SUMMARY ON

ENVIRONMENTAL IMPACT ASSESSMENT

REPORT

OF

Mahendra Sponge & Power Ltd.

[Unit – II]

Proposed Expansion of Steel Plant

at

Village: Sarora & Parsada, Tehsil: Tilda, District: Raipur [C.G.]

Submitted to

Chhattisgarh Environment Conservation Board

Address: "Paryavaas Bhawan", North Block, Sector – 19, Atal Nagar, District: Raipur [C.G.]

1.0 PROJECT DESCRIPTION

M/s. Mahendra Sponge & Power Ltd. (MSPL) [Unit – II] is operating 1x90 TPD and 2 x 100 TPD Sponge Iron plant at Sarora & Parsada Villages,Tilda(T), Raipur (D), C.G. CTE has been accorded to the 1 x 90 TPD DRI Kiln in the Name of **M/s. Arsh Iron & Steel Ltd.** by Chhattisgarh Environment Conservation Board (CECB) which was prior to EIA notification 2006. Later, Environment Clearance has been obtained for expansion proposal from MoEF&CC vide F.No. J-11011/1154/2007-IA-II (I) dated 27th January 2010. MOEF &CC has transferred the EC to the name of Mahendra Sponge & Power Ltd. (Unit-2) vide letter dated 30th November 2015. Consent to Operate was accorded by Chhattisgarh Environment Conservation Board vide order No. 6642/TS/CECB/2018, Naya Raipur dated 14/12/ 2018 for 1 x 90 TPD & 2 x 100 TPD Sponge Iron units. Remaining unit for which EC was obtained are under implementation.

Now it has been Proposed to Upgrade of existing DRI Kiln from 29,700 TPA to 30,000 TPA, establishment of New DRI Kilns (Sponge Iron – 2,31,000 TPA), New Induction Furnaces (Mild Steel Ingots & Billets – 3,96,000 TPA), Change of route in existing Induction Furnaces – 1,00,000 TPA (Change of product from Billets & Ingots to TMT Bars & Structural Steel by Hot Charging), New Rolling Mills (TMT bars & Structural Steel – 3,96,000 TPA), WHRB based Power Plant from 7 MW to 23 MW, CFBC based Power Plant from 8 MW to 22 MW, New Ferro Alloys plant (FeSi-15,600 TPA / FeMn-32,400 TPA / SiMn – 32,400 TPA).

Proposed expansion will be taken up partially in the existing land of 19.25 acres (7.79 Ha.), partially in the additionally purchased (25.61 Acres) and adjoining land (6.64 acres) aggregating 32.25 acres (13.05 Ha.).

S.No.	Khasra Nos.	Area in Ha.	Area in in Acres
1.	Existing Land: 19/2, 20/1, 22/2, 23/3, 24/1, 24/4, 25, 27/1, 27/2, 28/1, 28/2, 28/3, 28/4, 28/5, 28/6, 28/7, 28/8, 29	7.790	19.25
2.	Additionally Purchase Land: 19/1, 19/3, 19/4, 19/7, 19/5, 19/6, 20/2, 21, 22/1, 23/2, 23/4, 26, 33/3, 34/1, 34/2, 1339/1, 1339/2, 1339/3, 1339/4, 1340/2, 1341/4, 1341/5, 1346/3.	10.360	25.61
3.	Land yet to be acquire: 16/1, 16/2, 16/3	2.690	6.64
	Total	**20.840**	**51.50**

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 . **J-11011 / 1154/ 2007 - IA.II (I) dated 16th August 2018.** 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 project, solid waste management, Greenbelt development.
- Post Project Environmental Monitoring & Budget for Environmental Protection Measures.

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

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

S.No.	Salient Features / Environmental features	Distance w.r.t. site / Remarks
1.	Type of Land	Industrial Land
2.	Type of Land (Study Area)	As per LULC the land use within 10 Km. is as follows: Settlements – 4.1 %; Industrial Area- 1.9 %; Tank / River / Major canal etc. – 6.5 %; Scrub

S.No.	Salient Features / Environmental features	Distance w.r.t. site / Remarks
		Forest – 4.4 %; Single crop – 48.6 %; Double crop – 15.3 %; Plantation – 2.1 %; Land with scrub – 9.9 %; Land without scrub – 5.3 %; Sheet Roack area – 0.8%; Mining area – 1.1 %.
3.	National Park/ Wild life 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 13th January 2010	Nil
6.	Defence Installations	Nil
7.	Nearest village	Parsada Village 0.6 kms. Sarora Village – 1.0 Km.
8.	No. of Villages in the Study Area	40
9.	Nearest Major Hospital	Tilda – 5.0 Kms.(SE)
10.	Nearest School	Sarora – 1.5 kms. (W)
11.	Forests	Bilari RF – 0.7 Kms. ; Bilari Ghughua RF 4.0 Kms. No forest land is involved in the proposed Plant site.
12.	Water body	Seonath River – 7.0 Kms. Kharun River – 8.1 Kms. Kulhan Nallah - 8.5 Kms. Batapara Branch Mahanadi Canal – 1.5 Kms. A Stream is passing all along the Eastern boundary from North to South direction and which will diverted along the Boundary.
13.	Nearest Highway	NH # 130 (earlier NH # 200)– 5.0 Kms.
14.	Nearest Railway Station	Tilda RS – 4.6 Kms.
15.	Nearest Port facility	Nil
16.	Nearest Airport	Nil
17.	Nearest Interstate Boundary	Nil (Odisha State Boundary : 97 Kms.)
18.	Seismic zoneas per IS-1893	Seismic zone – II
19.	R & R	There is no rehabilitation and resettlement issue, as there are no Habitations in the additional land proposed for expansion project.
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
21.	List of industries within 10 km. Radius of the project site	• M/s. Hi-Tech Power & Steel Limited • M/s. Century Textiles & Industries Ltd.

S.No.	Salient Features / Environmental features	Distance w.r.t. site / Remarks
		(Unit : Century Cement) • M/s. Shri Bajrang Power &Ispat Ltd. • M/s. Sambhv Sponge Power Private Limited (Earlier Name: Khetan Sponge & Infrastructure Pvt. Ltd.) • M/s. Agrawal Infrasteel • M/s. Uday Sponge & Power Pvt. Ltd.

1.2 Plant Configuration and Production Capacity

The following are the existing & proposed products & their production capacities.

S.No.	Unit (Product)	Plant configuration & Production Capacity			
		Existing (in TPA)	EC obtained in Jan. 2010 (in TPA)	Present Proposal (in TPA)	After Present Proposal (in TPA)
1	DRI Kilns (Sponge Iron)	29,700 (1 x 90 TPD)	66,000 (2 x 100 TPD)	Upgradation of existing 29,700 to 30,000 + 2,31,000 (2 x 350 TPD)	3,27,000
2	Induction Furnaces (Mild Steel Ingot & Billets)	--	---	3,96,000 (8 x 15 MT)	3,96,000 TPA
3	Induction Furnaces (Hot liquid metal to TMT Bars & Structural Steel)	--	1,00,000 (3 x 10 MT)	Change of product from Billets & Ingots to TMT Bars & Structural Steel (by Hot Charging) [Now proposed to establish 2 x 15 MT instead of 3 x 10 MT]	1,00,000 TPA
4	Rolling Mill (TMT Bars & Structural Steel) with 24,000 m^3/hr Gasifier	--	--	3,96,000 TPA (2 x 600 TPD)	3,96,000 TPA (2 x 600 TPD)
5	Power Plant (Electricity)	--	15 MW (7 MW WHRB + 8 MW CFBC)	30 MW (16 MW WHRB + 14 MW CFBC)	45 MW
6	Submerged Electric Arc Furnaces (FeSi/SiMn/FeMn)			2 x 9 MVA (FeSi – 15,600 / SiMn – 32,400 / FeMn – 32,400)	2 x 9 MVA (FeSi – 15,600 / SiMn – 32,400 / FeMn – 32,400

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
Induction Furnace	:	Manufacturing of MS Billets / Hot Metal using Sponge Iron, MS

Unit	:	Description
		Scrap, Ferro Alloys as raw materials
Rolling Mill	:	Manufacturing of Rolled Product using MS Ingots / Steel Billets. By utilizing Pulverized coal / Furnace oil as fuel.
Power generation	:	By utilizing hot waste flue gases from DRI kilns in WHRB. By utilizing Coal / Dolochar in FBC boiler as fuel.

1.3 Raw Materials

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

S.No.	Raw Material		Quantity (TPA)	Source	Mode of Transport
For DRI Kilns (Sponge Iron) – 2,31,000 TPA					
1	Iron Ore		3,70,000	NMDC, Bailadila/ Bachheli	By rail & road (through covered trucks)
2	Coal	Indian Coal	3,00,000	SECL, Chhattisgarh / MCL Odisha	By rail & road (through covered trucks)
		Imported Coal	1,92,000	Indonesia / South Africa / Australia	Through sea route, Rail & road (through covered trucks)
3	Dolomite		11,500	Local Area	By road (through covered trucks)
For Steel Melting Shop (Hot metal) – 1,00,000 TPA					
1	Sponge Iron		80,000	Own generation	----
2	MS Scrap		40,000	Local Area	By road (through covered trucks)
3	Ferro alloys		5,300	Own Generation	----
For Steel Melting Shop (MS Billets) – 3,96,000 TPA					
1	Sponge Iron		3,00,000	Own generation	----
2	MS Scrap		1,40,000	Local Area	By road (through covered trucks)
3	Ferro alloys		5,300	Own Generation	----
For Rolling Mill (TMT bars & Structural Steel) – 3,96,000 TPA					
1	MS Billets		4,20,000	Own generation & Purchased from Chhattisgarh	---- By Road (through covered trucks)
2	Furnace oil		19800	Local Market	By road (through covered trucks)
3	Coal (for Gasifier 24000 NM^3/Hr.)	Indian Coal	79200	SECL, Chhattisgarh / MCL Odisha	By rail & road (through covered trucks)
		Imported Coal	50688	Indonesia / South Africa / Australia	Through sea route , Rail & road (through covered trucks)
For Rolling Mill (TMT bars & Structural Steel) – 1,00,000 TPA (through hot charging)					
1	Hot metal		1,00,000	Own generation	----

S.No.	Raw Material		Quantity (TPA)	Source	Mode of Transport
For CFBC Boiler - Power Generation 14 MW (56 TPH Boiler)					
1	Dolochar		69,300	Own generation	----
2	Coal	Indian Coal	75,600	SECL, Chhattisgarh / MCL Odisha	By rail & road (through covered trucks)
		Imported Coal	48,000	Indonesia / South Africa / Australia	Through sea route, rail & Road (through covered trucks)
For Ferro Silicon unit (for 15,600 TPA)					
1	Quartz		26520	Chhattisgarh / Andhra Pradesh	By Rail & Road (covered trucks)
2	LAM Coke		8580	Imported	Through sea route & Road (through covered trucks)
3	MS Scrap		395	In-house Generation / local areas	---
4	Mill Scales		7920	In-house Generation	---
5	Electrode paste		360	Jharkhand	By Road (covered trucks)
6	Bag filter dust		780	In-house Generation	---
For Ferro Manganese unit (for 32,400 TPA)					
1	Manganese Ore		73710	MOIL / OMC	By Rail & Road (covered trucks)
2	LAM Coke		11826	Imported	Through sea route & Road (through covered trucks)
3	Quartz		972	Chhattisgarh	By Road (covered trucks)
4	Electrode Paste		648	Jharkhand	By Road (covered trucks)
5	Bag filter dust		5184	Inhouse Generation	-----
For Silico Manganese unit (for 32,400 TPA)					
1	Manganese Ore		52812	MOIL / OMC	By Rail & Road (covered trucks)
2	Fe-Mn Slag		20574	In house generation	-----
3	LAM Coke		12474	Imported	Through sea route & Road (through covered trucks)
4	Quartz		6480	Chhattisgarh / AP	By Rail & Road (covered trucks)
5	Electrode Paste		630	Jharkhand	By Road (covered trucks)
6	Bag filter dust		4860	In-house Generation	---

1.4 Manufacturing Process

1.4.1 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 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 2x15 MT Induction furnaces which are unimplemented in the earlier E.C. was permitted to manufacture M.S. Billets / Ingots. Now it is proposed to manufacture Hot Metal of 1,00,000 TPA instead of M.S. Billets / Ingots. The Hot Metal produced from LRF will be directly sent to Rolling Mill without using Re-heating Furnace through Hot charging method.

Also as part of expansion 8x15 MT Induction Furnaces are proposed to produce M.S. Billets / M.s. Ingots of 3,96,000 TPA which will be sent to Re-heating Furnace to reheat the Billets then sent to Rolling Mill to manufacture Rolled Products .

1.4.3 Manufacturing of Rolled products through Rolling Mill

The Hot Metal produced from Unimplemented Induction Furnaces will be directly sent to Rolling Mill to produce Rolled Products (OR) if M.S. Billets / M.s. Ingots produced in Induction Furnace will be sent to 2 nos. of 40 TPH reheating furnaces for the heating and will be sent to Rolling Mill. Furnace will be heated with Prodcuer Gas / Furnace oil. A bar and round mill will be installed in the plant to produce 3,96,000 TPA of Rolled Products /TMT Bars / Structural Steels.

1.4.4 Power Generation

Through WHRB Boiler

The hot flue gases from proposed DRI kilns (2x350 TPD) will pass through waste heat recovery Boiler to recover the heat and to generate 2x8 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 CFBC Boiler

Coal (Imported / Indian) along with dolochar will be used in FBC Boiler to generate 14 MW electricity. The flue-gases will be treated in high efficiency ESP and then discharged through stack into the atmosphere.

1.5 Water Requirement

The water requirement for the proposed expansion project will be **1460 KLD**. This includes Make-up water for DRI Kiln, SMS unit, Rolling Mill, Ferro Alloy plant, Power Plant & for domestic consumption. Air cooled condensers will be provided in the power plant to reduce the water requirement significantly. Water required for the existing plant is being sourced from Ground water Source. Water required for the present expansion

proposal will be sourced from Ground Water / Shivnath river. The following is the break-up of the water requirement for proposed expansion project.

BREAK-UP OF WATER REQUIREMENT

S.No.	UNITS	Water Requirement in KLD			
		Existing	Earlier EC Expansion	Proposed expansion	After present Expansion
1	DRI kilns	50	100	230	380
2	Steel Melting Shops	--	100	280	380
3	Rolling Mills	--	--	360	360
4	Ferro alloys	--	--	60	60
5	Power Plant		193	520	713
	a) Makeup water for Cooling tower	--	135	360	
	b) Makeup water for Boiler		48	140	
	c) DM plant regeneration water		10	20	
6	Domestic	3	7	10	20
	Total	**53**	**400**	**1460**	**1913**

1.6 Waste Water Generation

Closed loop cooling water system will be adopted in DRI, SMS, Rolling Mill & Ferro Alloy units. The effluent generated from Rolling Mill will be sent to settling tank & clear water will be recycled through closed circuit cooling system. Effluent from power plant will be treated and after ensuring compliance with SPCB norms, it will be utilized for dust suppression, ash conditioning and for greenbelt development. Sanitary wastewater will be treated in Sewage Treatment Plant (STP) of 20 KLD capacity and treated sewage will be utilised for greenbelt development. No effluent will be discharged outside the plant premises. The following will be the total wastewater & it's break-up.

BREAKUP OF WASTE WATER GENERATION

S.No.	Source	Quantity in KLD			
		Existing	Earlier EC Expansion	Proposed expansion	Total after Expansion
1.	DRI kiln	Nil	Nil	Nil	Nil
2.	Steel melting shop	Nil	Nil	Nil	Nil
3.	Rolling mill	Nil	Nil	Nil	Nil
4.	Power Plant				
	• Cooling tower blowdown	Nil	34	90	124
	• Boilers blowdown	Nil	10	28	38
	• D.M. plant regeneration water	Nil	10	20	30
5.	Sanitary Wastewater	2.4	5.6	8	16
	Total	**2.4**	**59.4**	**146**	**208**

1.7 Wastewater Characteristics

The following are the characteristics of effluent

CHARACTERISTICS OF EFFLUENT

PARAMETER	CONCENTRATION			
	DM plant regeneration	Boiler blowdown	Cooling Tower blowdown	Sanitary waste water
pH	4 – 10	9.5 – 10.5	7.0 – 8.0	7.0 – 8.5
BOD (mg/l)	--	--	--	200 – 250
COD (mg/l)	--	--	--	300 – 400
TDS (mg/l)	5000 -6000	1000	1000	800 – 900
Oil & Grease (mg/l)	--	10	--	--

2.0 DESCRIPTION OF ENVIRONMENT

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

2.1 Ambient air quality

Ambient air quality was monitored for $PM_{2.5}$, PM_{10}, SO_2, NOx & CO at 8 stations including project site during 1st March 2018 to 31st May 2018. The following are the concentrations of various parameters at the monitoring stations:

Parameter		Concentration
$PM_{2.5}$	:	19.7 to 36.2 µg/m^3
PM_{10}	:	34.8 to 62.7 µg/m^3
SO_2	:	7.1 to 11.8 µg/m^3
NO_X	:	7.5 to 19.9 µg/m^3
CO	:	368 to 995 µg/m^3

2.2 Water Quality

2.2.1 Surface Water Quality

Seonath River, Kharun River is flowing at a distance of 7.0 Kms. & 8.1 Kms. from the plant. Kulhan Nallah & Batapara Branch Mahanadi Canal is flowing at a distance of 8.5 Kms. & 1.5 Kms. from the plant. 2 no. of Samples from Seonath River & 2 no. of Samples from Kharun Rivers have been collected at 60m Upstream & 60 m Downstream. 1 no. of sample have been collected from Kulhan Nallah & Batapara Branch Mahanadi Canal and analyzed for various parameters. No other surface water samples have been collected as the study period is summer season. 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 **43.86 dBA to 68.71 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 **1.58 «g/m^3** at a distance of 1300 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 **0.66 g/m^3**.

The predicted max incremental SO_2 concentrations (24 hourly) due to the emissions from operation of proposed expansion project will be **15.2 «g/m^3** at a distance of 1300 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 **8.14 «g/m^3** at a distance of 1300 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 **4.8 «g/m^3**.

The predicted incremental rise in CO concentration due to the Vehicular emission will be **3.8 «g/m^3**.

NET RESULTANT MAXIMUM CONCENTRATIONS DUE TO PROPOSED EXPANSION PROJECT

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	62.7	11.8	19.9	995
Maximum predicted incremental rise in concentration due to **the proposed expansion Project.**	1.58	15.2	8.14	--
Maximum predicted incremental rise in concentration due to **Vehicular Emissions from the proposed expansion project.**	0.66	--	4.8	3.8
Net resultant concentrations during operation of the proposed expansion project.	**64.93**	**27.0**	**32.84**	**998.8**
National Ambient Air Quality Standards	**100**	**80**	**80**	**2000**

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

3.2 Prediction of impacts on noise quality

The major sources of noise generation in the proposed project will be STG, boilers, compressors, DG set, etc. Acoustic enclosures will be provided to the STG. The ambient noise levels will be within the standards prescribed by MoEF vide notification dated 14-02-2000 under the Noise Pollution (Regulation & Control), Rules 2000 i.e. the noise levels will be less than 75 dBA during day time and less than 70 dBA during night time. **17 acres (6.88 Ha.)** of extensive greenbelt will be developed (inclusive of existing) to further attenuate the noise levels. Hence there will not be any adverse impact due to noise on population in surrounding areas due to the proposed expansion project.

3.3 Prediction of impacts on Water Environment

Closed loop cooling water system will be adopted in DRI, SMS, and Rolling Mill units. The effluent generated from Rolling Mill will be sent to settling tank & clear water will be recycled through closed circuit cooling system. Effluent from power plant will be treated and after ensuring compliance with SPCB norms, it will be utilized for dust suppression, ash conditioning and for greenbelt development. Sanitary waste water will be treated in STP. There will not be any effluent discharge outside the premises. ZLD will be followed. 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. **17 acres (6.88 Ha.)** of extensive greenbelt will be developed (inclusive of existing) as per guidelines. Hence, there will not be any adverse impact on land environment due to the proposed expansion project.

3.5 Socio - Economic Environment

There will be lot of opportunities in employment to local people during construction as well as in operation phase. There will be further upliftment in Socio Economic status of the people in the area. A separate Budget will allocated for CER activities which will be implemented in the nearby villages. Hence there will be further development of the area due to the proposed project.

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 & Waste water quality				
A.	Water quality in the area	Quarterly basis	Composite sampling (24 hourly)	As per IS: 10500
B.	Effluent at the outlet	Once in a month	Grab sampling	As per EPA Rules, 1996

S.No.	Particulars	Frequency of Monitoring	Duration of sampling	Parameters required to be monitored
	of the ETP		(24 hourly)	
C.	STP inlet & outlet	Once in a month	Grab sampling (24 hourly)	As per EPA Rules1996
2. Air Quality				
A.	Stack Monitoring	Online monitors (WHRB & FBC boiler stacks) Quarterly Once	Continuous 24 hourly	PM PM, SO_2 & NOx
B.	Ambient Air quality	CAAQMS Quarterly Once	Continuous 24 hourly	PM $PM_{2.5}$, PM_{10}, SO_2, NOx
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	Once in a month	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 additional land proposed for expansion. 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. Top priority will be given to locals in employment. Budget will be allocated for Corporate Environment Responsibility (CER) activities to be taken up in the surrounding village as per the Ministry's Office Memorandum vide F.No. 22-65/2017-IA.III dated 1st May 2018 for Brownfield projects. These activities will help in contributing to the development of villages in the nearby areas.

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	Maximum Emission at the outlet
1	DRI kilns with WHRBs	Electro Static Precipitators (ESP) – 2 nos.	PM - 30 mg/Nm^3
2	Induction Furnaces with CCM (2x15 T)	Fume Extraction system with bag filters – 2 nos.	PM - 30 mg/Nm^3
3	Induction Furnaces with CCM (8x15 T)	Fume Extraction system with bag filters – 8 nos.	PM - 30 mg/Nm^3
4	Rolling Mill	Chimney of Adequate Height	----
5	Ferro Alloy (SEAF)	4th hole Fume Extraction system with bag filters – 2 nos.	PM - 30 mg/Nm^3
6	CFBC Boiler	Electro Static Precipitator – 1 no.	PM - 30 mg/Nm^3 SOx - 100 mg/Nm^3 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

Closed loop cooling water system will be adopted in DRI, SMS, and Rolling Mill & Ferro Alloy units. The effluent generated from Rolling Mill will be sent to settling tank & clear water will be recycled through closed circuit cooling system. Effluent from power plant will be treated in ETP and after ensuring compliance with SPCB norms, it will be utilized for dust suppression, ash conditioning and for greenbelt development. There will not be any effluent discharge outside the premises. Sanitary wastewater will be treated in

Sewage Treatment Plant (STP) of 20 KLD capacity and treated sewage will be utilized for greenbelt development. No effluent will be discharged outside the plant premises.

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 sent to Holding Tank along with Cooling Tower Blowdown. Service water will be treated in an oil separator and after treatment it will be taken to Holding Tank. The treated effluent will be utilized for dust suppression, ash conditioning and for Green belt development. Sanitary wastewater will be treated in Sewage Treatment Plant (STP) of 20 KLD capacity and treated sewage will be utilized for greenbelt development. No effluent will be let out of the plant premises. Hence Zero discharge concept will be implemented.

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

Solid waste generation and disposal

S.No.	Waste	Quantity (TPD)		Method of disposal
		Existing and earlier EC (TPD)	Proposed Expansion (TPD)	
1	Ash from DRI	53	126	Is being given (for existing) to Cement Plants & Brick manufacturers. The same practice will be continued after expansion.
2	Dolochar	87	210	Is being utilized in existing FBC boiler and after expansion same practice will be continued.
3	Wet scrapper sludge	13.8	32.2	Is being used in road construction & being given to brick manufacturer and same practice will be continued after the proposed expansion also.
4	Kiln Accretion Slag	2.7	6.3	Is being used in road construction and same practice will be continued after the proposed expansion also.
5	SMS Slag	30	120	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.
6	Mill scales from Rolling Mill	Nil	24	Mill scales from Rolling Mill will be reused in proposed to manufacture Ferro Alloys.
7	End cuttings from Rolling Mill	Nil	36	End cuttings from Rolling Mill is being reused in the SMS
8	Ash (with Indian Coal + dolochar)	130	200	Will be given to Cement Plants / Bricks manufacturers
		(OR)		
	Ash (with imported Coal + dolochar)	81	149	Will be given to Cement Plants / Bricks manufacturers
9	Fe-Si Slag	Nil	13.5	Will be given to cast iron foundries
		(OR)		
	Si-Mn Slag	Nil	124	Will be utilized in road construction
		(OR)		
	Fe-Mn Slag	Nil	69	Will be used in manufacture of Silico Manganese as it contains high MnO_2 and

7.5 Greenbelt Development

Greenbelt of **17 acres (6.88 Ha.)** of extensive greenbelt will be developed (inclusive of existing) in the plant premises. **10 to 115 m** wide greenbelt will be developed all around the plant.

7.6 Cost for Environment Protection

Capital Cost for Environment Protection for proposed plant : Rs. 27 Crores

Recurring Cost per annum for Environmental protection : Rs. 2.8 Crores

7.7 Implementation of CREP Recommendations

All the CREP recommendations will be strictly followed.

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