

**SUMMARY ON
ENVIRONMENTAL IMPACT ASSESSMENT REPORT**

OF

Raigarh Ispat & Power Pvt. Ltd.

[Expansion of Steel Plant (Category –A Project)]

[Expansion of Steel Plant–Sponge Iron from 1,20,000 TPA to 4,17,000 TPA, MS Ingots/Hot Billets from 90,000 TPA to 2,38,500 TPA, TMT bars/Rolled products from 90,000 TPA to 2,55,000 TPA (or) MS Strip Mill of 1,65,000 TPA (or) MS Pipe Mill of 1,65,000 TPA, WHRB Power from 8.0 MW to 28 MW, FBC Power from 4 MW to 14MW, 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), New Briquetting Plant (200 Kg/hr) & Fly Ash Brick Making unit (55,000 Brick /day)]

located at

**Delari & Saraipali Villages, Tehsil: Raigarh,
District: Raigarh, Chhattisgarh**

Submitted to

CHHATTISGARH ENVIRONMENT CONSERVATION BOARD

1.0 PROJECT DESCRIPTION

M/s. Raigarh Ispat And Power Private Limited (RIPPL), have proposed to expand the existing steel plant at Delari Village, Raigarh Tehsil, Raigarh District, Chhattisgarh.

Chronology of Permissions obtained for Existing plant:

- CTE obtained for 2 x 100 TPD DRI kilns from CECB vide no. 442/TS/CECB/2005, Raipur dated 25th January 2005.
- Existing plant has obtained Environment Clearance from MoEF, New Delhi vide F.No. J-11011/1040/2007/ IA II (I) dated 27th January 2010
- Accordingly obtained Consent to Establishment (CTE) from Chhattisgarh Environment Conservation Board (CECB) vide letter no. 2433/TS/CECB/2010, Raipur dated: 26/07/2010.
- Extension of E.C. validity of E.C. accorded on **14th July 2017** upto 26-01-2020 for unimplemented units.
- The existing plant have obtained Consent to Operate from the CECB for few units vide No. **10522 /TS/CECB/ 2021** dated **26/02/2021** which is valid **29-02-2024** & **Amendment in consent** issued for Rolling Mill of 90,000 TPA capacity vide No. **2736/TS/CECB/ 2022** dated **15/07/2022** which is valid **28-02-2023**.

Proposed Project

Now it is proposed to go for expansion of existing plant along with new facilities i.e. Expansion of Steel Plant–Sponge Iron from 1,20,000 TPA to 4,17,000 TPA, MS Ingots/Hot Billets from 90,000 TPA to 2,38,500 TPA, TMT bars/Rolled products from 90,000 TPA to 2,55,000 TPA (or) MS Strip Mill of 1,65,000 TPA (or) MS Pipe Mill of 1,65,000 TPA, WHRB Power from 8.0 MW to 28 MW, FBC Power from 4 MW to 14MW, 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), New Briquetting Plant (200 Kg/hr) & Fly Ash Brick Making unit (55,000 Brick /day). Accordingly Application has been submitted for EC under violation category.

Reasons for violation of Rolling mill of 90,000 TPA:

The company has installed Rolling mill plant and obtained CTO from CECB vide no. **2736/TS/CECB/ 2022** dated **15/07/2022** which is after expiry of E.C.80% Rolling Mill work

has been completed within the EC validity period. Remaining 20% of work has been completed after EC validity. Hence this comes under violation as per EIA notification 2006.

Present status of Rolling mill:

- Installation of Rolling mill has been completed.
- Production is yet to be started.

Total cost of Rolling Mill : Rs 27.8 Crores

Expenditure incurred for Installation of Rolling Mill till EC validity : Rs. 19.73 Cr
(copy of CA certificate is shown in subsequent slides)

Expenditure incurred on Rolling Mill under Violation : Rs. 27.8 Cr – Rs. 19.73 Cr
: Rs. 8.07 Cr

Existing plant is located in **22.72 Ha. (56.15 Acres)** of land. Additional **11.78 Ha. (29.10 Acres)**. Total land for the proposed expansion will be **34.5 Ha. (85.25 Acres)**. The following are the Khasra nos. are involved in total land 2/1, 2/2, 61/2, 65, 70/1, 70/2, 72, 73, 74, 75, 76/1, 76/2, 77, 78/2, 79, 80, 81, 82/1, 82/2, 83/1, 83/2, 85, 88/2, 89/2 of Delari Village & 560, 561, 562, 563, 564, 565/1, 565/2, 566, 567, 568, 569, 570 of Saraipali Village.

Total estimated project cost for the project is **Rs.489 Crores**.

As per the Ministry of Environment, Forests & Climate Change, New Delhi notification, dated 14th September, 2006 and its subsequent amendments, all Primary metallurgical processing industries are classified under **Category 'A'**.

In order to obtain Environmental Clearance for the proposed expansion of Steel plant, Form-I, proposed TOR along with Pre-Feasibility Report were submitted to the Honourable Ministry of Environment, Forests & Climate Change (MoEF&CC), New Delhi vide proposal No. IA/CG/IND1/415808/2023 dated on **20th April 2023**.

Presentation was made before the 29th meeting of the Expert Appraisal Committee (Industry - 1) held on 1st May 2023 for the approval of TOR (Terms of Reference) for EIA study. Subsequently TOR letter was issued vide letter No. **J-11011 / 45 / 2023– IA II (IND-I), dated 3rd October 2023**. Draft EIA report is prepared incorporating the Terms of Reference & 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 Draft Environmental Impact Assessment (EIA) report for the proposed expansion 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 expansion 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 Plant site:

Environment Setting Within 10 Kms. Radius of the Plant Site

S.No.	Salient Features / Environmental features	Distance w.r.t. site / Remarks
1.	Type of Land	Partly Industrial & Partly Pvt. Agricultural Land.
2.	National Park/ Wild life sanctuary / Biosphere reserve / Tiger Reserve / Elephant Corridor / migratory routes for Birds	There are no Notified National Parks, Sanctuaries, Biosphere Reserves, Migratory Corridors of Wild animals, or other protected areas except reserved and protected forests within the 10 Km buffer zone. It is located in an industrial park. There are several industrial units in operation in the Industrial Park where the plant is situated. However, movement of Elephants is observed within 10 Kms. radius of the plant, as per the secondary source. Conservation plan is being prepared & recommendations of the PCCF will be followed.
3.	Historical places / Places of Tourist importance / Archeological sites	Banjari Mata Temple – 4.6 Kms. Ram Jharna & Singhanpur Caves (7.6 Kms.)

S.No.	Salient Features / Environmental features	Distance w.r.t. site / Remarks
4.	Critically polluted area as per MoEF&CC Office Memorandum dated 13 th January 2010	Nil
5.	Defense Installations	Nil
6.	Nearest village	Delari – 0.3 Kms. (SEE)
7.	Forests	No forest land involved in the Existing plant site & additional land. Unnamed PF (0.1 Kms.), Urdana RF (0.6 Kms - South Direction), Taraimal RF (2.4 Kms -North Direction), Barkachhar PF (8.5 Kms -East Direction), Khardungari PF (8.0 Kms -East Direction), Rabo RF (2.4 Kms -West Direction), Samaruma RF (8.5 Kms - North Direction) exist within 10 Km. radius of the plant site.
8.	Water body	Kelo River (E; 5.7 Kms.), Banjari nallah (S; 0.2 Kms.) Gerwani Nallah (NE; 2.4 Kms.), Dewanmunda nallah (N; 3.0 Kms.), Korpali Nallah (N; 2.6 Kms.), Barade Nallah (NWW; 3.7 Kms.), Rabo DAM catchment area (NWW; 8.7 Kms.) exists with in 10 Km. radius of the plant site.
9.	Nearest Highway	Raigarh – Ambikapur Highway (4.4 Kms.)
10.	Nearest Railway Station	Bhupdeopur RS–7.5 Kms. (SW) Kirodimal RS – 8.7 Kms (S)
11.	Nearest Port facility	Nil within 10 Km. Radius.
12.	Nearest Airport	Jindal Air Strip – 7.3 Kms. Jharsuguda Airport – 75 Kms.
13.	Nearest Interstate Boundary	Nil within 10 Km. Radius. (Odisha – 22 Kms.)
14.	Seismic zones as per IS-1893	Seismic zone – III
15.	R & R	Not applicable as there are no Habitations in the additional land proposed.
16.	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 plant configuration and production capacity proposed now

Plant Configuration and Production Capacity (Existing & Proposed)

S.No.	Units (Products)	Capacities as per E.C. dt 27/01/2010 & extension vide dated 06/08/2015	CTO & Amended CTO obtained from CECB vide dt 26/02/2021 & 15/07/2022 (in TPA)	Proposed Expansion (in TPA)	Production Capacity After Expansion (in TPA)

S.No.	Units (Products)		Capacities as per E.C. dt 27/01/2010 & extension vide dated 06/08/2015	CTO & Amended CTO obtained from CECB vide dt 26/02/2021 & 15/07/2022 (in TPA)	Proposed Expansion (in TPA)	Production Capacity After Expansion (in TPA)
1.	DRI Kilns (Sponge Iron)		1,20,000 (4 x 100 TPD)	1,20,000 (4 x 100 TPD)	2,97,000 (2 x 350 TPD + 1 x 200 TPD)	4,17,000 (4 x 100 TPD + 2 x 350 TPD + 1 x 200 TPD)
2.	Induction Furnace (M.S. Billets/ Hot Billets)		90,000 (3 x 10 T IF)	90,000 (3 x 10 T IF)	1,48,500 (3 x 15 T)	2,38,500 (3 x 10 T + 3 x 15 T)
3.	Rolling Mill (TMT bars / Rolled products) (85 % Hot charging and remaining 15% through RHF with LDO)	Rolling Mill	90,000 (1 x 300 TPD)	90,000 (1 x 300 TPD)	1,65,000 (1 x 500 TPD)	2,55,000 (1x300 TPD + 1 x 500 TPD)
					(or)	(or)
		MS Strip Mill	----	----	1,65,000 (1 x 500 TPD)	1,65,000 (1 x 500 TPD)
					(or)	(or)
	MS Pipe Mill	----	----	1,65,000 (1 x 500 TPD)	1,65,000 (1 x 500 TPD)	
4.	Ferro Alloys Unit (FeSi / FeMn / SiMn / FeCr)		30,000 TPA (2 x 9 MVA)	Not Implemented as EC lapsed	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	2 x 9 MVA FeSi- 14,000 TPA / FeMn- 50,400 TPA / SiMn – 28,800 TPA / Fecr- 30,000 TPA / Pig Iron – 50,400 TPA
5.	BRIQUETTING PLANT		----	----	200 Kg/hr	200 Kg/hr
6.	Fly Ash Brick Manufacturing Unit		---	----	55,000 Brick/day	18.15 Million Bricks/ Annum
7.	Power Plant	WHRB Power Plant	8.0 MW (4 x 2 MW)	8.0 MW (4 x 2 MW)	20 MW (2x8 MW + 1 x 4 MW)	28 MW (4 x 2 MW + 2x8 MW + 1 x 4 MW)
		FBC Power Plant	46 MW	4.0 MW (1x4 MW) (Remaining EC lapsed)	10 MW (1 x 10 MW)	14 MW (1x4 MW+ 1 x 10 MW)

1.3 RAW MATERIALS (FOR EXPANSION PROJECT)

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

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) 2,97,000 TPA (2 x 350 TPD & 1 x 200 TPD)				
a)	Iron ore	475,200	Barbil, Odisha	~ 500 Kms	By rail & road (covered trucks)

S.No.	Raw Material		Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
b)	Coal	Indian(100%)	3,86,100	SECL Chhattisgarh / MCL Odisha	~ 500 Kms	By rail & road (covered trucks)
		Imported(100%)	2,47,104	Indonesia / South Africa / Australia	~ 600 Kms. (from Vizag Port)	Through sea route, rail route & by road (covered trucks)
c)	Dolomite		14,850	Chhattisgarh	~ 100 Kms.	By road (covered trucks)
2.	For Steel Melting Shop (Hot Billets / MS Ingots / Billets) –1,48,500 TPA (3 x15 T)					
a)	Sponge Iron		1,50,000	Own generation	---	Through covered conveyers
b)	MS Scrap/ Pig Iron		22,000	Chhattisgarh	~ 100 Kms.	By road (covered trucks)
c)	Ferro alloys		7,000	Own generation	---	By road (covered trucks)
3.	For Rolling Mill through Hot charging &RHF(TMT bars / Rolled products) – 1,65,000 TPA					
a)	Hot Billets		1,45,860	Own generation	----	----
b)	Billets / Ingots		27,225	Own generation	----	----
c)	LDO / LSHS		800kl/annum	Nearby IOCL Depot	~ 100 Kms.	By road (through Tankers)
4.	For FBC Boiler [Power Generation 1 x 10MW]					
OR						
a)	Dolochar + Indian Coal	Dolochar	59,400	In plant generation	---	through covered conveyers
		Indian Coal	44,550	SECL Chhattisgarh / MCL Odisha	~ 500 Kms.	By rail & road (covered trucks)
OR						
b)	Dolochar + Imported Coal	Dolochar	59,400	In plant generation	---	---
		Imported Coal	28,512	Indonesia / South Africa / Australia	~ 600 Kms. (from Vizag Port)	Through sea route, rail route & by road (covered trucks)
5.	For Ferro Alloys (2 x 9 MVA)					
5 (i)	For Ferro Silicon – 14,000 TPA					
a)	Quartz		21,280	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (covered trucks)
b)	LAM coke		7,840	Andhra Pradesh	~ 500 Kms.	By road

S.No.	Raw Material	Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
					(covered trucks)
c)	MS Scrap / Mill scales	490	In-house Generation	---	By road (covered trucks)
d)	Electrode paste	280	Maharashtra / West Bengal	~ 300 Kms.	By road (covered trucks)
e)	Bagfilter dust	532	Own generation	---	---
5 (ii)	For Ferro Manganese – 50,400 TPA				
a)	Manganese Ore	1,14,660	MOIL / OMC	~ 500 Kms.	By road (covered trucks)
b)	LAM coke	18,396	Andhra Pradesh	~ 500 Kms.	By road (covered trucks)
c)	Dolomite	8,568	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (covered trucks)
d)	MS Scrap / Mill scales	7,560	Inhouse Generation	---	By road (covered trucks)
e)	Electrode Paste	655	Maharashtra / West Bengal	~ 300 Kms.	By road (covered trucks)
f)	Bagfilter dust	2,520	Own generation	---	---
5 (iii)	For Silico Manganese – 28,800 TPA				
a)	Manganese Ore	46,944	MOIL / OMC	~ 500 Kms.	By Rail & Road (covered trucks)
b)	LAM Coke	10,800	Andhra Pradesh	~ 500 Kms.	By road (covered trucks)
c)	FeMn. Slag	30,472	In house generation	---	----
d)	Dolomite	6,480	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
e)	Electrode paste	576	Maharashtra / West Bengal	~ 300 Kms.	By road (covered trucks)
f)	Quartz	6,912	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (covered trucks)
g)	Bagfilter dust	432	Own 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 (covered Trucks)
b)	LAM Coke	9,900	Andhra Pradesh	~ 500 Kms.	By road (covered trucks)
c)	Quartz	5,250	Chhattisgarh /	~ 500 Kms.	By road

S.No.	Raw Material	Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
			Andhra Pradesh		(covered trucks)
d)	MS Scrap / Mill Scale	4,500	Inhouse Generation	---	By road (covered trucks)
e)	Magnetite / Bauxite	5,070	Chhattisgarh / Maharashtra	~ 500 Kms.	By road (covered trucks)
f)	Electrode Paste	900	Maharashtra / West Bengal	~ 300 Kms.	By road (covered trucks)
g)	Bagfilter dust	1,920	Own generation	---	---
5 (v)	<i>For Pig Iron (54,400 TPA)</i>				
a)	Iron Ore / Sinter	74,340	Barbil, Odisha NMDC, Chhattisgarh	~ 500 Kms.	By Road (Covered trucks)
b)	LAM Coke	24,444	Chhattisgarh / Bihar Imported from Australia, China	~ 100 Kms. ~ 480 Kms. (from Vizag Port)	By Road (Covered trucks) From Vizag Port by Road (Covered Trucks)
c)	Lime stone	6,300	Chhattisgarh	~ 300 Kms.	By Road (Covered trucks)
d)	Quartz	3,024	Chhattisgarh / Andhra Pradesh	100 – 300 Kms.	By Road (Covered trucks)
e)	Bagfilter dust	1,512	Own generation	---	---

1.4 MANUFACTURING PROCESS

1.4.1 Manufacturing of Sponge Iron (DRI)

The Direct Reduced Iron (DRI) plant will comprise of **2 x 350 TPD** & **1 x 200 TPD** kilns and related accessories including Waste Heat Recovery power generating unit. Refractory lined rotary kilns will be used for reduction of iron ore in solid state.

A central Burner located at the discharge end will be used for initial heating of the kiln.

Iron ore will be continuously fed into the kiln along with coal which has dual role of fuel as well as reductant. Dolomite will be added to scavenge the sulphur from the coal. A number of air tubes will be provided along the length of the kiln. The desired temperature profile will be maintained by controlling the volume of the combustion air through these tubes. The Carbon monoxide generated due to the combustion of coal, reduces the iron ore and converts it into sponge iron. The rotary kiln is primarily divided into two zones viz. the pre

heating zone and the reduction zone. The preheating zone extends over 30 to 50 % of the length of the kiln and in this the moisture in the charge will be driven off and the volatile matter in the coal will be burnt with the combustion air supplied through the air tubes. Heat from the combustion raises the temperature of the lining and the bed surface. As the kiln rotates, the lining transfers the heat to the charge. Charge material, pre-heated to about 1000⁰C enters the reduction zone. Temperature of the order of 1050⁰C will be maintained in the reduction zone, which is the appropriate temperature for solid state reduction of iron oxide to metallic iron.

This hot material will be transferred to Heat exchanger. In Heat exchanger the material will be cooled to 160⁰C. The cooler discharge material consists of sponge iron lumps, sponge iron fines and char. Magnetic and non-magnetic material will be separated through magnetic separators and stored in separate bins. The hot flue gases will be taken to a Waste Heat Recovery Boilers and after heat recovery they will be treated in high efficiency ESP and discharged into the atmosphere through stack whose height will be in accordance with CPCB norms.

1.4.2 Steel Melting Shop

It is proposed to install **3 x 15 T** Induction Furnace along with LRF to produce Hot Billets / MS Billets / Ingots of 148500 TPA. 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). Either the Hot Billets produced from LRF will be directly sent to Rolling Mill without using Re-heating Furnace through Hot charging method (or) MS Billets / MS Ingots will be sent to Re-heating Furnace to reheat the Billets and then sent to Rolling Mill to manufacture TMT bars / Structural Steels.

1.4.3 Manufacturing of Rolled products through Rolling Mill

The Hot Billets produced from Induction Furnaces will be directly sent to Rolling Mill to produce Rolled Products (OR) Hot Billets will be cooled and stored will be sent to reheating furnaces for the heating and will be sent to Rolling Mill. Furnace will be heated with LDO /

LSHS. A Rolling mill will be installed in the proposed expansion to produce 1,65,000 TPA of TMT Bars / Structural Steels.

1.4.4 Power Generation

Through WHRB Boiler

It is proposed to install 20 MW WHRB based power plant in the expansion project in addition to the existing 8 MW WHRB to meet the power requirement for various processes of integrated plant including auxiliaries of power plant. The gases after heat recovery will pass through ESP and then discharged through chimneys into the atmosphere for effective dispersion of emissions into the atmosphere through stacks of adequate height.

Through AFBC Boiler

It is proposed to install 10 MW FBC based power plant in the expansion project. Coal (Imported / Indian) along with dolomite will be used as fuel in AFBC Boiler to generate 10.0 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.

1.4.5 Submerged Electric Arc Furnaces

Submerged Electric Arc Furnace of 2x9 MVA will be setup in the proposed plant. Ferro manganese, silicon-manganese will be produced using manganese ore as main raw material, Ferro silicon will be produced using Quartz as main raw material as main raw material in sub-merged arc furnaces using reducer (Coke) under high voltage. Pig Iron will be also produced from SEAF using iron ore, dolomite as raw material. Flue gases will be extracted through 4th hole and then treated in bag filters.

1.5 Water Requirement

- Water required in the existing plant is **450 KLD** and same being sourced from Ground water. Water permission for existing plant is obtained vide NOC no. **CGWA/NOC/IND/REN/1/2022/6665** and same is valid till **23/01/2024**.
- Water required for the proposed expansion project will be **1,360 KLD** and sourced from anicut on Kelo River (which is at a distance of 5.7 Kms. from the project site).
- Air cooled condensers will be provided for proposed Power Plant.

- Total water requirement after the proposed expansion will be **1,810 KLD**.
- Water drawl permission for expansion proposal from Water Resource Department, Chhattisgarh will be obtained.

Break Up of Water Consumption (Existing & Proposed)

S.No.	Unit	Quantity in KLD		
		Existing Plant	Proposed Expansion	Total after Expansion
1.	DRI Kilns	100	300	400
2.	Induction Furnace	30	100	130
3.	Rolling Millwith RHF	50	150	200
4.	Ferro Alloy Plant	0	60	60
5.	Power Plant (WHRB & AFBC)	260	720	980
6.	Brick Manufacturing plant	0	10	10
7.	Domestic	10	20	30
	Total	450	1,360	1,810

1.6 Waste Water Generation

Existing

- There will be no effluent discharge in the Sponge Iron unit as closed circuit cooling system will be adopted.
- The wastewater generated from Induction Furnaces, Rolling Mill units will be sent to CMB followed by RO 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.
- Sanitary wastewater, which is being treated in Septic tank followed by Soak pit.
- Zero liquid effluent discharge is being maintained in the existing plant.

Proposed

- There will be no effluent discharge in the Sponge Iron unit as closed circuit cooling system will be adopted.
- The wastewater generated from Induction Furnaces, Rolling Mill units will be sent to CMB followed by RO and after ensuring compliance with SPCB norms, it will be utilized for dust suppression, ash conditioning and for greenbelt development.

- Air Cooled condensers will be provided in the power plant, which will be reduce the water consumption significantly. Hence wastewater generation will also be minimized.
- Effluent from power plant will be treated in ETP and after ensuring compliance with SPCB norms, it will be utilized for dust suppression, Ash conditioning and for greenbelt development.
- During monsoon period, the treated wastewater will be utilized as makeup water for Rolling Mill.
- Sanitary waste water will be treated in STP and after ensuring compliance with the norms it will be utilized for greenbelt development.
- Garland drains will be provided around all the raw material stacking areas.
- Zero liquid effluent discharge practice will be continued in the proposed expansion also.

BREAKUP OF WASTE WATER GENERATION

S.No.	Source	Generation (KLD)		
		Existing plant	Proposed Expansion	After Proposed Expansion
1.	DRI Kilns	---	---	---
2.	Induction Furnaces	2	5	7
3.	Rolling Mill	3	9	12
4.	Ferro Alloys Unit	---	4	4
5.	Brick manufacturing plant	---	---	---
6.	Power Plant (WHRB + FBC)			
	a) Cooling Tower blowdown	26	87	113
	b) Boilers blowdown	22	73	95
	c) D.M. plant regeneration water	35	114	149
7.	Sanitary Wastewater	8	16	24
	Total	96	308	404

1.7 Wastewater Characteristics

The following are the Characteristics of waste water

CHARACTERISTICS OF WASTEWATER

PARAMETER	CONCENTRATION			
	DM plant regeneration	Boiler blowdown	Cooling Tower blowdown	Sanitary waste water
pH	4 – 10	9.5 – 10.5	7.0 – 8.0	7.0 – 8.5
BOD (mg/l)	--	--	--	200 – 250
COD (mg/l)	--	--	--	300 – 400

TDS (mg/l)	5000 -6000	1000	1000	800 – 900
Oil & Grease (mg/l)	--	10	--	--

2.0 DESCRIPTION OF ENVIRONMENT

Base line data has been collected on ambient air quality, water quality, noise levels, flora and fauna and socio-economic details of people within 10 km radius of the plant.

2.1 Ambient air quality

Ambient air quality was monitored for PM_{2.5}, PM₁₀, SO₂, NO_x & CO at 8 stations including project site during 1st December 2022 To 28th February 2023. The following are the concentrations of various parameters at the monitoring stations:

AAQ DATA SUMMARY

S.No.	Parameter	Concentration (in µg/m ³)	Standard as per NAAQS (in µg/m ³)
1.	PM _{2.5}	25.1 to 47.1	60
2.	PM ₁₀	36.6 to 79.4	100
3.	SO ₂	6.6 to 22.3	80
4.	NO _x	6.9 to 34.2	80
5.	CO	365 to 1355	2000

2.2 Water Quality

2.2.1 Surface Water Quality

Two samples (Upstream and Downstream) from Kelo River and one sample from Banjari 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 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 day time & Night time. The equivalent day-night noise levels in the study zone are ranging from **48.73 dBA to 68.89 dBA**.

3.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

3.1 Prediction of impacts on air quality

The likely emissions from the proposed project are PM₁₀, SO₂, NO_x & CO. The predictions of Ground level concentrations have been carried out using Industrial Source Complex (ISC-3) model. Meteorological data such as wind direction, wind speed, max. and min. temperatures collected at the site have been used as input data to run the model.

NET RESULTANT MAXIMUM CONCENTRATIONS DUE TO PROPOSED EXPANSION

Item	PM ₁₀ (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)	CO (µg/m ³)
Maximum baseline conc. in the study area	47.1	79.4	22.3	34.2
Maximum predicted incremental rise in concentration due to expansion project	0.29	0.49	4.15	2.78
Maximum predicted incremental rise in concentration due to Vehicular Emissions from the proposed expansion project	0.27	0.47	---	3.51
Net resultant concentrations during operation of the plant	47.66	80.36	26.45	40.49
National Ambient Air Quality Standards	100	80	80	2000
The net resultant Ground level concentrations during operation of the expansion project are within the NAAQS. Hence there will not be any adverse impact on air environment due to the proposed expansion 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. **11.5 Ha. (28.4 Acres)** of extensive greenbelt will be developed (inclusive of existing) 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 expansion project.

3.3 Prediction of impacts on Water Environment

- There will be no wastewater discharge in the DRI Unit, Induction Furnace Unit, Ferro Alloys as closed circuit cooling system will be adopted.
- Effluent from Rolling mill will be sent to oil separator followed settling tank and will be recycled through closed circuit cooling system.
- Effluent from power plant will be treated in ETP and after ensuring compliance with CECB norms, it will be utilized for dust suppression, ash conditioning and for greenbelt development.
- 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 practice will be continued in the proposed expansion also.
- 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.
- Rain water harvesting pits have been proposed to recharge the precious ground water in consultation with CGWB.

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. **11.5 Ha. (28.4 Acres)** of extensive greenbelt will be developed (inclusive of existing) as per guidelines. Hence, there will not be any adverse impact on land environment due to the proposed expansion project.

3.5 Socio - Economic Environment

There will be further upliftment in Socio Economic status of the people in the area. Hence, there will be further development of the area due to the proposed expansion project.

Due to this the economic conditions, the educational and medical standards of the people living in the study area will certainly move upwards which will result in overall economic development, improvement in general aesthetic environment and increase in business opportunities.

4.0 ENVIRONMENTAL MONITORING PROGRAMME

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

Table no. 4.1: MONITORING SCHEDULE FOR ENVIRONMENTAL PARAMETERS

S.No.	Particulars	Frequency of Monitoring	Duration of sampling	Parameters required to be monitored
1. Water & Waste water quality				
A.	Water quality in the area	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	As per EPA Rules, 1996
C.	STP Inlet & Outlet	Once in a month	Composite Sampling	As per EPA Rules 1996
2. Air Quality				
A.	Stack Monitoring	Online monitors (all stacks) Once in a month	---	PM, SO ₂ , NO _x , CO PM, SO ₂ , NO _x , CO
B.	Ambient Air quality	Continuous Quarterly Once	Continuous 24 hours	PM ₁₀ , SO ₂ & NO _x PM _{2.5} , PM ₁₀ , SO ₂ , NO _x & CO
C.	Fugitive emissions	Quarterly Once	8 hours	PM
3. Meteorological Data				
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	Continuous for 24 hours with 1 hour	Noise levels

S.No.	Particulars	Frequency of Monitoring	Duration of sampling interval	Parameters required to be monitored

5.0 ADDITIONAL STUDIES

No rehabilitation and resettlement is required as the additional land shown is not having any habitations.

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. Separate budget will be allocated for Social welfare & developmental activities to develop the surrounding villages.

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 SYSTEM PROPOSED

S.No.	Source	Control Equipment	Maximum emission at the outlet
1.	DRI kilns with WHRB's	Electro Static Precipitators (ESP)	PM < 30 mg/Nm ³
2.	Induction Furnaces	Fume Extraction system with bag filters	PM < 30 mg/Nm ³
3.	Re-heating furnaces attached to Rolling Mill	Stack	PM < 30 mg/Nm ³
4.	Submerged Electric Arc Furnaces	4 th Hole Fume Extraction system with bag filters	PM < 30 mg/Nm ³
5.	FBC Boiler	Electro Static Precipitator	PM < 30 mg/Nm ³
		Automated lime dosing	SOx < 100 mg/Nm ³
		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 Fume extraction system with bagfilters, Dry fog system, dust suppressionsystem, Mechanical sweepers, covered conveyers, etc. will also be provided in the plant premises.

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 in the DRI Unit, Induction Furnace Unit, Ferro Alloys as closed circuit cooling system will be adopted.
- Effluent from Rolling mill will be sent to oil separator followed settling tank and will be recycled through closed circuit cooling system.
- Effluent from power plant will be treated in ETP and after ensuring compliance with CECB norms, it will be utilized for dust suppression, ash conditioning and for greenbelt development.
- 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 practice will be continued in the proposed expansion also.
- 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.
- Rain water harvesting pits have been proposed to recharge the precious ground water in consultation with CGWB.

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

TREATED EFFLUENT DISPOSAL

Total Effluent generation after the expansion project	:	404 m³/day
Effluent quantity to be used for ash conditioning	:	44 m ³ /day
Effluent to be used for dust suppression in CHP	:	67 m ³ /day
Effluent to be used for Vehicle washing, Toilet flushing	:	9 m ³ /day
Effluent to be used for Greenbelt development	:	284 m ³ /day

28.4 Acres (11.5 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. Treated effluent which is proposed to be utilized for greenbelt during non-monsoon period, will be used as make up water for Rolling Mill, during monsoon.

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 expansion project.

TABLE NO. 7.2: SOLID WASTE GENERATION & ITS DISPOSAL

S.No.	Waste	Quantity (TPA)			Method of disposal
		Existing	Proposed	After expansion	
1.	Ash from DRI	21,600	53,460	75,060	Is being given to near-by brick manufacturing units and now it will be utilised in the proposed brick manufacturing unit.
2.	Dolochar	24,000	59,400	83,400	Is being utilized in the existing FBC boiler based power plant. The same practice will be continued after expansion also.
3.	Kiln Accretion Slag	1,080	2,673	3,753	Is being given to road contractors for road construction & given to brick manufacturer and after proposed expansion will be utilised in the proposed brick manufacturing unit.
4.	Wet Scraper Sludge	4,800	11,880	16,680	Is being given to road contractors for road construction & given to brick manufacturer and after proposed expansion will be utilised in the proposed brick manufacturing unit.
5.	SMS Slag	9,000	14,850	23,850	Slag from SMS will be crushed and iron will be recovered & then remaining non-magnetic material being inert by nature will be given to road contractors for road laying and will also be utilised in proposed brick manufacturing unit.
6.	Mill Scales	270	495	765	Will be used in proposed Ferro Alloys plant captively
7.	End cuttings	2,295	4,951	7,246	Will be reused in SMS.
8.	Ash from Power Plant	21,030	55,688	76,718	Is being given to near-by brick manufacturing units and now it will be utilised in the proposed brick manufacturing unit.
9.	Slag from FeMn	---	30,472	30,472	Will be reused in manufacture of SiMn as it contains high SiO ₂ and Silicon.
10.	Slag from FeSi	---	3,371	3,371	Will be given to Cast iron foundries
11.	Slag from SiMn	---	25,654	25,654	will be used for Road construction / will be given to slag cement manufacturing
12.	Slag from FeCr	---	17,424	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.

S.No.	Waste	Quantity (TPA)			Method of disposal
		Existing	Proposed	After expansion	
					If Chrome content exceeds the permissible limits, it will be sent to nearest TSDF.
13.	Slag from Pig Iron	---	21,672	21,672	Will be given to slag based cement manufacturing units

7.5 Greenbelt Development

- Out of total **85.25 Ac. (34.5 Ha.)** of land, **28.4 Acres (11.5 Ha.)** i.e. 33.3% of land is envisaged for greenbelt.
- In the Existing plant around **18,500 nos.** of trees are exists in 18.7 Acres of area.
- It is proposed to plant another **10,250 nos.** of Trees as part of expansion proposal.
- It has been proposed to develop minimum of 10 meters wide green belt along the periphery inside the factory premises.
- 2500 nos. of plants will be planted per ha. as per CPCB norms.

7.6 Cost for Environment Protection

Budget allocated for Environment Management Plan : Rs. 40.6 Crores
Recurring Cost per annum for Environmental protection : Rs. 7.76 Crores

7.7 Implementation of CREP Recommendations

All the CREP recommendations will be implemented & followed strictly.

- Continuous stack monitoring system is proposed for stack attached to WHR Boiler.
- 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.
- Additional Rain water harvesting pits will be constructed outside the plant premises in consultation with CGWB.