

Executive Summary

For

*Expansion of Manufacturing of Ferro Alloys from
48,000 TPA to 64,000 TPA*

Project Proponent

M/s Hira Power and Steels Limited

At

Khasra No. 511/1, 512/2, 513/1, 513/2, 513/3, 513/4 and others

Urla Industrial Area, Raipur, Chhattisgarh

Environmental Consultant

Pollution and Ecology Control Services

Near Dhantoli Police Station, Dhantoli, Nagpur

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1.0 INTRODUCTION

The proposed brownfield project attracts the provisions of EIA Notification, 2006 and falling under Category 'A' of Schedule 3 (a) Metallurgical Industries (Ferrous and Non-ferrous). The proponent made an online application on 21st October 2021 along with Form-1, Pre-feasibility report and other documents for Terms of Reference (TORs) for undertaking detailed EIA study. Standard ToR was granted vide letter J-11011/836/2008-IA.II(I) dated 27th October 2021 for undertaking EIA study for the proposed expansion project.

A closure notice was issued by C.G. Environment Conservation Board to Hira Power and Steel Limited at Khasra No. 511/1,512/2,513/1, 513/2, 513/3, 513/4 and others, Urla Industrial Area, Raipur Chhattisgarh. The appeal was submitted by Hira Power and Steel Limited to Awas and Paryawaran Vibhaag Mantralaya, Raipur. The hearing was postponed due to the lockdown due to onset of COVID 19 in Raipur. The case is still pending with Awas and Paryawaran Vibhaag Mantralaya, Raipur.

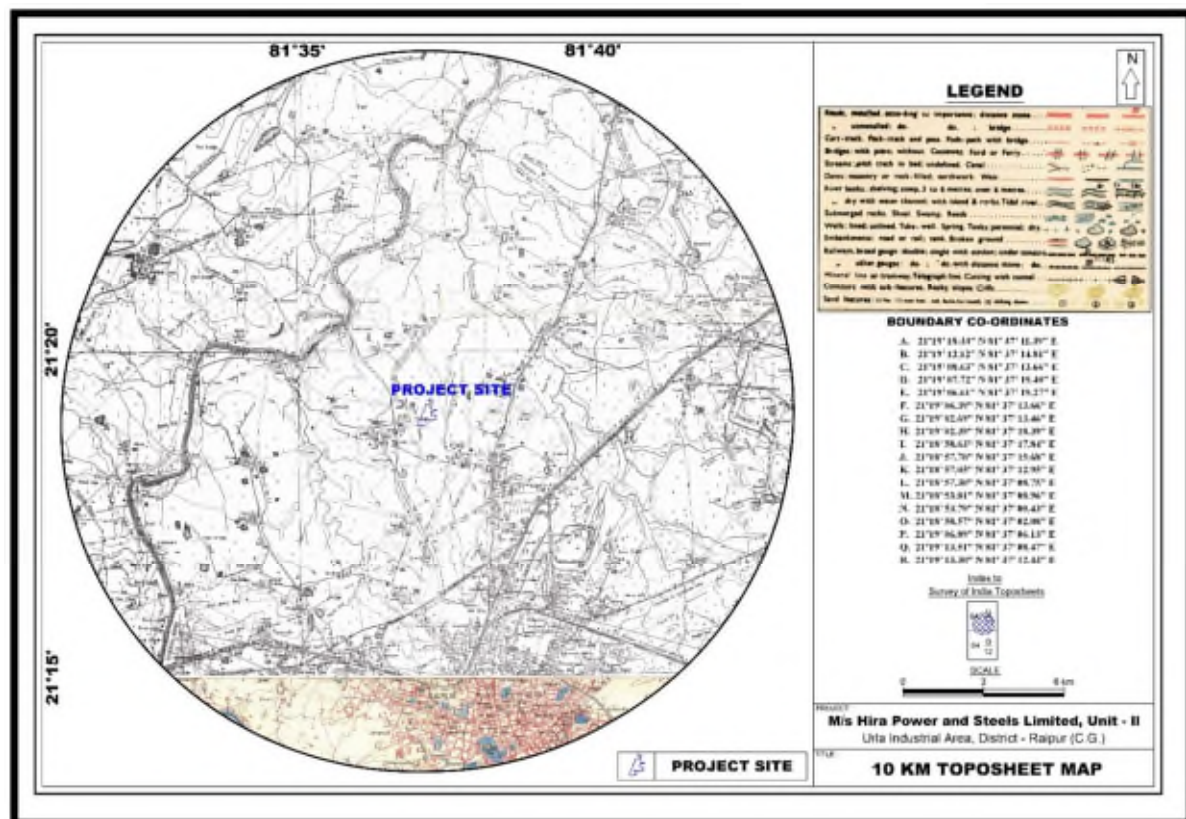
Hira Power and Steel Limited has proposed to expand the manufacturing of Ferro alloy from 48,000 TPA to 64,000 TPA without change in plant and machinery at Khasra No. 511/1,512/2,513/1, 513/2, 513/3, 513/4 and others, Urla Industrial Area, Raipur Chhattisgarh. Proposed Brownfield project will be established in 17.60 ha. of CSIDC allotted land, where existing plant is already in operation.

Presently Hira Power and Steel Limited has proposed the expansion of Ferro Alloy from 48000 TPA to 64000 TPA without change in plant and machinery.

2.0 PROJECT DESCRIPTION

The Plant Site is a part of the Survey of India Toposheet No. 64/G/11 and 64/12. The site falls between 21°18' 53.79" N to 21°19' 18.33" N Latitude and 81° 37' 00.43" E to 81° 37' 11.39" E Longitude with an average altitude of 273 m above MSL.

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Source: SOI Toposheet
Topographical Map (10 km Radius)
Salient Features of the Proposed Project

Particulars	Description
Cost of the Project	Expansion cost : Rs. 4.10 Crores Existing Cost : Rs. 188.61 Crores Total Cost : Rs. 192.71 Crores
Total Area	17.6 Ha
Water Requirement	Total: 550 KLD Total yearly water requirement will be $550 \times 330 = 181500$ KLA. Source: CSIDC and Ground Water Zero discharge will be maintained
Air Pollution Control Equipment	The emissions from the furnace is being/will be sucked through bag filters and then let out through a stack to maintain the emission below 30 mg/Nm^3 .

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Power Requirement	Total power requirement: 18.9 MW Source: Captive Power Plant
Total Manpower Utilization	906 people.
No. of Working Days	330

The Project is an expansion of existing ferro alloys plant without change in plant and machineries.

Production Scenario

S.N.	Description	Existing Capacity	Proposed Capacity	Total Capacity	Remarks
1	Ferro Alloys (including low / medium Ferro Alloys) And Ferro Alloys	18000 TPA And 30,000 TPA	Ferro Alloys 16,000 TPA	Ferro Alloys 64,000 TPA (Including 48,000 Low/Medium Carbon Ferro Alloys)	Hira Power and Steel Limited has proposed the expansion of Ferro Alloy from 48000 TPA to 64000 TPA without change in plant and machinery
2	Pig Iron From 2 x 5.5 MVA Submerged Arc	56,000 TPA	NIL	No Change. Same as Existing	
3	Power Plant	20 MW	NIL	No Change. Same as Existing	

PROCESS DESCRIPTION

Standard Ferro Manganese is melted at about 1700 - 1800°C. This is achieved by a conventional Submerged Arc Electric Furnace. The three carbon electrodes, partially submerged in the charge, are supported on hydraulic cylinders for upward and downward movements to maintain the desired electrical conditions in the furnace.

The body of the furnace is cylindrical in shape, and is lined with firebricks, silicon carbide bricks and carbon tamping paste. Two tap-holes are provided at 120 Deg. apart for draining out both the molten alloy and the slag. During the repair works of one of the tap holes the other will function as standby. The raw materials are thoroughly mixed in the proper proportion before being charged into the furnace. Manual poking rods or stoker car are used for stoking the charge on the furnace top.

- Smoke Hood
- Connecting Duct and Emergency Stack
- Electrode Carrying System
- Suspension Mantle
- Electrode Holders and Pressure Rings
- Electrode Slipping Device
- Electrode Lowering and Raising Mechanism
- Hydraulic Power Pack
- Refractories
- Vacuum Circuit Breaker
- Copper Bus Bar, Copper Bus Tubes, Copper Flexibles Etc.

3.0 DESCRIPTION OF THE ENVIRONMENT

Air Environment

The ambient air quality monitored at 08 locations selected based on predominant wind direction, indicated the following ranges;

PM₁₀: 48.5 to 92.4 µg/m³.

PM_{2.5} : 22.4 to 56.4 µg/m³

SO₂ : 6.2 to 20.6 µg/m³

NO_x : 16.2 to 42.6 µg/m³

CO: 0.1 to 1.8 mg/m³

Industrial Area	PM ₁₀	PM _{2.5}	SO ₂	NO _x
Residential, Rural Area (CPCB Norms)	100 µg/m ³	60 µg/m ³	80 µg/m ³	80 µg/m ³

The concentrations of PM₁₀, PM_{2.5}, SO₂ and NO_x were found within the National Ambient Air Quality Standards (NAAQ).

Water Environment

A total 16 samples including eight surface & eight ground water samples were collected and analyzed. The water samples were analyzed as per Standard Methods for Analysis of Water and Wastewater, American Public Health Association (APHA) Publication.

The data indicates that the ground water as well as the surface water quality are below the stipulated standard for drinking water (BIS 10500 – 2012) except high concentration of total coli form in surface water, which may be due to the human activities.

Noise Environment

Noise levels measured at eight stations are within limit of 55.0 dB (A) for Residential Area or 75.0 dB (A) for Industrial Area as given in MoEF Gazette notification for National Ambient Noise Level Standard.

Area Code	Category of Area	Limits in dB(A) Leq	
		Day time	Night time
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Zone**	50	40

** Silence zone is defined as area up to 100 meters around premises of hospitals, educational institutions and courts. Use of vehicle horns, loud speakers and bursting of crackers are banned in these zones

Land Environment

Eight Soil samples were collected analyzed for physico-chemical characteristics at selected locations in the study area to assess the existing soil conditions around the proposed project site. The relevant parameters show the following characteristics.

The characteristics of the soil sample were compared with different depths for respective parameters.

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The observations of soil characteristics are discussed parameter wise below;

- a) Texture of soil samples are Silt Clay.
- b) Colour of soil samples are brownish, blackish brown.
- c) The Organic Matter of soil samples are in the range of 0.41 to 0.76 g/cc
- d) pH values of soil samples varied between 6.22 to 7.12.
- e) Soil samples have conductivities between 152.4 to 328.3 mmhos/cm

4.0 Anticipated Impacts & Mitigation Measures

Impact on Air Quality

The major pollutants of air in a proposed plant are the particulate matters from the various stacks and fugitive emissions due to material handling. Company is presently taking all measures to effectively control the air emissions and periodic monitoring of the stack emissions & ambient air quality is being done to monitor the pollutant concentrations. Same will be continued after the proposed expansion. During operation phase, air emissions both gaseous and fugitive will be on account of process emissions from stack of SAF, Power plant as well as transportation of men and material. The impacts on air quality due to source of the air pollutant in the proposed facilities have been identified.

Emissions released from the stacks during operation phase will get dispersed in the atmosphere and finally reach the ground at a specified distance from the sources. From the proposed activities the possible environmental impact on air quality has been envisaged due to the following sources.

In this case the source emission is envisaged from various sources, 6 Stack of different heights are available for proper dispersion of gaseous pollutants.

Mitigation Measures

- Bag filter of Capacity 60000 m³/Hr , 60000 m³/Hr, 75000 m³/Hr , 60000 m³/Hr, and 75000 m³/Hr has been installed in ARC furnaces A, B,C D and E respectively.
- All internal roads are tarxred.
- Stack is well equipped with continuous emission monitoring system along with remote calibration facility for gaseous parameters.

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- Fugitive as well ambient air quality monitoring is being/will be carried out on regular basis to ensure the compliance with National Ambient Air Quality Standards (NAAQS). The ambient air quality within the factory premises shall not exceed the standards (PM_{10} 100 $\mu\text{g}/\text{m}^3$, $PM_{2.5}$ 60 $\mu\text{g}/\text{m}^3$ SO_2 80 $\mu\text{g}/\text{m}^3$ and NO_x 80 $\mu\text{g}/\text{m}^3$ prescribed by CPCB).
- Water sprinklers are installed in the existing plant to control dust emission.
- Vacuum cleaners also has been installed in the existing plant for road sweeping. It is self machine, designed for industrial cleaning work.

I. Fugitive Emission

Fugitive emissions are the air pollutants released in the air. Fugitive dust may be defined as “any solid particulate matter that becomes airborne by natural or man-made activities, excluding particulate matter emitted from an exhaust stack.

Sources of Fugitive Emissions& Mitigation Measures

In plant, the fugitive dust is emitted primarily from the following:

Transportation: Movement of heavy trucks/vehicles on the roads generates substantial Quantity of dust. This is due to the presence of dust over the road, which is carried away by wind.

Raw Material Handling: Raw materials like Manganese ore, Dolomite etc. when transferred within the premises will lead to the fugitive dust emissions.

Storage of Raw Materials & Finished Product: Dust may be generated due to carryover by wind. However, to avoid this, the raw materials is/will be covered by Tarpaulin sheets.

Fugitive emissions from the Submerged Electric Arc Furnace (SEAF) will be sucked through hoods and will pass through a Fume extraction system by PTFE Coated filter bags with 50% extra rated flow and then the treated gases will be discharged into the atmosphere through a stack of specific height for effective dispersion of emissions from SAF. The outlet dust emission in the exhaust gases will be less than 30 mg/Nm³.

Action plan to control Fugitive emissions

- All Internal roads are paved to prevent the fugitive dust emission due to vehicular movement.
- Speed limit in plant premises is in control.
- All transportation vehicles carry/ will carry a valid PUC (Pollution under Control) Certificate.
- Flow of vehicles is being/will be maintained.
- Proper traffic management is being/will be undertaken.
- Proper servicing& maintenance of vehicles is being/will be carried out.
- Proper dust masks are being/will be provided to workers coming in direct contact of fugitive emissions
- Adequate greenbelt will be developed in the plant area. Greenbelt acts as a surface for settling of dust particles and thus reduces the concentration of particulate matter in air.
- Water Sprinkling is being /will be done to reduce fugitive emission in the plant and maintain the ambient air quality within CPCB standard.
- Ambient air quality is being/will be regularly monitored, so as to keep a check on the emissions of different pollutants.
- Fugitive emission sources are being /will identified and monitored at regular basis.

Noise Levels

The noise levels will not exceed the standards stipulated by Central Pollution Control Board at any point of time. The equipments are inbuilt noise control devices. The measured noise level produced by any equipment will not exceed 85 dB(A) at a distance of 1.0-m from its boundary in any direction under any load condition. The noise produced in valves and piping associated with handling compressible and incompressible fluids will be attenuated to 75 dB(A) at a distance of 1.0 m from the source by the use of low noise trims, baffle plate silencers/line silencers, acoustic lagging (insulation), thick-walled pipe work as and where necessary. The general mitigation for the attenuation of the noise are given below:

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- ❖ Encasement of noise generating equipment where otherwise noise cannot be controlled
- ❖ Providing noise proof cabins to operators where remote control for operating noise generating equipment is feasible.
- ❖ In all the design/installation precautions are taken as specified by the manufacturers with respect to noise control will be strictly adhered to;
- ❖ High noise generating sources will be insulated adequately by providing suitable enclosures;
- ❖ Use of lagging with attenuation properties on plant components / installation of sound attenuation panels around the equipment
- ❖ Other than the regular maintenance of the various equipment, ear plugs/muffs are recommended for the personnel working close to the noise generating units;
- ❖ All the openings like covers, partitions will be designed properly
- ❖ Inlet and outlet mufflers will be provided which are easy to design and construct.
- ❖ All rotating items will be well lubricated and provided with enclosures as far as possible to reduce noise transmission. Extensive vibration monitoring system will be provided to check and reduce vibrations. Vibration isolators will be provided to reduce vibration and noise wherever possible;
- ❖ The insulation provided for prevention of loss of heat and personnel safety will also act as noise reducers.

Impact on Water

Total water requirement for the proposed project will be about 550 KLD. Water requirement for the project will be sourced from CSIDC (500 KLD) & Groundwater Extraction (100 KLD).

The Hira Power and Steel Limited is committed to ZERO Discharge of waste water.

154 KLD Industrial waste water will be taken to Neutralization tank where it is treated and then reused for dust suppression.

Impact on Terrestrial ecology

There is no National park, Wildlife sanctuary, Biosphere reserves and protected forest within 10 km of the plant area. No schedule- I species were recorded in the core and buffer zone of plant area during the biodiversity assessment. There may be an impact on the biological environment of the area due to operation of plant, if proper care will not be taken.

Solid Waste Generation

The solid waste generation and utilization from the Hira Power and Steel Limited is given below as Table.

Table : Solid Waste Quantity and Disposal for Existing and Proposed plant

Description	Ferro Alloys 48,000 TPA (Including 18,000 Low/ Medium Carbon Ferro Alloys)	Ferro Alloys 64,000 TPA (Including 48,000 Low/Medium Carbon Ferro Alloys)	Method of Disposal
FeMn and SiMn Slag	43,200	51,200	It is used in manufacturing of Si-Mn, and presently sold to market.
Bag Filter Dust	1,986	2,640	Recycling/Reuse in the Manufacturing process after briquetting
Mn3O4 Dust	1,980	2,500	Recycling/Reuse in the Manufacturing process
Fly Ash	90,000	90,000	Brick/Block/Other products manufacturing
Alumino thermic Slag	1,044	1,318	Being Sold in the market as it is used as synthetic slag for steel making.
AOD Slag	3,118	8,315	It is High MnO Slag used in manufacturing of Si-Mn, presently sold to market.

Impact on Socio-Economic Environment

The Hira Power and Steel Limited is providing direct employment 523 workers. The local persons have been given preference in employment as per the qualification and technical competencies. In order to mitigate the adverse impacts likely to arise in the proposed project activities and also to minimize the apprehensions to the local people, it is necessary to formulate an affective EMP for smooth initiation and functioning of the project. The suggestions are given below:

- ❖ Communication with the local people will be established regular basis by project authority to provide an opportunity for local youth.
- ❖ Project authorities will undertake regular environmental awareness program on environmental management
- ❖ Job opportunities are the most demanding factor, the local people as per their education will be employed.
- ❖ For social welfare activities to be undertaken by the project authorities, collaboration should be sought with the local administration, gram panchayat, block development office etc for better coordination.

5.0 Environmental Monitoring Programme

The environmental monitoring will be important to assess performance of pollution control equipment in the proposed project of Hira power and Steel Limited. The proposed expansion project is for expansion of manufacturing of Ferro Alloys. The sampling and analysis of environmental attributes including monitoring locations will be as per the conditions of the Consent issued by Chhattisgarh Environment Conservation Board (CECB).

Environmental monitoring will be conducted on regular basis by in-house team of Hira power and Steel Limited to assess the pollution level in the proposed plant. Therefore, regular monitoring program of the environmental parameters is essential to take into account the environmental pollutant of the study area.

The objective of monitoring is:

- To follow the trend of parameters which have been identified as pollutants;
- To check or assess the efficiency of the controlling measures;

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- To ensure that new parameters, other than those identified in the impact assessment study, do not become critical due to the commissioning of proposed facilities;
- To check assumptions made with regard to the development and to detect deviations in order to initiate necessary measures;

The attributes, which needs regular monitoring, are specified below:

- Air quality
- Water and wastewater quality;
- Noise levels;
- Soil quality;

6.0 Capital Cost

Total cost of the project will be Rs. 192.71 Crores.

Budget for Implementation of Environmental Management Plan

The budgetary provision for EMP will be as Rs. 410 Lacs & recurring cost is Rs. 40 Lacs/annum.

7.0 CER Plan

As per the Office Memorandum No. 22-65/2017-IA.III dated 20th October 2020 based on the issued raised at the time of public hearing the CER will be detailed in the Final EIA Report.

8.0 Occupational Health Measures

Occupational health needs attention both during erection, operation and maintenance phases. However, the problem varies both in magnitude and variety in the above phases. To control any occupational health and safety impact a detailed planning for mitigation measures has been done in the design stage of the project. Apart from the occupational exposure mitigation plans for various activities and work areas of hazards, following existing administrative control measures will be undertaken to ensure occupational health and safety of the employees:

- All employees will be trained for EHS policies and practices.
- Periodic health check-up for employees.

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- All employees will be trained in first aid and emergency handling during fire breakout.
- Preparation and training of the employees in safety and emergency preparedness.
- Compliance to PPE use.
- Safety display sign board in the plant.

9.0 Environmental Management

The management of the M/s Hira Power and Steel Limited has taken all the necessary steps to control and mitigate the environmental pollution in the existing project and will continue to do the same in the proposed expansion project. The environmental management plan briefs all the elements of environment pollution controlling systems proposed by the project proponent in operation phase. The environmental management plan describes briefly the action plans to be implemented during the post project monitoring stage as per the Ministry of Environment and Forest (MoEF) New Delhi, Central and State Pollution Control Board guidelines.

10.0 Conclusion

It can be concluded that there would be negligible impact in the buffer zone due to the proposed expansion. The project shall contribute to the socio-economic development, strengthening of infrastructural facilities like medical, educational etc. The plant shall be operated keeping "Sustainable Development" of the region in mind.

Further, management is committed to contribute towards improving socio-economic status of the surrounding local community.

Environmental monitoring is a successful tool for the management for implementation of adequate & effective environmental measures. It also helps the management to take mid-course correction, if required based on the environmental monitoring results. Considering the above overwhelming positive impact on the community, there shall be overall development of the area.