SUMMARY ON

ENVIRONMENTAL IMPACT ASSESSMENT

REPORT

OF

Sunil Ispat and Power Limited

[Proposed expansion of Steel Plant – DRI Kiln (Sponge Iron from 1,15,000 TPA to 3,46,500 TPA), Induction Furnaces with matching LRF & CCM (MS Billets / Ingots from 30,000 TPA to 3,46,800 TPA), Rolling Mill with hot charging (Rolled Products 30,000 TPA to 2,90,000 TPA), New Rolling Mill with Conventional with LDO (Rolled Products 30,000 TPA), New Ferro Alloy Unit with 2x18 MVA Submerged Electric Furnaces (FeMn 90,000 TPA/SiMn 60,000 TPA / FeCr 60,000 TPA / FeSi 30,000 TPA/Pig Iron – 90,000 TPA /Cast iron – 90,000 TPA), WHRB based Power Plant from 12 MW to 34 MW, CFBC based Power Plant 4.9 MW to 29.9 MW & New Fly Ash brick manufacturing unit (38,000 Bricks/day)]

at

Khasra Nos. 98/1, 103, 109, 110, 111/1, 111/2, 111/4, 112, 113, 114, 115, 118 & 134,
At Chiraipani Village, Lakha Gram Panchayat, Raigarh Tehsil & District, Chhattisgarh

Submitted to

CHHATTISGARH ENVIRONMENT CONSERVATION BOARD
Chhattisgarh

1.0 PROJECT DESCRIPTION

Sunil Ispat and Power Limited was accorded Consent To establish vide Lr. No. 236/TS/CECB/2005 date 12/01/2005 at Chiraipani Village, Lakha Gram Panchayat, Raigarh Tehsil & District, Chhattisgarh and CTE granted prior to EIA notification 2006. As per EIA notification 1994 also EC is not applicable as investment is 32.0 crores, which is less than Rs 100 Crores for greenfield projects, subsequently First Consent to Operate obtained from Chhattisgarh Environment Conservation Board vide consent order No.TS/CECB/2009 date 03/01/2009 and Consent to Operate is regularly renewing from CECB and later CTO is valid up to 26/02/2022. Total land of 21.57 Ha (i.e. 53.32 acres) is available with the company.

Now as a part of expansion, company is planning for proposed expansion of Steel Plant – DRI Kiln (Sponge Iron from 1,15,000 TPA to 3,46,500 TPA), Induction Furnaces with matching LRF & CCM (MS Billets / Ingots from 30,000 TPA to 3,46,800 TPA), Rolling Mill with hot charging (Rolled Products 30,000 TPA to 2,90,000 TPA), New Rolling Mill with Conventional with LDO (Rolled Products 30,000 TPA), New Ferro Alloy Unit with 2x18 MVA Submerged Electric Furnaces (FeMn 90,000 TPA/SiMn 60,000 TPA / FeCr 60,000 TPA / FeSi 30,000 TPA/Pig Iron – 90,000 TPA /Cast iron – 90,000 TPA), WHRB based Power Plant from 12 MW to 34 MW, CFBC based Power Plant 4.9 MW to 29.9 MW & New Fly Ash brick manufacturing unit (38,000 Bricks/day) in the existing plant premises in Khasra numbers 98/1, 103, 109, 110, 111/1, 111/2, 111/4, 112, 113, 114, 115, 118 & 134 of Chiraipani Village, Lakha Gram Panchayat, Raigarh Tehsil & District, Chhattisgarh.

Total land avaialble for the existing plant is 21.57 Ha. (53.32 acres).Total land is in possession of the management. Proposed expansion will be taken up in the Existing plant premises only. No additional Land envisaged for expansion.The project cost envisaged for the proposed expansion project is Rs. 602.5 Crores.

As per the Ministry of Environment, Forest& Climate Change, New Delhi notification, dated 14thSeptember, 2006 and its subsequent amendments, all Primary metallurgical processing industries are classified under Category 'A'. The Ministry of Environment, Forest& Climate Change (MOEF&CC), New Delhi has accorded Terms of Reference (TOR) for the proposed expansion project vide letter No.F.No. J-11011/13/2021-IA II (I) dated 08th February 2021.The EIA Report has been prepared by incorporating the TOR stipulated by MOEF&CC.

Pioneer Enviro Laboratories & Consultants Private Limited, Hyderabad, which is accredited by NABET, Quality Council of India, vide certificate No. NABET/ EIA/ 1922/ RA 0149, for preparing EIA report for Metallurgical Units, have prepared Environmental Impact Assessment (EIA) report for the proposed expansion projectby incorporating the TOR approved by Ministry of Environment, Forest & 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 proposedexpansion 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,etc.
- 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:

Table No. 1.1: Environment Setting within 10 Km. radius of the site

S.NO.	SALIENT FEATURES / ENVIRONMENTAL FEATURES	DISTANCE W.R.T. SITE / REMARKS
1.	Type of Land	Existing Plant 21.57 Ha. (i.e. 53.32 acres)is being used for Industrial purpose
2.	Type of land (Study area)	As per LULC the land use within 10 Km. is as follows: Settlements – 5.1 %; Industrial Area –8.4 %; Tank/River/Major canal/Reservoir etc. – 8.4 %; Forest area – 43.1 %; Single crop land – 18.9 %; Double Crop Land – 5.4 %; Land with scrub – 7.6 %; Land without scrub – 1.8 %, Mining area – 1.1% and Ash Pond – 0.4%.
3.	National Park/ Wild life sanctuary / Biosphere reserve / Tiger Reserve / Elephant Corridor / migratory routes for Birds	There are no National Park/ Wild life sanctuary / Biosphere reserve / Tiger Reserve / migratory routes for Birds Movement of Elephants is observed within 15 Kms. radius of the plant, as per the secondary source.
4.	Historical places / Places of Tourist importance / Archeological sites	BanjariMata temple is situated at a distance of 5.5Kms. from the plant.
5.	Industrial areas / cluster /Critically polluted area as per MoEF&CC Office	Nil with in 10 Km radius

S.NO.	SALIENT FEATURES / ENVIRONMENTAL FEATURES	DISTANCE W.R.T. SITE / REMARKS
	Memorandum dated 13th January 2010	
6.	Defense Installations	Nil with in 10 Km radius
7.	Nearest village	KeloPriyotoma Colony - 0.3 Kms.(East Direction) Chiraipani Village - 0.35 Kms(South Direction).
8.	No. of Villages in the Study Area	58 nos.
9.	Forests	Taraimal RF (2.9 Kms.), Rabo RF (6.2 Kms), Urdana RF (0.7 Kms.) Pajhar PF (9.1 Kms.), Kharidungri PF (2.8 Kms.), Keradungri PF (4.6 Kms.), Dungapani PF (2.6 Kms.), Lakha PF (0.4 Kms.), Barkachhar RF (1.7 Kms.), Punjipathra PF (7.5 Kms.), Lamidarha PF (7.5 Kms) Boirdadar RF(8.1 Kms) etc. are exists within the study are
10.	Water body	Kelo river -1.5 Kms.,Dilipsinghjudev mega pariyojana – 1.1 Kms.,Kokritarai Pond near Kirodimal(5.6Kms.), GerwaniNala (2.6Kms.), Few seasonal nalas, ponds exist within the study area.
11.	Highway	Raigarh – Ambikapur Highway (0.4 Kms.) NH # 200 – 4.9 Kms.
12.	Railway Station	Kirodimalnagar Railway Station –6.8Kms.
13.	Port facility	Nil with in 10 Km.
14.	Airport/Airstrip	Jindal Airstrip –4.9 Kms
15.	Interstate Border	Nil within 10 Km radius
16.	R & R	There are no habitations in the total land. Envisaged for the project. Hence, no rehabilitation and resettlement is involved.
17.	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

The proposed Steel Plant envisages manufacturing of the following products.

Table No.1.2: EXISTING & PROPOSED UNITS, PRODUCTS & THEIR PRODUCTION CAPACITIES

S.No.	Units and product		Existing plant in operation	Obtained CTE from CECB (work yet to commence)	Proposed expansion proposal	After Proposed expansion proposal
1	DRI Kilns (Sponge Iron)		1,15,000 TPA (1X350 TPD)	--	Production increase from 1,15,000 TPA To 1,32,000 TPA (by usage of Pellets & increase in number of Working Days 330) &2,14,500 TPA(1X650 TPD)	3,46,500 TPA
2	Induction Furnace (MS Billets / Ingots / Hot Billets)		--	30,000 TPA (2X6 T)	3,16,800 TPA (4X30T)	3,46,800 TPA
3	Rolling Mill with Hot Charging (Rolled Products)		--	30,000 TPA (1X90TPD)	2,60,00 TPA (1X787 TPD)	3,20,000 TPA
4	Reheating Furnace (Rolled products) with LDO as fuel		--	--	30,000 TPA (1X90TPD)	
5	Ferro Alloys (FeMn / SiMn / FeCr / FeSi / Pig Iron / Cast Iron)		--	--	FeMn 90,000 TPA / SiMn 60,000 TPA / FeCr – 60,000 TPA / FeSi – 30,000 TPA/Pig iron – 90,000 TPA / Cast iron 90,000 TPA (2X18 MVA)	FeMn 90,000 TPA / SiMn 60,000 TPA / FeCr – 60,000 TPA / FeSi – 30,000 TPA/ Pig iron – 90,000 TPA / Cast iron 90,000 TPA
6	Power	WHRB	--	1X12 MW	1X22 MW	63.9 MW
		CFBC	--	1X4.9 MW(CFBC)	1X25 MW(CFBC)	
7	Fly Ash brick manufacturing unit (Bricks)		--	--	38,000 Bricks/day	38,000 Bricks/day

1.3 RAW MATERIAL REQUIRMENT

The following will be the raw material requirement for the existing and proposed expansionproject along with its source and mode of transportation is given as below:

Table No.1.3: Raw Material Requirement, Source &Mode of Transport

S.No.	Raw material	Quantity required per annum			Source	Distance from site (Kms.)	Mode of Transportation
		Existing	Expansion	Total			
A	**For DRI Kilns (Sponge Iron) – from 1,15,000 to 1,32,000 TPA**						
1	Iron ore (100%)	2,12,750	---	2,12,750	Odisha/ Chhattisgarh	300	By rail & road (through covered trucks)
	(OR)						
	Pellets (100%)	---	1,91,400	1,91,400	Odisha/ Chhattisgarh	300	By rail & road (through covered trucks)
2	Indian coal	1,49,500	22,100	1,71,600	SECL Chhattisgarh / MCL Odisha	200	By rail & road (through covered trucks)
	(OR)						
	Imported coal	95,450	14,110	1,09,560	Indonesia / South Africa / Australia	20	Through sea route, rail route & by road
3	Dolomite	5,750	850	6,600	Chhattisgarh	100	By road (through covered trucks)
B	**For DRI Kilns (Sponge Iron) – 2,14,500 TPA**						
1	Iron ore (100%)	---	3,43,200	3,43,200	Odisha/ Chhattisgarh	300	By rail & road (through covered trucks)
2	Indian coal	---	2,78,850	2,78,850	SECL Chhattisgarh / MCL Odisha	200	By rail & road (through covered trucks)

	(OR)						
	Imported coal	---	1,78,464	1,78,464	Indonesia / South Africa / Australia	20	Through sea route, rail route & by road
3	Dolomite	---	10,725	10,725	Chhattisgarh	100	By road (through covered trucks)
C	**For Steel Melting Shop (MS Billets/ Ingots/Hot Billets) – 3,46,800 TPA**						
1	Sponge Iron	30,303	3,20,000	3,50,303	Own generation/ Chhattisgarh	100	By road (through covered trucks)
2	MS Scrap / Pig Iron	4,545	48,000	52,545	Own generation/ Chhattisgarh	100	By road (through covered trucks)
3	Ferro alloys	1,515	16,000	17,515	Own generation	---	---
D	**For Rolling Mill through Hot charging (Rolled Products) – 2,90,000 TPA**						
1	Hot Billets	31,800	2,85,681	3,17,481	Own generation	---	---
E	**For Rolling Mill (Rolled Products) – 30,000 TPA with LDO**						
1	MS Billets /Ingots	---	31,800	31,800	Own generation	---	---
2	LDO	---	1595 KL/Annum	1,595 KL/Annum	From oil depos, raigarh	Upto 200	By tanker
F	**For Boiler [Power Generation 4.9 MW & 25 MW]**						
1	Indian Coal (100 %)	29,106	1,48,500	1,77,606	SECL Chhattisgarh / MCL Odisha	Upto 200	By rail & road (through covered trucks)
	(OR)						
1	Imported Coal (100 %)	19,600	1,00,000	1,19,600	Indonesia / South Africa / Australia	20	Through sea route, rail route & by road
	(OR)						
1	Dolochar	23,000	69,300	92,300	In plant generation	---	through covered conveyors
2	Indian Coal	17,606	1,13,850	1,31,456	SECL Chhattisgarh / MCL Odisha	Upto 200	By rail & road (through covered trucks)

	(OR)						
1	Dolochar	23,000	69,300	92,300	In plant generation	---	through covered conveyors
2	Imported Coal	11,268	72,864	84,132	Indonesia / South Africa / Australia	20	Through sea route, rail route & by road
G	**For Ferro Alloys (2 x 18 MVA)**						
	For Ferro Manganese –90,000 TPA						
1	Manganese Ore	---	2,04,750	2,04,750	Chhattisgarh /Odisha/ Andhra Pradesh	Up to 600	By road (through covered trucks)
2	LAM Coke	---	32,850	32,850	Andhra Pradesh	Up to 600	By road (through covered trucks)
3	Quartz	---	2,700	2,700	Andhra Pradesh	Upto 600	By road (through covered trucks)
4	Bag filter dust	---	14,400	14,400	Inhouse Generation	---	Through covered conveyers
	(OR)						
	For Silico Manganese – 60,000 TPA						
1	Manganese Ore	---	97,800	97,800	MOIL / OMC	Upto 500	By Rail & Road (through covered trucks)
2	FeMn Slag	---	37,080	37,080	Inhouse Generation	---	---
3	LAM Coke	---	23,100	23,100	Andhra Pradesh	Up to 600	By road (through covered trucks)
4	Quartz	---	12,000	12,000	Andhra Pradesh	Up to 600	By road (through covered trucks)
5	Bag filter dust	---	6,000	6,000	Inhouse Generation	---	Through covered conveyers
	(OR)						
	For Ferro Chrome – 60,000 TPA						

1	Chrome Ore	---	1,20,000	1,20,000	MOIL / OMC	Upto 600	By Rail & Road (through covered trucks)
2	LAM Coke	---	19,800	19,800	Andhra Pradesh	Upto 600	By road (through covered trucks)
3	Quartz	---	1,200	1,200	Chhattisgarh / Andhra Pradesh	Upto 600	By road (through covered trucks)
4	Lime	---	1,500	1,500	Chhattisgarh / Andhra Pradesh	Upto 600	By road (through covered trucks)
5	Molasses	---	1,500	1,500	Chhattisgarh / Andhra Pradesh	Upto 600	By road (through covered trucks)
6	Bag filter dust	---	2,100	2,100	In house generation	---	Through covered conveyers
	(OR)						
	For Ferro Silicon – 30,000 TPA						
1	Quartz	---	91,200	91,200	Chhattisgarh / Andhra Pradesh	Upto 600	By road (through covered trucks)
2	Mill Scale	---	45,600	45,600	Inhouse Generation	----	--
3	M.S. Scrap	---	23,400	23,400	Chhattisgarh / Andhra Pradesh	Upto 600	By road (through covered trucks)
4	LAM Coke	---	1,050	1,050	Andhra Pradesh	Upto 600	By road (through covered trucks)
5	Bag filter dust	---	16,800	16,800	Inhouse Generation	---	Through covered conveyers
	(OR)						
	For Pig iron – 90,000 TPA						
1	Iron Ore / Sinter	---	1,64,285	1,64,285	Odisha/ Chhattisgarh	Upto 350	By road (through covered trucks)
2	LAMCoke	---	76,785	76,785	Andhra Pradesh	Upto 600	By road (through covered trucks)

3	Limestone	---	10,714	10,714	Chhattisgarh	Upto 200	By road (through covered trucks)
4	Quartz	---	5,357	5,357	Chhattisgarh / Andhra Pradesh	upto600	By road (through covered trucks)
	(OR)						
	For Cast iron – 90,000 TPA						
1	Iron Ore / Sinter	---	1,64,285	1,64,285	Odisha/ Chhattisgarh	Upto 350	By road (through covered trucks)
2	LAMCoke	---	76,785	76,785	Andhra Pradesh	Upto 600	By road (through covered trucks)
3	Limestone	---	10,714	10,714	Chhattisgarh	Upto 200	By road (through covered trucks)
4	Quartz	---	5,357	5,357	Chhattisgarh / Andhra Pradesh	upto600	By road (through covered trucks)
H	**Brick Manufacturing unit – 38,000 per day**						
1	Ash	---	26,600	26,600	Own generation	---	--
2	Stone dust	---	5,700	5,700	Chhattisgarh	Upto 200	By road (through covered trucks
3	Cement	---	3,800	3,800	Chhattisgarh	Upto 200	By road (through covered trucks
4	Gypsum	---	1,900	1,900	Chhattisgarh	Upto 200	By road (through covered trucks

1.4 MANUFACTURING PROCESS

1.4.1 Sponge Iron (DRI)

The proposal consists of 1x650 TPD of DRI kilns to produce 2,14,500 TPAof Sponge Iron with 1X 22 MW WHRB facility. Refractory lined rotary kiln will be used for reduction of iron ore in solid state. Refractory lined rotary kiln 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 Pellets/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 Boiler and after heat recovery they will be treated in high efficiency ESP and discharged into the atmosphere through stack whose height will be in accordance with CPCB norms.

1.4.2 Steel Melting Shop

In Steel Melting Shop (SMS), Sponge Iron will be melted along with melting scrap and fluxes to make pure liquid steel and then to mould it in required size billets. The SMS will consist ofInduction furnaces, Ladles, Cranes & Continuous Casting Machine (CCM). There will be40 X30 T Induction furnaces to manufacture MS Billets / Ingots / Hot Billetsof 3,16,800 TPA. Either the Hot Billets produced from LRF will be directly sent to Rolling Mill without using Re-heating Furnace through

Hot charging method (or) Billets / Ingots will be sent to Re-heating Furnace to reheat the Billets and then sent to Rolling Mill to manufacture Rolled Products.The flue gases will be treated in fume extraction system with bagfilters.

1.4.3 Rolling Mill

The Hot Billets produced from Induction Furnaces will be directly sent to Rolling Mill to produce Rolled Products (OR) Hot Billetswill 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. The proposed Rolling mill will produce 2,90,000 TPA of Rolled Products.

1.4.4 Submerged Electric Arc Furnaces

2no.s of Submerged Electric Arc Furnace each of 18 MVA will be setup in the proposed plant. Ferro manganese, silicon-manganese will be produced using manganese ore as main raw material, Ferro silicon will be produced using Quartz as main raw material & Ferro Chrome will be produced using Chrome Ore as main raw material in sub-merged arc furnaces using reducer (Coke) under high voltage. Flue gases will be extracted through 4th hole and then treated in bagfilters.

1.4.5 Power Generation

Through WHRB Boiler

The hot flue gases from proposed 1x650 TPD capacity DRI kiln will pass through waste heat recovery Boiler to recover the heat and to generate 22 MWelectricity. The gases after heat recovery will pass through ESP and then discharged through chimneys into the atmosphere for effective dispersion of emissions into the atmospherethrough stack of adequate height.

Through AFBC Boiler

Coal (Imported / Indian) along withdolochar will be used as fuel in CFBC Boiler to generate 25 MW (1 x 25 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.

1.5 Water Requirement

- Water required for existing plant & units for which Consent obtained (yet to commence) is 267 KLD and same being sourced from Ground Water source.

- Water required for the proposed expansion project will be 1346 KLD and same will be sourced from Keloriver.
- Total water requirement after expansion will be 1613 KLD.
- This includes make-up water for DRI Plant, Induction Furnace, Rolling Mill, Power Plant& Domestic. Air cooled condensers will be provided for power plant to reduce the water requirement.
- Application has been submitted to Water Resource Department, Govt. of Chhattisgarh forWater drawl permission and is under process.
- Air cooled condensers will be provided to CFBC Power plant.Hence the net water requirement will be substantially reduced.

Table No.1.4: Water Requirement Breakup

S.No.	Unit	Quantity in KLD		
		Existing Plant permissions	Proposed Expansion	Total after Expansion
1.	DRI Kilns	115	210	325
2.	Induction Furnaces	20	220	240
3.	Rolling Mills	27	260	287
4.	Submerged Electric Arc Furnaces	--	120	120
5.	Power Plant	100	500	600
	• Cooling tower makeup	22	110	132
	• Boiler make up	63	315	378
	• DM plant Regeneration	15	75	90
6.	Fly Ash brick manufacturing unit	--	25	25
7.	Domestic	05	11	16
	Total	**267**	**1346**	**1613**

1.6 Wastewater Generation

The total effluent generation from the existing & proposed expansion project will be 257.2KLD inclusive of sanitary wastewater.Closed loop cooling water system will be adopted in DRI, SMS, and Rolling Mill units. The effluent generated from Rolling Mill will be sent to settling tank & clear water will be recycled through closed circuit cooling system. Effluent from power plant will be treated and after ensuring compliance with SPCB norms, it will be used for dust suppression, Ash conveyingand for greenbelt development. Sanitary waste water will be treated in STP. There will not be any effluent discharge outside the premises. ZLD will be followed. The following will be the total wastewater & it's break-up.

Table No.1.5: BreakupofWastewater Generation

S.NO.	EFFLUENT SOURCE	EFFLUENT GENERATION (KLD)		
		EXISTING PLANT AND CTE OBTAINED	PRESENT PROPOSAL	TOTAL AFTER PRESENT PROPOSAL
1	Power Plant (CFBC)			
	a) Cooling Tower blowdown	4.4	22.0	26.4
	b) Boilers blowdown	21.0	107.0	128.0
	c) D.M. plant regeneration water	15.0	75.0	90.0
2	Domestic	4.0	8.8	12.8
	Total	**44.4**	**212.8**	**257.2**

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 wastewater
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 plant site during **1st October 2020 to 31st December 2020**. The following are the concentrations of various parameters at the monitoring stations:

TableNo.2.1: Ambient Air Quality Summary

S.No.	Parameter		Concentration
1.	$PM_{2.5}$	:	26.7 to 47.2µg/m^3
2.	PM_{10}	:	44.5 to 78.6µg/m^3
3.	SO_2	:	9.2 to 18.4µg/m^3
4.	NO_2	:	14.2 to 45.6µg/m^3

5.	CO	:	647 to 1547 μg/m^3

2.2 Water Quality

2.2.1 Surface Water Quality

Keloriver (1.5Kms.), Dilipsinghjudev mega pariyojana(1.1 Kms.) Kokritarai Pond near Kirodimal(5.6Kms.)&GerwaniNala (2.6 Kms.) are present within the study area. 2 no. of surface water samples from Kelo River i.e. 60 m Uptream (SW1) & 60 m Down Stream& 1 no. of Sample from Upstream of GerwaniNala, 1 no. of Sample from Point of joining of GerwaniNalah to Kelo&1 no. of Sample from Kokritarai Pond near Kirodimal has been collected and analyzed for various parameters. No other surface water samples have been collected as the study period. The analysis of samples shows that all the parameters are in accordance with BIS-2296 specifications.

2.2.2 Ground Water Quality

8No. of ground water samples from open wells / bore wells were collected from the nearby villages to assess ground water quality impactsand analyzed for various Physico-Chemical parameters. The analysis of samples shows that all the parameters are in accordance withBIS: 10500 specifications.

2.3 Noise Levels

Noise levels were measured at 8locations during day time & Night time. The noise levels at the monitoring stations are ranging from 46.50dBA to 65.50dBA.

3.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

3.1 Prediction of impacts on air quality

The predicted max. Incremental PM_{10} concentrations due to the proposedexpansion project will be 1.1μg/M^3 at a distance of 1050 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 0.6μg/m^3.

Hence the total predicted incremental rise in PM_{10}due to the emission from proposed expansion and due the vehicular emission will be 1.1μg/m^3 + 0.6μg/m^3 = 1.7μg/m^3

The predicted max incremental SO_2 concentrations due to the proposed expansion project will be 5.6μg/m^3 at a distance of 1050 m from the stack in the down wind direction over the baseline concentrations.

The predicted max incremental NO_2 concentrations due to the proposedexpansion project will be 7.2µg/m^3 at a distance of 1050 m from the stack in the down wind direction over the baseline concentrations.

The predicted incremental rise in NO_2 concentration due to the Vehicular emission will be 4.4µg/m^3.

Hence the total predicted incremental rise in NOx due to the emission from expansion project and due the vehicular emission will be 7.2µg/m^3 + 4.4µg/m^3 = 11.6µg/m^3

The predicted incremental rise in CO concentration due to the Vehicular emissionwill be2.7µg/m^3.

The net resultant concentrations (Maximum baseline conc. + predicted incremental rise in conc.) of PM_{10}, SO_2 and NO_X& CO shown in Table No. 3.1, 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 expansion activities.

Table No.3.1: NET RESULTANT MAXIMUM CONCENTRATIONS DUE TO THE EXPANSION PROJECT (APCS WORKING SCENARIO)

Item	PM_{10} (µg/m^3)	SO_2 (µg/m^3)	NO_2 (µg/m^3)	CO (µg/m^3)
Maximum baseline conc. in the study area	78.6	17.5	45.6	1547
Maximum predicted incremental rise in concentration due to the proposed expansionproject.	1.1	5.6	7.2	--
Maximum predicted incremental rise in concentration due to Vehicular Emissions from the proposed expansion project.	0.6	--	4.4	2.7
Net resultant concentrations during operation of the plant after expansion	80.3	23.1	57.2	1549.7
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. 19.5 Acres (7.90 Ha.) of 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

The effluent generated fromDRI kiln, SMS units will be recycled with closed loop cooling water system. Effluent from Rolling Mill will be sent to settling tank & 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 used for dust suppression, Ash conveying, and for greenbelt development. Garland drains will be provided around all the raw material stacking areas. Sanitary waste water will be treated in STP. There will not be any effluent discharge outside the premises. ZLD will be followed.Hence there will not be any adverse impact on environment due to the proposed expansion project.

3.4 Prediction of Impacts on Land Environment

The effluent will be treated to achieve CECB standards. Zero effluent discharge will be adopted. All the required air pollution control systems will be provided to comply with CPCB / CECB norms. All solid wastes will be disposed / utilized as per CPCB / CECB norms. 19.5 Acres (7.90 Ha.)of 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	Grab sampling	As per IS: 10500
B.	Effluent at the inlet & outlet of the ETP	Once in a month	composite sampling (24 hourly)	As per EPA Rules, 1996
C.	Sanitary Wastewater (inlet & outlet of STP)	Once in a month	Composite sampling	As per EPA Rules, 1996
2. Air Quality				
A.	Stack Monitoring	CEMS (all Stacks) Once in a month	--	PM PM, SO_2&NOx
B.	Ambient Air quality	CAAQMS Quarterly in a Month	Continuously 24 hours	PM $PM_{2.5}$, PM_{10}, SO_2, NOx& CO
C.	Fugitive emissions	Quarterly in a Month	8 hours	PM
3. Meteorological Data				
	Meteorological data to be monitored at the plant.	Daily	Continuous monitoring	Temperature, Relative Humidity, rainfall, wind direction & wind speed.
4. Noise level monitoring				
	Ambient Noise levels	Once in a month (Hourly)	Continuous for 24 hours with 1-hour interval	Noise levels

5.0 ADDITIONAL STUDIES

Existing plant is located at ChiraipaniVillage, Lakha Gram Panchayat, Raigarh Tehsil & District, Chhattisgarh. Total land available with company is 21.57 Ha (i.e. 53.32 acres).The proposed expansion project will be taken in the existing plant premises. No Rehabilitation and Resettlement is involved in the proposed expansion project. Hence, no R & R study has been carried out.

6.0 PROJECT BENEFITS

With the establishment of the proposed expansion 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 expansion project. Periodic medical checkups will be carried out. Top priority will

be given to locals in employment. 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 expansion project:

Table No.7.1: Air Emission Control Systems Proposed

S.No.	Source	Control Equipment	Particulate emission at the outlet
1	DRI kiln with WHRB (1x650 TPD)	Electro Static Precipitator (ESP)	<30 mg/Nm^3
2	Induction Furnaces with CCM (4x 30 T)	Fume Extraction system with bag filters	< 30 mg/Nm^3
3	Re-heating furnaces attached to Rolling Mill	Stack is adequate	< 30 mg/Nm^3
4	CFBC Boiler 100 TPH (1X25 MW)	Electro Static Precipitator for control of PM	PM - 30 mg/Nm^3 SOx - 100 mg/Nm^3 NOx - 100 mg/Nm^3
5	Submerged Electric Arc Furnaces (2x 18 MVA)	Fourth hole Fume Extraction system with bag filters	< 30 mg/Nm^3
Note: Apart from the above Fume extraction system with bagfilters, dust suppression system, covered conveyers etc. will also be installed.			

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

The total effluent generation from the existing & proposed expansion projects will be 257.2 KLD inclusive of sanitary wastewater. The following will be the treatment method

pH of the boiler blowdown will be between 9.5 to 10.5. Hence a neutralization tank will be constructed for neutralizing the boiler blow down. DM plant regeneration water will be neutralized in a neutralization tank. After neutralization, these two effluent streams will be mixed with Cooling Tower blowdown in a Holding Tank. Service water will be treated in an oil separator and after treatment it will be taken to Holding Tank. The treated effluent will be re-circulated for Cooling Tower make-up, utilized for ABC & GCT cooling in DRI plant, dust suppression, Ash conveying, for Road washing and for greenbelt development No effluent will be let out of the plant premises. Sanitary waste water will be treated in STP. There will not be any effluent discharge outside the premises. ZLD will be followed.

TREATED EFFLUENT DISPOSAL

Table No. 7.2

Utilization of treated effluent during Non-Monsoon period:

Effluent generation from the existing plant	44.4 m^3/day
Effluent generation from the proposed expansion	212.8 m^3/day
Total effluent generation after proposed expansion	**257.2 m^3/day**
Effluent quantity to be used for ash conditioning	19.2 m^3/day
Effluent to be used for dust suppression in CHP	30 m^3/day
Balance effluent to be used for Greenbelt development	195 m^3/day

Utilization of treated effluent during Monsoon period:

Effluent generation from the existing plant	44.4 m^3/day
Effluent generation from the proposed expansion	212.8 m^3/day
Total effluent generation after proposed expansion	**257.2 m^3/day**
Effluent quantity to be used for ash conditioning	19.2 m^3/day
Effluent to be used for dust suppression in CHP	30 m^3/day

7.3 Noise Environment

The major sources of noise generation in the proposed expansion 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 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 expansion project will be treated in the Effluent Treatment Plant to comply with the CECB standards and will be utilized dust suppression, Ash conveying and for greenbelt development. All the required Air emission control systems will be installed and operated to comply with CECB 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.7.3: Solid Waste Generation and Disposal

S.NO.	WASTE / BY PRODUCTS	QUANTITY			METHOD OF DISPOSAL
		EXISTING QUANTITY IN TPA	EXPANSION QUANTITY IN TPA	AFTER EXPANSION IN TPA	
1	Ash from DRI	20,790	38,610	59,400	Is being given to nearby Cement plant and Brick manufacturing unit. Now it is proposed to be utilized in the Brick manufacturing proposed in the present proposal.
2	Dolochar	23,000	46300	69,300	Is being given to nearby FBC based Power plant. Now it is proposed to be utilised in the proposed CFBC power plant as a fuel.
3	Kiln Accretion Slag	1,040	1,931	2,971	Is being utilised in road construction& given to brick manufacturer and now it is proposed to be utilized in the Brick manufacturing proposed in the present proposal.
4	Wet Scraper Sludge	3,453	9,867	13,320	Is being utilised in road construction & given to brick manufacturer and now it is proposed to be utilized in the Brick manufacturing proposed in the present proposal.
5	SMS Slag	3,000	31,680	34,680	Slag generated from Induction Furnace melting will be crushed to recover metal. After recovery of Iron the inert material left over will be used as / will be given for filling material for low lying areas and utilized as aggregate for road making.
6	Mill scales from Rolling Mill	600	5,794	6,394	Will be utilized in the proposed Ferro Alloys units.

7	End cutting from Rolling Mill	900	8,694	9,594	Will be used as Raw material in the proposed Induction Furnace
8	Dust from Bagfilters of SEAF and during tapping	--	1320	1,320	Will be reused in Ferro alloys manufacturing process
9	Slag from SiMn	--	43,995	43,995	Will be utilised in road construction
	(OR)				
	Slag from FeMn	--	50,940	50,940	Will be used in manufacture of Silico manganese as it contains high MnO2
	(OR)				
	Slag from FeSi	--	8,865	8,865	Will be given to cast iron foundries
	(OR)				
	Slag from FeCr	--	29,731	29,731	Will be further processed in Zigging plant for Chrome recovery and the non-chrome contents will be sent for land filling.
	(OR)				
	Slag from Pig iron	--	61,285	61,285	Will be given to cement industry who manufacture slag cement
	(OR)				
	Slag from Cast iron	--	61,285	61,285	Will be given to cement industry who manufacture slag cement
10	Ash from Power Plant (with 100 % Indian Coal)	--	66,825	66,825	It is proposed to be utilized in the Brick manufacturing proposed in the present proposal.
	(OR)				
	Ash from Power Plant (with100 % Imported Coal)	--	12,000	12,000	It is proposed to be utilized in the Brick manufacturing proposed in the present proposal.
	(OR)				
	Ash from Power	--	92,813	92,813	It is proposed to be utilized in the Brick manufacturing proposed in the present

	Plant (with Dolochar + Indian Coal)				proposal.
	(OR)				
	Ash from Power Plant (with Dolochar + Imported Coal)	--	50,324	50,324	It is proposed to be utilized in the Brick manufacturing proposed in the present proposal.

7.5 Greenbelt Development

Greenbelt has been developed in the existing plant. 14,000 nos.of plants are existing. Out of total 53.32 acres of land, 19.5 acres (1/3rd of total land) of land will be developed with greenbelt (which includes existing greenbelt). Now it is proposed to maintain 1,000 saplings per Acer, hence we will develop additional5,500 plants in the plant premises by December 2022 to further mitigate the emissions.

7.6 Cost for Environment Protection

Capital Cost for Environment Protection for proposed expansion project : Rs. 22.83Crores

Recurring Cost per annum for Environmental protection for expansion project : Rs. 2.17Crores