SUMMARY ON

ENVIRONMENTAL IMPACT ASSESSMENT

REPORT

OF

MSM & SNDB Ispat and Power Pvt. Ltd.

[Establishment of Greenfield steel plant comprising of DRI Kilns (Sponge Iron – 99,000 TPA), Induction Furnace with LRF& CCM (Hot Billets / MS Billets / MS Slab– 1,48,500 TPA), Rolling Mill(TMT Bars, Structural Steel - Angle, Channels, Gutters, Coils, Flat Bars, Strips, MS Pipes, MS Tubes, Galvanized Pipes and angles(85 % Hot charging with Hot Billets and remaining 15% through RHF with LDO/Producer Gas as fuel–1,40,250 TPA),Coal Gasifier for Rolling Mill (1200 NM3/ Hr), M.S. Pipe Plant-1,00,000 TPA, Ferro Alloys - 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), WHRB based Power Plant – 7.5 MW, FBC based Power Plant – 5.0 MW, Brick Manufacturing unit (6,500 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

MSM & SNDB Ispat and Power Pvt. Ltd. is proposing to establish a Steel Plant, a Greenfield Project, comprising of Establishment of DRI Kilns (Sponge Iron – 99,000TPA), Induction Furnace with LRF& CCM (Hot Billets / MS Billets / Ingots –1,48,500 TPA), Rolling Mill(TMT Bars, Structural Steel - 85 % Hot charging with Hot Billets and remaining 15% through RHF with LDO/Producer Gas as fuel–1,40,250 TPA),Coal Gasifier for Rolling Mill (1200 NM^3/ Hr.), MS. Pipe Plant- 1,00,000 TPA, Ferro Alloys - 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), WHRB based Power Plant – 7.5 MW, FBC based Power Plant – 5.0 MW, Brick Manufacturing unit (6,500 Bricks/day) & Briquetting Plant (Briquettes – 200 Kg/Hr.).

Total land envisaged for the proposed project is **15.36 Ha.**

- Out of which **11.209 Ha.** is allotted by Chhattisgarh State Industrial Development Corporation Ltd. (CSIDC Ltd.) vide Khasra no. 79/2, 79/4, 337/1 (Part), 337/2, 77/1 (Part and including 77/2 & 78/2), 78/1 (Part), 78/3 (Part), 75/2 (Part and including 76/1 & 76/2) & 37/4 (Part) and same is taken on lease from Chhattisgarh State Industrial Development Corporation Limited (CSIDC Ltd.) for 99 years vide Lease Deed dt. 15.11.2022.
- Remaining **4.15 Ha.** is Private Land, vide Khasra no. 79/3, 79/7, 314/7 and same is in possession of management.

The estimated project cost for the proposed project is **Rs. 185 Crores.**

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) & 1(d) Thermal Power Plants under Category 'A'.

In order, to obtain Environmental Clearance for the proposed Steel plant, Form-I (Part A, B), proposed TOR along with Pre-Feasibility Report were submitted to the Honourable Ministry of Environment, Forests & Climate Change (MoEF&CC), New Delhi on 11th April 2023 vide Proposal No. IA/CG/IND1/418884/2023. The Standard Terms of Reference (ToR) for EIA study was issued vide F.No. J-11011/89/2023-IA-II (IND-I), dated 21st April 2023. Draft EIA report has been prepared incorporating the Terms of Reference & is being submitted to CECB for conducting Public hearing/consultation.

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 project by incorporating the TOR approved by Ministry of Environment, Forests & Climate Change, New Delhi. The report contains detailed description of the following:

- Characterization of status of environment with in an area of 10 km radius from the plant for major environmental components including air, water, noise, soil, flora, fauna and socio-economic environment.
- Assessment of air emissions, liquid waste and solid waste from the proposed 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 & Private Land
2.	Type of Land (Study Area)	As per LULC the land use within 10 Km. is as follows: Settlement / Air Strip – 5.2 %, Industrial Area – 4.1 %, Tank / River / Major Canal etc. – 8.7 %, Scrub Forest – 1.9 %, Single Crop – 51.2 %, Double Crop – 9.1 %, Plantation – 2.1 %, Land with scrub – 9.8 %, 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	None

S.No.	Salient Features / Environmental features	Distance w.r.t. site / Remarks
	Office Memorandum dated 13th January 2010	And also the Plant area does not fall in the areas given in Hon'ble NGT order issued vide dated 10th July 2019.
6.	Defence Installations	Nil
7.	Nearest village	Nakti Khapri Village – 0.6 Kms.(SE)
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 – 0.5 Kms.
11.	Forests	Mohrenga PF – 7.5 Kms
12.	Water body	Mahanadi -Bhatapara Branch Canal - 0.35 Kms. Kirna Pond - 1.8 Kms.
13.	Nearest Highway	Nil within 10 Kms. radius (NH # 200 – 10.3 Kms. Aerial distance)
14.	Nearest Railway Station	Baikunth RS - 2.3 Kms (by Aerial)
15.	Nearest Port facility	Nil within 15 Km. Radius.
16.	Nearest Airport	Nil within 15 Kms. Radius [Raipur Airport - 34.2 (by Aerial)]
17.	Nearest Interstate Boundary	Nil within 15 Kms. Radius
18.	Seismic zone as per IS-1893	Seismic zone – II, MSL of the Project area – 289 m to 294 m
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.	DRI Kilns (Sponge Iron)	3 x 100 TPD (99,000 TPA)
2.	Induction Furnaces with LRF & CCM (Hot Billets / MS Billets / Ingots)	3 x 15 T (1,48,500 TPA)
3.	Rolling mill (TMT bars / Structural Steel) (85% Hot charging with Hot Billets and remaining 15% through RHF with LDO as fuel)	1 x 425 TPD (1,40,250 TPA)
4.	Gasifier for Reheating Furnace	1200 NM^3/Hr.

S.No.	Units (Products)		Plant Configuration (Production Capacity)
5.	M.S. Pipe Plant		1,00,000 TPA
6.	Ferro Alloys Unit (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)
7.	Briquetting Plant		200 Kg/Hr.
8.	Brick Manufacturing Unit		6,500 Brick/ day
9.	Power Plant (12.5 MW)	WHRB Power Plant (3 x 2.5 MW)	7.5 MW
		FBC Power Plant (1 x 5 MW)	5.0 MW

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) – 99,000TPA**					
a)	Pellets (100 %)		1,43,550	Chhattisgarh	~ 100 Kms.	By road (through covered trucks)
	or					
	Iron ore (100%)		1,58,400	Barbil, Orissa NMDC, Chhattisgarh	~ 500 Kms.	By rail & road (through covered trucks)
b)	Coal	Indian	1,58,700	SECL Chhattisgarh / MCL Odisha	~ 500 Kms.	By rail & road (through covered trucks)
		(or)				
		Imported	82,368	Indonesia / South Africa / Australia	~ 600 Kms. (from Vizag Port)	Through sea route, rail route & by road (through covered trucks)
c)	Dolomite		4,950	Chhattisgarh	~ 100 Kms.	By road (through covered trucks)
2.	**For Steel Melting Shop (Hot Billets / MS Billets/ Ingots) – 1,48,500 TPA**					
a)	Sponge Iron		1,50,000	Inhouse Generation + Purchased from outside	--- ~ 100 Kms.	Through covered conveyers

S.No.	Raw Material		Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
b)	MS Scrap / Pig Iron		22,000	Chhattisgarh	~ 100 Kms.	By road (through covered trucks)
c)	Ferro alloys		7,000	Inhouse Generation	---	By road (through covered trucks)
3.	**For Rolling Mill through Hot charging (TMT Bars, Structural Steel - Angle, Channels, Gutters, Coils, Flat Bars, Strips, MS Pipes, MS Tubes, Galvanized Pipes and angles) – 1,40,250 TPA**					
a)	Hot Billets (for Hot charging)		1,23,981	Inhouse Generation	---	---
b)	Billets (for Reheating furnace)		23,141	Inhouse Generation	---	---
c)	LDO		681 KL/annum	Nearby IOCL Depot	~ 100 Kms.	By road (through Tankers)
d)	Coal for gasifier (Producer Gas) 1200 Nm^3/Hr	Indian	3786	SECL Chhattisgarh / MCL Odisha	~ 500 Kms.	By rail & road (through covered trucks)
		Imported	2423	Indonesia / South Africa / Australia	~ 600 Kms. (from VizagPort)	Through sea route, rail route & by road
4.	**For FBC Boiler [Power Generation 5.0 MW]**					
a)	Indian Coal		29,700	SECL Chhattisgarh / MCL Odisha	~ 500 Kms.	By rail & road (through covered trucks)
	OR					
b)	Imported Coal		19,000	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	19,800	Inhouse Generation	---	through covered conveyors
		Indian Coal	19,800	SECL Chhattisgarh / MCL Odisha	~ 500 Kms.	By rail & road (through covered trucks)
	OR					
d)	Dolochar + Imported Coal	Dolochar	19,800	Inhouse Generation	---	through covered conveyors
		Imported Coal	9,100	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)**					
5 (i)	*For Ferro Silicon – 14000 TPA*					

S.No.	Raw Material	Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
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	3,780	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	---	---
5 (ii)	*For Ferro Manganese – 50,400 TPA*				
a)	Manganese Ore	1,14,660	MOIL / OMC	~ 500 Kms.	By Rail & Road (through covered 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	---	---
5 (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

S.No.	Raw Material	Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
					trucks)
e)	Electrode paste	576	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)
f)	Quartz	6,912	Maharashtra / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
g)	Bag filter dust	432	In house generation	---	---
5 (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 (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	---	---
5 (iv)	*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	6300	Chhattisgarh	~ 100 Kms.	By road (through covered trucks)
d)	Quartz	3024	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered

S.No.	Raw Material	Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
					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	---	---
6	**M.S. Pipe Plant (1,00,000 TPA)**				
a)	Hot Strips	1,00,000	Own generation	---	---

1.4 MANUFACTURING PROCESS

1.4.1 Sponge Iron (DRI)

The proposal consists of 3 x 100 TPD to manufacture 99,000 TPA of Sponge Iron with 7.5 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 1000^0C 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.

1.4.2 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 3x15T Induction furnaces to manufacture Hot Billets / MS Billets / MS Ingots of 1,48,500 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 TMT Bars, Structural Steel - Angle, Channels, Gutters, Coils, Flat Bars, Strips, MS Pipes, MS Tubes, Galvanized Pipes and angles. The flue gases will be treated in fume extraction system with bagfilters.

1.4.3 Rolling Mill

The Hot Billets produced from Induction Furnaces will be directly sent to Rolling Mill to produce Rolled Products (OR) Hot Billets will be cooled and stored will be sent to reheating furnaces for the heating and will be sent to Rolling Mill. Furnace will be heated with either LDO / Producer Gas. A Rolling mills (1 x 425 TPD) will be installed in the present proposal to produce 1,40,250 TPA of TMT Bars, Structural Steel.

1.4.4 MS Pipes Plant

Coil of suitable sizes & specification are placed on the coil feeding ramp. A coil carriage picks single coils from the ramp and places them on the de-coiler mandrel. The coil is mechanically operated and the leading strip end is automatically inserted in the combined pinch roll and leveling machine. The pinch roll leveling machine feed the strip into the shear & welder, where the possibly deformed strip end is chopped off and the strip is joined to the strip end of the preceding coil by gas shielded are welding.

The strip is fed into the loop type accumulator, which stores sufficient strip to provide for continuous operation of the forming machine during the strip joining process.

When leaving the strip accumulator and before entering the forming machine, the strip passes through a combined leveling and strip guiding unit.

In the forming section of the Pipe mill round pipe is formed and this open seam tubing is welded in the next welding section. In order to provide positive guiding to the pipe during the welding process a seam guide unit is provided before the welding stand. Immediately before entering the welding pass the open seam pipe passes through the high frequency induction coil; where a relatively small section of the strip edges is heated to welding temperature. Therefore the longitudinal bead is formed during welding.

The welded pipe passes through a water cooling section for final cooling down to room temperature and the cold pipe is perfectly sized and straightened in the sizing group of the pipe/Pipe mill.

The Horizontal forming and sizing Rolls and driven by 2 Nos. of D.C. Motors which are electrically synchronized. Speed will be adjustable from the Control Desk in common. The D.C. Motors are connected to Twin outlet gear Boxes via Elastic Couplings. Universal joint propeller shafts transmit the power from the gear Boxes via Elastic Couplings. Universal joint propeller shafts transmit the power from the gear boxes to the roll shafts.

The following flying cut off Machine cut off Machine cuts the continuously emerging pipe into commercial lengths. In case of producing round pipes only rotary type disc cutters will be employed and for production of square & rectangular hollow sections, a saw cut of will be required however.

It follows the run out roller conveyor with two side ejecting device. The ejected pipe rolls off into the collecting troughs, which are installed at both sides of the roller table.

The pipe can alternatively be conveyed directly to the floor finishing machines a soluble Oil circulation system circulates the oil through the main drive gear boxes. The high frequency generator and the switch board cabinets for the electrical control are set up adjacent to the machine. The soluble oil pit is provided within the foundation works or outside of the plant.

A non-destructive testing unit is providing for preliminary testing of pipes during the rolling in line.

1.4.5 Power Generation

Through WHRB Boiler

The hot flue gases from proposed 3 x 100 TPDDRI kilns will pass through waste heat recovery Boiler to recover the heat and to generate (7.5 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 atmosphere through stacks of adequate height.

Through FBC Boiler

Coal (Imported / Indian) along with dolochar will be used as fuel in FBC Boilers to generate 5.0 MW of electricity. The flue-gases will be treated in high efficiency ESP and then discharged through a stack of adequate height into the atmosphere.

1.4.6 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. HG Iron ore will be used for manufacturing of Pig Iron.

1.4.7 Ferro Chrome Briquette Manufacturing Plant

Chromites ore Fines and concentrates cannot be charged directly into the smelting furnace, especially closed top submerged arc furnace for reason of safety and bad performances. The fines are therefore agglomerated for improving the smelting condition Various processes are available for agglomeration- sinter pellet, briquettes and chrome ore sinter, the first two process being most widely used. As explained in Figure below, the 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.

1.4.8 Fly Ash Brick Manufacturing Unit

It is proposed to establish Fly Ash brick making unit of 65,00 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 530 KLD. This includes make up water for DRI Kiln, Induction Furnace, Rolling Mill, Coal Gasifier, Ferro Alloys, Brick Manufacturing unit, Briquetting Unit & Domestic.
- Air cooled condensers will be provided Power plant.
- Water required for proposed project (for process and domestic) will be met from partly from Ground Waterand partly from KumhariJalasay Jal Aawardhan Yojna (Samoda Barrage Mahanadi).
- A dedicated pipeline will be laid upto the project site.

Table No.1.4: Water Requirement Breakup

S.No.	Unit	Quantity in KLD
1.	Make-up water for DRI plant	75
2.	Make-up water for SMS plant	90
3.	Make-up water for Rolling mill	100
4.	Make-up water for Ferro Alloy plant	40
5.	Make-up water for Coal Gasifier	5
6.	Bricks manufacturing Unit	5
7.	Briquetting plant	5
8.	Captive Power Plant	100
	• Cooling Tower Make-up	48
	• Boiler make-up	36
	• D.M. plant regeneration water	16
9.	Domestic	20
10.	Water for Greenbelt development	90
	Total	**530**

1.6 Wastewater Generation

- Wastewater generated from the proposed project will be 75 KLD.
- There will be no effluent discharge in the Sponge Iron, unit as closed-circuit cooling system will be adopted.

- Effluent generated from Induction Furnace Unit, Ferro Alloys, M.S. Pipe Plant will be sent to Effluent Treatment Plant (ETP) for treatment and after ensuring compliance with SPCB norms, it will be utilized for dust suppression, ash conditioning and for greenbelt development.
- 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.
- Effluent generated from Coal Gasifier will be used in ABC Chamber of DRI Kilns.
- Air cooled condenser will be provided in the power plant, which will reduce the water consumption significantly. Hence wastewater generation will be also be minimized.
- Sanitary waste water will be treated in STP and after treatment it will be utilized for greenbelt development.
- Zero liquid effluent discharge will be maintained in the proposed project.
- 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: Breakup of Wastewater Generation

S.No.	Source	Generation (KLD)
1.	From DRI Kiln	---
2.	From Induction Furnace	9.0
3.	From Rolling Mill	5.0
4.	From Ferro Alloys	3.0
5.	From Coal Gasifier	4.0
6.	Power Plant	38.0
	a) Cooling Towerblowdown	12.0
	b) Boilers blowdown	10.0
	c) D.M. plant regeneration water	16.0
7.	Sanitary Wastewater	16.0
	Total	**75.0**

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 (µg/m^3)	Standard as per NAAQS (µg/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. Batapara Branch Mahanadi Canal &Kirna Pond are flowing at a distance of 0.35 Kms. & 1.8 Kms. from the project site 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.3.1: 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)	0.51	7.64	2.92	---
Maximum predicted incremental rise in concentration due to proposed project (Vehicular emissions)	0.45	---	3.07	1.99
Net resultant concentrations during operation of the proposed project	**69.36**	**21.84**	**27.79**	**1350.99**
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.**5.10 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

- There will be no effluent discharge in the Sponge Iron, unit as closed-circuit cooling system will be adopted.
- Effluent generated from Induction Furnace Unit, Ferro Alloys, M.S. Pipe Plant will be sent to Effluent Treatment Plant (ETP) for treatment and after ensuring compliance with SPCB norms, it will be utilized for dust suppression, ash conditioning and for greenbelt development.
- 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.
- Effluent generated from Coal Gasifier will be used in ABC Chamber of DRI Kilns.
- Air cooled condenser will be provided in the power plant, which will reduce the water consumption significantly. Hence wastewater generation will be also be minimized.
- Sanitary waste water will be treated in STP and after treatment it will be utilized for greenbelt development.
- Zero liquid effluent discharge will be maintained in the proposed project.
- 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.
- Garland drains will be constructed around the storage yards to prevent any run off from the storage yards entering into the water bodies.
- Rain water harvesting pits have been proposed to recharge the precious ground water in consultation with SGWB. The depth of ground water table will certainly increase due to Rain water harvesting measures.

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 **5.10**

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

3.5 Socio - Economic Environment

There will be certain upliftment in Socio Economic status of the people in the area & development of the area due to the proposed project. Due to this the economic conditions, the educational and medical standards of the people living in the study area will certainly move upwards which will result in overall economic development, improvement in general aesthetic environment and increase in business opportunities.

4.0 ENVIRONMENTAL MONITORING PROGRAMME

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

TABLE NO.4.1: MONITORING SCHEDULE FOR ENVIRONMENTAL PARAMETERS

S.No.	Particulars	Frequency of Monitoring	Duration of sampling	Parameters required to be monitored
1. Water & Wastewater quality				
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	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 Rules1996
2. Air Quality				
A.	Stack Monitoring	Online monitors (all stacks) Once in a month		PM PM, SO_2 & NOx
B.	Ambient Air quality (CAAQMS)	Continuous Quarterly Once	Continuous 24 hours	PM_{10}, SO_2& NOx $PM_{2.5}$, PM_{10}, SO_2, NOx & 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	Noise levels

S.No.	Particulars	Frequency of Monitoring	Duration of sampling	Parameters required to be monitored
			hours with 1 hour interval	

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

S.No.	Source	Control Equipment	Emission at the outlet
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

- Wastewater generated from the proposed project will be 75 KLD.
- There will be no effluent discharge in the Sponge Iron, unit as closed-circuit cooling system will be adopted.
- Effluent generated from Induction Furnace Unit, Ferro Alloys, M.S. Pipe Plant will be sent to Effluent Treatment Plant (ETP) for treatment and after ensuring compliance with SPCB norms, it will be utilized for dust suppression, ash conditioning and for greenbelt development.
- 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.
- Effluent generated from Coal Gasifier will be used in ABC Chamber of DRI Kilns.
- Air cooled condenser will be provided in the power plant, which will reduce the water consumption significantly. Hence wastewater generation will be also be minimized.
- Sanitary waste water will be treated in STP and after treatment it will be utilized for greenbelt development.
- Zero liquid effluent discharge will be maintained in the proposed project.

- 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.

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	75 KLD
Effluent quantity to be used for ash conditioning	15 KLD
Effluent to be used for dust suppression in CHP	10 KLD
Effluent to be used for Greenbelt development	36 KLD
Effluent to be used in ABC of DRI Kiln	4 KLD
RO Rejects to be used for Floor washing, Toiler cleaning & Flushing	10 KLD

5.10 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	Quantity (TPA)	Proposed method of disposal
1.	Ash from DRI	17,820	Will be utilized in the proposed Brick Manufacturing Unit
2.	Dolochar	19,800	Will be used in proposes FBC power plant as fuel.
3.	Kiln Accretion Slag	891	Will be utilized in the proposed Brick Manufacturing Unit
4.	Wet scrapper sludge	3,960	Will be utilized in the proposed Brick Manufacturing Unit
5.	SMS Slag	14,850	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 Rolling Mill	3,576	Will be reused in the SMS
7.	Mill scales from Rolling Mill	421	Mill scales will be recycled to Ferro alloys unit.
8.	End Cuttings from Pipe Mill	3,000	Will be reused in the SMS
9.	Ash from Power Plant (Indian Coal + Dolochar)	20,790	Will be utilized in the proposed Brick Manufacturing Unit
10.	Slag from FeMn	30,472	Will be reused in manufacture of SiMn as it contains high SiO_2 and Silicon.
	(or)		
11.	Slag from FeSi	3,371	Will be given to Cast iron foundries
	(or)		
12.	Slag from SiMn	25,654	will be used for Road construction / will be given toslag cement manufacturing
	(or)		
13.	Slag from FeCr	17,424	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.
	(or)		
14.	Slag from Pig Iron	32,508	Will be given slag based cement manufacturing units

7.5 Greenbelt Development

Greenbelt of **5.10 Ha.** of extensive greenbelt will be developed in the plant premises. Width of proposed greenbelt ranges from 20 m.

7.6 Cost for Environment Protection

Capital Cost for Environment Protection for proposed plant : Rs. 24.85 Crores

Recurring Cost per annum for Environmental protection : Rs. 4.594 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.