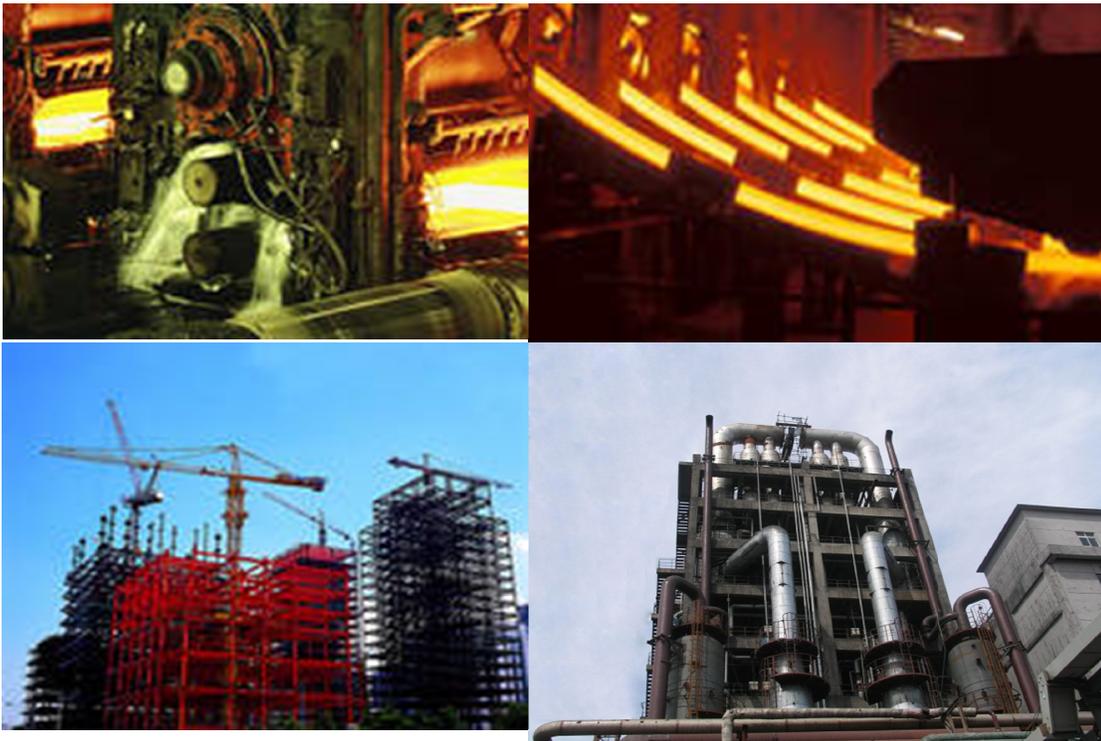# RASHI STRIPS PRIVATE LIMITED

EXECUTIVE SUMMARY
for
1.0 million ton/ year INTEGRATED IRON & STEEL PLANT
at village Paraghat and Beltukri,
Tehsil- Matsuri, District Bilaspur, Chhattisgarh

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Executive Summary

1. INTRODUCTION

M/s. RASHI STRIPS PRIVATE LIMITED (RSPL) has proposed a green-field integrated iron and steel plant of capacity 1.0 million ton / year of DRI using the SHAFT FURNACE -EAF-CCM route with coal gasification and RHF- SAF- Ductile Iron Spun Pipe Plant. It will also have a 200 MW coal based FBC captive power plant, coal washery, ore benificiation plant, pellet plant, producer gas plant, Ferro alloy plant and ash brick plant within the project site. The technologies are state-of-the-art technologies, new to the country and environmental friendly.

2. PROJECT DESCRIPTION

The unit configuration of the proposed project is as given in **Table I.**

Table I: Unit configuration

S.No	Particulars	Installed Capacity
1	Beneficiation & Pelletization of Iron Ore	1.3 million tons / year
2	Coal Washery	2 x 1.2 million tons / year
3	**DRI PLANT**	
	Shaft Furnace with Gasifier	0.6 million tons / year
	Rotary Hearth Furnace	0.4 million tons / year
4	Steel Melting Shop	0.792 million tons / year
5	Concast Complex	0.768 million tons / year
6	Rolling Mill	0.696 million tons / year
7	Ductile Pipe Plant	0.3 million tons / year
8	Submerged Arc Furnace	3 x 9 MVA
9	Ferro Alloy Plant	0.06 million tons / year
10	Captive Power Plant	200 MW
11	Fly Ash Bricks	30 M.Nos

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Location

The proposed project site is located at Village Paraghat and Beltukri, Tehsil- Matsuri, District Bilaspur, Chattisgarh. The details of Environmental settings around the site are as given in the following **Table II.** The location map is given below as **Figure I & II**.

Table II: Details of Environmental Settings

Sl.No.	Particulars	Details
1	Plant site latitude	22^0 1'58.93''N
2	Plant site longitude	$82^0$19'30.81''E
3	Plant Site Elevation	894 m above MSL
4	Climatic Conditions	Max. Temp: 41^0C Min. Temp: 6^0C Annual Avg. rainfall: 1200 mm Wind Direction: Nov – Mar: shall be from East or South East Apr – Oct : shall be from West or North – West
5	Nature and extent of land	Barren Land
6	Nearest Highway	NH-200 (7 Km)
7	Nearest Railway Station	Jairam Nagar (5 Km)
8	Nearest village	Jairam Nagar-2.5 km Limtara-7.2 km.

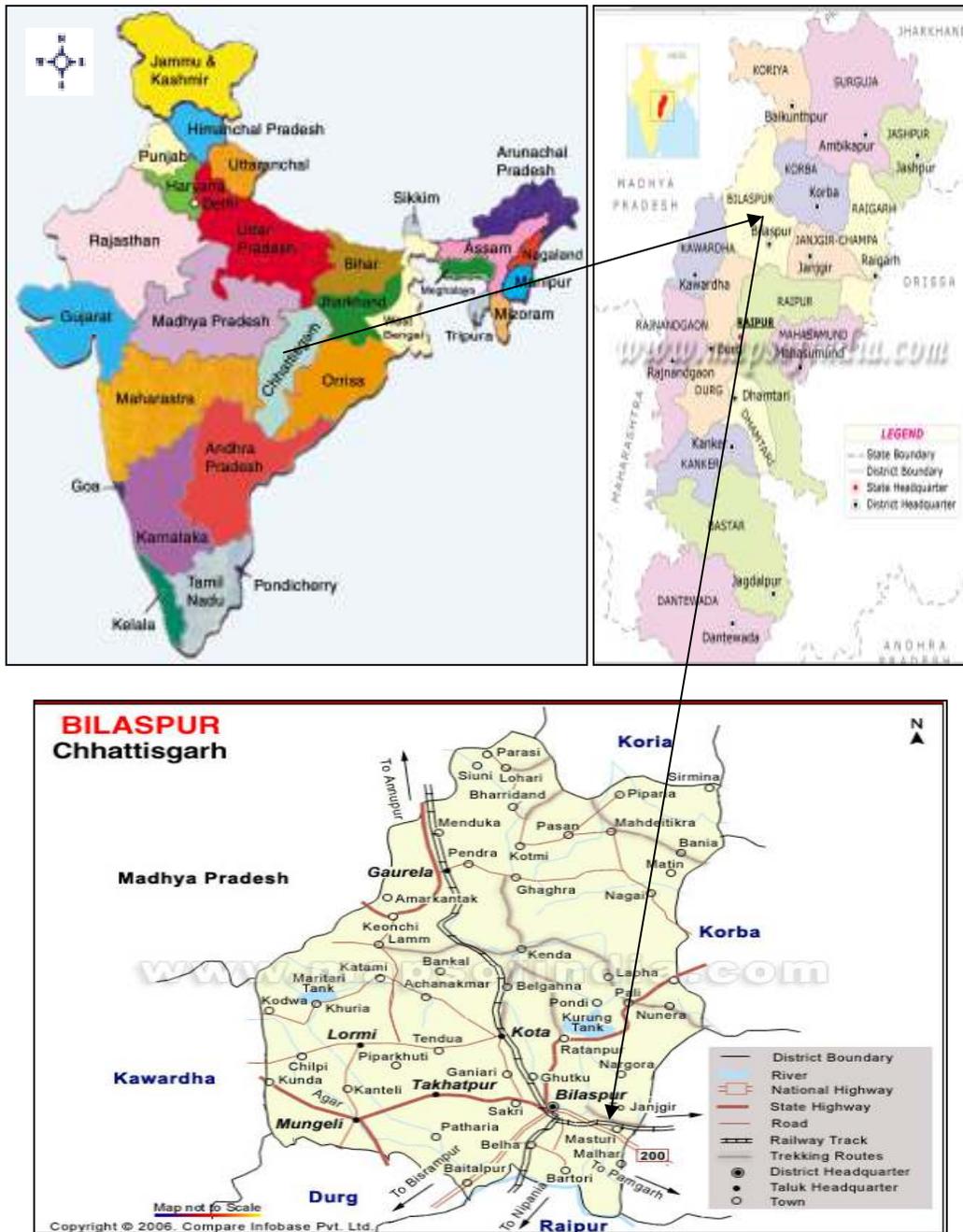Grass Roots Research and Creations India (P) Ltd

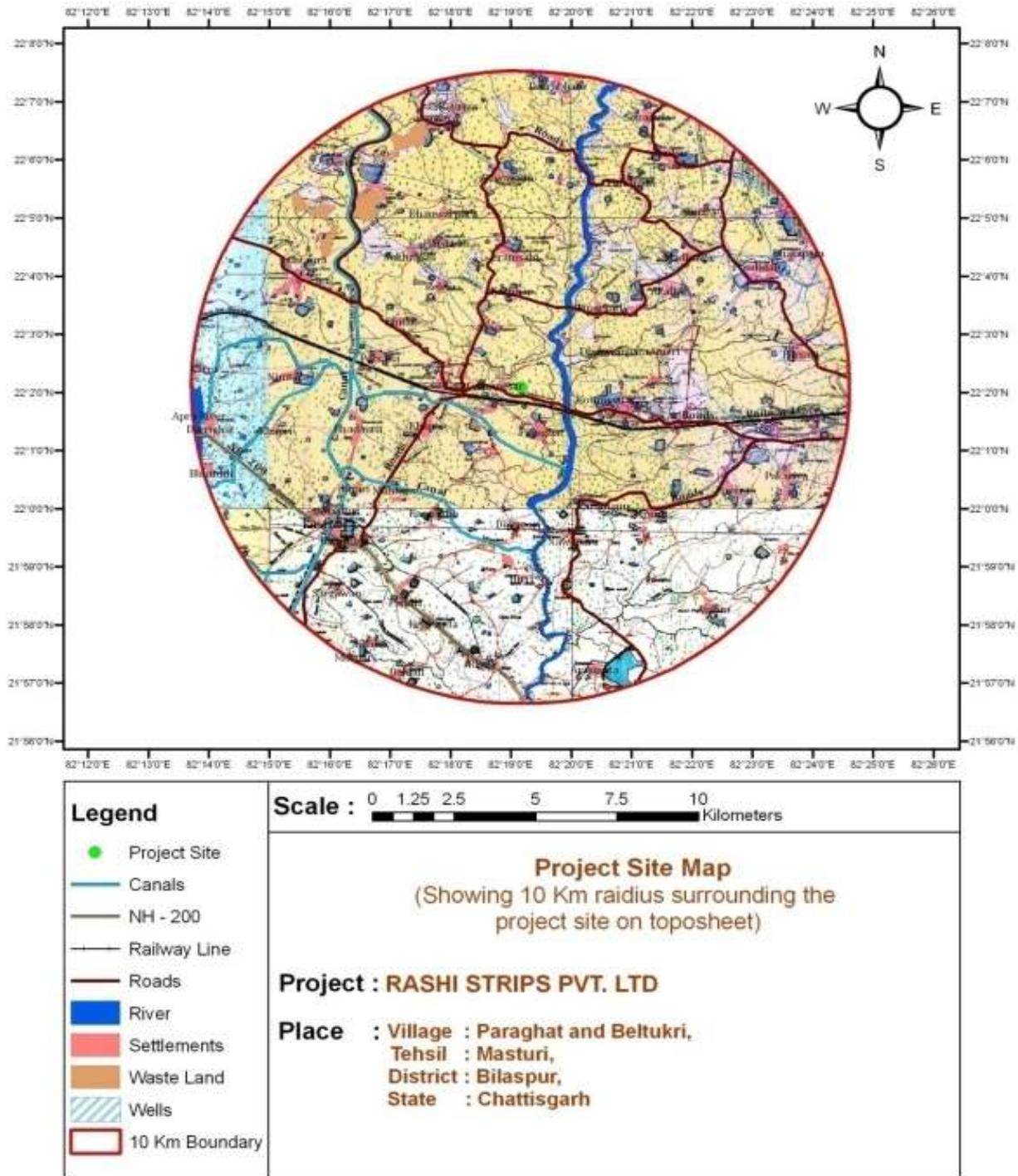*Figure I. Vicinity Map*

Figure II: Features within 10 km radius of the proposed project site

Project Cost

The project cost is Rs. 3000 crore for the proposed Integrated Steel Plant project of M/s. Rashi Strips Private Limited.

Land Requirement

Total land required is 593 acres. The land for the project has been acquired from land owners on mutually agreed terms.

Raw Material Requirement

The major raw materials required for the proposed project and their sources are mentioned in the **Tables III** and **IV** respectively.

Table III: Raw Material Requirement

SI.NO.	MATERIAL	REQUIREMENT (TONNES/YR)
i)	Raw coal	38,81,600
ii)	Iron Ore	19,00,000
iii)	Purchased scrap	3,38,000
iv)	Limestone	1,18,470
v)	Dolomite	64,836
	FERRO ALLOY PLANT	
vi)	Manganese ore	1,27,500
vii)	Iron ore	2000
viii)	Fe. Mn Slag	22,500
ix)	Pearl Coke	27,300
x)	Coal (domestic)	20,600
xi)	Quartz	12,400
xii)	Dolomite	18,400
xiii)	Electrode paste	1100

Table IV: Raw Material Sources

S.no	Raw material	Source
1	Coal	SECL -Bilaspur –Korba / Deppika / Gavera / Raigarh
2	Iron Ore Lumps / fines	NMDC Jagdalpur/ Beladula & Berbil / Keonjhar area of Orrissa
3	Manganese Ore	Moil- Nagpur
4	Water	Lilagar river and ground Water

Power Requirement

The power requirement for the proposed project is 203000 KWh.

Water Requirement

The total requirement of water for the proposed project works out to be 24,150 m^3 per day. A reservoir of capacity 4, 83,000 m^3 with a depth of 4.5 m is proposed to store the water for a minimum period of 20 days. A part of the requirement will be met through a separate pond for rain water harvesting. A suitable low level area for collecting the rain water will be kept and will be used suitably as per need. The water balance diagram is shown in ***Annexure-I(A)*** of EIA report.

The water for the plant will be sourced from Lilaghar River about 2 km away from the proposed project site through pipelines supplemented by Groundwater for which permissions have been sought from concerned govt. departments (enclosed in the Annexures –III of Draft EIA Report).

3. DESCRIPTION OF ENVIRONMENT

Introduction

The present report covers baseline environmental data generated within 10 km radius surrounding area from the proposed project site which is the study area. The proposed project site within 593 acres of land is termed as Core Zone and the surrounding area beyond Core Zone within study area is termed as Buffer Zone.

The baseline environmental data were generated during December 2010 – February 2011 (winter season) for meteorology, air quality, water quality, noise levels and soil characteristics, by setting up a number of monitoring stations. Further, existing ecological and socio-economic features were also studied. The collected data were analyzed for identifying, predicting and evaluating environmental impacts. The maximum anticipated impacts were assessed and based on which an environmental management plan has been drawn.

Meteorology

A meteorological station was set up near the proposed plant site. The summarised monitored meteorological data is mentioned in **Table V**. Main features of the climate and meteorology in the study area is as follows:

- In winter, the predominant wind direction was North East, followed by North and South. Calm conditions prevailed for 34.78 % of the time.

- During day time, predominant wind direction was from North East and followed by East and South. During day time, calm conditions prevailed for 21.74 % of the time.

- During night the predominant wind direction is from South followed by East, and North East. During night time, calm condition prevailed for 43.48% of the time.

Table V: Summarized Meteorological Data for the Monitoring Period
(Dec 2010 – Feb 2011)

Month	Wind Speed (m/s)			Temperature (°C)			Relative Humidity (%)		Rainfall (mm)		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Total	24 hours highest	No of rainy Days
Dec 2010	4.5	<1	2.1	25	9	18	48	12	3.7	52.1	0.4
Jan 2011	3.2	<1	1.1	20	7	15	43	12	6.7	55.4	0.8
Feb 2011	3.5	<1	1.3	26	13	19	39	14	12.3	57.4	1.0

Ambient Air

To assess the ambient air quality level, 8 (eight) monitoring stations were set up. It has

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been observed that the values of $PM_{2.5}$ ranges between 29.5 to 36.9 µg/m³, $P.M_{10}$ ranges from 83.1 - 97.4 µg/m³, SO_2 ranges between 10.4 -13.0 µg/m³ and NO_X ranges between 23.3 – 27.8 µg/m³. The results when compared with National Ambient Air Quality Standards (NAAQS) of Central Pollution Control Board (CPCB) for "Industrial/ Residential/ Rural and Other Areas" show that the average values of ambient air quality parameters are well within the stipulated limit. The NAAQ values are given in **Table 3.3** in **Chapter-3** of EIA Report.

Ambient Noise

The noise monitoring was done at eight locations. The compiled noise levels during daytime and nighttime during the study period Dec-2010 to Feb-2011 is given in **Table - 3.5** in Chapter-3 of EIA Report. It can be seen that the night time Leq (Ln) varies from 38.1 to 42.1dB (A) and the daytime Leq (Ld) varies from 42.3-52.2 dB (A) within the study area. Low noise level is due to absence of any industrial activity in the area. The status of noise quality within the 10 km zone of the study area is, within the CPCB standards.

Water Environment

Eight ground water and three surface water samples were collected and analyzed. Surface water quality was analyzed for parameters as mentioned in the 'Methods of Monitoring & Analysis published by CPCB (Annexure–IV)' and it was rated according to the CPCB Water Quality Criteria against A, B, C, D, & E class of water based on parameters identified in the criteria.

Quality of ground water was compared with IS: 10500: 1991 (Reaffirmed 1993 With Amendment NO -3 July 2010) for drinking purposes. It was observed that all the physico chemical parameters and heavy metals from all the ground water samples are below stipulated drinking water standards. All the ground water samples analyzed can be considered fit for drinking purpose in the absence of alternate sources. It can be seen that water collected from pond at Parsada, river Lilaghar and pond at project site can be compared with class C and can be used as drinking water source after conventional treatment and disinfection. Bacteriological Examination of surface water indicates the presence of total coliform, which may be due to human activities observed during the study period.

Soil

Eight samples of soil were collected and analyzed. Within the study area, the pH of the soil was found to be neutral (6.78 to 7.81) and conductivity ranged from 69 to 217 μmhos/cm. The bulk density of the soil ranged between 1.31 to 1.38 g/cm^3, which indicate favorable physical condition for plant growth.

Ecological Features

The Biological /Ecological study has been done within 10 km radius surrounding area from the proposed project site which is the study area. The proposed project site within 593 acres of land is termed as Core Zone and the surrounding area beyond Core Zone within study area is termed as Buffer Zone.

There is no major ecologically sensitive zone within the study area. Neither any corridor for the movement of wildlife, nor any other ecological sensitive areas located within the study area. However, a crocodile conservation site is present within the buffer zone of the project area known by the name Kotmisonar Crocodile Park which is about 4.5 km away from the proposed project site. This crocodile park is an artificially developed aquatic habitat for crocodile conservation. This is a manmade park created to avoid human-crocodile conflict. The crocodile park is on the other side of river as well as upstream of the river. Therefore no impacts on this park, due to the project are envisaged.

The nearest wildlife sanctuary, Achanakmar Wildlife Sanctuary is situated in Bilaspur district which is 55 km away from the proposed project site. One of the famous zoos named Kanan Pindari is situated 38 km away from the present project site.

The project site mostly contains shrubs and herbs scattered over the area. The vegetation pattern of core zone of study area comprised of thirteen shrub species (*Lantana camara, Ziziphus mauritiana, Murraya koenigii, Ipomoea fistulosa, Argemone mexicana*) and seventeen herb species (*Cynodon dactylon, Chenopodium album, Euphorbia hirta, Ocimum tenuiflorum*) area present in this zone.

Buffer zone of the study area comprises of fifty four tree species, twenty seven shrub species and forty nine herb/climber species. The dominant tree species in the buffer zone are *Butea monosperma, Acacia nilotica, Terminalia tomentosa, Albizia lebbeck, Terminalia arjuna, Madhuca indica* and *Terminalia bellerica*. Shrubs in the buffer zone comprised of mostly *Lantana camara, Ziziphus mauritiana, Jatropha curcas, Calotropis procera, Ipomoea fistulosa, Nerium oleander* and *Argemone mexicana* whereas the ground flora of buffer zone is dominated

with *Cynodon dactylon, Chenopodium album, Euphorbia hirta, Ocimum tenuiflorum,* and *Cissus repanda.*

The major part of the study area lies under agriculture field and human settlements which restricted the wildlife habitat significantly. Most of the mammalian species reported in the study area are wild boars, squirrels and Indian hare and domesticated animals.

There are many small ponds present in the buffer zone of study area which are the major attraction sites for avifauna. Common Maina, Kingfisher, Spotted dove, Pintail and Pond Heron are some dominant bird species present in the study area. There is no migratory movement of birds in the study area. As far as the reptiles' community was concerned, ratsnake, python, karait, and house lizard are reported from the study area.

Socio-Economic Environment

The study area within 10 km radius of the proposed integrated steel plant of M/s Rashi Strips Pvt. Ltd. is spread over in four districts of Chhattisgarh state. These districts are Bilaspur, Raipur, Durg and Jangir Champa. While the major portion of the study area falls in district Bilaspur a small portion each is stretch out in district Raipur, Durg and Jangir-Champa. The Sub-districts (Tehsils) falling in the study area are Masturi, Thakatpur, Lormi and Bilaspur in district Bilaspur, Bhatapara in district Raipur, Dhamdha in district Durg and Jangir in District Jangir-Champa.

The study area is dotted with 40 villages and one town. The only town located in the study area is Bhatapara, which is situated at an altitude of 261 Meters (856 feet) from the sea level. Bilaspur is the nearest town. Akaltara, Kumhari, Ratanpur, Lormi, and Thakatpur are the other towns. The average distance between a village and the nearest town is approximately 18 Km. Bilaspur is the nearest town from village Ameri located at a distance of 2 kilometers. Besides agricultural land and settlements other important landuse/ land cover patterns are open scrub land, river, barren wasteland, other natural vegetation, water bodies, wells etc, road, railway lines, National Highways, etc.

- The total population of the study area is 116756, of which 51 percent are male and the remaining 49 percent are female.

- Again, of the total population 23.5 percent are Scheduled caste and 7.9 percent are Scheduled Tribe. Gondas, Bhaina, Bhattara, Binjhwar, Karku, Khairwar, Mawasi, Nagesia, Pradhan, Pardhi, Parja, Saonta and Sonr, are the important tribes found in the area.

- The number of literate persons in the study area is 66970, which constitutes 57.4 percent of the total population. Of this male shares 34.8 percent and female 22.6 percent

- The total number of workers in the study area is 44181 of which 64 percent are male and the remaining 36 percent are female. Sector wise they are distributed as 63.4 percent from rural areas and 36.6 percent from urban areas.

Landuse

The land use of the study area was carried out by utilizing three principal resources, namely, (i) Survey of India topo-sheet of 1:50,000 scale; (ii) Satellites imagery data without any cloud cover; and (iii) ground validation for the interpretation of the FCC imagery. **Table VI** describes distribution of land area in hectares and percentage based on Census of India 2001 which has been illustrated in pie diagram in Figure 7.1 of EIA Report. The landuse/landcover pattern can be more meaningful through a land-use map (Figure 7.2 in Chapter-7 of EIA Report).

Table VI: Land use pattern in Study Area

Serial No.	Description	Area (in Hectares)	Percentage share in total area
(1)	(2)	(3)	(4)
1	Forest Land	144	0.8
2	Total irrigated area	9585	59.7
3	Total non-irrigated area	2664	19.4
4	Culturable waste	1953	14.4
5	Area not available for cultivation	575	5.7
	Total	*14921*	*100*

4. ANTICIPATED ENVIRONMENTAL IMPACTS

Impact during Construction

All the major construction activity will be limited within the proposed plant premises. Prior to construction, land will be developed through leveling and grading. Construction activities will result

in loss of vegetation cover (grass and shrubs) and topsoil to some extent in the proposed plant area. The construction activities attract a sizeable population and influx of population is likely to be associated with construction of temporary hutments for construction work force, having an effect on land use pattern of the areas surrounding the project. However, the impact of such activities will be temporary and will be restricted to the construction phase only.

There will be impact in the ambient air quality due to fugitive dust emission and impact on ambient noise quality because of earth moving equipments, transportation and civil work activities. However, water sprinkling will be regularly carried in order to arrest the fugitive dust to the maximum extent possible. Also the impact on the environment due to noise generation during construction period is likely to be insignificant, reversible and localized in nature and mainly confined to the day hours. The noise level will drop down to the acceptable level, once the construction activities are over.

Impact during Operation

During operation of the plant, environmental releases in the form of air emissions, waste water discharges, solid waste, noise, etc, may affect air, water, land and ecological environment directly. In addition to the above primary impact, some indirect impact on the surrounding socio-economic environment may also take place. These are mentioned below in brief

1. **Impact on Air Environment**

The principal impacts on ambient air quality due to operation of the proposed units will be due to emissions from the stacks of the proposed units and emissions of fugitive dust from the iron ore and coal handling areas. The predicted maximum contribution of GLC for all stacks is given in the following table and at at different co-ordinate, which is 7.0 ug/m^3 for PM$_{10}$, 10.0 ug/m^3 for SO$_2$ and 26.0 ug/m^3 for NOx respectively. The nearest AAQ monitoring station where maximum GLC values have occurred is Kanumanu in South direction. The monitored background 98 percentile value for AAQ of Kanumanu is 96.7 ug/m^3 for PM$_{10}$, 13.7 for ug/m^3 for SO$_2$ and 33.8 ug/m^3 NO$_x$ for the study period.

The predicted maximum incremental values (**Table VII)** of GLC for all stacks at different monitoring locations, are 7.0 ug/m3 for PM10, 3.2 ug/m^3 for SO$_2$ and 4.9 ug/m3 for NOx. The nearest AAQ monitoring station where maximum GLC values have occurred is Kanumanu in South direction. The monitored background 98 percentile value for AAQ of Kanumanu is 96.9

ug/m^3 for PM$_{10,}$ 12.1 ug/m^3 for SO$_2$ and 27.8 ug/m^3 NOx.

The AAQ station Kanumanu is on south side of the plant at a distance of 3.5 km. The predicted contributions of different pollutants from the proposed steel plant when added with the monitored existing background levels of Kanumanu indicate that the maximum concentrations will be 96.2ug/m^3, 14.9ug/m^3 and 32.6ug/m^3 for PM10, SO2 and NOX respectively. Since, the values are within permissible values for rural/ residential/ Industrial areas/other area, therefore no significant impacts are expected from the steel plant provided steel plant authority incorporates pollution control measures indicated in the report and implemented holistically. All the fugitive emissions where de-dusting suction hoods cannot be provided due to physical constraints shall be provided with dry fog dust suppression system/water sprinklers.

Table VII: Predicted value of GLCs

Location	Background value ug/m^3			Incremental value ug/m^3			Total Predicted GLC ug/m^3		
	SO$_2$	NOx	PM$_{10}$	SO$_2$	NOx	PM$_{10}$	SO$_2$	NOx	PM$_{10}$
Site	10.4	23.9	96.9	2.3	4.9	2.3	12.7	28.8	99.2
Piparsati	12.1	23.8	95.4	1.1	2.1	-	13.2	25.9	95.4
Beltukuri	11.5	27.8	88.8	1.8	2.9	4	13.3	30.7	92.8
Rasera	11.3	26.7	83.1	1.6	3.0	0	12.9	29.7	83.1
Khaira	11.8	27.4	85.7	2.3	4.9	3.5	14.1	32.3	89.2
Kanumanu	11.7	27.7	93.6	3.2	4.9	2.6	14.9	32.6	96.2
Bhatapara	12.0	23.3	97.4	2.6	2.8	-	14.6	26.1	97.4
Parsada	11.1	25.8	84.8	1.9	1.7	7	13.0	27.5	91.8

2. Impact on Water Environment

The maximum requirement of make-up water for the proposed plant will be 24,150 m^3/day, which will be met from Lilaghar River supplemented by ground water for domestic purposes. Water will be treated in clarifier or thickeners near the pump house. The treated water will be stored in the plant reservoirs which will be subsequently transferred to the independent units with the help of pumps. As the plant water system is designed based on maximum re-circulation system and effective discharge from plant to outside will be insignificant. Run-off water from the raw material storage yard will be routed through garland drains to catch pits to settle out suspended solids. The clear

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water will be discharged into natural drainage channels.

RSPL is having plan for maximum recirculation/reuse of waste water in normal circumstances. However in case of abnormal condition occasionally small quantities of waste water have to be discharged to prevent build up of excess dissolved solids in circulating water. During the monsoon, requirement of water for dust suppression and green belt irrigation will be drastically reduced. Hence excess water will have to be discharged. This waste water will mostly contain salts of Calcium and Magnesium and suspended solids already present in the raw water. All the blow water is taken to the blow down tank and then used for irrigation, dust suppression etc. Moreover, the waste water quality will be well within the stipulated norms.

3. Impact on Solid Waste

The major solid wastes expected to be generated from the various facilities of integrated steel plant are given in following **Table VIII**:

Table VIII : Quantity of Solid Waste Generated

Sl. No.	Item	Description	Norm	Quantity tpa	Quantity tpd	Pollution Control
1	**Coal washery**	Rejects	10%	240000	706	Twin ponds for collection ,one in use and the other being emptied-filter cake is being formed and sold
2	**Ore Beneficiation**	Slime	30%	633284	1863	Twin ponds for collection ,one in use and the other being emptied-filter cake is being formed and sold
3	**Coal gasifier**	Ash	30%	108000	327	Ash collection system. Disposal through Brick making
		Dust in outgoing gases	0.50%	1800	5	Dust collection from outgoing flue gases. Disposal through Brick making

Sl. No.	Item	Description	Norm	Quantity	Quantity	Pollution
	Pellet plant					
4	Fine Iron Ore & Ore dust	Grate Kiln, Dryer & Ball mill exhaust gases, Ore & Bentonite storage bins and Process air fans	~45 Kg/t	27000	82	Dust Collected From all dust collecting system consists of iron ore fines is sent back in the raw pellet mix
5	**Rotary hearth furnace**	Dust from the grinding units and briquetting plant and screening material. Cyclone type Dust collector system for outgoing flue gases	20 Kg/t	8000	24	To be recycled in the system
6	**Submerged arc furnace for making iron**	Process slag	290 kg/t	116000	331	slag will be granulted and sold
7	**Power plant**	Ash 55%	FBC Flyash	1090000	2995	Ash collection system. Disposal through Brick making
			FBC Bottom ash	272000	745	
	Ferro-alloy unit	Fe Mn slag SiMn slag		14000 12000	47 40	Use in SiMn production Road construction/land filling
	Steel Melt Shop (SMS)					
8	Slag	From the Process	200kg/t of LS			Road construction
	Scrap	From the Process	2%	15280	4.8	Recycled to SMS

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Sl. No.	Item	Description	Norm	Quantity	Quantity	Pollution
	CCM Scale	From the CCM	0.5% of billet	3820	12	To be charged in base mix for RHF
	Fine Dust	From the EAF & LF	10-15 Kg/t of Billets	7640	24	To be charged in base mix for RHF
		From the Ladles & CCM	0.25 Kg/t of billets	191	0.6	To be pelletised in RHF
		From Raw material & FAFA handling units	0.5 Kg/t of billets	382	1.2	To be pelletised in RHF
	Mills					
	Steel scrap	From the Process	3%	23300	73	To be Recycled in SMS
	Mill Scale	From the Reheating furnace and rolling	0.75% from Reheating furnace & 0.5% from each mill			To be charged back as blend mix for RHF

4. Impacts on Noise Levels

During plant operations noise generated will be close to the compressors and blowers and as a result will be confined within plant boundary, thus will not have any impact out of the plant boundary. In high noise work-zone, protective measures as given in Environmental Management Plan will be followed to minimize the impact on workers.

5. Impact on Ecological Features

Since the change in ambient air quality due to emissions from the proposed capacity expansion will be small, vegetation in study area will not be damaged. The waste water discharge from the plant will be minimized and will meet the surface water discharge norm thus there will insignificant impact on the ecological environment of surface water in the study area.

5. ENVIRONMENTAL MANAGEMENT PLAN

Air Pollution Management

All stack emission will be designed on SPM emission of 50 mg/Nm^3. To reduce fugitive dust emission due to handling of iron ore, coal, dust extraction and dust suppression systems will be installed at appropriate locations. Plain water type dust suppression system will be provided in the coal/ raw material stockpiles area. The dust suppression systems will consist of water sprinkling systems. Air Pollution Control Measures are given in brief in the **Table IX**.

Table IX: Air Pollution Control:

S. No.	Item	Description	Pollution Control
1	**Raw material handling area, Material Transfer Points**	Non Process	Dust suppression system and de-dusting systems comprising of bag filters.
2	**Coal washery**	Non Process	Control of fugitive dust emission by Dust suppression system.
3	**Ore Beneficiation**	Non Process	Control of fugitive dust emission by Dust suppression system in the material handling area.
4	**Coal gasifier** Syn Gas	Non Process+ Process	Control of fugitive dust emission by Dust suppression system in coal handling area & de-dusting plant using bag filter. Syn gases having calorific value of 2600 Kcal/m^3 will be used in the plant after cleaning to required level in gas cleaning plant. Syn gas heater flue gas will be cleaned in a bag filter system
5	**Pellet plant** Dust Laden Gases	Process	Fume extraction & de-dusting plant using bag filter.

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S. No.	Item	Description	Pollution Control
6	**Rotary hearth furnace**	Process + Non process	Control of fugitive dust emission by water spraying and de-dusting system using bag filter.A burner at the bottom of the stack burns any combustibles remaining in the flue gas. For that dilution air is injected prior to the stack.A portion of the flue gas sensible heat is used to preheat combustion air. Dust from the grinding units and briquetting plant and screened material in outgoing flue gases
7	**Submerged arc furnace for making Ferro alloy**	Process + secondary emission	The exhaust gas from submerged arc furnace would be cooled and a canopy will suck non process dust and after mixing with primary gas will be cleaned by dry gas cleaning process using bag filter.
8	**Power plant**	Process	ESP having two passes to be provided. Limestone dosing along with coal feed to control SO_2 emission. NOx emission will be low due to low combustion temperature.
9	**Steel Melt Shop (SMS)**		
	Common fume extraction and gas cleaning facilities will be provided to extract fume through fourth hole in the roof, canopy at the top for fugitive emission control and discharge it to the atmosphere after cooling and cleaning. The gas cleaning system will be complete with water-cooled duct, gas cooler, bag house, ID fan and stack. The cleaned gas discharged into the atmosphere will have a dust content well within the statutory limits. The pulse jet type bag filter will be installed for control of air pollution in EAF		
	Flue gases	From the EAF & LRF	To be discharged through chimney after fume extraction & Gas cleaning plant
	Flue gases	From the Ladles & CCM	Fume extraction & de-dusting plant-

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S. No.	Item	Description	Pollution Control
	Flue gases	From Raw materials & FAFA handling units	Fume extraction & de-dusting plant-
10	**Mills**		
	Flue gases with SO_2	From the Reheating Furnaces	To be dispersed by tall stack as per the CPCB formula $H=14xQ^{0.3}$ H = Ht of chimney in m Q = Quantity of SO2 generated / hour in kg.

Water Pollution Management

The prevention and control of water pollution aim at conserving make-up water by recycling the wastewater after treatment. During the operation of the plant, three major categories of wastewater, viz. blow down water from the cooling tower, slurry water and sanitary waste water streams would be generated. Efforts will be made to reuse most of the wastewater in the plant itself. Efforts will be made to harvest rainwater in the plant. Run-off water from the office areas, shop roofs will be collected and used for future use.

The oil effluent will be collected from areas where there are possibilities of contamination by oil (transformer yard, fuel & lubricating oil storage areas, and workshop) and the drains from such areas will be routed through an oil-water separator. The collected oil shall be sold to re-refiner approved by SPCB.

All storm water drains from the raw materials and solid waste handling areas will be routed through garland drains into catch pits of sufficient volume to settle out suspended solids present in the storm water run-offs. The clear water will be discharged into natural drainage channels. This type of effluent is anticipated only in monsoon season. The sewage from the Plant, Township and Canteen waste water will be treated in sewage Treatment Plant. The treated sewage will be utilized for irrigation of green cover inside plant/colony premises.

Solid Waste Management

The principal solid waste produced by any steel plant is slag, scrap, scale and dust. The dust from

dust catcher unit, SMS section will be recycled to the RHF in the plant itself.

Part of the SMS slag will be treated and shall be sold as ballast. Remaining shall be used to fill low-lying areas. Slag from EAF and SAF will be granulated and sold to the cement plants for slag cement.   Scrap from SMS and other areas will be recycled to RHF in the steel plant. Scale and debris from HSM will be recycled to the RHF in the plant itself. The solid waste generated and their control measures are indicated in the **Table IX**. All the scraps & scales will be recycled fully.

Noise Level Management

The following measures will be undertaken to reduce noise and its impact:

- Equipment will be placed on rubber bushes to reduce Noise level at 1m distance to 85 dB (A).
- Sound proof enclosures will be provided to operators in high noise zone. Workers will be provided with ear muffs/ earplugs and the duration of exposure of the personnel will be regulated as per applicable norms.
- Regular check-up of workers for noise related health problem and if detected alternative duty will be provided.

6. PROJECT BENEFITS

The following benefits are anticipated in the study area:

- The project may not cause any significant impact on the existing agricultural situation.
- There will be change in pattern of demand among people by way of shift from food items to non-food items.
- There will be a positive impact on employment and income scenario, both direct as well as indirect.
- There is a possibility of increase in industrialization in the vicinity of RSPL. This is likely to bring more skill diversification among local people.
- Overall peoples' perception on the project is good.
- The project will undertake various infrastructure developments and welfare activities in the neighboring area in consultation with the local Panchayat and District Administrations under

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various CSR programmes

7. EMP IMPLEMENTATION AND MONITORING

All necessary steps will be taken to implement the measures suggested by Chattisgargh Pollution Control Board & CPCB and the Charter on Corporate Responsibility for Environmental Protection (CREP) for Integrated Iron and Steel Industry. The suggestions given in the EMP shall be implemented by following an implementation schedule. ISO-14001 will be implemented for the total plant.

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