

ईस्टर्न कोलफील्ड्स लिमिटेड

(कोल इंडिया लिमिटेड की एक अनुषंगी कम्पनी)
महाप्रबंधक का कार्यालय, एस.पी.माइन्स क्षेत्र,
पो:-चित्तरा, जिला - देवघर,
झारखण्ड - 815351



EASTERN COALFIELDS LIMITED

(A subsidiary of Coal India Limited)

Office of the General Manager, S.P. Mines Area
PO - Chitra, District - Deoghar,
Jharkhand - 815351

(An ISO 9001:2015; ISO 14001:2015 and ISO 45001:2018 Certified Company)

ECL/SPM/GM/21-22/ 1-6/572

Date: 11/09/2021

To
The Member Secretary,
Jharkhand State Pollution Control Board,
Township Administration Building,
HEC Complex, Dhurwa,
Ranchi 834004

SUB: Submission of Environmental Statement in Form V of Chitra East OCP under SP Mines Area, ECL for FY 2020-21

Dear Sir,

Enclosed please find the Environment Statement in Form - V (Under Rule -14, Environmental (Protection) Rules, 1986) in respect of Chitra East OCP under SP Mines Area, ECL for FY 2020-21.

The said enclosure is of 14 (fourteen) pages.

This is for your kind information, please.

Enclo: As mentioned above

2/11.9.21
General Manager
SP Mines Area, ECL

[Signature]

Distribution:

1. The Additional PCCF (C), MoEF&CC, Ranchi - 834002
2. The Regional Officer, JSPCB, Dumka - 814110
3. The HoD (Env. & F.), ECL

**ENVIRONMENTAL STATEMENT
IN
FORM-V**

(Under Rule-14, Environmental (Protection) Rules, 1986)

(2020 – 2021)

**FOR
CHITRA (EAST) OCP
(OPENCAST PROJECT)
S. P. Mines Area
Eastern Coalfields Limited**

**Prepared at
Regional Institute – I
Central Mine Planning & Design Institute Ltd.
(A Subsidiary of Coal India Ltd.)
G. T. Road (West End)
Asansol - 713 304**



Coal India Limited
A Maharatna Company
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CMPDI

ISO 9001:2015 Company

ENVIRONMENTAL STATEMENT FOR CHITRA (EAST) OPENCAST PROJECT

FOR THE YEAR: 2020-2021

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CHAPTER – I INTRODUCTION

1.1 GENESIS:

The Gazette Notification vide G.S.R No. 329 (E) dated 13th March, 1992 and subsequently renamed to 'Environmental Statement' vide Ministry of Environment & Forests (MOEF), Govt. of India gazette notification No. G.S.R No. 386 (E) dated 22nd April'93 reads as follows:

“Every person carrying on an industry, operation or process requiring consent under section 25 of the Water Act, 1974 or under section 21 of the Air Act, 1981 or both or authorisation under the Hazardous Waste Rules, 1989 issued under the Environmental Protection Act, 1986 shall submit an Environmental Audit Report for the year ending 31st March in Form V to the concerned State Pollution Control Board on or before the 30th day of September every year.”

In compliance with the above, the work of preparation of Environmental Statement (Form – V) for Chitra (East) Opencast Project was entrusted to CMPDI by HOD (Environment & Forest), Eastern Coalfields Limited.

1.2 PROJECT DESCRIPTION :

A number of coal seams of Karharbari and Barakar formations occur in the form of a basin in Saharjuri coalfield. A large number of small quarries and underground workings, mostly worked by erstwhile owners exist over the entire coalfield. After nationalization of these collieries in 1975, ECL formed the reorganized Chitra colliery by combining all these taken over mines. Two quarries namely, Chitra A & Chitra B quarries were working in the eastern part of Chitra block. The present project, renamed as Chitra (East) OCP envisaged amalgamation of the existing mine workings and thereby augmenting the production level from 1.20 MTY to 2.50 MTY. The total mineable reserve of the proposed OCP is 60.40 MT in three different quarries with an average stripping ratio of 3.0 m³/te as on 31.12.2006. The life of the project is 26 years. The environmental clearance for Chitra (East) OCP (2.50 MTY) has been obtained vide letter no. - J11015/652/2007-IA.II(M) dated 04th March 2010 from MoEF&CC, New Delhi for an ML area of 780.80 Ha.

The Project is situated at a distance of about 80 km. from Asansol. The Opencast project is within the leasehold area of SP Mines of ECL. The nearest Railway Station Jamtara of Eastern Railway is 26 km away from the project. The Project is under the administrative control of GM, SP Mines Area.

The location map of Chitra East Opencast Project is given as Plate – I.

In year 2020-21, total coal production from the mine was 0.87 MT and overburden produced was 2.67 Mm³. Present manpower of the project as on 31st March, 2021 was 1006. Total no. of working days was 365.

1.2.1 SALIENT FEATURES AS PER EMP :

1	Rated capacity per annum	2.50 MT
2	Total Block Area	780.80 Ha
3	Forest land	155.60 Ha
4	Mineable reserve	60.40 MT
5	Life of mine	26 Years

1.3 ENVIRONMENTAL SCENARIO:

After the grant of EC, routine environment monitoring is being carried out quarterly as per the guidelines of Ministry of Environment and Forests (MoEF&CC) by CMPDI, RI-I. Accordingly, ambient air quality monitoring and noise level measurement stations has been fixed at four stations. However, from the first fortnight of September'16 onwards, monitoring schedule has changed from quarterly to fortnightly basis at the designated four stations. Since the first fortnight of March'19, two more ambient air quality and noise level measurement stations have been added in the project. The details of the sampling stations are given below:

Area	Project	Station code	Monitoring Station	Industrial Category
SP Mines	Chitra (East) OCP	13A1	Attendance Room Near Store	Industrial
		13A2	Weigh Bridge Near Sales Office	Industrial
		13A3	Chitra Guest House	Residential
		13A4	ECL Office at Jamtara Railway Siding	Industrial
		13A5	Weigh Bridge at Jamtara Railway Siding	Industrial
		13A6	Railway substation Near Jamtara Railway Siding	Industrial

Effluent water quality is being monitored at one location for mine discharge water from Chitra OCP. 5 parameters namely, pH, TSS, TDS, O&G and COD is being monitored every fortnight and 29 parameters is being monitored twice in a year during September & March and compared with MoEF&CC Schedule VI (General Standards for Discharge of Effluents). Noise levels were recorded at four locations (13A1, 13A2, 13A3 and 13A4) earmarked for ambient air sampling as shown in the above table. Groundwater level are recorded once every quarter at five dugwells located in and around core and buffer zone. Groundwater quality is being analysed during May every year at these five earmarked locations. Drinking water quality is analysed at one location once every quarter.

Location of these dugwells are given below:

Project	Station code	Name of the Station
Chitra(East) OCP	13GWL1	Dugwell at Dukhiababa mandir of Chitra Village
	13GWL2	Dugwell of west side Barmaria Village
	13GWL3	Dugwell of Jamnitand Village near Transformer
	13GWL4	Dugwell of Patrika Village
	13GWL5	Dugwell of Murgabari near J.p. Mahato's House
	13DW1	Outlet from water treatment plant.

One no. of piezometer has also been constructed at Chitra OCP for groundwater level measurement on quarterly basis. The details are given below:

Sl. No.	Station Code	Location of Piezometer
1	CPZ-01	SP Mines (Chitra magazine house)

The Environmental monitoring result for the year ending March'21 is appended as Annexure- I, II, III and IV. The environmental monitoring result for the year 2020-21 can be concluded as given below:

AMBIENT AIR QUALITY

The PM₁₀ concentration levels were found in the range of 81.6 to 536.5 µg/m³ and has exceeded the limit as per GSR 742 (E) dated 25.09.2000 on 17 occasions out of 120 samples analysed during the year. The PM_{2.5} concentration levels were found in the range of 28.0 to 65.0 µg/m³ and has exceeded the limit as per NAAQS, 2009 on 2 occasions out of 120 samples analysed during the year. The SO₂ concentration remained <10.0 µg/m³ and NO_x concentration levels were in the range of 4.1 to 21.6 µg/m³ and were well within the standards.

ENVIRONMENTAL STANDARDS:

Environmental Standards for Ambient air quality (AAQ):

Station Category	Environmental standard for Raniganj Coalfield vide MOEF, Govt. of India, Gazette Notification No. GSR 742 (E) dated 25.09.2000 for 24 hourly samples at 500 meters from dust generating point			National Ambient Air Quality Standards (NAAQS), 2009 for industrial, residential and rural areas for 24 hours samples	
	Pollutant Concentration (µg/m³)				
	PM ₁₀	SO ₂	NO _x		PM _{2.5}
Industrial	300.0	120.0	120.0	60.0	
Residential	100.00	80.0	80.0		

WATER QUALITY

Ground water percolates into working area from the surrounding aquifers which have been exposed due to opencast mining. The mine is dewatered regularly to maintain dry working conditions. This mine discharge water is partly utilized for dust suppression by sprinkling at coal faces and on haul roads & other industrial as well as domestic activities while the remainder is discharged onto adjoining cultivable lands for irrigation purposes. Part-B of the Environmental Statement proforma contains the detailed break-up of water consumption.

The analysis results reveal that most of the parameters are below permissible limits prescribed by Ministry of Environment & Forests (MOEF) as General Standards for Class-'A' effluent (Effluent discharged into inland surface water) and IS-10500:2012 standards for drinking water & groundwater.

Mine water, ground water and Drinking water analysis results are given in Annexure-III.

Well water level results are given in Annexure – IV.

NOISE LEVEL

The monitoring schedule for day time noise level measurement has been changed from fortnight to quarter since August'18 at all monitoring stations. Noise level at workplace (industrial category station) was found in the range of 50.7 to 82.86 dB (A) and the limit has been exceeded on 10 occasions out of 30 samples while Noise level at Chitra Guest House (residential category station) was found in the range of 48.3 to 101.15 dB (A) and the limit has been exceeded on 7 occasions out of 10 samples.

Noise Pollution (Regulation and Control) Rules, 2000 defines the limit of noise during day and night time as given below:

Station Category	Limits for noise (Leq dB (A))	
	Day Time (6am-10pm)	Night Time (10pm-6am)
Industrial	75.0	70.0
Commercial	65.0	55.0
Residential	55.0	45.0
Silence Zone	50.0	40.0

CHAPTER - II
ENVIRONMENTAL STATEMENT FORM – V
Environmental statement for the financial year ending March, 2021

PART – A

SL. NO.	HEADING	PARTICULARS
(I)	NAME AND ADDRESS OF THE PROJECT	Chitra (East) OCP, Chitra Colliery, S.P. Mines Area, PO: Chitra, Dist.: Deogarh, Jharkhand – 815351
(II)	INDUSTRY CATEGORY	Red
(III)	PRODUCTION CAPACITY	2.50 MTY
	PRODUCTION DURING 2020-21	0.87
(IV)	YEAR OF ESTABLISHMENT	1975
(V)	DATE OF THE LAST ENVIRONMENTAL STATEMENT SUBMITTED	26 th September, 2020

PART – B

WATER AND RAW MATERIAL CONSUMPTION

(I) WATER CONSUMPTION (Cu.m/day)

Mine water

- a. Total quantity of mine pumping during 2020 – 21 : 4300 m³/day
- b. Quantity of mine water utilized along with purpose : 4300* m³/day
*(excess water is supplied to local village pond, agricultural use, domestic use and industrial use)
- c. Quantity of mine water discharged outside : Nil

#	Particulars	2019-20	2020-21
A.	MINING (Dust suppression, Firefighting and Others)	377	377
B.	COOLING (in radiators of trucks/HEMM & workshop)	100	100
C.	DOMESTIC		
i	Colony (Mine water)	700	700
	TOTAL	1177.0	1177.0

Name of Product	Process water consumption per unit of product output (l/day/te)	
	2019-20	2020-21
Coal	0.23	0.55

(II) RAW MATERIAL CONSUMPTION:

Name of raw material	Name of products	Consumption of raw material (per unit of output)	
		During previous financial year (2019-20)	During current financial year (2020-21)
1. Explosive	Coal	1.12 kg/te	1.12 kg/te
2. Diesel		0.95 l/te	0.95 l/te
3. Lubricants		0.11 l/te	0.11 l/te

**PART – C
POLLUTION GENERATED**

Pollution	Quantity of pollutants discharged (mass/day)	Concentrations of pollutants discharged (mass/volume)	Percentage variation from prescribed standards with reasons
WATER	-		
AIR*	Total pollutant load of PM ₁₀ and PM _{2.5} are 1326.97 kg/day and 230.52 kg/day as compared to previous year when they were 2454.80 kg/day and 392.33 kg/day respectively from all the source generating points like opencast pit, haul roads, external OB dump, coal transportation route, railway siding, CHP, etc.	1. Mine water discharge Analysis results are given in Annexure-III. 2. The main air pollutant is suspended PM ₁₀ , PM _{2.5} , SO ₂ and NO _x . The air quality results are appended as Annexure-I.	1. 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). 2. Ambient air quality results show that the values of PM ₁₀ , PM _{2.5} , SO ₂ and NO _x are within the prescribed standards as per GSR 742 (E) dated 25.09.2000 and NAAQS, 2009 barring few occasions as mentioned in earlier section.

*PM₁₀ and PM_{2.5} estimation has been done using empirical formula which includes Emission Factors derived from S&T studies done by CMPDI.

**PART – D
HAZARDOUS WASTE**

(As specified under Hazardous waste management and handling Rules, 1989)

Hazardous waste	Total quantity		Disposal Method
	During previous financial year (2019-20)	During current financial year (2020-21)	
A. From process Used oil	15580 litres	13960 litres	Dealt in Part – F
B. Lead-Acid Batteries			
i. Automobile Batteries	42 nos.	30 nos.	
ii. Cap-lamp batteries	Nil	Nil	
C. Used Cotton waste	2600 kg	1680 kg	
D. Metal Scrap	132 tonnes	Nil	

PART – E SOLID WASTE

Particulars	Total quantity (In Million Cu.m)	
	During previous financial year (2019-20)	During current financial year (2020-21)
a) From process (Mining)	5.55	2.67
b) From pollution control facilities	-	-
c) Quantity recycled or reutilized (back filled)	4.69*	2.67**

*0.87 Mm³ of OB was dumped externally during FY 2019-20

** 5770 m³ of OB was dumped externally during FY 2020-21

PART – F

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

Details of hazardous waste generated during the year are given in the table PART-D and are being deposited at area store disposal stock yard.

Used oil is kept in suitable container and is sent to other area for further use as lubricants in other UG mines within the command area of ECL.

Cotton waste is being dumped along with OB during backfilling.

HEMM / Automobile batteries are sent to manufacturer and exchanged for new batteries under buyback scheme.

Metal scraps, if generated are declared and report is sent to ECL, HQ. The scraps are then auctioned and sold through ECL, HQ.

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) Drills used in overburden removal and coal production are fitted with dust control devices.
- ii) Water sprinkling is done regularly on haul roads, colony roads, railway siding and nearby villages during mining operations.
- iii) Coal is transported by trucks covered with tarpaulin.
- iv) Regular water sprinkling with the help of tankers is being done within the mine and plantation have been done at railway siding and other areas within mine lease.
- v) Fixed sprinklers have been installed at coal crusher plant for dust suppression.
- vi) Plantation of local species have been carried out on 0.50 Ha of ML area with 70% survival rate during 2020-21.

2.0 WATER POLLUTION CONTROL MEASURES:

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

- i) Most of the parameters of mine water conform to General Standard of MoEF&CC for Class- A effluent as mentioned earlier.
- ii) The septic tanks & soak pits are provided in residential quarters of mine colony.
- iii) There is a treatment plant for treatment of mine water. Mainly settling, filtration & chlorination process is used to treat the water. Filtered water is supplied to local residents.
- iv) Septic tank attached with each quarter block. Preparation of scheme for STP is being undertaken by CMPDIL. STP will be constructed in Chitra Colliery Colony in FY 2021-22.
- v) Regular monitoring of mine water and ground water quality is being done.
- vi) Preparation of scheme for ETP is being undertaken by CMPDIL. ETP will be constructed in Central Excavation Workshop in FY 2021-22.
- vii) Two nos. of rain water harvesting structures have been proposed to be constructed in FY 2021-22.

3.0 NOISE & VIBRATION CONTROL MEASURES:

- i) Regular maintenance of HEMMs and other equipment.
- ii) Afforestation on OB dump, colony, road side and around mine area which acts as barrier.
- iii) Controlled blasting is practiced for winning of coal at OCP.
- iv) HEMM & dumpers are fitted with silencers to reduce noise level.

4.0 LAND RESOURCE MANAGEMENT:

- i) Quarried area have been backfilled and technically reclaimed with OB dump during 2020-21 accommodating 2.67 Mm³ of OB.

PART – H

ADDITIONAL INVESTMENT PROPOSAL FOR ENVIRONMENTAL PROTECTION INCLUDING ABATEMENT OF POLLUTION

The following are the additional investment proposals for environmental protection:

- a) Proposed plantation to be carried out in next five years

Year of plantation	Area to be planted (Ha)	Species selected
2021-22	1.0	Local species having 65-70% survival rate
2022-23	1.0	Local species having 65-70% survival rate
2023-24	1.0	Local species having 65-70% survival rate
2024-25	1.0	Local species having 65-70% survival rate
2025-26	1.0	Local species having 65-70% survival rate

- b) The Environmental monitoring of the project will be continued fortnightly/half-yearly/annually as per the guidelines of Ministry of Environment and Forest & Climate Change (MoEF&CC) and EC condition.
- c) Necessary Consent (CTE/CTO) has been taken from Competent Authority.

PART – I

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

- i) The Environmental Monitoring is carried out fortnightly for the colliery by CMPDI, RI-I as per the guideline of Ministry of Environment and Forest & Climate Change (MoEF&CC) and based on the result thereof, colliery take necessary action if needed.
- ii) Various activities have been carried out under CSR like distribution of packets containing essential commodities of daily needs to the villagers of the surrounding villages during COVID-19 pandemic, disbursement of funds to Deoghar and Jamtara District Authorities, Municipalities and Nagar Panchayats of Madhupur, Basukinath, Dumka, Jamtara, Mihijam, and in the MLA Area Development Schemes for sanitization works to be carried out in the respective areas and for procurement of mask, sanitizers and ration packets and one ambulance specially designated for Covid-19 has been deployed with total expenditure of ₹ 1.38 Crores during FY 2020-21 as compared to ₹ 62.17 Lakhs in FY 2019-20.
- iii) World Environment Day, 2020 with theme “Biodiversity – Time for Nature” celebrated. Mango saplings were distributed amongst nearby villagers on this occasion.
- iv) Van Mahotsav was celebrated with plantation of 1000 nos. of saplings and distribution of 1000 nos. of saplings among local population.
- v) Annual Mine Closure Fund is being deposited in the Escrow Account as per the approved Mine Closure Plan.

Annexure-I

Air Quality Monitoring Report

Station No.	Station Name	Month	Fortnight	Date of Sampling	PM ₁₀	PM _{2.5}	SO ₂	NO _x
13A1	Attendance Room Near Store	May	First	05-May-20	278.6	59.5	<10.0	19.2
13A1	Attendance Room Near Store	May	Second	20-May-20	246	53	<10.0	18.4
13A1	Attendance Room Near Store	June	First	04-Jun-20	188.2	53.6	<10.0	18.9
13A1	Attendance Room Near Store	June	Second	18-Jun-20	146	47.6	<10.0	19.5
13A1	Attendance Room Near Store	July	First	07-Jul-20	145.2	50.2	<10.0	17.5
13A1	Attendance Room Near Store	July	Second	21-Jul-20	156.7	47.6	<10.0	18.5
13A1	Attendance Room Near Store	August	First	12-Aug-20	151.8	38.3	<10.0	18.2
13A1	Attendance Room Near Store	August	Second	24-Aug-20	156.3	42.6	<10.0	18.3
13A1	Attendance Room Near Store	September	First	01-Sep-20	176.8	56.8	<10.0	19.4
13A1	Attendance Room Near Store	September	Second	28-Sep-20	206.8	45.2	<10.0	19.5
13A1	Attendance Room Near Store	October	First	07-Oct-20	166.7	47.9	<10.0	18.8
13A1	Attendance Room Near Store	October	Second	27-Oct-20	136.4	44.7	<10.0	18.3
13A1	Attendance Room Near Store	November	First	05-Nov-20	186.4	50.4	<10.0	18.5
13A1	Attendance Room Near Store	November	Second	17-Nov-20	170.3	49.2	<10.0	18.9
13A1	Attendance Room Near Store	December	First	07-Dec-20	172.6	50.6	<10.0	19.2
13A1	Attendance Room Near Store	December	Second	30-Dec-20	192.9	32	<10.0	18.6
13A1	Attendance Room Near Store	January	First	12-Jan-21	193.8	46.8	<10.0	19.5
13A1	Attendance Room Near Store	January	Second	29-Jan-21	218.9	53.8	<10.0	15.4
13A1	Attendance Room Near Store	February	First	11-Feb-21	176.5	38.6	<10.0	17.6
13A1	Attendance Room Near Store	February	Second	22-Feb-21	203.5	53.2	<10.0	20.1
13A1	Attendance Room Near Store	March	First	01-Mar-21	356	56.8	<10.0	20.4
13A1	Attendance Room Near Store	March	Second	25-Mar-21	446.4	44	<10.0	18.7
13A2	Weigh Bridge Near Sales Office	May	First	05-May-20	312.6	60.1	<10.0	21.6
13A2	Weigh Bridge Near Sales Office	May	Second	20-May-20	287.3	55.5	<10.0	20.5
13A2	Weigh Bridge Near Sales Office	June	First	04-Jun-20	181.5	51.9	<10.0	18.2
13A2	Weigh Bridge Near Sales Office	June	Second	18-Jun-20	119	39.5	<10.0	17.5
13A2	Weigh Bridge Near Sales Office	July	First	07-Jul-20	141.3	48.6	<10.0	17.6
13A2	Weigh Bridge Near Sales Office	July	Second	21-Jul-20	172.6	39.5	<10.0	16.7
13A2	Weigh Bridge Near Sales Office	August	First	12-Aug-20	147.3	37.1	<10.0	18
13A2	Weigh Bridge Near Sales Office	August	Second	24-Aug-20	150.1	40.5	<10.0	18.1
13A2	Weigh Bridge Near Sales Office	September	First	01-Sep-20	218.2	47.4	<10.0	18.6
13A2	Weigh Bridge Near Sales Office	September	Second	28-Sep-20	176.8	48	<10.0	18.4
13A2	Weigh Bridge Near Sales Office	October	First	07-Oct-20	162.3	45.8	<10.0	18.2
13A2	Weigh Bridge Near Sales Office	October	Second	27-Oct-20	168.7	46	<10.0	19.7
13A2	Weigh Bridge Near Sales Office	November	First	05-Nov-20	148.3	48.3	<10.0	19.2
13A2	Weigh Bridge Near Sales Office	November	Second	17-Nov-20	164.5	47.4	<10.0	18.3
13A2	Weigh Bridge Near Sales Office	December	First	08-Dec-20	167.4	49.2	<10.0	18.5
13A2	Weigh Bridge Near Sales Office	December	Second	30-Dec-20	271.5	58.1	<10.0	17.5
13A2	Weigh Bridge Near Sales Office	January	First	12-Jan-21	184.7	49.6	<10.0	19.2
13A2	Weigh Bridge Near Sales Office	January	Second	28-Jan-21	199.9	39.4	<10.0	13.6
13A2	Weigh Bridge Near Sales Office	February	First	11-Feb-21	238.4	44.2	<10.0	19.8
13A2	Weigh Bridge Near Sales Office	February	Second	22-Feb-21	230.5	55.8	<10.0	19.3
13A2	Weigh Bridge Near Sales Office	March	First	01-Mar-21	245.3	55.2	<10.0	21.6
13A2	Weigh Bridge Near Sales Office	March	Second	25-Mar-21	276.4	53	<10.0	16.4
13A3	Chitra Guest House	May	First	06-May-20	93.4	31.8	<10.0	13.4
13A3	Chitra Guest House	May	Second	21-May-20	89.6	30.7	<10.0	14.2
13A3	Chitra Guest House	June	First	04-Jun-20	95.4	39.6	<10.0	14.9
13A3	Chitra Guest House	June	Second	18-Jun-20	81.6	28.1	<10.0	12.6
13A3	Chitra Guest House	July	First	07-Jul-20	89.7	37.4	<10.0	14.1

Station No.	Station Name	Month	Fortnight	Date of Sampling	PM ₁₀	PM _{2.5}	SO ₂	NO _x
13A3	Chitra Guest House	July	Second	21-Jul-20	83.5	28.1	<10.0	13.4
13A3	Chitra Guest House	August	First	13-Aug-20	88.6	29.8	<10.0	4.1
13A3	Chitra Guest House	August	Second	24-Aug-20	89.7	30.3	<10.0	14.2
13A3	Chitra Guest House	September	First	01-Sep-20	88.3	30.3	<10.0	12.4
13A3	Chitra Guest House	September	Second	28-Sep-20	84.7	29.2	<10.0	14.2
13A3	Chitra Guest House	October	First	07-Oct-20	90.4	28.6	<10.0	14.4
13A3	Chitra Guest House	October	Second	27-Oct-20	86.4	29.7	<10.0	15.2
13A3	Chitra Guest House	November	First	05-Nov-20	93.7	31.9	<10.0	14.8
13A3	Chitra Guest House	November	Second	17-Nov-20	92.4	30.4	<10.0	15
13A3	Chitra Guest House	December	First	07-Dec-20	94.1	31.6	<10.0	15.4
13A3	Chitra Guest House	December	Second	30-Dec-20	294.3	28	<10.0	13.8
13A3	Chitra Guest House	January	First	12-Jan-21	279.5	58.5	<10.0	17.3
13A3	Chitra Guest House	January	Second	28-Jan-21	189.7	41.2	<10.0	14.5
13A3	Chitra Guest House	February	First	11-Feb-21	168.7	29.7	<10.0	14.2
13A3	Chitra Guest House	February	Second	23-Feb-21	255.4	58.4	<10.0	17.5
13A3	Chitra Guest House	March	First	01-Mar-21	384.1	58.5	<10.0	17.4
13A3	Chitra Guest House	March	Second	25-Mar-21	377.3	34	<10.0	13.3
13A4	Jamtara Railway Siding	May	First	05-May-20	178.6	57.4	<10.0	18.7
13A4	Jamtara Railway Siding	May	Second	21-May-20	194.3	52.4	<10.0	19.6
13A4	Jamtara Railway Siding	June	First	05-Jun-20	199.5	56.8	<10.0	19.2
13A4	Jamtara Railway Siding	June	Second	19-Jun-20	193.6	52.2	<10.0	18.5
13A4	Jamtara Railway Siding	July	First	08-Jul-20	150.1	51.6	<10.0	17.9
13A4	Jamtara Railway Siding	July	Second	22-Jul-20	128.5	52.2	<10.0	18.6
13A4	Jamtara Railway Siding	August	First	13-Aug-20	156.3	43.9	<10.0	18.7
13A4	Jamtara Railway Siding	August	Second	25-Aug-20	160.3	46.8	<10.0	18.9
13A4	Jamtara Railway Siding	September	First	02-Sep-20	148.7	48.4	<10.0	17.6
13A4	Jamtara Railway Siding	September	Second	29-Sep-20	104.6	35.2	<10.0	16.2
13A4	Jamtara Railway Siding	October	First	08-Oct-20	179.2	51.3	<10.0	19.1
13A4	Jamtara Railway Siding	October	Second	28-Oct-20	112.8	37.6	<10.0	17.6
13A4	Jamtara Railway Siding	November	First	06-Nov-20	262.7	56.3	<10.0	16.9
13A4	Jamtara Railway Siding	November	Second	18-Nov-20	182.6	53.2	<10.0	19.2
13A4	Jamtara Railway Siding	December	First	07-Dec-20	186.4	56.4	<10.0	19.4
13A4	Jamtara Railway Siding	December	Second	29-Dec-20	258.7	65	<10.0	18.4
13A4	Jamtara Railway Siding	January	First	13-Jan-21	208.4	52.6	<10.0	19.7
13A4	Jamtara Railway Siding	January	Second	29-Jan-21	234.3	46.8	<10.0	16.5
13A4	Jamtara Railway Siding	February	First	12-Feb-21	278.6	34.6	<10.0	18.4
13A4	Jamtara Railway Siding	February	Second	22-Feb-21	209.6	53.4	<10.0	19.9
13A4	Jamtara Railway Siding	March	First	02-Mar-21	536.5	59.3	<10.0	20.8
13A4	Jamtara Railway Siding	March	Second	26-Mar-21	381.6	51	<10.0	18.7
13A5	Weigh Bridge Jamtara Railway Siding	May	First	06-May-20	208.6	56	<10.0	20.6
13A5	Weigh Bridge Jamtara Railway Siding	April	Second	21-May-20	213.5	57.2	<10.0	17.5
13A5	Weigh Bridge Jamtara Railway Siding	June	First	05-Jun-20	190.3	54.1	<10.0	18.8
13A5	Weigh Bridge Jamtara Railway Siding	June	Second	19-Jun-20	157.4	51	<10.0	17.6
13A5	Weigh Bridge Jamtara Railway Siding	July	First	08-Jul-20	140.2	49.2	<10.0	17.5
13A5	Weigh Bridge Jamtara Railway Siding	July	Second	22-Jul-20	144.6	51	<10.0	17.2
13A5	Weigh Bridge Jamtara Railway	August	First	12-Aug-20	148.9	36.8	<10.0	18.3

Station No.	Station Name	Month	Fortnight	Date of Sampling	PM ₁₀	PM _{2.5}	SO ₂	NO _x
	Siding							
13A5	Weigh Bridge Jamtara Railway Siding	August	Second	25-Aug-20	158	39.6	<10.0	18.4
13A5	Weigh Bridge Jamtara Railway Siding	September	First	02-Sep-20	172.5	46.9	<10.0	18.3
13A5	Weigh Bridge Jamtara Railway Siding	September	Second	29-Sep-20	186.7	44.9	<10.0	19.4
13A5	Weigh Bridge Jamtara Railway Siding	October	First	08-Oct-20	175.4	50.2	<10.0	19
13A5	Weigh Bridge Jamtara Railway Siding	October	Second	28-Oct-20	156.4	42.9	<10.0	19.1
13A5	Weigh Bridge Jamtara Railway Siding	November	First	06-Nov-20	176.8	56.8	<10.0	17.3
13A5	Weigh Bridge Jamtara Railway Siding	November	Second	18-Nov-20	180.3	51.4	<10.0	18.8
13A5	Weigh Bridge Jamtara Railway Siding	December	First	08-Dec-20	183.5	53.2	<10.0	18.9
13A5	Weigh Bridge Jamtara Railway Siding	December	Second	29-Dec-20	264.3	41	<10.0	19.6
13A5	Weigh Bridge Jamtara Railway Siding	January	First	13-Jan-21	204.1	51.7	<10.0	19.2
13A5	Weigh Bridge Jamtara Railway Siding	January	Second	29-Jan-21	288.6	57.9	<10.0	17.2
13A5	Weigh Bridge Jamtara Railway Siding	February	First	12-Feb-21	322.8	47.2	<10.0	19.6
13A5	Weigh Bridge Jamtara Railway Siding	February	Second	23-Feb-21	207.5	50.1	<10.0	19.4
13A5	Weigh Bridge Jamtara Railway Siding	March	First	02-Mar-21	364.9	57.2	<10.0	20
13A5	Weigh Bridge Jamtara Railway Siding	March	Second	26-Mar-21	392.2	51	<10.0	19.6
13A6	Railway Substation in Jamtara	May	First	06-May-20	186.5	50.4	<10.0	17.5
13A6	Railway Substation in Jamtara	May	Second	21-May-20	194.2	52.4	<10.0	19.2
13A6	Railway Substation in Jamtara	June	First	05-Jun-20	160.8	52.4	<10.0	17.8
13A6	Railway Substation in Jamtara	June	Second	19-Jun-20	115.8	38.5	<10.0	18.5
13A6	Railway Substation in Jamtara	July	First	08-Jul-20	134.3	45	<10.0	16.5
13A6	Railway Substation in Jamtara	July	Second	22-Jul-20	176.5	38.5	<10.0	18.9
13A6	Railway Substation in Jamtara	August	First	13-Aug-20	138.6	35.7	<10.0	16.2
13A6	Railway Substation in Jamtara	August	Second	25-Aug-20	140.2	36.8	<10.0	16.7
13A6	Railway Substation in Jamtara	September	First	02-Sep-20	204.3	44.7	<10.0	19.7
13A6	Railway Substation in Jamtara	September	Second	29-Sep-20	104.3	35.1	<10.0	17.1

Analysis of Heavy Metals in Air

Station No.	Station Name	Date of Sampling	Arsenic (ng/m ³)	Cadmium (µg/m ³)	Chromium (µg/m ³)	Mercury (µg/m ³)	Nickel (ng/m ³)	Lead (µg/m ³)
Method of Detection			Atomic Absorption Spectrophotometric (AAS)					
Detection Limit			1	0.001	0.01	0.001	0.1	0.005
13A1	Attendance Room Near Store	1-Sep-20	BDL	BDL	BDL	BDL	BDL	BDL
13A2	Weigh Bridge Near Sales Office	1-Sep-20	BDL	BDL	BDL	BDL	BDL	BDL
13A3	Chitra Guest House	1-Sep-20	BDL	BDL	BDL	BDL	BDL	BDL
13A4	Jamtara Railway Siding	2-Sep-20	BDL	BDL	BDL	BDL	BDL	BDL
13A5	Weigh Bridge Near Jamtara Railway Siding	2-Sep-20	BDL	BDL	BDL	BDL	BDL	BDL
13A6	Railway substation Near Jamtara Railway Siding	2-Sep-20	BDL	BDL	BDL	BDL	BDL	BDL
13A1	Attendance Room Near Store	1-Mar-21	BDL	BDL	BDL	BDL	BDL	BDL
13A2	Weigh Bridge Near Sales Office	1-Mar-21	BDL	BDL	BDL	BDL	BDL	BDL
13A3	Chitra Guest House	1-Mar-21	BDL	BDL	BDL	BDL	BDL	BDL
13A4	Jamtara Railway Siding	2-Mar-21	BDL	BDL	BDL	BDL	BDL	BDL
13A5	Weigh Bridge Near Jamtara Railway Siding	2-Mar-21	BDL	BDL	BDL	BDL	BDL	BDL
13A6	Railway substation Near Jamtara Railway Siding	2-Mar-21	BDL	BDL	BDL	BDL	BDL	BDL

Environmental standards:

National Ambient Air Quality Standards (NAAQS), 2009 for residential, industrial and rural areas for 24 hourly/yearly samples:

Heavy Metal	Arsenic (As) (ng/m ³)	Cadmium (Cd) (µg/m ³)	Chromium (Cr) (µg/m ³)	Mercury (Hg) (µg/m ³)	Nickel (Ni) (ng/m ³)	Lead (Pb) (µg/m ³)
Concentration	6	Not specified	Not specified	Not specified	20	0.5

Annexure-II**NOISE LEVEL**

Station No.	Station Name	Month	Fortnight	Date of Sampling	Noise Level dB(A)
13N1	Attendance Room Near Store	May	First	21-May-20	65.4
13N1	Attendance Room Near Store	September	First	02-Sep-20	56.8
13N1	Attendance Room Near Store	November	First	05-Nov-20	58.4
13N1	Attendance Room Near Store	December	First	07-Dec-20	62.7
13N1	Attendance Room Near Store	January	First	12-Jan-21	59.7
13N1	Attendance Room Near Store	January	Second	28-Jan-21	72.62
13N1	Attendance Room Near Store	February	First	11-Feb-21	58.41
13N1	Attendance Room Near Store	February	Second	22-Feb-21	73.84
13N1	Attendance Room Near Store	March	First	01-Mar-21	81.72
13N1	Attendance Room Near Store	Second	First	25-Mar-21	79.88
13N2	Weigh Bridge Near Sales Office	May	First	21-May-20	63.2
13N2	Weigh Bridge Near Sales Office	September	First	02-Sep-20	54.2
13N2	Weigh Bridge Near Sales Office	November	First	05-Nov-20	56.4
13N2	Weigh Bridge Near Sales Office	December	First	07-Dec-20	58.3
13N2	Weigh Bridge Near Sales Office	January	First	11-Jan-21	72.73
13N2	Weigh Bridge Near Sales Office	January	Second	28-Jan-21	59.97
13N2	Weigh Bridge Near Sales Office	February	First	12-Feb-21	51.39
13N2	Weigh Bridge Near Sales Office	February	Second	23-Feb-21	62.73
13N2	Weigh Bridge Near Sales Office	March	First	02-Mar-21	80.59
13N2	Weigh Bridge Near Sales Office	Second	First	26-Mar-21	77.48
13N3	Chitra Guest House	May	First	21-May-20	56.7
13N3	Chitra Guest House	September	First	02-Sep-20	48.3
13N3	Chitra Guest House	November	First	06-Nov-20	49.2
13N3	Chitra Guest House	December	First	07-Dec-20	52.8
13N3	Chitra Guest House	January	First	12-Jan-21	101.15
13N3	Chitra Guest House	January	Second	29-Jan-21	72.42
13N3	Chitra Guest House	February	First	11-Feb-21	56.93
13N3	Chitra Guest House	February	Second	22-Feb-21	57.63
13N3	Chitra Guest House	March	First	01-Mar-21	71.53
13N3	Chitra Guest House	Second	First	25-Mar-21	74.72
13N4	Jamtara Railway Siding	May	First	21-May-20	64.2
13N4	Jamtara Railway Siding	September	First	02-Sep-20	50.7
13N4	Jamtara Railway Siding	November	First	06-Nov-20	57.4
13N4	Jamtara Railway Siding	December	First	07-Dec-20	55.4
13N4	Jamtara Railway Siding	January	First	11-Jan-21	68.32
13N4	Jamtara Railway Siding	January	Second	29-Jan-21	60.74
13N4	Jamtara Railway Siding	February	First	12-Feb-21	58.63
13N4	Jamtara Railway Siding	February	Second	23-Feb-21	78.46
13N4	Jamtara Railway Siding	March	First	02-Mar-21	82.86
13N4	Jamtara Railway Siding	Second	First	26-Mar-21	78.6

Annexure-III

EFFLUENT WATER QUALITY (5 PARAMETERS)

Station No.	Station Name	Month	Fortnight	Date of Sampling	pH	TSS	TDS	O&G	COD
13MW1	Mine discharge water from Chitra OC	May	First	12-May-20	8.03	26	496	<2.0	20
		May	Second	21-May-20	8.02	34	428	<2.0	24
		June	First	05-Jun-20	8.01	36	440	<2.0	20
		June	Second	19-Jun-20	8.06	30	446	<2.0	20
		July	First	09-Jul-20	8.02	28	496	<2.0	28
		July	Second	21-Jul-20	8.03	26	462	<2.0	28
		August	First	13-Aug-20	7.92	28	487	<2.0	32
		August	Second	24-Aug-20	7.84	28	478	<2.0	28
		September	Second	28-Sep-20	7.91	27.4	428	<2.0	16
		October	First	08-Oct-20	8.01	25	470	<2.0	20
		October	First	08-Oct-20	8.01	25	470	<2.0	20
		October	Second	27-Oct-20	8.04	26.1	482	<2.0	20
		October	Second	27-Oct-20	8.04	26.1	482	<2.0	20
		November	First	05-Nov-20	7.89	22	436	<2.0	16
		November	Second	17-Nov-20	8.02	20.2	482	<2.0	20
		December	First	07-Dec-20	7.77	17.1	432	<2.0	20
		December	Second	31-Dec-20	7.84	15.8	460	<2.0	20
		January	First	14-Jan-21	7.85	14.6	474	<2.0	28
		January	Second	28-Jan-21	7.92	15.4	456	<2.0	32
		February	First	11-Feb-21	7.76	15.2	436	<2.0	36
		February	Second	23-Feb-21	7.62	17.4	447	<2.0	24
		March	First	01-Mar-21	15.2	15.2	446	<2.0	24

Note: All parameters are in mg/l unless otherwise specified

Effluent Water Quality Standards (MoEF Schedule – VI Standards)

Parameters	pH	TSS	TDS	Oil & Grease	COD
Limit	5.5-9.0	100	Not Specified	10	250

EFFLUENT QUALITY STANDARDS (29 PARAMETERS)

Sl. No.	Parameters	Analytical Results	Analytical Results	General Standards for Discharge of Effluent (Schedule VI)	Method of Detection	Detection Limit
	Date of Sampling	1-Sep-20	25-Mar-21			
1	Colour	4	3	Unobjectionable	Platinum Cobalt	1.0
2	Odour	Unobjectionable	Unobjectionable	Unobjectionable	Physical	-
3	TSS	30	18.4	100	Gravimetric	10
4	pH	7.88	7.58	5.5-9.0	Electrometric	0.01
5	Temperature (°C)	29.2	28.0	Shall not exceed 5 °C above the receiving water temperature	Thermometric	0.1
6	Oil & Grease	BDL	BDL	10	Partition Gravimetric	2.0
7	Total Residual Chlorine	BDL	BDL	1.0	Colorimetric	0.02
8	Ammonical Nitrogen	0.72	0.74	50	Nesslerization	0.01
9	Total Kjeldahl Nitrogen	1.36	1.59	100	Macro Kjeldahl	1.0
10	Free Ammonia	BDL	BDL	5.0	Spectrophotometric	0.02
11	BOD	10	6	30	Bioassay	2.0
12	COD	24	20	250	Closed Reflux	4.0
13	Arsenic	BDL	BDL	0.2	AAS-VGA	0.002
14	Lead	BDL	BDL	0.1	AAS-GTA	0.005
15	Hexavalent Chromium	BDL	BDL	0.1	Colorimetric	0.01
16	Total Chromium	BDL	BDL	2.0	AAS-Flame	0.04
17	Copper	BDL	BDL	3.0	AAS-Flame	0.03
18	Zinc	0.03	BDL	5.0	AAS-Flame	0.01
19	Selenium	BDL	BDL	0.05	AAS-GTA	0.002
20	Nickel	BDL	BDL	3.0	AAS-Flame	0.01
21	Fluoride	0.30	0.26	2.0	SPADNS	0.02
22	Dissolved Phosphate	1.32	1.36	5.0	Molybdovanadate	0.30
23	Sulphide	0.006	0.007	2.0	Methylene Blue	0.005
24	Phenolics	BDL	BDL	1.0	Chloroform Extraction	0.001
25	Manganese	0.20	BDL	2.0	AAS-Flame	0.02
26	Iron	0.09	BDL	3.0	AAS-Flame	0.06
27	Nitrate Nitrogen	2.6	3.0	10	Spectrophotometric	0.5
28	Cadmium	BDL	BDL	2.0	AAS-GTA	0.0005
29	Total Dissolved Solids	484	461	Not Specified	Gravimetric	25.0

Note: All parameters are in mg/l unless otherwise specified

GROUND WATER QUALITY

Sl. No.	Parameters	Analytical Results					Indian Standard Drinking Water (IS-10500 :2012)		Method of detection	Detection Limit
	Sample code	13GW1	13GW2	13GW3	13GW4	13GW5				
	Sampling Date	24-May-20	23-May-20	23-May-20	23-May-20	23-May-20	Acceptable Limit	Permissible Limit		
1	Colour, Hazen	3	3	2	3	2	5.0	15.0	Platinum Cobalt	1.0 Hazen
2	Odour	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable		Physical	-
3	Taste	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable		Physical	-
4	Turbidity, NTU	2	1	2	3	2	1	5	Nephelometric	1.0 NTU
5	pH value	7.55	7.57	7.54	7.76	7.72	6.5-8.5	No relaxation	Electrometric	0.01
6	Total Hardness	217	84	130	84	114	300	600	EDTA	4.0
7	Iron	0.06	BDL	BDL	BDL	BDL	0.3	No relaxation	AAS Flame	0.06
8	Chlorides	105	35	67	27	56	250	1000	Argentometric	2.0
9	Res Free Chlorine	0.02	0.03	0.04	0.02	0.03	0.2	1	Spectrophotometric	0.02
10	Dissolved Solids	538	148	264	184	554	500	2000	Gravimetric	10.0
11	Calcium	64	32	34	26	34	75	200	EDTA	1.60
12	Copper	BDL	BDL	BDL	BDL	BDL	0.05	1.5	AAS Flame	0.03
13	Manganese	BDL	BDL	BDL	BDL	BDL	0.1	0.3	AAS Flame	0.02
14	Sulphate	28	12	28	11	54	200	400	Turbidity	2.0
15	Nitrate	9.86	10.46	10.28	11.46	9.60	45	No relaxation	Spectrophotometric	0.5
16	Fluoride	0.54	0.46	0.14	0.36	0.94	1	1.5	SPANDS	0.02
17	Selenium	BDL	BDL	BDL	BDL	BDL	0.01	No relaxation	AAS - GTA	0.002
18	Arsenic	BDL	BDL	BDL	BDL	BDL	0.01	0.05	AAS - VGA	0.002
19	Lead	BDL	BDL	BDL	BDL	BDL	0.01	No relaxation	AAS - GTA	0.005
20	Zinc	0.03	0.02	0.02	0.02	0.02	5	15	AAS Flame	0.01
21	Hex Chromium	BDL	BDL	BDL	BDL	BDL	0.05	0.05	Colorimetric	0.01
22	Boron	BDL	BDL	BDL	BDL	BDL	0.5	1	Colorimetric Carmine	0.20

Sl. No.	Parameters	Analytical Results					Indian Standard Drinking Water (IS-10500 :2012)		Method of detection	Detection Limit
	Sample code	13GW1	13GW2	13GW3	13GW4	13GW5				
	Sampling Date	24-May-20	23-May-20	23-May-20	23-May-20	23-May-20	Acceptable Limit	Permissible Limit		
23	Coliforms (MPN)	NIL	NIL	NIL	NIL	NIL	Not Specified		Chloroform Extraction	1.0
24	Phenolics	BDL	BDL	BDL	BDL	BDL	0.001	0.002	Titrimetric Indicator	0.001
25	Alkalinity	180	196	84	144	232	200	600	Titrimetric	4.0
26	Cadmium	BDL	BDL	BDL	BDL	BDL	0.003	No relaxation	AAS - GTA	0.0005

Note: All parameters are in mg/l unless otherwise specified

DRINKING WATER QUALITY

Sl. No.	Parameters	Analytical results	Analytical results	Indian Standard Drinking Water (IS-10500 :2012)		Method of detection	Detection Limit
	Sample code	13DW1	13DW1				
	Date of sampling	28-Sep-20	26-Mar-21	Desirable Limit	Permissible Limit		
1	Colour, Hazen	2	3	5	15	Platinum Cobalt	1.0
2	Odour	Unobjectionable	Unobjectionable	Agreeable		Physical	-
3	Taste	Agreeable	Agreeable	Agreeable		Physical	-
4	Turbidity, NTU	1	2	1.0	5.0	Nephelometric	1.0
5	Potential of Hydrogen (pH)	7.9	7.68	6.5-8.5	No relaxation	Electrometric	0.01
6	Total Hardness	168	545	300	600	EDTA	4.0
7	Iron	0.07	BDL	0.3	No relaxation	AAS-Flame	0.06
8	Chlorides	37	17	250	1000	Argentometric	2.0
9	Free Residual Chlorine	BDL	0.03	0.2	1.0	Spectrophotometric	0.02
10	Total Dissolved Solids	284	298	500	2000	Gravemetric	10.0
11	Calcium	52	56.5	75	200	EDTA	1.60
12	Copper	0.03	BDL	0.05	1.5	AAS-Flame	0.03
13	Manganese	0.02	BDL	0.1	0.3	AAS-Flame	0.02
14	Sulphate	47.4	52	200	400	Turbidity	2.0
15	Nitrate	15.8	15.68	45.0	No relaxation	Spectrophotometric	0.5
16	Fluoride	0.36	0.34	1.0	1.5	SPADNS	0.02
17	Selenium	BDL	BDL	0.01	No relaxation	AAS-GTA	0.002
18	Arsenic	BDL	BDL	0.01	0.05	AAS-VGA	0.002
19	Lead	BDL	BDL	0.01	No relaxation	AAS-GTA	0.005
20	Zinc	0.03	BDL	5	15	AAS-Flame	0.01
21	Hex Chromium	BDL	BDL	0.05	0.05	Colorimetric	0.01
22	Boron	BDL	BDL	0.5	1.0	Colorimetric Carmine	0.20
23	Coliforms (MPN)	Nil	NIL	Not Specified		Multiple Tube Fermentation	1.0
24	Phenolics	BDL	BDL	0.001	0.002	Chloroform Extraction	0.001
25	Alkalinity	116	164	200	600	Indicator	4.0
26	Cadmium	BDL	BDL	0.003	No relaxation	AAS-GTA	0.0005

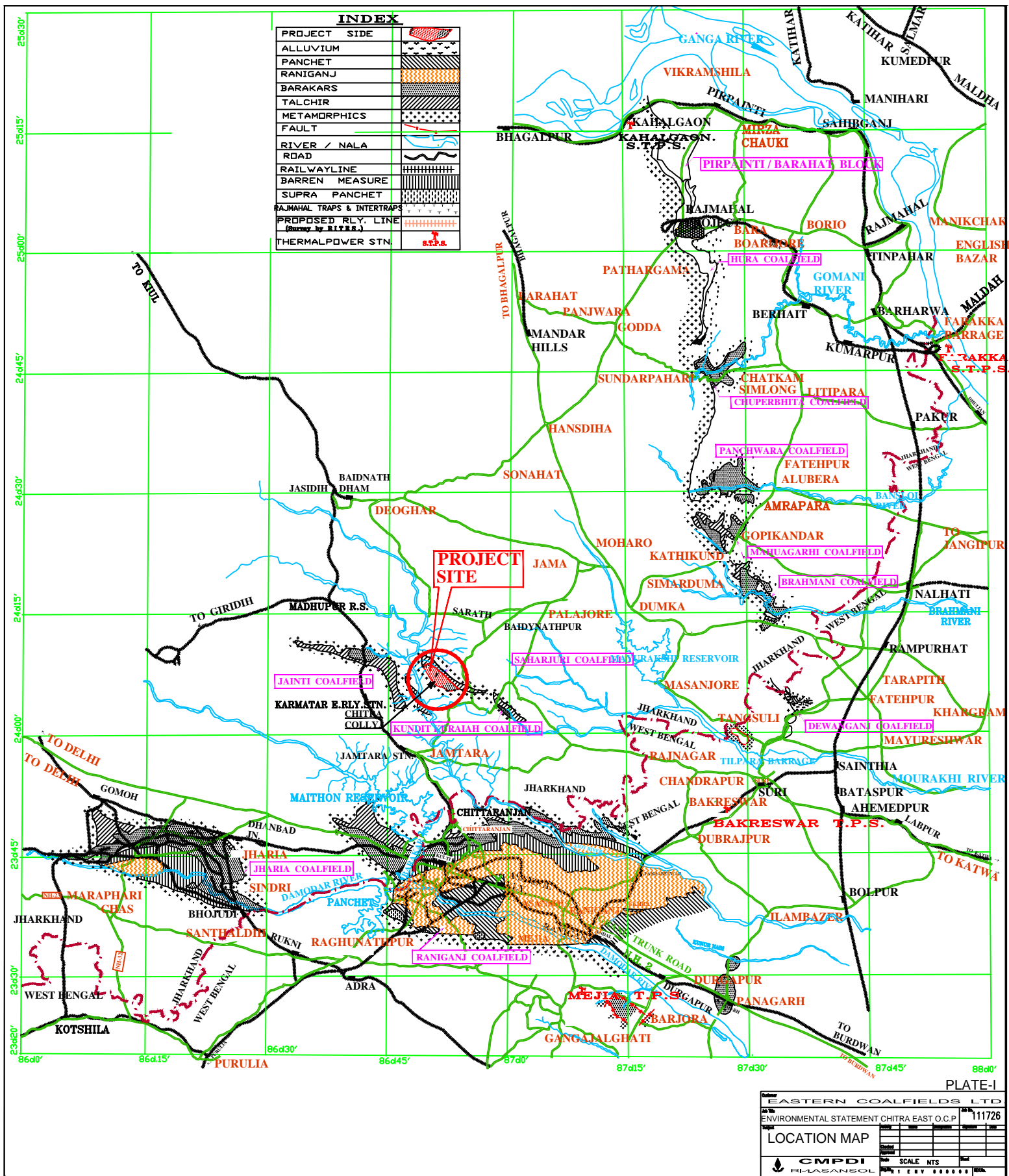
Note: All parameters are in mg/l unless otherwise specified

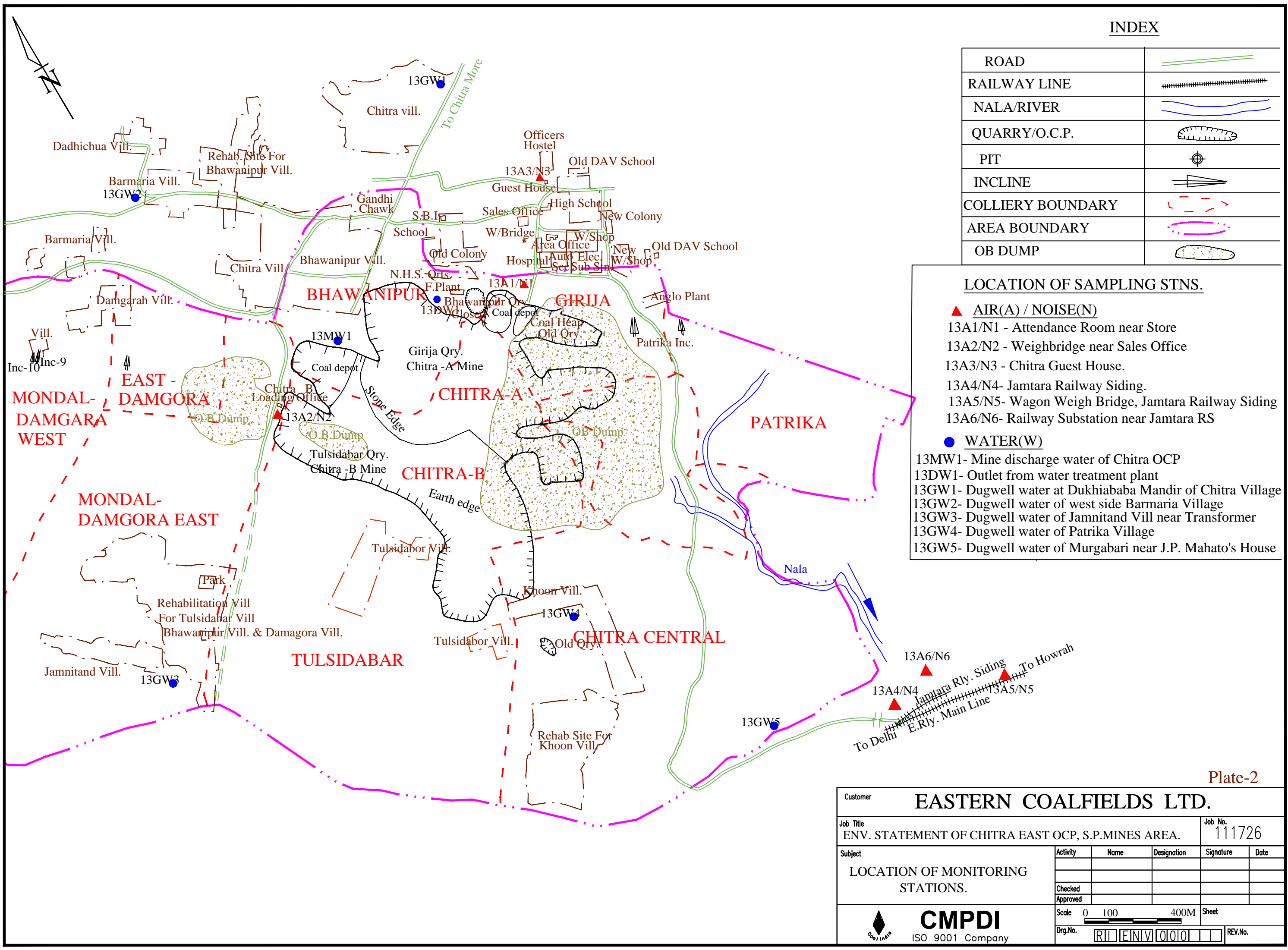
Annexure-IV**Groundwater Level**

Station No.	Station Name	Month	Fortnight	Date of Sampling	Ground Water Level BGL (mtr)
13GWL1	Dugwell at Dukhiababa mandir of Chitra Village	May	First	23-May-20	10.70
13GWL1	Dugwell at Dukhiababa mandir of Chitra Village	November	First	07-Nov-20	4.65
13GWL1	Dugwell at Dukhiababa mandir of Chitra Village	December	First	31-Dec-20	4.75
13GWL1	Dugwell at Dukhiababa mandir of Chitra Village	January	First	24-Jan-21	7.30
13GWL2	Dugwell of west side Barmaria Village	May	First	23-May-20	10.70
13GWL2	Dugwell of west side Barmaria Village	November	First	07-Nov-20	6.20
13GWL2	Dugwell of west side Barmaria Village	December	First	31-Dec-20	6.40
13GWL2	Dugwell of west side Barmaria Village	January	First	25-Jan-21	9.50
13GWL3	Dugwell of Jamnitand Village near Transformer	May	First	23-May-20	8.28
13GWL3	Dugwell of Jamnitand Village near Transformer	November	First	07-Nov-20	6.80
13GWL3	Dugwell of Jamnitand Village near Transformer	December	First	31-Dec-20	8.40
13GWL3	Dugwell of Jamnitand Village near Transformer	January	First	28-Jan-21	7.70
13GWL4	Dugwell of Patrika Village	May	First	23-May-20	10.20
13GWL4	Dugwell of Patrika Village	November	First	07-Nov-20	4.80
13GWL4	Dugwell of Patrika Village	January	First	28-Jan-21	8.60
13GWL5	Dugwell of Murgabari near J.P. Mahato's House	May	First	23-May-20	6.68
13GWL5	Dugwell of Murgabari near J.P. Mahato's House	November	First	07-Nov-20	3.42
13GWL5	Dugwell of Murgabari near J.P. Mahato's House	December	First	31-Dec-20	3.50
13GWL5	Dugwell of Murgabari near J.P. Mahato's House	January	First	28-Jan-21	5.50

Piezometer water level during FY 2020-21

Sl. No.	Station Code	Location of Piezometer	Date of measurement	Water level (in Meters) Below Ground Level
1	CPZ-01	SP Mines, Chitra magazine house	23-May-20	18.00
1	CPZ-01	SP Mines (Chitra magazine house)	13-Aug-20	7.50
1	CPZ-01	SP Mines (Chitra magazine house)	7-Nov-20	13.80
1	CPZ-01	SP Mines (Chitra magazine house)	29-Jan-21	11.80





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ROAD	
RAILWAY LINE	
NALA/RIVER	
QUARRY/O.C.P.	
PIT	
INCLINE	
COLLIERY BOUNDARY	
AREA BOUNDARY	
OB DUMP	

LOCATION OF SAMPLING STNS.

▲ AIR(A) / NOISE(N)

- 13A1/N1 - Attendance Room near Store
13A2/N2 - Weighbridge near Sales Office
13A3/N3 - Chitra Guest House.
13A4/N4- Jamtara Railway Siding.
13A5/N5- Wagon Weigh Bridge, Jamtara Railway Siding
13A6/N6- Railway Substation near Jamtara RS

● WATER(W)

- 13MW1- Mine discharge water of Chitra OCP
13DW1- Outlet from water treatment plant
13GW1- Dugwell water at Dukhiababa Mandir of Chitra Village
13GW2- Dugwell water of west side Barmaria Village
13GW3- Dugwell water of Jamnitand Vill near Transformer
13GW4- Dugwell water of Patrika Village
13GW5- Dugwell water of Murgabari near J.P. Mahato's House

Plate-2

Customer EASTERN COALFIELDS LTD.					
Job Title ENV. STATEMENT OF CHITRA EAST OCP, S.P. MINES AREA.					Job No. 111726
Subject LOCATION OF MONITORING STATIONS.	Activity	Name	Designation	Signature	Date
	Checked				
	Approved				
Scale 0 100 400M			Sheet		
Org.No. RI ENV 0101			REV.No.		