SUMMARY ON

ENVIRONMENTAL IMPACT ASSESSMENT

REPORT

OF

GOS ISPAT PVT. LTD.

(Proposed Steel Plant)

at

Ghughuwadih Village, Simga Tehsil

Balodabazar - Bhatapara District, Chhattisgarh

Submitted to

CHHATTISGARH ENVIRONMENT CONSERVATION BOARD

1.0 PROJECT DESCRIPTION

GOS Ispat Private Limited has proposed to establish Mini Steel Plant, a Greenfield Project, comprising of establishment of DRI Kilns (Sponge Iron - 7,09,500 TPA), Induction Furnaces with LRF + CCM (Billets / Ingots / Hot Billets) (5,94,000 TPA), Rolling Mill – 7,50,000 TPA (TMT / Wire Rod – 2,00,000 TPA, HR Strip Mill – 2,00,000 TPA & Structural Mill – 1,00,000 TPA, Pipe Mill – 2,50,000 TPA), Gasifier of 7,000 m3/hr, Ferro Alloy Unit 2 x 9 MVA (FeSi-14,000 TPA (or) FeMn- 50,400 TPA (or) SiMn –28,800 TPA (or) Pig Iron– 50,400 TPA), Briquetting Plant of 200 Kg/hr, Fly Ash Brick making plant of 23 Million Bricks/ Annum, WHRB based Power Plant – 53 MW & CFBC based Power Plant - 18 MW at Khasra nos. 19.49 Ha. (48.16 Acres) is Private Agricultural land are 14, 15/1, 15/2, 16, 18, 19/3, 20, 21, 22, 23, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 36, 37, 38, 39, 40, 41, 42, 43, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 59, 60, 61, 62, 63, 64, 65, 67, 69, 71, 72, 73, 76, 77, 79, 80, 84, 85, 87, 89, 90, 91, 92, 93, 94, 95 and Khasra no. of 7.59 Ha. (18.75 Acres) of Govt. Land are 13, 35, 44, 58, 74, 75, 78, 81, 82, 86, 88, 96. of Ghughuwadih Village, Simga Tehsil, Balodabazar – Bhatapara District, Chhattisgarh.

Total land envisaged for the proposed project is 27.08Ha. (66.91 Acres). out of which 19.49 Ha. (48.16 acres) is Private Agricultural land and 7.59 Ha. (18.75 Acres) is Govt. land. The project cost envisaged for the proposed project is **Rs. 655 Crores.**

As per the Ministry of Environment, Forests & Climate Change, New Delhi notification, dated 14th September, 2006 and its subsequent amendments, all Primary metallurgical processing industries are classified under Category 'A'. The Ministry of Environment, Forests & Climate Change, New Delhi has accorded Terms of Reference (TOR) for the proposed project vide letter no. **IA/J/11011/185/2021-IA.II(I),** dated **17th May 2021** and Subsequently **Amendment to TOR letter** was issued vide No. **IA/J/11011/185/2021-IA.II(I)** dated **10th January 2022.** The EIA Report has been prepared by incorporating the TOR stipulated by the Hon'ble EAC.

Pioneer Enviro Laboratories & Consultants Private Limited, Hyderabad, which is accredited by NABET, Quality Council of India, vide certificate No. NABET/ EIA/ 1922/ SA 0148, valid up to 21st September 2022 for preparing EIA report for Metallurgical Unit, have prepared Environmental Impact Assessment (EIA) report for the proposed project by incorporating the TOR approved by Ministry of Environment, Forests & Climate Change, New Delhi. The report contains detailed description of the following:

- Characterization of status of environment with in an area of 10 km radius from the plant for major environmental components including air, water, noise, soil, flora, fauna and socio-economic environment.
- Assessment of air emissions, liquid waste and solid waste from the proposed project along with the noise level assessment.
- Environmental Management Plan comprising of emission control measures proposed to be adopted in the proposed project, solid waste management, Greenbelt development.
- Post Project Environmental Monitoring & Budget for Environmental Protection Measures.

1.1 ENVIRONMENTAL SETTING WITHIN 10 Km. RADIUS OF THE PLANT SITE

The following is the environmental setting within the 10 Km. radius of the Project site:

S.No.	Salient Features / Environmental features	Distance w.r.t. site / Remarks
1.	Type of Land	Agricultural Land and Govt.land
2.	National Park/ Wildlife sanctuary / Biosphere reserve / Tiger Reserve / Elephant Corridor / migratory routes for Birds	Nil
3.	Historical places / Places of Tourist importance / Archeological sites	Nil
4.	Critically polluted area as per MoEF&CC Office Memorandum dated 13th January 2010	None And also the Plant area does not fall in the areas given in Hon'ble NGT order issued vide dated 10th July 2019.
5.	Defence Installations	Nil
6.	Nearest village	Village Jhiriya (1.1 Kms. – NNE Direction)
7.	Nearest Hospital	Simga – 7.8 Kms.
8.	Nearest School	Jhiriya Village – 1.1 Km.
9.	Forests	Bilari Ghughua RF (0.26 Kms. – South Direction) & Bilar RF (5.8 Kms. – SW Direction) are present within study area of the project site.
10.	Water body	Chitawar Nallah (Adjacent to plant site – East Direction), Bhatapara Branch Canal of Mahanadi Canal (1.5 Kms. – SE Direction), Ghughua Water Reservoir (2.6 Kms. – SW Direction), Shivnath River (9.0 Kms. – West Direction) exists within study area of the project site.
11.	Nearest Highway	NH # 200 - 6.4 Kms. (NW Direction)
12.	Nearest Railway Station	Hathband RS – 6.6 Kms. (By road)
13.	Nearest Port facility	Nil within 10 Km. Radius.
14.	Nearest Airport	Nil within 10 Kms. Radius [Raipur Airport – 48.0 Kms. (Aerial)]
15.	Nearest Interstate Boundary	Nil
16.	Seismic zone as per IS-1893	Seismic zone – II
17.	R & R	There is no rehabilitation and resettlement issue, as there are no habitations present in the site area.
18.	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. 11.1.1: PROPOSED PLANT CONFIGURATION & PRODUCTION CAPACITIES

S.No.	Units (Products)	Plant configuration	Production capacities
1.	DRI Kilns (Sponge Iron)	3 x 600 TPD & 1 x 350 TPD	7,09,500 TPA
2.	Induction Furnace with LRF + CCM (Billets / Ingots / Hot Billets)	6 x 30 T	5,94,000 TPA
3.	Rolling Mill (85 % Hot charging with Hot Billets and remaining 15% through RHF with LDO / Producer Gas as fuel)		
	TMT / Wire Rod / H.B. Wire	1 x 667 TPD	2,00,000 TPA
	HR Strip Mill	1 x 667 TPD	2,00,000 TPA
	Structural Mill (Angles / channels / Beams / Flat / Round / Square bars)	2 x 167 TPD	1,00,000 TPA
	Pipe Mill	6 x 140 TPD	2,50,000 TPA
4.	Gasifier (Producer Gas)	7000 Nm^3/hr	7000 Nm^3/hr
5.	Power generation through WHRB (Electricity)	3 x 15 MW + 1 x 8 MW	53 MW
6.	Power generation through CFBC (Electricity)	1 x 18 MW	18 MW
7.	Ferro Alloys Unit (FeSi / FeMn / SiMn / Pig Iron)	2 x 9 MVA	FeSi-14,000 TPA (or) FeMn- 50,400 TPA (or) SiMn – 28,800 TPA (or) Pig Iron – 50,400 TPA)
8.	Briquetting Plant	200 Kg/hr	200 Kg/hr
9.	Fly Ash Brick Manufacturing Unit	70,000 Brick/ day	23 Million Bricks/ Annum

1.3 RAW MATERIAL REQUIRMENT

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

TABLE NO. 11.1.2: RAW MATERIAL REQUIREMENT, SOURCE & MODE OF TRANSPORT

S.No.	Raw Material		Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
1.	**For DRI Kilns (Sponge Iron) – 7,09,500 TPA**					
a)	Iron ore (100%)		10,64,250	Barbil, Orissa NMDC, Chhattisgarh	~ 500 Kms.	By rail & road (through covered trucks)
b)	Coal	Indian	9,22,350	SECL Chhattisgarh / MCL Odisha	~ 500 Kms.	By rail & road (through covered trucks)
		Imported	5,90,300	Indonesia / South Africa / Australia	~ 600 Kms. (from Vizag	Through sea route, rail route & by road

S.No.	Raw Material		Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
					Port)	(through covered trucks)
c)	Dolomite		35,475	Chhattisgarh	~ 100 Kms.	By road (through covered trucks)
2.	**For Steel Melting Shop (Billets/ Ingots/Hot Billets) – 5,94,000 TPA**					
a)	Sponge Iron		6,05,880	Own generation	---	Through covered conveyers
b)	MS Scrap / Pig Iron		89,000	Chhattisgarh	~ 100 Kms.	By road (through covered trucks)
c)	Ferro alloys		30,000	Own generation	---	By road (through covered trucks)
3.	**For Rolling Mill through Hot charging (TMT/Wire Rode, HR Strips & Structural Steels) – 7,50,000 TPA**					
a)	Hot Billets / Billets / Ingots		5,94,000 2,01,000	Own generation & Ext. Purchase	~ 100 Kms.	By road (through covered trucks)
b)	LDO / LSHS (or) Producer Gas		3,700 Kl/annum 7,000 m^3/hr	Nearby IOCL Depot Own generation	~ 100 Kms. ----	By road (through Tankers) ----
c)	Coal for Gasifier		20,250	SECL Chhattisgarh / MCL Odisha	~ 500 Kms.	By rail & road (through covered trucks)
4.	**For FBC Boiler [Power Generation - 1 x 18 MW]**					
a)	Indian Coal (100 %)		97,200	SECL Chhattisgarh / MCL Odisha	~ 500 Kms.	By rail & road (through covered trucks)
	OR					
b)	Imported Coal (100 %)		62,208	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	1,41,900	In plant generation	---	through covered conveyors
		Indian Coal	26,250	SECL Chhattisgarh / MCL Odisha	~ 500 Kms.	By rail & road (through covered trucks)
	OR					
d)	Dolochar + Imported Coal	Dolochar	1,41,900	In plant generation	---	through covered conveyors
		Imported Coal	16,800	Indonesia / South Africa / Australia	~ 600 Kms. (from Vizag Port)	Through sea route, rail route & by road (through covered trucks)
5.	**For Ferro Alloys (2 x 9 MVA)**					

S.No.	Raw Material	Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
6 (i)	***For Ferro Silicon – 14,000 TPA***				
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)
e)	Bagfilter dust	200	Own generation	---	---
6 (ii)	***For Ferro Manganese – 50,400 TPA***				
a)	Manganese Ore	68,400	MOIL / OMC	~ 500 Kms.	By road (covered trucks)
b)	LAM coke	19,800	Andhra Pradesh	~ 500 Kms.	By road (covered trucks)
c)	Dolomite	8,100	C.G./ A.P	~ 500 Kms.	By road (covered trucks)
d)	MS Scrap / Mill scales	7,200	Inhouse Generation	---	By road (covered trucks)
e)	Electrode Paste	630	Maharashtra / West Bengal	~ 300 Kms.	By road (covered trucks)
f)	Bagfilter dust	1,000	Own generation	---	---
6 (iii)	***For Silico Manganese –28,800 TPA***				
a)	Manganese Ore	48,600	MOIL / OMC	~ 500 Kms.	By road (covered trucks)
b)	LAM Coke	16,200	Andhra Pradesh	~ 500 Kms.	By road (covered trucks)
c)	FeMn. Slag	30,294	In house generation	---	----
d)	Dolomite	7,380	C.G./ A.P	~ 500 Kms.	By road (covered trucks)
e)	Electrode paste	630	Maharashtra / West Bengal	~ 300 Kms.	By road (covered trucks)
f)	Quartz	7,740	C.G./ A.P	~ 500 Kms.	By road (covered trucks)
g)	Bagfilter dust	400	Own generation	---	---
6 (iv)	***For Pig Iron – 50,400 TPA***				
a)	Iron Ore	92,000	Barbil, Orissa NMDC, Chhattisgarh	~ 500 Kms.	By road (covered trucks)
b)	LAM Coke	43,200	Andhra Pradesh	~ 500 Kms.	By road (covered trucks)
c)	Dolomite	6,000	C.G./ A.P	~ 500 Kms.	By road (covered

S.No.	Raw Material	Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
					trucks)
d)	Quartz	3,060	C.G./ A.P	~ 500 Kms.	By road (covered trucks)
e)	Bagfilter dust	1,200	Own generation	---	---
f)	Electrode Paste	1,650	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)

1.4 MANUFACTURING PROCESS

1.4.1 Manufacturing of Sponge Iron (DRI)

The proposal consists of 3 x 600 TPD & 1 x 350 of DRI kilns to produce 7,09,500 TPA of Sponge Iron with 3x 15 MW & 1 x 8 MW WHRB facility. Refractory lined rotary kilns will be used for reduction of iron ore in solid state.

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

Iron ore will be continuously fed into the kiln along with coal which has dual role of fuel as well as reductant. Dolomite will be added to scavenge the sulphur from the coal. A number of air tubes will be provided along the length of the kiln. The desired temperature profile will be maintained by controlling the volume of the combustion air through these tubes. The Carbon monoxide generated due to the combustion of coal, reduces the iron ore and converts it into sponge iron. The rotary kiln is primarily divided into two zones viz. the pre heating zone and the reduction zone. The preheating zone extends over 30 to 50 % of the length of the kiln and in this the moisture in the charge will be driven off and the volatile matter in the coal will be burnt with the combustion air supplied through the air tubes. Heat from the combustion raises the temperature of the lining and the bed surface. As the kiln rotates, the lining transfers the heat to the charge. Charge material, pre-heated to about 1000^0C enters the reduction zone. Temperature of the order of 1050^0C will be maintained in the reduction zone, which is the appropriate temperature for solid state reduction of iron oxide to metallic iron.

This hot material will be transferred to Heat exchanger. In Heat exchanger the material will be cooled to 160^0C. The cooler discharge material consists of sponge iron lumps, sponge iron fines and char. Magnetic and non-magnetic material will be separated through magnetic separators and stored in separate bins. The hot flue gases will be taken to a Waste Heat Recovery Boilers and after heat recovery they will be treated in high efficiency ESP and discharged into the atmosphere through stack whose height will be in accordance with CPCB norms.

1.4.2 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 of Induction furnace, Ladles, Cranes & Continuous Casting Machine (CCM). There will be 6 x 30 T Induction furnaces to manufacture Hot Billets/ Billets of 5,94,000 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 (TMT / Wire rod, HR Strip, Structural steel & Pipes).

1.4.3 Manufacturing of Rolled products through Rolling Mill

The Hot Billets produced from Induction Furnaces will be directly sent to Rolling Mill consisting of Wire rod mill, HR strip mill, Structural Mill & pipe mill to produce TMT / Wire rods, HR Strip, Structural steel & Pipes. Furnace will be heated with LDO / LSHS. A Rolling mill will be installed in the plant to produce 7,50,000 TPA of TMT / Wire rods, HR Strip, Structural steel & Pipes.

1.4.4 Manufacturing of Ferro Alloys through SEAF

2 nos. of Submerged Electric Arc Furnace each of 9 MVA will be setup in the proposed plant. Ferro manganese, silicon-manganese will be produced using manganese ore as main raw material, Ferro silicon will be produced using Quartz as main raw material & Ferro Chrome will be produced using Chrome Ore as main raw material in a sub-merged arc furnace using reducer (Coke) under high voltage. Pig iron will be produced using High grade Iron Ore as main raw material in a sub-merged arc furnace using reducer (Coke) under high voltage. Briquetting plant of 200 Kg/hr is also proposed to install to agglomerate the Chrome ore fines for improving the smelting condition along with Chrome dust from APCS.

1.4.5 Power Generation

Through WHRB Boiler

The hot flue gases from proposed 3 x 600 TPD & 1 x 350 TPD DRI kilns will pass through waste heat recovery Boiler to recover the heat and to generate 53 MW (4 x 15 MW & 1 x 8 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 CFBC Boiler

Coal (Imported / Indian) along with dolochar will be used as fuel in CFBC Boilers to generate 18 MW (1 x 18 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.

1.4.6 FLY ASH BRICK MANUFACTURING UNIT

It is proposed to establish Fly Ash / Slag brick making unit of 70,000 bricks/day capacity. Fly ash (70%), Gypsum (5%), cement (10%) and 15% of Slag (Kiln Accretion Slag, Wet scrapper sludge, SMS Slag) are manually feed into a pan mixer where water is added to the required proportion for homogeneous mixing. Then the blocks/ blocks are placed on wooden pallets and kept as it is for two days there-after transported to open area where they are water cured for 10 -15 days.

1.5 Water Requirement

- Water required for the proposed project will be 2165 KLD. This includes make up water for DRI Kilns, Induction Furnaces, Rolling Mill, Ferro Alloys Unit & Domestic.
- Water required for proposed project will be sourced from Shivnath River (which is at a distance of 9.0 Kms. from the project site).
- Water drawl permission from water Resource Department, Chhattisgarh is under process.
- Air cooled condensers will be provided to FBC Power plant. Hence the net water requirement will be substantially reduced.

TABLE NO. 11.1.3: BREAK-UP OF WATER REQUIREMENT

S.No.	Unit	Quantity in KLD
1.	DRI Kilns	600
2.	Induction Furnaces	350
3.	Rolling Mills with Gasifier	450
4.	Submerged Electric Arc Furnaces	60
5.	Power Plant (FBC)	680
	• Cooling tower makeup	330
	• Boiler make up	245
	• DM plant Regeneration	105
6.	Domestic	25
	Total	**2165**

1.6 Waste Water Generation

- Total wastewater generation will be **278 KLD.**
- There will be no effluent discharge in the 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 settling tank & will be recycled through closed circuit cooling system.
- Effluent from Gasifier will have mainly phenolic compounds and will be used in After Burning Chamber of proposed DRI kilns for quenching and to regulate the temperature of the hot flue gas in accordance with inlet requirement of waste heat recovery boiler.
- 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 waste water will be treated in STP. STP of capacity **20 KLD** will be installed.
- Garland drains will be provided around all the raw material stacking areas

TABLE NO. 11.1.4: BREAKUP OF WASTE WATER GENERATION

S.No.	Source	Generation (KLD)

1.	Power Plant	258
	a) Cooling Tower blowdown	83
	b) Boilers blowdown	70
	c) D.M. plant regeneration water	105
2.	Sanitary Wastewater	20
	Total	**278**

1.7 Wastewater Characteristics

The following are the Characteristics of waste water

TABLE NO. 11.1.5: CHARACTERISTICS OF EFFLUENT

PARAMETER	CONCENTRATION			
	Cooling Tower blowdown	DM Plant Regeneration	Boiler Blowdown	Sanitary waste water
pH	7.0 – 8.0	5.0 – 10.0	9.5 – 10.5	7.0 – 8.5
BOD (mg/l)	--	--	--	200 – 250
COD (mg/l)	--	--	--	300 – 400
TDS (mg/l)	1000	5000 – 6000	1000 mg/l	800 – 900
Oil & Grease (mg/l)	--	10	--	5 - 10
TSS (mg/l)	--	--	--	150-200

2.0 DESCRIPTION OF ENVIRONMENT

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

2.1 Ambient air quality

Ambient air quality was monitored for $PM_{2.5}$, PM_{10}, SO_2, NOx & CO at 8 stations including project site during **1st October 2021 to 31st December 2021 (for 8 nos. of Stations) & 31st December 2021 to 15th February 2022**. The following are the concentrations of various parameters at the monitoring stations:

Parameter		Concentration
$PM_{2.5}$	:	23.3 to 41.8 µg/m^3
PM_{10}	:	40.2 to 69.6 µg/m^3
SO_2	:	7.2 to 15.8 µg/m^3
NO_X	:	7.9 to 33.4 µg/m^3
CO	:	422 to 1354 µg/m^3

2.2 Water Quality

2.2.1 Surface Water Quality

Shivnath river (9.0 Kms. in West), Ghughua Water Reservoir (2.6 Kms. in SW), Bhatapara Branch canal (1.5 Kms. In SE) are present within 10 Km. radius of the project site. 2 no. of samples i.e. 60m Upstream & 60 m Downstream from Shivnath River & each and one

sample from Ghughua Water Reservoir, Bhatapara Branch canal have 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

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 noise levels at the monitoring stations are ranging from **46.25 dBA to 52.82 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_{10}, SO_2, NOx & CO. The predictions of Ground level concentrations have been carried out using Industrial Source Complex (ISC-3) model. Meteorological data such as wind direction, wind speed, max. and min. temperatures collected at the site have been used as input data to run the model.

The predicted max. Incremental PM_{10} concentrations (24 hourly) due to the proposed project will be 0.88 $\mu g/M^3$ at a distance of 3000 m from the stack in the down wind direction over the baseline concentrations.

The predicted incremental rise in Particulate Matter concentration due to the Vehicular emission will be 1.26 $\mu g/m^3$.

The predicted max incremental SO_2 concentrations (24 hourly) due to the emissions from operation of proposed project will be 10.3 $\mu g/m^3$ at a distance of 3500 m from the stack in the down wind direction over the baseline concentrations.

The predicted max incremental NOx concentrations (24 hourly) due to the proposed project will be 5.12 $\mu g/m^3$ at a distance of 3200 m from the stack in the down wind direction over the baseline concentrations.

The predicted incremental rise in NOx concentration due to the Vehicular emission will be 9.9 $\mu g/m^3$.

The predicted incremental rise in CO concentration due to the Vehicular emissions will be 6.14 $\mu g/m^3$.

NET RESULTANT MAXIMUM CONCENTRATIONS DUE TO PROPOSED PROJECT

Item	PM_{10} ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_X ($\mu g/m^3$)	CO ($\mu g/m^3$)
Maximum baseline conc. in the study area	69.6	15.8	33.4	1354
Maximum predicted incremental rise in concentration due to proposed project of **GOSIPL**	0.88	10.3	5.12	---
Maximum predicted incremental rise in concentration due to **Vehicular Emissions from the proposed project**	1.26	---	9.9	6.14
Net resultant concentrations during operation of the plant	**71.74**	**26.1**	**48.42**	**1360.14**
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. **9.03 Ha. (22.3 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 DRI, SMS, Ferro Alloy and Rolling Mill units. Effluent from power plant will be treated 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 of 20 KLD. 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. 9.03 Ha. (22.3 Acres) of extensive greenbelt will be developed as per guidelines. Hence, there will not be any adverse impact on land environment due to the proposed project.

3.5 Socio - Economic Environment

There will be certain upliftment in Socio Economic status of the people in the area & development of the area due to the proposed project. Due to this the economic conditions, the educational and medical standards of the people living in the study area will certainly move upwards which will result in overall economic development, improvement in general aesthetic environment and increase in business opportunities.

4.0 ENVIRONMENTAL MONITORING PROGRAMME

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

MONITORING SCHEDULE FOR ENVIRONMENTAL PARAMETERS

S.No.	Particulars	Frequency of Monitoring	Duration of sampling	Parameters required to be monitored
1. Water & Wastewater quality				
A.	Water quality in the area	Once in a month except for heavy metals which will be monitored on quarterly basis.	Composite sampling (24 hourly)	As per IS: 10500
B.	Effluent at the outlet of the ETP	Once in a month	Grab sampling (24 hourly)	As per EPA Rules, 1996
C.	STP Inlet & Outlet	Once in a month	Grab sampling (24 hourly)	As per EPA Rules1996
2. Air Quality				
A.	Stack Monitoring	Online monitors (all major stacks) Once in a month		PM PM, SO_2 & NOx
B.	Ambient Air quality (CAAQMS)	Continuous Quarterly Once	Continuous 24 hours	PM_{10}, SO_2 & NOx $PM_{2.5}$, PM_{10}, SO_2, NOx & CO
C.	Fugitive emissions	Quarterly Once	8 hours	PM
3. Meteorological Data				
A.	Meteorological data to be monitored at the plant.	Daily	Continuous monitoring	Temperature, Relative Humidity, rainfall, wind direction & wind speed.
4. Noise level monitoring				
A.	Ambient Noise levels	Quarterly 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:

S.No.	Source	Control Equipment	Emission at the outlet
1.	DRI kilns with WHRB's	Electro Static Precipitators (ESP) (high performance rigid electrodes with transformer)	< 30 mg/Nm^3
2.	Induction Furnaces with CCM	Fume Extraction system with with PTFE membrane bag filters	< 30 mg/Nm^3
3.	Submerged Electric Arc Furnace	4th Hole Fume Extraction system with PTFE membrane bag filters	< 30 mg/Nm^3
4.	Re-heating furnaces attached to Rolling Mill	Stack	< 30 mg/Nm^3
5.	FBC Boiler	Electro Static Precipitator (high performance rigid electrodes with transformer)	< 30 mg/Nm^3
		Automatic lime dosing control system	SOx < 100 mg/Nm^3
		Low NOx burners with 3-stage combustion, flue gas recirculation and auto combustion control system will be provided	NOx < 100 mg/Nm^3
Note : Apart from the above Fume extraction system with bagfilters, 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

- Total wastewater generation will be **278 KLD**.
- There will be no effluent discharge in the 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 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.

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

Net Effluent generation after recycling : 278 KLD
Effluent quantity to be used for ash conditioning : 50 m^3/day
Effluent to be used for dust suppression in CHP : 138 m^3/day
Effluent to be used for Greenbelt development : 90 m^3/day

9.03 Ha. (22.3 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. 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.

Solid waste generation and disposal

S.No.	Waste / By Product	Quantity (TPA)	Proposed method of disposal
1.	Ash from DRI	1,27,710	Will be given utilized in proposed Brick making plant.
2.	Dolochar	1,41,900	Will be used in proposed FBC power plant as fuel.
3.	Kiln Accretion Slag	6,400	Will be given utilized in proposed Brick making plant.
4.	Wet scrapper sludge	25,200	Will be given to Road Contractor for utilisation in road construction & utilized in proposed brick making unit.
5.	SMS Slag	59,400	Slag from SMS will be crushed and iron will be recovered & then remaining non -magnetic material being inert by nature will be given to Road Conractors for utilising it as sub base material in road construction / will be utilized in proposed Brick making plant.
6.	End Cuttings from Rolling Mill	22,500	Will be reused in the own SMS
7.	Mill scales from Rolling Mill	15,000	Will be utilised in the proposed Ferro Alloys unit
8.	Ash from Power Plant (with Indian Coal + dolochar)	96,950	Will be given utilized in proposed Fly ash Brick making plant.
9.	Slag from FeMn	30,295	Will be reused in manufacture of SiMn as it contains high SiO_2 and Silicon.
10.	Slag from FeSi	1,010	Will be given to Cast iron foundries
11.	Slag from SiMn	30,900	Will be given to Road Contractor for utilisation in road construction / will be given to slag cement manufacturing
12.	Slag from Pig Iron	34,450	Will be given to Slag cement manufacturing unit
13.	Dust from Bagfilters	660	Will be given utilized in proposed Fly ash Brick making plant.
14.	Ash generated from Gasifier	430	Will be given utilized in proposed Fly ash Brick making plant.
15.	Tar generation from Gasifier	60	Will be given to coal tar recyclers / agencies engaged in construction activities.

7.5 Greenbelt Development

- **9.03 Ha. (22.3 Acres)** of Greenbelt will be developed within the project site.
- **22,600 nos.** of saplings will be planted within the project site premises**.**
- 10 to 73 m wide greenbelt will be developed all around the project site.
- 20 M wide greenbelt will be developed towards village in NE direction.

7.6 Cost for Environment Protection

Capital Cost for Environment Protection for proposed plant : Rs.68.5 Crores

Recurring Cost per annum for Environmental protection : Rs.6.86 Crores

7.7 Implementation of CREP Recommendations

All the CREP recommendations will be strictly followed.

- Continuous stack monitoring system is proposed for major stacks.
- Online Ambient Air Quality Monitoring Stations will be established in consultation with SPCB during operation of the plant.
- Fugitive emission monitoring will be carried out as per CPCB norms.
- Energy meters will be installed for all the pollution control systems.

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