SUMMARY ON

ENVIRONMENTAL IMPACT ASSESSMENT

REPORT

OF

Singhal Steel Pvt. Ltd.

[Steel Plant]

at

Patarapali, Kotarliya & Siyarpali Villages, Raigarh Tehsil & District, Chhattisgarh

Submitted to

CHHATTISGARH ENVIRONMENT CONSERVATION BOARD
Chhattisgarh

1.0 PROJECT DESCRIPTION

Singhal Steel Pvt. Ltd. has proposed to establishment of Greenfield Steel Plant comprising of Iron Ore Beneficiation Plant (1 x 1.7 MTPA), Pellet Plant (1 x 1.2 MTPA), Coal Gasifier for Pellet Plant (45,000 NM^3/Hr.), Sinter Plants (2 x 60 m^2 - 12,00,000 TPA), Coke Oven Units (1 x 1500 TPD - 5,00,000 TPA), Blast Furnaces (2 x 350 m^3 - 8,50,000 TPA), Ductile Iron Pipe Plant (1 x 1515 TPD - 5,00,000 TPA), Oxygen Plant (Oxygen - 10000 NM^3/Hr., Nitrogen- 10000 NM^3/Hr.), DRI Kilns (3 x 350 TPD - 3,46,500 TPA); Electric Arc Furnace & LRF (2 x 60 T - MS Billets / Ingots - 3,96,000 TPA), Induction Furnace with CCM & LRF along with EOF facility (1 x 50 T) and Vacuum Degassing facility (1 x 50 T) [4 x 25 T - Hot Billets / MS Billets / Ingots - 3,30,000 TPA), Rolling Mill (TMT bars/Wired Rod/Structural Steel/HR coil/HR Strips) 2 x 3,00,000 TPA (85% Hot charging with Hot Billets and remaining 15% through RHF with Producer Gas as fuel), Coal Gasifier for Rolling Mill – 2 x 2,340 NM^3/Hr.; Ferro Alloys Unit (2 x 9 MVA) to produce FeSi - 14,000 TPA / FeMn – 40,000 TPA / SiMn -28,000 TPA / FeCr - 30,000 TPA/ Pig iron-48,000 TPA; Briquetting Plant- 200 Kg/Hr., Coal Washery (1 x 0.6 MTPA); Power Plant [WHRB Power through DRI kilns - 3 x 10 MW – (30 MW); WHRB Power through BF gases - 2 x 10 MW (20 MW); WHRB Power Coke Oven gases – 2 x 15 MW (30 MW); FBC based Power Plant - 1 x 80 MW (80 MW)]; Brick Manufacturing Unit - 39,600 Bricks/Day.

Total land envisaged for the proposed project is 30.705 Ha. and is Private Unirrigated Agricultural land. Out of which,

- 19.976 Ha. is Registered in the name of Singhal Steel Pvt. Ltd.
- 7.298 Ha. is in name of Mr. Sanjay Agrawal & Mr. Ajay Agrawal Directors of Singhal Steel Pvt. Ltd. Lease Agreement has been entered between Directors and Singhal Steel Pvt. Ltd.
- 3.431 Ha. is in the name of M/s. Singhal Steel & Power Pvt. Ltd. (Earlier Singhal Enterprises Pvt. Ltd. - Sister concern company). Lease agreement has been entered M/s. Singhal Steel & Power Pvt. Ltd. and M/s. Singhal Steel Pvt. Ltd.

The project cost envisaged for the proposed project is Rs. 1170 Crores.

The proposed project activity is listed at schedule no. 3(a) Metallurgical Industries (ferrous & non-ferrous), 2(a) Coal Washeries, 2(b) Mineral Beneficiation and 1(d) Thermal Power Plants under Category "A" of the schedule of the EIA Notification, 2006 and appraised at Central Level.

In order, to obtain Environmental Clearance for the proposed Steel Plant, (CAF, Form – I Part A & B), copy of Pre-Feasibility report and proposed ToRs were submitted to the Honourable Ministry of Environment, Forests & Climate Change (MoEF&CC), New Delhi on 26th October 2024 vide Proposal No. IA/CG/IND1/482520/2024. Subsequently TOR letter & its amendment was issued vide letter File No. IA-J-11011/298/2024–IA-II (IND-I), dated 3rd November 2024 and dated 5th August 2025 (TOR Amendment). Draft EIA report has been prepared incorporating the Terms of Reference & is being submitted to Chhattisgarh Environment Conservation Board (CECB) for conducting Public hearing/consultation.

Pioneer Enviro Consultants Private Limited, Hyderabad, which is accredited by NABET, Quality Council of India, vide certificate No. NABET/EIA/25-28/RA 0456**,** for preparing Environmental Impact Assessment (EIA) report for Metallurgical Unit, have prepared 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	Private Unirrigated Agricultural land and same will be converted for Industrial Purpose. Out of total 30.705 Ha. of land, 19.976 Ha. of land is in registered in the name of Singhal Steel Pvt. Ltd., 7.298 Ha. is in the name of Directors of Company and remaining 3.431 Ha. of land is in the name of M/s. Singhal Steel & Power Pvt. Ltd. (Earlier Singhal Enterprises Pvt. Ltd. - Sister concern company).
2.	Type of Land (Study Area)	As per LULC the land use within 10 Km. is as follows: Settlements – 9.6%, Industrial area – 3.6%, Tank / River/ Reservoir etc. – 9.3%, Dense Forest / Scrub Forest – 19.2%, Single crop – 27.3%, Double Crop – 16.8%, Land with scrub – 10.3%, Land without scrub – 2.8%, Ash Storage Areas – 1.1%
3.	National Park/ Wildlife sanctuary / Biosphere reserve / Tiger Reserve / Elephant Corridor	There are no notified National Park /Wildlife sanctuary/ Biosphere reserve/ Tiger Reserve within 10 Kms. radius of the project site. Movement of Elephants is observed within 15 Kms. radius of the plant, as per the secondary source. Conservation Plan is prepared.
4.	Historical places / Places of Tourist importance / Archeological sites	Nil
5.	Critically polluted area as per MoEF&CC Office Memorandum dated 13th January 2010	None 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	None
7.	Nearest village	Patrapali East Village - 0.12 Kms. – NE Direction
8.	Nearest Hospital	Primary Health Centre (PHC), Patrapali – 0.5 Kms. – NE Direction Raigarh Ayurvedic Hospital – 0.4 Kms. – SW direction.
9.	Nearest School	Govt. Higher Secondary School, Patrapali East Village – 0.16 Kms. – E Direction
10.	Forests	Boirdadar RF (3.4 Kms. – NW direction), Barkachhar RF (7.7 Kms. – NW direction), Jhariadipa RF (4.2 Kms. – NE direction), Sukhadongri RF (8.5 Kms. – E direction), Kukurda RF (4.2 Kms. – SEE direction), Gajmar RF (3.3 Kms. – SWW direction) and Sambalpuri PF (4.0 Kms. – N direction), Mauhapali

S.No.	Salient Features / Environmental features	Distance w.r.t. site / Remarks
		PF (3.5 Kms. – SE direction), Patrapali PF (1.75 Kms. – N direction), Kumbahal PF (5.4 Kms. – NE direction), Chuhapali PF (4.2 Kms. – NEE direction), Kolaibahal PF (8.6 Kms. – E direction) are present within 10 Kms. radius of the project site.
11.	Water body	Loig Nallah (0.2 Kms. – SW direction), Sapnai Nallah (2.2 Kms. – NE direction), Kelo River (4.5 Kms. – SW direction), Sanphkhar Nallah (6.6 Kms. – NW direction) are present within 10 Kms. radius of the project site.
12.	Nearest Highway	NH # 217 (1.0 Kms. – SE direction)
13.	Nearest Railway Station	Kotarliya Railway Station (0.5 Kms. – NE direction)
14.	Nearest Port facility	Nil within 10 Km. Radius.
15.	Nearest Airport	Nil within 10 Km. Radius.
16.	Nearest Interstate Boundary	Chhattisgarh – Odisha Interstate border (7.0 Kms. – SE direction)
17.	Seismic zone as per IS-1893	Zone II
18.	MSL of the Project area	218.0 m to 223.5 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.	Iron ore Beneficiation (Iron ore concentrate)	1 x 1.7 MTPA	17,00,000 TPA
2.	Pellet Plant (Pellet)	1 x 1.2 MTPA	12,00,000 TPA
3.	Coal Gasifier for Pellet Plant (Producer Gas)	1 x 45,000 NM^3/Hr.	45,000 NM^3/Hr.
4.	Sinter Plants (Sinter)	2 x 60 m^2	12,00,000 TPA
5.	Coke Oven Plant (Coke)	1 x 1500 TPD	5,00,000 TPA
6.	Blast Furnaces (Pig Iron)	2 x 350 m^3	8,50,000 TPA
7.	Ductile Iron Pipe Plant	1 x 1515 TPD	5,00,000 TPA
8.	Oxygen Plant	350 TPH	27,72,000 TPA

S.No.	Units (Products)			Plant Configuration	Production Capacity
				[10000 NM^3/Hr]	
9.	Nitrogen Plant			10000 NM^3/Hr	27,72,000 TPA
10.	DRI Kilns (Sponge Iron)			3 x 350 TPD	3,46,500 TPA
11.	Electric Arc Furnace [MS Billets / Ingots]			2 x 60 T	3,96,000 TPA
12.	Induction Furnaces with CCM & LRF [Hot Billets / MS Billets / Ingots]			4 x 25 T IF with CCM & LRF along with EOF facility (1 x 50 T) and Vacuum Degassing facility (1 x 50 T)	3,30,000 TPA
13.	Rolling Mill (TMT bars / Wired Rod/Structural Steel / HR Coil / HR Strips) (85% Hot charging with Hot Billets and remaining 15% through RHF)			2 x 909 TPD	6,00,000 TPA
14.	Coal Gasifier for Reheating Furnace			2 x 2,340 Nm^3/Hr	4,680 Nm^3/Hr
15.	Ferro Alloys Unit (FeSi / FeMn / SiMn / FeCr / Pig Iron)			2 x 9 MVA	FeSi - 14,000 TPA / FeMn – 40,000 TPA / SiMn -28,000 TPA / FeCr - 30,000 TPA / Pig iron-48,000 TPA
16.	Briquetting Plant (Briquetts)			200 Kg/Hr.	200 Kg/Hr.
17.	Coal Washery (throughput capacity) (Washed Coal)			1 x 0.6 MTPA	6,00,000 TPA
18.	Power Plant (160 MW)	WHRB	DRI kilns	3 x 10 MW	30 MW
			BF	2 x 10 MW	20 MW
			Coke Oven	2 x 15 MW	30 MW
		FBC Boiler		1 x 80 MW	80 MW
19.	Brick Manufacturing Unit			39,600 Bricks/ day	39,600 Bricks/ day

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.	**Beneficiation Plant - 13,60,000 TPA (through put capacity)**				
i.	Iron Ore Fines	17,00,000	Chhattisgarh / Odisha	~ 150 Kms.	By Rail & Road (Covered trucks)

S.No.	Raw Material	Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
2.	**Pellet Plant –12,00,000 TPA**				
i.	I/O Concentrate	13,20,000	Own generation	---	Through Conveyor
ii.	Anthracite Coal	42,000	SECL Chhattisgarh / Jharkhand, Odisha	~ 150 Kms.	By Rail & Road (Covered trucks)
iii.	Bentonite	9,600	Gujarat	~ 600 Kms.	By Road (Covered trucks)
iv.	Lime Powder	18,000	Madhya Pradesh & Odisha	~ 150 Kms.	By Rail & Road (Covered trucks)
3.	**Producer Gas Plant for Pellet Plant - (45,000 Nm^3/Hr)**				
i.	Indian Coal	1,35,000	SECL Chhattisgarh / MCL Odisha	~ 150 Kms.	By Rail & Road (Covered trucks)
	OR				
i.	Imported Coal	86,400	Indonesia / South Africa / Australia	~ 600 Kms. (from Vizag Port)	Through sea route, rail route & by road (through covered trucks)
4.	**Coal Washery - 6,00,000 TPA**				
i.	ROM Coal	6,00,000	SECL Chhattisgarh / MCL Odisha	~ 150 Kms.	By Rail & Road (Covered trucks)
5.	**Coke Ovens - 5,00,000 TPA**				
i.	Coking coal	7,50,000	SECL Chhattisgarh / MCL Odisha	~ 150 Kms.	By Rail & Road (Covered trucks)
6.	**Sinter Plant (Sintered Ore) - 12,00,000 TPA**				
i.	Iron ore fines	10,80,000	Chhattisgarh / Orissa	~ 150 Kms.	By Road (Covered trucks)
ii.	Limestone	1,54,000	Chhattisgarh / Madhya Pradesh	~ 150 Kms.	By Road (Covered trucks)
iii.	Dolomite	1,08,000	Chhattisgarh / Madhya Pradesh	~ 150 Kms.	By Road (Covered trucks)
iv.	Coke fines	1,02,000	Chhattisgarh/ Odisha/Maharashtra	~ 150 Kms.	By Rail & Road (Covered trucks)
v.	Mill scale	30,000	Own Generation	---	Internal Transfer (Covered trucks)
vi.	Dust from SMS, BF, Coke Oven	1,18,800	Own Generation	---	Internal Transfer (Covered trucks)
vii.	Sinter plant return	2,52,095	Own Generation	---	Internal Transfer (Covered trucks)
7.	**Blast Furnace - 8,50,000 TPA**				
i.	Sinter	11,79,000	Own Generation	---	Internal Transfer (Covered trucks)
ii.	Iron ore lumps	3,40,000	Odisha / Chhattisgarh	~ 150 Kms.	By Rail & Road (Covered trucks)

S.No.	Raw Material	Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
iii.	BF Coke	4,76,000	Own generation	---	Internal Transfer (Covered trucks)
iv.	Quartzite	17,000	Chhattisgarh / Jharkhand	~ 150 Kms.	By Rail & Road (Covered trucks)
v.	Dolomite	46,000	Chhattisgarh / Madhya Pradesh	~ 150 Kms.	By Road (Covered trucks)
vi.	Lime Stone	55,000	Chhattisgarh / Madhya Pradesh	~ 150 Kms.	By Road (Covered trucks)
8.	**Ductile Iron Pipe Plant - 5,00,000 TPA**				
i.	Hot metal from BF	5,30,000	Own generation	---	Internal Transfer (Covered trucks)
ii.	Mould Powder	1,360	Gujarat / Jharkhand	~ 300 Kms.	By Rail & Road Covered trucks
iii.	Ferro Silicon	1,500	Own generation	---	Internal Transfer (Covered trucks)
iv.	Inoculant	480	Chhattisgarh	~ 150 Kms.	By Road (Covered trucks)
v.	Magnesium	850	Orissa / Gujarat	~ 300 Kms.	By Rail & Road Covered trucks
vi.	Rubber Coat	2,550	Gujarat / Jharkhand	~ 300 Kms.	By Rail & Road Covered trucks
vii.	Slag Coagulant	700	Maharashtra	~ 150 Kms.	By Road (Covered trucks)
viii.	Zinc	1,000	Rajasthan	~ 300 Kms.	By Rail & Road Covered trucks
ix.	Bituminous Epoxy Solution	850	Maharashtra	~ 150 Kms.	By Road (Covered trucks)
9.	**DRI Kilns (Sponge Iron) – 3,46,500 TPA**				
i.	Iron Ore Pellets	5,02,425	Own generation	---	Internal Transfer (Covered trucks)
	OR				
	Iron Ore	5,54,400	Odisha / Chhattisgarh	~ 150 Kms.	By Rail & Road (Covered trucks)
ii.	Indian Coal	4,50,450	SECL Chhattisgarh / MCL Odisha	~ 150 Kms.	By Rail & Road (Covered trucks)
	OR				
	Imported coal	2,88,288	Indonesia/South Africa / other countries also	~ 600 Kms. (from Vizag Port)	Through sea route, rail route & by road (through covered trucks)
iii.	Dolomite	17,325	Chhattisgarh / Madhya Pradesh	~ 150 Kms.	By Road (Covered trucks)

S.No.	Raw Material		Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
10.	**FBC Boiler [Power Generation - 1 x 80 MW]**					
i.	Indian Coal 100%		4,75,200	SECL Chhattisgarh / MCL Odisha	~ 150 Kms.	By Rail & Road (Covered trucks)
	OR					
ii.	Imported Coal 100%		3,04,128	Indonesia/South Africa / other countries also	~ 600 Kms. (from Vizag Port)	Through sea route, rail route & by road (through covered trucks)
	OR					
iii.	Dolochar + Indian Coal	Dolochar	69,300	Own generation	---	Internal Transfer (Covered trucks)
		Indian Coal	4,40,550	SECL Chhattisgarh / MCL Odisha	~ 150 Kms.	By Rail & Road (Covered trucks)
	OR					
iv.	Dolochar + Imported Coal	Dolochar	69,300	Own generation	---	Internal Transfer (Covered trucks)
		Imported Coal	1,94,642	Indonesia/South Africa / other countries also	~ 600 Kms. (from Vizag Port)	Through sea route, rail route & by road (through covered trucks)
	OR/AND					
v.	Washery rejects		2,50,000	Own generation	---	Internal Transfer (Covered trucks)
11.	**Induction Furnace (IF) – 3,30,000 TPA**					
i.	Sponge Iron		3,33,000	Own generation	---	Internal Transfer (Covered trucks)
ii.	MS scrap/Pig Iron		50,000	Own generation	---	Internal Transfer (Covered trucks)
iii.	Ferro alloys		17,000	Own generation	---	Internal Transfer (Covered trucks)
12.	**Electric Arc Furnace (EAF) – 3,96,000 TPA**					
i.	Sponge Iron		1,98,000	Own generation	---	Internal Transfer (Covered trucks)
ii.	Hot metal/Pig Iron		39,600	Own generation	---	Internal Transfer (piped conveyor) / covered trucks
iii.	Melting Scrap (end cuttings also)		1,98,000	Own generation	---	Internal Transfer (Covered trucks)
iv.	Lime		59,800	Chhattisgarh / Madhya Pradesh	~ 150 Kms.	By Road (Covered trucks)

S.No.	Raw Material		Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
v.	Ferro Alloys (SiMn)		5,940	Own generation	---	Internal Transfer (Covered trucks)
13.	**Rolling Mill – 6,00,000 TPA**					
i.	Hot Billets		5,30,400	Own generation	---	Through roller
ii.	Billets / Ingots		99,000	Own generation	---	Internal Transfer (Covered trucks)
iii.	LDO		2914 KL/annum			
iv.	Coal for gasifier (producer Gas) 2 x 2340 Nm^3/Hr	Indian	14,040	SECL Chhattisgarh / MCL Odisha	~ 150 Kms.	By Rail & Road (Covered trucks)
		Imported	8,986	Indonesia/South Africa / other countries also	~ 600 Kms. (from Vizag Port)	Through sea route, rail route & by road (through covered trucks)
14.	**For Ferro Alloys: 2 x 9 MVA [SiMn / FeMn / FeCr / FeSi / Pig Iron]**					
	(a) For manufacturing Silico Manganese - 28,000 TPA					
i.	Manganese Ore		56,000	MOIL / OMC Imported	~ 500 Kms. ~ 600 Kms. (from Vizag Port)	By Road (Covered trucks) Through sea route, rail route & by road (through covered trucks)
ii.	FeMn Slag		12,600	Own generation	---	Internal Transfer (Covered trucks)
iii.	Coke		8,400	Chhattisgarh, Jharkhand	~ 300 Kms.	By Road (Covered trucks)
iv.	Dolomite		8,400	Chhattisgarh, Jharkhand	~ 300 Kms.	By Road (Covered trucks)
v.	Electrode paste		560	Maharashtra / West Bengal	~ 300 Kms.	By Road (Covered trucks)
vi.	Quartz		9,800	Chhattisgarh, Jharkhand	~ 300 Kms.	By Road (Covered trucks)
vii.	Briquetted Bag filter dust		420	Own generation	---	Internal Transfer (Covered trucks)
	OR					
	(b) For manufacturing Ferro Manganese – 40,000 TPA					
i.	Manganese Ore		96,000	MOIL / OMC Imported	~ 500 Kms. ~ 600 Kms.	By Road (Covered trucks) Through sea route, rail route &

S.No.	Raw Material	Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
				(from Vizag Port)	by road (through covered trucks)
ii.	Coke	12,000	Chhattisgarh, Jharkhand	~ 300 Kms.	By Road (Covered trucks)
iii.	MS scrap / Mill scales	8,000	Own generation	---	Internal Transfer (Covered trucks)
iv.	Electrode paste	880	Maharashtra / West Bengal	~ 300 Kms.	By Road (Covered trucks)
	OR				
	(c) For manufacturing Fe-Si – 14,000 TPA				
i.	Quartz	30,800	Chhattisgarh, Jharkhand	~ 300 Kms.	By Road (Covered trucks)
ii.	Mill Scale & M.S. Scrap	6,300	Own generation	---	Internal Transfer (Covered trucks)
iii.	Coke	21,700	Chhattisgarh, Jharkhand	~ 300 Kms.	By Road (Covered trucks)
iv.	Electrode paste	1,400	Maharashtra / West Bengal	~ 500 Kms.	By Road (Covered trucks)
v.	Briquetted Bag filter dust	980	Own generation	---	Internal Transfer (Covered trucks)
	OR				
	(d) For manufacturing Ferro chrome – 30,000 TPA				
i.	Chrome Ore	72,000	Odisha Import, South Africa	~ 150 Kms. ~ 600 Kms. (from Vizag Port)	By road (through covered trucks) From Port By Road (through covered Trucks)
ii.	LAM Coke	15,000	Andhra Pradesh	~ 500 Kms.	By Road (Covered trucks)
iii.	Quartz	1,830	Chhattisgarh, Jharkhand	~ 300 Kms.	By Road (Covered trucks)
iv.	MS scrap/Mill scales	4,500	Own generation	---	Internal Transfer (Covered trucks)
v.	Magnetite / Bauxite	4500	Chhattisgarh / Maharashtra	~ 300 Kms.	By Road (Covered trucks)
vi.	Electrode paste	600	Maharashtra / West Bengal	~ 500 Kms.	By Road (Covered trucks)
vii.	Briquetted Bag filter dust	600	Own generation	---	Internal Transfer (Covered trucks)
	OR				
	(e) For manufacturing Pig Iron – 48,000 TPA				

S.No.	Raw Material	Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
i.	Iron Ore	52,560	Odisha / Chhattisgarh	~ 150 Kms.	By Rail & Road (Covered trucks)
ii.	Mill Scale	31,200	Own generation	---	Internal Transfer (Covered trucks)
iii.	Coke	30,144	Chhattisgarh, Jharkhand	~ 300 Kms.	By Road (Covered trucks)
iv.	Limestone	7,200	Chhattisgarh, Jharkhand	~ 300 Kms.	By Road (Covered trucks)
v.	Fluorspar	1,200	Chhattisgarh / Andhra Pradesh	~ 300 Kms.	By Road (Covered trucks)
vi.	Dolomite	7,200	Chhattisgarh, Jharkhand	~ 300 Kms.	By Road (Covered trucks)

1.4 MANUFACTURING PROCESS

1.4.1 Iron Ore Beneficiation

Beneficiation is a process which removes the gang particle like Alumina, Silica from the Iron Ore. Basically, it separates Fe_2O_3 or Fe_3O_4 from other impurities in the iron ore. In this process the Fe content is improve to maximum possible extent. The highest can be 70% i.e. purest form.

1.4.2 Pelletization

Iron ore fines will be grinded in Ball mills. The concentrate will be fed to thickener and subsequently to filtering unit. The filter cake will be sent to pellet plant comprising of Travelling grate kiln. Green pellets will be produced from this process. The flue gases from grate kiln will be treated in ESP and discharged through a stack.

1.4.3 Coal Gasification Plant/Producer Gas Plant

Gasification of coal is a conversion technology which converts coal into producer gas. It is a high temperature process. The temperature is optimized to produce a fuel gas with a minimum of liquid and solids. This process consists of heating the feed material coal in a vessel with or without the addition of oxygen (O_2). Carbon reacts with water in the form of steam and O_2 at relatively high pressure and produce producer gas. This producer gas will be used in kiln/furnace.

Tar and phenolic water is generated in coal gasification process. Tar is separated and sold. Tar sludge shall be mixed with coal and shall be recycled to coke ovens. The phenolic

discharge of PGP will be utilized in ABC of DRI Kiln as per the Guidelines of CPCB. The ash will be utilized in brick manufacturing plant for bricks making.

1.4.4 Sponge Iron (DRI)

The proposal consists of 3 x 350 TPD of DRI kilns to produce Sponge Iron with 3 x 10 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.

1.4.5 Steel Melting Shop

Induction Furnace:

An induction furnace constitutes a single larger primary coil made of water-cooled copper tube. The working voltage is impressed across the terminals of the coil. These furnaces have a great much application for melting of Iron, Steel and Non-ferrous. There will be 4 x 25 T Induction Furnaces to manufacture Hot Billets / MS Billets / Ingots.

Electric Arc Furnace:

Manufacturing of Hot Billets / MS billets using Sponge Iron, Pig iron, Scrap, Lime & SiMn as raw materials though Electric Arc Furnace, In which primarily uses high-voltage electrified arcs to melt scrap steel for conversion into liquid steel without altering the electrochemical properties of the specific metal. There will be 2 x 60 T Electric Arc Furnace to manufacture Hot Billets/ MS Billets.

1.4.6 Rolling Mill

The Hot Billets produced from Induction Furnaces will be directly sent to Rolling Mill to produce Structural Steel / TMT Bars (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 Producer Gas.

1.4.7 Sinter Plant

The proposed sinter plant complete will consist of 2 Nos. of Sinter Machines each of 60m^2 grate area along with associated services facilities. The sinter plant is rated for a total production of 12,00,000 TPA of BF Sinter at a rated productivity of 1.3 t/m^2/hr. Sintering is a process agglomeration of fines into solid blocks, in the process of sintering iron ore files / flue dust / ESP Dust / Mill Scale / GCP Sludge etc. along with Dolomite, Coke fines and limestone are mixed and is fused at a temperature ranging between 900 to 950^o C. These fines get converted into blocks known as Sinter.

1.4.8 Blast Furnace

The blast furnace shop will comprise of 2 Nos. of furnaces each of 350m^3 working volume. The blast furnace is envisaged to operate with sized lump iron ore, Sinter, coke, fluxes and additives. The liquid slag will be granulated at cast house granulation unit and sold to the

cement plants for converting into slag cement. The BF top gas will be cleaned in dust catcher and gas cleaning system and distributed to the stoves, burners for runner drying and process steam supply. Part of this gas will be used for power generation. The excess gas will be flared through flare stack.

1.4.9 Coke Oven Plant

Metallurgical coke is a hard carbon material produced in the process of the 'destructive distillation' of various blends of bituminous coal. It is produced by carbonization of coal at high temperatures (around 1100^0C) in an oxygen deficient atmosphere in a coke oven. When the heat energy of flue gases is recovered in the form of steam then the non-recovery coke ovens are known as heat recovery or energy recovery coke ovens. In this process, ovens are usually built in rows, one oven beside another with common walls between neighboring ovens. Such a row of ovens is termed a battery. A battery usually consists of many ovens in a row.

1.4.10 Coke Dry Quenching (CDQ) System

CDQ is a heat recovery system to cool the hot coke from coke ovens. It is one of the most renowned energy-efficient and environmentally-friendly facilities within steel production. CDQ is a system where hot coke removed from coke ovens at a temperature of approximately 1,000°C is cooled and kept dry with inert gas and the resulting steam produced in a waste heat recovery boiler is used to generate electricity. As the sensible heat recovered by heat transfer in the cooling chamber is utilized as a heat source for steam generation, electricity generated by CDQ is clean, environmentally-friendly energy. In addition, compared to the conventional wet quenching type, CDQ brings about advantages such as the reduction of dust emissions and improvement of coke quality.

1.4.11 Submerged Electric Arc Furnace

2 nos. of Submerged Electric Arc Furnace each of 9 MVA will be setup in the proposed plant. Ferro manganese, silicon-manganese will be produced using manganese ore as main raw material& Ferro Chrome will be produced using Chrome Ore as main raw material in a sub-merged arc furnace using reducer (Coke) under high voltage.

1.4.12 Power Generation

Through WHRB Boiler

Waste hot gases generated from Blast Furnace, coke oven and DRI plant. Captive power Plant of 80 MW capacity is proposed. 20 MW power will be generated from blast furnace gas, 30 MW power will be generated from coke Oven Flue gas using WHRB & 30 MW power will be generated from DRI kilns.

Through FBC Boiler

Coal (Imported / Indian) along with dolochar will be used as fuel in FBC Boilers to generate 80 MW (1 x 80 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.

1.4.13 Coal Washery

It has been proposed to establish 1 x 0.6 MTPA Wet type Heavy Media Cyclone type Coal Washery. The heavy media cyclone is an extremely efficient coal cleaning technology. Its a wet separation process comprising of crushing, screening, washing and handling. ROM coal is subjected to crushing & screening to Obtain (-) 50mm size fraction. Feed coal is processed in heavy media cyclone.

1.4.15 Brick Manufacturing Plant (39,600 Bricks/day)

Raw material for bricks manufacturing are mainly Cement, tailings, fly ash, bed ash &non-magnetic slag dust. These materials are fed to the mixture through weighing and batching system.

1.4.16 Oxygen Plant

Compression of Atmospheric Air By Air Compressor Highly efficient dry-type suction filters are applied for the consuming of free saturated air from the atmosphere into the first stage of the horizontal balanced opposed, lubricated reciprocating air compressor. In the moisture separator from the compressed air the condensed moisture is separated which gets chilled at a temperature of 12° C in a chilling unit & is done prior to its entry into the Molecular Sieve Battery. It slowly becomes oil free when passed through an Oil Absorber before sending the air to Molecular Sieve Battery.

1.5 Water Requirement

- Water required for the proposed project will be 10,830 KLD.
- Water required for proposed project (for process and domestic) will be met from partly from Sapnai Nallah (flowing at distance of 2.2 Kms. from the project site) and partly from Ground Water Sources.
- An application has been submitted to Water Resources Department, Government of Chhattisgarh for withdrawal of water from Sapnai Nallah.
- Air cooled condensers will be provided to FBC Power plant instead of water cooled consdensers to reduce the water consumption significantly.

Table No.1.4: Breakup of Water Requirement

S.No.	Unit	Water Requirement (KLD)
1.	Iron Ore Beneficiation Unit	410
2.	Iron Ore Pelletization Unit	300
3.	Coal gasifier for Pellet plant & RM	45
4.	Sinter Plant	1200
5.	Coke Oven plant	1350
6.	Blast Furnace	1280
7.	Ductile Iron Pipe unit	1225
8.	Sponge Iron Unit	350
9.	Electric Arc Furnace	280
10.	Induction Furnace	230
11.	Rolling Mills	540
12.	Submerged Electric Arc Furnaces	60
13.	Coal washery	300
14.	Power Plant (WHRB+FBC)	3200
	• Cooling tower makeup	1540
	• Boilers make up	1155
	• DM plant Regeneration	505
15.	Brick manufacturing plant	10
16.	Briquetting plant	10
17.	Domestic requirement	40
	Total	**10,830**

1.6 Wastewater Generation

- Total wastewater generated from the proposed project is 1646 KLD.
- There will be no wastewater discharge from Iron Ore beneficiation unit, Sinter plant, Coke oven unit, Sponge Iron Unit, Coal washery as Closed-circuit cooling system will be adopted.
- Wastewater generated from Iron ore Pelletisation unit, Ductile Iron pipe unit, Electric Arc Furnace, Induction Furnace, Rolling Mills, Submerged Arc Furnace 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 Gasifier will be reused ABC chamber in DRI Kiln.
- Wastewater from Rolling Mill will be treated in oil separator followed by settling tank and will be recycled through closed circuit cooling system
- RO rejects will be utilised for Flushing in Toilets, Cleaning of Toilets, Floor washings, etc.
- Effluent from Gas cleaning plant of Blast Furnace will be treated in a settling tank and after treatment it will be recycled.
- 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.
- Sanitary wastewater generated (32 KLD) from proposed project will be treated in proposed STP (32 KLD) and after treatment the treated sewage will be used for greenbelt development.
- Garland drains will be constructed around the storage yards to prevent any run off from the storage yards entering into the water bodies.
- 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.	Iron Ore Beneficiation Unit	---
2.	Iron Ore Pelletization Unit	15
3.	Coal gasifier	36
4.	Sinter Plant	---
5.	Coke Oven plant	---
6.	GCP effluent from Blast Furnace	192
7.	Ductile Iron Pipe unit	74
8.	Sponge Iron Unit	---
9.	Electric Arc Furnace	28
10.	Induction Furnace	23
11.	Rolling Mills	27
12.	Submerged Electric Arc Furnaces	4
13.	Coal washery	---
14.	Power Plant (WHRB+FBC)	1215
	• Cooling tower makeup	385
	• Boilers make up	325
	• DM plant Regeneration	502
15.	Sanitary Wastewater	32
	Total	**1646**

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 March 2024 to 31st May 2024***. The following are the concentrations of various parameters at the monitoring stations:

Table No.2.1: AAQ Data Summary

S.No.	Parameter	Concentration (in µg/m³)	Standard as per NAAQS (in µg/m³)
1.	$PM_{2.5}$	26.5 to 37.4	60
2.	PM_{10}	44.2 to 62.4	100
3.	SO_2	8.7 to 14.2	80
4.	NO_X	12.2 to 21.4	80
5.	CO	490 to 1050	2000

2.2 Water Quality

2.2.1 Surface Water Quality

Three samples (60m Upstream and 60m Downstream) from Kelo River and one sample from Sapnai nallah 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 Nos. of ground water samples from open wells / bore wells were collected from the nearby villages to assess ground water quality impacts and analyzed for various Physico-Chemical parameters. The analysis of samples shows that all the parameters are in accordance with BIS: 10500 specifications.

2.3 Noise Levels

Noise levels were measured at 8 locations during daytime & Nighttime. The equivalent **day-night** noise levels in the study zone are ranging from **48.46 dBA to 67.23 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 $PM_{2.5}$, 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.

The predicted max. Incremental $PM_{2.5}$ concentrations (24 hourly) due to the proposed project will be **2.32 µg/M^3** at a distance of **800 m** from the stack in the down wind direction over the baseline concentrations.

The predicted incremental rise in $PM_{2.5}$ concentration due to the Vehicular emission will be **0.92 µg/m^3.**

Hence the total predicted incremental rise in $PM_{2.5}$concentration due to the emission from proposed project and due the vehicular emissions will be **2.32 µg/m^3 + 0.92 µg/m^3 = 3.24 µg/m^3.**

The predicted max. Incremental PM_{10} concentrations (24 hourly) due to the proposed project will be **3.90 µg/M^3** at a distance of **800 m** from the stack in the down wind direction over the baseline concentrations.

The predicted incremental rise in PM_{10} concentration due to the Vehicular emission will be **1.49 µg/m^3.**

Hence the total predicted incremental rise in PM_{10} concentration due to the emission from proposed project and due the vehicular emissions will be **3.90 µg/m^3 + 1.49 µg/m^3 = 5.39 µg/m^3.**

The predicted max incremental **SO_2** concentrations (24 hourly) due to the emissions from operation of proposed project will be **7.94 µg/m^3** at a distance of **1500 m** from the stack in the down wind direction over the baseline concentrations.

The predicted max incremental **NO_2** concentrations (24 hourly) due to the proposed project will be **5.38 µg/m^3** at a distance of **1100 m** from the stack in the down wind direction over the baseline concentrations.

The predicted incremental rise in **NOx** concentration due to the Vehicular emission will be **4.12 µg/m^3.**

Hence the total predicted incremental rise in NOx concentration due to the emission from project and due the vehicular emission will be **5.38 µg/m^3 + 4.12 µg/m^3 = 9.50 µg/m^3**

The predicted max incremental **CO** concentrations (24 hourly) due to the proposed project will be **0.81 µg/m^3** at a distance of **1300 m** from the stack in the down wind direction over the baseline concentrations.

The predicted incremental rise in **CO** concentration due to the Vehicular emissions will be **2.24 µg/m^3**.

Hence the total predicted incremental rise in CO concentration due to the emission from project and due the vehicular emission will be **0.81 µg/m^3 + 2.24 µg/m^3 = 3.05 µg/m^3**

The net resultant concentrations (Maximum baseline conc. + predicted incremental rise in conc.) of PM, SO_2 and NO_X shown in Table No. 4.2.4, by considering the emissions from other industries in the area will be well within the National Ambient Air Quality Standards (NAAQS) when the plant will commence the operation. Hence there will not be any adverse impact on air environment due to the proposed activities.

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

Item	$PM_{2.5}$ (µg/m^3)	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	37.40	62.40	14.20	21.40	1050.00
Maximum predicted incremental rise in concentration due to proposed project (Point Sources)	2.32	3.90	7.94	5.38	0.81
Maximum predicted incremental rise in concentration due to proposed project (Vehicular emissions)	0.92	1.49	---	4.12	2.24
Net resultant concentrations during operation of the proposed project	**40.64**	**67.79**	**22.14**	**26.78**	**1053.05**
National Ambient Air Quality Standards	**60**	**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. **10.534 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 wastewater discharge from Iron Ore beneficiation unit, Sinter plant, Coke oven unit, Sponge Iron Unit, Coal washery as Closed circuit cooling system will be adopted.
- Wastewater generated from Iron ore Pelletisation unit, Ductile Iron pipe unit, Electric Arc Furnace, Induction Furnace, Rolling Mills, Submerged Arc Furnace 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 Gasifier will be reused ABC chamber in DRI Kiln.
- Wastewater from Rolling Mill will be treated in oil separator followed by settling tank and will be recycled through closed circuit cooling system
- RO rejects will be utilised for Flushing in Toilets, Cleaning of Toilets, Floor washings, etc.
- Effluent from Gas cleaning plant of Blast Furnace will be treated in a settling tank and after treatment it will be recycled.
- 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.
- Sanitary wastewater generated (32 KLD) from proposed project will be treated in proposed STP (32 KLD) and after treatment the treated sewage will be used for greenbelt development.
- Garland drains will be constructed around the storage yards to prevent any run off from the storage yards entering into the water bodies.
- 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.

Hence there will not be any adverse impact on environment due to the proposed project.

3.4 Prediction of Impacts on Land Environment

The effluent will be treated to achieve SPCB standards. Zero effluent discharge will be adopted. All the required air pollution control systems will be provided to comply with CPCB / SPCB norms. All solid wastes will be disposed / utilized as per CPCB / SPCB norms. **10.534 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	Grab sampling	As per IS: 10500
B.	Effluent at the outlet of the ETP	Once in a month	Composite sampling (24 hourly)	As per EPA Rules, 1996
C.	STP Inlet & Outlet	Once in a month	Composite sampling (24 hourly)	As per EPA Rules1996
2. Air Quality				
A.	Stack Monitoring	Online monitors (all stacks) Quarterly Once	Continuous ----	PM, SO_2, NOx & CO PM, SO_2, NOx & CO
B.	Ambient Air quality (CAAQMS)	Continuous Quarterly Once	Continuous 24 hours	$PM_{2.5}$, PM_{10}, SO_2, NOx CO & O_3 $PM_{2.5}$, PM_{10}, SO_2, NOx

S.No.	Particulars	Frequency of Monitoring	Duration of sampling	Parameters required to be monitored
				CO & O_3
C.	Fugitive emissions	Quarterly Once	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. Soil Quality monitoring				
A.	Soil Quality	Half yearly once	Core drilling sample	pH, SAR, texture, N,P,K, etc.

5.0 ADDITIONAL STUDIES

No Rehabilitation and Resettlement is involved in the proposed project as there are no habitations in the project site.

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.

The proposed project creates direct employment to about 1000 persons (skilled, semiskilled & unskilled) and indirect employment of about 750 persons.

As per MoEF&CC Office Memorandum vide F.No.22-65/2017-IA.III dt. 30th September 2020, the budgetary allocation for commitment made by Project Proponent to address the concern raised during public hearing & based on Social Impact Assessment (SIA). Hence A separate budget will be allocated for Social welfare measures after completion of Public Hearing.

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 Outlet
1.	Iron ore Beneficiation	Bag filters	PM < 30mg/Nm^3
2.	Pellet Plant	Electro Static Precipitator	PM < 30mg/Nm^3
3.	DRI kilns with WHRB	Electro Static Precipitator	PM < 30mg/Nm^3
4.	Induction Furnace	Fume Extraction system with bag Filters	PM < 30mg/Nm^3
5.	Electric Arc Furnace	4th Hole Fume Extraction system with bag filters	PM < 30mg/Nm^3
6.	Submerged Electric Arc Furnaces	4th Hole Fume Extraction system with bag filters	PM < 30mg/Nm^3
7.	Re-heating furnaces attached to Rolling Mills	Stack	PM < 30mg/Nm^3
8.	Coke Oven Plant	Electro Static Precipitator	PM < 30mg/Nm^3
9.	Sinter Plant	Electro Static Precipitator	PM < 30mg/Nm^3
10.	Blast Furnaces	Gas Cleaning Plant	PM < 5 mg/Nm^3
11.	Blast Furnace (Stock house)	Dust Catcher followed by Venturi Scrubber	PM <10 mg/Nm^3
12.	Blast Furnace (Cast house)	Dust Extraction system with bagfilters (PTFE membrane)	PM < 30 mg/Nm^3
13.	Ductile Iron Pipe Plant (Annealing Furnace)	Fume Extraction system with bag Filters	PM < 30 mg/Nm^3
14.	FBC Boiler	Electro Static Precipitators (ESP)	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

- There will be no wastewater discharge from Iron Ore beneficiation unit, Sinter plant, Coke oven unit, Sponge Iron Unit, Coal washery as Closed-circuit cooling system will be adopted.
- Wastewater generated from Iron ore Pelletisation unit, Ductile Iron pipe unit, Electric Arc Furnace, Induction Furnace, Rolling Mills, Submerged Arc Furnace 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 Gasifier will be reused ABC chamber in DRI Kiln.
- Wastewater from Rolling Mill will be treated in oil separator followed by settling tank and will be recycled through closed circuit cooling system
- RO rejects will be utilised for Flushing in Toilets, Cleaning of Toilets, Floor washings, etc.
- Effluent from Gas cleaning plant of Blast Furnace will be treated in a settling tank and after treatment it will be recycled.
- 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.
- Sanitary wastewater generated (32 KLD) from proposed project will be treated in proposed STP (32 KLD) and after treatment the treated sewage will be used for greenbelt development.
- Garland drains will be constructed around the storage yards to prevent any run off from the storage yards entering into the water bodies.

- During monsoon the treated effluent will be utilized as makeup water in Rolling Mill. Accordingly, the makeup water for Rolling mill also reduces during the rainy period.
- Zero Liquid Discharge (ZLD) will be maintained in the proposed project.

TREATED EFFLUENT DISPOSAL

Effluent from Gasifier will be send to ABC Chamber of DRI Kiln	36 KLD
Effluent recycled back to Blast Furnace	130 KLD
Effluent used for slag granulation	162 KLD
Effluent quantity to be used for ash conditioning	640 KLD
Effluent to be used for dust suppression	306 KLD
Effluent to be used for Greenbelt development	228 KLD
RO rejects to be used for washing, Toilet cleaning & Flushing	50 KLD
Sanitary waste water will be reused for Greenbelt development	32 KLD

10.534 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.	Tailings from I/O Beneficiation	3,40,000	Will be taken to filter press & water will be recovered. Cake of tailing will be stored in tailing yard & it will be given to cement plants and other possible users will be explored.
2.	Ash / dust from Pellet plant	36,000	Will be utilized in proposed Brick manufacturing unit.
3.	Cinder from Gasifier	60,750	Will be utilized in the proposed Brick Manufacturing Unit
4.	Slag from Blast Furnace	2,55,000	Granulated slag will be given to cement plants
5.	Dust from Blast Furnace	43,000	Will be reused in the sinter plant
6.	Coke breeze/Coke fines	45,000	Will be reused in the sinter plant
7.	Fines from Sinter Plant	2,52,095	Will be reused in the sinter plant
8.	Dolochar	69,300	Will be used in proposed FBC power plant as fuel.
9.	Ash from DRI Kiln	62,370	Will be utilized in the proposed Brick Manufacturing Unit
10.	Kiln Accretion Slag	3,119	Will be used in road construction & utilised in the proposed brick manufacturing unit.
11.	Wet scrapper sludge	13,860	Will be used in road construction & utilised in the proposed brick manufacturing unit within the premises.
12.	SMS Slag (IF+EAF)	1,18,140	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.
13.	End Cuttings from Rolling Mill	18,000	Will be reused in the SMS
14.	Mill scales from Rolling Mill	1800	Mill scales will be utilized in the proposed Ferro alloys manufacturing units.
15.	Dust & sludge DI pipe plant	12,500	Will be utilized in the proposed Sinter Plant. And also Sold to PCB certified Paint manufacturer
16.	Slag from DI pipe plant	13,600	Will be used for Road Construction purpose / paver block making.
17.	Runner Scrapper from DI pipe plant	160	Will be utilized in the proposed Brick Manufacturing Unit
18.	Cement Slurry from DI pipe plant	1425	Cement slurry is taken to the Effluent Treatment Plant from which the water is recycled and the solid is given to manufacturing brick/cement tiles or for cement making
19.	Ash from Power Plant (with Indian Coal +	2,39,828	Will be utilized in the proposed Brick Manufacturing Unit

S.No.	Waste / By product	Quantity (TPA)	Proposed method of disposal
	dolochar)		
20.	Slag from FeMn	40,000	Will be reused in manufacture of SiMn as it contains high SiO_2 and Silicon.
21.	Slag from FeSi	1,960	Will be given to Cast iron foundries
22.	Slag from SiMn	28,000	Will be used for Road construction / will be given to slag cement manufacturing
23.	Slag from FeCr	27,000	Will be processed in jigging plant for Chrome recovery. After Chrome recovery, the left-over slag will be analysed for Chrome content through TCLP test, if the Chrome content in the slag is within the permissible limits, then it will be utilised for Road laying /brick manufacturing. If Chrome content exceeds the permissible limits, it will be sent to nearest TSDF.
24.	Rejects from Coal washery	1,20,000	Will be used in proposed FBC power plant as fuel.

7.5 Greenbelt Development

- **10.534 Ha.** (33% of total land) of land is earmarked for Greenbelt development in the proposed project.
- Total of 26,335 nos. (@2500 nos. per Ha.) of plant will be planted in the proposed project.
- Greenbelt of width ranging from 20 m to 60 m will be maintained all around the peripheral boundary of the project site.
- The tree species to be selected for the plantation are pollutant tolerant, fast growing, wind firm, deep rooted. A three-tier plantation is proposed comprising of an outer most belt of taller trees which will act as barrier, middle core acting as air cleaner and the innermost core which may be termed as absorptive layer consisting of trees which are known to be particularly tolerant to pollutants.
- Local DFO will be consulted in developing the green belt**.**

TREE ENUMERATION / TREE TRANSLOCATION

- Total number of plants existing in the proposed project site are 100 Nos.
- Out of 100 nos., 50 No.s of trees will be translocated to the periphery of the plant boundary. Remaining 50 Nos. will be retained as it is.

- No cutting of trees will be involved.
- Trees proposed to be translocated to within the premises peripherally.
- Letter is issued by DFO confirming no forest land is involved in the project site and No Objection in translocation of trees within the project premises vide letter no. Land Management/2024/3072 dt. 01.10.2024.

7.6 Cost for Environment Protection

Capital Cost for Environment Protection for proposed plant : Rs. 103.0 Crores

Recurring Cost per annum for Environmental protection : Rs. 18.5 Crores/annum

7.7 Implementation of CREP Recommendations

All the CREP recommendations will be implemented & followed strictly.

- Continuous stack monitoring system is proposed for stack attached to all the Stacks.
- 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 will be constructed in consultation with CGWB.