

**SUMMARY ON  
ENVIRONMENTAL IMPACT ASSESSMENT  
REPORT**

of

**SUN STEEL & POWER PVT.LTD**

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

[Sponge iron from 60,000TPA to 2,40,000 TPA, WHRB based Power Plant from 4 MW to 16 MW, AFBCbased Power Plant from 8 MW to 14MW, SEAF 1x4 MVA (Cast Iron -15,000 TPA), SEAFs 2x9 MVA (FeSi – 14,000 TPA / FeMn-50,400 TPA / SiMn-28,800 TPA / FeCr-30,000 TPA.) Establishment of New Induction Furnaces along with CCM&LRF to produce 1,80,000 TPA of Hot Billets / Billets / Ingots, Rolling Mill to produce 90,000TPA of TMT bars / Wire Rod through 85% Hot charging, Gasifier of 810 Nm<sup>3</sup>/hr for Rolling Mill, New Briquetting unit 200Kg/ Hr, New Fly Ash Brick Manufacturing unit of 40,000 Bricks/ day]

at

**Bade Gumda Village, Garghoda Tehsil,  
Raigarh District, Chhattisgarh**

Submitted to

**CHHATTISGARH ENVIRONMENT CONSERVATION BOARD**

## 1.0 PROJECT DESCRIPTION

**Sun Steel & Power Pvt. Ltd.** is an existing plant located at Bade Gumda Village, Garghoda Tehsil, Raigarh District, Chhattisgarh. Environmental Clearance obtained from MoEF, New Delhi vide No. J-11011/448/2007/ IA II (I) dated 13<sup>th</sup> May 2009.

The existing plant have obtained Consent to Operate from the CECB for few units vide No. **7783/TS/CECB/ 2022** dated **01.02.2022** which is valid upto **30.11.2023** & Recently CTE obtained for **Cast Iron 1x4 MVA Submerged Arc Furnace - 15,000 TPA** vide no. **7397/TS/CECB/2023**.

### Proposed Project

Now it is proposed to go for expansion of existing plant along with new facilities i.e. Expansion of Steel Plant– DRI Kilns (Sponge Iron from 60,000 TPA to 2,40,000 TPA), WHRB based Power Plant from 4 MW to 16 MW, AFBC based Power Plant from 8 MW to 14 MW, SEAF 1x4 MVA (Cast Iron -15,000 TPA), SEAFs 2x9 MVA (FeSi – 14,000 TPA / FeMn-50,400 TPA / SiMn-28,800 TPA / FeCr-30,000 TPA.) Establishment of New Induction Furnaces along with CCM & LRF (Hot Billets / Billets / Ingots 1,80,000 TPA), Rolling Mill (TMT bars / Wire Rods) (85 % Hot charging with Hot Billets and remaining 15% through RHF with LDO as fuel – 90,000 TPA), Gasifier for Rolling Mill (810 Nm<sup>3</sup>/hr), New Briquetting unit 200Kg/ Hr, New Brick Manufacturing unit 40,000 Bricks/ day.

Existing plant is located over an extent of **15.38 Ha. (38 Acres)** of land & the proposed expansion will be taken up in the existing plant premises & partly in additional land of **2.056 Ha. (5.08 Acres)** which is adjacent to the existing plant. Total land after proposed expansion project will be **17.435 Ha. (43.08 acres)**.

Estimated Project Cost for the proposed expansion will be **Rs. 530 Crores**.

As per the Ministry of Environment, Forests & Climate Change, New Delhi, EIA notification dated 14<sup>th</sup> September, 2006 & its subsequent amendments, all Primary metallurgical processing industries are listed under S. No. 3(a) Metallurgical industries (ferrous & non ferrous), 1(d) Thermal Power Plants under Category 'A'.

In order, to obtain Environmental Clearance for the proposed Steel plant, Form-I (Part A, B), proposed TOR along with Pre-Feasibility Report were submitted to the Honourable Ministry of Environment, Forests & Climate Change (MoEF&CC), New Delhi on 29/06/2023 vide Proposal No. IA/CG/IND1/434750/2023. Subsequently Standard TOR letter was issued vide letter No . **IA-J-11011/253/2023-IA-II (IND-I) dated 21<sup>st</sup> August 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**

<b>S.No.</b>	<b>Salient Features / Environmental features</b>	<b>Distance w.r.t. site / Remarks</b>
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	There are no notified National Park/ Wild life sanctuary / Biosphere reserve / Tiger Reserve/ migratory routes for Birds with in 10 Km. radius

S.No.	Salient Features / Environmental features	Distance w.r.t. site / Remarks
	Birds	of the plant. <b>However, movement of Elephants is observed within 10 Kms. radius of the plant, as per the secondary source. Conservation plan is being prepared &amp; recommendations of the PCCF will be followed.</b>
3.	Historical places / Places of Tourist importance / Archeological sites	Nil
4.	Critically polluted area as per MoEF&CC Office Memorandum dated 13 <sup>th</sup> January 2010	None And also the Plant area does not fall in the areas given in Hon'ble NGT order issued vide dated 10 <sup>th</sup> July 2019.
5.	Defense Installations	Nil
6.	Nearest village	Bankheta Village – 0.28 Kms (N) Bade Gumda (V) – 2.2 Kms. (N)
7.	Forests	<b>Forests :-</b> <b>Reserved Forests :</b> Suhai RF -1.0 Kms (S), Samaruma RF -6.0 Kms (SE), Marpahar RF -6.3 Kms (NW), Rabodongri RF -8.8 Kms (N), Lamikhair RF -9.0 Kms (W), <b>Protected Forests :</b> Nanagarh PF -2.0 Kms (NW), Khatangdi PF -2.0 Kms (W), Kurke PF -2.2 Kms (NNE), Chhindpani PF -2.3 Kms (W), Unnamed PF -3.5 Kms (SE), Bhengari PF -6.0 Kms (SW), Unnamed PF -7.0 Kms (N), Panikhet PF -7.5 Kms (SSW). are existing within study area.
8.	Water body	Kurket River Adjacent plant site (E) Bankheta Dam – 0.01 Kms. (NNE) Khalamura Nala – 0.55 Kms (SE) Kesh Nala – 4.45 Kms (SW) Barkha Nala – 1.15 Kms (W) Bhendra Nala – 7.48 Kms (E) Kosam Nala – 6.8 Kms (SSE) Tenda Nala – 6.73 Kms (W) Upka Nala – 2.0 Kms (N) Benengari Nala – 7.9 Kms (SW) Bodojuri Nala – 7.5 Kms (SSE) Kasala Nala – 5.2 Kms (NNE)

S.No.	Salient Features / Environmental features	Distance w.r.t. site / Remarks
		Ranal Nala – 8.8 Kms (SE) and other unnamed small ponds are existing within study area. A seasonal stream is passing through the site in NW corner of the Plant Site.
9.	Nearest Highway	State Highway # 1 –5.2 kms (E)
10.	Nearest Railway Station	Gharghoda RS – 2.5Kms.(NE)
11.	Nearest Port facility	Nil within 10 Km. Radius.
12.	Nearest Airport	Nil within 10 Kms. Radius [O.P Jindal Airport – 25.0 Kms. , Jharsuguda Airport 81kms]
13.	Nearest Interstate Boundary	Nil within 10 Km. Radius. (Odisha – 27 Kms.)
14.	Seismic zone as per IS-1893	Project area falls in Seismicity zone – II MSL of the Project area – 260 m to 270 m
15.	R & R	There is no rehabilitation and resettlement issue, as there are no habitations present in the site area.
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.	Unit (Product)	Total Capacity as per the CTE dated 17.10.2005 & E.C.	Implementation status as per the current CTO dated 01/02/2022	Proposed Expansion	Total production capacity After Present Expansion
1.	DRI Kiln (Sponge Iron)	60,000 TPA (2 x 100 TPD)	60,000 TPA (2 x 100 TPD)	1,80,000 TPA (3 x 200 TPD)	2,40,000 TPA (3 x 200 TPD + 2 x 100 TPD )
2.	Induction furnace with LRF & CCM (Hot Billets / MS billets)	---	---	1,80,000 TPA (4 x 15 MT /Heat)	1,80,000 TPA
3.	Rolling Mill (Wire Rods / TMT bars/ Structural Steel)	---	---	90,000 TPA (1x300 TPD )	90,000 TPA

S. No.	Unit (Product)	Total Capacity as per the CTE dated 17.10.2005 & E.C.	Implementation status as per the current CTO dated 01/02/2022	Proposed Expansion	Total production capacity After Present Expansion
4.	Gasifier	---	---	810 NM <sup>3</sup> /Hr	810 NM <sup>3</sup> /Hr
5.	Ferro Alloy unit (through SEAF) (FeSi / FeMn / SiMn / FeCr)	1 x 9 (12,000 TPA. FeSi / FeMn / SiMn / FeCr.)	Not Implemented	2 x 9 MVA (FeSi – 14,000 TPA / FeMn- 50,400 TPA / SiMn-28,800 TPA / FeCr- 30,000 TPA)	2 x 9 MVA (FeSi – 14,000 TPA / FeMn- 50,400 TPA / SiMn-28,800 TPA / FeCr- 30,000 TPA)
6.	Cast Iron Unit thorough SEAF (Cast Iron) *	---	1x4 MVA*	15,000 TPA	
7.	Power generation through WHRB of DRI	4 MW	4 MW	12 MW	16 MW
8.	Power Plant through CFBC Boiler/AFBC Boiler	8 MW	8 MW	06 MW	14 MW
9.	Fly Ash Brick making unit	---	---	40,000 Bricks/Day	40,000 Bricks/Day
10.	Briquetting Unit	---	---	200 kg/ Hr	200 kg/ Hr

Note:

\*Recently obtained CTE for Proposed installation of the Cast Iron Plant through setting up of 1x4 MVA Submerged Arc Furnace for production of Cast Iron (15000 TPA) vide CTE no. 7397/TS/CECB/2023 dated

20.01.2023 subject to Industry shall not use ore as raw material for production of cast iron. Industry shall use iron oxide waste like mill scale, jams of rolling mill, Iron bearing materials reclaimed from sponge iron kiln waste, m.s. scrap, iron slag etc.

### 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 (in Kms.)	Mode of Transport
1.	<b>For DRI Kilns (Sponge Iron) – 1,80,000 TPA</b>				
a)	Pellets (100 %)	2,61,000	Odisha, Chhattisgarh	---	Through covered conveyers

	or				
	Iron ore (100%)	2,88,000	Odisha, Chhattisgarh, Jharkhand & Imported	~ 500 Kms.	By rail & road (covered trucks)
b)	Coal	Indian	2,34,000	SECL Chhattisgarh /MCL Odisha	~ 500 Kms. By rail & road (covered trucks)
	(or)				
		Imported	1,49,760	Indonesia / South Africa / Australia	~ 600 Kms. (from Vizag Port) Through sea route, rail route & by road (covered trucks)
c)	Dolomite		9,000	Maharashtra	~ 100 Kms. By road (covered trucks)
2.	<b>For Steel Melting Shop (Billets/ Ingots/Hot Billets) – 1,80,000 TPA</b>				
a)	Sponge Iron		1,82,000	Inhouse Generation	--- Through covered conveyers
b)	MS Scrap / Pig Iron		27,000	Odisha, Chhattisgarh	~ 100 Kms. By road (covered trucks)
c)	Ferro alloys		9,000	Inhouse Generation	--- By road (covered trucks)
3.	<b>For Rolling Mill through Hot charging (Rolled Products) – 90,000TPA</b>				
a)	Hot Billets /Billets/Ingots		94,410	Inhouse Generation	--- ---
b)	LDO / LSHS		446 KL/annum	Nearby IOCL Depot	~ 100 Kms. By road (through Tankers)
c)	Coal for gasifier (producer Gas) 810 Nm <sup>3</sup> /Hr	Indian	2,430	SECL, Chhattisgarh /MCL Odisha	~ 500 Kms. By rail & road (covered trucks)
		Imported	1,555	Indonesia / South Africa / Australia	~ 600 Kms. (from Vizag Port) Through sea route, rail route & by road
4.	<b>For CFBC Boiler [Power Generation 6 MW]</b>				
a)	Dolochar + Indian Coal	Dolochar	36,000	Inhouse Generation	--- through covered conveyers
		Indian Coal	14,400	SECL Chhattisgarh /MCL Odisha	~ 500 Kms. By rail & road (covered trucks)
	<b>OR</b>				
b)	Dolochar + Imported Coal	Dolochar	36,000	Inhouse Generation	--- through covered conveyers
		Imported Coal	9,216	Indonesia / South Africa / Australia	~ 600 Kms. (from Vizag Port) Through sea route, rail route & by road (covered trucks)
5.	<b>For Ferro Alloys (2x 9 MVA)</b>				
5 (i)	<i>For Ferro Silicon – 14,000 TPA</i>				
a)	Quartz		21,280	Chhattisgarh /	~ 500 Kms. By road

			Andhra Pradesh		(covered trucks)
b)	Mill Scale	3,290	Andhra Pradesh	~ 500 Kms.	By road (covered trucks)
c)	M.S. Scrap	490	Inhouse Generation	---	By road (covered trucks)
d)	LAM Coke	7,840	Chhattisgarh / Bihar Imported from Australia, China	~ 100 Kms. ~ 480 Kms. (from Vizag Port)	By Road (Covered trucks) From Vizag Port by Road(Covered Trucks)
e)	Electrode paste	280	Inhouse Generation	---	---
5 (ii)	<i>For Ferro Manganese – 50,400 TPA</i>				
a)	Manganese Ore	1,14,660	Odisha Madhya Pradesh & Chhattisgarh	~ 500 Kms.	By Rail & Road (covered trucks)
b)	LAM Coke	18,396	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)	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)	Briquetted Bag filter dust	2,520	In house generation	---	---
5 (iii)	<i>For Silico Manganese – 28,800 TPA</i>				
a)	Manganese Ore	46,944	MOIL / OMC	~ 500 Kms.	By Rail & Road (covered trucks)
b)	FeMn Slag	30,472	In house generation	---	----
c)	LAM Coke	10,800	Chhattisgarh / Bihar Imported from Australia, China	~ 100 Kms. ~ 480 Kms. (from Vizag Port)	By Road (Covered trucks) From Vizag Port by Road(Covered Trucks)
d)	Dolomite	6,480	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (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)	Briquetted Bag filter dust	432	In house generation	---	---
5 (iv)	<i>For Ferro Chrome – 30,000 TPA</i>				

a)	Chrome Ore	60,000	Sukinda, Odisha Import, South Africa	~ 500 Kms. ~ 600 Kms. (Vizag Port)	By road (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 / Andhra Pradesh	~ 500 Kms.	By road (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)	Briquetted Bag filter dust	1,920	Own generation	---	---

## 1.4 MANUFACTURING PROCESS

### 1.4.1 Manufacturing of Sponge Iron (DRI)

The Direct Reduced Iron (DRI) plant will comprise of **3 x 200TPD** 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 1000<sup>0</sup>C enters the reduction zone. Temperature of the order of 1050<sup>0</sup>C 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<sup>0</sup>C. 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 **4 x 15 T** Induction Furnace along with LRF to produce Hot Billets / MS Billets / Ingots of 180,000 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 90,000 TPA of TMT Bars / Structural Steels.

#### **1.4.4 Power Generation**

##### **Through WHRB Boiler**

It is proposed to install 12 MW WHRB & 1 x 6 MW FBC based power plant in the proposed expansion project to meet the power requirement for various processes of steel 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**

Coal (Imported / Indian) along with dolochar will be used as fuel in AFBC Boiler to generate 6.0 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 4<sup>th</sup> hole and then treated in bag filters.

#### **1.5 Water Requirement**

- Water required in the operating plant & CTE permitted unit is **341 KLD** and same being sourced from Kurkut River.
- Water required for the proposed expansion project will be **855 KLD** and same will be sourced from Kurkut River.
- Water cooled condensers in the existing plant will be converted to Air cooled condensers. In expansion project also Air cooled condensers will be provided.
- Total water requirement after the proposed expansion will be **1196 KLD**.
- Water drawl permission for expansion proposal will be obtained from water source Department of Chhattisgarh.

**Break Up of Water Consumption (Existing & Proposed)**

S.No.	Unit	Quantity in KLD			
		Existing Plant (under operation)	Recent CTE granted 1x4 MVA SEAF unit	Proposed Expansion	Total after Proposed Expansion
1.	DRI Kilns	60	---	180	240
2.	Induction Furnace	--	---	130	130
3.	Rolling Mill	---	---	80	80
4.	Gasifier	---	---	10	10
5.	Cast iron Unit (1 x 4.0 MVA)	---	26	---	26
6.	Ferro alloys unit	---	---	50	50
7.	Power Plant (WHRB&FBC)	240	---	360	600
8.	Briquetting Unit	---	---	10	10
9.	Brick Manufacturing plant	---	---	10	10
10.	Domestic	10	5	25	40
	<b>Total</b>	<b>310</b>	<b>31</b>	<b>855</b>	<b>1196</b>

**1.6 Waste Water Generation**

**Existing**

- There was no effluent discharge from the existing DRI Unit, as Closed circuit cooling system adopted.
- The wastewater generated from Power plant will be treated in ETP followed by RO plant. Treated effluent & RO rejects is being utilized for Dust suppression in CHP, for Ash Conditioning, for Greenbelt development.
- Sanitary wastewater, which was treated in Septic tank.
- Zero liquid effluent discharge was maintained in the existing plant.

**Proposed**

- There was no effluent discharge from the existing DRI Unit, as Closed circuit cooling system adopted.
- Effluent from SMS, Rolling mill, Ferro Alloy and power plant will be treated in ETP.
- The wastewater generated will be treated in ETP followed by RO plant. Treated effluent & RO rejects will be utilized for Dust suppression in CHP, for Ash Conditioning, Floor washing, Vehicle washing & for Greenbelt development.
- Phenolic discharge of PGP will be utilized in After Burning Chamber (ABC) of DRI kilns.

- Sanitary wastewater (32 KLD) generated from proposed expansion project will be treated in proposed STP and after treatment the treated sewage will be used for greenbelt development.
- There will not be any effluent discharge outside the premises.
- Air Cooled condensers will be provided in the power plant, which will reduce the water consumption significantly. Hence wastewater generation will also be minimized.
- During monsoon period, the treated wastewater will be utilized as makeup water for Rolling Mill.
- Garland drains will be provided around all the raw material stacking areas.
- No effluent will be let out of the plant premises. Zero effluent discharge will be implemented.

**BREAKUP OF WASTE WATER GENERATION**

S.No.	Source	Generation (KLD)			
		Existing Plant (under operation)	Recent CTE granted 1x4 MVA SEAF unit	Proposed Expansion	Total after Proposed Expansion
1.	DRI Kilns	---	---	---	---
2.	Induction Furnaces	---	---	10.0	10.0
3.	Rolling Mill	---	---	6.0	6.0
4.	Gasifier For RHF	---	---	2.0	2.0
5.	Ferro Alloys Unit	---	---	5.0	5.0
6.	Cast iron unit	---	---	2.0	2.0
7.	Brick manufacturing plant	---	---	---	---
8.	Briquetting Plant	---	---	---	---
9.	Power Plant	92		138	230
	a) Cooling Towerblowdown	30		42	72
	b) Boilers blowdown	37		58	95
	c) D.M. plant regeneration water	25		38	63
10.	Sanitary Wastewater	8.0	4.0	20	32
	<b>Total</b>	<b>100</b>	<b>4.0</b>	<b>183</b>	<b>287</b>

**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<sub>2.5</sub>, PM<sub>10</sub>, SO<sub>2</sub>, NO<sub>x</sub> & CO at 8 stations including project site during **1<sup>st</sup> March 2023 To 31<sup>st</sup> May 2023**. The following are the concentrations of various parameters at the monitoring stations:

**AAQ DATA SUMMARY**

S.No.	Parameter	Concentration (in µg/m <sup>3</sup> )	Standard as per NAAQS (in µg/m <sup>3</sup> )
1.	PM <sub>2.5</sub>	24.6 to 47.6	60
2.	PM <sub>10</sub>	51.3 to 79.7	100
3.	SO <sub>2</sub>	8.7 to 21.1	80
4.	NO <sub>x</sub>	8.4 to 29.5	80
5.	CO	398 to 804	2000

**2.2 Water Quality**

**2.2.1 Surface Water Quality**

Two samples (60m Upstream and 60m Downstream) from Kurket River 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 **48.91 dBA to 68.57 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<sub>10</sub>, SO<sub>2</sub>, NO<sub>x</sub> & 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 <sub>2.5</sub> (µg/m <sup>3</sup> )	PM <sub>10</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	NO <sub>x</sub> (µg/m <sup>3</sup> )	CO (µg/m <sup>3</sup> )
Maximum baseline conc. in the study area	47.6	79.7	21.1	29.5	804
Maximum predicted incremental rise in concentration due to expansion project	0.42	0.69	4.46	4.16	---
Maximum predicted incremental rise in concentration due to <b>Vehicular Emissions from the proposed expansion project</b>	0.14	0.23	---	1.80	1.15
<b>Net resultant concentrations during operation of the plant</b>	48.16	80.62	25.56	35.46	805.15
<b>National Ambient Air Quality Standards</b>	<b>60</b>	<b>100</b>	<b>80</b>	<b>80</b>	<b>2000</b>
<b>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.</b>					

### 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. **6.58 Ha. (16.26 Ac.)** 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 was no effluent discharge from the existing DRI Unit, as Closed circuit cooling system adopted.
- Effluent from SMS, Rolling mill, Ferro Alloy and power plant will be treated in ETP.
- The wastewater generated will be treated in ETP followed by RO plant. Treated effluent & RO rejects will be utilized for Dust suppression in CHP, for Ash Conditioning, Floor washing, Vehicle washing & for Greenbelt development.
- Phenolic discharge of PGP will be utilized in After Burning Chamber (ABC) of DRI kilns.
- Sanitary wastewater generated from proposed expansion project will be treated in proposed STP and after treatment the treated sewage will be used for greenbelt development.
- There will not be any effluent discharge outside the premises.
- Air Cooled condensers will be provided in the power plant, which will reduce the water consumption significantly. Hence wastewater generation will also be minimized.
- During monsoon period, the treated wastewater will be utilized as makeup water for Rolling Mill.
- Garland drains will be provided around all the raw material stacking areas.
- No effluent will be let out of the plant premises. Zero effluent discharge will be implemented.

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. **6.58 Ha. (16.26 Ac.)** 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:

#### MONITORING SCHEDULE FOR ENVIRONMENTAL PARAMETERS

S.No.	Particulars	Frequency of Monitoring	Duration of sampling	Parameters required to be monitored
<b>1. Water &amp; Waste water quality</b>				
A.	Water quality in the area	Quarterly Once including heavy metals	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
<b>2. Air Quality</b>				
A.	Stack Monitoring	Online monitors (all stacks) Once in a month	---	PM, SO <sub>2</sub> , NO <sub>x</sub> , CO PM, SO <sub>2</sub> , NO <sub>x</sub> , CO
B.	Ambient Air quality	Continuous  Quarterly Once	Continuous  24 hours	PM <sub>10</sub> , SO <sub>2</sub> & NO <sub>x</sub> PM <sub>2.5</sub> , PM <sub>10</sub> , SO <sub>2</sub> , NO <sub>x</sub> & CO
C.	Fugitive emissions	Quarterly Once	8 hours	PM
<b>3. Meteorological Data</b>				
A.	Meteorological data to be monitored at the plant	Daily	Continuous monitoring	Temperature, Relative Humidity, rainfall, wind direction & wind speed.
<b>4. Noise level monitoring</b>				

S.No.	Particulars	Frequency of Monitoring	Duration of sampling	Parameters required to be monitored
A.	Ambient Noise levels	Once in a month	Continuous for 24 hours with 1 hour interval	Noise levels

## 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. The expansion project creates direct employment to about 250 persons (skilled, semiskilled & unskilled) once the expansion comes to the operational stage and indirect employment of about 300 persons. 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	Emission at the outlet
1.	DRI kilns with WHRB's	Electro Static Precipitators (ESP) (High Performance rigid electrodes)	PM <30 mg/Nm <sup>3</sup>
2.	Induction Furnaces	Fume Extraction system with PTFE bag filters	PM < 30 mg/Nm <sup>3</sup>
3.	Re-heating furnaces attached to Rolling Mill	Stack	PM < 30 mg/Nm <sup>3</sup>
4.	Submerged Electric Arc Furnace	4 <sup>th</sup> Hole Fume Extraction system With bag filters	PM < 30 mg/Nm <sup>3</sup>
5.	FBC Boiler	Electro Static Precipitators (High Performance rigid electrodes)	PM < 30 mg/Nm <sup>3</sup>
		Limestone will be used as bed material and act as sulphur absorbent.	SOx < 100 mg/Nm <sup>3</sup>
		Combustion temperature will be around	NOx < 100 mg/Nm <sup>3</sup>

S.No.	Source	Control Equipment	Emission at the outlet
		800-850 <sup>0</sup> 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.	

**Note : Apart from the above Fume extraction system with bagfilters, dry fog system, dust suppression system, covered conveyers, water cannon spray, Wheel washing at entry and exit gates 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 was no effluent discharge from the existing DRI Unit, as Closed circuit cooling system adopted.
- Effluent from SMS, Rolling mill, Ferro Alloy and power plant will be treated in ETP.
- The wastewater generated will be treated in ETP followed by RO plant. Treated effluent & RO rejects will be utilized for Dust suppression in CHP, for Ash Conditioning, Floor washing, Vehicle washing & for Greenbelt development.
- Phenolic discharge of PGP will be utilized in After Burning Chamber (ABC) of DRI kilns.
- Sanitary wastewater (32 KLD) generated from proposed expansion project will be treated in proposed STP and after treatment the treated sewage will be used for greenbelt development.
- There will not be any effluent discharge outside the premises.

- Air Cooled condensers will be provided in the power plant, which will reduce the water consumption significantly. Hence wastewater generation will also be minimized.
- During monsoon period, the treated wastewater will be utilized as makeup water for Rolling Mill.
- Garland drains will be provided around all the raw material stacking areas.
- No effluent will be let out of the plant premises. Zero effluent discharge will be implemented.

#### **TREATED EFFLUENT DISPOSAL**

Effluent quantity to be used for ash conditioning	:	50 KLD
Effluent to be used for dust suppression in CHP	:	50 KLD
Effluent to be used for Floor washing, Vehicle washing	:	27 KLD
Effluent to be used for Greenbelt development	:	160 KLD

**6.58 Ha.(16.26 acres)** of greenbelt (inclusive of existing) will be developed by using the treated effluent. 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.

**SOLID WASTE GENERATION & ITS DISPOSAL**

S.No.	Waste	Quantity (TPA)			Proposed method of disposal
		Existing	Expansion	Total	
1.	Ash from DRI	10,800	32,400	43,200	Will be utilized in the proposed Brick Manufacturing Unit
2.	Dolochar	12,000	36,000	48,000	Will be used in proposes CFBC power plant as fuel.
3.	Kiln Accretion Slag	540	1,620	2,160	Will be utilized in the proposed Brick Manufacturing Unit
4.	Wet scrapper sludge	2,400	7,200	9,600	Will be utilized in the proposed Brick Manufacturing Unit
5.	SMS Slag	---	18,000	18,000	Slag from SMS will be crushed and iron will be recovered & then remaining non-magnetic material being inert by nature will be used in proposed Brick Manufacturing Unit
6.	End Cuttings from Rolling Mill	---	2,700	2,700	Will be reused in the SMS
7.	Mill scales from Rolling Mill	---	270	270	Mill scales will be recycled to Ferro alloys unit.
8.	Ash from Power Plant (Indian Coal + Dolochar)	37,440	28,080	65,520	Will be utilized in the proposed Brick Manufacturing Unit
9.	Slag from Cast iron unit	2,970	---	2970	Will be utilized in the proposed Brick Manufacturing Unit
10.	Slag from FeMn	---	30,472	30,472	Will be reused in manufacture of SiMn as it contains high SiO <sub>2</sub> and Silicon.
	(or)				
11.	Slag from FeSi	---	3,371	3,371	Will be given to Cast iron foundries
	(or)				
12.	Slag from SiMn	---	25,654	25,654	will be used for Road construction / will be given to slag cement manufacturing
	(or)				
13.	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

S.No.	Waste	Quantity (TPA)			Proposed method of disposal
		Existing	Expansion	Total	
					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.
14.	Dust from APCS	150	450	600	Will be utilized in the proposed Brick Manufacturing Unit

### 7.5 Greenbelt Development

- Out of total **17.435 Ha. (43.08 Ac.)** of land, **6.58 Ha. (16.25 Ac.)** i.e. **37.8 %** of land is envisaged for greenbelt.
- 8000 nos. of plants are exists till date.
- 5,000 nos. of plants will be planted in this Monsoon.
- Another 3,450 nos. of saplings will be planted as part of expansion.
- It has been proposed to develop 10-15 meters wide green belt along the periphery inside the factory premises.
- **20 m to 40 m wide Greenbelt is being / will be developed towards River side.**
- **50 m** wide green belt will be developed inside the plant premises towards the Bankheta Village.
- Lawns with shrubs will be developed in the 10 m width on either side of the Stream to prevent soil erosion. This ensures no adverse impact on Stream due to the proposed project.
- Greenbelt will be developed as per CPCB guidelines.
- 2500 plants will be planted per hectare as per CPCB norms.

### 7.6 Cost for Environment Protection

Budget allocated for Environment Management Plan : Rs. 47.5 Crores

Recurring Cost per annum for Environmental protection : Rs. 8.2 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.