SUMMARY ON

ENVIRONMENTAL IMPACT ASSESSMENT

REPORT

OF

ISKCO Iron & Steel Pvt. Ltd.

[Establishment of DRI Kilns (Sponge Iron – 1,32,000 TPA), Induction Furnace with LRF & CCM (Hot Billets / MS Billets / Ingots – 1,65,000 TPA), Strip Mill (Strips) (85 % Hot charging with Hot Billets and remaining 15% through RHF with Producer Gas/Coal Pulveriser as fuel – 1,65,000 TPA), Submerged Electric Arc Furnace (FeSi - 14,000 TPA / FeMn – 50,400 TPA / SiMn – 28,800 TPA / FeCr - 30,000 TPA / Pig Iron – 50,400 TPA), WHRB based Power Plant – 2 x 5.0 MW, FBC based Power Plant – 1 x 10 MW, Brick Manufacturing unit (18,000 Bricks/day) & Briquetting Plant (Briquettes - 200 Kg/Hr.)]

at

NaktiKhapri Village, Tilda Tehsil,

Raipur District, Chhattisgarh

Submitted to

CHHATTISGARH ENVIRONMENT CONSERVATION BOARD

Chhattisgarh

1.0 PROJECT DESCRIPTION

ISKCO Iron & Steel Pvt. Ltd is proposing to establish a Steel Plant, a Greenfield Project, comprising of Establishment of DRI Kilns (Sponge Iron – 1,32,000 TPA), Induction Furnace with LRF & CCM (Hot Billets / MS Billets / Ingots – 1,65,000 TPA), Strip Mill (Strips) (85 % Hot charging with Hot Billets and remaining 15% through RHF with Producer Gas/Coal Pulveriser as fuel – 1,65,000 TPA), Submerged Electric Arc Furnace (FeSi - 14,000 TPA / FeMn – 50,400 TPA / SiMn – 28,800 TPA / FeCr - 30,000 TPA / Pig Iron – 50,400 TPA), WHRB based Power Plant – 2 x 5.0 MW, FBC based Power Plant – 1 x 10 MW, Brick Manufacturing unit (18,000 Bricks/day) & Briquetting Plant (Briquettes - 200 Kg/Hr.).

Total land identified for the proposed project is **22.404 Ha. (55.36 acres)** and same is taken on lease from Chhattisgarh State Industrial Development Corporation Limited (CSIDC Ltd.) for 99 years vide Lease Deed dt. 15.12.2022.

As per the Ministry of Environment, Forests & Climate Change, New Delhi, EIA notification 14th September 2006 & its subsequent amendments, all Primary metallurgical processing industries are listed under S.No. 3(a), 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. **F.No. IA-J-11011/88/2023-IA-II(IND-I), dated 31stMay 2023.** 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/2225/RA 0282, for preparing EIA report for Metallurgical Unit, have prepared Environmental Impact Assessment (EIA) report for the proposed projectby 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 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 Kms. radius of the site

S.No.	Salient Features / Environmental features	Distance w.r.t. site / Remarks
1.	Type of Land	Govt. Land
2.	Type of Land (Study Area)	As per LULC the land use within 10 Km. is as follows: Settlements – 5.3 %; Industrial area - 4.1 %; Tanks / River – 8.6 %; Scrub Forest – 1.9 %; Single crop – 49.9 %; Double crop – 8.9 %; Plantation - 2.3 %; Land with scrub – 11.1 %; Land without scrub - 2.2 %; Mining area - 4.5; Ash Pond -1.2 %.
3.	National Park/ Wildlife sanctuary / Biosphere reserve / Tiger Reserve / Elephant Corridor / migratory routes for Birds	There are no notified National Park/ Wild life sanctuary / Biosphere reserve / Tiger Reserve/ migratory routes for Birds with in 10 Km. radius of the plant.
4.	Historical places / Places of Tourist importance / Archeological sites	Nil
5.	Critically polluted area as per MoEF&CC Office Memorandum dated 13th January 2010	Nil And also the Plant area does not fall in the areas given in Hon'ble NGT order issued vide dated 10thJuly 2019.
6.	Defence Installations	Nil
7.	Nearest village	Kundru Village – 0.60 Kms.
8.	No. of Villages in the Study Area	60 nos.
9.	Nearest Hospital	Nearest Hospital is at Tilda at 7.3 Kms.
10.	Nearest School	Nearest School is at Govt. High School at Kundru Village at adjacent to the project boundary
11.	Forests	Mohrenga PF – 7.5 Kms
12.	Water body	Mahanadi -Bhatapara Branch Canal (0.18 Kms.) Kirna Pond (1.8 Kms.)
13.	Nearest Highway	Nil within 10 Kms. radius (NH # 200 – 10.2 Kms. Aerial distance)
14.	Nearest Railway Station	Baikunth RS - 2.2 Kms (by Aerial)

S.No.	Salient Features / Environmental features	Distance w.r.t. site / Remarks
15.	Nearest Port facility	Nil
16.	Nearest Airport	Raipur Airport- 34.2 (by Aerial)
17.	Nearest Interstate Boundary	Nil within 15 Km. radius
18.	Seismic zone as per IS-1893	Seismic zone – II
19.	R & R	Not applicable as there are no habitations in the proposed project land.
20.	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.	Unit (Product)		Configuration	Capacity
1.	DRI Kilns (Sponge Iron)		2 x 200 TPD	1,32,000 TPA
2.	Induction furnace with 6/11 CCM (Hot Billets / MS Billets / Ingots)		2 x 25 T	1,65,000 TPA
3.	Strip Mill (Strips) (85% Hot charging with Hot Billets and remaining 15% through RHF with Producer Gas / Coal Pulverizer as fuel)		1 x 500 TPD	1,65,000 TPA
4.	Ferro Alloys (FeSi / FeMn / SiMn / FeCr / Pig Iron)		2 x 9 MVA	FeSi - 14,000 TPA / FeMn – 50,400 TPA / SiMn – 28,800 TPA / FeCr - 30,000 TPA / Pig Iron – 50,400 TPA
5.	Power plant (20 MW)	WHRB Based Power Plant	2 x 5 MW	10 MW
		FBC Based Power Plant	1 x 10 MW	10 MW
6.	Brick manufacturing Unit		18,000 Bricks /Day	18,000 Bricks /Day
7.	Briquetting plant		200 Kg/Hr.	100 Kg/Hr.

1.3 RAW MATERIAL REQUIRMENT

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 from site (in Kms.)	Mode of Transport
1.	**For DRI Kilns (Sponge Iron) – 1,32,000 TPA**				
a)	Pellets (100 %)	1,91,400	Purchased from out side	---	Through covered conveyers

S.No.	Raw Material		Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
	or					
	Iron ore (100%)		2,11,200	Barbil, Orissa NMDC, Chhattisgarh	~ 500 Kms.	By rail & road (through covered trucks)
b)	Coal	Indian	1,71,600	SECL Chhattisgarh / MCL Odisha	~ 500 Kms.	By rail & road (through covered trucks)
		or				
		Imported	1,09,824	Indonesia / South Africa / Australia	~ 600 Kms. (from Vizag Port)	Through sea route, rail route & by road (through covered trucks)
c)	Dolomite		6,600	Chhattisgarh	~ 100 Kms.	By road (through covered trucks)
2.	**For Steel Melting Shop (Hot Billets / MS Billets / Ingots) – 1,65,000 TPA**					
a)	Sponge Iron		1,67,000	Inhouse Generation Purchased from out side (Chhattisgarh)	--- ~ 100 Kms.	Through covered conveyers By road (through covered trucks)
b)	MS Scrap / Pig Iron		25,000	Chhattisgarh	~ 100 Kms.	By road (through covered trucks)
c)	Ferro alloys		8,000	Inhouse Generation	---	By road (through covered trucks)
3.	**Strip Mill through Hot charging (Rolled Products) – 1,65,000 TPA**					
a)	Hot Billets (for Hot charging)		1,45,860	Own generation	---	----
b)	Billets (for Reheating furnace)		27,225	Chhattisgarh	~ 100 Kms.	By road (through covered trucks)
c)	LDO		801 Kl/annum	Nearby IOCL Depot	~ 100 Kms.	By road (through Tankers)
d)	Gasifer (1485 Nm^3/Hr.)	Indian Coal	4455	SECL Chhattisgarh / MCL Odisha	~ 500 Kms.	By rail & road (through covered trucks)
		Imported Coal	2851	Indonesia / South Africa / Australia	~ 600 Kms. (from Vizag Port)	Through sea route, rail route & by road (through covered

S.No.	Raw Material		Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
						trucks)
4.	**For FBC Boiler [Power Generation - 10 MW]**					
a)	Indian Coal		59,400	SECL Chhattisgarh / MCL Odisha	~ 500 Kms.	By rail & road (through covered trucks)
b)	Imported Coal		38,016	Indonesia / South Africa / Australia	~ 600 Kms. (from Vizag Port)	Through sea route, rail route & by road (through covered trucks)
	or					
c)	Dolochar + Indian Coal	Dolochar	26,400	Inhouse Generation	---	through covered conveyors
		Indian Coal	46,200	SECL Chhattisgarh / MCL Odisha	~ 500 Kms.	By rail & road (through covered trucks)
	or					
d)	Dolochar + Imported Coal	Dolochar	26,400	Inhouse Generation	---	through covered conveyors
		Imported Coal	24,816	Indonesia / South Africa / Australia	~ 600 Kms. (from Vizag Port)	Through sea route, rail route & by road (through covered trucks)
5.	**For Ferro Alloys (2 x 9 MVA)**					
7 (i)	*For Ferro Silicon – 14,000 TPA*					
a)	Quartz		21,280	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
b)	LAM coke		7,840	Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
c)	Mill scales/ MS Scrap		3,290 / 490	Inhouse Generation	---	By road (through covered trucks)
d)	Electrode paste		280	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)
e)	Bagfilter dust		532	Inhouse Generation	---	---
7 (ii)	*For Ferro Manganese – 50,400 TPA*					
a)	Manganese Ore		1,14,660	MOIL / OMC	~ 500 Kms.	By Rail & Road (through covered

S.No.	Raw Material	Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
					trucks)
b)	LAM coke	18,396	Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
c)	Dolomite	8,568	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
d)	MS Scrap / Mill scales	7,560	Inhouse Generation	---	By road (through covered trucks)
e)	Electrode Paste	655	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)
f)	Bagfilter dust	2,520	In house generation	---	---
7 (iii)	*For Silico Manganese – 28,800 TPA*				
a)	Manganese Ore	46,944	MOIL / OMC	~ 500 Kms.	By Rail & Road (through covered trucks)
b)	FeMn Slag	30,472	In house generation	---	----
c)	LAM Coke	10,800	Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
d)	Dolomite	6,480	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
e)	Electrode paste	576	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)
f)	Quartz	6,912	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
g)	Bag filter dust	432	In house generation	---	---
7 (iv)	*For Ferro Chrome – 30,000 TPA*				
a)	Chrome Ore	60,000	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	9,900	Andhra Pradesh	~ 500 Kms.	By road

S.No.	Raw Material	Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
					(through covered trucks)
c)	Quartz	5,250	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
d)	MS Scrap / Mill Scale	4,500	Inhouse Generation	---	By road (through covered trucks)
e)	Magnetite / Bauxite	5,070	Chhattisgarh / Maharashtra	~ 500 Kms.	By road (through covered trucks)
f)	Electrode Paste	900	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)
g)	Bagfilter dust	1,920	Own generation	---	---
7 (v)	*For Pig Iron –50,400 TPA*				
a)	HG Iron ore	74,340	Barbil, Orissa NMDC, Chhattisgarh	~ 500 Kms.	By rail & road (through covered trucks)
b)	LAM Coke	24,444	Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
c)	Lime stone	6,300	Chhattisgarh	~ 100 Kms.	By road (through covered trucks)
d)	Quartz	3,024	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
e)	Electrode Paste	1,008	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)
f)	Briquetted Bag filter dust	1,512	Own generation	---	---

1.4 MANUFACTURING PROCESS

1.4.1 Sponge Iron (DRI)

The proposal consists of 2 x 200 TPD to manufacture 1,32,000 TPAof Sponge Iron with 10.0MW 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 1000^0C enters the reduction zone. Temperature of the order of 1050^0C 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 160^0C. 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.

1.4.2Steel 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 consistofInduction furnace, Ladles, Cranes & Continuous Casting Machine (CCM). There will be2 x 25 TInduction furnaces to manufacture Hot Billets / MS Billets / Ingots of 1,65,000TPA. Either the Hot Billets produced from LRF will be directly sent to Strip 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 Strip Mill to manufacture Strips. The flue gases will be treated in fume extraction system with bagfilters.

1.4.3 Rolling Mill (Strip Mill)

The Hot Billets produced from Induction Furnaces will be directly sent to Strip Mill to produce Rolled Products (OR) Hot Billetswill be cooled and stored will be sent to reheating furnaces for the heating and will be sent to Strip Mill.Furnace will be heated with either LDO / Producer Gas. A Strip mills(1 x 500 TPD) will be installed in the present proposal to produce 1,65,000 TPA ofStrip.

1.4.4 Submerged Electric Arc Furnace

Submerged Electric Arc Furnace(2 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 4thhole and then treated in bag filters.

1.4.5 Power Generation

Through WHRB Boiler

The hot flue gases from proposed 2 x 200 TPDDRI kilns will pass through waste heat recovery Boiler to recover the heat and to generate (2 x 5 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 atmospherethroughstacks of adequate height.

Through FBC Boiler

Coal (Imported / Indian) along withdolochar will be used as fuel in FBC Boilers to generate 10 MWofelectricity. 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 18,000 bricks/day capacity. Fly ash (70%), Gypsum (5%), cement (10%) and Stone dust (15%) are manually feed 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 1020 KLD. This includes make up water for DRI Kiln, Induction Furnace, Strip Mill, Gasifier, Ferro Alloys, Domestic purpose & for Greenbelt development.
- Water required for proposed project (for process and domestic) will be met from partly from Ground Water and partly from Shivnath River / Jalso Dam.
- Application has been submitted to Water Resource Department, Govt. of Chhattisgarh for drawl of water from Jalso dam.
- NOC from CGWA for drawl of ground water will be obtained.
- Air cooled condenser will be provided in the Power Plant.

Table No.1.4: Water Requirement Breakup

S.No.	Unit	Quantity in KLD
1.	Make-up water for DRI plant	130
2.	Make-up water for SMS plant	120
3.	Strip Mill	150
4.	Gasifier	5
5.	Make-up water for Ferro Alloy plant	60
6.	Bricks manufacturing Unit	5
7.	Briquetting plant	5
8.	Captive Power Plant	400
	• Cooling Tower Make-up	192
	• Boiler make-up	144
	• D.M. plant regeneration water	64
9.	Green Belt Development	135
10.	Domestic	10
	Total	**1020**

1.6 Wastewater Generation

- Total effluent generated from the proposed project will be **188** KLD.
- There will be no effluent discharge from the Sponge Iron 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 SMS, Strip Mill, Gasifier, Ferro Alloys Units will be sent to settling tank & oil separator will be recycled through closed circuit cooling system.
- 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, brick making and for greenbelt development.
- Sanitary waste water will be treated in STP.
- Garland drains will be provided around all the raw material stacking areas.
- Zero liquid effluent discharge practice will be maintained in the proposed project.
- During monsoon the treated effluent will be utilized as makeup water in Strip Mill. Accordingly, the makeup water for Strip mill also reduces during the rainy period.
- 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.

Table No.1.5: BreakupofWastewater Generation

S.No.	Source	Generation (KLD)
1.	Sponge Iron Unit	---
2.	SMS Unit	12
3.	Strip Mill	8
4.	Gasifier	4
5.	Ferro-Alloy SAF Unit	4
6.	Power Plant	152
	a) Cooling Tower blowdown	48
	b) Boilers blowdown	41
	c) D.M. plant regeneration water	63
7.	Sanitary Wastewater	8
	Total	**188**

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 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 $PM_{2.5}$, PM_{10}, SO_2, NOx & CO at 8 stations including project site during **1st December 2022 to 28th February 2023**. The following are the concentrations of various parameters at the monitoring stations:

Table No.2.1: AAQ Data Summary

S.No.	Parameter	Concentration range ($\mu g/m^3$)	Standard as per NAAQS ($\mu g/m^3$)
1.	$PM_{2.5}$	27.2 to 41.8	60
2.	PM_{10}	46.9 to 68.4	100
3.	SO_2	8.2 to 14.2	80
4.	NO_X	9.8 to 18.8	80
5.	CO	420 to 1350	2000

2.2 Water Quality

2.2.1 Surface Water Quality

2 no. of samples i.e.from Bhatapara Branch Mahanadi Canal &Kirna Pond, flowing at a distance of 0.18 Kms. & 1.8 Kms. from the project site respectively, 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 **44.74 dBA to 54.28 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_{10}, SO_2, NOx& 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.

Table No.2.2: NET RESULTANT MAXIMUM CONCENTRATIONS DURING THE OPERATION OF THE PROPOSEDPROJECT (APCS WORKING SCENARIO)

Item	PM_{10} ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_X ($\mu g/m^3$)	CO ($\mu g/m^3$)
Maximum baseline conc. in the study area	68.4	14.2	18.8	1350
Maximum predicted incremental rise in concentration due to proposed project (Point Sources)	0.45	4.03	2.70	1.52
Maximum predicted incremental rise in concentration due to proposed project (Vehicular emissions)	0.33	---	2.40	---
Net resultant concentrations during operation of the proposed project	**69.18**	**18.23**	**23.9**	**1351.52**
National Ambient Air Quality Standards	**100**	**80**	**80**	**2000**

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.**10.62 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 generation will be **188 KLD.**
- There will be no effluent discharge from the Sponge Iron 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 SMS, Strip Mill, Ferro Alloys Units will be sent to settling tank & oil separator will be recycled through closed circuit cooling system.
- Effluent generated from Coal Gasifier will be used in ABC Chamber of DRI Kilns.
- 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, brick making and for greenbelt development.
- Sanitary waste water will be treated in STP.
- Garland drains will be provided around all the raw material stacking areas.
- Zero liquid effluent discharge practice will be maintained in the proposed project.
- During monsoon the treated effluent will be utilized as makeup water in Strip Mill. Accordingly, the makeup water for Strip mill also reduces during the rainy period.

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**10.62 Ha.** of extensive greenbelt will be developed as per guidelines. Hence, there will not be any adverse impact on land environment due to the proposedproject.

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
1. Water & Waste water quality				
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
2. Air Quality				
A.	Stack Monitoring	CEMS (all Stacks) Once in a month	-- --	PM, SO_2& NOx PM, SO_2& NOx
B.	Ambient Air quality	CAAQMS Quarterly Once	continuously 24 Hourly	$PM_{2.5}$, PM_{10}, SO_2, NOx $PM_{2.5}$, PM_{10}, SO_2, NOx & CO
C.	Fugitive emissions	Once in a Month	8 hours	PM
3. Meteorological Data				
A.	Meteorological data to be monitored at the plant.	Daily	Continuous monitoring	Temperature, Relative Humidity, rainfall, wind direction & wind speed.
4. Noise level monitoring				
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 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	Emission at the outlet
1.	DRI kilns with WHRB's	Electro Static Precipitators (ESP)	PM < 30 mg/Nm^3
2.	Induction Furnaces with CCM	Fume Extraction system with PTFE bag filters	PM < 30 mg/Nm^3
3.	Submerged Electric Arc Furnace	4th Hole Fume Extraction system with bag filters	PM < 30 mg/Nm^3
4.	Re-heating furnaces attached to Rolling Mill	Stack	PM < 30 mg/Nm^3
5.	FBC Boiler	Electro Static Precipitators	PM < 30 mg/Nm^3
		Limestone will be used as bed material and act as sulphur absorbent. Lime dosing will also be done	SOx< 100 mg/Nm^3
		Combustion temperature will be around 800-850^{0}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^3
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.			

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 will be **188 KLD.**
- There will be no effluent discharge from the Sponge Iron 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 SMS, Strip Mill, Ferro Alloys Units will be sent to settling tank & oil separator will be recycled through closed circuit cooling system.
- Effluent generated from Coal Gasifier will be used in ABC Chamber of DRI Kilns.
- 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, brick making and for greenbelt development.
- Sanitary waste water will be treated in STP.
- Garland drains will be provided around all the raw material stacking areas.
- Zero liquid effluent discharge practice will be maintained in the proposed project.
- During monsoon the treated effluent will be utilized as makeup water in Strip Mill. Accordingly, the makeup water for Strip mill also reduces during the rainy period.

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 Greenbelt development. No effluent will be let out of the plant premises. Hence Zero discharge concept will be implemented.

TREATED EFFLUENT DISPOSAL

Total treated effluent generation	188 KLD
Effluent quantity to be used for ash conditioning	16 KLD
Effluent to be used for dust suppression in CHP	10 KLD
Effluent to be used for Greenbelt development	125 KLD
Effluent from Gasifier to be used in ABC Chamber	4 KLD
RO Rejects to be used for Floor washing, Toiler cleaning & Flushing	33 KLD

10.62 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 proposedproject.

Table No.7.2: Solid Waste Generation and Disposal

S.No.	Waste	Quantity (TPA)	Proposed method of disposal
1.	Ash from DRI	23,760	Will be utilized in the proposed Brick Manufacturing Unit
2.	Dolochar	26,400	Will be used in proposes FBC power plant as fuel.

S.No.	Waste	Quantity (TPA)	Proposed method of disposal
3.	Kiln Accretion Slag	1,188	Will be utilized in the proposed Brick Manufacturing Unit
4.	Wet scrapper sludge	5,280	Will be utilized in the proposed Brick Manufacturing Unit
5.	SMS Slag	16,500	Slag from SMS will be crushed and iron will be recovered & then remaining non -magnetic material being inert by nature will be used in proposed Brick Manufacturing Unit
6.	End Cuttings from Strip Mill	4951	Will be reused in the SMS
7.	Mill scales from Strip Mill	495	Mill scales will be utilized in the proposed Ferro alloys manufacturing units.
8.	Ash from Power Plant (Indian Coal + Dolochar)	36,630	Will be utilized in the proposed Brick Manufacturing Unit
9.	Slag from FeMn	30,472	Will be reused in manufacture of SiMn as it contains high SiO_2 and Silicon.
		(or)	
10.	Slag from FeSi	3,371	Will be given to Cast iron foundries
		(or)	
11.	Slag from SiMn	25,654	will be used for Road construction / will be given to slag cement manufacturing
		(or)	
12.	Slag from FeCr	17424	Will be processed in Zigging 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.
13.	Slag from Pig Iron	21,672	Will be given to cement manufacturing unit

7.5 Greenbelt Development

Greenbelt of **10.62 Ha.** of extensive greenbelt will be developed in the plant premises. Width of proposed greenbelt ranges from 15m.

7.6 Cost for Environment Protection

Capital Cost for Environment Protection for proposed plant : Rs. 31.35 Crores

Recurring Cost per annum for Environmental protection : Rs. 6.13 Crores

7.7 Implementation of CREP Recommendations

All the CREP recommendations will be strictly followed.

- Continuous stack monitoring system is proposed for stack attached to all the Stacks.
- 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.
- Rain water harvesting pits are being constructed in consultation with CGWB.