

**SUMMARY ON  
ENVIRONMENTAL IMPACT ASSESSMENT  
REPORT**

**OF**

**Phil Steel & Power Pvt. Ltd.**

[Establishment of DRI Kilns (Sponge Iron -2,31,000 TPA), Induction Furnaces with LRF & CCM (MS Billets / Ingots – 99,000 TPA), Ferro Alloy Unit (FeSi-14,000 TPA / FeMn-50,400 TPA / SiMn-28,800 TPA / FeCr-30,000 TPA), WHRB based Power Plant – 20 MW, AFBC based Power Plant - 12 MW, Briquetting plant -200 Kg/Hr& Brick Manufacturing unit of 30,000 Bricks / Day]

at

Ghutku&Nirtu Villages, Takhatpur Tehsil, Bilaspur District, Chhattisgarh

Submitted to

**CHHATTISGARH ENVIRONMENT CONSERVATION BOARD  
Chhattisgarh**

**1.0 PROJECT DESCRIPTION**

Phil Steel & Power Pvt. Ltd. has proposed to establish Steel Plant, a Greenfield Project, comprising of establishment of DRI Kilns (Sponge Iron -2,31,000 TPA), Induction Furnaces with LRF & CCM (MS Billets / Ingots – 99,000 TPA), Ferro Alloy Unit (FeSi-14,000 TPA / FeMn-50,400 TPA / SiMn-28,800 TPA / FeCr-30,000 TPA), WHRB based Power Plant – 20 MW, AFBC based Power Plant - 12 MW, Briquetting plant -200 Kg/Hr & Brick Manufacturing unit of 30,000 Bricks / Dayat Khasra Nos. of are 2741/1, 2741/2, 2744/1, 2744/2, 2745/1, 2745/2, 2746/1, 2746/2, 2747/2, 2749, 2750/1, 2750/2, 2751/1, 2751/2, 2752, 2753, 2756/1, 2756/2, 2957, 2766, 2951/4, 2952, 2951/6, 2953, 2954, 2955, 2956, 2958, 2959/1, 2959/2 of Ghutku Village & 1804/1d, 1804/1k, 1804/x, 1808/2, 1813, 1814, 1815/1, 1815/2, 1815/5, 1816/1, 1816/2, 1817/1, 1817/2, 1817/3, 1817/4, 1818/1, 1818/2, 1819/1 d, 1819/1K, 1819/1M, 1819/2d, 1819/2k, 1819/3d, 1819/3K, 1819/3x, 1819/3k, 1819/4d, 1819/5, 1820/2, 1821, 1822, 1823/2, 1823/4, 1823/8, 1823/1, 1823/3, 1823/5, 1823/6, 1823/7, 1919/4 of Nirtu Village, Takhatpur Tehsil, Bilaspur District, Chhattisgarh.

Total land envisaged for the proposed project is **15.91 Ha. (39.32 Acres)**. The project cost envisaged for the proposed project is **Rs. 217 Crores**.

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-11011/395/2021-IA-II(IND-I), dated 27<sup>th</sup> October, 2021**. The EIA Report has been prepared by incorporating the TOR stipulated by the Hon'ble EAC.

*Pioneer Enviro Laboratories & Consultants Private Limited, Hyderabad*, which is accredited by NABET, Quality Council of India, vide certificate No. NABET/ EIA/ 1922/ RA 0149, for preparing EIA report for Metallurgical Unit, have prepared Environmental Impact Assessment (EIA) report for the proposed 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 within 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 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 Project site:

**Table No. 1.1: Environment Setting within 10 Km. radius of the site**

S.No.	Salient Features / Environmental features	Distance w.r.t. site / Remarks
1.	Type of Land	Agricultural Land
2.	Type of Land (Study Area)	As per LULC the land use within 10 Km. is as follows: Settlements – 6.1 %, Industrial Area – 2.5 %, Tank / River / Reservoir – 7.7%, Single Crop – 54.6%, Double Crop – 10.3%, Plantation – 0.5%, Land with scrub – 8.2%, Land without scrub – 6.1%, Stony waste area – 4.0%
3.	National Park/ Wildlife sanctuary / Biosphere reserve / Tiger Reserve / Elephant Corridor / migratory routes for Birds	Nil
4.	Historical places / Places of Tourist importance / Archeological sites	Nil
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	Nil
7.	Nearest village	Kahipara- 0.6 Kms (S)
8.	Forests	Nil
9.	Water body	Unnamed canal passes across the site in small portion of site on western side where culvert will be constructed. Two ponds are at a distance of 100 m (S) Arpa river – 1.9 Kms. (E)

S.No.	Salient Features / Environmental features	Distance w.r.t. site / Remarks
		Kurung Right Bank Canal – 5.7 Kms. (E) GhonghaNadi – 7.7 Kms. (W) Gokena Nallah – 2.9 Kms. (W)
10.	Nearest Highway	NH # 130 – 7.5 Kms
11.	Nearest Railway Station	Railway siding of group company is 0.2 Kms. Ghutku Railway Station – 1.2 Kms.
12.	Nearest Port facility	Nil within 10 Km. Radius.
13.	Nearest Airport	Nil within 10 Kms. Radius
14.	Nearest Interstate Boundary	Nil within 10 Kms. Radius
15.	Seismic zone as per IS-1893	Seismic zone – II
16.	R & R	There is no rehabilitation and resettlement issue, as there are no habitations present in the site area.
17.	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 the proposed plant configuration and proposed production capacities:

**Table No.1.2: Proposed Plant Configuration & Production Capacities**

S.No.	Units (Products)	Plant Configuration	Production Capacity
1.	DRI Kilns (Sponge Iron)	2 x 350 TPD	2,31,000 TPA
2.	Induction Furnaces (Billets / Ingots)	2 x 15 T IF with 6/11 Caster	99,000 TPA
3.	Ferro Alloys Unit (FeSi / FeMn / SiMn / FeCr)	2 x 9 MVA	FeSi-14,000 TPA / FeMn-50,400 TPA / SiMn-28,800 TPA / FeCr-30,000 TPA
4.	Power Plant (28 MW)	WHRB	2 x 8 MW
		AFBC	1 x 12 MW
5.	Brick Manufacturing Unit	30,000 Bricks/day	30,000 Bricks/day
6.	Briquetting Plant	200 kg/hr	200 kg/hr

### 1.3 RAW MATERIAL REQUIREMENT

The following will be the raw material requirement for the proposed project:

**Table No.1.3: Raw Material Requirement, Source & Mode of Transport**

S.No.	Raw Material	Quantity (TPA)	Sources	Distance w.r.t site (in Kms.)	Mode of Transport
1.	<b>For DRI Kilns (Sponge Iron) – 2,31,000 TPA</b>				
a)	Pellets (100 %)	3,46,500	Chhattisgrh / Orissa	~ 300 Kms.	By rail & road (through covered trucks)

S.No.	Raw Material		Quantity (TPA)	Sources	Distance w.r.t site (in Kms.)	Mode of Transport
	or					
b)	Iron ore (100%)		3,69,600	Barbil, Orissa NMDC, Chhattisgarh	~ 500 Kms.	By rail & road (through covered trucks)
c)	Coal	Indian	3,00,300	SECL Chhattisgarh / MCL Odisha	~ 500 Kms.	By rail & road (through covered trucks)
		Imported	1,92,192	Indonesia / South Africa / Australia	~ 600 Kms. (from Vizag Port)	Through sea route, rail route & by road (through covered trucks)
d)	Dolomite		11,550	Chhattisgarh	~ 100 Kms.	By road (through covered trucks)
<b>2.</b>	<b>For Steel Melting Shop (Billets/ Ingots) – 99,000 TPA</b>					
a)	Sponge Iron		1,00,000	Own generation	---	Through covered conveyers
b)	MS Scrap / Pig Iron		15,000	Chhattisgarh	~ 100 Kms.	By road (through covered trucks)
c)	Ferro alloys		5,000	Own generation	---	By road (through covered trucks)
<b>3.</b>	<b>For FBC Boiler [Power Generation 1 x 12 MW]</b>					
a)	Indian Coal (100 %)		80,190	SECL Chhattisgarh / MCL Odisha	~ 500 Kms.	By rail & road (through covered trucks)
<b>OR</b>						
b)	Imported Coal (100 %)		51,400	Indonesia / South Africa / Australia	~ 600 Kms. (from Vizag Port)	Through sea route, rail route & by road (through covered trucks)
<b>OR</b>						
c)	Dolochar + Indian Coal	Dolochar	46,200	In house generation	---	through covered conveyers
		Indian Coal	57,100	SECL Chhattisgarh / MCL Odisha	~ 500 Kms.	By rail & road (through covered trucks)
<b>OR</b>						
d)	Dolochar + Imported Coal	Dolochar	46,200	In house generation	---	through covered conveyers
		Imported Coal	26,200	Indonesia / South Africa / Australia	~ 600 Kms. (from Vizag Port)	Through sea route, rail route & by road (through covered trucks)
<b>4.</b>	<b>For Ferro Alloys (2 x 9 MVA)</b>					
6 (i)	<i>For Ferro Silicon – 14,000 TPA</i>					
a)	Quartz		24,300	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
b)	LAM coke		18,900	Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)

S.No.	Raw Material	Quantity (TPA)	Sources	Distance w.r.t site (in Kms.)	Mode of Transport
c)	MS Scrap / Mill scales	4,230	Inhouse Generation	---	By road (through covered trucks)
d)	Electrode paste	360	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)
e)	Bagfilter dust	200	Own generation	---	---
6 (ii)	<i>For Ferro Manganese – 50,400 TPA</i>				
a)	Manganese Ore	68,400	MOIL / OMC	~ 500 Kms.	By Rail & Road (through covered trucks)
b)	LAM coke	19,800	Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
c)	Dolomite	8,100	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
d)	MS Scrap / Mill scales	7200	Inhouse Generation	---	By road (through covered trucks)
e)	Electrode Paste	630	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)
f)	Bagfilter dust	1000	Own generation	---	---
6 (iii)	<i>For Silico Manganese – 28,800 TPA</i>				
a)	Manganese Ore	48,600	MOIL / OMC	~ 500 Kms.	By Rail & Road (through covered trucks)
b)	LAM Coke	16,200	Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
c)	FeMn. Slag	30,294	In house generation	---	----
d)	Dolomite	7,380	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
e)	Electrode paste	630	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)
f)	Quartz	7740	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
g)	Bagfilter dust	200	Own generation	---	---
6 (iv)	<i>For Ferro Chrome – 30,000 TPA</i>				
a)	Chrome Ore	56,700	Sukinda, Odisha Import, South Africa	~ 500 Kms. ~ 600 Kms. (from Vizag Port)	By road (through covered trucks) From Port By Road (through covered Trucks)
b)	LAM Coke	19,800	Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
c)	Quartz	8,100	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
d)	MS Scrap / Mill Scale	2,700	Inhouse Generation	---	By road (through covered trucks)
e)	Magnetite / Bauxite	5,400	Chhattisgarh / Maharashtra	~ 500 Kms.	By road (through covered trucks)

S.No.	Raw Material	Quantity (TPA)	Sources	Distance w.r.t site (in Kms.)	Mode of Transport
f)	Electrode Paste	540	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)
g)	Bagfilter dust	1,200	Own generation	---	---

**Note: Railway siding of sister concern will be utilised for transportation**

## 1.4 MANUFACTURING PROCESS

### 1.4.1 Sponge Iron (DRI)

The proposal consists of **2 x 350 TPD** of DRI kilns to produce **2,31,000TPA** of Sponge Iron with **2 x 8.0 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>0</sup>C enters the reduction zone. Temperature of the order of 1050<sup>0</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>0</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 2 x 15 T Induction furnaces to manufacture Hot Billets/ Billets of **99,000 TPA**. 85% of the Hot Billets produced from LRF will be directly sent to Rolling Mill without using Re-heating Furnace through Hot charging method & 15 % of cooled Billets / Ingots will be sent to Re-heating Furnace to reheat the Billets and then sent to Rolling Mill to manufacture Rolled Products.

#### **1.4.3 Submerged Electric Arc Furnaces**

**2 nos.** of Submerged Electric Arc Furnace each of **9.0 MVA** will be setup in the proposed plant. 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.

#### **1.4.4 Ferro Chrome Briquette Manufacturing process**

Chrome ore fines received from mines are first dried in dryer. The dry ore is mixed with molasses, and the green mix is then fed to the briquetting presses. The presses compact the mixture at high pressure to form green briquettes. The green briquettes are stored in the storage yard for curing. After curing at ambient temperature for 24- 48 hrs, the briquettes become stronger and are fed into Submerged Arc Furnaces.

#### **1.4.5 Fly Ash Brick Manufacturing Process**

It is proposed to establish Fly Ash / Slag brick making unit of 30,000 bricks/day capacity. Fly ash (70%), Gypsum (5%), cement (10%) and 15% of Slag (Kiln Accretion Slag, Wet scrapper sludge, SMS Slag) 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. After mixing, the mixture is allowed to belt conveyor through



feed in to automatic block making machine where the blocks are pressed automatically. Then the blocks/ blocks are placed on wooden pallets and kept as it is for two days there-after transported to open area where they are water cured for 10 -15 days. The blocks are sorted and tested before dispatch.

**1.4.6 Power Generation**

**Through WHRB Boiler**

The hot flue gases from proposed 2 x 350 TPD DRI kilns will pass through waste heat recovery Boiler to recover the heat and to generate 16 MW (2 x 8.0 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 AFBC Boiler**

Coal (Imported / Indian) along with dolochar will be used as fuel in AFBC Boilers to generate 12 MW (1 x 12 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.

**1.5 Water Requirement**

- Water required for the proposed project will be 1472 KLD. This includes make up water for DRI Kilns, Induction Furnaces, Ferro Alloys Unit, & Domestic.
- Air cooled condensers will be provided to FBC Power plant.
- Water required for proposed project will be sourced from Arpa River (which is at a distance of 1.9 Kms. from the project site).
- Water drawl permission from Water Resource Department, Chhattisgarh will be obtained after receipt of TOR letter for proposed project.

**Table No. 1.4: Water Requirement Breakup**

S.No.	Unit	Quantity in KLD
1.	DRI Kilns	525
2.	Induction Furnaces	150
3.	Power Plant (WHRB + FBC :28 MW)	672
	• Cooling tower makeup	262
	• Boiler make up	335
	• DM plant Regeneration	75

4.	Ferro Alloy Unit	90
5.	Brick making plant	10
6.	Domestic	25
	<b>Total</b>	<b>1472</b>

**1.6 Wastewater Generation**

- Total wastewater generation will be 227 KLD.
- There will be no effluent discharge from the Sponge Iron, Induction Furnaces, Ferro Alloys unit as closed circuit cooling system will be adopted.
- Air Cooled condensers will be provided in the power plant, which will be reduce the water consumption significantly. Hence wastewater generation will also be minimized.
- Effluent from 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.
- Sanitary waste water will be treated in STP.
- Garland drains will be provided around all the raw material stacking areas

**Table No.1.5: BreakupOfWastewater Generation**

S.No.	Source	Generation (KLD)
1.	Power Plant (28 MW)	207
	a) Cooling Tower blowdown	48
	b) Boilers blowdown	84
	c) D.M. plant regeneration water	75
2.	Sanitary Wastewater	20
	<b>Total</b>	<b>227</b>

**1.7 Wastewater Characteristics**

The following are the Characteristics of wastewater.

**Table No.1.6: Characteristics of Effluent**

PARAMETER	CONCENTRATION			
	Cooling Tower blowdown	DM Plant Regeneration	Boiler Blowdown	Sanitary wastewater
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 **15<sup>th</sup> October 2021 to 15<sup>th</sup> January 2022**. The following are the concentrations of various parameters at the monitoring stations:

**Table No.2.1 : Ambient Air Quality Summary**

S.No.	Parameter		Concentration
1.	PM <sub>2.5</sub>	:	18.5 to 38.7 µg/m <sup>3</sup>
2.	PM <sub>10</sub>	:	34.4 to 66.5 µg/m <sup>3</sup>
3.	SO <sub>2</sub>	:	7.0 to 19.6 µg/m <sup>3</sup>
4.	NO <sub>x</sub>	:	7.2 to 28.4 µg/m <sup>3</sup>
5.	CO	:	314 to 1085 µg/m <sup>3</sup>

### 2.2 Water Quality

#### 2.2.1 Surface Water Quality

Arpariver (2.0 Kms. – East), GhonghaNadi(7.9 Kms. - West), Gokena Nallah(2.9 Kms. - West) are present within 10 Km. radius of the project site. 2 no. of samples i.e. 60m Upstream & 60 m Downstream from Arpa River and one sample from GhonghaNadi, Gokena Nallah, Karhipara Village Pond have been collected and analyzed for various parameters. No other surface water samples have been collected as the study period. The analysis of samples shows that all the parameters are in accordance with BIS-2296 specifications.

#### 2.2.2 Ground Water Quality

8 Nos. of ground water samples from open wells / bore wells have been 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 noise levels at the monitoring stations are ranging from **44.73 dBA to 51.72 dBA**.

### 3.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

#### 3.1 Prediction of impacts on air quality

The likely emissions from the **proposed project & expansion of adjacent Coal washery unit** 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.

The predicted max. Incremental PM<sub>10</sub> concentrations (24 hourly) due to the proposed project & expansion of adjacent Coal washery unit will be **0.42 µg/m<sup>3</sup>** at a distance of **1100 m** from the stack in the down wind direction over the baseline concentrations.

The predicted incremental rise in Particulate Matter concentration due to the Vehicular emissions from proposed project & expansion of adjacent Coal washery unit will be **0.98 µg/m<sup>3</sup>**.

The predicted max incremental SO<sub>2</sub> concentrations (24 hourly) due to the emissions from operation of proposed project & expansion of adjacent Coal washery unit will be **3.3 µg/m<sup>3</sup>** at a distance of **1100 m** from the stack in the down wind direction over the baseline concentrations.

The predicted max incremental NO<sub>x</sub> concentrations (24 hourly) due to the proposed project & expansion of adjacent Coal washery unit will be **1.86 µg/m<sup>3</sup>** at a distance of **1100 m** from the stack in the down wind direction over the baseline concentrations.

The predicted incremental rise in NO<sub>x</sub> concentration due to the Vehicular emission from proposed project & expansion of adjacent Coal washery unit will be **8.70 µg/m<sup>3</sup>**.

The predicted incremental rise in CO concentration due to the Vehicular emissions from proposed project & expansion of adjacent Coal washery unit will be **4.96 µg/m<sup>3</sup>**.

**Table No.3.1: NET RESULTANT MAXIMUM CONCENTRATIONS DURING THE OPERATION OF THE PROPOSED PROJECT**

Item	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	66.5	19.6	28.4	1085
Maximum predicted incremental rise in concentration due to <b>proposed project &amp; expansion of adjacent Coal washery unit</b> (Point Sources)	0.42	3.3	1.86	Nil
Maximum predicted incremental rise in concentration due to <b>proposed project &amp; expansion of adjacent Coal washery unit</b> (Vehicular emissions)	0.98	Nil	8.70	4.96
<b>Net resultant concentrations during operation of the proposed project</b>	<b>67.9</b>	<b>22.9</b>	<b>38.96</b>	<b>1089.96</b>
<b>National Ambient Air Quality Standards</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. **5.34 Ha. (13.2 Acres)** 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

Closed loop cooling water system will be adopted in DRI, SMS, and Ferro Alloy units. Effluent from power plant will be treated in Effluent Treatment Plant and after ensuring compliance with SPCB norms, it will be utilized for dust suppression, ash conditioning and for greenbelt development. Sanitary wastewater will be treated in Sewage Treatment Plant. Treated sewage will be used for Greenbelt development. There will not be any effluent discharge outside the premises. ZLD will be followed. Hence there will not be any adverse impact on environment due to 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. **5.34 Ha. (13.2 Acres)** 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. Developmental activities will be taken up in consultation with village panchayat. 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	Once in a month except for heavy metals which will be monitored on quarterly basis.	Composite sampling (24 hourly)	As per IS: 10500
B.	Effluent at the outlet of the ETP	Once in a month	Grab sampling (24 hourly)	As per EPA Rules, 1996
C.	STP Inlet & Outlet	Once in a month	Grab sampling (24 hourly)	As per EPA Rules 1996
<b>2. Air Quality</b>				
A.	Stack Monitoring	Online monitors (all stacks) Once in a month	Continuous --	PM PM, SO <sub>2</sub> & NO <sub>x</sub>
B.	Ambient Air quality (CAAQMS)	Continuous Quarterly Once	Continuous 24 hours	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

S.No.	Particulars	Frequency of Monitoring	Duration of sampling	Parameters required to be monitored
C.	Fugitive emissions	Quarterly Once	8 hours	PM
<b>3. Meteorological Data</b>				
	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>				
	Ambient Noise levels	Quarterly Once	Continuous for 24 hours with 1 hour interval	Noise levels

**5.0 ADDITIONAL STUDIES**

No Rehabilitation and Resettlement is involved in the proposed project as there are no habitations in the project site. Hence no R & R study has been carried out.

**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 Systems Proposed**

S.No.	Source	Control Equipment	Particulate emission at the outlet
1.	DRI kilns with WHRB's	Electro Static Precipitators (ESP) (high performance rigid electrodes with transformer)	PM <30 mg/Nm <sup>3</sup>
2.	Induction Furnaces with CCM	Fume Extraction system with PTFE membrane bag filters	PM <30 mg/Nm <sup>3</sup>
3.	SEAF	4 <sup>th</sup> Hole Fume Extraction system with PTFE membrane bag filters	PM <30 mg/Nm <sup>3</sup>
4.	AFBC Boiler	Electro Static Precipitator (high performance rigid electrodes with transformer)	PM <30 mg/Nm <sup>3</sup>
		Automatic Lime dosing	SOx < 100 mg/Nm <sup>3</sup>
		Low NOx burners with 3-stage	NOx < 100 mg/Nm <sup>3</sup>

S.No.	Source	Control Equipment	Particulate emission at the outlet
		combustion, flue gas recirculation and auto combustion control system will be provided	

Apart from the above the following air emission control systems/ measures are proposed in the Plant:

- All conveyors will be completely covered with G.I. sheets to control fugitive dust.
- All bins will be totally packed and covered so that there will not be any chance for dust leakage.
- All the dust prone points material handling systems will be connected with de-dusting system with bag filters.
- All discharge points and feed points, wherever the possibility of dust generation is there a de-dusting suction point will be provided to collect the dust.

**7.2 Water Environment**

- Total wastewater generation from the proposed project will be **227 KLD**.
- There will be no effluent discharge from the Sponge Iron, Induction Furnaces, Ferro Alloys unit as closed circuit cooling system will be adopted.
- Air Cooled condensers will be provided in the power plant, which will be reduce the water consumption significantly. Hence wastewater generation will also be minimized.
- Effluent from 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.
- Sanitary waste water will be treated in STP.
- Garland drains will be provided around all the raw material stacking areas

**EFFLUENT TREATMENT PLANT**

pH of the boiler blowdown will be between 9.5 to 10.5. Hence a neutralization tank will be constructed for neutralizing the boiler blow down. DM plant regeneration water will be neutralized in a neutralization tank. After neutralization, these two effluent streams will be mixed with Cooling Tower blowdown in a Central Monitoring Basin (CMB). Service water will be treated in an oil separator and after treatment it will be taken to CMB. The treated



effluent will be utilized for dust suppression, ash conditioning and for Green belt development. No effluent will be let out of the plant premises. Hence Zero discharge concept will be implemented.

**The following will be treated combined effluent characteristics.**

• pH	-	6.5 - 8.5
• TSS	-	< 100 mg/l
• Oil & Grease	-	< 10 mg/l
• Free available chlorine	-	< 1.0 mg/l
• Copper	-	<1.0 mg/l
• Iron	-	< 1.0 mg/l
• Zinc	-	< 1.0 mg/l
• Chromium	-	< 0.2 mg/l
• Phosphates	-	< 5.0 mg/l

**Treated Sewage Characteristics**

S.No.	Parameters	Parameters limit
1.	pH	6.5 – 8.0
2.	BOD (mg/ L)	Not more than 10
3.	COD (mg/ L)	Not more than 50
4.	TSS (mg/ L)	Not more than 20
5.	NH <sub>4</sub> -N (mg/ L)	Not more than 5
6.	N-Total (mg/ L)	Not more than 10
7.	Fecal Coliform (MPN/100 ml)	Less than 100

**TREATED EFFLUENT DISPOSAL**

Effluent quantity to be used for ash conditioning	:	75 m <sup>3</sup> /day
Effluent to be used for dust suppression in CHP	:	100 m <sup>3</sup> /day
Effluent to be used for Greenbelt development	:	52 m <sup>3</sup> /day

**5.34 Ha. (13.2 Acres)** 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.

The characteristics of the treated effluent will comply with the SPCB Standards for onland irrigation. Hence there will not be any adverse impact on ground water / surface water due to the proposed project.

**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 to STG & DG sets. 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 and Disposal**

S. No.	Waste / By product	Quantity (TPA)	Proposed method of disposal
1.	Ash from DRI	41,580	Will be utilised in the proposed Brick Manufacturing Unit
2.	Dolochar	46,200	Will be used in proposed FBC power plant as fuel.
3.	Kiln Accretion Slag	2,079	Will be used in road construction & utilised in the proposed brick manufacturers.
4.	Wet scrapper sludge	10,626	Will be used in road construction & utilized in the proposed brick manufacturers.
5.	SMS Slag	9,900	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 & utilized in the proposed brick manufacturing unit.
6.	Ash from Power Plant (with Imported Coal + dolochar)	30,865	Will be utilized in the proposed brick manufacturing unit
7.	Slag from FeMn	30,294	Will be reused in manufacture of SiMn as it contains high SiO <sub>2</sub> and Silicon.
8.	Slag from FeSi	1,010	Will be given to Cast iron foundries
9.	Slag from SiMn	30,888	will be used for Road construction / will be given to slag cement manufacturing

10.	Slag from FeCr	27,918	Will be processed in jiggling 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 laying /brick manufacturing. If Chrome content exceeds the permissible limits, it will be sent to nearest TSDF.
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### 7.5 Greenbelt Development

Greenbelt of 5.34 Ha. (13.2 Acres) of extensive greenbelt will be developed in the plant premises. Width of proposed greenbelt ranges from 10 to 50 m. Total 13,200 nos. of saplings will be planted with in the plant premises.

### 7.6 Cost for Environment Protection

Capital Cost for Environment Protection for proposed plant : Rs. 26.5 Crores

Recurring Cost per annum for Environmental protection : Rs.3.1 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 all the stacks.
- Fugitive emission monitoring will be carried out as per CPCB norms.
- Energy meters will be installed for all the pollution control systems.