SUMMARY ON

ENVIRONMENTAL IMPACT ASSESSMENT

REPORT

OF

Hi-Tech Power & Steel Limited

Proposed Expansion of Steel Plant

at

Parsada Village, Tilda Tehsil, Raipur District, Chhattisgarh

Submitted to

CHHATTISGARH ENVIRONMENT CONSERVATION BOARD

1.0 PROJECT DESCRIPTION

Hi-Tech Power & Steel Limited is operating steel plant consist of DRI plant to produce Sponge Iron, Induction Furnace Unit to produce Billets and Rolling Mill to produce Rolled Products & Power generation through WHRB & FBC at Parsada Village, Tilda Tehsil, Raipur District, Chhattisgarh.

Now it has been proposed to increase the production capacity of Sponge Iron plant from 60,000 TPA to 90,000 TPA along with Waste Heat Recovery Boiler (WHRB) based power from 4 MW to 6 MW in the existing plant premises only.

The total land available for the entire project is **71.8 acres / 20.079 Ha**. Total land is in possession of management. The proposed expansion will be taken up in the existing plant premises only. The Khasara nos. involved in project site are 435, 436,438/1, 438/2, 439/1,439/2, 440/1, 440/2, 440/3, 440/4, 440/5, 440/6, 440/7, 441, 445/1, 445/2, 445/3, 445/4, 445/5, 445/6, 446/1, 446/2, 447/2, 447/3, 447/4,448/1, 448/2, 449,450,451/1, 451/2, 451/3, 451/5, 451/6, 451/7, 451/8, 451/9, 452/1, 452/2, 452/3, 452/4, 452/5, 452/6, 452/7, 452/8, 452/9, 452/10, 453,454/1, 454/2, 454/3, 454/4, 455/1, 455/2, 456/1,456/2, 456/3, 456/4, 456/5,456/6,457/1, 457/2, 458/1,458/2,459/1, 459/2, 459/3, 459/4, 459/5, 459/6, 459/7, 460/1,460/2, 460/3,461/1, 461/3, 461/4, 462/1, 462/2, 462/3, 462/4,462/5, 462/7, 463,464/1, 464/2,464/3, 465, 466,467/2, 468/2, 468/6.

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 expansion project vide letter no. **J-11011 / 171 / 2017 - IA.II (I) dated 22nd May 2017.** 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/ 1619/ RA 026, for preparing EIA report for Metallurgical Unit, have prepared Draft Environmental

Impact Assessment (EIA) report for the proposed expansion project by incorporating the TOR approved by Ministry of Environment, Forests & Climate Change, New Delhi. The report contains detailed description of the following:

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

1.1 Plant Configuration and Production Capacity

The following are the existing & proposed products & their production capacities [by the time of ToR application]:

Sr. No.	Units	Existing CFE awarded		Proposed Expansion	Production Capacity after Expansion
		Implemented	To be Implemented		
1.	Sponge Iron Kilns	2 x 100 TPD (60,000 TPA)	---	1 x 100 TPD (30,000 TPA)	2 x 100 TPD & 1 x 100 TPD (90,000 TPA)
2.	Induction Furnaces	2 x 8 MT & 1 x 10 MT	2 x 10 MT	---	2 x 8 MT & 3 x 10 MT (1,38,000 TPA)
3.	Electric Arc Furnaces (EAFs)	---	3 x 3 MVA	---	12,000 TPA
4.	Rolling Mill	1 x 500 TPD (1,50,000 TPA)	---	---	1 x 500 TPD (1,50,000 TPA)
5.	Power Plant – WHRB based	4 MW	---	2 MW	6 MW
6.	Power Plant – FBC based	6 MW	---	--	6 MW

The proposed Steel Plant will produce the following products:

Unit	:	Description
DRI Kiln	:	Manufacturing of Sponge Iron using Iron Ore, Dolomite, Limestone and Coal as raw materials
Power generation	:	By utilizing hot waste flue gases from DRI kilns in WHRB.

1.2 Raw Materials

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

Raw Material		Quantity (TPA)	Sources	Mode of Transport
Iron Ore		48,000	NMDC, Bailadila / Bachheli & Open Market	By rail & road (through covered trucks)
Coal	Indian	39,000	SECL, Chhattisgarh / MCL Odisha	By rail & road (through covered trucks)
	Imported	24,960	Indonesia / South Africa / Australia	Through sea route, rail route & by road
Dolomite		1,650	Local area	By road (through covered trucks)
Limestone		2,250	Local area	By road (through covered trucks)

1.3 Manufacturing Process

1.3.1 Sponge Iron (DRI)

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 160ºC. 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.

1.3.2 Power Generation through WHRB Boiler

The hot flue gases from DRI kilns will pass through waste heat recovery Boilers to recover the heat and to generate 1 x 2 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.

1.4 Water Requirement

The water requirement for the proposed expansion project will be **75 KLD.** This includes Make-up water for DRI Kiln, Power Plant & for Domestic purpose. Air cooled condensers has been provided to FBC boiler. Hence the net water requirement had been substantially reduced. Water required after proposed expansion project will be sourced from Ground Water. Water withdrawal permission for existing plant as well as for proposed expansion project is already been obtained from Central Ground Water Board, New Delhi. The following is the break-up of the water requirement for proposed expansion project.

WATER REQUIREMENT

Sr. No.	Water requirement	Quantity in KLD		
		Existing	Proposed	Total after Expansion
1.	DRI kiln	50	24	74
2.	Steel melting shop	90	--	90
3.	Rolling mill	40	--	40
4.	Power Plant (10 MW + 2 MW)			
	• Boiler make up	225	40	265
	• DM plant Regeneration	25	10	35
5.	Domestic	12	1	13
	Total	**442**	**75**	**517**

1.5 Waste Water Generation

The wastewater generated from cooling in DRI plant 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 utilized for dust suppression, ash conditioning and for greenbelt development. Sanitary waste water will be treated in septic tank followed by sub-surface dispersion trench. The following will be the total wastewater & it's break-up.

BREAKUP OF WASTE WATER GENERATION [from proposed expansion]

S.No.	Source	Generation (in KLD)
1.	DRI kiln	Nil
2.	Power Plant	
	a) Boilers blowdown	7
	b) D.M. plant regeneration water	10
3.	Sanitary Wastewater	0.8
	Total	**17.8**

1.6 Wastewater Characteristics

The following are the characteristics of effluent

CHARACTERISTICS OF EFFLUENT

PARAMETER	CONCENTRATION		
	DM plant regeneration	Boiler blowdown	Sanitary waste water
pH	4 – 10	9.5 – 10.5	7.0 – 8.5
BOD (mg/l)	--	--	200 – 250
COD (mg/l)	--	--	300 – 400
TDS (mg/l)	5000 -6000	1000	800 – 900
Oil & Grease (mg/l)	--	10	--

2.0 DESCRIPTION OF ENVIRONMENT

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

2.1 Ambient air quality

Ambient air quality was monitored for $PM_{2.5}$, PM_{10}, SO_2, NOx & CO at 8 stations including project site during **1st December 2017 to 28th February 2018**. The following are the concentrations of various parameters at the monitoring stations:

Parameter		Concentration
$PM_{2.5}$	:	19.2 to 34.5 µg/m^3
PM_{10} *	:	32.5 to 69.5 µg/m^3
SO_2	:	7.2 to 13.5 µg/m^3
NO_X	:	7.1 to 21.4 µg/m^3
CO	:	354 to 947 µg/m^3

2.2 Water Quality

2.2.1 Surface Water Quality

Seonath River, Kharun River is flowing at a distance of 7.2 Kms. & 8.5 Kms. from the plant. Kulhan Nallah & Batapara Branch Mahanadi Canal is flowing at a distance of 8.6 Kms. & 0.5 Kms. from the plant. 4 no. of Samples have been collected 60m Upstream & 60 m

Downstream of Seonath River, Kharun Rivers, 2 no. of samples have been collected from Kulhan Nallah, Batapara Branch Mahanadi Canal and analyzed for various parameters. The analysis of samples shows that all the parameters are in accordance with BIS-2296 specifications.

2.2.2 Ground Water Quality

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

2.3 Noise Levels

Noise levels were measured at 8 locations during day time & Night time. The noise levels at the monitoring stations are ranging from **47.38 dBA to 69.56 dBA.**

3.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

3.1 Prediction of impacts on air quality

The likely emissions from the proposed expansion 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 emissions from operation of proposed expansion project will be **0.16 «g/m^3** at a distance of 900 m from the stack in the down wind direction over the baseline concentrations.

The predicted incremental rise in PM concentration due to the Vehicular emission will be **0.08 «g/m^3**.

Hence the total predicted incremental rise due to the emissions from operation of proposed expansion project and due the vehicular emission will be **0.16 «g/m^3 + 0.08 «g/m^3 = 0.24 «g/m^3.**

The predicted max incremental SO_2 concentrations (24 hourly) due to the emissions from operation of proposed expansion project will be **4.4 «g/m^3** at a distance of 900 m from the stack in the down wind direction over the baseline concentrations.

The predicted max incremental NOx concentrations (24 hourly) due to the emissions from operation of proposed expansion project will be **0.64 «g/m^3** at a distance of 900 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 **0.69 «g/m^3**.

Hence the total predicted incremental rise due to the emissions from operation of proposed expansion project and due the vehicular emission will be **0.64 «g/m^3 + 0.69 «g/m^3 = 1.33 «g/m^3**

The predicted incremental rise in CO concentration due to the Vehicular emission will be **0.4 «g/m^3**.

NET RESULTANT MAXIMUM CONCENTRATIONS

DUE TO PROPOSED EXPANSION PROJECT & DUE TO OTHER INDUSTRIES IN THE AREA

Item	PM_{10} («g/m^3)	SO_2 («g/m^3)	NO_X («g/m^3)	CO («g/m^3)
Maximum baseline conc. in the study area	69.5	13.5	21.4	947
Maximum predicted incremental rise in concentration due to **the proposed expansion Project.**	0.16	4.4	0.64	Nil
Maximum predicted incremental rise in concentration due to **Vehicular Emissions from the proposed expansion project.**	0.08	Nil	0.69	0.40
Maximum predicted incremental rise in concentration due to **other industries in the study area.**	0.36	3.8	1.1	0.85
Net resultant concentrations during operation of the proposed expansion project.	**70.1**	**21.7**	**23.83**	**948.25**
National Ambient Air Quality Standards	**100**	**80**	**80**	**2000**

The predicted results show that the net resultant concentration (max. baseline conc. + max. incremental rise in conc.) of PM_{10}, SO_2, and NOx will be well within the National Ambient Air Quality Standards after commissioning of proposed expansion project. 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 expansion 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. **9.7 Ha. (24 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 expansion project.

3.3 Prediction of impacts on Water Environment

There will be no effluent generation in the DRI plant as closed circuit cooling system will be adopted. 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 waste water will be treated in septic tank followed by sub-surface dispersion trench. 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 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. **9.7 Ha. (24 Acres)** of greenbelt will be developed as per guidelines. Hence there will not be any adverse impact on land environment due to the proposed expansion project.

3.5 Socio - Economic Environment

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

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

4.0 ENVIRONMENTAL MONITORING PROGRAMME

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

MONITORING SCHEDULE FOR ENVIRONMENTAL PARAMETERS

Sr. No.	Particulars	Frequency of Monitoring	Duration of sampling	Parameters required to be monitored
1. Water & Waste water quality				
A.	Water quality in the area	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.	Sanitary waste water	Twice in a month	Grab sampling (24 hourly)	As per EPA Rules1996
2. Air Quality				
A.	Stack Monitoring	Online monitors (WHRB & FBC boiler stacks) Once in a month		PM PM, SO_2 & NOx
B.	Ambient Air quality	Once in a month	Once in a month	$PM_{2.5}$, PM_{10}, SO_2 & NOx
C.	Fugitive emissions	Quarterly basis	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	Twice in a year	Continuous for 24 hours with 1 hour interval	Noise levels

5.0 ADDITIONAL STUDIES

There will not be any additional land procurement for the proposed expansion project. The expansion project will be taken up in the existing plant premises only. 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.

7.0 ENVIRONMENT MANAGEMENT PLAN

7.1 Air Environment

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

S.No.	Source	Control Equipment	Particulate emission at the outlet
1.	DRI kilns with WHRB's	Electro Static Precipitators (ESP)	< 50 mg/Nm^3

Note : Apart from the above Fume extraction system with bagfilters, dust suppression system, covered conveyers etc. will also be installed

The following air pollution 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.
- The flue gases from the DRI kiln will pass through Waste Heat Recovery Boiler and after heat recovery the gases will be treated in High efficiency ESP to bring down the particulate emission in the exhaust gases to below 50 mg/Nm3 and then discharged into the atmosphere through a stack of 60 m height.

7.2 Water Environment

There will be no effluent generation in the DRI plant as closed circuit cooling system will be adopted. 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 waste water will be treated in septic tank followed by sub-surface dispersion trench.

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 in a Central Monitoring Basin (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. Sanitary waste water will be treated in septic tank followed by sub-surface dispersion trench.

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

Solid waste generation and disposal

Sr. No.	Waste	Quantity (TPD)		Method of disposal
		Existing	Proposed	
1	Char and Dolochar	60	30	Is being utilized in existing FBC boiler and after expansion same practice will be continued.
2	Kiln Accretion Slag	5	2	Is being used in road construction & being given to brick manufacturer and same practice will be continued after the proposed expansion also.
3	SMS Slag	45	--	Slag from SMS is being crushed and iron is being recovered & then remaining non -magnetic material being inert by nature is used as sub base material in road construction/brick manufacturing
4	Mill scales from Rolling Mill	15	--	Sold to nearby Pellet Plant, Ferro alloys and Casting units.
5	End Cuttings	25	--	End cutting is being reused as raw material in induction furnaces
6	Ash from Power Plant (with Indian Coal)	50	--	Ash generated is being given to Cement Plants / Brick Manufacturers

7.5 Greenbelt Development

9.7 Ha. (24 Acres) of Greenbelt inclusive of existing greenbelt has been developed in the plant premises. **10 to 105 m wide greenbelt** already been developed all around the plant. Capital cost for environment protection for the total project is **Rs. 35 Crores**.

7.6 Implementation of CREP Recommendations

All the CREP recommendations will be strictly followed.

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