

**SUMMARY ON
ENVIRONMENTAL IMPACT ASSESSMENT
REPORT**

OF

Karnikripa Power Private Limited

[Establishment of Iron ore beneficiation (8,00,000 TPA), Pellet Plant (Pellets- 6,00,000 TPA), DRI Kilns (sponge iron - 6,60,000 TPA), Induction Furnace with matching LRF & CCM (Billets / Ingots / Hot Billets-2,97,000 TPA), Rolling Mill (TMT Bars / Structural Steel -3,63,000 TPA), Ferro Alloy Unit (FeSi-14,000 TPA / FeMn-50,400 TPA / SiMn-28,800 TPA / FeCr-30,000 TPA), Waste Heat Recovery Boiler based Power Plant – 50 MW, FBC based Power Plant - 24 MW& Brick Manufacturing unit (58,000 Bricks / Day)]

at

Khairjhitti&Kauwajhar Village,
Mahasamund Tehsil & District, Chhattisgarh

Submitted to

**CHHATTISGARH ENVIRONMENT CONSERVATION BOARD
Chhattisgarh**

1.0 PROJECT DESCRIPTION

Karnikripa Power Pvt. Ltd. has proposed to establish a Steel Plant comprising of establishment of 8,00,000 TPA Iron ore beneficiation plant, Pellet Plant to manufacture 6,00,000 TPA of Pellets, DRI Kilns to manufacture 6,60,000 TPA of sponge iron, Induction Furnaces with matching LRF & CCM to manufacture 2,97,000 TPA of Billets / Ingots / Hot Billets, Rolling Mill to manufacture 3,63,000 TPA of TMT Bars / Structural Steel, Ferro Alloy Unit to manufacture FeSi-14,000 TPA / FeMn-50,400 TPA / SiMn-28,800 TPA / FeCr-30,000 TPA, Waste Heat Recovery Boiler based Power Plant to produce 50 MW electricity, FBC based Power Plant to produce 24 MW electricity & Brick Manufacturing unit to produce 58,000 Bricks / Day at Khasra nos. 42/2, 47/2, 48/3, 49, 50, 51, 52, 54, 55, 56, 58, 59, 60, 61/1, 63, 65, 66/1, 66/3, 75/1, 80, 82, 84, 86/1, 86/2, 87/1, 91, 92, 93, 94/1, 94/2, 95, 96, 97, 98, 1012/2, 1015, 1014, 1016, 1017, 1018, 1019, 1020, 1020/2, 1021/1, 1022/2, 1023/1, 1025, 1026, 1027/1, 1027/2, 1028, 1029, 1030, 1031, 1032, 1033, 1034, 1035, 1036, 1037, 1038, 1040, 1041/1, 1041/2, 1041/3, 1042/1, 1042/2, 1042/3, 1043, 1044, 1045/1, 1045/2, 1045/3, 1045/4 , 1063, 1064/1, 1064/2, 1065, 1066, 1067, 1068, 1069, 1070, 1071/1, 1071/2, 1072, 1073, 1074, 1075, 1076/1, 1076/2, 1077/4, 1078/4, 1078/5, 1078/6, 1081, 1082/1, 1082/2, 1082/3, 1082/4, 1082/5, 1083/1, 1083/2, 1084, 1085, 1086, 1087, 1088, 1089, 1090/2, 1092/1, 1092/2 , 1093, 1094, 1095, 1096, 1097, 1098, 1099/1, 1100, 1103/2, 1104, 1106, 1107, 1108, 1109, 1110 of Khairjhitti&Kauwajhar Villages, Mahasamund Tehsil & District, Chhattisgarh.

Total land envisaged for the proposed project is 50.57 Ha. (124.95 Acres). Out of total land, agreements have been entered with landowners for 40.71 Ha. (100.59 acres) of land and the remaining 9.86 Ha. (24.366 Acres) of land is under process.

The project cost envisaged for the proposed project is Rs. 880 Crores.

As per the Ministry of Environment, Forest & Climate Change, New Delhi notification, dated 14th September, 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 project vide letter no. J-11011 / 154 / 2021 – IA II (I), dated 17th May 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 project by 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 within an area of 10 km radius from the plant for major environmental components including air, water, noise, soil, flora, fauna and socio-economic environment.
- Assessment of air emissions, liquid waste and solid waste from the proposed project along with the noise level assessment.
- Environmental Management Plan comprising of emission control measures proposed to be adopted in the proposed project, solid waste management, Greenbelt development, 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 Project 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	Agricultural Land
2.	Type of Land (Study Area)	As per LULC the land use within 10 Km. is as follows: Settlements – 3.8 %, Industrial Area – 1.4 %, Tank / River / Reservoir – 11.6%, Scrub Forest / Dense Forest – 20.9%, Single Crop – 14.2%, Double Crop – 35.3%, Crop land within forest – 3.5%, Land with scrub – 6.8%, Land without scrub – 2.1%, Sheet rock area – 0.4%
3.	National Park/ Wildlife sanctuary / Biosphere reserve / Tiger Reserve / Elephant Corridor / migratory routes for Birds	Nil
4.	Historical places / Places of Tourist importance / Archeological sites	Nil
5.	Critically polluted area as per MoEF&CC Office Memorandum dated 13 th January	None And also the Plant area does not fall in the

S.No.	Salient Features / Environmental features	Distance w.r.t. site / Remarks
	2010	areas given in Hon'ble NGT order issued vide dated 10 th July 2019.
6.	Defence Installations	Nil
7.	Nearest village	Kauwajhar Village (0.5 Kms. – SE Direction)
8.	No. of Villages in the Study Area	42 nos.
9.	Nearest Hospital	Tumgaon – 2.6 Kms.(SW Direction)
10.	Nearest School	Malidih Village – 1.0 Km. (NE Direction)
11.	Forests	Tumgaon RF (0.5 Kms. – SW), Sirpur RF (1.28 Kms. – East), Kukradih RF (3.8 Kms. – NW), Sorid PF (4.1 Kms. – S), Loharidih PF (7.6 Kms. – SE) are present within 10 Km. radius of the project site
12.	Water body	Unused Canal – Ending into the project site (SW), Tributary of Dhaskut Nala is passing through the site on the Eastern side, Kurar river (2.6 Kms. – S), Kurar Water Reservoir (3.8 Kms. – SE), Mahanadi river (8.5 Kms. - NW) are present within 10 Km. radius of the project site
13.	Nearest Highway	NH # 6 (adjacent to Site)
14.	Nearest Railway Station	Nil within 10 Km. Radius (Belsonda RS – 16.5 Kms.)
15.	Nearest Port facility	Nil within 10 Km. Radius.
16.	Nearest Airport	Nil within 10 Km. Radius [Nearest is Raipur Airport – 40 Kms. (Aerial)]
17.	Nearest Interstate Boundary	Nil
18.	Seismic zone as per IS-1893	Seismic zone – II
19.	R & R	There is no rehabilitation and resettlement issue, as there are no habitations present in the site area.
20.	Litigation / court case is pending against the proposed project / proposed site and or any direction passed by the court of law against the project	Nil

1.2 PLANT CONFIGURATION AND PRODUCTION CAPACITY

Following is the proposed plant configuration and proposed production capacities:

Table No.1.2: Proposed Plant Configuration & Production Capacities

S.No.	Units (Products)	Plant Configuration (Production Capacity)
1.	Iron ore Beneficiation (Beneficiated ore)	8,00,000 TPA (Throughput capacity)
2.	Pellet Plant (Pellet)	6,00,000 TPA
3.	DRI Kilns (Sponge Iron)	4 x 500 TPD (6,60,000 TPA)

S.No.	Units (Products)	Plant Configuration (Production Capacity)	
4.	Induction Furnace (Billets / Ingots / Hot Billets)	6 x 15 T (2,97,000 TPA)	
5.	Rolling Mill (TMT bars / Structural Steel)	1 x 1100 TPD (3,63,000 TPA)	
6.	Ferro Alloys Unit (FeSi / FeMn / SiMn / FeCr)	2 x 9 MVA (FeSi-14,000 TPA / FeMn-50,400 TPA / SiMn-28,800 TPA / FeCr-30,000 TPA)	
7.	Brick Manufacturing Unit	58,000 Bricks / Day	
8.	Power Plant	WHRB Power Plant	4 x 12.5 MW (50 MW)
		FBC Power Plant	2 x 6 MW & 1 x 12 MW (24 MW)

1.3 RAW MATERIAL REQUIREMENT

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

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

S.No.	Raw Material	Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
1.	Iron Ore Beneficiation Plant (8,00,000 TPA – throughput capacity)				
a)	Iron ore fines	8,00,000	Chhattisgarh / Orissa	~ 600 Kms.	By rail & road (through covered trucks)
2.	Pellet Plant (Pellets) - 6,00,000 TPA				
a)	Iron Ore Concentrate	6,20,000	Own generation	---	Through covered conveyers
b)	Bentonite	4,800	Gujarat	~ 600 Kms.	By rail & road (through covered trucks)
c)	Limestone	9,000	Chhattisgarh	~ 100 Kms.	By road (through covered trucks)
d)	Anthracite Coal	6,000	SECL Chhattisgarh / MCL Odisha	~ 500 Kms.	By rail & road (through covered trucks)
	For DRI Kilns (Sponge Iron) – 6,60,000 TPA				
a)	Pellets (100 %)	9,90,000	Own generation & purchased from outside	---	Through covered conveyers & By road (through covered trucks)
	or				
b)	Iron ore (100%)	10,56,000	Barbil, Orissa NMDC, Chhattisgarh	~ 500 Kms.	By rail & road (through covered trucks)
c)	Coal	Indian	SECL Chhattisgarh / MCL Odisha	~ 500 Kms.	By rail & road (through covered trucks)
		Imported	Indonesia /	~ 600 Kms.	Through sea route,

S.No.	Raw Material		Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
				South Africa / Australia	(from Vizag Port)	rail route & by road (through covered trucks)
d)	Dolomite		33,000	Chhattisgarh	~ 100 Kms.	By road (through covered trucks)
4.	Steel Melting Shop (Billets/ Ingots/Hot Billets) – 2,97,000 TPA					
a)	Sponge Iron		3,00,000	Own generation	---	Through covered conveyers
b)	MS Scrap / Pig Iron		45,000	Chhattisgarh	~ 100 Kms.	By road (through covered trucks)
c)	Ferro alloys		15,000	Own generation	---	By road (through covered trucks)
5.	Rolling Mill (Rolled Products) – 3,63,000 TPA					
a)	Hot Billets / Billets / Ingots		3,88,400	Own generation	---	----
b)	LDO / LSHS		20,000 Kl/annum	Nearby IOCL Depot	~ 100 Kms.	By road (through Tankers)
6.	FBC Boiler [Power Generation 2 x 6 MW & 1 x 12 MW]					
a)	Indian Coal (100 %)		1,42,560	SECL Chhattisgarh / MCL Odisha	~ 500 Kms.	By rail & road (through covered trucks)
OR						
b)	Imported Coal (100 %)		91,381	Indonesia / South Africa / Australia	~ 600 Kms. (from Vizag Port)	Through sea route, rail route & by road (through covered trucks)
OR						
c)	Dolochar + Indian Coal	Dolochar	1,98,000	In plant generation	---	through covered conveyers
		Indian Coal	43,560	SECL Chhattisgarh / MCL Odisha	~ 500 Kms.	By rail & road (through covered trucks)
OR						
d)	Dolochar + Imported Coal	Dolochar	1,98,000	In plant generation	---	through covered conveyers
		Indian Coal	26,208	Indonesia / South Africa / Australia	~ 600 Kms. (from Vizag Port)	Through sea route, rail route & by road (through covered trucks)
7.	Ferro Alloys (2 x 9 MVA)					
7 (i)	<i>Ferro Silicon – 14,000 TPA</i>					
a)	Quartz		24,300	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
b)	LAM coke		18,900	Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
c)	MS Scrap / Mill scales		4,230	Inhouse Generation	---	By road (through covered trucks)
d)	Electrode paste		360	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)

Karnikripa Power Pvt. Ltd.

(Mini Steel Plant)

Khairjhitti & Kauwajhar Villages,
Mahasamund Tehsil & District, Chhattisgarh

S.No.	Raw Material	Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
e)	Bagfilter dust	200	Own generation	---	---
7 (ii)	<i>Ferro Manganese – 50,400 TPA</i>				
a)	Manganese Ore	68,400	MOIL / OMC	~ 500 Kms.	By Rail & Road (through covered trucks)
b)	LAM coke	19,800	Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
c)	Dolomite	8,100	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
d)	MS Scrap / Mill scales	7,200	Inhouse Generation	---	By road (through covered trucks)
e)	Electrode Paste	630	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)
f)	Bagfilter dust	1,000	Own generation	---	---
7 (iii)	<i>Silico Manganese – 28,800 TPA</i>				
a)	Manganese Ore	48,600	MOIL / OMC	~ 500 Kms.	By Rail & Road (through covered trucks)
b)	LAM Coke	16,200	Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
c)	FeMn. Slag	30,294	In house generation	---	----
d)	Dolomite	7,380	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
e)	Electrode paste	630	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)
f)	Quartz	7,740	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
g)	Bagfilter dust	200	Own generation	---	---
7 (iv)	<i>Ferro Chrome – 30,000 TPA</i>				
a)	Chrome Ore	56,700	Sukinda, Odisha Import, South Africa	~ 500 Kms. ~ 600 Kms. (from Vizag Port)	By road (through covered trucks) From Port By Road (through covered Trucks)
b)	LAM Coke	19,800	Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
c)	Quartz	8,100	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
d)	MS Scrap / Mill Scale	2,700	Inhouse Generation	---	By road (through covered trucks)
e)	Magnetite / Bauxite	5,400	Chhattisgarh / Maharashtra	~ 500 Kms.	By road (through covered trucks)
f)	Electrode Paste	540	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)
g)	Bagfilter dust	1,200	Own generation	---	---

1.4 MANUFACTURING PROCESS

1.4.1 Iron ore Beneficiation & Pellet plant

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

1.4.2 Sponge Iron (DRI)

The proposal consists of 4x500 TPD of DRI kilns to produce 6,60,000TPA of Sponge Iron with 4 x12.5 MW WHRB facility. Refractory lined rotary kilns will be used for reduction of iron ore in solid state.

Refractory lined rotary kilns will be used for reduction of iron ore in solid state. A central Burner located at the discharge end will be used for initial heating of the kiln.

Iron ore 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 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.

1.4.3 Steel Melting Shop

In Steel Melting Shop (SMS), Sponge Iron will be melted along with melting scrap and fluxes to make pure liquid steel and then to mould it in required size billets. The SMS will consist of Induction furnaces, Ladles, Cranes & Continuous Casting Machine (CCM). There will be 6 x 15 T Induction furnaces to manufacture Hot Billets/ Billets of 2,97,000 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.

1.4.4 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. The proposed Rolling mill will produce 3,63,000 TPA of TMT Bars / Structural Steels.

1.4.5 Submerged Electric Arc Furnaces

2 no.s of Submerged Electric Arc Furnace each of 9 MVA will be setup in the proposed plant. Ferro manganese, silicon-manganese will be produced using manganese ore as main raw material, Ferro 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.

1.4.6 Power Generation

Through WHRB Boiler

The hot flue gases from proposed 4x500 TPD capacity DRI kilns will pass through waste heat recovery Boilers to recover the heat and to generate 50 MW (4 x 12.5 MW) electricity. The gases after heat recovery will pass through ESP and then discharged through chimneys into

the atmosphere for effective dispersion of emissions into the atmosphere through stacks of adequate height.

Through AFBC Boiler

Coal (Imported / Indian) along with dolomite will be used as fuel in AFBC Boilers to generate 24 MW (2 x 6 MW & 1 x 12 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 the proposed project will be 2155 KLD. This includes make up water for I/O Beneficiation, Pellet Plant, DRI Kilns, Induction Furnaces, Rolling Mill, Ferro Alloys Unit, Brick manufacturing unit & Domestic.
- Water required for proposed project will be sourced from Kurar River, which is at a distance of 2.6 Kms. from the project site.
- Application has been submitted to Water Resource Department, Govt. of Chhattisgarh for Water drawl permission and is under process.
- Air cooled condensers will be provided to FBC Power plant. Hence the net water requirement will be substantially reduced.

Table No.1.4: Water Requirement Breakup

S.No.	Unit	Quantity in KLD
1.	I/O Beneficiation & Pellet Plant	350
2.	DRI Kilns	660
3.	Induction Furnaces	210
4.	Rolling Mills	330
5.	Submerged Electric Arc Furnaces	60
6.	Power Plant (FBC)	480
	• Cooling tower makeup	231
	• Boiler make up	173
	• DM plant Regeneration	76
7.	Brick Manufacturing unit	25
8.	Domestic	40
	Total	2155

1.6 Wastewater Generation

- Total wastewater generation will be 215 KLD.

- There will be no effluent discharge in the I/O ore beneficiation unit, Pelletisation plant, Sponge Iron, Induction Furnaces, Ferro Alloys unit as closed-circuit cooling system will be adopted.
- 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 Rolling Mill will be sent to oil separator followed by settling tank & will be recycled through closed circuit cooling system.
- 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 will be treated in STP.
- Garland drains will be provided around all the raw material stacking areas.

Table No.1.5: Breakup of Wastewater Generation

S.No.	Source	Generation (KLD)
1.	Power Plant	183
	a) Cooling Tower blowdown	58
	b) Boilers blowdown	49
	c) D.M. plant regeneration water	76
2.	Sanitary Wastewater	32
	Total	215

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}, PM₁₀, SO₂, NO_x & CO at 8 stations including project site during **1st March 2021 to 31st May 2021**. The following are the concentrations of various parameters at the monitoring stations:

Table No.2.1 : Ambient Air Quality Summary

S.No.	Parameter		Concentration
1.	PM _{2.5}	:	20.1 to 30.9µg/m ³
2.	PM ₁₀	:	33.4 to 51.5 µg/m ³
3.	SO ₂	:	6.9 to 11.5µg/m ³
4.	NO _x	:	7.2 to 14.6 µg/m ³
5.	CO	:	375 to 865 µg/m ³

2.2 Water Quality

2.2.1 Surface Water Quality

Kurar river (2.6 Kms. – S), Kurar Water Reservoir (3.8 Kms. – SE), Mahanadi River (8.5 Kms. - NW) are present within 10 Km. radius of the project site. 2 no. of samples i.e. 60m Upstream & 60 m Downstream from Kurar River & Mahanadi River each and one sample from Kurar Water Reservoir have been collected and analyzed for various parameters. The analysis of samples shows that all the parameters are in accordance with BIS-2296 specifications.

2.2.2 Ground Water Quality

8 Nos. of ground water samples from open wells / bore wells have been collected from the nearby villages to assess ground water quality impacts and analyzed for various Physico-Chemical parameters. The analysis of samples shows that all the parameters are in accordance with BIS: 10500 specifications.

2.3 Noise Levels

Noise levels were measured at 8 locations during daytime&Nighttime. The noise levels at the monitoring stations are ranging from **45.9 dBA to 55.6 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.

The predicted max. Incremental PM₁₀ concentrations (24 hourly) due to the proposed project will be 0.66µg/M³ over the baseline concentrations.

The predicted incremental rise in Particulate Matter concentration due to the Vehicular emission will be 1.04µg/m³.

Hence the total predicted incremental rise in Particulate Matter concentration due to the emission from proposed project and due the vehicular emissions will be 0.66µg/m³ + 1.04µg/m³ = 1.7µg/m³.

The predicted max incremental SO₂ concentrations (24 hourly) due to the emissions from operation of proposed project will be 8.67µg/m³ over the baseline concentrations.

The predicted max incremental NO_x concentrations (24 hourly) due to the proposed project will be 4.07µg/m³ over the baseline concentrations.

The predicted incremental rise in NO_x concentration due to the Vehicular emission will be 5.92µg/m³.

Hence the total predicted incremental rise in NO_x concentration due to the emission from project and due the vehicular emission will be 4.07µg/m³ + 5.92µg/m³ = 9.99µg/m³

The predicted incremental rise in CO concentration due to the Vehicular emissions will be 3.68µg/m³.

Table No.3.1: NET RESULTANT MAXIMUM CONCENTRATIONS DURING THE OPERATION OF THE PROPOSED PROJECT

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	51.5	11.5	14.6	865
Maximum predicted incremental rise in concentration due to proposed project (Point Sources)	0.66	8.67	4.07	Nil
Maximum predicted incremental rise in concentration due to proposed project (Vehicular emissions)	1.04	Nil	5.92	3.68
Net resultant concentrations during operation of	53.2	20.17	24.59	868.68

the proposed project				
National Ambient Air Quality Standards	100	80	80	2000

The net resultant Ground level concentrations during operation of the proposed project are within the NAAQS. Hence, there will not be any adverse impact on air environment due to the proposed project.

3.2 Prediction of impacts on Noise quality

The major sources of noise generation in the proposed project will be STG, boilers, compressors, DG set, etc. Acoustic enclosures will be provided to the STG. The ambient noise levels will be within the standards prescribed by MoEF vide notification dated 14-02-2000 under the Noise Pollution (Regulation & Control), Rules 2000 i.e. the noise levels will be less than 75 dBA during day time and less than 70 dBA during night time. 16.69 Ha. (41.2 Acres)of extensive greenbelt will be developed to further attenuate the noise levels. Hence there will not be any adverse impact due to noise on population in surrounding areas due to the proposed project.

3.3 Prediction of impacts on Water Environment

Closed loop cooling water system will be adopted in Pellet Plant, DRI, SMS, and Ferro Alloy units. Effluent from Rolling mill will be treated in oil separator followed by settling tank & will be recycled back. Effluent from power plant will be treated in Effluent Treatment Plant and after ensuring compliance with SPCB norms, it will be utilized for dust suppression, ash conditioning and for greenbelt development. Sanitary wastewater will be treated in Sewage Treatment Plant. Treated sewage will be used for Greenbelt development. 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 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. 16.69 Ha. (41.2 Acres)of extensive greenbelt will be developed as per guidelines. Hence, there will not be any adverse impact on land environment due to the proposedproject.

3.5 Socio - Economic Environment

There will be certain upliftment in Socio Economic status of the people in the area & development of the area due to the proposed project. Developmental activities will be taken up in consultation with village panchayat. 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 sample	As per IS: 10500
B.	Effluent at the outlet of the ETP	Twice in a month	composite sample (24 hourly)	As per EPA Rules, 1996
C.	STP Inlet & Outlet	Twice in a month	Composite sample (24 hourly)	As per EPA Rules 1996
2. Air Quality				
A.	Stack Monitoring	Online monitors (all stacks) Once in a month		PM PM, SO ₂ & NO _x
B.	Ambient Air quality (CAAQMS)	Continuous	Continuous	PM _{2.5} , PM ₁₀ , SO ₂ , NO _x & CO
C.	Fugitive emissions	Monthly Once	8 hours	PM
3. Meteorological Data				
	Meteorological data to be monitored at the plant.	Daily	Continuous monitoring	Temperature, Relative Humidity, rainfall, wind direction & wind speed.
4. Noise level monitoring				
	Ambient Noise levels	Monthly once	Continuous for 24 hours with 1 hour interval	Noise levels

5.0 ADDITIONAL STUDIES

No Rehabilitation and Resettlement is involved in the proposed project as there are no habitations in the project site. Hence no R & R study has been carried out.

6.0 PROJECT BENEFITS

With the establishment of the proposed project employment potential will increase. Land prices in the area will increase. The economic status of the people in the area will improve due to the proposed project. Periodic medical checkups will be carried out. Top priority will be given to locals in employment.

7.0 ENVIRONMENT MANAGEMENT PLAN

7.1 Air Environment

The following are air emission control systems proposed in the proposed project:

Table No.7.1: Air Emission Control Systems Proposed

S.No.	Source	Control Equipment	Emission at the outlet
1.	Pellet Plant	Electro Static Precipitators (ESP)	PM< 30 mg/Nm ³
2.	DRI kilns with WHRB's	Electro Static Precipitators (ESP)	PM< 30 mg/Nm ³
3.	Induction Furnaces with CCM	Fume Extraction system with bag filters	PM< 30 mg/Nm ³
4.	Submerged Electric Arc Furnace	4 th Hole Fume Extraction system with bag filters	PM< 30 mg/Nm ³
5.	Re-heating furnaces attached to Rolling Mill	---	PM< 30 mg/Nm ³
6.	FBC Boiler	Electro Static Precipitator	PM< 30 mg/Nm ³
		Lime dosing	SOx< 100 mg/Nm ³
		Low NOx burners with 3-stage combustion, flue gas recirculation and auto combustion control system	NOx < 100 mg/Nm ³

Note : Apart from the above Fume extraction system with bagfilters, dust suppression system, mechanical dust sweepers, 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

- Total wastewater generation will be 215 KLD.
- There will be no effluent discharge in the I/O ore beneficiation unit, Pelletisation plant, Sponge Iron, Induction Furnaces, Ferro Alloys unit as closed-circuit cooling system will be adopted.
- 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 Rolling Mill will be sent to oil separator followed by settling tank & will be recycled through closed circuit cooling system.
- 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 will be treated in STP and after ensuring compliance with norms will be utilized for greenbelt development.
- Garland drains will be provided around all the raw material stacking areas.

EFFLUENT TREATMENT PLANT

pH of the boiler blowdown will be between 9.5 to 10.5. Hence a neutralization tank will be constructed for neutralizing the boiler blow down. DM plant regeneration water will be neutralized in a neutralization tank. After neutralization, these two effluent streams will be mixed with Cooling Tower blowdown in a Central Monitoring Basin (CMB). Service water will be treated in an oil separator and after treatment it will be taken to CMB. The treated effluent will be utilized for dust suppression, ash conditioning and for Green belt development. No effluent will be let out of the plant premises. Hence Zero discharge concept will be implemented.

The following will be treated combined effluent characteristics.

• pH	-	6.5 - 8.5
• TSS	-	< 100 mg/l
• Oil & Grease	-	< 10 mg/l
• Free available chlorine	-	< 1.0 mg/l
• Copper	-	<1.0 mg/l
• Iron	-	< 1.0 mg/l
• Zinc	-	< 1.0 mg/l
• Chromium	-	< 0.2 mg/l
• Phosphates	-	< 5.0 mg/l

Treated Sewage Characteristics

S.No.	Parameters	Parameters limit
1.	pH	6.5 – 8.0
2.	BOD (mg/ L)	Not more than 10
3.	COD (mg/ L)	Not more than 50
4.	TSS (mg/ L)	Not more than 20
5.	NH ₄ -N (mg/ L)	Not more than 5
6.	N-Total (mg/ L)	Not more than 10
7.	Fecal Coliform (MPN/100 ml)	Less than 100

TREATED EFFLUENT DISPOSAL

Effluent quantity to be used for ash conditioning : 25 m³/day

Effluent to be used for dust suppression in CHP : 120 m³/day

Effluent to be used for Greenbelt development : 70 m³/day

41.2 Acres of greenbelt will be developed within the plant premises by using the treated effluent. A dedicated pipe distribution network will be provided for using the treated effluent for greenbelt development.

7.3 Noise Environment

The major sources of noise generation in the proposed project will be STG, boilers, compressors, DG set, etc. Acoustic enclosure will be provided to STG & DG sets. All the machinery will be manufactured in accordance with MoEF&CC norms on Noise levels. The employees working near the noise generating sources will be provided with earplugs. The extensive greenbelt development proposed within the plant premises will help in

attenuating the noise levels further. Noise barriers in the form of trees are recommended to be grown around administrative block and other utility units.

7.4 Land Environment

The wastewater generated from the proposed project will be treated in the Effluent Treatment Plant to comply with the SPCB standards and will be used for dust suppression, ash conditioning and for greenbelt development. All the required Air emission control systems will be installed and operated to comply with SPCB norms. Solid wastes will be disposed off as per norms. Extensive greenbelt will be developed in the plant premises. Desirable beautification and landscaping practices will be followed. Hence there will not be any impact due to the proposed project.

Table No.7.2: Solid Waste Generation and Disposal

S.No.	Waste / By product	Quantity (TPA)	Proposed method of disposal
1.	Tailing from I/O Benf.	2,00,000	Will be taken to filter press & recovered the water. Cake of tailing will be stored in tailing yard & it will given to nearby Ceramic Unit.
2.	Ash from Pellet Plant	18,000	Will be utilised in the proposed Brick Manufacturing Unit
3.	Ash from DRI	1,18,800	Will be utilised in the proposed Brick Manufacturing Unit
4.	Dolochar	1,98,000	Will be used in proposed FBC power plant as fuel.
5.	Kiln Accretion Slag	5,940	Will be used in road construction & utilised in the proposed Brick Manufacturing Unit.
6.	Wet scrapper sludge	30,360	Will be used in road construction & utilised in the proposed Brick Manufacturing Unit
7.	SMS Slag	29,700	Slag from SMS will be crushed and iron will be recovered & then remaining non -magnetic material being inert by nature will be used as sub base material in road construction.
8.	End Cuttings from Rolling Mill	10,890	Will be reused in the SMS
9.	Mill scales from Rolling Mill	7,260	Mill scales will be utilised proposed Ferro alloys manufacturing units.
10.	Ash from Power Plant (with Indian Coal + dolochar)	1,38,402	Will be utilized in the proposed brick manufacturing unit
11.	Slag from FeMn	30,294	Will be reused in manufacture of SiMn as it contains high SiO ₂ and Silicon.
12.	Slag from FeSi	1,000	Will be given to Cast iron foundries
13.	Slag from SiMn	30,888	will be used for Road construction / will be given

S.No.	Waste / By product	Quantity (TPA)	Proposed method of disposal
			toslag cement manufacturing
14.	Slag from FeCr	27,918	Will be processed in jigging plant for Chrome recovery. After Chrome recovery, the left-over slag will be analysed for Chrome content through TCLP test, if the Chrome content in the slag is within the permissible limits, then it will be utilised for Road laying /brick manufacturing.If Chrome content exceeds the permissible limits, it will be sent to nearest TSDF.

7.5 Greenbelt Development

Greenbelt of 16.69 Ha. (41.2 Acres)of extensive greenbelt will be developed in the plant premises. Width of proposed greenbelt ranges from 15 to 150 m.

7.6 Cost for Environment Protection

Capital Cost for Environment Protection for proposed plant : Rs. 63.3 Crores

Recurring Cost per annum for Environmental protection : Rs.2.13Crores