

## 1.0 INTRODUCTION

**N.R. Ispat & Power Private Limited** has a proposal to manufacture 200 TPD of Sponge Iron, 200 TPD of M.S.Billets, 200 TPD of Rolled products and 14 MW of Power in Gaurmudi Village, Tamnar Tehsil, Raigarh District, Chhattisgarh.

Sr. No.	Details	Plant Configuration
1	Sponge Iron Unit	2 x 100 TPD
2	Induction Furnaces	2X10 MT/Heat
3	Rolling Mill	1x200 TPD
4	<b>Power Generation</b>	<b>14 MW</b>
	WHRB Based	4 MW
	FBC Based	10 MW

Pioneer Enviro Laboratories & Consultants Private Limited, Hyderabad, have prepared Draft Rapid Environmental Impact Assessment (DREIA) report for the proposed Mini Integrated Steel Plant by incorporating the Terms of Reference (TOR) approved by the Ministry of Environment & Forests, New Delhi. The report contains detailed description of the following

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

## 2.0 PROJECT DESCRIPTION

1. The Proposed plant is located at Gaurmudi Village, Tamnar Tehsil, Raigarh District, Chhattisgarh.
2. The nearest railway facility is available at Raigarh, which is about 15 Kms. from the plant.

3. The power generated in the plant will be utilized for plant internal requirement.
4. 52.65 Acres of land is acquired for the proposed project
5. The average annual rainfall in the area is 1520 mm.
6. There are no National parks / Wild life sanctuaries/ Bird sanctuaries within 10 Km radius of project site.
7. The following industries are situated with in 25 Km. radius.

S.NO	NAME OF THE INDUSTRY
1.	M/s. Nalwa Sponge Iron Ltd
2.	M/s. Ind Agro Limited
3.	M/s. MSP Steels Pvt. Ltd.
4.	M/s. Singhal Enterprises (P) Ltd
5.	M/s. Seleno Steels Ltd.
6.	M/s. Ambica Sponge Iron Ltd.
7.	M/s. Shyam Steel Pvt Ltd.
8.	M/s. Anjani Steels (P) Ltd.
9.	M/s. Navadurga Fuels(P) Ltd.
10.	M/s. Salasar Sponge Iron & Power Ltd.
11.	M/s. Raigarh Ispat Ltd.
12.	M/s. B.S. Sponge Pvt Ltd.
13.	M/s. Raigarh Iron Industries Ltd.
14.	M/s. Siddhi Vinayak Sponge Iron Pvt Ltd.
15.	M/s. Jindal Industrial Park.
16.	M/s. Mahamaya Rolling Mill

### **3.0 DETAILS OF PROJECT**

#### **3.1 RAW MATERIALS**

The raw materials for the proposed mini integrated steel plant are Iron ore, coal, dolomite, scrap and Ferro alloys. These raw materials will be transported by rail/ road in covered trucks.

#### **3.2 MANUFACTURING PROCESS**

##### **3.2.1 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 Pellets and convert 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°C enters the reduction zone. Temperature of the order of 1050°C 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°C. 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.

### **3.2.2 STEEL MELTING SHOP:**

Initially scrap & other metallics such as Sponge Iron will be charged into the induction furnace. After scrap & other metallics are fully melted, the temperature of the melt reaches above 1600°C, and then DRI will be continuously charged into the furnace. As soon as the charge is melted, bath samples will be taken and temperature will be measured. There will be 2 nos. of induction furnaces in the SMS each of 10 MT capacity. Concast will be used to produce Billets.

### **3.2.3 ROLLING MILL:**

A 200 TPD furnace is proposed for the heating of billets. Furnace will be heated with Furnace oil. A bar and round mill will be installed in the plant to produce 200 TPD of TMT bars/ Structural steel.

### **3.2.4 POWER GENERATION**

#### **3.2.4.1 THROUGH WASTE HEAT RECOVERY BOILER (WHRB)**

The hot flue gases from DRI kilns will pass through waste heat recovery Boilers to recover the heat and to generate electricity of 4 MW through proposed sponge iron kilns. Hence a total of 4 MW will be generated through WHRBs. The gases after heat recovery will pass through ESP and then discharged through a common stack (with twin flues) of 60 m height. The outlet dust emission will be less than 50 mg/Nm<sup>3</sup>.

### 3.2.4.2 THROUGH AFBC BOILER

Dolochar and coal will be used in AFBC Boiler to generate steam and then electricity of 10 MW. The flue-gases will be treated in a high efficiency Electro Static Precipitator and then discharged through stack of 50 m height. The outlet dust emission will be less than 50 mg/Nm<sup>3</sup>.

### 3.3 WATER REQUIREMENT

The proposed project requires about 966 cum/day of water. The water requirement for the proposed project will be met from the Delari Jharna Nallah. Permission from Water Resources Department, Govt. of Chhattisgarh is under process. Water drawl permission will be obtained before starting the operation. Hence there will not be any adverse impact on the down stream users due to the proposed project. The following is the break-up of water requirement for the proposed project.

S.No	Unit	Water Consumption (Cum/Day)
1.	Cooling water Make-up for DRI plant	30
2.	Cooling water make-up for SMS plant	30
3.	Cooling water make-up for Rolling Mill	40
3.	<b>POWER PLANT</b>	
	a) Cooling Tower Make-up	800
	b) Boilers make-up	48
	c) D.M. plant regeneration water	8
4.	Domestic	10
<b>Total</b>		<b>966</b>

### 3.4 Waste Water Generation

The total effluent quantity expected from the proposed project will be 181 cum/day. Closed circuit cooling system will be adopted in sponge iron, SMS and Rolling mill. Hence there will not be any effluent generation from the process & cooling from these units. The effluent generated from the power plant will be mainly Boilers blow down, cooling tower blow down & DM plant regeneration along with sanitary waste water.

#### WASTE WATER GENERATION

	Unit	Wastewater Generation (KL/Day)
1.	<b>POWER PLANT</b>	
	a) Cooling Tower Blowdown	150
	b) Boiler blowdown	15
	c) D.M. plant regeneration water	8
2.	Domestic	8
<b>Total</b>		<b>181</b>

### 3.5 Waste water Characteristics

The following are the Characteristics of the effluents generated from different sources.

#### 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
TDS (mg/l)	5000 – 6000	1000	800 - 1000	800 - 900
COD (mg/l)	--	--	--	300 – 400
BOD (mg/l)	--	--	--	200 - 250

### 4.0 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 proposed site.

#### 4.1 Ambient air quality

Ambient air quality was monitored for RSPM, SPM, SO<sub>2</sub> & NO<sub>x</sub> at 8 stations including project site for one season as per MOEF guidelines. The following are the concentrations of various parameters at the monitoring stations.

Parameter		Concentration
RSPM	:	28.2 to 49.8
SPM *	:	99.6 to 149.8
SO <sub>2</sub>	:	7.3 to 12.3
NO <sub>x</sub>	:	8.9 to 14.1

\* PAH in SPM was analyzed and the concentrations at all monitoring stations are Below Detectable Level.

#### 4.2 Water quality

Ground water samples were collected at 8 stations along with surface water samples and analysed for various Physico-Chemical parameters. The water samples show that they are suitable for potable purposes.

#### 4.3 Noise levels

Noise levels were measured at 8 locations during day time & Night time. The noise levels at the monitoring stations are ranging 44.70 dBA to 48.45 dBA.

## **5.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

### **5.1 Prediction of impacts on air quality**

The emissions from the proposed project are SPM, SO<sub>2</sub>, NO<sub>x</sub>. The predictions of Ground 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 emissions from the stacks in the proposed project and the fugitive emissions from the same are considered in the Modeling.

It is observed from the computation results that the maximum predicted incremental rise in 24 hourly ground level concentrations of SPM, SO<sub>2</sub> and NO<sub>x</sub> during operation of proposed project are 0.8 µg/m<sup>3</sup>, 7.6 µg/m<sup>3</sup> and 5.7 µg/m<sup>3</sup> respectively at a distance 975 m in the down wind direction. We have also considered the impact of other industries /proposals in the area for prediction of Ground level concentrations (GLC). The net resultant GLCs due to the proposed project and other industries in the area are within the National Ambient Air Quality Standards (NAAQS). Hence there will not be any adverse impact on air environment due to the proposed project.

### **5.2 Prediction of impacts on noise quality**

The major sources of noise generation in the proposed project will be STG, compressors, etc. The ambient noise levels will be with in the standards prescribed by MOE&F 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. 20 acres of extensive greenbelt is proposed to be developed in the plant premises 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.

### **5.3 Prediction of impacts on water Environment**

Closed circuit cooling system will be implemented in DRI, SMS & Rolling Mill units. Hence there will not be any effluent generation from the process & cooling from these units. The effluent generated will be from power plant activities which include Boilers blow down, cooling tower blow down, DM plant regeneration and this will be treated in Effluent treatment plant. This treated effluent after ensuring compliance with norms of CECB/CPCB for on land for irrigation, will be utilized for dust suppression, ash conditioning & greenbelt development. Zero discharge will be maintained after implementation of the project also. Sanitary waste water will be

treated in septic tank followed by soak pit. Rain water harvesting will be implemented in consultation with Central Ground Water Board. This will help in improvement of ground water table in the area.

#### 5.4 Prediction of Impacts on Land Environment

The effluent will be treated to achieve CECB standards for on land for irrigation. All the required air pollution control systems will be provided to meet CPCB / CECB norms. All solid wastes will be disposed / utilized as per CPCB/CECB norms. 20 Acres of greenbelt will be developed. Hence there will not be any adverse impact on land environment due to the proposed project.

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

#### 6.0 ENVIRONMENTAL MONITORING PROGRAMME

Post project monitoring will be conducted as per the guidelines of CECB and MoEF are tabulated below.

##### MONITORING SCHEDULE FOR ENVIRONMENTAL PARAMETERS

Sr. No.	Particulars	Frequency of Monitoring	Duration of sampling	Parameters required to be monitored
<b>1. Water &amp; Waste water quality</b>				
A.	Water quality in the plant	Once in a month	Composite sampling (24 hourly)	As per IS: 10500
<b>2. Air Quality</b>				
A.	Stack Monitoring	Online monitors (WHRB, FBC Boiler) Once in a month		SPM SO <sub>2</sub> & NO <sub>x</sub>
B.	Ambient Air quality	Twice a week	24 hours continuously	RSPM, SPM, SO <sub>2</sub> & NO <sub>x</sub>
C.	Fugitive emissions (As per CPCB norms)	Once in a month	8 hourly	Particulate matter
<b>3. Meteorological Data</b>				
	Meteorological data to be monitored at the plant.	Daily	Continuous monitoring	Temperature, Relative Humidity, rainfall, wind direction & wind speed.
<b>4. Noise level monitoring</b>				
A.	Ambient Noise levels	Twice in a year	Continuous for 24 hours with 1 hour interval	

## 7.0 PROJECT BENEFITS

The local areas will be benefited by way of generation of employment opportunities, increased demand for local products and services. There will be an overall improvement in the income level of the local people.

The project creates employment to about 100 persons once the plant is commissioned and for 350 persons during construction stage. Priority will be given to locals for Semi-Skilled and Unskilled workers. With the development of this plant there will be lot of scope for more industrial investments which in turn will benefit the nation.

## 8.0 ENVIRONMENT MANAGEMENT PLAN

### 8.1 Air Environment

**The following are air pollution control systems proposed in the proposed project.**

S. NO.	SOURCE	CONTROL EQUIPMENT
1.	DRI kilns with WHRBs	Electro Static Precipitators (ESP)
2.	Steel Melting Shop	Fume Extraction system with bag filters
3.	AFBC Boiler	Electro Static Precipitator

The following air pollution control systems/ measures are proposed in the Plant

- All conveyors will be completely covered with G.I. sheets hoods 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 collected dust from the Bag house of Steel Melting will be taken to a dust storage bin through a pneumatic conveying system.
- All the required Air pollution control measures will be strictly implemented so that the ambient air quality will be with in the National Ambient Air Quality standards during the operation of the plant.
- All internal roads will be asphalted. This will eliminate the fugitive emissions due to vehicular movement.
- Extensive greenbelt proposed to be developed will help in further mitigating the air emissions.

## **8.2 WATER ENVIRONMENT**

Waste water generated from the proposed Plant will be treated in Effluent Treatment Plant and fully reused within the plants/premises. Zero discharge system will be adopted.

### **EFFLUENT TREATMENT PLANT**

The effluent generated from the proposed Plant will be treated in the following manner. 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. After neutralization these two effluent streams will be mixed with Cooling Tower blowdown in a Central Monitoring Basin (CMB). The treated effluent after ensuring compliance with CECB norms will be utilized for dust suppression, ash conditioning & for green belt development within the premises. A dedicated pipe distribution network will be provided for using the treated effluent for on land for irrigation. Sanitary waste water will be treated in Septic tank followed by soak pit. No effluent will be let out of the plant premises. Hence Zero discharge will be implemented.

## **8.3 Noise environment**

The major sources of noise in the proposed Plant will be STG, Boilers & compressors. All the turbines and other machinery will be manufactured in accordance with MOEF norms on Noise levels. The employees working near the noise generating sources will be provided with earplugs. Noise absorbing materials will be used in the construction of roofs, walls and floors. 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. Training will be imparted to plant personnel to generate awareness about the damaging effects of noise.

## **8.4 Land Environment**

The waste water generated from the Proposed project will be treated in the Effluent Treatment plant to comply with the CECB standards and will be used for dust suppression, ash conditioning and for greenbelt development. All the required Air pollution control systems will be installed and operated to comply with CECB norms. Solid wastes will be disposed off as per norms. Extensive greenbelt will be developed in the plant premises. Desirable beautification and landscaping

practices will be followed. Hence there will not be any impact due to the proposed project.

### **Solid waste generation and disposal**

<b>S. No</b>	<b>Solid Waste</b>	<b>Quantity (TPD)</b>	<b>Method of Disposal</b>
1	Dolochar	60	Will be captively consumed in FBC boiler.
2	Ash & Dust from Bag filters	190	Will be given to brick manufactures / Cement plants
3	Accretion slag	2.0	Will be used in road construction
4.	Wet Scraper sludge	4.0	Will be given to brick manufactures
5	Slag from SMS	20	Will be used in road construction after removal of Iron Contents
6	Mill scales	10	Reused in to the SMS

### **8.5 GREENBELT DEVELOPMENT**

A greenbelt of 20 acres will be developed in the plant premises. A 15 m wide greenbelt will be developed all around the plant.

### **8.6 IMPLEMENTATION OF CREP RECOMMENDATIONS**

All the CREP recommendations will be strictly followed in the proposed Plant.

### **8.7 POST PROJECT ENVIRONMENTAL MONITORING**

Ambient Air Quality, Stack monitoring & effluent analysis will be carried out regularly as per CPCB norms and the analysis reports shall be submitted to MOEF & CECB regularly.

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