

## **EXECUTIVE SUMMARY**

### **1.0 INTRODUCTION**

M/s. RUPL is engaged in manufacturing of M.S. Ingot/ Billets and re-rolled steel product. The project has got existing EC vide letter no. 191/EC/Raipur/1650, dated 13/05/2022 for the rolling mill through Hot Charging capacity 57800 MT/ Yearly (Merger of unit II M.S. Ingot – 28800 MT/ Year and Unit III M.S. Ingot – 29000 MT/ Year) from the State Environment Appraisal Committee (SEAC). The project is categorized as B; project Activity covered under 3(a) "Metallurgical Industries". However, General Condition is applicable since the project falls under CPA. As per EIA Notification 2006 and subsequent amendment thereof the project is Cat. A and shall be appraised at MoEF&CC, New Delhi.

The Company (M/s Rama Udyog Pvt Ltd,) is currently operating its 50 TPD X 4 Nos. DRI kilns with annual capacity of 60000 TPA with WHRB-06 MW & AFBC-02 MW with billet 57800 MT Yearly with valid Consent under Air and Water Act. Now the company aims to reconfigure DRI Kilns from 4x40 TPD to 2x100 TPD for Sponge Iron production, enhancing their existing IFs to boost MS Billets production from 57,800 metric tons per annum (TPA) to 250,000 TPA.

The unit has been in operation under the Consent of the Air Act and Water Act since 2005 and CTE for Rolling Mill through Hot Charging Furnace route with CCM by Merger of Unit-II and Unit-III, Capacity 57800 MT/Yearly was obtained vide letter no 4651/TC/CECB/2022 dated 07/10/2022., which is yet to be implemented until the issuance of Consent to Operate. There is no violation of EIA Notification 1994 and EIA Notification 2006.

Anacon Laboratories Pvt. Ltd., Nagpur, is QCI-NABET accredited in 'Category A' environment consultant organization (Certificate No.: NABET/EIA/2326/RA 0304) has been assigned to undertake an Environmental Impact Assessment (EIA) study and preparation of Environment Management Plan (EMP) for various environmental components, which may be affected due to the impacts arising out of the proposed project.

The proposed project involves expanding capacity on a brownfield site spanning 14.21 hectares of existing land. In this expansion plan, M/s. RUPL aims to reconfigure DRI Kilns from 4x40 TPD to 2x100 TPD for Sponge Iron production, enhancing their existing IFs to boost MS Billets production from 57,800 metric tons per annum (TPA) to 250,000 TPA. This expansion also includes the installation of new CCMs. Additionally, a cutting-edge rolling mill will be established to produce 30,000 TPA of re-rolled steel, utilizing an innovative Billet Reheating Furnace powered by a coal gasifier. Plans further involve setting up a Ferro Alloys facility with a capacity of 6 Mega Volt Ampere (MVA), generating 9,000 TPA of Silico Manganese. The renewal of consent has been obtained for the existing Sponge Iron facility and waste heat recovery boilers (WHRB) and Atmospheric Fluidized Bed Combustion (AFBC) units vide letter No 7650/TC/CEB/2023 dated 31/01/2023 and has been implemented. To promote sustainable energy practices, M/s. RUPL intends to propose the construction of a 6-megawatt biomass-based power plant at Siltara Industrial Growth Center Phase-II, Village - Siltara, Tahsil - Dharsiwa, District-Raipur 493111 C.G.

EIA process requires the primary baseline data collection to know the information on the biophysical, social and economic backgrounds of Brownfield project. The Environmental Impact Assessment (EIA) report is prepared for obtaining Environmental Clearance (EC) from Ministry of Environment, Forest and Climate Change (MoEF&CC), New Delhi and the Consent for Establishment from the Chhattisgarh Environment Conservation Board (CECB) for the

## **1.1 IDENTIFICATION OF PROJECT**

The proposal is for expansion of production capacities at Siltara Industrial Growth Center Phase-II, Village - Siltara, Tahsil - Dharsiwa, District-Raipur 493111 C.G. by M/s. Rama Udyog Pvt Ltd in the following manner:

Existing production facilities comprises of DRI Kilns 4x40 TPD configuration and Rolling Mill through Hot Charging capacity 57800 MT/Year. It is proposed to augmented existing production facilities by reconfiguration of DRI Kilns 4x50 TPD to 2x100 TPD of Sponge Iron 60,000 TPA and expansion MS Billet/Ingot and Rerolled products through IF with CCM and rolling mill from 57800 TPA to 250000 TPA. Now the total capacity of Rerolled Steel product after amalgamation of existing and proposed enhancement will be will be 250,000 TPA.

The company has also proposed to produce 30,000 TPA rerolled products with gasifier and Ferro Alloys (SiMn) 9000 TPA and CPP 14 MW ( Existing WHRB 6 MW & AFBC – 2 MW) and new biomass based 6 MW power plant.

The proposal is for expansion of production capacities at Siltara Industrial Growth Center Phase-II, Village - Siltara, Tahsil - Dharsiwa, District-Raipur 493111 C.G. by M/s. Rama Udyog Pvt Ltd in the following manner:

### ➤ **DRI Kiln (Coal Fired):**

The company has proposed reconfiguration of existing 50TPD x 4 kiln to 100 TPD x 2 Nos @ 300 days . The Spong Iron production will remain same as 60,000 TPA.

### ➤ **MS Billet through Induction Furnace, CCM:**

Existing To complement the enhanced production capacity, the installation of state-of-the-art Continuous Casting Machines (CCMs) equipped with real-time monitoring capabilities will streamline the production of billets and rerolled products (57,800 metric tons per annum (TPA) to 250,000 TPA). These smart machines will enable real-time data analysis, facilitating proactive adjustments to optimize production parameters and reduce material wastage.

### ➤ **Rerolled Steel Products through Rolling Mill:**

Furthermore, the establishment of a modern rolling mill will incorporate innovative technologies to produce 30,000 TPA of rerolled steel. The introduction of a Billet Reheating Furnace powered by a coal gasifier will not only reduce energy consumption but also minimize carbon emissions, aligning with sustainability goals.

### ➤ **Ferro-Alloys (SiMn)**

The company has proposed Electrically operated Sub-merged Arc Furnace of 6 MVA capacity to produce SiMn of capacity 9000 TPA.

### ➤ **Captive Power Plant (Boiler and TG based)**

The company has existing 6MW WHRB based and 2MW AFBC based captive power plant and has now proposed Biomass based 6MW power plant in the expansion project.

The following capacities would require EC for expansion of the existing facilities:

**TABLE 1: EXISTING AND PROPOSED CAPACITY DETAILS (IN TPA)**

S. No.	Details	Existing Capacity	Proposed addition/change	Total Capacity after expansion
1	Sponge Iron	200 TPD (4X50 TPD)	Nil	200 TPD (2X100 TPD)
3	Induction Furnace with CCM & Rerolled Products	57800 TPA	192,000	250000 TPA
4	Re rolled product with gasifier	Nil	30,000	30000 TPA
5	Ferro Alloys	Nil	6 MVA	6 MVA
6	Power plant			
	I WHRB from Sponge Iron	6 MW	Nil	6 MW
	II AFBC boiler	2 MW	Nil	2 MW
	II Biomass based power plant	Nil	6MW	6 MW

## 1.2 LOCATION OF THE PROJECT

The proposed expansion project activities will be carried out within existing plant premises of 14.21 Ha. The proposed project located at Khasra No. (Existing)111/1 to 7,112/1 to 10,114/1 to 9, Village - Siltara, Tahsil -Dharsiwa, District – Raipur (C.G.). The nearest city is Raipur which is around 16 km in SE direction. Nearest airport is Swami Vivekananda Airport, Domestic Airport (Raipur Airport) which is around 56.00 km at E direction. The project site can be reached through National highway namely NH 130. The project is well connected to all weather roads. Nearest railway station is Mandhar Railway Station which is 6.82 km SE.

The details of environmental setting are given in **Table 2**.

## 1.3 EIA/EMP REPORT

In line with the approved ToR obtained from EAC (Industry –I), MoEF&CC, New Delhi, baseline environmental monitoring was conducted during Pre-monsoon season (**15<sup>th</sup> March 2023 – 15<sup>th</sup> June 2023**) for determining the status of ambient air quality, ambient noise levels, surface and groundwater quality, soil quality, status of flora, fauna and eco-sensitive areas and socio-economic status of the villages within 10 km radius study area from the project site (**Figure 1**). The observations of the studies are incorporated in the EIA/EMP report. Impacts of the proposed project activities during construction and operation stages were identified and duly addressed in the report.

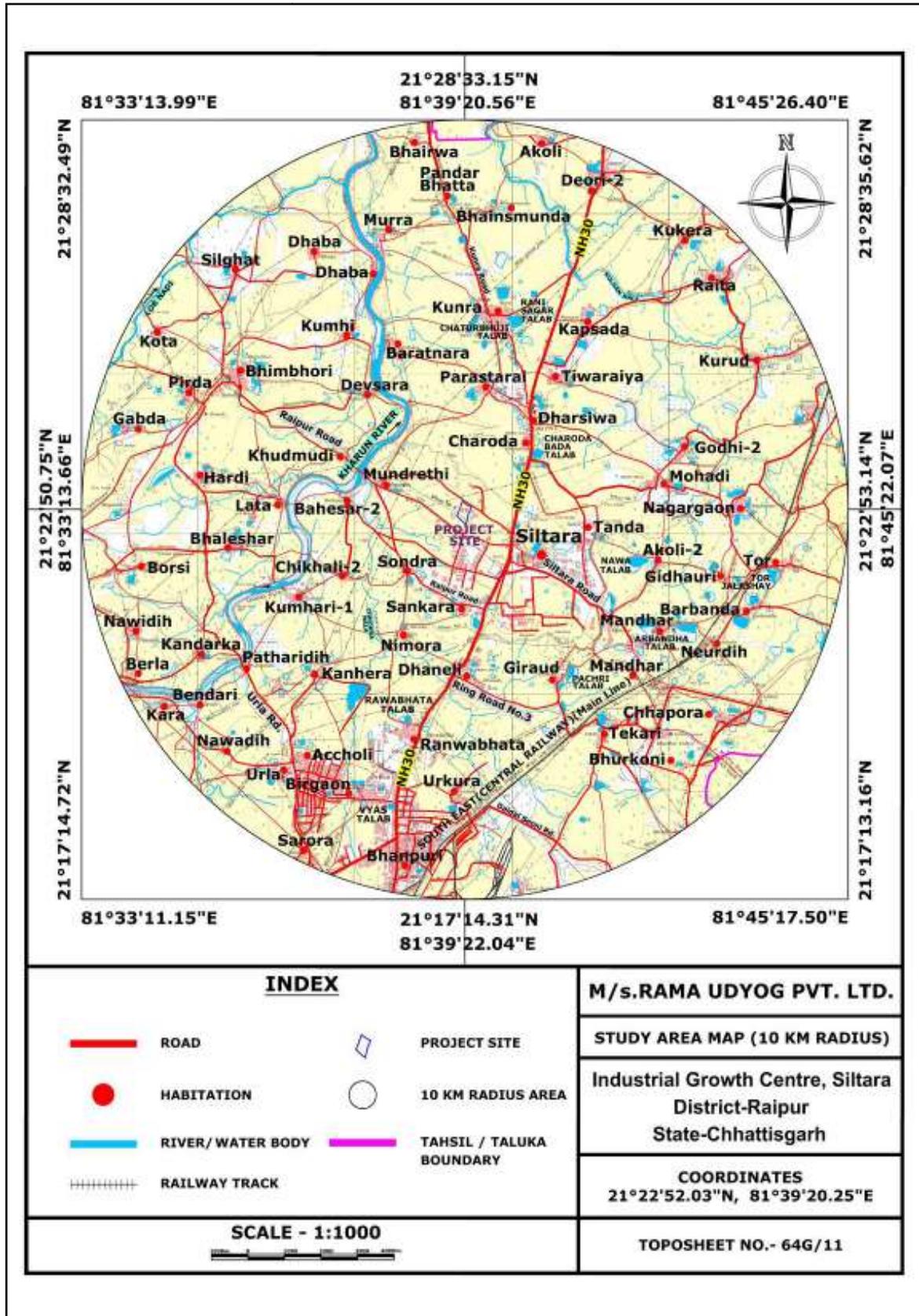


FIGURE 1: STUDY AREA (10 KM RADIAL DISTANCE)

### TABLE 2: DETAILS OF ENVIRONMENTAL SETTINGS

Particulars	Details			
Project Location	<b>Village-</b> Siltara <b>District-</b> Raipur, <b>State-</b> Chhattisgarh			
Office	18 <sup>th</sup> Mile Stone, SKS Road, Siltara Industrial Growth Centre Phase-II, Siltara, Raipur, Chhattisgarh 493111			
Latitude/Longitude	21°22'52.03"N, 81°39'20.25"E			
Location covered in Toposheet No.	64G/11			
Nearest representative IMD Station	IMD Raipur - 18.62 km/S			
Site elevation above Mean Sea Level	292m-300m			
Nearest roadway	Road connecting NH30 and project Site- Adjacent/N NH30-1.17km/E NH 53 NH130			
Nearest Railway Station	Mandhar Railway Station-6.82 km/SE Raipur Railway Station-13.84 km/SSW			
Nearest Air Port	Swami Vivekananda International Airport, Raipur, Atal Nagar Nava Raipur, Chhattisgarh-23.16km/SSE			
Nearest village	Munrethi-2.03km/WNW Siltara-1.60km/ESE			
Nearest Port	1) Gopalpur Port-416km/ESE 2) Paradeep Port-537km/ESE			
Distance from Sea Coast	Bay of Bengal-413km/SE			
Nearest major city with 2,00,000 population	Raipur-5.67km/SSW			
Nearest State/National Boundaries	1) Odisha-90.32km/SE 2) Madhya Pradesh-95.40km/WNW 3) Maharashtra-101.03km/WSW			
Hills/Valleys	None within study area			
Ecologically sensitive zone	None within study area			
National Parks, Wildlife Sanctuaries, etc.	None within study area			
Nearest Reserved / Protected forests	None within study area			
Historical/Tourist places	<b>Sr. No.</b>	<b>Name</b>	<b>Distance (Km)</b>	<b>Direction</b>
	1	Kharun Dam, Bahesar	2.86	WNW
	2	Rawabhata Talab	6.05	SSW
	3	Maa Chaturbhuj Mandir	5.20	NNE
	4	Banjari Mata Mandir	7.51	SSW
Nearest Industries	<b>Sr. No.</b>	<b>Name</b>	<b>Distance (Km)</b>	<b>Direction</b>
	1	SKS Ispat & Power Ltd.	0.60	NW
	2	Rashmi Sponge Iron & Power Industries Private Limited	0.03	N
	3	GR Sponge and Power Ltd Unit-II	0.16	S
	4	P.D Industries Pvt. Ltd.	Adjacent	E
	5	Jayaswal Neco Industries Ltd.	3.03	SE
	6	API Ispat & Powertech Pvt. Ltd. (Real Ispat)	1.25	WSW
7	Sunil Sponge Private Ltd	0.16	SSW	

Particulars	Details				
	8	Jagdamba Power (Hira Group)	1.15	WNW	
	9	Godawari Power & Ispat Ltd.	2.32	ESE	
	10	Ratna Engineering Works	Adjacent	S	
	11	Narmada Industries	1.51	WNW	
	12	Gopal Sponge & Power Pvt. Ltd.	0.98	WSW	
	13	Gajapati TMT	1.15	WNW	
	14	Bhagwati Power & Steel Limited	0.45	ESE	
	15	Vandana Global Limited	1.67	S	
	16	Nandan Steel and Power Ltd.	1.91	WSW	
	17	Agrawal Channel Mills Pvt. Ltd.	0.85	SW	
	18	Aarti Sponge and Power Limited	1.50	WSW	
	19	Mahendra Sponge and Power	1.82	SSW	
	20	Sarda Energy & Minerals Ltd.	2.63	ESE	
	21	Nakoda Ispat Ltd. Power Plant	2.05	S	
	22	Drolia Electrosteels Private Limited	0.43	NNE	
	23	Sarda Energy and Minerals Limited	2.64	ESE	
	Nearest Water Bodies	<b>Sr. No.</b>	<b>Name</b>	<b>Distance (Km)</b>	<b>Direction</b>
		1	Karun River		
		2	Pachri Talab, Giraud	5.10	SE
		3	Arbandha Talab, Giroud Road	6.58	ESE
		4	Rani Sagar Talab, Kunra	5.24	NNE
		5	Dongia Talab Giraud	5.42	SSE
		6	Rawabhata Talab	6.13	SSW
7		Tor Jalashay	8.52	ESE	
8		Chaturbhuji Talab	5.24	NNE	
9		Charoda Bada Talab	2.23	NE	
10		Vyas Talab, Bhanpuri	8.53	SSW	
11		Sodhe Talab, Tekari, Chatoud	7.7	SSE	
12		Rani Sagar Talab Kunra	5.20	NNE	
13		Atmanand Sarovar	7.83	ESE	
<b>Nalas;</b>					
<b>Sr. No.</b>		<b>Name</b>	<b>Distance (Km)</b>	<b>Direction</b>	
1	Chhokra Nala	2.24	WSW		
2	Lor Nadi	9.8	NNW		
3	Kulhan Nala	7.13	NNE		

Particulars	Details			
Religious Places	<b>Sr. No.</b>	<b>Name</b>	<b>Distance (Km)</b>	<b>Direction</b>
	1	Shitla Mata Mandir Murethi	2.55	WNW
	2	Ma Banjari Mandir	7.51	SSW
	3	Boharhi Ma Ka Mandir	8.90	E
	4	Shitla Mata Mandir	8.25	SSW
	5	Satbahinya Temple	7.98	NNW
	6	Shri Radhe Krishna Mandir	6.06	ENE
	7	Maa Durga Mandir	8.23	SSW
	8	Shiv Mandir Charoda	1.81	NE
	9	Jama Masjid Charoda	2.26	NE
	10	Shri Mahakaleshwar Temple	7.82	SSW
11	Gurudwara Guru Nanak Sahib	5.65	SSW	
Hospitals and Education Institutions (Sensitive Manmade Land use)	<b>HOSPITALS</b>			
	<b>Sr. No.</b>	<b>Name</b>	<b>Distance (Km)</b>	<b>Direction</b>
	1	ESIC Hospital, Raipur	6.3	SSW
	2	UMA Dental Care	4.76	S
	3	B.K. Multi-speciality Clinic	7.97	SSW
	4	Siddi Vinayak Hospital	7.85	SSW
	5	Maa Sharda Hospital & Maternity Home	8.43	SSW
	6	C H C Dharsiwa (Hospital)	4.09	NNE
	7	Government Hospital	3.01	NNE
	8	Sai Kripa Hospital	1.90	SSE
	9	Shree Gopendra Memorial Hospital	7.49	WNW
	10	Community Health Centre Birgaon	7.41	SSW
	<b>EDUCATIONAL INSTITUTIONS</b>			
	<b>Sr. No.</b>	<b>Name</b>	<b>Distance (Km)</b>	<b>Direction</b>
	1	VITS College Raipur, Baratnara	3.57	NW
	2	Dau Poshanlal Government Higher Secondary School, Parastarai, Dharsiwa	3.06	NNE
	3	Govt. High School Kunra	4.64	NNE
	4	Ambition English Medium School	2.83	NNE
	5	Vidya Sagar English School	9.78	SSW
	6	Ambition English Medium School	7.96	WSW
7	Columbia Global School	8.56	SE	
8	Government Primary School, Mandhar	6.58	ESE	
9	Shaskiya Navin Prathmik School	7.29	SSW	

Particulars	Details			
	10	Columbia Institute of Engineering and Technology	8.75	SE
	11	Pandit Shyamacharan Shukla College Dharsinwa	3.79	NNE
	12	Swami Atmanand English medium school	8.20	SSW
Community Places	<b>Sr. No.</b>	<b>Name</b>	<b>Distance (Km)</b>	<b>Direction</b>
	1	Nagar Palika Nigam Birgaon Community Hall	9.16	SSW
	2	Shagun Marriage Hall	8.53	SW
	3	Berlakala Naya Para	9.64	WSW
Seismic zone	Seismic zone - II			
Area is subjected to environmental pollution if any	Siltara Industrial Area is Critically Polluted Area under CEPI - 2018.			

## 2.0 PROJECT DESCRIPTION

### 2.1 PROCESS DESCRIPTION

#### 2.1.1 Manufacturing process of Steel Melting Shop with CCM and Hot Charging Rolling Mill

##### Induction Furnaces

- The manufacturing process installed in the unit is one which is well established and proven technology presently being followed by majority of similar manufacturing units mostly in small or medium scale sector.
- The melting process involves taking sample of Sponge Iron & Pig Iron; Iron Powder and mild steel scrap, end cutting from rolling mills or scrap from user units is taken from raw material storage. This is then tested for its chemical composition and noted..
- Melting of steel along with other alloying element is accomplished in the crucible of coreless M.F. Induction Furnace.
- After completion of melting cycle of an hour the homogeneous molten mass is poured hydraulically into the ladle.

##### ➤ CCM

- The ladle containing liquid steel is placed on the Continuous Casting Machine platform and continuous casting of hot billet is carried out in the same.
- In the CCM section hot billet shearing machines will be installed with each casting strand, so as to facilitate the cutting of billets to proper length for feeding in to the rolling mill.

#### 2.1.2 Manufacturing process of rerolled steel through Billet heating furnace (Producer Gas based) Rolling Mill

- Cold Steel Billets received in the mill are cut to size; either by Gas Cutting or by automatic shearing machine
- The sized billets are then Pushed into Billet reheating furnace fired with coal/ hot producer gas.
- After the Billet is Red Hot then these are pushed out to rolling stands for re-rolling.
- Steel Pieces are rolled through all stands in order to get required shape of finished goods i.e., MS Channel, Structure and other rerolled product as finished product

### Producer Gas plant based on Coal

In Order to provide required thermal energy to Billet reheating furnace in Rolling Mill permission for coal producer gas plant is obtained with about 1 to 1.5 ton per hour C grade coal used which would produce about 3000 NM<sup>3</sup> to 3500 NM<sup>3</sup> producer Gas per hour. The TAR condensate collected from the Hot Cyclone and PG Pipe traps (Water Seals) would be collected and used in the BRH furnace.

### 2.1 LAND REQUIREMENT

Total land requirement is 14.21 Hectare possession of M/s. Rama Udyog Pvt Ltd. out of which 12.21 Hectare is already diverted for industrial purpose and rest of the 2 Ha. Will be under process of diversion. The land is existing industrial land. No additional land proposed to be acquired. Greenbelt area 40% (i.e., 5.684 Ha.) will be kept unchanged. The land already diverted to industrial purpose. Sufficient flat land, free from major undulations and sparse vegetation is available within the plant premises. The detail of land use planning is provided in **Table 3**.

**TABLE 3: AREA STATEMENT**

Description of Activity / Facility / Plant / Others	Land requirement in Ha			Percentage %
	Existing	Proposed	Total after expansion	
DRI Kiln Along with WHRB (Existing & Proposed)	0.60		0.60	4.22
Induction Furnace (Existing & Proposed)	0.60		0.60	4.22
Rolling Mill (Existing & Proposed)	0.60		0.60	4.22
Power Plant (Existing)	0.22		0.22	1.55
Ferro Alloys Plant (Proposed)		0.23	0.23	1.62
Bio Mass Power Plant (Proposed)		0.42	0.42	2.96
Material Storage Yard & Shed Area	0.282		0.282	1.98
ETP/STP/WTP Area	0.008	0.02	0.028	0.19
Admin & Other Non-Plant Buildings	0.587	0.05	0.637	4.82
Utilities Area	0.021		0.021	0.15
Internal Roads	1.252	0.089	1.341	9.44
Truck Parking & Car, Two-Wheeler Parking	2.13		2.130	14.99
Open Area	1.27	0.20	1.47	10.34
Green Belt	4.64	0.99	5.63	39.62
<b>Total</b>	<b>12.21</b>	<b>2.00</b>	<b>14.21</b>	<b>100 %</b>

### 2.2 RAW MATERIALS REQUIREMENT, SOURCE & MODE OF TRANSPORT

Availability of raw material is abundant in a range of distance within 50 km to 250 km area from project site. The details of raw material requirement are given in Table 2.4.

**TABLE 4: RAW MATERIAL REQUIREMENT AND MODE OF TRANSPORTATION**

S. No.	Raw Material	Consumption (In TPA)	Source	Mode of Transportation
<b>For Sponge Iron Plant</b>				
1	Iron Ore (Fe 64+)	100000	Odisha Iron Ore Mine and NMDC	By Rail to the nearest railway siding and then by Road through covered truck.

S. No.	Raw Material	Consumption (In TPA)	Source	Mode of Transportation
2	Coal (FC 40)	85000	SECL Coal mines or imported Coal	By Rail to the nearest railway siding and then by Road through covered truck or by port and then by rail to the nearest railway siding and then by Road through covered truck
3	Dolomite /Limestone	600	Open Market	By Road through covered truck
<b>For Induction Furnace (Steel Melting Shop)</b>				
1	DRI (Sponge Iron)	240000	Captive production/ Local market	By Road through covered truck.
2	Scrap (10%)	30000	Captive production/ Local market	Internally available/ By Road through covered truck.
3	Pig Iron (10%)	30000	Local market	Internally available/ By Road through covered vehicles
4	Ferro Alloys	3250	Captive production/ Local market	
5	Fluxes	16,170	Open Market	By Road through covered truck.
6	Oxygen	23,10,000 Nm3	Open Market	
<b>For Continuous Casting Machine (CCM, Billets)</b>				
1	Liquid Steel from IF	250000	Induction Furnace production	Internally available/ By Road through covered vehicles
2	Argon	41,250 Nm3	Open Market	By Road through covered vehicles
<b>For Hot Charging Rerolling Mill</b>				
1	Hot Billets	250000	Captive Production in Steel Melting shop	Internal Transfer
<b>For Reheating Furnace Based Rolling Mill</b>				
1	Cold Mild Steel Billets	32,400	Captive Production in Steel Melting shop / From local market through covered trucks	By Road through covered vehicles
2	Coal	3,600	SECL Mines	By Road through covered vehicles
<b>For Ferro Alloys Plant</b>				
1	Mn Ore	22500	Open Market	By Road through covered vehicles
2	High Mn Slag	2000	Open Market	
3	Quartz	3150	Open Market	
4	Coke/Coal/Charcoal	7200	Open Market	
5	Dolomite	300	Open Market	
6	Electrode Paste	300	Open Market	
7	M.S. Item.	100	Open Market	Internal Transfer
8	Lancing Pipe and Canister Sheet	150	Open Market	By Road through covered vehicles
<b>Captive AFBC Power Plant (2 MW)</b>				
1	Char Dolochar	15000	Captive generation in SID	Internally available.
2	Coal (GCV – 4000)	15000	SECL Mines	By Road through covered vehicles
3	Fluidizing Bed Media	50	Open Market	By Road through covered vehicles
<b>Captive Biomass Power Plant (2 MW)</b>				
1	Biomass (paddy	47500	From surrounding	By Road through covered vehicles

S. No.	Raw Material	Consumption (In TPA)	Source	Mode of Transportation
	firewood, rice husk, Baggasse, Municipal Waste, Poultry Litter and other Biomass West		(50 KM)	

### 2.3.1 Solid and Hazardous waste generation

The total estimated solid waste generation (including existing and proposed expansion) will be 100344.7TPA and 3 KLA Hazardous Waste in the form of Waste oil/ used oil. The detail of solid waste generation is presented in Table 5 and hazardous waste generation details are presented in Table 6.

**TABLE 5: SOLID AND HAZARDOUS WASTE GENERATION AND ITS DISPOSAL**

Name of Waste / By product generated	Qty (TPA)	Proposed Disposal Plan
Char / Dolochar	700	Will be given to power plant
Slag from SMS	900	Slag will be crushed and after recovery of iron, it will be used for road construction.
Mill Scales from Rolling Mill	60	Will be reused in SMS
Slag from Silico Manganese Manufacturing Process	6000	Will be utilized in road construction
Ash generated from Gasifier (Rolling Mill) and AFBC Power Plant	84000	Will be given to brick manufacturing units. (The company have agreement with MO bricks and Mahaveer Bricks)
Ash from Biomass based power generation	8660	
Kiln Accretion	24	Will be utilized in road construction
Spent Resin (Haz. Waste)	0.5	Will be given to authorized recycler having authorization from competent authority.
ETP Sludge (Haz. Waste)	0.2	Will be utilized in greenbelt
<b>Total</b>	<b>100344.7</b>	

**TABLE 6: HAZARDOUS WASTE GENERATION**

Type of Hazardous Waste	H. W. Category	Quantity	Disposal
Waste Oil/Used Oil	5.1(as per HWMSchedule I)	3 KL/Annum	Will be given to authorized recycler having authorization from competent authority.
Used Lead Acid batteries	17 (as per HWMSchedule IV)	—	

### 2.3 WATER REQUIREMENT & SOURCE

Closed circuit cooling system will be adopted. Industrial waste water (49KLD) will be treated in ETP (Cap. 60 KLD). Treated water will be used in process.

Domestic waste water generation (12KLD) will be treated in STP (20 KLD). Treated water will be used for greenbelt development

CSIDC Water Connection

Total Yearly water requirement will be = 225000 KLA

**CGWA area type category:** Critical

Closed Circuit cooling system will be adopted to minimize the fresh water requirement

## 2.4 POWER REQUIREMENT & SUPPLY

Total power requirement (existing and proposed expansion) will be 23 MW. 14 MW will be met through CPP and rest 9 MW from CSPDCL industrial power supply network; in addition to these we already have 3 Nos of 500 kVA DG sets & 1 No of 1250 KVA DG set proposed for emergency backup.

## 2.5 MANPOWER REQUIREMENT

The industry will provide employment to about 310 (250 existing + 60 additional) persons. Total manpower requirement is given in **Table** .

**TABLE 7: TOTAL MANPOWER REQUIREMENT FOR THE PROPOSED EXPANSION PROJECT**

Particulars	Existing	Proposed additional	Total
Administrative Staff	40	10	50
Production Staff	210	50	260
<b>Total :</b>	<b>250</b>	<b>60</b>	<b>310</b>

## 2.6 FIRE FIGHTING FACILITIES

In order to fight with emergency situation due to fire in plant premises, firefighting facilities are provided in various units of the plant. In addition to this, all plant units, office buildings, laboratories, etc. will be provided with adequate number of portable fire extinguishers to be used as first aid fire appliances.

## 2.7 PROJECT COST

The total project cost of the project is **17390.65 Lakhs** (which includes Existing -Rs.5241.65 Lakhs + Rs.12149.00 Lakhs).

## 3.0 EXISTING ENVIRONMENTAL SCENARIO

### 3.1 BASELINE ENVIRONMENTAL STUDIES

Baseline environmental studies were conducted at project site along with 10 km radial distance from the project site. The baseline environmental quality data for various components of environment, viz. Air, Noise, Water, and Land were monitored during **Pre-monsoon season (15<sup>th</sup> March 2023 – 15<sup>th</sup> June 2023)**

### 3.2 METEOROLOGY & AMBIENT AIR QUALITY

**Summary of the Meteorological Data Generated at Site (15<sup>th</sup> March 2022 – 15<sup>th</sup> June 2022)**

Predominant Wind Direction	Period: 15 <sup>th</sup> Mar 2023 – 15 <sup>th</sup> June 2023
First Predominant Wind Direction	WSW (12.86%)
Second Predominant Wind Direction	W (10.05%)
Calm conditions (%)	2.63
Avg. Wind Speed (m/s)	2.65

The status of ambient air quality within the study area was monitored for pre-monsoon season at 8 locations. All these 8 sampling locations were selected based on the meteorological conditions considering upwind and downwind, cross wind directions and reference point. The levels of Respirable Particulate Matter (PM<sub>10</sub>), Fine Particulates (PM<sub>2.5</sub>), Sulphur Dioxide (SO<sub>2</sub>), Oxides of

Nitrogen (NO<sub>x</sub>) and carbon monoxide (CO), Ammonia, Ozone, Benzene and BAP were monitored. The details of Ambient Air Quality Monitoring Results are summarized and given in **Table 6**.

**TABLE 8:SUMMARY OF AMBIENT AIR QUALITY MONITORING RESULTS**

Sr. No.	Location		PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>2</sub>	CO	Ozone	NH <sub>3</sub>
			µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	mg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>
1	Project Site	Min	72.2	31.8	15.3	21.6	0.303	7.9	6.3
		Max	105.7	50.4	21.6	32.7	0.457	14.3	11.3
		Avg	84.3	39.4	18.3	26.8	0.371	11.1	8.6
		98 <sup>th</sup>	103.7	49.1	21.0	32.1	0.440	14.1	11.1
2	Siltara	Min	80.5	36.2	17.7	25.9	0.444	10.3	10.1
		Max	126.0	51.3	27.0	40.6	0.562	18.3	14.4
		Avg	104.7	43.1	21.5	32.7	0.512	14.3	12.2
		98 <sup>th</sup>	124.7	50.1	26.4	39.8	0.558	18.1	14.2
3	Sondra	Min	63.8	26.9	12.5	16.8	0.254	7.9	6.9
		Max	87.4	37.6	19.0	23.9	0.547	14.2	12.8
		Avg	76.5	32.8	15.6	21.2	0.365	10.8	9.6
		98 <sup>th</sup>	86.5	37.5	18.6	23.9	0.540	14.2	12.6
4	Chikhali-2	Min	61.8	27.6	10.6	15.7	0.274	7.4	6.4
		Max	87.3	38.5	17.2	22.3	0.353	11.2	9.9
		Avg	74.0	32.4	13.6	18.5	0.311	9.2	8.2
		98 <sup>th</sup>	84.7	37.7	16.7	21.8	0.348	11.1	9.9
5	Bahesar - 2	Min	59.4	9.1	10.2	13.7	0.248	6.3	6.3
		Max	78.6	16.9	16.1	20.2	0.314	10.7	9.0
		Avg	70.7	14.2	12.6	16.7	0.286	8.4	7.6
		98 <sup>th</sup>	78.1	16.6	15.7	19.7	0.312	10.2	8.9
6	Charoda	Min	63.0	24.6	12.0	15.4	0.269	7.3	6.0
		Max	82.2	36.8	17.2	23.3	0.405	12.4	11.4
		Avg	72.6	29.7	14.4	19.6	0.329	10.2	8.7
		98 <sup>th</sup>	81.6	35.6	16.6	22.9	0.390	12.2	11.0
7	Tanda	Min	71.7	28.1	13.8	21.6	0.346	10.0	8.7
		Max	92.1	42.6	19.9	30.0	0.475	14.8	13.5
		Avg	82.5	35.2	16.3	25.4	0.414	12.5	10.6
		98 <sup>th</sup>	92.0	42.0	19.7	29.6	0.472	14.7	13.2
8	Sankara	Min	71.8	24.0	15.3	20.8	0.300	9.2	7.4
		Max	87.3	41.3	20.0	29.5	0.406	13.6	10.9
		Avg	81.3	31.5	17.4	24.3	0.344	11.4	9.0
		98 <sup>th</sup>	87.3	39.6	19.8	28.9	0.402	13.3	10.8
<b>CPCB Standards</b>			<b>100</b> (24hr)	<b>60</b> (24hr)	<b>80</b> (24hr)	<b>80</b> (24hr)	<b>2</b> (8hrs)	<b>100</b> (8hr)	<b>400</b> (24hr)
<b>CONCENTRATION OF HEAVY METALS &amp; VOC'S IN AMBIENT AIR</b>									
<b>Location</b>	<b>Pb (µg/m<sup>3</sup>)</b>	<b>As (ng/m<sup>3</sup>)</b>	<b>Ni (ng/m<sup>3</sup>)</b>	<b>Benzene (µg/m<sup>3</sup>)</b>	<b>BaP (ng/m<sup>3</sup>)</b>				
Project Site	0.31	0.12	BDL (DL-0.1)	BDL (DL-0.01)	BDL (DL-0.01)				
Siltara	0.42	0.17	BDL (DL-0.1)	BDL (DL-0.01)	BDL (DL-0.01)				
Sondra	0.27	0.11	BDL (DL-0.1)	BDL (DL-0.01)	BDL (DL-0.01)				
Chikhali – 2	0.18	BDL (DL-0.1)	BDL (DL-0.1)	BDL (DL-0.01)	BDL (DL-0.01)				
Bahesar – 2	0.15	BDL (DL-0.1)	BDL (DL-0.1)	BDL (DL-0.01)	BDL (DL-0.01)				
Charoda	0.23	BDL (DL-0.1)	BDL (DL-0.1)	BDL (DL-0.01)	BDL (DL-0.01)				
Tanda	0.2	BDL (DL-0.1)	BDL (DL-0.1)	BDL (DL-0.01)	BDL (DL-0.01)				
Sankara	0.29	0.12	BDL (DL-0.1)	BDL (DL-0.01)	BDL (DL-0.01)				
<b>Ambient Air</b>	<b>1 (24 hrs)</b>	<b>6 (Annual)</b>	<b>20 (Annual)</b>	<b>5 (Annual)</b>	<b>1 (Annual)</b>				

Sr. No.	Location	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>2</sub>	CO	Ozone	NH <sub>3</sub>
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	mg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>
<b>Standard</b>								

*BDL: Below Detectable Limit.*

From the above results, it is observed that the ambient air quality at all the monitoring locations was within the permissible limits specified by CPCB.

### 3.3 AMBIENT NOISE LEVELS

Site of an area was selected to meets the manmade land use pattern as prescribed in the standard e.g., Industrial, Commercial, Residential and Silence Zone. Eight (8) locations were identified based on the activities in the village area, traffic and sensitive areas like hospitals and schools.

**TABLE 9:SUMMARY OF AMBIENT NOISE LEVEL MONITORING RESULTS**

Sr. No.	Monitoring Locations	Equivalent Noise Level	
		Leq <sub>Day</sub>	Leq <sub>Night</sub>
<b>Residential Area</b>			
1.	Sondra	52.8	40.1
2.	Tanda	51.4	39.7
<b>CPCB Standards dB(A)</b>		<b>55.0</b>	<b>45.0</b>
<b>Commercial Area</b>			
3.	Sankara	65.2	46.3
4.	Charoda	63.7	44.5
<b>CPCB Standards dB(A)</b>		<b>65.0</b>	<b>55.0</b>
<b>Silence Zone</b>			
5.	Chikhali-2	47.9	38.6
6.	Bahesar-2	48.2	39.1
<b>CPCB Standards dB(A)</b>		<b>50.0</b>	<b>40.0</b>
<b>Industrial Area</b>			
7.	Project Site	62.3	50.6
8.	Siltara Industrial Area	66.7	51.8
<b>CPCB Standards dB(A)</b>		<b>75.0</b>	<b>70.0</b>

*Source: Field monitoring and analysis by Anacon Laboratories Pvt. Ltd., Nagpur*

### 3.4 SURFACE AND GROUND WATER RESOURCES & QUALITY

#### 3.4.1 Regional Geology

##### ➤ Site Specific Geology

The study area is mainly covered by rocks of Meso to Neo Proterozoic age. Major rock types present in the study area are stromatolitic dolomitic limestones. Though few appearances of sandstones and laterites are noticed in the study area. The rocks of study area are represented by Chandi Formation belonging to Raipur Group of Chhattisgarh Super Group.

- **ChandiFormation:**

Chandi Formation is mostly a calcareous facies with intra-formational arenite represented by stromatolitic limestone and dolomite with argillaceous intercalations at places. The limestone /Dolomite is pink, purple, reddish brown, grey, greenish grey, in colour, fine to medium grained, hard and compact bedded rock. The arenite is reddish brown, brown in colour, fine to coarse grained, cross bedded with micaceous shale partings. Fine grained facies is thinly laminated.

The study area is gently undulating, and pediments and pediplains are the most prominent geomorphic units. Physiographically the area district having plains belonging to Chhattisgarh basinal area and the general slope is towards the north-east. Active flood plains and abandoned channels are concentrated mainly in the western part of the study area. Other significant geomorphic features area cut-off meanders, point bars and lateric uplands.

The study area is drained by the Kharun & Kulhan rivers and their distributaries. Drainage pattern of the area is dendritic to sub-dendritic in nature.

### 3.4.2 Hydrogeology and Aquifer Systems

The occurrence of groundwater and its distribution in space are highly influenced by the underlying geological formations and hydrogeological characteristics of the surroundings. The porous, weathered, jointed, and fractured zones present in the rocks or formation provide scope for groundwater occurrence, storage, and movement. The hydrogeology of the area broadly describes the disposition of water-bearing formations, occurrence of groundwater and its yield potential, groundwater regime conditions, depth to water levels in different seasons, etc.

The main rock type consists of arenaceous-argillaceous-calcareous rocks and is dominated by limestone/ dolomite and calcareous shale. The ground water in these formations occurs under semi-confined and confined conditions. The weathered, cavernous and fractured part of the formation constitutes the aquifers in the area.

- **Chandi Limestones**

Chandi limestone is controlled by the solution cavities, joints and fractures. Generally, 1 to 2 sets of fractures are encountered within 50 m depth, 1 to 3 sets of fractures within 50 to 200 m depth. The discharge varies from 0.1 to 2.0lps. The drawdown varies widely from 2m to 29.7m. These formations are mostly developed by the way of dug wells, bore wells and tube wells.

The Pre-Monsoon depth to water Level 4 to 18.54 mbgl is observed in the study area and Post-Monsoon depth to water Level 3 to 6 mbgl is observed in major parts of the area. As per CGWA Categorization of Assessment Units as per Dynamic Ground Water Resources of India the area comes under Critical category

### Water Quality

A - Surface Water Quality			B - Groundwater Quality		
Parameters	Unit	Baseline Monitoring Period (15 <sup>th</sup> Mar, 2023 – 15 <sup>th</sup> June, 2023)	Parameters	Unit	Baseline Monitoring Period (15 <sup>th</sup> Mar, 2023 – 15 <sup>th</sup> June, 2023)
		Range			Range
pH	-	7.58 – 7.82	pH	-	7.43 – 7.85
EC	µs/cm	629.51 - 941.62	EC	µs/cm	780.69 – 1375.94
TDS	mg/l	386 - 529	TDS	mg/l	491 - 773
Total hardness	mg/l	188.86 -223.66	Total hardness	mg/l	248.24 – 553.19
DO	mg/l	5.3-6.1	Chloride	mg/l	92.78 – 181.30
BOD	mg/l	7.66 – 21.36	Sulphate	mg/l	23 – 41.81
COD	mg/l	19.34 – 65.18	Nitrate	mg/l	9.19 – 27.74
Chloride	mg/l	70.53 – 156.46	Fluoride	mg/l	0.25 – 0.53
Sulphate	mg/l	25.42 – 37.71	Iron	mg/l	0.05 – 0.36

A - Surface Water Quality			B - Groundwater Quality		
Parameters	Unit	Baseline Monitoring Period (15 <sup>th</sup> Mar, 2023 – 15 <sup>th</sup> June, 2023)	Parameters	Unit	Baseline Monitoring Period (15 <sup>th</sup> Mar, 2023 – 15 <sup>th</sup> June, 2023)
		Range			Range
Fluoride	mg/l	0.14 – 0.35	Arsenic	mg/l	BDL (DL - 0.01)
Iron	mg/l	0.11 – 0.32	Zinc	mg/l	0.07 – 0.18
Cadmium	mg/l	BDL (DL - 0.001)	Lead	mg/l	BDL (DL - 0.001)
Arsenic	mg/l	BDL (DL - 0.01)	Chromium	mg/l	BDL (DL - 0.03) – 0.04
Zinc	mg/l	0.07 – 0.22			
Lead	mg/l	BDL (DL - 0.001)			
Chromium	mg/l	BDL (DL - 0.03) – 0.05			
Total Coliform	MPN/100 ml	Present			

### Location wise Water Quality Assessment

S. N.	Locations	WQI	Quality	Remark
1.	Project Site	62.56	Good	<b>Water quality assessments based upon above physico-chemical parameters showed quality of ground water samples is good.</b>
2.	Sondra	78	Good	
3.	Sankara	66.48	Good	
4.	Giraud	55.61	Good	
5.	Siltara	58.37	Good	
6.	Tanda	57.25	Good	
7.	Charoda	56.17	Good	
8.	Munrethi	56.19	Good	

### Bacteriological Characteristics

Coliform group of organisms are indicators of fecal contamination in water. All surface water samples were found to be bacteriologically contaminated. Presence of total coliforms in surface water indicates that a contamination pathway exists between any source of bacteria (septic system, animal waste, etc.) and the surface water stream. A defective well can often be the cause when coliform bacteria are found in well water. For surface water, treatment followed by chlorination or disinfection treatment is needed before use for domestic purpose. Groundwater samples were not found to be bacteriologically contaminated.

### 3.5 LAND USE LAND COVER CLASSIFICATION

The land-use & land cover map of the 10 km radial study area from the periphery of project site has been prepared using Resource SAT-1 (IRS-P6), sensor-LISS-3 having 23.5m spatial resolution and date of pass 24<sup>th</sup> May 2021 satellite image with reference to Google Earth data. In order to strengthen the baseline information on existing land use pattern, the following data covering 10 km radius is approximate about 21°22'52.03"N to latitude and 81°39'20.25"E to longitude and elevation 292 to 300 meters are used as per the project site confined within that area.

The Land Cover classes and their coverage are summarized in **Table 8**.

**TABLE 10: LU/LC AND ITS COVERAGE WITHIN 10 KM RADIUS**

Sr. No	Level-I	Level-II	Area (Sq. Km <sup>2</sup> )	Percentage (%)
--------	---------	----------	-----------------------------	----------------

Sr. No	Level-I	Level-II	Area (Sq. Km <sup>2</sup> )	Percentage (%)
1	Built-up land	Settlement	25.92	7.85
		Industrial Settlement	11.42	3.46
		Road Infrastructure	3.45	1.04
		Railway Line	1.42	0.43
2	Agricultural Land/ Crop Land	Single Crop	183.15	55.46
		Double Crop	54.33	16.45
3	Mines Area	Stone Quarry	0.62	0.19
4	Scrubs/Wastelands	Open Scrub	23.63	7.16
		Wasteland	4.56	1.38
5	Waterbodies	River/Nala/Stream/Canal	13.48	4.08
		Pond/Lake/Jalashay	8.23	2.49
		<b>Total</b>	<b>330.21</b>	<b>100</b>

### 3.6 SOIL QUALITY

The project site and its terrain consist of flat to moderately steep slopes. The terrain is characterized by forest, agricultural land, land, various settlements, waterbody and open scrub/wasteland. It is also observed that the open scrub area and barren land are dominant in South South East (SSE) and North West (NW) Portion of the study area. The following observations from the Soil Quality reports are as follows:

Parameters	Unit	Results	Fertility Status
pH	-	5.91 – 6.58	Slightly acidic to Neutral
Organic Carbon	%	1.63 – 2.77	more than sufficient
Nitrogen	Kg/hect	131.28 – 313.58	Better
Phosphorus	Kg/hect	20.22 – 35.26	Less to medium
Potassium	Kg/hect	129.34 – 282.76	Less to average
Sodium Absorption Ratio	-	0.82 – 1.64	Excellent (Little or No Hazard)

### 3.7 BIOLOGICAL ENVIRONMENT

#### Floral composition in Study Area:

The entire industrial area is partly covered with vegetation. The plantations were observed along the main roadside, periphery of the various companies, private land and nursery. Total 110 plant species were enlisted within the study site out of which habitat wise details are given as follows: Trees: 62, Shrubs: 23, Herbs: 13, Climbers: 7, Grasses & Bamboos: 4, and Parasite: 1 species observed in the study area.

#### ➤ RET Status and Endemic Plants of the Study Area

According to IUCN Status report 2013 out of total 110 plant species identified within study area. Among the identified plant species in the study area belongs to least concern (LC), Data Deficient (DD) and Data not available (NA), as per IUCN status. Thus, none of reported species in study area belongs to Rare, Endangered or Threatened category. Among recorded plant species none were assigned the status of endemic plant of this region.

**Faunal details in Study Area:**

Study area was found to be a home to several species of Mammals, Reptiles, Aves and other lower invertebrates. However, faunal wealth including birds was not significantly observed in the immediate vicinity of the project area may be due to non-conductive atmosphere and industrial development.

➤ **As per IUCN RED (2013) List**

Among the reported animals, all are categorized under least concern category as per IUCN list.

➤ **As per Indian Wild Life (Protection) Act, 1972**

Among mammals; Common Langur (*Semnopithecus entellus*), Indian fox (*Vulpes bengalensis*), Jackal (*Canis aureus*), Common Mongoose (*Herpestes edwardsi*), are protected in Schedule-II. whereas, Palm squirrel (*Funambulus pinnati*), Black-naped hare (*Lepus nigricollis*) protected in Schedule-IV and Rats protected in Schedule-V.

Among the Herpetofauna, Common Rat Snake (*Ptyas mucosa*) and Indian Cobra (*Naja naja*) were provided protection as per Schedule-II of Wild life protection act, (1972) and Common Indian Krait (*Bungarus caeruleus*), Indian Toad (*Bufo parietalis*) were provided as per Schedule – IV.

Among the Avifauna in the study area, all birds observed in the study area are protected in Schedule-IV.

**3.8 SOCIO-ECONOMIC ENVIRONMENT**

Information on socio-demographic status and the trends of the communities in the 10 km radius was collected through primary social survey and secondary data collection from census 2011 & District Census hand book 2011. Summary of the socio-economic status of the study area is given in **Table 12**. Details regarding education and infrastructure facilities 2011 are presented in **Table 11** respectively

**TABLE 11: SUMMARY OF SOCIO-ECONOMIC ENVIRONMENT OF VILLAGES WITHIN 10 KM RADIUS AREA**

No. of villages	64
Total households	51664
Total population	244206
Male Population	125950
Female population	118256
SC Population	30599
ST Population	9867
Total literates	159221
Total Illiterates	84985
Total workers	94101
Total main workers	80437
Total marginal workers	16564
Total non-workers	147205

*Source: Primary census abstract 2011, District Raipur and Durg, State Chhattisgarh.*

**TABLE 12: IN PERCENTAGE DETAILS REGARDING INFRASTRUCTURE FACILITIES WITHIN 10 KM RADIUS STUDY AREA**

Infrastructure facilities	Availability (In percentage) As per year 2011, Census Dist. Raipur and Durg Chhattisgarh
Educational Facilities	100
Drinking water	100
Road	98.27
Power	100
Communication	94.82
Transportation	79.31
Medical	51.72
Bank & Society	24.13
Drainage	53.44
Recreation	94.82

Source: Primary census abstract 2011, District Raipur and Durg, State Chhattisgarh.

## 4.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

### 4.1 Air Environment

#### Impact on Air Environment

The impact on air environment mainly depends on magnitude of operation and threshold limit of the project. The source of emission will be mainly in form of fugitive emission and point source.

The mathematical **Model AERMOD** was used for predicting the GLCs, which is entirely in line with the requirement of Central Pollution Control Board, New Delhi. In 1991, the U.S. Environmental Protection Agency (EPA) in conjunction with the American Meteorological Society (AMS) formed the AERMOD. AERMOD is a steady-state plume model aimed at short-range (up to 50 km) dispersion from stationary industrial-type sources.

The impact of a source or group of sources on air quality is evaluated using mathematical models. The widely accepted interpretation models simulate the relationships between air pollutant emissions and its impact on air quality. For the present study, this model is used for the prediction of maximum ground level concentrations.

#### Presentation of Results

The model simulations are done for the air pollutants due to existing and proposed project. Ground level concentration has been carried out using hourly meteorological data for various scenarios as

#### PREDICTED INCREMENTAL GROUND LEVEL CONCENTRATIONS

Pollutant	Baseline Concentration at Project Site ( $\mu\text{g}/\text{m}^3$ )	Incremental Concentration ( $\mu\text{g}/\text{m}^3$ )	Resultant Concentration ( $\mu\text{g}/\text{m}^3$ )	NAAQ Standards ( $\mu\text{g}/\text{m}^3$ )
PM <sub>10</sub>	105	0.46	105.46	100
PM <sub>2.5</sub>	50.4	0.80	51.20	60
SO <sub>2</sub>	21.6	2.80	24.40	80
NO <sub>x</sub>	32.7	3.80	36.50	80
CO	105	0.46	105.46	

#### Details of Air Pollution Control System/Mitigation measures

Facilities	Air Pollution Control equipment
------------	---------------------------------

Facilities	Air Pollution Control equipment
DRI Kiln with WHRB	a. Dust extraction system, ESP with Chimney b. Bag Filters for Product house; Kiln discharge end and transfer points.
Steel Melting Shop with hot charging rolling mill	Bag Filters with Chimney
Coal Gassifier based Reheating Furnace	Waste heat recuperator with Wet Scrubber and dust cyclone with a Chimney
Bio Mass Power Plant	ESP with Chimney
Ferro Alloy Plant	Bag Filters with Chimney
AFBC based power plant	ESP with Chimney And 2 Bag Filters at Coal conveyors

#### Additional Measures to reduce/control pollution control

- Roads will be frequently sprinkled with water.
- Most of the materials like Sponge Iron ore, pig iron will be stored under covered shed.
- In case of storage of Sponge Iron, pig iron in open, it will be covered by tarpaulins to prevent spread of dust from it during transportation.
- Regular sweeping of road by using vacuum cleaner will be carried out
- Regular maintenance of vehicles and machineries will be carried out in order to control emissions.
- Green belt development will be taken up all along the roads, plant premises etc.
- Protective appliances will be provided to all the workers exposed in dusty atmosphere.
- Avoiding overloading of the trucks.
- Workers will be equipped with all personal protective devices like Gum Boot; hand gloves; Safety helmet; Safety goggles, earplugs at work place.
- By controlling the speed of the truck.
- Proper gradient of roads to reduce cumulative noise.
- Transportation of materials will be limited to day hours only.
- Periodical maintenance of process machinery.

#### 4.2 Noise Impacts

There will be noise generation from earth moving equipment and material handling traffic. The major sources of noise during the construction phase are vehicular traffic, construction equipment like dozers, scrapers, concrete mixers, cranes, pumps, compressors, pneumatic tools, saws, vibrators etc. The operation of these equipments will generate noise ranging between 85-90 dB (A) near the source. These noise levels will be generated within the plant boundary and will be temporary in nature.

The construction activity will be carried out mostly during daytime. The construction equipment will undergo preventive maintenance test at routine intervals. Any machinery or equipment generating excessive noise levels (above 90 dBA) will be taken out of service and replaced by new ones. The noise generation will be confined within the surrounding areas of construction site. Greenbelt will be developed from construction stage hence its impact will be minimum.

- Dense plantation will help to reduce noise pollution in the following ways –
- The sounds that are produced by the leaves helps muffle the noise.
- Hedging makes a thick front of the wall and blocks the noise.
- Thick tree trunks create a sound-absorbing buffer zone.
- They help in filtering the noise.
- The research also concluded that a 20 m dense plantation can give a noise reduction of 6 dB (A).
- Equipment will be standard and equipped with silencer. The equipment will be in good working conditions, properly lubricated and maintained to keep noise within permissible limits.
- Most of the equipment's will be placed in closed room
- Equipment's will be placed on acoustic floor to reduce vibration and noise
- High noise zone will be marked, and earplugs will be provided to the workmen near high noise producing equipment.
- Use of PPES awareness program will be provided to all workers.
- Proper shifting arrangement will be made to prevent over exposure to noise and vibration.
- Silent DG sets will be used site.
- Speed limits will be enforced on vehicle.
- Regular noise & vibration monitoring will be carried for all equipment's to check compliance with prevailing rules.

#### **4.3 Impact on Water Environment**

The proposed expansion may have some impact on the water environment. The impact may be on the source of water in the form of depletion of water resources of the area and in the form of deterioration of quality of natural water resources due to discharge of plant effluent

##### **➤ Mitigation measures**

- Adequate pollution control Equipment as per the CPCB Guidelines should be adopted and proper maintenance of industrial and pollution control equipment should be done to ensure minimum pollution.
- The efficiency of the pollution control equipment should be checked periodically to comply with the emission standards provided by CPCB and minimize the pollution levels.
- Ensure that roads are properly signed, vehicles are well maintained and drivers are well trained and safety conscious.
- A Safety climate should be prepared and every worker should be trained with all safety equipment. All health and safety measures should be adopted by the company to ensure the safety of the workers and the surrounding society.
- Project proponent should take appropriate steps to keep environment clean and green belts development/ Plantation along with the internal Road.
- Transportation of hazardous waste should be done as per CPCB Guidelines. The heavy trucks

#### 4.4 Impact on Biological Environment

**Ecology & Biodiversity:** Aspect- Impact identification and mitigation measures suggestion for proposed expansion project.

S. No.	Project Aspects / Activities	Residual Impacts	Mitigation Measures Suggested
1.	Transportation, unloading & storage of Material and Movement of vehicle inside plant, Dust and sound generation due to proposed expansion activities	Impact on nearby vegetation and avifauna in a scale of 3 out of 5 due to proposed expansion activity.	Thick greenbelt will be developed along periphery of the project site in order to provide buffer between plant fugitive emission and nearest vegetation.
2.	Gaseous emission from Stack, Movement of vehicle inside plant and Raw material & finished product transportation, Product manufacturing	Decline in photosynthetic activities, Stomatal index may be minimized, Crop yield may be reduced.	Air quality modelling outputs study revealed that, the resultant concentrations of particulate matter, are well within the prescribed limits and no addition of Sulphur di-oxide and oxides of nitrogen in expansion project. The total plant area is 14.21 Ha. Greenbelt area of 5.63 Ha. (39.62%) [will be provided with local species, broad leaves, higher canopy and fast-growing tree species. Indigenous species for plantation is recommended along the approach road and plantation under CER. Thus, the impact due to proposed expansion project would be minimal as project activity will be carried out within the plant boundary limit with proper control measures.

#### 4.5 Impact on Socio-economic environment

##### ➤ Positive Impacts

- **Economic Resilience:** Diversification of the local economy can strengthen the community's economic resilience and provide stability in the face of external economic shocks.
- **Access to Education:** Improved access to education empowers the local workforce with valuable skills, enhancing their employability.
- **Better Healthcare:** Enhanced healthcare facilities ensure better health services, improving the overall well-being of the community.
- **Community Development:** Cultural and community development initiatives foster a sense of belonging, social cohesion, and an enriched quality of life.
- **Local Business Growth:** Economic diversification can spur local business growth, offering opportunities for entrepreneurship and income generation.
- **Environmental Improvement:** Sustainable practices and pollution control measures contribute to environmental improvement and long-term well-being.

➤ **Negative Impacts**

- **Economic Disruption:** The process of economic diversification may initially disrupt existing economic structures, potentially causing a short-term economic adjustment for some community members.
- **Construction Inconvenience:** Infrastructure development and healthcare facility upgrades may result in temporary disruptions, including noise and congestion.
- **Environmental Concerns:** Despite sustainable practices, some environmental impact may persist, necessitating ongoing vigilance and management.
- **Cultural Shifts:** The introduction of cultural and community development initiatives may bring changes to local traditions and social dynamics, which could be unsettling for some residents.

➤ **Mitigation Measures**

In order to mitigate the adverse impact likely to arise in social, cultural and economic aspects in the surrounding region due to the proposed expansion project and improvement in quality-of-life following mitigation measures should be adopted:

- **Economic Disruption:** Offer support and training to help local businesses transition and adapt to new economic activities.
- **Construction Inconvenience:** Develop clear construction schedules, minimize noise and traffic disruptions, and communicate project updates with the affected communities.
- **Environmental Concerns:** Implement robust environmental monitoring and control measures to mitigate and minimize any potential environmental impact.
- **Cultural Shifts:** Engage the community in decision-making processes related to cultural development and maintain a balance between tradition and innovation.

## **5.0 ANALYSIS OF ALTERNATIVES (SITE AND TECHNOLOGY)**

### **5.1 Site Selection**

The proposal is for a Brownfield project for the expansion of their facilities for production of MS Billets, Hot-rolled Steel Rerolled products, along with existing Reheating Furnace based Rerolling Mill unit within the existing premises of M/s. RUPL which is having prior environmental clearance. Since the Project is a brownfield project no site alternative has been considered. The additional Induction Furnace will be implemented within the existing shade.

### **5.2 Selection of Alternative Technology**

The aspects of the project are dealing with the study of alternative technology in brief involved in each of the products and choice of the technology based on environmental applicability, technical and financial viability.

## **6.0 ENVIRONMENTAL MONITORING PROGRAM**

An Environmental Management Cell (EMC) will be established for the proposed project under the control of by General Manager (Plant Head) with a direct reporting to Board of Directors.

The company has proposed to set up its own Environment Monitoring lab as it is evident with the investment of about Rs15 lakhs on Capital cost towards monitoring equipment whereas Rs.2 Lakhs cost per year for monitoring of Environment. This facility will be created along with the gradual

In addition to the above as the proposed project comes into operation, NABL/MoEFCC accredited lab (Third party) will engage to monitor all the environmental components as per CPCB/CECB norms.

## **7.0 ADDITIONAL STUDIES**

### **7.1 PUBLIC CONSULTATION**

The Draft EIA-EMP report for expansion of production facility of Induction, CCM and Hot Charging based steel Rolling Mill facility at Khasra No. (Existing)111/1 to 7,112/1 to 10,114/1 to 9, Village - Siltara, Tahsil-Dharsiwa, District – Raipur (C.G.) is prepared as per the TOR issued by EAC(Industry-I), MoEF&CC, New Delhi and the report is submitted for public consultation process as per the provisions of EIA Notification 2006 and amendments thereof.

After completing the public consultation process, the points raised and commitment of project proponent during the public hearing will be incorporated in the final EIA-EMP report for final submission to Environmental Clearance.

### **7.2 RISK ASSESSMENT & DISASTER MANAGEMENT PLAN**

Hazard analysis involves the identification and quantification of the various hazards (unsafe conditions) that exist in the project site. Industrial process and activities cause hazards. There may be possible hazards to human beings, flora-fauna, building structure and the environment. Extreme care is essential in handling all of them in various stages of manufacturing viz. processing, treatment, transport etc. On the other hand, risk analysis deals with the identification and quantification of risks occurring due to the plant equipment and personnel exposed, due to accident resulting from the hazards in the plant.

The main objective of the risk assessment study is to determine damage due to major hazards having damage potential to life and property and provide a scientific basis to assess safety level of the facility. The secondary objective is to identify major risk in manufacturing process, operation, occupation and provide control through assessment and also to prepare on-site, off site plans to control hazards.

Risk analysis (RA) provides a numerical measure of the risk that a particular facility causes to the public. It begins with the identification of potential hazardous events and determination of impact of each event. The consequences of each event are then calculated for numerous combinations of weather conditions and wind direction. These consequences predications are combined to provide numerical measures of the risk for entire facility.

## **8.0 PROJECT BENEFITS**

### **Proposed Social Welfare Arrangement**

M/s. Rama Udyog Pvt. Ltd. also support social welfare activities under CSR obligation under companies act.

The Social welfare/CSR activities will aim at strengthening the bond between the project authorities and the local population in the vicinity of project area. In line with CSR policy, M/s RUPL is being and will carry community welfare activities in the following areas:

- Community development
- Health & medical care
- Roads
- Education
- Drainage and sanitation
- Drinking water supply occasionally in the event of water scarcity through tankers, etc.
- The project benefits also entail revenue earnings to national and state exchequer through

- Fully compliance of Corporate Responsibility for Environmental Protection (CREP) for steel industry.
- Thus, result in –
  - ✓ Periodic Monitoring Low emissions,
  - ✓ Water conservation, recycle of treated wastewater,
  - ✓ Solid waste management
  - ✓ Thereby protection of environment and also result in low cost of production
  - ✓ Hot Charging based steel rerolling will also result in fuel emission avoidance of almost 33600t CO<sub>2</sub> per annum.

## **9.0 ENVIRONMENTAL MANAGEMENT PLAN**

An Environmental Management Plan comprising following set of mitigation, management, monitoring and institutional measures to be taken during implementation and operation of the project, to eliminate adverse environmental impacts or reduce them to acceptable levels.

- Overall conservation of environment.
- Minimization of natural resources and water.
- Ensure effective operation of all control measures.
- Monitoring of cumulative and longtime impacts.
- Ensure effective operation of all control measures.
- Control of waste generation and pollution.

The total project cost of the project is 17390 Lakhs (which includes Existing - Rs. 5241.65 Lakhs + proposed Rs. 12149 Lakhs). Capital cost of EMP in the project will be **Rs 2000Lakhs** and recurring cost will be **Rs. 69 Lakhs**.

## **10.0 CONCLUSION**

The proposed project of M/s. Rama Udyog Pvt Ltd will be beneficial for the overall development of the nearby villages. Some environmental aspects like dust emission, noise, wastewater, traffic density, etc. will have to be controlled better than the permissible norms to avoid impacts on the surrounding environment. Necessary pollution control equipment like bag house, water sprinklers, enclosures, etc. are integral part of the plant infrastructure. Additional pollution control measures and environmental conservation measures will be adopted to control/minimize impacts on the environment and socio-economic environment of the area. Measures like development of green belt and plantation in nearby village and along transport road, adoption of rainwater harvesting/recharging in the plant and in nearby villages will be carried out. The proposed CSR/CER activities to be initiated by the industry will be helpful to improve the social, economic and infrastructure availability status of the nearby villages.

Thus, it can be concluded that with the judicious and proper implementation of the pollution control and mitigation measures, the proposed project will not add adverse pollution levels to the environment, moreover, it will be beneficial to the society and will help to reduce the demand-supply gap of steel to some extent and will contribute to the economic development of the region and thereby the country.

## **11.0 DISCLOSURE OF CONSULTANTS**



## M/s. Rama Udyog Pvt Ltd



The Environmental studies for proposed expansion project of M/s Rama Udyog Pvt. Ltd. has been carried out by M/s. Anacon Laboratories Pvt. Ltd., Nagpur (M/s. ALPL). Anacon established in 1993 as an analytical testing laboratory and now a leading Environmental Consultancy company backed by testing lab for environment and food in Central India region. M/s. ALPL is a group of experienced former Scientists from the Government Institutions and excellent young scientist of brilliant career with subject expertise. It is recognized by Ministry of Environment & Forests, New Delhi for carrying out environmental Studies & accredited by Quality Council of India (QCI) for conducting Environmental studies having Accreditation Certificate No.: **NABET/EIA/2326/RA0304**dtd. 18 September, 2023 valid till Sept 29, 2026.