

**SUMMARY ON  
ENVIRONMENTAL IMPACT ASSESSMENT REPORT**

**OF**

**Raigarh Ispat & Power Pvt. Limited**  
**[Proposed Steel Plant (Category –A Project)]**

[Establish a Steel Plant comprising of Establishment of DRI Kilns (6,93,000 TPA), Induction Furnaces with matching LRF & CCM (Hot Billets / Billets - 2,97,000 TPA), Rolling Mill & Strip Mill (Rolled Products – 3,30,000 TPA), Ferro Alloy Unit 4 x 9 MVA (FeSi – 28,000 TPA/ FeMn – 1,00,800 TPA/ SiMn – 57,600 TPA/FeCr – 60,000 TPA), Briquetting Plant (400 Kg/Hr), WHRB based Power Plant –48 MW, CFBC based Power Plant - 16 MW & Brick Manufacturing unit (76,000 Bricks / Day)

located at

**Shivpuri Village, Raigarh Tehsil, Raigarh (D), Chhattisgarh**

Submitted to

**CHHATTISGARH ENVIRONMENT CONSERVATION BOARD**

## **1.0 PROJECT DESCRIPTION**

**Raigarh Ispat & Power Pvt. Limited** is proposing to establish a Steel Plant comprising of Establishment of DRI Kilns (6,93,000 TPA), Induction Furnaces with matching LRF & CCM (Hot Billets / Billets - 2,97,000 TPA), Rolling Mill & Strip Mill (Rolled Products – 3,30,000 TPA), Ferro Alloy Unit 4 x 9 MVA (FeSi – 28,000 TPA/ FeMn – 1,00,800 TPA/ SiMn – 57,600 TPA/FeCr – 60,000 TPA), Briquetting Plant (400 Kg/Hr),WHRB based Power Plant –48 MW, CFBC based Power Plant - 16 MW & Brick Manufacturing unit (76,000 Bricks / Day).

**Total land identified for the proposed project is 46.337 Ha. (114.499 Acres). The land earmarked for the proposed project is Private Land.**

As per the Ministry of Environment, Forests & Climate Change, New Delhi notification, dated 14<sup>th</sup> September, 2006 and its subsequent amendments, all Primary metallurgical processing industries are classified under Category 'A'. The Ministry of Environment, Forests & Climate Change, New Delhi has accorded Terms of Reference (TOR) for the proposed project vide letter no. **IA-J-11011/45/2023-IA-II(IND-I)**, dated **18<sup>th</sup>September2023**.The EIA Report has been prepared by incorporating the TOR stipulated by the Hon'ble EAC.

*Pioneer Enviro Consultants Private Limited, Hyderabad*, which is accredited by NABET, Quality Council of India, vide certificate No. NABET/ EIA/ 2225/ RA 0282, for preparing EIA report for Metallurgical Unit, have prepared Draft Environmental Impact Assessment (EIA) report for the proposed expansion project by incorporating the TOR approved by Ministry of Environment, Forests & Climate Change, New Delhi. The report contains detailed description of the following:

- Characterization of status of environment with in an area of 10 km radius from the plant for major environmental components including air, water, noise, soil, flora, fauna and socio-economic environment.
- Assessment of air emissions, liquid waste and solid waste from the proposed expansion project along with the noise level assessment.
- Environmental Management Plan comprising of emission control measures proposed to be adopted in the proposed project, solid waste management, Greenbelt development.

- Post Project Environmental Monitoring & Budget for Environmental Protection Measures.

### 1.1 ENVIRONMENTAL SETTING WITHIN 10 Km. RADIUS OF THE PLANT SITE

The following is the environmental setting within the 10 Km. radius of the Plant site:

#### Environment Setting Within 10 Kms. Radius of the Plant Site

S.No.	Salient Features / Environmental features	Distance w.r.t. site / Remarks
1.	Type of Land	Agricultural Land ( Un – irrigated)
2.	Type of Land (Study Area)	As per LULC the land use within 10 Km. is as follows: Settlements – 3.5 %; Industrial area – 8.5%; Tanks / River, etc – 9.6 %; Dense Forest – 42.1 %; Single crop – 12.1 %; Double crop – 4.2 %; Land with scrub – 12.3 %; Land without scrub – 3.2 %; Mining area– 1.3%; Ash pond – 1.1%; Gullied Land – 2.1%.
3.	National Park/ Wildlife sanctuary / Biosphere reserve / Tiger Reserve / Elephant Corridor / migratory routes for Birds	There are no notified National Park /Wildlife sanctuary/ Biosphere reserve/ Tiger Reserve /migratory routes for Birds within 10Km. radius Of the plant. Movement of Elephants is observed within 10 Kms. radius of the plant, as per the secondary source.
4.	Historical places / Places of Tourist importance / Archeological sites	Ram jharna Caves – Bhupdevpur (8.48 kms -SW) Banjari mata Temple – 3.8 Kms.
5.	Critically polluted area as per MoEF&CC Office Memorandum dated 13 <sup>th</sup> January 2010	None And also the Plant area does not fall in the areas given in Hon'ble NGT order issued vide dated 10 <sup>th</sup> July 2019.
6.	Defence Installations	None
7.	Nearest village	Shivpuri Village Adjacent the project site.
8.	No. of Villages in the Study Area	58
9.	Nearest Hospital	Govt.Health center-6.0 kms
10.	Nearest School	Shivapuri Village-0.08 kms <b>(with 3 nos. of Rooms with 30 nos. of students)</b>
11.	Forests	<b>Reserved Forests:-</b> Urdana RF – 2.2 Kms. (S) Taraimal RF – 3.0 Kms. (N) Barkachhar RF – 4.6 Kms. (E) Rabo RF – 6.4 Kms. (W) Samaruma RF – 9.1 Kms. (NNW)  <b>Protected Forests:-</b>

S.No.	Salient Features / Environmental features	Distance w.r.t. site / Remarks
		Keradungri PF – 5.7 Kms. (E) Lakha PF – 6.8 Kms. (S) Punjipathra PF – 6.6 Kms. (N) Pajhar PF – 4.2 Kms. (NNE) Junwani PF -6.9 Kms. (SE) Chhirwani PF – 7.1 Kms. (SE) Dungapani PF – 7.4 Kms. (SSE) Barlia PF – 8.0 Kms. (SSE) Amaghat PF – 8.6 Kms. (NNE) Unnamed PF – 3.4 Kms. (W) Exists within the study area Km radius.
12.	Water body	Gerwani Nala – 1.10 KMS (N) Kelo River – 1.3 Kms. (NE) Dewanmunda Nala – 2.2 Kms. (NW) Karanara Nala – 3.0 Kms. (NE) Banjari Nala – 3.2 Kms. (N) Ratrot Nala – 5.2 Kms. (NNE) Tipakhhol Pond – 5.6 Kms. (S) Barade Nala – 6.7 Kms. (NW) PajharNadi – 6.75 Kms. (NNE) Kokritaral Pond – 7.2 Kms. (S) Bilaspur Reservoir – 7.3 Kms. (SW) Few seasonal nalas, ponds exist within the study area.
13.	Nearest Highway	Raigarh to Ambikapur State Highway (SH#1 - 0.66 Km – E) the project site.
14.	Nearest Railway Station	Kirodimal Railway Station 8.6 Kms (SW)
15.	Nearest Port facility	Nil within 10 Km. Radius.
16.	Nearest Airport	O.P Jindal Airport 7.26 Kms(SE)
17.	Nearest Interstate Boundary	Nil within 10 Km. Radius.
18.	MSL of the Project area	Nil within 10 Km. Radius.
19.	Seismic zone as per IS-1893	Seismic zone – III
20.	R & R	There is no rehabilitation and resettlement issue, as there are no habitations present in the site area.
21.	Litigation / court case is pending against the proposed project / proposed site and or any direction passed by the court of law against the project	Nil

## 1.2 PLANT CONFIGURATION AND PRODUCTION CAPACITY

Following is plant configuration and production capacity proposed now

### Proposed Plant Configuration & Production Capacities

S. No.	Units(Products)		Unit Configuration	Production Capacity (inTPA)
1.	DRI Kilns (SpongeIron)		6 x 350 TPD	6,93,000
2.	InductionFurnace(Hot Billets/Billets) Billets)		6x15 MT /Heat	2,97,000
3.	Rolledproducts (85% Hot charging withHot Billetsandremaining15 % through RHF withLDO)	Rolling mill	1x600 TPD	1,98,000
		Strip Mill	1x 400TPD	1,32,000
4	FerroAlloys Unit (FeSi/FeMn/SiMn/FeCr)		4x 9MVA	Fesi-28,000 / FeMn -1,00,800/ SiMn -57,600/ FeCr-60,000
5.	BriquettingPlant		400 Kg/hr	400 Kg/hr
6.	Fly AshBrick ManufacturingUnit		76,000 Bricks/ day	25.08 Million /Annum
7.	Power Plant	WHRBPowerPlant	6 x 8 MW	48 MW
		CFBC PowerPlant	1x16MW	16 MW

## 1.3 RAW MATERIALS (FOR EXPANSION PROJECT)

The following will be the raw material requirement for the proposedproject:

### Raw Material Requirement, Source &Mode of Transport

S.No.	Raw Material		Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
1.	<b>For DRI Kilns (Sponge Iron) – 6,93,000 TPA</b>					
a)	Pellets		10,04,850	Chhattisgarh	~ 200	By rail & road (covered trucks)
	(or)					
b)	Iron Ore		11,08,800	Odisha, Chhattisgarh, Jharkhand & Imported	~ 500	By rail, road (Covered trucks) & Through vessel
c)	Coal	Indian	9,00,900	SECL Chhattisgarh / MCL Odisha	~ 500	By rail & road (covered trucks)
		Imported	5,76,576	Indonesia / South Africa / Australia	~ 600	Through vessel, rail & by road (Covered trucks)
d)	Dolomite		34,650	Chhattisgarh	~ 150	By road (covered trucks)
2.	<b>For Steel Melting Shop (Billets/ Ingots/Hot Billets) – 2,97,000 TPA</b>					

S.No.	Raw Material		Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
a)	Sponge Iron		3,00,000	Own generation	---	Through covered conveyers
b)	MS Scrap / Pig Iron		45,000	Own generation	~ 100	By road (covered trucks)
c)	Ferro alloys		15,000	Own generation	---	By road (covered trucks)
3.	<b>For Rolling Mill through Hot charging (Rolled Products) – 3,30,000 TPA</b>					
a)	Hot Billets / Billets		3,46,170	Own generation	---	----
b)	LDO / LSHS		1603 Kl/annum	Nearby IOCL Depot	~ 100	By road (through Tankers)
4.	<b>For FBC Boiler [Power Generation 1 x 16 MW]</b>					
a)	Indian Coal (100 %)		1,03,950	SECL Chhattisgarh / MCL Odisha	~ 500	By rail & road (covered trucks)
<b>OR</b>						
b)	Imported Coal (100 %)		66,528	Indonesia / South Africa / Australia	~ 600 (from Vizag Port)	Through sea route, rail route & by road (covered trucks)
<b>OR</b>						
c)	Dolochar + Indian Coal	Dolochar	1,41,900	In plant generation	---	through covered conveyers
		Indian Coal	33,000	SECL Chhattisgarh / MCL Odisha	~ 500	By rail & road (covered trucks)
<b>OR</b>						
d)	Dolochar + Imported Coal	Dolochar	1,41,900	In plant generation	---	through covered conveyers
		Imported Coal	21,120	Indonesia / South Africa / Australia	~ 600 (from Vizag Port)	Through sea route, rail route & by road (covered trucks)
5.	<b>For Ferro Alloys (4 x 9 MVA)</b>					
5 (i)	For Ferro Silicon – 28,000 TPA					
a)	Quartz		61,600	Chhattisgarh / Andhra Pradesh	~ 500	By road (covered trucks)
b)	Mill Scale & M.S. Scrap		12,600	Inhouse Generation	---	By road (covered trucks)
c)	Char Coal / Coke		43,400	Andhra Pradesh	~ 500	By road (covered trucks)
d)	Electrode paste		2,800	Maharashtra / West Bengal	~ 300	By road (covered trucks)
e)	Briquetted Bag filter dust			Own generation	---	---
5 (ii)	For Ferro Manganese – 1,00,800 TPA					
a)	Manganese Ore		1,92,000	MOIL / OMC	~ 500	By Rail & Road (covered trucks)

S.No.	Raw Material	Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
b)	coke	24,000	Andhra Pradesh	~ 500	By road (covered trucks)
c)	MS Scrap / Mill scales	16,000	Inhouse Generation	---	By road (covered trucks)
d)	Electrode Paste	1,760	Maharashtra / West Bengal	~ 300	By road (covered trucks)
5 (iii)	For Silico Manganese –56,000 TPA				
a)	Manganese Ore	1,12,000	MOIL / OMC	~ 500	By Rail & Road (covered trucks)
b)	FeMn Slag	25,200	Andhra Pradesh	~ 500	By road (covered trucks)
c)	Coke	16,800	In house generation	---	----
d)	Dolomite	16,800	Chhattisgarh / Andhra Pradesh	~ 500	By road (covered trucks)
e)	Electrode paste	1,120	Maharashtra / West Bengal	~ 300	By road (covered trucks)
f)	Quartz	19,600	Chhattisgarh / Andhra Pradesh	~ 500	By road (covered trucks)
g)	Bagfilter dust	840	Own generation	---	---
5(iv)	For Ferro Chrome – 60,000 TPA				
a)	Chrome Ore	1,44,000	Sukinda, Odisha Import, South Africa	~ 500 ~ 600 (from Vizag Port)	By road (covered trucks) From Port By Road (covered Trucks)
b)	Lam Coke	30,000	Andhra Pradesh	~ 500	By road (covered trucks)
c)	Quartz	3,660	Chhattisgarh / Andhra Pradesh	~ 500	By road (covered trucks)
d)	MS Scrap / Mill Scale	9,000	Inhouse Generation	---	By road (covered trucks)
e)	Magnetite / Bauxite	9,000	Chhattisgarh / Maharashtra	~ 500	By road (covered trucks)
f)	Electrode Paste	1,200	Maharashtra / West Bengal	~ 300	By road (covered trucks)
g)	Bagfilter dust	1,200	Own generation	---	---

## 1.4 MANUFACTURING PROCESS

### 1.4.1 Sponge Iron (DRI)

The proposal consists of 6 x 350 TPD to manufacture 6,93,000 TPA of Sponge Iron with 48.0 MW WHRB facility. Refractory lined rotary kilns will be used for reduction of iron ore in solid state.

Refractory lined rotary kilns will be used for reduction of iron ore in solid state. A central Burner located at the discharge end will be used for initial heating of the kiln.

Iron ore will be continuously fed into the kiln along with coal which has dual role of fuel as well as reductant. Dolomite will be added to scavenge the sulphur from the coal. A number of air tubes will be provided along the length of the kiln. The desired temperature profile will be maintained by controlling the volume of the combustion air through these tubes. The Carbon monoxide generated due to the combustion of coal, reduces the iron ore and converts it into sponge iron. The rotary kiln is primarily divided into two zones viz. the pre heating zone and the reduction zone. The preheating zone extends over 30 to 50 % of the length of the kiln and in this the moisture in the charge will be driven off and the volatile matter in the coal will be burnt with the combustion air supplied through the air tubes. Heat from the combustion raises the temperature of the lining and the bed surface. As the kiln rotates, the lining transfers the heat to the charge. Charge material, pre-heated to about 1000<sup>o</sup>C enters the reduction zone. Temperature of the order of 1050<sup>o</sup>C will be maintained in the reduction zone, which is the appropriate temperature for solid state reduction of iron oxide to metallic iron.

This hot material will be transferred to Heat exchanger. In Heat exchanger the material will be cooled to 160<sup>o</sup>C. The cooler discharge material consists of sponge iron lumps, sponge iron fines and char. Magnetic and non-magnetic material will be separated through magnetic separators and stored in separate bins. The hot flue gases will be taken to a Waste Heat Recovery Boilers and after heat recovery they will be treated in high efficiency ESP and discharged into the atmosphere through stack whose height will be in accordance with CPCB norms.

#### **1.4.2 Steel Melting Shop**

In Steel Melting Shop (SMS), Sponge Iron will be melted along with melting scrap and fluxes to make pure liquid steel and then to mould it in required size billets. The SMS will consist of Induction furnace, Ladles, Cranes & Continuous Casting Machine (CCM). There will be 6 x 15 Induction furnaces to manufacture Hot Billets / MS Billets / MS Slab of 2,97,000TPA. Either the Hot Billets produced from LRF will be directly sent to Rolling Mill



without using Re-heating Furnace through Hot charging method (or) Billets / Ingots will be sent to Re-heating Furnace to reheat the Billets and then sent to Rolling Mill to manufacture TMT Bars, Structural Steel - Angle, Channels, Gutters, Coils, Flat Bars, Strips, MS Pipes, MS Tubes, Galvanized Pipes and angles. The flue gases will be treated in fume extraction system with bagfilters.

#### **1.4.3 Rolling Mill**

The Hot Billets produced from Induction Furnaces will be directly sent to Rolling Mill to produce Rolled Products (OR) Hot Billets will be cooled and stored will be sent to reheating furnaces for the heating and will be sent to Rolling Mill. Furnace will be heated with either LDO / Producer Gas. A Rolling mills (1 x 600 TPD Rolling Mill & 1 x 400 TPD Strip Mill) will be installed in the present proposal to produce 3,30,000 TPA of Rolled products such as TMT Bars, Structural Steel, etc.

#### **1.4.4 Submerged Electric Arc Furnace**

Submerged Electric Arc Furnace (4 x 9 MVA) will be setup in the proposed project. Ferro Manganese, Silicon Manganese will be produced using manganese ore as main raw material, Ferro Silicon will be produced using Quartz as main raw material & Ferro Chrome will be produced using Chrome Ore as main raw material in a sub-merged arc furnace using reducer (Coke) under high voltage. Flue gases will be extracted through 4<sup>th</sup> hole and then treated in bag filters.

#### **1.4.5 Power Generation**

##### **Through WHRB Boiler**

The hot flue gases from proposed 6 x 350 TPDDR kilns will pass through waste heat recovery Boiler to recover the heat and to generate (6 x 8 MW) electricity. The gases after heat recovery will pass through ESP and then discharged through chimneys into the atmosphere for effective dispersion of emissions into the atmosphere through stacks of adequate height.

##### **Through FBC Boiler**

Coal (Imported / Indian) along with dolomite will be used as fuel in FBC Boilers to generate 16 MW of electricity. The flue-gases will be treated in high efficiency ESP and then discharged through a stack of adequate height into the atmosphere.

#### **1.4.7 Fly Ash Brick Manufacturing Unit**

It is proposed to establish Fly Ash brick making unit of 76,000 bricks/day capacity. Fly ash (70%), Gypsum (5%), cement (10%) and Stone dust (15%) are manually fed into a pan mixer where water is added to the required proportion for homogeneous mixing. The proportion of raw material may vary depending upon quality of raw materials

### **1.5 Water Requirement**

- Water required for the proposed project will be **3,180 KLD**. This includes make up water for DRI Kilns, Induction Furnaces, Rolling Mill, Ferro Alloys Unit, Brick manufacturing unit & for Domestic requirement.
- Water required for proposed project (for process and domestic) will be met from Kelo river (which is at a distance of 1.30 Kms. from the project site). A dedicated pipeline will be laid from the river to the project site.
- Water drawl permission from Water Resource Department, Govt. of Chhattisgarh will be obtained.
- Air cooled condensers will be provided to CFBC Power plant instead of water cooled condensers to reduce the water consumption significantly

#### **Water Requirement Breakup**

<b>S.No.</b>	<b>Unit</b>	<b>Quantity in KLD</b>
1.	DRI Kilns	694
2.	Induction Furnaces	210
3.	Rolling Mills	300
4.	Ferro Alloys	360
5.	Power Plant (WHRB & FBC)	1536
	• Cooling tower makeup	739
	• Boilers make up	554
	• DM plant Regeneration	243
6.	Brick Manufacturing unit	10
7.	Briquetting Plant	10
8.	Domestic	60
	<b>Total</b>	<b>3180</b>

### 1.6 Wastewater Generation

- Total wastewater generated from the proposed project will be **685 KLD**.
- There will be no wastewater discharge in DRI Kilns as closed circuit cooling system will be adopted.
- Wastewater from Induction Furnace, Rolling Mill, Ferro Alloys, power plant will be treated in ETP and after ensuring compliance with SPCB norms, it will be utilized for dust suppression, ash conditioning and for greenbelt development.
- Wastewater from Rolling Mill will be treated in oil separator followed by settling tank and will be recycled through closed circuit cooling system Air Cooled condensers will be provided in the power plant, which will reduce the water consumption significantly. Hence wastewater generation will also be minimized.
- Sanitary waste water will be treated in STP.
- Garland drains will be provided around all the raw material stacking areas
- During monsoon the treated effluent will be utilized as makeup water in Rolling Mill. Accordingly, the makeup water for Rolling mill also reduces during the rainy period.
- Zero Liquid Discharge (ZLD) will be maintained in the proposed project.

#### Breakup of Wastewater Generation

S.No.	Source	Generation (KLD)
1.	Induction Furnace	11.0
2.	Rolling Mill	18.0
3.	Ferro Alloys	25
4.	Power Plant	583
	a) Cooling Tower blowdown	185
	b) Boilers blowdown	156
	c) D.M. plant regeneration water	243
5.	Sanitary Wastewater	48
	<b>Total</b>	<b>685</b>

### 1.7 Wastewater Characteristics

The following are the Characteristics of wastewater.

#### Characteristics of Effluent

PARAMETER	CONCENTRATION			
	Cooling Tower blowdown	DM Plant Regeneration	Boiler Blowdown	Sanitary waste water
pH	7.0 – 8.0	5.0 – 10.0	9.5 – 10.5	7.0 – 8.5

BOD (mg/l)	--	--	--	200 – 250
COD (mg/l)	--	--	--	300 – 400
TDS (mg/l)	1000	5000 – 6000	1000 mg/l	800 – 900
Oil & Grease (mg/l)	--	10	--	5 - 10
TSS (mg/l)	--	--	--	150-200

## 2.0 DESCRIPTION OF ENVIRONMENT

Base line data has been collected on ambient air quality, water quality, noise levels, flora and fauna and socio-economic details of people within 10 Km. radius of the plant.

### 2.1 Ambient air quality

Ambient air quality was monitored for PM<sub>2.5</sub>, PM<sub>10</sub>, SO<sub>2</sub>, NO<sub>x</sub> & CO at 8 stations including project site during **1<sup>st</sup>December 2022 to 28<sup>th</sup> February 2023**. The following are the concentrations of various parameters at the monitoring stations:

**Table No.11.2.1 : AAQ Data Summary**

S.No.	Parameter	Concentration range	Standard as per NAAQS
1.	PM <sub>2.5</sub>	24.2 to 47.1µg/m <sup>3</sup>	60
2.	PM <sub>10</sub>	38.2 to 79.4µg/m <sup>3</sup>	100
3.	SO <sub>2</sub>	6.8 to 22.3µg/m <sup>3</sup>	80
4.	NO <sub>x</sub>	7.0 to 34.2µg/m <sup>3</sup>	80
5.	CO	395 to 1355µg/m <sup>3</sup>	2000

## 2.2 Water Quality

### 2.2.1 Surface Water Quality

3 no. of samples i.e. 60m Upstream & 60 m Downstream from Kelo River (1.3 Kms. – North East Direction), and one sample from Gerawani nala(1.10 Kms. – North direction)have been collected and analyzed for various parameters.The analysis of samples shows that all the parameters are in accordance with BIS-2296 specifications.

### 2.2.2 Ground Water Quality

8 No. of ground water samples from open wells / bore wells were collected from the nearby villages to assess ground water quality impacts and analyzed for various Physico-Chemical parameters. The analysis of samples shows that all the parameters are in accordance with BIS: 10500 specifications.

### 2.3 Noise Levels

Noise levels were measured at 8 locations during daytime&Nighttime. The equivalent day-night noise levels in the study zone are ranging from **48.5 dBA to 62.8 dBA**.

### 3.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

#### 3.1 Prediction of impacts on air quality

The likely emissions from the proposed project are PM<sub>10</sub>, SO<sub>2</sub>, NO<sub>x</sub> & CO. The predictions of Ground level concentrations have been carried out using Industrial Source Complex (ISC-3) model. Meteorological data such as wind direction, wind speed, max. and min. temperatures collected at the site have been used as input data to run the model.

#### NET RESULTANT MAXIMUM CONCENTRATIONS DURING THE OPERATION OF THE PROPOSEDPROJECT (APCS WORKING SCENARIO)

Item	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	PM <sub>10</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	NO <sub>x</sub> (µg/m <sup>3</sup> )	CO (µg/m <sup>3</sup> )
Maximum baseline conc. in the study area	47.1	79.4	22.3	34.2	1355
Maximum predicted incremental rise in concentration due to proposed project (Point Sources)	0.57	0.95	4.76	5.76	1.24
Maximum predicted incremental rise in concentration due to proposed project (Vehicular emissions)	0.35	0.58	---	4.34	2.79
<b>Net resultant concentrations during operation of the proposed project</b>	<b>48.02</b>	<b>80.93</b>	<b>27.06</b>	<b>44.3</b>	<b>1359.03</b>
<b>National Ambient Air Quality Standards</b>	<b>60</b>	<b>100</b>	<b>80</b>	<b>80</b>	<b>2000</b>

The net resultant Ground level concentrations during operation of the proposed project are within the NAAQS. Hence, there will not be any adverse impact on air environment due to the proposed project.

#### 3.2 Prediction of impacts on Noise quality

The major sources of noise generation in the proposed project will be STG, boilers, compressors, DG set, etc. Acoustic enclosures will be provided to the STG. The ambient noise levels will be within the standards prescribed by MoEF vide notification dated 14-02-2000 under the Noise Pollution (Regulation & Control), Rules 2000 i.e. the noise levels will be less than 75 dBA during day time and less than 70 dBA during night time.**22.93 Ha.of**

extensive greenbelt will be developed to further attenuate the noise levels. Hence there will not be any adverse impact due to noise on population in surrounding areas due to the proposed project.

### **3.3 Prediction of impacts on Water Environment**

- Total wastewater generated from the proposed project will be **685 KLD**.
- There will be no wastewater discharge in DRI Kilns as closed circuit cooling system will be adopted.
- Wastewater from Induction Furnace, Rolling Mill, Ferro Alloys, power plant will be treated in ETP and after ensuring compliance with SPCB norms, it will be utilized for dust suppression, ash conditioning and for greenbelt development.
- Wastewater from Rolling Mill will be treated in oil separator followed by settling tank and will be recycled through closed circuit cooling system Air Cooled condensers will be provided in the power plant, which will reduce the water consumption significantly. Hence wastewater generation will also be minimized.
- Sanitary waste water will be treated in STP.
- Garland drains will be provided around all the raw material stacking areas
- During monsoon the treated effluent will be utilized as makeup water in Rolling Mill.
- Accordingly, the makeup water for Rolling mill also reduces during the rainy period.
- Zero Liquid Discharge (ZLD) will be maintained in the proposed project.

### **3.4 Prediction of Impacts on Land Environment**

The effluent will be treated to achieve SPCB standards. Zero effluent discharge will be adopted. All the required air pollution control systems will be provided to comply with CPCB / SPCB norms. All solid wastes will be disposed / utilized as per CPCB / SPCB norms **22.93 Ha**. of extensive greenbelt will be developed as per guidelines. Hence, there will not be any adverse impact on land environment due to the proposed project.

### **3.5 Socio - Economic Environment**

There will be certain upliftment in Socio Economic status of the people in the area & development of the area due to the proposed project. Due to this the economic conditions,

the educational and medical standards of the people living in the study area will certainly move upwards which will result in overall economic development, improvement in general aesthetic environment and increase in business opportunities.

#### 4.0 ENVIRONMENTAL MONITORING PROGRAMME

Post project monitoring will be conducted as per the guidelines of SPCB and MoEF&CC are tabulated below:

**Table no. 4.1: MONITORING SCHEDULE FOR ENVIRONMENTAL PARAMETERS**

S.No.	Particulars	Frequency of Monitoring	Duration of sampling	Parameters required to be monitored
<b>1. Water &amp; Waste water quality</b>				
A.	Water quality in the area	Quarterly Once	Grab sampling	As per IS: 10500
B.	Effluent at the inlet & outlet of the ETP	Once in a month	Composite Sampling	As per EPA Rules, 1996
C.	Sanitary Wastewater (inlet & outlet of STP)	Once in a month	Composite Sampling	As per EPA Rules, 1996
<b>2. Air Quality</b>				
A.	Stack Monitoring	CEMS (all Stacks) Once in a month	-- --	PM, SO <sub>2</sub> & NO <sub>x</sub> PM, SO <sub>2</sub> & NO <sub>x</sub>
B.	Ambient Air quality	CAAQMS Quarterly Once	continuously 24 Hourly	PM <sub>2.5</sub> , PM <sub>10</sub> , SO <sub>2</sub> , NO <sub>x</sub> PM <sub>2.5</sub> , PM <sub>10</sub> , SO <sub>2</sub> , NO <sub>x</sub> & CO
C.	Fugitive emissions	Once in a Month	8 hours	PM
<b>3. Meteorological Data</b>				
A.	Meteorological data to be monitored at the plant.	Daily	Continuous monitoring	Temperature, Relative Humidity, rainfall, wind direction & wind speed.
<b>4. Noise level monitoring</b>				
A.	Ambient Noise levels	Once in a month (Hourly)	Continuous for 24 hours with 1-hour interval	Noise levels

#### 5.0 ADDITIONAL STUDIES

No rehabilitation and resettlement is required as the additional land shown is not having any habitations.

## 6.0 PROJECT BENEFITS

With the establishment of the proposed project employment potential will increase. Land prices in the area will increase. The economic status of the people in the area will improve due to the proposed project. Periodic medical checkups will be carried out. Top priority will be given to locals in employment.

## 7.0 ENVIRONMENT MANAGEMENT PLAN

### 7.1 Air Environment

The following are air emission control systems proposed in the proposed project:

**TABLE NO. 7.1: AIR EMISSION CONTROL SYSTEM PROPOSED**

S.No.	Source	Control Equipment	Emission at the outlet
1.	DRI kilns with WHRB's	Electro Static Precipitators (ESP)	PM < 30 mg/Nm <sup>3</sup>
2.	Induction Furnaces with CCM	Fume Extraction system with PTFE bag filters	PM < 30 mg/Nm <sup>3</sup>
3.	Submerged Electric Arc Furnace	4 <sup>th</sup> Hole Fume Extraction system with bag filters	PM < 30 mg/Nm <sup>3</sup>
4.	Re-heating furnaces attached to Rolling Mill	Stack	PM < 30 mg/Nm <sup>3</sup>
5.	FBC Boiler	Electro Static Precipitators	PM < 30 mg/Nm <sup>3</sup>
		Limestone will be used as bed material and act as sulphur absorbent. Lime dosing will also be done	SOx < 100 mg/Nm <sup>3</sup>
		Combustion temperature will be around 800-850 <sup>0</sup> C, which is not conducive for thermal NOx formation. Low NOx burners with 3-stage combustion, flue gas recirculation and auto combustion control system will be provided.	NOx < 100 mg/Nm <sup>3</sup>

**Note :** Apart from the above Dry fog system with dust suppression at transfer points, crushing plant , dust extraction system with bagfilters at other dust emanating areas , covered conveyers, mechanical dust sweepers, etc. will also be provided.

### 7.2 Water Environment

- Total wastewater generated from the proposed project will be **685 KLD**.
- There will be no wastewater discharge in DRI Kilns as closed circuit cooling system will be adopted.



- Wastewater from Induction Furnace, Rolling Mill, Ferro Alloys, power plant will be treated in ETP and after ensuring compliance with SPCB norms, it will be utilized for dust suppression, ash conditioning and for greenbelt development.
- Wastewater from Rolling Mill will be treated in oil separator followed by settling tank and will be recycled through closed circuit cooling system Air Cooled condensers will be provided in the power plant, which will reduce the water consumption significantly. Hence wastewater generation will also be minimized.
- Sanitary waste water will be treated in STP.
- Garland drains will be provided around all the raw material stacking areas
- During monsoon the treated effluent will be utilized as makeup water in Rolling Mill. Accordingly, the makeup water for Rolling mill also reduces during the rainy period.
- Zero Liquid Discharge (ZLD) will be maintained in the proposed project.

#### **TREATED EFFLUENT DISPOSAL**

Total treated effluent generation	<b>685 KLD</b>
Effluent to be used for dust suppression	50 KLD
Effluent quantity to be used for ash conditioning in CHP	100 KLD
Effluent to be used for Greenbelt development	490 KLD
RO Rejects to be used for Floor washing, Toiler cleaning & Flushing	45 KLD

**22.93 Ha.** of greenbelt will be developed within the plant premises by using the treated effluent. A dedicated pipe distribution network will be provided for using the treated effluent for greenbelt development.

### **7.3 Noise Environment**

The major sources of noise generation in the proposed project will be STG, boilers, compressors, DG set, etc. Acoustic enclosure will be provided. All the machinery will be manufactured in accordance with MoEF&CC norms on Noise levels. The employees working near the noise generating sources will be provided with earplugs. The extensive greenbelt development proposed within the plant premises will help in attenuating the noise levels further. Noise barriers in the form of trees are recommended to be grown around administrative block and other utility units.

#### 7.4 Land Environment

The wastewater generated from the proposed project will be treated in the Effluent Treatment Plant to comply with the SPCB standards and will be used for dust suppression, ash conditioning and for greenbelt development. All the required Air emission control systems will be installed and operated to comply with SPCB norms. Solid wastes will be disposed off as per norms. Extensive greenbelt will be developed in the plant premises. Desirable beautification and landscaping practices will be followed. Hence there will not be any impact due to the proposed project.

**TABLE NO. 7.2: SOLID WASTE GENERATION & ITS DISPOSAL**

S.No.	Waste / By product	Quantity (TPA)	Proposed method of disposal
1.	Ash from DRI	1,24,740	Will be utilised in the proposed Brick Manufacturing Unit
2.	Dolochar	1,38,600	Will be used in proposed FBC power plant as fuel.
3.	Kiln Accretion Slag	6,237	Will be used in road construction & utilised in the proposed brick manufacturing unit.
4.	Wet scrapper sludge	27,720	Will be used in road construction & utilised in the proposed brick manufacturing unit within the premises.
5.	SMS Slag	29,700	Slag from SMS will be crushed and iron will be recovered & then remaining non -magnetic material being inert by nature will be used as sub base material in road construction.
6.	End Cuttings from Rolling Mill	9900	Will be reused in the SMS
7.	Mill scales from Rolling Mill	990	Mill scales will be utilized in the proposed Ferro alloys manufacturing units.
8.	Ash from Power Plant (with Indian Coal + dolochar)	99,990	Will be utilized in the proposed brick manufacturing unit within the premises.
9.	Slag from FeMn	60,944	Will be reused in manufacture of SiMn as it contains high SiO <sub>2</sub> and Silicon.
10.	Slag from FeSi	6,742	Will be given to Cast iron foundries
11.	Slag from SiMn	51,308	will be used for Road construction / will be given to slag cement manufacturing
12.	Slag from FeCr	34,847	Will be processed in jigging plant for Chrome recovery. After Chrome recovery, the left-over slag will be analysed for Chrome content through TCLP test, if the Chrome content in the slag is within the permissible limits, then it will be utilised for Road

S.No.	Waste / By product	Quantity (TPA)	Proposed method of disposal
			laying /brick manufacturing. If Chrome content exceeds the permissible limits, it will be sent to nearest TSDF.

### 7.5 Greenbelt Development

- Out of total **46.337 Ha.(114.499 Ac.)** of land, **22.93 Ha. (56.66 Acres)** i.e. **49.49%** of land is envisaged for greenbelt development.
- It is proposed to take-up extensive green belt development by planting about 2500 trees per Ha. i.e. 57,325 Nos.**(inclusive of existing plantation)**
- Total no. of Trees present in the Project site : 2500 nos.
- All Existing plants will be retained within the plant premises only.
- No cutting of trees will be involved.
- Greenbelt width towards the village side (West) is 50-120 m.
- Greenbelt width towards the School side (NWW) is 280 m.
- Moreover, no process activity is proposed in 360 m on the side of the School and it will be utilized for greenbelt & other non-process activity.

### 7.6 Cost for Environment Protection

Capital Cost for Environment Protection for proposed plant	: Rs. 87.5 Crores
Recurring Cost per annum for Environmental protection	: Rs. 15.6 Crores

### 7.7 Implementation of CREP Recommendations

All the CREP recommendations will be implemented & followed strictly.

- Continuous stack monitoring system is proposed for stack attached to WHR Boiler.
- Online Ambient Air Quality Monitoring Stations will be established in consultation with SPCB during operation of the plant.
- Fugitive emission monitoring will be carried out as per CPCB norms.
- Energy meters will be installed for all the pollution control systems.
- Additional Rain water harvesting pits will be constructed outside the plant premises in consultation with CGWB.