

SUMMARY ON
ENVIRONMENTAL IMPACT ASSESSMENT
REPORT

OF

Navic Steel & Power Pvt. Ltd.

[Establishment of Greenfield steel plant comprising of Iron ore beneficiation (8,50,000 TPA), Pellet Plant (6,00,000 TPA), Gasifier for Pellet Plant (21,000 Nm³/hr) DRI Kilns (6,27,000 TPA), Induction Furnace with matching LRF & CCM (Hot Billets / Billets / Ingots - 4,62,000 TPA), Rolling Mill (TMT Bars / Structural Steel - 4,62,000 TPA), Gasifier for Reheating Furnace (3570 Nm³/hr), Ferro Alloy Unit (FeSi – 42,000 TPA/FeMn – 1,51,200 TPA/SiMn – 86,400 TPA/FeCr – 90,000 TPA/Pig Iron – 60,000 TPA), Briquetting Plant (600 Kg/Hr), WHRB based Power Plant –46 MW , FBC based Power Plant - 20 MW& Brick Manufacturing unit (1,00,000 Bricks / Day)]

at

Jhiriya&Bitkuli Villages, Bemetara Tehsil & District, Chhattisgarh

Submitted to

CHHATTISGARH ENVIRONMENT CONSERVATION BOARD
Chhattisgarh

1.0 PROJECT DESCRIPTION

Navic Steel & Power Pvt. Ltd. is proposing to establish a Greenfield steel plant comprising of Iron ore beneficiation (8,50,000 TPA), Pellet Plant (6,00,000 TPA), Gasifier for Pellet Plant (21,000 Nm³/hr.) DRI Kilns (6,27,000 TPA), Induction Furnace with matching LRF & CCM (Billets / Ingots / Hot Billets- 4,62,000 TPA), Rolling Mill (TMT Bars / Structural Steel - 4,62,000 TPA), Gasifier for Reheating Furnace (3570 Nm³/hr.), Ferro Alloy Unit (FeSi – 42,000 TPA/FeMn – 1,51,200 TPA/SiMn – 86,400 TPA/FeCr – 90,000 TPA/Pig Iron – 60,000 TPA), Briquetting Plant (600 Kg/Hr.), WHRB based Power Plant –46 MW , FBC based Power Plant - 20 MW & Brick Manufacturing unit (1,00,000 Bricks / Day) at Jhiriya & Bitkuli Villages, Bemetara Tehsil & District, Chhattisgarh. The project cost envisaged for the proposed project is Rs. 850 Crores.

Total land envisaged for the proposed project is **43.5 Ha. (107.575 Acres)**. Following is the status of land acquisition:

Table No. 1.1: Status of land acquisition

S.No.	Status of land	Extent (in Ha.)	Extent (in Acres)
1.	Land Registered in the name of M/s. Navic Steel & Power Pvt. Ltd.	0.86	2.125
2.	Land for which agreements entered with M/s. Shourya Spat Pvt. Ltd. (Sister Concern Unit)	36.97	91.350
3.	Land for which agreements entered with Private Land owners	5.70	14.100
	Total land	43.53	107.575

As per the Ministry of Environment, Forests & Climate Change, New Delhi notification, dated 14th 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-11011/122/2022-IA-II(IND-I)**, dated **3rd June 2022**. 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/ SA 0148 (Rev.01), 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 Kms. radius of the site

S.No.	Salient Features / Environmental features	Distance w.r.t. site / Remarks
1.	Type of Land (Project site)	Private Land (Agricultural Land)
2.	Type of Land (Study Area)	Settlement (4.6%), Tank/River (6.9%), Single Crop (69.9 %), Double Crop (7.8 %), Plantation (3.3 %), Land with scrub (5.1 %), Land without scrub (2.4 %).
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 th January 2010	None And also the Plant area does not fall in the areas given in Hon'ble NGT order issued vide dated 10 th July 2019.
6.	Defence Installations	Nil
7.	Nearest village	Jhiria Village (0.63 Kms.)
8.	No. of Villages in the Study Area	82 Nos.
9.	Nearest Hospital	PHC Chandanu at 1.90 Kms.
10.	Nearest School	Bitkuli Village at 1.2 Kms.
11.	Forests	Nil
12.	Water body	Unnamed Nala passing through Project site,

S.No.	Salient Features / Environmental features	Distance w.r.t. site / Remarks
		Seonath River (2.3 Kms. – SE Direction), Karua Nala (0.18 Kms. – South Direction), Hanp River (3.55 Kms. – North Direction) & Few ponds are present within 10 Kms. radius of the project site.
13.	Nearest Highway	State Highway Dholiyaa to Badnara – 1.48 Kms. (North direction)
14.	Nearest Railway Station	Hathbandh Railway Station – 23.8 Kms. (Aerial)
15.	Nearest Port facility	Nil within 10 Km. Radius.
16.	Nearest Airport	Nil within 10 Kms. Radius [Bilaspur Airport – 50.6Kms. (Aerial)]
17.	Nearest Interstate Boundary	Nil
18.	Seismic zone as per IS-1893	Seismic zone – II
19.	R & R	There is no rehabilitation and resettlement issue, as there are no habitations present in the site area.
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.	Units (Products)	Plant Configuration (Production Capacity)
1.	Iron ore Beneficiation (Iron ore concentrate)	0.85 MTPA
2.	Pellet Plant (Pellet)	0.60 MTPA
3.	Gasifier for Pellet Plant	21,000 Nm ³ /hr.
4.	DRI Kilns (Sponge Iron)	6,27,000 TPA (2 x 350 TPD & 2 x 600 TPD)
5.	Induction Furnaces with LRF & CCM (Hot Billets / MS Billets / Ingots)	4,62,000 TPA (4 x 15 T & 4 x 20 T)
6.	Rolling mill (TMT bars / Structural Steel) (85% Hot charging with Hot Billets and remaining 15% through RHF)	4,62,000 TPA (4 x 350 TPD)
7.	Gasifier for Reheating Furnace	3,570 Nm ³ /hr
8.	Ferro Alloys Unit (FeSi / FeMn / SiMn / FeCr / Pig Iron)	FeSi – 42,000 TPA/FeMn – 1,51,200 TPA/SiMn – 86,400 TPA/FeCr – 90,000 TPA/Pig Iron – 60,000 TPA (2 x 18 MVA & 2 x 9 MVA)

S.No.	Units (Products)		Plant Configuration (Production Capacity)
9.	Briquetting Plant		600 Kg/Hr.
10.	Brick Manufacturing Unit		1,00,000 Bricks/ day
11.	Power Plant (66 MW)	WHRB Power Plant (2 x 8 MW & 2 x 15 MW)	46.0 MW
		CFBC Power Plant (1 x 20 MW)	20.0 MW

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 from site (in Kms.)	Mode of Transport
1.	Iron Ore Beneficiation Plant (8,50,000 TPA – throughput capacity)					
a)	Iron ore fines		8,50,000	Chhattisgarh / Orissa	~ 600 Kms.	By rail & road (through covered trucks)
2.	Pellet Plant (Pellets) - 6,00,000 TPA					
a)	Iron Ore Concentrate		6,60,000	Own generation	---	Through covered conveyers
b)	Bentonite		4,800	Gujarat	~ 600 Kms.	By rail & road (through covered trucks)
c)	Limestone		9,000	Chhattisgarh	~ 100 Kms.	By road (through covered trucks)
d)	Anthracite Coal		21,000	SECL Chhattisgarh / MCL Odisha	~ 500 Kms.	By rail & road (through covered trucks)
e)	Coal for Gasifier (21,000 Nm ³ /hr.)	Indian Coal	63,000	SECL Chhattisgarh / MCL Odisha	~ 500 Kms.	By rail & road (through covered trucks)
		Imported Coal	40,320	Indonesia / South Africa / Australia	~ 600 Kms. (from Vizag Port)	Through sea route, rail route & by road (through covered trucks)
3.	DRI Kilns (Sponge Iron) – 6,27,000 TPA					
a)	Pellets (100 %)		9,09,150	Own generation & purchased from outside	---	Through covered conveyers & By road (through covered trucks)

S.No.	Raw Material		Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
	Or					
b)	Iron ore (100%)		10,03,200	Barbil, Orissa NMDC, Chhattisgarh	~ 500 Kms.	By rail & road (through covered trucks)
c)	Coal	Indian	8,15,100	SECL Chhattisgarh / MCL Odisha	~ 500 Kms.	By rail & road (through covered trucks)
		Imported	5,21,664	Indonesia / South Africa / Australia	~ 600 Kms. (from Vizag Port)	Through sea route, rail route & by road (through covered trucks)
d)	Dolomite		31,350	Chhattisgarh	~ 100 Kms.	By road (through covered trucks)
4.	Steel Melting Shop (Hot Billets /Billets/ Ingots) – 4,62,000 TPA					
a)	Sponge Iron		4,67,000	Own generation	---	Through covered conveyers
b)	MS Scrap / Pig Iron		70,000	Chhattisgarh	~ 100 Kms.	By road (through covered trucks)
c)	Ferro alloys		23,000	Own generation	---	By road (through covered trucks)
5.	Rolling Mill through Hot charging & Reheating Furnace (Rolled Products) – 4,62,000 TPA					
a)	Hot Billets		4,08,408	Own generation	---	----
b)	Billets / Ingots		76,230	Own generation & Purchased from outside	~ 100 Kms.	By road (through covered trucks)
c)	Coal for Gasifier (3,570Nm ³ /hr)	Indian Coal	10,810	SECL Chhattisgarh / MCL Odisha	~ 500 Kms.	By rail & road (through covered trucks)
		Imported Coal	7,000	Indonesia / South Africa / Australia	~ 600 Kms. (from Vizag Port)	Through sea route, rail route & by road (through covered trucks)
d)	LDO		2244 Kl/annum	Nearby IOCL Depot	~ 100 Kms.	By road (through Tankers)
6.	FBC Boiler [Power Generation - 1 x 20 MW]					
a)	Indian Coal (100 %)		1,18,800	SECL Chhattisgarh /	~ 500 Kms.	By rail & road (through covered trucks)

S.No.	Raw Material		Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
				MCL Odisha		trucks)
OR						
b)	Imported Coal (100 %)		76,032	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	1,25,400	In plant generation	---	through covered conveyors
		Indian Coal	56,100	SECL Chhattisgarh / MCL Odisha	~ 500 Kms.	By rail & road (through covered trucks)
OR						
d)	Dolochar + Imported Coal	Dolochar	1,25,400	In plant generation	---	through covered conveyors
		Imported Coal	48,660	Indonesia / South Africa / Australia	~ 600 Kms. (from Vizag Port)	Through sea route, rail route & by road (through covered trucks)
7.	For Ferro Alloys (2 x 18 MVA & 2 x 9 MVA)					
7 (i)	<i>Ferro Silicon – 42,000 TPA</i>					
a)	Quartz		63,840	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
b)	LAM coke		23,520	Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
c)	MS Scrap		1,470	Inhouse Generation	---	By road (through covered trucks)
d)	Mill scales		9870	Inhouse Generation	---	By road (through covered trucks)
e)	Electrode paste		840	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)
f)	Briquetted Bag filter dust		1,596	Inhouse Generation	---	By road (through covered trucks)
7 (ii)	<i>Ferro Manganese – 1,51,200 TPA</i>					
a)	Manganese Ore		3,43,980	MOIL / OMC	~ 500 Kms.	By Rail & Road (through covered trucks)

S.No.	Raw Material	Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
b)	LAM coke	55,188	Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
c)	Dolomite	25,704	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
d)	MS Scrap / Mill scales	22,680	Inhouse Generation	---	By road (through covered trucks)
e)	Electrode Paste	1,966	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)
f)	Briquetted Bag filter dust	7,560	Own generation	---	---
7 (iii)	<i>Silico Manganese –86,400 TPA</i>				
a)	Manganese Ore	1,40,832	MOIL / OMC	~ 500 Kms.	By Rail & Road (through covered trucks)
b)	LAM Coke	32,400	Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
c)	FeMn Slag	91,416	In house generation	---	---
d)	Dolomite	19,440	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
e)	Electrode paste	1,728	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)
f)	Quartz	20,736	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
g)	Briquetted Bag filter dust	1,728	Own generation	---	---
7 (iv)	<i>For Ferro Chrome – 90,000 TPA</i>				
a)	Chrome Ore	1,80,000	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	29,700	Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)

S.No.	Raw Material	Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
c)	Quartz	15,750	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
d)	MS Scrap / Mill Scale	13,500	Inhouse Generation	---	By road (through covered trucks)
e)	Magnetite / Bauxite	15,210	Chhattisgarh / Maharashtra	~ 500 Kms.	By road (through covered trucks)
f)	Electrode Paste	2,700	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)
g)	Bagfilter dust	5,760	Own generation	---	---
7 (v)	For Pig Iron-1,51,200 TPA				
a)	HG Iron ore	2,23,020	Barbil, Orissa NMDC, Chhattisgarh	~ 500 Kms.	By rail & road (through covered trucks)
b)	LAM Coke	73,332	Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
c)	Lime stone	18,900	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
d)	Quartz	9,072	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
e)	Electrode Paste	3,024	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)
f)	Briquetted Bag filter dust	4,536	Own generation	---	---

1.4 MANUFACTURING PROCESS

1.4.1 IRON ORE BENEFICIATION PLANT

The proposal consists of 0.85 MTPA Iron Ore Beneficiation unit. Beneficiation process is a combination of crushing, screening, washing, grinding, classifying by gravity separation, magnetic separation, floatation processes. The final concentrate slurry is filter pressed to get a dry enriched ore quality with Fe > 65% and moisture ~10%. The water is recycled in the process. The tailings are processed in a thickener & Filter pressed and the excess water will be recovered and circulated in the process. The tailings filter cake is of low value with Fe <45% and moisture content ~10%. This Filter cake will be stored in storage yard earmarked within the plant premises.

1.4.2 PELLETISATION UNIT

The proposal consists of 0.60 MTPA Pellet Plant. The process of pelletization enables converting Iron Ore Fines into “Uniformed Sized Iron Ore Pellets” that will be charged into the Rotary Kiln for production of Direct Reduced Iron (DRI). Pellets are uniform size, with purity of 63%- 65% contributing to faster reduction and high metallization rates. Pellets with their high, uniform mechanical strength and high abrasive strength.

1.4.3 Sponge Iron (DRI)

The proposal consists of 2 x 350 TPD & 2 x 600 TPD to manufacture 6,27,000 TPA of Sponge Iron with 46.0MW 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 1000⁰C enters the reduction zone. Temperature of the order of 1050⁰C 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 160⁰C. 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.

1.4.4 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 4 x 15 T & 4 x 20 T Induction furnaces to manufacture Hot Billets/ Billets of 4,62,000 TPA. 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 Rolled Products. The flue gases will be treated in fume extraction system with bagfilters.

1.4.5 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 LDO / LSHS. A Rolling mill will be installed in the plant to produce 4,62,000 TPA of TMT Bars / Structural Steels.

1.4.6 Submerged Electric Arc Furnace

Submerged Electric Arc Furnace (2 x 18 MVA & 2 x 9 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. Flue gases will be extracted through 4th hole and then treated in bag filters.

1.4.7 Power Generation

Through WHRB Boiler

The hot flue gases from proposed 2 x 350 TPD & 2 x 600 TPDDRI kilns will pass through waste heat recovery Boiler to recover the heat and to generate (2 x 8 MW & 2 x 15 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 CFBC Boilers to generate 20 MW 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 3400 KLD. This includes make up water for I/O Beneficiation, Pellet Plant, 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 partly from Water Reservoir at the site and partly from Shivanth river (which is at a distance of 2.3 Kms. from the project site). A dedicated pipeline will be laid from the river to the project site.
- Application has been submitted for drawl of water from Shivanth river.
- State Investment Promotion Board (SIPB) has issued an assurance letter as per MoU entered with Govt. of Chhattisgarh, for supply of water from Shivanth River.

- Air cooled condensers will be provided to FBC Power plant instead of water-cooled condensers to reduce the water consumption significantly.

Table No.1.4: Water Requirement Breakup

S.No.	Unit	Quantity in KLD
1.	I/O Beneficiation & Pellet Plant	350
2.	Coal Gasifier	20
3.	DRI Kilns	630
4.	Induction Furnaces	320
5.	Rolling Mills	420
6.	Ferro Alloys	180
7.	Power Plant (WHRB & FBC)	1320
	• Cooling tower makeup	635
	• Boilers make up	476
	• DM plant Regeneration	208
8.	Brick Manufacturing unit	10
9.	Briquetting Plant	10
10.	Domestic	40
11.	Water Treatment Plant (WTP)	100
	Total	3400

1.6 Wastewater Generation

- Total effluent generated from the proposed project will be 722 KLD.
- There will be no effluent discharge from the Sponge Iron unit & I/O ore beneficiation unit as closed-circuit cooling system will be adopted.
- Effluent from Pelletisation plant, Induction Furnace, 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.
- Effluent from Coal gasifier (phenolic effluent) will be used in ABC chamber for quenching in DRI Units.
- Effluent from Rolling Mill will be sent to settling tank & will be recycled through closed circuit cooling system.
- 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.
- WTP rejects will be used for dust suppression & ash conditioning.
- 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.

Table No.1.5: Breakup of Wastewater Generation

S.No.	Source	Generation (KLD)
1.	I/O Beneficiation plant	---
2.	Pellet Plant	8
3.	DRI Unit	---
4.	Induction Furnace	32
5.	Rolling Mill	21
6.	Ferro Alloys	12
7.	Coal Gasifier	16
8.	Power Plant	501
	a) Cooling Tower blowdown	159
	b) Boilers blowdown	134
	c) D.M. plant regeneration water	208
9.	WTP rejects	100
10.	Sanitary Wastewater	32
	Total	722

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}, PM₁₀, SO₂, NO_x & CO at 8 stations including project site during **1st March 2022 to 31st May 2022**. The following are the concentrations of various parameters at the monitoring stations:

Table No.2.1 : AAQ Data Summary

S.No.	Parameter	Concentration range	Standard as per NAAQS
1.	PM _{2.5}	22.3 to 50.5 µg/m ³	60
2.	PM ₁₀	39.8 to 68.6 µg/m ³	100
3.	SO ₂	8.4 to 15.3 µg/m ³	80
4.	NO _x	10.4 to 18.6 µg/m ³	80
5.	CO	525 to 1150 µg/m ³	2000

2.2 Water Quality

2.2.1 Surface Water Quality

4 no. of samples i.e. 60m Upstream & 60 m Downstream from Seonath River (2.3 Kms. – West Direction) and Hanp River (3.4 Kms. – N 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 **46.7 dBA to 51.4 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 PM₁₀, SO₂, NO_x & 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 PROPOSED PROJECT (APCS WORKING SCENARIO)

Item	PM ₁₀ (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)	CO (µg/m ³)
Maximum baseline conc. in the study area	68.6	15.3	18.6	1150
Maximum predicted incremental rise in concentration due to proposed project (Point Sources)	1847.9	9.47	11.71	---
Maximum predicted incremental rise in concentration due to proposed project (Vehicular emissions)	1.32	----	9.89	6.39
Net resultant concentrations during operation of the proposed project	1,917.82	24.77	40.2	1,156.39
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. **14.37 Ha. (35.50 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

- There will be no effluent discharge from the Sponge Iron unit & I/O ore beneficiation unit as closed-circuit cooling system will be adopted.
- Effluent from Pelletisation plant, Induction Furnace, 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.
- Effluent from Coal gasifier (phenolic effluent) will be used in ABC chamber for quenching in DRI Units.

- Effluent from Rolling Mill will be sent to settling tank & 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.
- WTP rejects will be used for dust suppression & ash conditioning.
- 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. **14.37 Ha. (35.50 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. 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 & Wastewater quality				
A.	Water quality in the area	Once in a month except for heavy metals which	Composite sampling (24 hourly)	As per IS: 10500

S.No.	Particulars	Frequency of Monitoring	Duration of sampling	Parameters required to be monitored
		will be monitored on quarterly basis		
B.	Effluent at the outlet of the ETP	Twice in a month	Grab sampling (24 hourly)	As per EPA Rules, 1996
C.	STP Inlet & Outlet	Twice in a month	Grab sampling (24 hourly)	As per EPA Rules 1996
2. Air Quality				
A.	Stack Monitoring	Online monitors (all stacks) Once in a month		PM PM, SO ₂ & NO _x
B.	Ambient Air quality (CAAQMS)	Continuous Quarterly Once	Continuous 24 hours	PM ₁₀ , SO ₂ & NO _x PM _{2.5} , PM ₁₀ , SO ₂ , NO _x & CO
C.	Fugitive emissions	Quarterly Once	8 hours	PM
3. Meteorological Data				
	Meteorological data to be monitored at the plant.	Daily	Continuous monitoring	Temperature, Relative Humidity, rainfall, wind direction & wind speed.
4. Noise level monitoring				
	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.11.7.1: Air Emission Control Systems Proposed

S.No.	Source	Control Equipment	Emission at the outlet
1.	Pellet Plant	Electro Static Precipitators (ESP)	PM < 30 mg/Nm ³
2.	DRI kilns with WHRB's	Electro Static Precipitators (ESP) (High Performance rigid electrodes)	PM < 30 mg/Nm ³
3.	Induction Furnaces with CCM	Fume Extraction system with PTFE bag filters	PM < 30 mg/Nm ³
4.	Submerged Electric Arc Furnace	4 th Hole Fume Extraction system with bag filters	PM < 30 mg/Nm ³
5.	Re-heating furnaces attached to Rolling Mill	Stack	PM < 30 mg/Nm ³
6.	FBC Boiler	Electro Static Precipitators (High Performance rigid electrodes)	PM < 30 mg/Nm ³
		Limestone will be used as bed material and act as sulphur absorbent. Lime dosing will also be done	SO _x < 100 mg/Nm ³
		Combustion temperature will be around 800-850 ⁰ C, which is not conducive for thermal NO _x formation. Low NO _x burners with 3-stage combustion, flue gas recirculation and auto combustion control system will be provided.	NO _x < 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 effluent generated from the proposed project will be 722 KLD.

- There will be no effluent discharge from the Sponge Iron unit & I/O ore beneficiation unit as closed-circuit cooling system will be adopted.
- Effluent from Pelletisation plant, Induction Furnace, 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.
- Effluent from Coal gasifier (phenolic effluent) will be used in ABC chamber for quenching in DRI Units.
- Effluent from Rolling Mill will be sent to settling tank & will be recycled through closed circuit cooling system.
- 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.
- WTP rejects will be used for dust suppression & ash conditioning.
- 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.

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.

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 ₄ -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

Total treated effluent generation	722 KLD
Effluent quantity to be used for ash conditioning	86 KLD
Effluent to be used for dust suppression in CHP	130 KLD
Effluent to be used for Greenbelt development	355 KLD
Effluent from Gasifier to be used in ABC Chamber	16 KLD
RO Rejects to be used for Floor washing, Toiler cleaning & Flushing	135 KLD

14.37 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 and Disposal

S.No.	Waste / By product	Quantity (TPA)	Proposed method of disposal
1.	Tailing from I/O Benf.	1,70,000	Will be taken to filter press and after dewatering, the filter cake of tailing will be stored in tailing yard & it will given to nearby Ceramic Units.
2.	Ash from Pellet Plant	18,000	Will be utilized in the proposed Brick Manufacturing Unit
3.	Ash from DRI	1,12,860	Will be utilized in the proposed Brick Manufacturing Unit
4.	Dolochar	1,25,400	Will be used in proposed FBC power plant as fuel.
5.	Kiln Accretion Slag	5,643	Will be used in road construction & utilized in the proposed brick manufacturing unit.
6.	Wet scrapper sludge	25,080	Will be used in road construction & utilized in the proposed brick manufacturing unit within the premises.
7.	SMS Slag	46,200	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.
8.	End Cuttings from Rolling Mill	2,079	Will be reused in the SMS
9.	Mill scales from Rolling Mill	1,386	Mill scales will be utilized in the proposed Ferro alloys manufacturing units.
10.	Ash from Power Plant (with Indian Coal + dolochar)	1,00,485	Will be utilized in the proposed brick manufacturing unit within the premises.
11.	Slag from FeMn	91,416	Will be reused in manufacture of SiMn as it contains high SiO ₂ and Silicon.
12.	Slag from FeSi	10,114	Will be given to Cast iron foundries
13.	Slag from SiMn	76,962	will be used for Road construction / will be given to slag cement manufacturing
14.	Slag from FeCr	52,271	Will be processed in jigging plant for Chrome recovery. After Chrome recovery, the left-over slag

S.No.	Waste / By product	Quantity (TPA)	Proposed method of disposal
			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 utilized for Road laying /brick manufacturing. If Chrome content exceeds the permissible limits, it will be sent to nearest TSDF.
15.	Slag from Pig Iron	65,016	Will be given to slag cement manufacturing

7.5 Greenbelt Development

Greenbelt of **14.37 Ha.** of extensive greenbelt will be developed in the plant premises. Width of proposed greenbelt ranges from 20m.

7.6 Cost for Environment Protection

Capital Cost for Environment Protection for proposed plant : Rs. 55.6 Crores
Recurring Cost per annum for Environmental protection : Rs. 10.3 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.