TEST RESULT

The sample has been tested with the following results:-

Area : **Kathara** **Project:** **Jarangdih OC** **Stations:** Mine Water

Analysis Results of FN Effluent Water							
Parameters →				**COD**	**O & G**	**pH value**	**TSS**
Detection Limit				**4**	**2**	**0.2**	**10**
MOEF -SCH-VI, STANDARDS, Class 'A'				**250**	**10**	**5.5 to 9.0**	**100**
Month	Date of Sampling	Date of Receipt of Sample	Date of Analysis	**Value in mg/l, except pH**			
Jan-23 1st FN	13/01/23	16/01/23	16/01/23-31/01/23	24	<2.00	8.3	54
Jan-23 2nd FN	23/01/23	01/02/23	01/02/23-15/02/23	20	<2.00	8.1	47.1
Feb-23 3rd FN	15/02/23	16/02/23	16/02/23-28/02/23	20	<2.00	8.5	42.5
Feb-23 4th FN	28/02/23	01/03/23	01/03/23-15/03/23	16	<2.00	8.6	40
Mar-23 5th FN	11/03/23	16/03/23	16/03/23-31/03/23	20	<2.00	7.8	43
Mar-23 6th FN	31/03/23	03/04/23	03/04/23-13/04/23	16	<2.00	8.2	39
BIS Standard & Method				APHA, 23rd Edition, Closed Reflux, Titrimetric Method, 2017	IS 3025/39:1991, R : 2003, Partition Gravimetric	IS-3025/11:1983, R-1996, Electrometric	IS 3025/17:1984, R :1996, Gravimetric Method

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TEST REPORT

03/23 Test Report No. 1920	Job No. 094322160	Year	FY2022-23
Type of Sample:	Surface Water	Quarter Ending	Mar-23
Customer	CCL	Date of Receipt:	16-01-2023
Mode of Receipt of Sample:	Joint sampling with customer	Date of Analysis:	16.01.23-11.04.23
Testing/ Sampling Protocol:	LQR 33		
Remarks & Observation:	Samples received in 5 ltrs plastic Jerri cane, Colour as observed is transparent		

TEST RESULT

The sample has been tested with the following results:-

Area : Kathara **Project:** Jarangdih OC

Stations: Konar River Near Railway Bridge **Date of Sampling:** 13-01-2023

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	IS 3025/37:1988 R : 2003, AAS-VGA, Method
2	BOD (3 days 27°C), mg/l, Max	<2.0				2.00	IS 3025 /44: 1993, R: 2003 3 day incubation at 27°C
3	Cadmium(as Cd), mg/l, Max	<0.0004				0.0004	APHA, 23rd Edition AAS-GTA Method, 2017
4	Chlorides (as Cl), mg/l, Max	8				2.00	IS-3025/32:1988, R-2007, Argentometric Method
5	Copper (as Cu), mg/l, Max	<0.02				0.02	IS 3025/42: 1992, R : 2009, AAS (Air-Ac-Flame)
6	Dissolved Oxygen, min.	7.3				0.10	IS 3025/38: 1989, R:2003, Winkler Azide Method
7	Fluoride (as F) mg/l, Max	0.38				0.02	APHA, 23rd Edition, SPADNS Method, 2017
8	Hexavalent Chromium, mg/l, Max	<0.01				0.01	APHA, 23rd Edition, 2017 Diphenylcarbohydrazide,
9	Iron (as Fe), mg/l, Max	<0.04				0.04	IS 3025 /53: 2003, R : 2009, AAS (Air-Ac-Flame)
10	Lead (as Pb), mg/l, Max	<0.001				0.001	APHA, 23rd Edition AAS-GTA Method, 2017
11	Nitrate (as NO_3), mg/l, Max	1.46				0.50	APHA, 23rd Edition, UV - Spectrophotometric, 2017
12	pH value	8.7				1.0	IS-3025/11:1983, R-1996, Electrometric Method
13	Phenolic compounds (as C_6H_5OH), mg/l, Max	<0.001				0.001	APHA, 23rd Edition, 2017, 4-Amino Antipyrine Method,
14	Selenium (as Se), mg/l, Max	<0.0005				0.0005	IS 3025/56:2003 AAS-VGA Method
15	Sulphate (as SO_4) mg/l, Max	17				2.00	APHA, 23rd Edition Turbidity Method, 2017
16	Total Dissolved Solids, mg/l, Max	121				25.00	IS 3025 /16:1984 R : 2006, Gravimetric Method
17	Total Suspended Solids, mg/l, Max	19				10.00	IS 3025 /17:1984, R :1996, Gravimetric Method
18	Zinc (as Zn), mg/l, Max	<0.005				0.005	IS 3025 /49: 1994, R : 2009, AAS (Air-Ac-Flame)

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TEST REPORT

03/23 Test Report No. Metal / 03		Job No. 094322160	2022-23
Type of Sample	Ambient Air	Quarter Ending	March '2023
Customer	CCL	Date of Receipt of Sample:	16/01/23
Mode of Receipt of Sample:	Joint sampling with customer	Date of Analysis:	06/02/23-10/02/23
Sampling Protocol:	USEPA IO-3.2: 1999, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results:-

Area : **Kathara** **Project:** **Jarangdih OC**

Stations: **Date of Sampling:**

1. Gayatri Colony 04-05/01/2023
2. Jarangdih Colony 04-05/01/2023
3. P.O.Office 04-05/01/2023
4. Guest House 05-06/01/2023

S.No	Test Parameters	Units	Test Result				Method detection Limit	Limit (NAAQS-2011)	Test Method
Stations:			1	2	3	4			
1	Conc. of As in Air	ng/m^3	0.87	0.74	2.17	1.09	0.1	6.00	USEPA IO-3.2:1999
2	Conc. of Ni in Air	ng/m^3	4.97	4.75	5.17	4.97	0.1	20.00	USEPA IO-3.2:1999
3	Conc. of Pb in Air	µg/m^3	0.019	0.027	0.018	0.019	0.005	1.0	USEPA IO-3.2: 1999
4	Conc. of Cu in Air	ng/m^3	0.16	0.12	0.14	0.15	0.1	-	USEPA IO-3.2: 1999
5	Conc. of Cd in Air	ng/m^3	0.03	0.06	0.05	0.07	0.02	-	USEPA IO-3.2: 1999
6	Conc. of Cr in Air	ng/m^3	0.87	0.60	1.19	1.25	0.1	-	USEPA IO-3.2: 1999
7	Conc. of Hg in Air	ng/m^3	<0.005	<0.005	<0.005	0.005	0.005	-	USEPA IO-3.2: 1999

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TEST REPORT

03/23 Test Report No. 1906	Job No. 094322160	Year	FY2022-23
Type of Sample	Ambient Air	Quarter Ending	March-23
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol:	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results:-

Area : **Kathara** **Project:** **Jarangdih OC** **Stations:** Gayatri Colony

Month	Date of Sampling	Date of receipt of sample	Date of analysis	Parameters NAAQS (8 Hourly Average)			Wind Direction (from) & Weather
				Ammonia (in µg/m³)	CO (in mg/m³)	Ozone (in µg/m³)	
Jan.'23 1st FN	04/01/23	04/01/23	04/01/23	<20	0.441	<19.62	E to W
Jan.'23 2nd FN	18/01/23	18/01/23	18/01/23	<20	0.503	<19.62	E to W
Feb.'23 3rd FN	05/02/23	05/02/23	05/02/23	<20	0.419	<19.62	E to W
Feb.'23 4th FN	19/02/23	19/02/23	19/02/23	<20	0.585	<19.62	E to W
March '23 5th FN	03/03/23	03/03/23	03/03/23	<20	0.563	<19.62	E to W
March '23 6th FN	18/03/23	18/03/23	18/03/23	<20	0.544	<19.62	E to W

Note:
1. Gazette Notification No. G.S.R 742(E) dt.25th Sept.'2000 is applicable in core zone.
2. Gazette Notification No. G.S.R 826 (E) dt.Nov.'2009 is applicable in buffer zone.

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TEST REPORT

03/23 Test Report No. 1907	Job No. 094322160	Year	FY2022-23
Type of Sample	Ambient Air	Quarter Ending	March-23
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol:	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results:-

Area : **Kathara** **Project:** **Jarangdih OC** **Stations:** **Jarangdih Colony**

Month	Date of Sampling	Date of receipt of sample	Date of analysis	Parameters NAAQS (8 Hourly Average)			Wind Direction (from) & Weather
				Ammonia (in µg/m³)	CO (in mg/m³)	Ozone (in µg/m³)	
Jan.'23 1st FN	04/01/23	04/01/23	04/01/23	<20	0.495	<19.62	E to W
Jan.'23 2nd FN	18/01/23	18/01/23	18/01/23	<20	0.461	<19.62	E to W
Feb.'23 3rd FN	05/02/23	05/02/23	05/02/23	<20	0.427	<19.62	N to S
Feb.'23 4th FN	19/02/23	19/02/23	19/02/23	<20	0.484	<19.62	E to W
March '23 5th FN	03/03/23	03/03/23	03/03/23	<20	0.513	<19.62	E to W
March '23 6th FN	18/03/23	18/03/23	18/03/23	<20	0.533	<19.62	E to W

Note:
1. Gazette Notification No. G.S.R 742(E) dt.25th Sept.'2000 is applicable in core zone.
2. Gazette Notification No. G.S.R 826 (E) dt.Nov.'2009 is applicable in buffer zone.

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TEST REPORT

03/23 Test Report No. 1908	Job No. 094322160	Year	FY2022-23
Type of Sample	Ambient Air	Quarter Ending	March-23
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol:	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results:-

Area : **Kathara** **Project:** **Jarangdih OC** **Stations:** **P.O.Office**

Month	Date of Sampling	Date of receipt of sample	Date of analysis	Parameters NAAQS (8 Hourly Average)			Wind Direction (from) & Weather
				Ammonia (in µg/m³)	CO (in mg/m³)	Ozone (in µg/m³)	
Jan.'23 1st FN	04/01/23	04/01/23	04/01/23	<20	0.611	<19.62	E to W
Jan.'23 2nd FN	18/01/23	18/01/23	18/01/23	<20	0.543	<19.62	E to W
Feb.'23 3rd FN	05/02/23	05/02/23	05/02/23	<20	0.597	<19.62	N to S
Feb.'23 4th FN	19/02/23	19/02/23	19/02/23	<20	0.602	<19.62	E to W
March '23 5th FN	03/03/23	03/03/23	03/03/23	<20	0.578	<19.62	E to W
March '23 6th FN	18/03/23	18/03/23	18/03/23	<20	0.531	<19.62	E to W

Note:
1. Gazette Notification No. G.S.R 742(E) dt.25th Sept.'2000 is applicable in core zone.
2. Gazette Notification No. G.S.R 826 (E) dt.Nov.'2009 is applicable in buffer zone.

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TEST REPORT

03/23 Test Report No. 1909	**Job No. 094322160**	**Year**	FY2022-23
Type of Sample	Ambient Air	Quarter Ending	March-23
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol:	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results:-

Area : **Kathara** **Project:** **Jarangdih OC** **Stations:** **Guest House**

Month	Date of Sampling	Date of receipt of sample	Date of analysis	Parameters NAAQS (8 Hourly Average)			Wind Direction (from) & Weather
				Ammonia (in µg/m³)	CO (in mg/m³)	Ozone (in µg/m³)	
Jan.'23 1st FN	05/01/23	05/01/23	05/01/23	<20	0.505	<19.62	E to W
Jan.'23 2nd FN	19/01/23	19/01/23	19/01/23	<20	0.480	<19.62	E to W
Feb.'23 3rd FN	07/02/23	07/02/23	07/02/23	<20	0.459	<19.62	N to S
Feb.'23 4th FN	20/02/23	20/02/23	20/02/23	<20	0.516	<19.62	E to W
March '23 5th FN	04/03/23	04/03/23	04/03/23	<20	0.534	<19.62	W to E
March '23 6th FN	19/03/23	19/03/23	19/03/23	<20	0.427	<19.62	E to W

Note:

1. Gazette Notification No. G.S.R 742(E) dt.25th Sept.'2000 is applicable in core zone.
2. Gazette Notification No. G.S.R 826 (E) dt.Nov.'2009 is applicable in buffer zone.

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