HIRA FERRO ALLOYS

HFAL/ENV/2025-26/314 **Date: 14.02.2026**

To
The Director
Ministry of Environment, Forest and Climate Change
Government of India, Regional Office
Kendriya Paryavaran Bhawan, North Block, Sector-19
Nava Raipur Atal Nagar, Raipur, Chhattisgarh – 492002 India

Subject: Submission of Six-monthly Compliance Report, Dec-2025 of the environmental/ safeguards conditions stipulated in environment clearance letter for the "Expansion of Ferro Alloys Limited Production Unit (Unit I)" at Urla Industrial Area, Raipur, Chhattisgarh by M/s HIRA Ferro Alloys Limited.

Reference: File. No 1A-J-11011/153/2022-1A-II (IND-I) dated 20rd March, 2025.

Respected Sir,

We wish to inform you that we have obtained Environment Clearance from MoEF&CC vide File. No. **1A-J-11011/153/2022-1A-II (IND-I)** dated 20rd March, 2025 for the Project- "Expansion of Ferro Alloys Production Unit (Unit I)" at Urla Industrial Area, Urla, Raipur, Chhattisgarh by M/s HIRA Ferro Alloys Limited.

Further, Consent to Operate for the said project has been obtained from the Chhattisgarh Pollution Control Board vide Ref. No. **4838/TS/CECB/2025** dated **30.07.2025**

In compliance with the conditions stipulated in the Environmental Clearance, we are hereby submitting the **Six-Monthly Compliance Report** for the period ending **Dec-2025**, along with the necessary annexures, in accordance with the prescribed guidelines of the Ministry of Environment, Forest and Climate Change.

Yours faithfully,
For, M/s HIRA Ferro Alloys Limited (Unit I)

HIRA FERRO ALLOYS LTD. ★ INDIA ★ RAIPUR (C.G.)

Authorised Signatory

Name: Ajay Dubey (Director)
Mobile No.: 9755522009
Email ID: ajay.dubey@hiragroup.com

SIX MONTHLY COMPLIANCE REPORT, DECEMBER-2025

"Expansion of Ferro Alloys Production Unit (Unit I)"

at

Urla Industrial Area, Raipur, Chhattisgarh

Environment Clearance Letter	**F. No. 1A-J-11011/153/2022-1A-II (IND-I) dated 23rd March, 2025**
Consent to Operate	**Consent Order No: 4838/TS/CECB/2025 dated 30.07.2025 and valid till 31.07.2026**

Project Proponent

HIRA FERRO ALLOYS

M/s HIRA Ferro Alloys Limited

567B, 568, 553/B, Urla Industrial Area,

Raipur – 492003, Chhattisgarh

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CHAPTER 1. DATASHEET

Monitoring the Implementation of Environmental Safeguards

Ministry Of Environment & Forest

Monitoring Report

Part – I

Sr. No.	Particulars	Details
1.	Project type: River-valley/ Mining/Industry/Thermal/ Nuclear/ other (specify)	Industrial Project - I
2.	Name of the project	"Expansion of Existing Ferro Alloy Plant" by Hira Ferro Alloys Limited (HFAL), Unit-I for production Capacity of Si-Mn/Fe-Mn and proposed manufacturing of Fe-Si and Pig Iron at the Existing Plant Premises.
3.	Clearance letter (s) / OM no and date	**Clearance Letter (s):** Environmental Clearance (EC) for expansion of Ferro Alloys Production Unit and Captive Power Plant has been accorded vide letter no: 1A-J-11011/153/2022-IA-II(IND-I) dated 20th March, 2025 by MoEF&CC. **Clearance Letter / MOM:** MoEF&CC Minutes of 74th EAC Meeting Industry – 1 Sector held on 10th and 11th February 2025.
4.	Location (a) District (s) (b) State (s) (c) Latitude/ Longitude	Urla Industrial Area, Urla, Tehsil and District Raipur, Chhattisgarh. Raipur Chhattisgarh 21°18'48.74"N, 81°36'50.42"E
5.	Address for correspondence a) address of Concerned Project Chief Engineer (with pin code & telephone/telex/fax numbers) b) Address of Executive Project Engineer/ Manager (with pincode/ fax numbers)	Mr. Ajay Dubey (Director) Plot No. 567/B, 568, 553/B, Urla Industrial Area, District-Raipur, Chhattisgarh
6.	Salient features a) of the project b) of the environmental management plans	The salient features of the project along with environment management plans are provided in Executive summary as given below in Chapter 2.
7.	Break up of the project area a) Submergence area : forest & non-forest	The total land area of the plot is 9851.30 sq.m. (0.98513 Ha.). The total land is under the possession of company. There is no additional land was procured for the expansion

<table>
<tr><th>Sr. No.</th><th>Particulars</th><th>Details</th></tr>
<tr><td></td><td>b) Others</td><td>of the unit. The project does not entail submergence of any area, including forest and non-forest land.</td></tr>
<tr><td>8.</td><td>Breakup of the project affected population with enumeration of those losing houses / dwelling units only agricultural land only, both dwelling units labourers/ artisan
a) SC, ST/Adivasis
b) Others
(Please indicate whether these figures are based on any scientific and systematic survey carried out or only provisional figures, if a survey is carried out give details and years of survey)</td><td>There is no project-affected population, as the proposed expansion is being carried out entirely within the existing land already acquired and owned by the company. No additional land acquisition is involved, and therefore no displacement, rehabilitation, or resettlement of any population is required.</td></tr>
<tr><td>9.</td><td>Financial details
a) Project cost as originally planned and subsequent revised estimates and the year of price reference.

b) Allocation made for environmental management plans with item wise and year wise break-up.</td><td>a) The total project cost includes the existing and proposed cost of the project which is estimated as Rs. 27.89 Cr. (Existing: Rs. 9.89 Crores + Proposed: Rs. 18 Crores).

b) Cost towards Environment management plan Capital cost (Existing + Proposed) is 678.46 lakhs and recurring cost is 92.53 lakhs. Details are as follows:
<table>
<tr><th>Sr. No.</th><th>Component</th><th>Description</th><th>Capital cost (In Rs Lakhs)</th><th>Operational and Maintenance/ Recurring cost (In Rs/yr)</th></tr>
<tr><td>1</td><td>Air Pollution Control</td><td>Bag filter, Water sprinkling, Fogging system etc.</td><td>632.46</td><td>87.93</td></tr>
<tr><td>2</td><td>Water Pollution Control</td><td>Siltation Tank</td><td>9</td><td>0.9</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Sr. No.</th><th>Particulars</th><th>Details</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>3</td><td>Environmental Monitoring</td><td>Monitoring of Air Quality, Water Quality and Wastewater Quality</td><td>25</td><td>2</td></tr>
<tr><td>4</td><td>Green Belt</td><td>Plantation</td><td>9</td><td>0.9</td></tr>
<tr><td>5</td><td>Rainwater Harvesting System</td><td>Rainwater harvesting system</td><td>8</td><td>0.8</td></tr>
<tr><td colspan="3">Total</td><td>678.46</td><td>92.53</td></tr>
</table>
</td></tr>
<tr><td></td><td>c) Benefit cost ratio/ Internal rate of Return and the year of assessment.</td><td>c) 15.70%</td></tr>
<tr><td></td><td>d) Whether (c) includes the cost of environmental management as shown in the above.</td><td>d)Yes</td></tr>
<tr><td></td><td>e) Actual expenditure incurred on the project so far.

f) Actual expenditure incurred on the environmental management plans so far

g) Actual expenditure incurred on the CER/CSR</td><td>e) Presently, no additional plant or production machinery has been installed. Only modifications/upgradation of pollution control systems have been carried out to improve environmental performance and ensure regulatory compliance. The proposed enhancement in production will be achieved through optimization of the raw material mix by incorporating high-grade Mn ore and other raw materials. The actual expense incurred on the project as on date Rs. 14.95 Lakhs. The expense details is enclosed as Annexure I.

f) HFAL has incurred expenses on Pollution Control System. The actual expenditure incurred on environment management plan @ Rs. 14.95 lakhs.

g) Actual expenditure incurred on CER/CSR@Rs. 0.37 cr. approx. from April 2025 to December 2025. CER details are enclosed as Annexure – II. The expenditure is common with Unit II.</td></tr>
</table>

Sr. No.	Particulars	Details
10.	Forest land requirement a) The status of approval for diversion of forest land for non-forestry use b) The status of clearing felling c) the status of compensatory afforestation, if any d) Comments on the viability & sustainability of compensatory Programme in the actual field experience.	None of the forest land was diverted for the project. Hence, not applicable.
11.	The status of clear felling in non-forest areas (such as submergence area of reservoir, approach roads), if any with quantitative information.	The project site falls completely in the premises of Urla Industrial area. Hence, not applicable.
12.	Status of construction a) Date of commencement (Actual and/ or planned). b) Date of completion (Actual and/ or planned).	Presently, no additional plant or production machinery has been installed. Only modifications/upgradation of pollution control systems have been carried out to improve environmental performance and ensure regulatory compliance. The proposed enhancement in production will be achieved through optimization of the raw material mix by incorporating high-grade Mn ore and other raw materials. The expansion activities shall be implemented entirely within the existing plant premises. No additional land acquisition is involved, and there will be no change in the approved land use pattern. Existing infrastructure, utilities, and environmental management systems shall continue to be utilized, and all operations will remain in compliance with the conditions stipulated in the Environmental Clearance and applicable environmental regulations.
13.	Reasons for the delay if the project is yet to start.	Not applicable
14.	Dates of site visits a) The dates on which the project was monitored by	The recent site inspection has been carried out by Regional Office, CECB New Raipur on 11.07.2024. Further, the further site visit is awaited from from IRO, MoEF&CC, New Raipur

Sr. No.	Particulars	Details
	the Regional Office on previous occasions, if any. b) Date of site visit for this monitoring report	(C.G.)
15.	Details of correspondence with project authorities for obtaining action plans/ information on status of compliance to safeguards other than the routine letters for logistic support for site visits. (The first monitoring report may contain the details of all the letters issued so far, but the later reports may cover only the letters issued subsequently).	---

CHAPTER 2. EXECUTIVE SUMMARY

<table>
<tr><th>Attribute</th><th>Description</th></tr>
<tr><td>Location</td><td>The project site is located at Urla Industrial Area, Urla, Raipur Tehsil and District, Chhattisgarh, a well-developed industrial hub under the jurisdiction of Chhattisgarh State Industrial Development Corporation (CSIDC). The site is easily accessible via road and rail networks. The site is easily accessible via road and rail networks. The nearest road from the project is NH-30 located 1.6 km towards west direction. NH-30 is further connected to the Birgaon Main Road. Other highways and roads from the project are NH-53 located 7.8 km towards SW & NH-130B at 7.4 km towards SE direction. The nearest railway station from the project is Urkura Railway Station located 4.1 km towards SE direction. The nearest airport from the project is Raipur Airport located about 19 km away from site towards SE direction. The nearest town from the plant is Urla at 0.1 km W.</td></tr>
<tr><td>Land Area</td><td>The total land area of the plot is 9851.30 sq.m. (0.98513 Ha.). The total land is under the possession of company. Land use and land cover of the site is Industrial land. Proposed expansion is planned within the existing premises only. Hence no additional land is required. Approximately 1225.62 sq.m. (or 12.4%) is dedicated to green belt development within the premises.</td></tr>
<tr><td>Size of Project</td><td>The details of production capacity and products is provided below.
<table>
<tr><th>Particular</th><th>Capacity (MTPA)
After Expansion</th></tr>
<tr><td colspan="2">Furnace Configuration</td></tr>
<tr><td>SAF</td><td>1 x 11 MVA</td></tr>
<tr><td colspan="2">Production Capacity</td></tr>
<tr><td>Si-Mn</td><td>18,000 TPA or</td></tr>
<tr><td>Fe-Mn</td><td>29,000 TPA or</td></tr>
<tr><td>Fe-Si</td><td>9,000 TPA or</td></tr>
<tr><td>Pig Iron</td><td>30,000 TPA</td></tr>
</table>
Note: Presently, there has been no increase in production capacity. The plant is being operated strictly in accordance with the latest Renewal of Consent to Operate with approved capacities of 10,500 TPA for Ferro Alloys.</td></tr>
<tr><td>Screening Category</td><td>The Ferro Alloys manufacturing facility is categorized under Major Sector 3(a), Primary Metallurgical Industries – Category 'A', as per the Environmental Impact Assessment Notification dated September 14, 2006.</td></tr>
<tr><td>Plant Cost</td><td>Rs. 29.87 Crores.</td></tr>
<tr><td>Estimated & Revised Cost for EMP</td><td>Cost towards Environment management plan Capital cost (Existing + Proposed) is 6.78 crore and recurring cost is 0.93 crore/annum.</td></tr>
<tr><td colspan="2">Resource Requirement</td></tr>
<tr><td>Source of Water &</td><td>The total water requirement of plant is 80 m^3/day, used for ferro alloy plant consist of cooling tower, domestic purposes and horticulture primarily</td></tr>
</table>

<table>
<tr><th>Attribute</th><th>Description</th></tr>
<tr><td>Quantity</td><td>sourced from existing borewell within the premises, CSIDC (Chhattisgarh State Industrial Development Corporation) supply. The unit has valid approval from CSIDC and CGWA vide letter no. CSIDC/EE/DIV.-II/2021-22/4236 and CGWA/NOC/IND/ORIG/2021/13459, respectively. The water balance of the production unit and approval letter from CSIDC along with CGWA NOC is enclosed as Annexure – III. The monitoring report of surface water supplied by CSIDC is enclosed as Annexure IV.</td></tr>
<tr><td>Fuel & Power</td><td>Total power requirement of plant will be 8 MW which will be met through Unit II captive power plant and CSPDCL. The existing power infrastructure is adequate to meet the power demand for the current base-case operations. The plant holds a valid power sanction from CSPDCL. In Case of Emergency, power will be meet from sister concern company Unit – II and CSPDCL.</td></tr>
<tr><td>Raw Material</td><td>The project site is located near the State Highway. The raw material and products can easily be transported. All the raw materials are indigenous raw material except Manganese Ore. It is being imported from other countries at Vishakhapatnam Port and then transported to site through road.

The raw material yard storage capacity is provided below:

<table>
<tr><th rowspan="2">S. No.</th><th rowspan="2">Raw Material</th><th colspan="2">Storage Capacity (MT)</th></tr>
<tr><th>Existing</th><th>After Expansion</th></tr>
<tr><td colspan="4">FERRO ALLOYS</td></tr>
<tr><td>1</td><td>Manganese Ore</td><td>3500</td><td>4500</td></tr>
<tr><td>2</td><td>Coke</td><td>1000</td><td>1300</td></tr>
<tr><td>3</td><td>Dolomite</td><td>300</td><td>450</td></tr>
<tr><td>4</td><td>Carbon Paste</td><td>40</td><td>50</td></tr>
<tr><td>5</td><td>Quartz</td><td>40</td><td>50</td></tr>
<tr><td>6</td><td>Ferro Slag</td><td>100</td><td>200</td></tr>
</table>

The quantity of total raw material requirement post expansion of project as per granted Environment Clearance is provided below.:

<table>
<tr><th>Sr. No</th><th>Product</th><th>Quantity (TPA)</th></tr>
<tr><td>1</td><td>Manganese Ore</td><td>45,000</td></tr>
<tr><td>2</td><td>Coal and coke</td><td>10,080</td></tr>
<tr><td>3</td><td>Dolomite</td><td>4,500</td></tr>
<tr><td>4</td><td>Carbon Paste</td><td>540.00</td></tr>
<tr><td>5</td><td>Ferro Slag</td><td>5,400</td></tr>
<tr><td>6</td><td>High Mn Slag</td><td>5,400</td></tr>
<tr><td>7</td><td>Iron</td><td>2,900</td></tr>
<tr><td>8</td><td>Iron Ore</td><td>36,000</td></tr>
<tr><td>9</td><td>Mill Scale</td><td>15,300</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Attribute</th><th>Description</th></tr>
<tr><td></td><td>
<table>
<tr><td>10</td><td>Iron Ore Fines</td><td>15,000</td></tr>
<tr><td>11</td><td>Quartz</td><td>15,300.00</td></tr>
<tr><td>12</td><td>Dolomite/Limestone</td><td>10,500.00</td></tr>
<tr><td>13</td><td>Electrode Paste</td><td>1,800.00</td></tr>
<tr><td>14</td><td>MS Scrap/Mill Scale</td><td>3960</td></tr>
</table>
</td></tr>
<tr><td>Wastewater Generation</td><td>The total wastewater generation from the production unit is 15 KLD of which cooling tower blowdown is 10 KLD and domestic wastewater is 5 KLD. The iindustrial effluent of 10 KLD is being collected in two separate RCC tanks made for collection and treatment of waters in which the suspended solids got settled in tank-I through gravity and this water is collected in tank - II. The water is further processed through charging of lime and bleaching for balancing of PH. For COD and BOD balancing in the tank, air pipes are separately arranged and blown up in regular intervals. After completion of all the process the treated water is supplied through pumps where all the water is pumped and reused in the plant.

Domestic wastewater is being disposed through septic tanks followed by soak pits. This closed-loop system ensures no effluent discharge outside plant premises, complying with Zero Liquid Discharge (ZLD) norms.</td></tr>
<tr><td colspan="2">Environmental Management System</td></tr>
<tr><td>Existing Effluent Treatment Plant</td><td>Presently, no water is used in the production process of ferro alloys. Water is utilized only for cooling purposes in a closed-loop recirculating system. However, the effluent generated is collected in two separate RCC tanks designed for collection and treatment. In Tank-I, suspended solids are allowed to settle by gravity. The clarified water is then transferred to Tank-II, where further treatment is carried out. After completion of the treatment process, the treated water is pumped and reused within the plant premises. Therefore, there is no requirement of Effluent Treatment Plant currently.</td></tr>
<tr><td>Flue Gas Emission</td><td>Flue gases emission generated in the furnace section are discharged into the atmosphere after passing through pollution control equipment comprising a heat exchanger, ID fan, and bag filter to meet the regulatory standard specified. The ID fan and chimney ensure effective dispersion, maintaining a pollution-free working area and surrounding atmosphere.</td></tr>
<tr><td>Process Gas Emission</td><td>The major air pollutants from HFAL Unit I plant operations are particulate matter (PM), SO_2, NO_x, and CO, generated from the ferroalloy furnaces and raw material handling systems. The emissions generated from ferroalloy furnaces are controlled through high-efficiency Reverse Pulse Jet Bag Filters with ID fans, water mist and fogging system. Dust generated from the semi-closed Submerged Arc Furnace (SAF) is captured through a dry-type gas cleaning plant. The resulting clean gas, post-combustion or incineration, is subsequently released through an appropriately elevated chimney following filtration through bag filters.</td></tr>
</table>

<table>
<tr><th>Attribute</th><th>Description</th></tr>
<tr><td></td><td>Fugitive emissions from material handling, crushers, screens, and dolomite/lime conveying systems are controlled through localized bag filters, enclosure, and dust suppression systems. Online Continuous Emission Monitoring Systems (OCEMS) are installed on all major stacks and connected to CPCB servers, and a Continuous Ambient Air Quality Monitoring Station (CAAQMS) is installed and linked to the CECB server.</td></tr>
<tr><td>Hazardous Wastes & Disposal Method</td><td>During plant operations, various types of hazardous waste are generated, with slag from ferro alloy and pig iron plant production constituting the majority. Efforts are made to reuse or sell these wastes to recyclers or other industrial users. Moreover, Hazardous waste is also generated, which are resure or sold out to authorized recyclers and managed in strict compliance with the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2024. Plant has valid Hazardous Waste Authorization issued by CECB.

The types and categories of hazardous waste generated during plant operations are identified in accordance with applicable regulations. Details of hazardous waste generation, classification, and disposal methods are summarized below.

<table>
<tr><th rowspan="2">Sr. No</th><th rowspan="2">Type of waste</th><th rowspan="2">Cat. & Sch</th><th colspan="2">Quantity (MTPA)</th><th rowspan="2">Disposal Method</th></tr>
<tr><th>Existing</th><th>After Expansion</th></tr>
<tr><td>1</td><td>Si-Mn Slag</td><td>-</td><td>10,500</td><td>18,000</td><td>Used for filling of low-lying area/land filling/ construction purpose/ sell to Cement plant.</td></tr>
<tr><td>2</td><td>and/or
Fe-Mn Slag</td><td>-</td><td>10,500</td><td>29,000</td><td>Reused as raw material in manufacturing of Silico Manganese/ Sold to Si-Mn Manufacturers.</td></tr>
<tr><td>3</td><td>and/ or
Pig-Iron Slag</td><td>-</td><td>0</td><td>12,000</td><td>Used for filling of low-lying area/land filling/ construction purpose/ sell to Cement plant.</td></tr>
<tr><td>4</td><td>and /or
Fe-Si slag</td><td>-</td><td>0</td><td>3,750</td><td>Used for filling of low-lying area/land</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Attribute</th><th>Description</th></tr>
<tr><td></td><td>
<table>
<tr><td></td><td></td><td></td><td></td><td></td><td>filling/ construction purpose/ sell to Cement plant.</td></tr>
<tr><td>5</td><td>Bag Filter dust</td><td>-</td><td>1 TPD</td><td>2.5 TPD</td><td>Sent to Cement plants</td></tr>
<tr><td>6</td><td>Used/spent oil</td><td>5.1 (Sch I)</td><td>2 KL/A</td><td>4 KL/A</td><td>To authorized recycler.</td></tr>
<tr><td>7</td><td>Empty Barrels/ Containers/liners contaminated with hazardous chemicals/wastes</td><td>33.1 (Sch I)</td><td>10 Nos.</td><td>12 Nos.</td><td>Sold to Authorized Recyclers</td></tr>
</table>

The monitoring report of slag is enclosed as Annexure V.
</td></tr>
<tr><td>Green Belt Development</td><td>HFAL has completed 40% greenbelt development (incorporating within and outside the plant premises) of the total project plot area. A total area of approximately 1225.62 sqm (12.4%) of the total area has been developed as green belt within the premises. In addition, 2758 sqm (28%) of green belt has been developed outside the premises along the factory boundary wall.

Majority of the plantation and heighted Boundary wall within and outside the plant have been developed towards NW direction to eliminate/reduce impact on the sensitivity area located towards NW direction. A 2.5 m wide green belt has been developed all along the boundary of the premises. The plantation comprises diverse flora, including 23 different species of trees and plants, developed within and along the boundary of the premises. The unit has conducted plantation evaluation and monitoring through third party which depicts that in total 1300 species were planted of which 1090 species has survived with an density of 1020 trees/ acre of land. The plantation evaluation and monitoring report is enclosed as Annexure VI.
<table>
<tr><th>S. No.</th><th>Location of Plantation</th><th>Plantation Area (Sqm)</th><th>Percentage (%)</th><th>Trees Planted (Nos)</th></tr>
<tr><td>1</td><td>Inside Premises</td><td>1225.62</td><td>12.4</td><td>275</td></tr>
<tr><td>2</td><td>Outside Premises</td><td>2758</td><td>28</td><td>815</td></tr>
<tr><td></td><td>Total</td><td>3983.62</td><td>40.4</td><td>1090</td></tr>
</table>
</td></tr>
<tr><td colspan="2">Environmental Management Plan</td></tr>
<tr><td>Water Environment</td><td>The plant has an integrated water management system comprising make-up water system and drinking water as well as emergency water supply system for the vital units of the plant operating under a Zero Liquid Discharge (ZLD)</td></tr>
</table>

Attribute	Description
	regime with no discharge outside the plant boundary. Industrial wastewater generated from cooling-tower blow-down is collected and treated through neutralization using lime and bleaching agents, followed by air scouring and sedimentation for reduction of COD, BOD, and suspended solids. Domestic wastewater is being disposed through septic tanks followed by soak pits. This closed-loop system ensures no effluent discharge outside plant premises, complying with Zero Liquid Discharge (ZLD) norms.
Air Environment	The major air pollutants from HFAL Unit I plant operations are particulate matter (PM), SO_2, NO_x, and CO, generated from the ferroalloy furnaces and raw material handling systems. The emissions generated from ferroalloy furnaces are controlled through high-efficiency Reverse Pulse Jet Bag Filters with ID fans, water mist and fogging system. Dust generated from the semi-closed Submerged Arc Furnace (SAF) is captured through a dry-type gas cleaning plant. The resulting clean gas, post-combustion or incineration, is subsequently released through an appropriately elevated chimney following filtration through bag filters. Fugitive emissions from material handling, crushers, screens, and dolomite/lime conveying systems are controlled through localized bag filters, enclosure, and dust suppression systems. Online Continuous Emission Monitoring Systems (OCEMS) are installed on all major stacks and connected to CPCB servers, and a Continuous Ambient Air Quality Monitoring Station (CAAQMS) is installed and linked to the CECB server.
Noise Environment	Noise will primarily be generated from process equipment such as Submerged Electric Arc Furnaces (SAF – 1 x 5 MVA), bag filterscooling towers, ID/FD fans, air compressors, material-handling conveyors, and intermittent DG sets (for emergency only). Vehicular movement for raw-material delivery and product dispatch will also contribute marginally. Since the facility lies in an established industrial estate, these impacts will remain localized within the premises, and attenuated significantly by the peripheral greenbelt and masonry boundary wall. Further, Noise control measures include the use of silencers on equipment, provision of earmuffs to workers, regular maintenance of machinery, and development of green buffer zones to minimize noise impact. Only properly certified, tested, and calibrated equipment is be used. DG sets with inbuilt acoustic enclosures were installed and operated only during emergency conditions.

CHAPTER 3. POINT-WISE COMPLIANCE OF THE ENVIRONMENTAL CONDITIONS

The below Compliance of environmental conditions is in respect of the expansion of Ferro Alloys Production Unit.

Table 2.1: Compliance of Environmental Conditions given in Part A- Specific Conditions for Metallurgical Industries (Ferrous and Non Ferrous)

S.No.	Environmental Conditions	Compliances
1	This Environmental clearance is granted subject to final outcome of Hon'ble supreme court of India, Hon'ble High court, Hon'ble NGT and any other court of Law, if any as may be applicable to this project	The condition is noted and accepted. The Project Proponent undertakes to abide by the final outcome of any proceedings before the Hon'ble Supreme Court of India, Hon'ble High Court, Hon'ble National Green Tribunal (NGT), or any other court of law, as applicable. **Complied**
2	The project proponent shall comply with all the environmental protection measures and safeguards proposed in the documents submitted to the Ministry. All the recommendations made in the EIA/EMP in respect of environmental management, and risk mitigation measures relating to the project shall be implemented.	The Project Proponent is being complied with and shall continue to comply with all environmental protection measures and safeguards as proposed in the documents submitted to the Ministry. All recommendations of the approved EIA/EMP relating to environmental management and risk mitigation measures are being implemented. **Being Complied**
3	The project proponent shall utilize modern technologies for capturing carbon emission and shall also develop adequate carbon sink/ carbon sequestration resources with an aim to meet the carbon neutrality mission in a time bound manner. The implementation report shall be submitted to the IRO, MoEF&CC in this regard.	The configuration of the Ferro Alloys production unit demonstrates lower environmental impacts compared to the base case due to the implementation of a combination of energy efficiency measures, cleaner energy integration, process optimization, and carbon sequestration initiatives, as established through the Life Cycle Assessment (LCA) results. • To mitigate GHG emissions, the project proposes an optimized power sourcing strategy, with approximately 50% electricity from grid supply and 50% from captive power, resulting in lower Scope-1 emissions compared to a 100% captive power scenario. • Further mitigation is achieved through energy-efficient furnace operation, reduction of auxiliary power losses, and process optimization to minimize specific energy consumption per tonne of product. • Transportation-related emissions will be reduced through optimized logistics planning and the use of fuel-efficient,

		Bharat Stage-VI compliant vehicles. • Improved raw material utilization will further reduce embodied carbon emissions. • Residual emissions will be partially offset through carbon sequestration measures, including development and maintenance of a greenbelt and plantation within and around the plant premises. The plantation is designed to provide sustained CO_2 sequestration over the project life, as assessed in the LCA study. • Although complete elimination of GHG emissions is not technically feasible due to the energy-intensive nature of ferro alloy production, the project adopts a carbon neutrality approach by minimizing avoidable emissions and offsetting residual emissions through sequestration measures. Overall, the proposed project demonstrates a reduction in carbon intensity per tonne of product compared to the base case and aligns with MoEF&CC guidelines and national climate mitigation objectives. The copy of LCA is enclosed as **Annexure VII.** **Being Complied**
4	In pursuance to MoEF&CC OMs dated 31st October,2019 & 30th December,2019 issued in compliance of the order of Hon 'ble NGT in OA No.1038/2018 dated 19th August,2019, the compliance of all the condition applicable to CEPI areas shall be implemented as per the submitted plan.	The compliance of all conditions applicable to CEPI areas has been implemented in accordance with the plan submitted in the EIA/EMP report. The details of compliance are provided below. • The bag filter system is being augmented by adding additional filter bags to enhance particulate matter removal efficiency. New bags have been added to the bag filter increasing its number from 1008 to 1344 which benefits in the performance of the bag filter. • The air-to-cloth ratio in the gas cleaning plant for stack emission control is being maintained within the range of 1.2 to 1.1. • All existing filter bags are being replaced with high-density Polyester Needle Felt bags with anti-adhesive treatment PTEF Membrane Laminated Fabrics (best upgraded) to improve dust capture and operational performance. • New water sprinklers are being integrated into the raw material handling

		system, including the ground hopper and conveyor systems. • Dust generated from the semi-closed Submerged Arc Furnace (SAF) is captured through a dry-type gas cleaning plant resulting in clean gas post-combustion or incineration which subsequently released through an appropriately elevated chimney following filtration through bag filters. • More number of trees have been planted in the unit & also in the periphery of the unit to increase the density of the trees. • Transportation of raw materials and finished products is presently carried out exclusively through road transport, as other modes of transportation are not feasible at this stage. • Approximately 4 KL per annum of waste/used oil is generated from ladle heating and machinery lubrication activities. The waste oil is collected and stored in covered HDPE drums placed in a designated, impervious storage area. • Online Continuous Emission Monitoring system (OCEMS) has already been installed to Submerged Arc furnace. **Complied**
5	Urla village is a distance of 0.3 km towards West , Birgaon at 0.8 km in West and Rawabhata at 2.6 km in East of the project site along with other sensitive areas within the study area of the project site. Proponent shall take appropriate environmental safeguard measures to minimise the impact on the habitation of the local. The project proponent needs to strengthen green belt all around in plant area to reduce the dust pollution. The PP shall also include some of these locations in its environment monitoring programme.	The nearest village i.e., Urla Village is located at 0.12 km, W. Village is located in upwind direction. Thus, impact from the plant will be minimal. However, considering the sensitivity of the area, all environmental protection measures are already adopted in the plant like, installation of Bag filters, covered conveyers, dust suppression system, mechanical dust sweeper, etc., Major of the plantation and heighted Boundary wall within and outside the plant have been developed towards NW direction to eliminate/reduce impact on the sensitivity area located towards NW direction. **Complied.**
6	There are water bodies reported within the study area of the project site. A robust and foolproof Drainage Conservation scheme to protect the natural drainage and its flow parameters; along with Soil conservation scheme and multiple Erosion control measures shall be implemented.	The project site is not located in the vicinity of any water body. The nearest water body is the Kharun River, situated at a distance of approximately 3.6 km from the project site. **Not Applicable**
7	Water Requirement of 80 KLD is proposed to	The total water requirement of plant is 80

	be met from ground water and CSIDC, PP shall obtain necessary water permission from the Competent Authority.	m^3/day, used for ferro alloy plant consist of cooling tower, domestic purposes and horticulture primarily sourced from existing borewell within the premises, CSIDC (Chhattisgarh State Industrial Development Corporation) supply. The unit has valid approval from CSIDC and CGWA vide letter no. CSIDC/EE/DIV.-II/2021-22/4236 and CGWA/NOC/IND/ORIG/2021/13459, respectively. The water balance of the production unit and approval letter from CSIDC along with CGWA NOC is enclosed as **Annexure – III.** **Complied**
8	PP shall undertake project specific AAQ Management Plan to minimise the levels of PM 10 and PM 2.5.	The Project Proponent has undertaken and implemented a project-specific Ambient Air Quality (AAQ) Management Plan to effectively minimize the levels of PM10 and PM2.5. This includes installation and proper operation of air pollution control devices such as bag filters, regular water sprinkling on roads and material handling areas, control of fugitive emissions through closed operations and enclosures, paving of internal roads, and development of green belt/plantation within and along the project boundary. Further, below are the mitigation measures implemented to minimize the levels of PM 10 and PM 2.5. • All SEAFs stack is fitted with pulse-jet bag filters achieving ≥ 99.9 % dust removal. • Fogging, DFDS (Dry Fog Dust Suppression System), deployed in material conveying system, loading and storage areas; mechanized road sweeping minimizes dust resuspension. • Quarterly foliage washing of greenbelt trees restores photosynthetic efficiency. • Enclosed conveyors, paved yards, and covered stockpiles reduce off-site dust drift. Also, vehicle movement is regulated through enforcement of speed limits and permitting only PUC-certified vehicles. Further, regular ambient air quality monitoring is carried out by the unit, and a Continuous Ambient Air Quality Monitoring Station (CAAQMS) has been installed to ensure continuous tracking and compliance with prescribed standards. Furthermore, the species selected for

		plantation include native, fast-growing, and evergreen varieties with high foliage density and strong pollution attenuation potential. Emphasis is given to hairy-leaf species which are effective in capturing particulate matter (PM), thus reducing its propagation in the ambient air. Further, HFAL has provided water tanker for regular and periodic water sprinkling on the nearest approach roads and in surrounding villages. This measure is undertaken to suppress dust, minimize fugitive dust emissions arising from vehicular movement, and improve ambient air quality in the nearby habitations. **Being Complied**
9	Three tier Green Belt shall be developed and maintained in atleast 33% of the project area, of adequate width and tree density shall not be less than 2500 per ha. Survival rate of green belt developed shall be monitored on periodic basis to ensure that damaged plants are replaced with new plants in the subsequent years. PP shall also develop greenbelt in the form of shelter belt comprising of total of 6 rows of 2x2m plantation with tall trees & broad leaves with thick canopy along with windshield inside the plant premises to act as green barrier for air pollution & noise levels towards sensitive areas nearby project site. Compliance status in this regard, shall be submitted to concerned Regional Office of the MoEF& CC.	HFAL has developed 40 % of greenbelt w.r.t to total project Area. Out of total greenbelt area, approximately 1,225.62 sqm (250 trees planted), accounting for about 12.4% of the total project area, has been developed as green belt within the plant premises. In addition, around 2,758 sqm (756 trees planted) (about 28% of the total area) has been developed as green belt outside the premises along the unit boundary wall encompassing both internal green areas and boundary green belt development. A continuous green belt of approximately 2.5 m width has been developed all along the boundary of the premises, which acts as a buffer for dust, noise, and air pollutants. The plantation includes a diverse mix of flora, comprising about 23 different species of trees and plants, carefully selected and developed within the premises and along the boundary to enhance ecological balance and improve the overall environmental quality. The unit has conducted plantation evaluation and monitoring through third party which depicts that in total 1300 species were planted of which 1090 species has survived with an density of 1020 trees/ acre of land. The plantation evaluation and monitoring report is enclosed as **Annexure VI.** **Complied**
10	The PP shall undertake plantation, in compliance to MoEFCC OM dated 24.07.2024, in the earmarked 33% or 40% greenbelt area, as the case may be, as a part of tree plantation campaign 'Ek Ped Mee Ke Neem' campaign and the details of the same shall be uploaded on MeriILiFE portal at (https;// merilife.nic.in)	
11	All the commitments made towards socio-economic development of the nearby villages shall be satisfactorily implemented. The action plan based on the social impact assessment study of the project as per the EMP in	It is proposed to spend INR 36 Lakhs on CER activities in the time span of 3 years from the issuance of Environmental Clearance. HFAL is committed to implement facilities for improvement of infrastructural

	accordance to the Ministry 's OM dated 30.9.2020 shall be strictly implemented, which is amounting to Rs. 0.36 Crores shall be strictly implemented and progress shall be submitted regularly to the Regional Office of MoEF&CC.	facilities for the local people in the field of Environmental and Medical. HFAL has implemented the following activities as part of their CER initiatives for the community development.
12	The project proponent shall undertake village adoption programme, as committed, and prepare and implement the action plan to develop them into a model village, in consultation with the State Administration.	▪ Green belt development and boundary wall white washing & painting work at Achholi Muktidham ▪ Greenbelt development at Urla Muktidham sitting arrangement under CSR ▪ Greenbelt development and white washing & painting work at Rawabhata Muktidham ▪ Greenbelt development at Urkura site on alloted govt. Land. ▪ Greenbelt development at Birgaov Muktidham ▪ Achholi Sheetla Talab_Pacharikaran and Gaharikaran ▪ Shulabh Shouchalay by HIRA group ▪ Aakanksha lions school for mentally handicapped under HIRA CSR foundation. ▪ Cancer screening van BALCO hospital _under HIRA CSR foundation ▪ English education project for primary and middle school-step up for India under HIRA CSR foundation ▪ F-95 advance physiotherapy & research centre (a unit of HIRA CSR foundation) ▪ Old age home gomchi (Maa Godawari Anand Vridhashram) under HIRA CSR foundation The details and photographs along with details of expense made is provided in **Annexure II.** The expenditure for CER/CSR is common with HIRA Unit II. **Being Complied**
13	As committed, the unit shall not use additional coal for fuel in the operational activities for proposed expansion in pursuance to Order by Government of Chhattisgarh vide File No. 3529/205/05/11 (E) dated 12.12.2007.	As committed, the unit will not use any additional coal as fuel for operational activities for the proposed expansion, in compliance with the Government of Chhattisgarh Order vide File No. 3529/205/05/11(E) dated 12.12.2007. **Being Complied**
14	PP shall explore the feasibility of installing an STP for domestic sewage treatment and ensure compliance with applicable environmental norms.	The domestic wastewater generation is approximately 5–6 KLD only from the production unit, the same is being treated and disposed of through a septic tank followed by soak pits. Therefore, installation of a sewage treatment plant (STP) within the project premises is not envisaged.

		Not Applicable
15	PP may explore generation of solar power in the premises of the plant and report to IRO through six monthly compliance report.	HFAL has commissioned 40 MW Captive Solar Power plant at District – Bemetara Chhattisgarh which is operational since March 2023. Also, 100 KW solar plant is installed at Unit II. There is no solar power plant within the premises. **Complied**
16	The PP shall ensure compliance of OM dated 14-01-2025 regarding streamlining the implementation of GST 702 and GSR dated 12-11-24 through which project requiring prior EC were exempted from requirement of CTE.	The Project Proponent has ensured compliance with the OM dated 14.01.2025, under which the said project with prior Environmental Clearance is exempted from the requirement of Consent to Establish (CTE). **Complied**

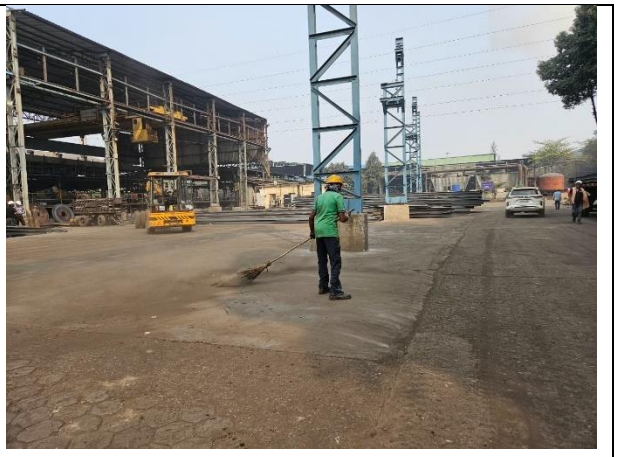
Table 2.2: Compliance of Environmental Conditions given in Part B- Standard Conditions for Metallurgical Industries (ferrous and non-ferrous)

S.No.	Environmental Condition	Compliances
1.	**Statutory Compliances**	
1.1	The Environment Clearance (EC) granted to the project /activity is strictly under the provisions of the EIA Notification, 2006 and its amendments issued from time to time. It does not tantamount / construe to approvals / consent/ permissions etc., required to be obtained or standards/ conditions to be followed under any other Acts /Rules /Subordinate, legislations, etc., as may be applicable to the project.	The Project Proponent acknowledges that the EC is granted under the EIA Notification, 2006 and its amendments and does not substitute any other statutory approvals. All applicable permissions, consents, and compliances under relevant Acts and Rules has been obtained separately. **Being Complied**
1.2	This Environmental clearance is granted subject to final outcome of Hon'ble supreme court of India Hon'ble NGT and other Court of Law, if any, as may be applicable to this project.	The condition is noted and accepted. The Project Proponent undertakes to abide by the final outcome of any proceedings before the Hon'ble Supreme Court of India, Hon'ble High Court, Hon'ble National Green Tribunal (NGT), or any other court of law, as applicable. **Complied**
2.	**Air Quality Monitoring and Preservation**	
2.1	The project proponent shall install 24x7 continuous emission monitoring system at process stacks to monitor stack emission as well as Continuous Ambient Air Quality Station (CAAQMS)for monitoring AAQ parameters with respect to standards prescribed in Environment	In line with regulatory requirements, the Unit has installed a 24×7 Online Continuous Emission Monitoring System (OCEMS) to all major stacks i.e. Submerged Arc Furnace (SAF) to monitor stack emissions and a Continuous Ambient Air Quality Monitoring Station (CAAQMS) to monitor ambient air quality parameters across the project premises. Further, the monitoring report for stack

	(Protection)Rules 1986 as amended from time to time. The CEMS and CAAQMS shall be connected to SPCB and CPCB online servers and calibrate these systems from time to time according to equipment supplier specification through labs recognized under Environment (Protection) Act, 1986 or NABL accredited laboratories.	emissions is enclosed as **Annexure VIII.** The data generated through CAAQMS and OCEMS monitoring is reviewed quarterly and forms the basis for adaptive environmental planning, reporting to statutory authorities, and continuous improvement under ISO 14001 EMS protocols. Online Continuous Emission Monitoring System (OCEMS) is connected to both CECB and CPCB online servers whereas Continuous Ambient Air Quality Monitoring system (CAAQMS) is connected to CECB server to ensure ongoing compliance and real-time data visibility. These systems are regularly calibrated as per the equipment supplier's specifications through laboratories recognized under the Environment (Protection) Act, 1986, or NABL-accredited laboratories to ensure accuracy and reliability of the monitoring data. Further, the calibration of these system is being done on regular basis. The photographs of installed OCEMS and CAAQMS is enclosed as **Annexure IX.** **Being Complied.**
2.2	The project proponent shall carryout Continuous Ambient Air Quality monitoring for common/criterion parameters relevant to the main pollutants released (e.g. PM10 and PM2.5 in reference to PM emission, and SO2 and NOx in reference to SO2 and NOx emissions) within and outside the plant area covering upwind and downwind directions.	A Continuous Ambient Air Quality Monitoring Station (CAAQMS) has been installed to monitor ambient air quality parameters across the project premises and connected to CECB server. Further, the ambient air quality monitoring is conducted for main pollutants (e.g. PM10 and PM2.5 in reference to PM emission, and SO2 and NOx in reference to SO2 and NOx emissions) within and outside the plant area covering upwind and downwind directions. The ambient air quality monitoring report is as **Annexure X.** **Being Complied**
2.3	The project proponent shall monitor fugitive emissions in the plant premises at least once in every quarter though laboratories recognized under Environment (protection)Act,1986 or NABL accredited laboratories.	The unit has conducted monitoring of fugitive emissions within the plant premises through NABL-accredited laboratory. The monitoring report is enclosed as **Annexure XI.** **Being Complied**
2.4	Sampling facility at process stacks and at quenching towers shall be provided as per CPCB guidelines for manual monitoring of emissions.	The Unit has provided sampling facilities at process stacks in accordance with CPCB guidelines to enable manual monitoring of emissions. These facilities ensure accurate

		collection of samples for periodic analysis and verification of compliance with the prescribed emission standards. The photograph of sampling facility at process stack is provided below.  **Complied**
2.5	Appropriate Air Pollution Control (APC) system shall be provided for all the dust generating points including fugitive dust from all vulnerable sources, so as to comply prescribed stack emission and fugitive emission standards.	The Unit has implemented a comprehensive Air Pollution Control (APC) strategy to manage and minimize emissions from all dust-generating sources within the plant. For point sources, such as process stacks, suitable APC systems i.e., bag filters, mist cannons, dry gas cleaning units, ID & FD Fans, Pipes, Pulse Jet, Dust Collector have been installed and are operated regularly to capture particulate matter and control gaseous emissions in compliance with the prescribed standards. The technical specifications of Bag filters are attached as **Annexure XII.** Fugitive dust emissions from material handling, storage yards, transportation, and other vulnerable areas are controlled through multiple measures. These include regular water sprinkling on roads and open areas, covering of raw material and product storage, use of closed conveyors and transfer points, and maintenance of proper operational practices. Additionally, green belts and tree plantations around the plant boundary act as natural barriers to further reduce dust dispersion. Fugitive emission monitoring reports are attached as **Annexure XI.** Periodic inspection, maintenance, and monitoring of all APC systems are carried out to ensure their efficiency. Emissions from both point and fugitive sources are regularly measured, and corrective

		actions are taken immediately if any deviations from standards are observed. The photographs of Air Pollution Control System installed at the premises is enclosed as **Annexure XIII.** **Being Complied**
2.6	The project proponent shall provide leakage detection and mechanized bag cleaning facilities for better maintenance of bags.	The unit has opted the following methods for better maintenance of bags. • Pneumatic conveying system for bag cleaning. • Regular monitoring is being carried out by Maintenance Team. • Sufficient spare inventory of filter bags, solenoid valves, mist nozzles, and pulse control modules is maintained on-site. • Preventive maintenance schedules are implemented for baghouses, fogging system, Water sprinklers and mist cannons to ensure consistent APCS uptime. **Being Complied**
2.7	Sufficient number of mobile or stationery vacuum cleaners shall be provided to clean plant roads, shop floors, regularly.	The unit has provided outdoor machine floor sweeper at the premises for road cleaning of the premises. Further, the shop floors and other project premises area is being cleaned manually. The photographs of the cleaning conducted at the premises is provided below. 

		  **Complied**
2.8	Ensure covered transportation and conveying of raw material to prevent spillage and dust generation. The project proponent use leak proof trucks/dumpers carrying coal and other raw materials and cover than with tarpaulin.	The unit has ensured covered transportation and conveying of raw materials to prevent spillage and dust generation. The leakage proof truck dumpers are being used for carrying coal and other raw materials and cover with tarpaulin sheet to avoid fugitive emissions generated from the transportation of raw materials by road. The photographs of covered transportation and conveying of raw material is provided below. 

		 **Being Complied**
2.9	Recycle and reuse iron ore fines, coal and coke fines, lime fines and such other fines collected in the pollution control devices and vacuum cleaning devices in the process after briquetting/agglomeration.	Iron ore fines, coal and coke fines, lime fines, and other process fines collected from pollution control devices and vacuum cleaning systems are stored in one ton gunny bags and post briquetted/agglomerated, these will be further reused within the manufacturing process. Any surplus material, if generated, is handled through sealed containers for interim storage and transfer, including external sale where applicable. No outdoor piling of fines is practiced. Regular and periodic cleaning, along with routine housekeeping, is carried out to ensure effective material recovery, prevent fugitive dust emissions, and maintain a clean and environmentally safe working environment. **Being complied**
2.10	The project proponent shall provide primary and secondary fume extraction system at all heat treatment furnaces.	Installation of Fourth-hole extraction system in SAF units is under progress, as part of the standard design to ensure the future adaptability, ensuring efficient removal of high-temperature process gases. The system shall provide to capture high-temperature process fumes from furnaces through a dedicated fourth hole in the furnace roof. The extracted gases shall be conveyed through refractory-lined and water-cooled ducts to high-efficiency air pollution control devices i.e. bag filters, after which the cleaned gases are discharged through an adequately designed stack. Inlet suction ducts are attached to the furnace hood and connected to the bag house through a heavy-duty ID fan. The flue gases pass through an air-cooling heat exchanger to reduce their

		temperature before entering the bag house. **Complied**
2.11	Wind shelter fence and chemical spraying shall be provided on the raw material stock piles.	The unit does not maintain any raw material piles within the premises. Raw materials are fed into the ground hopper through dumpers and pay loaders and are subsequently conveyed to storage bunkers via a belt conveyor system. Separate storage bunkers are provided in the stock house for different raw materials, which are fed through reversible conveyors. **Not Applicable**
2.12	Design the ventilation system for adequate air changes as per prevailing norms for all tunnels, motor houses, Oil Cellars.	A suitable ventilation system has been provided to ensure adequate air changes in all tunnels and motor houses, in line with prevailing industrial safety and ventilation norms. The system is designed to maintain acceptable levels of temperature, humidity, and air quality by effective removal of heat, fumes, and dust generated during operation. Both natural and mechanical ventilation arrangements have been incorporated, wherever applicable, to ensure continuous fresh air circulation and a safe working environment for personnel. **Complied**
2.13	Pollution control system in the plant shall be provided as per the CREP Guidelines of CPCB.	CREP Guidelines of CPCB is not applicable for Ferrous Alloys Plant. **Not Applicable**
2.14	The project proponent shall adopt the Clean Air practices like mechanical collectors, wet scrubbers, fabrics (bag houses), electrostatic precipitators, combustion systems (thermal oxidizers), condensers, absorbers, adsorbers, and biological degradation. Controlling emissions related to transportation shall include emission controls on vehicles as well as use of cleaner fuels. Sufficient numbers of additional tuck mounted Fog /mist water cannons shall be procured and operated regularly inside the project premises and also in the surrounding villages to suspended dust in the atmosphere.	The major air pollutants from HFAL plant operations are particulate matter (PM), SO_2, NO_x, and CO, generated from the ferroalloy furnaces, and raw material handling systems. The emissions generated from ferroalloy furnaces are controlled through high-efficiency Reverse Pulse Jet Bag Filters with ID fans, water mist and fogging system, dry-type gas cleaning systems, and treated gases are discharged through chimneys of adequate height after post-combustion/incineration. The unit has implemented Clean Air practices to control emissions from all dust-generating source multiple bag filters, water fogging systems, and mist cannons are installed and operated regularly to meet prescribed emission standards. Fugitive emissions from raw material handling, dolomite/lime conveying, coal crushers, and screens are controlled through localized bag filters. Dust suppression is further ensured

		through a network of strategically placed fixed sprinklers, mobile mist cannon units, and fogging systems at crushers, belt conveyors, and furnace areas. These systems collectively minimize ambient dust levels and protect workers' health. Regular inspection, maintenance, and monitoring of implemented measures are carried out, and corrective actions are taken promptly to ensure compliance. **Being Complied**
2.15	Bag filters shall be cleaned regularly and efficiency of bag filter system shall be monitored at regular intervals.	The unit ensures regular and systematic cleaning of bag filters through pulse-jet/mechanized cleaning systems to prevent dust accumulation and maintain optimal filtration efficiency. A preventive maintenance schedule is followed, including periodic inspection of filter bags, cages, hoppers, and ducting for wear, leakage, or damage. The efficiency of the bag filter system is monitored at regular intervals by checking pressure drop across the filters, stack emission levels, and overall system performance. Periodic stack monitoring is carried out through approved methods and NABL-accredited laboratories to ensure compliance with prescribed emission norms. Any deviation observed is immediately addressed by timely repair or replacement of filter bags and corrective operational measures. The performance monitoring report of Bag Filters is enclosed as **Annexure XIV.** **Being Complied**
2.16	Water Sprinklers /Water mist system shall be installed near raw material yards, operational unit and other strategic locations to control fugitive emissions from the plant.	The unit has implemented comprehensive dust suppression measures across raw material handling areas. Mobile and overhead water sprinklers are provided at raw material feeding and unloading points to control fugitive emissions. A closed dry fog dust suppression system is installed at all conveyor transfer points for effective control of fine particulates. Further strengthening these measures, new additional water sprinklers will be integrated into the raw material handling system, including ground hoppers and conveyors. These initiatives ensure effective dust control, improved housekeeping, and minimization of air pollution within the plant premises. The sample

		photographs of water sprinklers working within the premises is enclosed as **Annexure XV.** **Complied**
2.17	The particulate matter emissions from the process stacks shall be less than 30 mg /Nm3 and measures shall be undertaken as per the submitted action plan Efficient Air monitoring equipment shall be installed.	The unit ensures that particulate matter emissions from all process stacks are maintained below 30 mg/Nm³ through the installation and proper operation of efficient Air Pollution Control systems as per the approved action plan. Suitable air monitoring equipment is installed, and regular stack monitoring is carried out to verify compliance with the prescribed emission limits. Corrective measures are implemented immediately in case of any deviation. The detailed action plan for the pollution control system to achieve emissions below 30 mg/nm³ is enclosed as **Annexure XVI.** **Being Complied**
2.18	Following additional arrangements to control fugitive dust shall be provided; a. Fog /Mist Sprinklers at all on bulk raw material storage area (at the transfer points) like Iron Ore, Coal and for Fly Ash and similar solid waste storage areas. b. Proper covered vehicle shall be used while transport of materials. c. Wheel washing mechanism shall be provided in entry and exit gates with complete recirculation system.	**Closed Dry Fog Dust Suppression System:** A closed dry fog dust suppression system has been installed at all conveyor transfer and material discharge points to effectively control dust generation. The system generates ultra-fine water droplets that agglomerate with dust particles and suppress them at the source without wetting the material or affecting process efficiency. The dry fog system operates within an enclosed arrangement to prevent fugitive dust escape and is interlocked with the conveyor operation to ensure continuous dust control during material transfer. Regular inspection and maintenance of the system are carried out to ensure consistent and efficient performance. **Transportations of Materials:** All internal roads are of concrete and well maintained. Repairing work required, if any, is carried out immediately. No dust problem arises within the factory premises due to transportation. All transportation vehicles carry/ will carry a valid PUC (Pollution under Control) Certificate. **Wheel Washing Mechanism:** Wheel washing mechanisms with a complete water recirculation system are provided at both the entry and exit gates to prevent track-out of mud and dust is under process. The system will operate in a closed loop with sedimentation and filtration, ensuring efficient reuse of water and zero discharge.

		Being Complied
3.	**Air Quality Monitoring and Preservation In case of Ferro Alloys Plants**	
3.1	Briquetting and Jigging plant shall be installed in Ferro Alloys Plant.	Briquetting and jigging plants have not been implemented in the unit. For briquetting and jigging operations, the materials are sent to Unit-II, which is located at a distance of approximately 100 meters. **Being Complied**
3.2	The PP shall minimize the evaporation losses in jigging operation to less than 10% using suitable advanced process.	
3.3	The 4th hole extraction system shall be provided in the Sub Merged Act Furnaces and EAF.	Installation of Fourth-hole extraction system in SAF units is under progress, as part of the standard design to ensure the future adaptability, ensuring efficient removal of high-temperature process gases. The system shall provide to capture high-temperature process fumes from furnaces through a dedicated fourth hole in the furnace roof. The extracted gases shall be conveyed through refractory-lined and water-cooled ducts to high-efficiency air pollution control devices i.e. bag filters, after which the cleaned gases are discharged through an adequately designed stack. **Being Complied.**
3.4	Industry is going to use silica quartz in large quantities and going to produce Silico Manganese and Ferro alloy steel. Therefore, it is necessary to control silica/ quartz exposures at production Departments, not only emission as per Indian Factories Act. The permissible limit for silica /quartz be within 10 mg/m^3 for total dust as per Indian Factories Act. Therefore, it is recommended to monitor personal and area exposures for silica quartz dust in the process plants. (in case of Silico Manganese and Ferro Silicon alloy steel)	The unit is being carried out periodic personal and area monitoring of silica/quartz dust through NABL-accredited laboratories to ensure that exposure levels remain within the permissible limit of 10 mg/m^3 for total dust as stipulated under the Indian Factories Act. Monitoring records will be maintained systematically, and appropriate corrective measures shall be undertaken wherever required to ensure continued compliance and safeguard occupational health. **Being Complied**
3.5	No Ferro-chrome production shall be carried out without prior Environmental clearance from MOEF&CC.	The company is committed to maintaining operations within the scope of existing approvals and seeks prior clearance from the Ministry of Environment and Forests (MoEF) before any expansion or modification. **Noted and agreed**
4.	**Water Quality Monitoring and Preservation**	
4.1	The project proponent shall install 24x7 continuous effluent monitoring system with respect to standards prescribed in	The unit generates only cooling tower blowdown as wastewater, and no other industrial effluent is produced. The cooling tower blowdown is fully

	Environment (Protection) Rules 1986 as amended from time to time and connected to SPCB and CPCB online servers and calibrate these system from time to time according to equipment supplier specification through labs recognized under Environment (Protection) Act, 1986 or NABL accredited laboratories.	reused within the premises for water sprinkling for dust suppression and green belt maintenance; hence, there is no discharge outside the plant. As there is no continuous effluent discharge, continuous online effluent monitoring is not required. However, flow meters have already been installed to measure and record the quantity of cooling tower blowdown generated and reused. The reuse system is operated and maintained properly to ensure efficient water management and compliance with applicable environmental norms. The photographs installed flowmeter is provided below  **Complied**
4.2	The project proponent shall monitor regularly ground water quality at least twice a year (pre and post monsoon) at sufficient number of piezometers/ sampling wells in the plant and adjacent areas through labs recognized under Environment (Protection) Act, 1986 and NABL accredited laboratories.	The ground water quality report for the project unit is enclosed as **Annexure XVII.** **Being Complied**
4.3	Garland drains and collection pits shall be provided for each stock pile to arrest the run-off in the event of heavy rains and to check the water pollution due to surface run off.	Garland drains along with adequately designed catch pits have been constructed within the plant premises to effectively intercept, collect, and channel surface runoff. These systems facilitate the settling and trapping of suspended solids, thereby preventing runoff material from leaving the plant area. Strategically located catch pits ensure effective removal of sediments and contaminants from runoff, ensuring that no contaminated water is discharged outside the premises. This arrangement supports efficient housekeeping practices and provides effective

		protection of the surrounding environment. **Being Complied**
4.4	Water meters shall be provided at the inlet to all units processes in the steel plants.	There is no steel plant operated within the premises. **Not Applicable**
4.5	The project proponent shall make efforts to minimise water consumption in the steel plant complex by segregation of used water, practicing cascade use and by recycling treated water.	There is no steel plant operated within the premises. **Not Applicable**
4.6	The proposed project shall be designed as Zero Liquid Discharge Plant. ETP shall be installed and there shall be no discharge of effluent from the plant. Domestic effluent shall be treated in Sewage Treatment Plant. Suitable measures shall be adopted for sewage water handling to ensure no contamination of any kind of water body.	Industrial effluent is being collected in two separate RCC tanks made for collection and treatment of waters in which the suspended solids got settled in tank-I through gravity and this water is collected in tank - II. The water is further processed through charging of lime and bleaching for balancing of PH. For COD and BOD balancing in the tank, air pipes are separately arranged and blown up in regular intervals. After completion of all the process the treated water is supplied through pumps where all the water is pumped and reused in the plant. Domestic wastewater is being disposed through septic tanks followed by soak pits. The plant follows Zero Liquid Discharge process and there is no effluent discharge outside the plant premises. **Being Complied**
4.7	All stockyards shall have impervious flooring and shall be equipped with water spray system for dust suppression. Stock yards shall also have garland drains and catch pits to trap the run off material and shall be implemented as per the action plan submitted in EIA/EMP report.	All stockyards within the unit are stored on a properly designed concrete platform to prevent soil contamination and material loss. Further, the unit has implemented comprehensive dust suppression measures across raw material handling areas. Mobile and overhead sprinklers are provided at feeding and unloading points, while a closed dry fog system is installed at all conveyor transfer points. Further, mobile sprinklers covering ground hoppers and conveyors ensure effective dust control, improved housekeeping, and minimization of fugitive emissions within the plant premises. Garland drains along with adequately designed catch pits have been constructed within the plant premises to effectively intercept, collect, and channel surface runoff.

		Complied
4.8	Rain water harvesting shall be implemented to recharge/harvest water as per the action plan submitted in EIA/EMP report.	The unit has already constructed 1 No. of Rainwater Harvesting pit in which Approx. 1895 KL/year water is being recharge into the ground water through injection well through horizontal connected pipe with "V" wire filter Unit. Further, during rainy season, out of total Quantum of available Runoff (Cum/Year), 60 % (2842.04 cum) of water is lost due to evaporation/runoff and soil absorption and minimum of 1894.69 Cum/Year of assumed Quality of water can be recharged into the ground water source per day. The photographs of rainwater harvesting pit within the premises is provided below.   **Complied**
5.	**Noise Monitoring and Prevention**	
5.1	Noise pollution shall be monitored as per the prescribed Noise Pollution (Regulation and Control) Rules, 2000 and amendments thereof, and report in this regard shall be submitted to Regional Officer of the Ministry as a part of six monthly compliance report.	The noise pollution has been monitored as per Noise Pollution (Regulation and Control) Rules, 2000 and amendments. The noise monitoring reports is enclosed as **Annexure XVIII.** **Being complied**
5.2	The ambient noise levels should conform to the standards prescribed under E(P)A Rules, 1986 viz. 75 dB(A) during day time and 70 dB(A) during night time.	The ambient noise levels have been monitored through NABL accredited laboratory in line with the standards prescribed under EPA Rules, 1986. All the ambient noise monitoring results are found within the prescribed limits. **Being complied**
6.	**Energy Conservation Measures**	
6.1	Provide solar power generation on roof tops of buildings, for solar light system for all common areas, street lights, parking around project area and maintain the same regularly.	HFAL has commissioned 40 MW Captive Solar Power plant at District – Bemetara Chhattisgarh which is operational since March 2023. Also, 100 KW solar plant is installed at Unit II. There is no solar power plant within the premises.

		Being Complied
6.2	Provide LED lights in their offices and residential areas.	The unit has provided LED lights across the project premises including office areas and open areas within the facility. The photographs of LED is provided below   **Complied**
7.	**Waste Management**	
7.1	Oil Collection pits shall be provided in oil cellars to collect and reuse/recycle spilled oil.	Waste Oil generated from the unit is collected through dedicated drain ports and is safely transferred to leak-proof steel drums. The drums are properly labeled and stored in a designated, covered area with an impervious floor to prevent any leakage or spillage. The collected waste oil is subsequently reused or disposed of through authorized recyclers, in compliance with applicable environmental regulations. 4 KL /Annum of Waste/used oil used for heating ladle and machinery lubrication and will be stored in covered HDPE Drums and will be given to approved vendors/authorized recyclers and also waste oil is reused in co-processing. The photograph for waste oil storage at the premises is enclosed as **Annexure XIX.** **Complied**
7.2	Kitchen waste shall be composted or converted to biogas for further use.	Biodegradable waste generated within the unit, including kitchen and other organic waste, is segregated at source and collected separately. The collected biodegradable waste is scientifically managed through vermi-composting, resulting in the generation of nutrient-rich compost, which is reused for greenbelt development and landscaping within the premises. All activities related to the collection, handling, and disposal of biodegradable waste are carried out in compliance with the Solid Waste Management

		Rules, 2016, ensuring environmentally sound waste management practices. **Complied**
7.3	100% utilization of fly ash shall be ensured. All the fly ash shall be provided to cement and brick manufacturers for further utilization and Memorandum of Understanding in this regard shall be submitted to the Ministry's Regional Office.	There is no fly ash generated in the production unit since there is no power plant within the premises. **Not Applicable**
7.4	The Plastic Waste Management Rules 2016, inter-alia, mandated banning of identified Single Use Plastic (SUP) items with effect from 01/07/2022. In this regard, CPCB has issued a direction to all the State Pollution Control Boards (SPCBs)/ Pollution Control Committees (PCCs) on 30/06/2022 to ensure the compliance of Notification published by Ministry on 12/08/2021. The technical guidelines issued by CPCB in this regard is available at https://cpcb.nic.in/technical-guidelines-3/. All the project proponents are hereby requested to sensitize and create awareness among people working within the Project area as well as its surrounding area on the ban of SUP in order to ensure the compliance of Notification published by this Ministry on 12/08/2021. A report, along with photographs, on the measures taken shall also be included in the six monthly compliance report being submitted by project proponents.	The unit is a ferrous alloy production facility, and no plastic is used in any of the production processes. Nevertheless, the unit is regularly undertaking measures to sensitize and create awareness among personnel working within the project area, as well as in the surrounding areas, regarding the ban on Single-Use Plastic, in line with applicable regulatory requirements. **Being Complied**
7.5	A proper action plan must be implemented to dispose of the electronic waste generated in the industry.	The electronic waste generated from the unit operation is very minimal quantity. E-waste agreement is common for Unit I & II disposed off to authorized vendor. The agreement has been signed with the vendor M/s Star E Processors to dispose off the electronic waste generated. The copy of agreement with the vendor is enclosed as **Annexure XX.** **Complied**
8.	**Green Belt**	
8.1	The project proponent shall prepare GHG emissions inventory for the plant and shall submit the programme for	GHG emissions inventory has been provided Life Cycle Assessment Report of the unit. The unit has implemented all the associated as recommended in Life Cycle Assessment Report.

	reduction of the same including carbon sequestration by trees.	Further, the Project Proponent has implemented mitigation measures for the reduction of greenhouse gas (GHG) emissions through the plantation of 1090 trees within the plant premises and along the project boundary. This plantation initiative contributes to carbon sequestration by absorbing atmospheric CO_2, thereby helping to mitigate GHG emissions and support the project's carbon neutrality objectives. The detailed list of tree species planted inside and outside the plant boundary, along with their quantity for carbon sequestration assessment, is provided in LCA report enclosed as an **Annexure VII.** **Complied**
8.2	Project proponent shall submit a study report on Decarbonisation program, which would essentially consist of company's carbon emissions, carbon budgeting/balancing, carbon sequestration activities and carbon capture, use and storage and offsetting strategies. Further, the report shall also contain time bound action plan to reduce its carbon intensity of its operations and supply chains, energy transition pathway from fossil fuels to Renewable energy etc. All these activities/ assessments should be measurable and monitorable with defined time frames.	The unit has carried out a Life Cycle Assessment (LCA) study to assess carbon emissions across the entire life cycle of operations, including raw material sourcing, manufacturing, energy use, transportation, and waste management. The LCA outcomes form the basis for carbon footprint estimation, carbon budgeting and balancing. Based on the study, a decarbonisation program has been prepared incorporating energy efficiency measures, supply chain emission reduction, transition towards renewable energy, and carbon sequestration through greenbelt development. The potential for carbon capture, utilization and storage and offsetting strategies shall be explored in a phased manner. A measurable and monitorable time-bound action plan has been formulated to progressively reduce carbon intensity of operations and associated supply chains, ensuring continual improvement and alignment with sustainability goals. The copy of LCA is enclosed as **Annexure VII.** **Being Complied.**
8.3	Greening and Paving shall be implemented in the plant area to arrest soil erosion and dust pollution from exposed soil surface.	The project has developed 40 % greenbelt w.r.t to total project area. The greening and paving have been implemented in the plant area. There are 250 nos. of plantation done within the project premises which covers an area of1255.62 sq.m. i.e. 12.4% of the total plot area. The concrete roads has been provided within the plant premises for vehicular movement to arrest soil erosion and dust pollution from exposed soil surface. The photographs of concrete road is provided below.

		  **Complied**
9.	**Public Hearing and Human Health Issues**	

9.1	Emergency Preparedness Plan based on Hazard Identification and Risk Assessment (HIRA) and Disaster Management Plan shall be implemented.	The unit has emergency preparedness plan and related details are presented below.
		
		• **On-Site Emergency Plan (OSEP):** A statutory and site-specific On-Site Emergency Plan is implemented across the HFAL facility, approved by competent authorities. It clearly defines roles and responsibilities of the Chief Incident Controller (CIC), Works Incident Controller (WIC), Emergency Response Teams (ERT), and supporting staff. Layout maps, material inventories, communication protocols, and mutual aid coordination with nearby industries are included.
		
		• **Standard Operating Procedures (SOPs):** SOPs are developed for:
		  • Submerged Electric Arc Furnace (SEAF) operations
		  • Captive Power Generation (AFBC Boiler and TG)
		  • Solar Power operations
		  • Handling of hazardous substances (e.g., Diesel, Transformer Oil, LPG, Oxygen, Argon, Sulphuric Acid, etc.,)
		
		• **Mock Drills & Rehearsals:**

		• **Frequency:** Minimum twice a year • **Scenarios Covered:** Fire outbreak (waste cotton/coal), evacuation, internal communication, first response, equipment mobilization • **Emergency Control Centre (ECC):** Located within the Factory Manager's office, the ECC is equipped with: • Site layout maps and wind direction indicators • Emergency contact directories and MSDS sheets • First Aid supplies, SCBA sets, PPE, megaphone, and alarm controls • Walkie-talkies and fire logbooks • **Assembly Points:** • Ground Near Gate No.1 & 2 has been marked as Assembly Point • Clearly marked and known to all workers through orientation sessions. Further, Disaster Management Plan (DMP) is being implemented to ensure that effective emergency preparedness and response systems are in place to minimize the impact of any industrial accident or disaster. The DMP aims to: • **Safeguard Human Life:** Prevent injury or loss of life among workers, staff, and nearby communities during an emergency. • **Minimize Damage to Property and Environment**: Protect plant assets, equipment, and materials, and prevent environmental degradation due to accidental releases or fires. • **Ensure Prompt and Effective Emergency Response**: Establish clear procedures and responsibilities for rapid response, control, and mitigation of hazardous incidents. • **Facilitate Efficient Evacuation and Rescue Operations**: Enable timely evacuation of personnel from hazardous zones and rescue of affected individuals. • **Maintain Clear Communication Channels**: Ensure coordinated

		communication within the site and with external emergency services, local authorities, and community representatives. • **Define Roles and Responsibilities**: Clearly outline the roles of key personnel involved in emergency management, including the Incident Controller, site workers, safety officers, and first responders. • **Enhance Preparedness through Training and Drills**: Conduct periodic mock drills, training sessions, and awareness programs to improve the readiness of all stakeholders. • **Ensure Quick Restoration of Normal Operations**: Establish protocols for damage assessment, recovery, and restoration of operations after the incident. • **Comply with Legal and Regulatory Requirements**: Align emergency planning with the requirements of the Factories Act, Environment Protection Act, and MoEF&CC guidelines. • **Promote Safety Culture within the Organization**: Foster awareness and responsibility among employees towards health, safety, and environmental protection. **Complied**
9.2	The project proponent shall carry out heat stress analysis for the workmen who work in high temperature work zone and provide Personal Protective Equipment (PPE) as per the norms.	The unit has conducted comprehensive industrial hygiene survey to monitor and to assess the respirable dust concentration, noise level, Heat stress, Gas Chemicals, Illumination in the working environment and to further identify the potential hazard and risk arising from work place. The study has suggested the recommended measures to make the environment congenial, conducive and comfortable for the employees. The copy of the report is enclosed as **Annexure XXI.** **Complied**
9.3	Provision shall be made for the housing of construction labour within the site	No new construction has been carried out at the facility.

	with all necessary infrastructure and facilties such as fuel for cooking, mobile toilets, mobile STP. Safe drinking water, medical health acre, creche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.	**Not Applicable**
9.4	Occupational health surveillance of the workers shall be done on a regular basis and records maintained.	The occupational health surveillance of the workers is being done on regular basis. The sample heath records are enclosed as **Annexure XXII.** **Complied**
10. Environment Management		
10.1	The project proponent shall comply with the provisions contained in this Ministry's OM vide F.No. 22-65/2017-IA.III dated 30/09/2020. As part of Corporate Environment Responsibility (CER) activity, company shall adopt nearby villages based on the socio-economic survey and undertake community developmental activities in consultation with the village Panchayat and the District Administration as committed.	HFAL is committed to implement facilities for improvement of infrastructural facilities for the local people in the field of Environmental and Medical. Moreover, CSR Activities is common for our group of companies under HIRA CSR Foundation. HFAL has implemented the following activities as part of their CER initiatives for the community development. • Green belt development and boundary wall white washing & painting work at Nearest villages. • Greenbelt development at Birgoav Muktidham beautification under CSR • Greenbelt development at Urkura site on alloted govt. Land (4 Acre). • Achholi Sheetla Talab_Pacharikaran and Gaharikaran • Shulabh Shouchalay by HIRA group • Aakanksha lions school for mentally handicapped under HIRA CSR foundation. • Cancer screening van BALCO hospital _under HIRA CSR foundation • English education project for primary and middle school-step up for India under HIRA CSR foundation • F-95 advance physiotherapy & research centre (a unit of HIRA CSR foundation) • Old age home gomchi (Maa Godawari Anand Vridhashram) under HIRA CSR foundation The details and photographs along with details of expense made is provided in **Annexure II.**
10.2	The company shall have a well laid down environmental policy duly approve by the Board of Directors. The environmental policy should prescribe	The environmental policy of HFAL is enclosed as **Annexure XXIII.** **Complied**

	for standard operating procedures to have proper checks and balances to bring into focus any infringements/ deviation/ violation of the environmental / forest / wildlife norms / conditions. The company shall have defined system of reporting infringements / deviation / violation of the environmental / forest wildlife norms / conditions and/ or shareholders / stakeholders. The copy of the board resolution in this regard shall be submitted to the MoEF&CC as a part of six monthly report.	
10.3	A separate Environmental Cell both at the project and company headquarter level, with qualified personnel shall be setup under the control of senior executive, who will directly to the head of the organization.	HFAL has constituted an Environmental Management Cell (EMC) comprising designated officers to coordinate and implement environmental control measures. The EMC monitors stack emissions, ambient air quality, and noise levels through in-house systems or approved external agencies, as required. Regular environmental monitoring is carried out to identify any deterioration and to implement corrective measures through concerned departments. The EMC also oversees worker health and green belt development and is headed by the Executive Director, who reports to the Board of Directors. The hierarchy along with responsibilities of Environmental Management Cell is provided in **Annexure XXIV.** **Complied**
10.4	Performance test shall be conducted on all pollution control systems every year and report shall be submitted to Integrated Regional Office of the MoEF&CC.	The performance test report for Bag Filters is enclosed as **Annexure XIV.** **Being Complied**
11. Miscellaneous		
11.1	The project proponent shall make public the environmental clearance granted for their project along with the environmental conditions and safeguards at their cost by prominently advertising it at least in two local newspapers of the District or State, of which one shall be in the vernacular language in within seven days and in addition this shall also be displayed in the project proponent's website permanently.	The project proponent has provided the advertisement in two local newspapers namely Central Chronicle and Deshbandhu (Vernacular Language). The newspaper clip and evidence for display of EC on HFAL website is enclosed as **Annexure XXV.** **Complied.**
11.2	The copies of the environmental clearance shall be submitted by the	The copies of the environmental clearance have been submitted to Nagar Nigam. The receiving for

	proponents to the Heads of local bodies, Panchayats and Municipal Bodies in addition to the relevant offices of the Government who in turn has to display the same for 30 days form the of recipt.	the submission is enclosed as **Annexure XXVI.** **Complied**
11.3	The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and update the same on half-yearly basis.	The project proponent is submitting six monthly reports on the status of the compliance of the stipulated environmental conditions. **Being Complied**
11.4	The project proponent shall monitor the criteria pollutants level namely; PM10, S02, NOx (ambient levels as well as stack emissions) or critical sectoral parameters, indicated for the project and display the same at a convenient location for disclosure to the public and put on the website of the company.	The project proponent has monitored ambient air and stack emissions from the project operation through Continuous Ambient Air Quality Monitoring Station (CAAQMS). The levels have been displayed at the unit premises. The photograph of CAQQMS is provided as **Annexure IX.** **Complied**
11.5	Action plan for developing connecting and internal road in terms of MSA per IRC guidelines shall be implemented	Concrete roads are provided within the manufacturing unit. The photograph of internal concrete road is provided below  

		Complied
11.6	The project proponent shall submit six-monthly reports on the status of the compliance of the stipulated environmental conditions on the website of the ministry of Environment, Forest and Climate Change at environment clearance portal.	The project proponent is submitting six monthly reports on the status of the compliance of the stipulated environmental conditions. **Complied**
11.7	The project proponent shall submit the environmental statement for each financial year in form V to the concerned state Pollution control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently and put on the website of the company.	Noted and agreed
11.8	The project proponent shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities, commencing the land development work and start of production operation by the project.	Presently, no additional plant or production machinery has been installed. Only modifications/upgradation of pollution control systems have been carried out to improve environmental performance and ensure regulatory compliance. The unit will inform Regional office as well as Ministry for the required aspects once the amendment based on issued EC will be completed and production will be started. **Compliance under process**
11.9	The project proponent shall abide by all the commitments and recommendations made in the EIA/EMP report, commitment made during Public Hearing and also that during their presentation to the Expert Appraisal Committee.	Noted and agreed
11.10	The recommendations of the approved Site -Specific Wildlife Management Plan (in case of involvement of Schedule -I spcies) shall be implemented in consultation with the Stats Forest Department. The implementation report shall be furnished along with the six-monthly compliance report to the concerned Regional Office of the MoEF&CC.	Not Applicable
11.11	The PP shall put all the environment related expenditure, expenditure related to Action Plan on the PH issues, and other commitments made in the EIA/ EMP Report etc. in the company web	The unit is in the process of compiling and uploading details of all environment-related expenditures, expenditures related to the Action Plan on Public Health (PH) issues, and other commitments made in the EIA/EMP Report on the

	site for the intormation to public/ public domain. The PP shall also put the information on the left over funds allocated to EMP and PH as committed in the earlier ECs and shall be carried out and spent in next three years, in the company web site for the information to public/public domain.	company website for public information. Information regarding unutilized funds allocated for EMP and PH, as committed in earlier ECs, along with the plan for utilization over the next three years, is also under progress and shall be disclosed on the company website upon completion. **Compliance under process.**
11.12	No further expansion or modiffications in the plant shall be carried out without prior approval of the Ministry of Environment, Forests and Climate Change (MoEF&CC).	Noted and agreed
11.13	Concealing factual date or submission of False /fabricated date may result in revocation of this environmental clearance and attract action under the provisions of Environment (Protection) Act,1986.	Noted and agreed
11.14	The Ministry may revoke or suspend the clrarance, if implementation of any of the above conditions is satisfactory.	Noted and agreed
11.15	The Ministry reserves the right to stipulate additional conditions if found necessary. The Company in a time bound manner shall implement these conditions .	Noted and agreed
11.16	The Regional Office of this Ministry shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the office (s) of the Regional Office by furnishing the requisite date /information/ monitoring reports.	Noted and agreed
11.17	Any appeal against this EC shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of National Green Tribunal Act,2010.	Noted and agreed

HIRA FERRO ALLOYS LIMITED (UNIT I)

PLOT NO.567/B, 568, 553/B, URLA INDUSTRIAL AREA, URLA RAIPUR CHHATTISGARH

Sl No	Jobs Description	Item Description	Total
[A]	*Replacement of Filer Bags*	*DUST COLLECTOR BAG 900 X 900 X 1200 MM CAPACITY : 1 MT*	*21,200*
		POLYESTER NEEDLF FELT NON WOVEN FILTER BAG WITH SILICON TREATMENT SIZE : DIA. 150 MM X 4200 MM LENGTH, SNAP TYPE	*5,81,622*
	Filter Bags Total		**6,02,822**
[B]	*Purging System*	*ASBESTOS ROPE 10MM*	*5*
		C.S.BALL VALVE 1/2"	*5,880*
		G.I.PIPE 2"	*2,27,200*
		M.S.NIPPLE 1/2" X 6"	*240*
		M.S.SOCKET 1/2"	*360*
		MACHINE SCREW 4MM X 60MM	*440*
		PNEUMATIC CYLINDER REPAIR KIT FMK K05 75 -300 MAX PR - 10 BAR	*2,121*
		WELDING ROD 6013 (3.15MM x 350MM)	*3,960*
	Purging System Total		**2,40,206**
[C]	*FG System Duct Modification*	*Fabrication and erection of Bag House Inlet duct with consumables*	*2,47,500*
		Fabrication and erection of FD Cooler Inlet duct with consumables	*2,47,500*
		Service Charges of Duct Modification	*1,25,000*
	FG System Duct Modification Total		**6,20,000**
[D]	*Bag Cage*	*CAGE FOR FILTER BAG*	*32,500*
	Bag Cage Total		**32,500**
[E]	**Grand Total**		**14,95,529**

Annexure II: CER Details and Expense

HIRA
GROWING STRONGER TOGETHER

GREENBELT DEVELOPMENT & CSR & CER ACTIVITIES

LIST OF ACTIVITIES UNDER CSR AND GREENBELT DEVELOPMENT

- GREEN BELT DEVELOPMENT AND BOUNDARYWALL_WHITE WASHING & PAINTING WORK AT ACHHOLI MUKTIDHAM
- GREENBELT DEVELOPMENT AT URLA MUKTIDHAM SITTING ARRANGEMENT UNDER CSR
- GREENBELT DEVELOPMENT AND WHITE WASHING & PAINTING WORK AT RAWABHATA MUKTIDHAM
- GREENBELT DEVELOPMENT AT URKURA SITE ON ALLOTED GOVT. LAND.
- GREENBELT DEVELOPMENT AT BIRGAOV MUKTIDHAM
- ACHHOLI SHEETLA TALAB_PACHARIKARAN AND GAHARIKARAN
- SHULABH SHOUCHALAY BY HIRA GROUP
- AAKANKSHA LIONS SCHOOL FOR MENTALLY HANDICAPPED_UNDER HIRA CSR FOUNDATION
- CANCER SCREENING VAN BALCO HOSPITAL _UNDER HIRA CSR FOUNDATION
- ENGLISH EDUCATION PROJECT FOR PRIMARY AND MIDDLE SCHOOL-STEP UP FOR INDIA
- _UNDER HIRA CSR FOUNDATION
- F-95 ADVANCE PHYSIOTHERAPY & RESEARCH CENTRE (A UNIT OF HIRA CSR FOUNDATION)
- OLD AGE HOME GOMCHI (MAA GODAWARI ANAND VRIDHASHRAM)_UNDER HIRA CSR FOUNDATION

GREEN BELT DEVELOPMENT AT ACHHOLI MUKTIDHAM

GREEN BELT DEVELOPMENT AT ACHHOLI MUKTIDHAM

BOUNDARYWALL WHITE WASHING & PAINTING WORK AT ACHHOLI MUKTIDHAM

GREENBELT DEVELOPMENT AT URLA MUKTIDHAM

GREENBELT DEVELOPMENT AT URLA MUKTIDHAM

SITTING ARRANGEMENT AT URLA MUKTIDHAM UNDER CSR

GREENBELT DEVELOPMENT AT RAWABHATA MUKTIDHAM

GREENBELT DEVELOPMENT AT RAWABHATA MUKTIDHAM

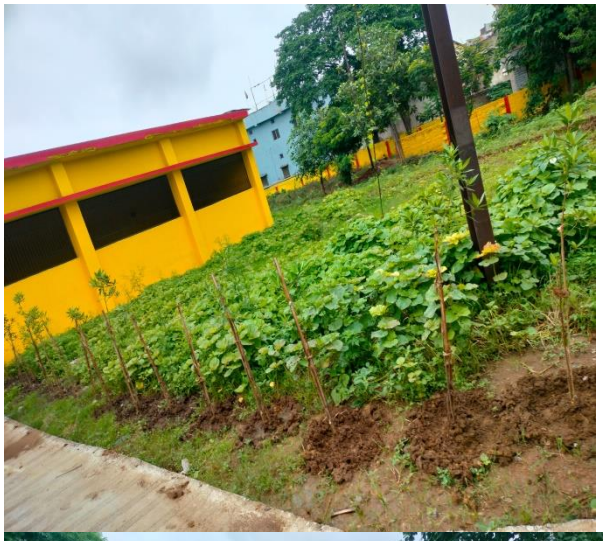
CSR ACTIVITIES WHITE WASHING & PAINTING WORK AT RAWABHATA MUKTIDHAM

CSR ACTIVITIES WHITE WASHING & PAINTING WORK AT RAWABHATA MUKTIDHAM

GREENBELT DEVELOPMENT AT URKURA SITE ON ALLOTED GOVT. LAND

GREENBELT DEVELOPMENT AT URKURA SITE ON ALLOTED GOVT. LAND

GREENBELT DEVELOPMENT AT BIRGAOV MUKTIDHAM



ACHHOLI SHEETLA TALAB_PACHARIKARAN AND GAHARIKARAN

SHULABH SHOUCHALAY BY HIRA GROUP

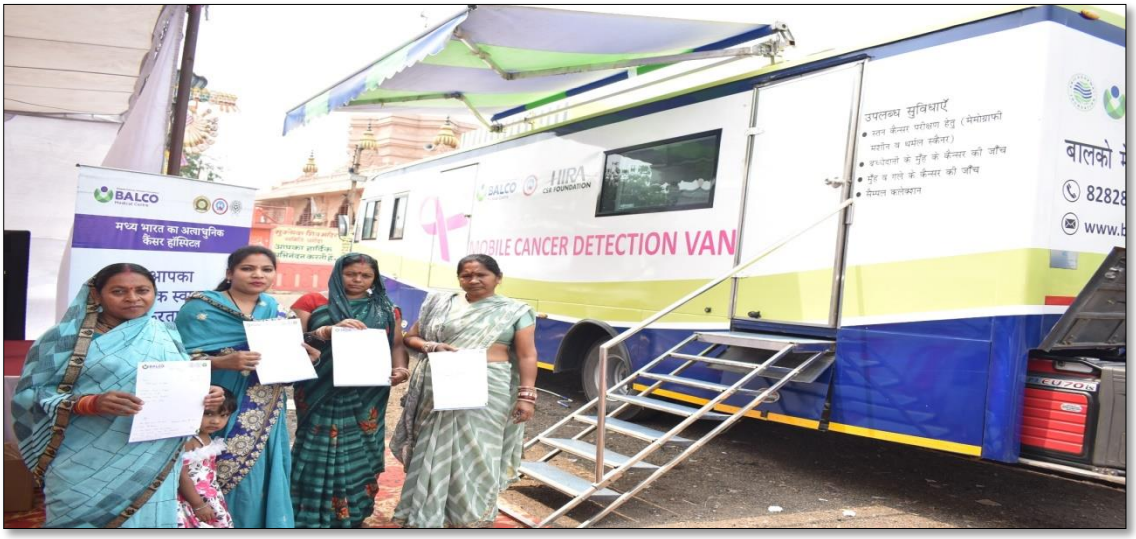
AT BAJAR CHOWK ACCHOLI	AT NEAR SHEETLA TALAB
	

AT NEAR BIRGAOV CANAL

Aakanksha Lions School for Mentally Handicapped_Under HIRA CSR FOUNDATION

Cancer Screening Van Balco Hospital _UNDER HIRA CSR FOUNDATION

Cancer Screening Van Balco Hospital _UNDER HIRA CSR FOUNDATION



Old Age Home Gomchi (Maa Godawari Anand Vridhashram)_UNDER HIRA CSR FOUNDATION

English Education Project for Primary and Middle School-Step Up For India _UNDER HIRA CSR FOUNDATION

F-95 Advance Physiotherapy & Research Centre (A Unit of HIRA CSR Foundation)

CER/CSR Expenditure for Unit II FY 2025-26									
1	22/09/2025	HIRA CSR FOUNDATION	15,00,000			15,00,000	BEING AMOUNT OF CSR FUND FOR THE MONTH OF SEP-2025 VIDE RECD DTD 15.09.2025		
2	24/11/2025	SHIVASHA FOUNDATION, S/O	1,00,000			1,00,000	BEING AMOUNT TRANSFER AGT CSR FUND		
						1600000			
URKURA PLANTATION									
1	26/4/2025	CHHATTISGARH STATE POWER DISTRIBUTION CO. LTD.				10700	ELECTRIC BILL OF URKURA GARDEN FOR MARCH-25		ELECTRIC BILL
2	05-12-2025	HARSHIT CONSTRUCTION AND MAINTENANCE SERVICES	157 dt. 12/05/2025	5000	900	5900	GREEN BELT URKURA SURVEY GROUND WATER WORK	FERRO\25-26\SO\0106 08/05/2025	
3	23/05/2025	CHHATTISGARH STATE POWER DISTRIBUTION CO. LTD.		5440		5440	ELECTRIC BILL OF URKURA GARDEN FOR APRIL-25		ELECTRIC BILL
4	26/06/2025	CHHATTISGARH STATE POWER DISTRIBUTION CO. LTD.	May-25			8160	ELECTRIC BILL OF URKURA GARDEN FOR MAY-25		ELECTRIC BILL
5	30/06/2025	GEETA NURSERY(S/S)	1696 dt. 12/06/2025	191934		191934	KUNDA JASMIN 25.000 NOS @ Rs 40.00 Per NOS	FERRO\25-26\PO\0392	

							,MADHU KAMINI 15 X 16 25.000 NOS @ Rs 40.00 Per NOS ,PELTA FORM 13X13 500.000 NOS @ Rs 60.00 Per NOS ,GULMOHAR (RED) SIZE: 15X16 600.000 NOS @ Rs 60.00 Per NOS ,CONOCARPUS ERITUS PLANT 2500.000 NOS		
6	28/07/2025	CHHATTISGARH STATE POWER DISTRIBUTION CO. LTD.	Jun-25	5470		5470	ELECTRIC BILL OF URKURA GARDEN FOR JUNE-25		
7	29/08/2025	CHHATTISGARH STATE POWER DISTRIBUTION CO. LTD.	Jul-25	26210		26210	ELECTRIC BILL OF URKURA GARDEN FOR JULY-25		
8	26/09/2025	CHHATTISGARH STATE POWER DISTRIBUTION CO. LTD.	Aug-25	10530		10530	BEING AMOUNT OF ELECTRICITY BILL OF URKURA GARDEN FOR AUGUST-25 FOR 500 UNITS		
9	27/10/2025	CHHATTISGARH STATE POWER DISTRIBUTION CO. LTD.	SEP-2025 18/10/2025	4360		4360	BEING AMOUNT OF ELECTRICITY BILL OF URKURA GARDEN FOR AUGUST-25 FOR 500 UNITS		
10	28/11/2025	CHHATTISGARH STATE POWER DISTRIBUTION CO. LTD.		7080		7080	BEING AMOUNT OF ELECTRICITY BILL OF URKURA GARDEN		

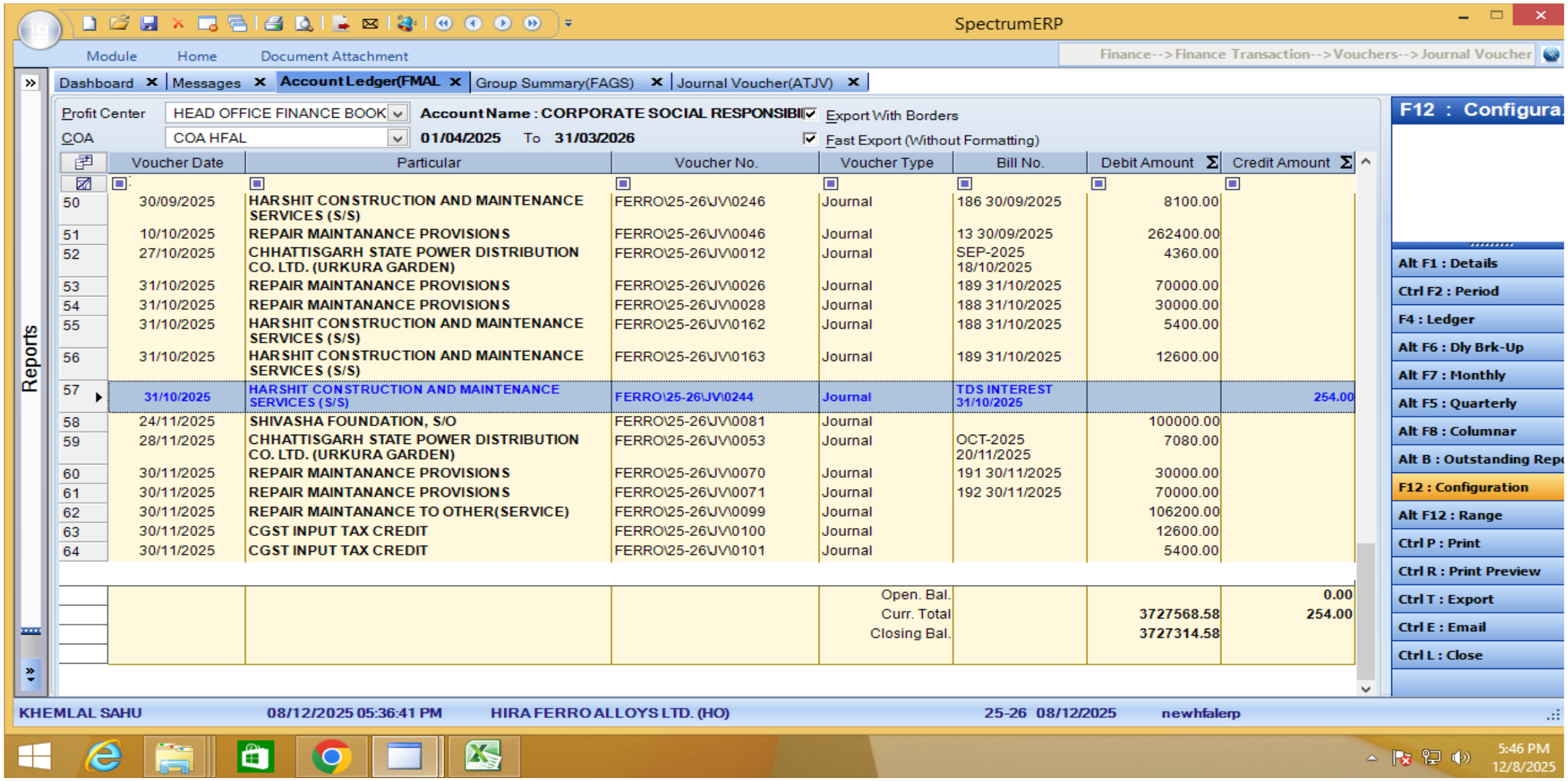
							FOR AUGUST-25 FOR 500 UNITS		
						275784			
URLA MUKTIDHAM									
1	30/4/2025	HARSHIT CONSTRUCTION AND MAINTENANCE SERVICES	152 dt. 30/04/2025	45000	8100	53100	GREEN BELT PLANTATION	FERRO\25-26\SO\0071 30/04/2025	
2	31/05/2025	HARSHIT CONSTRUCTION AND MAINTENANCE SERVICES	159 dt. 31/05/2025	45000	8100	53100	GREEN BELT PLANTATION	FERRO\25-26\SO\0071 30/04/2025	
3	18/06/2025	GEETA NURSERY(S/S)	1696 dt. 12/06/2025	131323		131323	CONOCARPUS ERITUS PLANT	FERRO\25-26\PO\0392	
4	30/06/2025	HARSHIT CONSTRUCTION AND MAINTENANCE SERVICES	166 dt. 30/06/2025	45000	8100	53100	GREEN BELT PLANTATION	FERRO\25-26\SO\0071 30/04/2025	
5	31/07/2025	HARSHIT CONSTRUCTION AND MAINTENANCE SERVICES	174 dt. 31/07/2025	45000	8100	53100	GREEN BELT PLANTATION	FERRO\25-26\SO\0071 30/04/2025	
6	31/08/2025	HARSHIT CONSTRUCTION AND MAINTENANCE SERVICES	182 dt. 31/08/2025	45000	8100	53100	GREEN BELT PLANTATION	FERRO\25-26\SO\0071 30/04/2025	

7	30/09/2025	HARSHIT CONSTRUCTION AND MAINTENANCE SERVICES	186 dt. 30/09/2025	45000	8100	53100	GREEN BELT PLANTATION	FERRO\25-26\SO\0071 30/04/2025	
8	30.11/2025	HARSHIT CONSTRUCTION AND MAINTENANCE SERVICES	193 dt. 30/11/2025	90000	16200	106200	GREEN BELT PLANTATION	FERRO\25-26\SO\0552 10/11/2025	
						556123			
ACHHOLI MUKTIDHAM									
1	04-07-2025	HARSHIT CONSTRUCTION AND MAINTENANCE SERVICES	150 dt. 07/04/2025	20000	3600	23600	INSTALLATION & TESTING CHARGES OF DRIP IRRIGATION SYSTEM	FERRO\25-26\SO\0005 DT.05/04/2025	
2	30/4/2025	HARSHIT CONSTRUCTION AND MAINTENANCE SERVICES	153 dt. 30/04/2025	30000	5400	35400	GREEN BELT PLANTATION	FERRO\24-25\SO\0207 27/06/2024	
3	31/05/2025	HARSHIT CONSTRUCTION AND MAINTENANCE SERVICES	160 dt. 31/05/2025	30000	5400	35400	GREEN BELT PLANTATION	FERRO\24-25\SO\0207 27/06/2024	
4	30/06/2025	HARSHIT CONSTRUCTION AND MAINTENANCE SERVICES	167 dt. 30/06/2025	30000	5400	35400	GREEN BELT PLANTATION	FERRO\24-25\SO\0207 27/06/2024	

5	31/07/2025	HARSHIT CONSTRUCTION AND MAINTENANCE SERVICES	175 dt. 31/07/2025	30000	5400	35400	GREEN BELT PLANTATION	FERRO\24-25\SO\0207 27/06/2024	
6	30/09/2025	HARSHIT CONSTRUCTION AND MAINTENANCE SERVICES	185 dt. 30/09/2025	60000	10800	70800	GREEN BELT PLANTATION	FERRO\25-26\SO\0402 13/09/2025 ,	AUGUST & SEP.
7	31/10/2025	HARSHIT CONSTRUCTION AND MAINTENANCE SERVICES	188 dt. 31/10/2025	30000	5400	35400	GREEN BELT PLANTATION	FERRO\25-26\SO\0402 13/09/2025 ,	
8	30/11/2025	HARSHIT CONSTRUCTION AND MAINTENANCE SERVICES	191 dt. 30/11/2025	30000	5400	35400	GREEN BELT PLANTATION	FERRO\25-26\SO\0402 13/09/2025 ,	
						306800			
RAWABHATHA MUKTIDHAM									
1	30/4/2025	HARSHIT CONSTRUCTION AND MAINTENANCE SERVICES	154 dt. 30/04/2025	70000	12600	82600	GREEN BELT PLANTATION	FERRO\24-25\SO\0314 20/08/2024 ,FERRO\24-25\SO\0537 11/12/2024	
2	31/05/2025	HARSHIT CONSTRUCTION AND MAINTENANCE SERVICES	161 dt. 31/05/2025	70000	12600	82600	GREEN BELT PLANTATION	FERRO\24-25\SO\0314 20/08/2024 ,FERRO\24-25\SO\0537 11/12/2024	

3	18/06/2025	GEETA NURSERY(S/S)	1696 dt. 12/06/2025	65662		65662	KUNDA JASMIN 25.000 NOS @ Rs 40.00 Per NOS ,MADHU KAMINI 15 X 16 25.000 NOS @ Rs 40.00 Per NOS ,PELTA FORM 13X13 500.000 NOS @ Rs 60.00 Per NOS ,GULMOHAR (RED) SIZE: 15X16 600.000 NOS @ Rs 60.00 Per NOS ,CONOCARPUS ERITUS PLANT 2500.000 NOS	FERRO\25-26\PO\0392	
4	30/06/2025	HARSHIT CONSTRUCTION AND MAINTENANCE SERVICES	168 dt. 30/06/2025	70000	12600	82600	GREEN BELT PLANTATION	FERRO\24-25\SO\0314 20/08/2024 ,FERRO\24-25\SO\0537 11/12/2024	
5	31/07/2025	HARSHIT CONSTRUCTION AND MAINTENANCE SERVICES	176 dt. 31/07/2025	70000	12600	82600	GREEN BELT PLANTATION	FERRO\24-25\SO\0314 20/08/2024 ,FERRO\24-25\SO\0537 11/12/2024	
6	30.09.2025	HARSHIT CONSTRUCTION AND MAINTENANCE SERVICES	184 dt. 30/09/2025	140000	25200	165200	GREEN BELT PLANTATION	FERRO\25-26\SO\0401 11/09/2025 ,	AUGUST & SEP.
7	31/10/2025	HARSHIT CONSTRUCTION AND	189 dt. 31/10/2025	70000	12600	82600	GREEN BELT PLANTATION	FERRO\25-26\SO\0401 11/09/2025 ,	

		MAINTENANCE SERVICES							
8	30/11/2025	HARSHIT CONSTRUCTION AND MAINTENANCE SERVICES	192 dt. 30/11/2025	70000	12600	82600	GREEN BELT PLANTATION	FERRO\25-26\SO\0401 11/09/2025 ,	
						726462			
NIMORA MUKTIDHAM									
NO.	**DATE**	**PARTY NAME**	**BILL NO.**	**BASIC AMT**	**GST 18%**	**TOTAL AMT**	**ITEM DESCIPTION**	**SERVICE ORDER NO.**	**PAYMENT TYPE**
1	10-10-2025	SILIP KUMAR UIKE	13 DT. 30.09.2025	262400		262400	GREEN BELT NIMORA MUKTIDHAM PLANTATION WORK , FANCING POLE FIXING ,BARBED WIRE BENDING ,CLEANING WORK AND 3 NOS NEW GATE MAKING & FIXING WORK	FERRO\25-26\SO\0299 DT. 28.07.2025	
2						**262400**			
				TOTAL CSR		**3727569**			



	Voucher Date	Particular	Voucher No.	Voucher Type	Bill No.	Debit Amount Σ	Credit Amount Σ
50	30/09/2025	HARSHIT CONSTRUCTION AND MAINTENANCE SERVICES (S/S)	FERRO\25-26\JV\0246	Journal	186 30/09/2025	8100.00	
51	10/10/2025	REPAIR MAINTANANCE PROVISIONS	FERRO\25-26\JV\0046	Journal	13 30/09/2025	262400.00	
52	27/10/2025	CHHATTISGARH STATE POWER DISTRIBUTION CO. LTD. (URKURA GARDEN)	FERRO\25-26\JV\0012	Journal	SEP-2025 18/10/2025	4360.00	
53	31/10/2025	REPAIR MAINTANANCE PROVISIONS	FERRO\25-26\JV\0026	Journal	189 31/10/2025	70000.00	
54	31/10/2025	REPAIR MAINTANANCE PROVISIONS	FERRO\25-26\JV\0028	Journal	188 31/10/2025	30000.00	
55	31/10/2025	HARSHIT CONSTRUCTION AND MAINTENANCE SERVICES (S/S)	FERRO\25-26\JV\0162	Journal	188 31/10/2025	5400.00	
56	31/10/2025	HARSHIT CONSTRUCTION AND MAINTENANCE SERVICES (S/S)	FERRO\25-26\JV\0163	Journal	189 31/10/2025	12600.00	
57	31/10/2025	HARSHIT CONSTRUCTION AND MAINTENANCE SERVICES (S/S)	FERRO\25-26\JV\0244	Journal	TDS INTEREST 31/10/2025		254.00
58	24/11/2025	SHIVASHA FOUNDATION, S/O	FERRO\25-26\JV\0081	Journal		100000.00	
59	28/11/2025	CHHATTISGARH STATE POWER DISTRIBUTION CO. LTD. (URKURA GARDEN)	FERRO\25-26\JV\0053	Journal	OCT-2025 20/11/2025	7080.00	
60	30/11/2025	REPAIR MAINTANANCE PROVISIONS	FERRO\25-26\JV\0070	Journal	191 30/11/2025	30000.00	
61	30/11/2025	REPAIR MAINTANANCE PROVISIONS	FERRO\25-26\JV\0071	Journal	192 30/11/2025	70000.00	
62	30/11/2025	REPAIR MAINTANANCE TO OTHER(SERVICE)	FERRO\25-26\JV\0099	Journal		106200.00	
63	30/11/2025	CGST INPUT TAX CREDIT	FERRO\25-26\JV\0100	Journal		12600.00	
64	30/11/2025	CGST INPUT TAX CREDIT	FERRO\25-26\JV\0101	Journal		5400.00	
				Open. Bal.			0.00
				Curr. Total		3727568.58	254.00
				Closing Bal.		3727314.58	

Annexure III: Water Permission/Agreement and Water Balance

Chhattisgarh State Industrial Development Corporation Limited
(A Government of Chhattisgarh Undertaking)
(ISO 9001:2015 Certified)
First Floor, Udyog Bhawan, Ring Road No.-1, Telibandha, Raipur-492006 (C.G.)
CIN : U45203CT1981SG001853, PAN : AABCM6288N, GST Regn. No. : 22AABCM6288N5ZY
Phone No. : 0771-6002071, 72, 73, Fax No. : 0771-2583794
Website: www.csidc.in, Email address: csidc_raipur@yahoo.com, csidc.cg@nic.in

No./CSIDC/EE/DIV.-II/2021-22/4236 Raipur, Dated 27 /08/2021

WATER AVAILABILITY CERTIFICATE FOR FRESH/TREATED WATER

TO WHOMSOEVER IT MAY CONCERN

Chhattisgarh State Industrial Development Corporation is providing fresh water supply/treated water supply to the tune of **100m^3/day** to the firm **M/s HIRA FERRO ALLOYS LTD.** Located at **Plot No. 567-B, 568 & 553-B Urla Industrial Complex, Raipur(C.G)**

As such the firm has to make its own arrangement for water supply to meet its entire/balance requirement after obtaining the necessary permission from the competent authority.

Executive Engineer
(Division-II)

date :-

भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन, नदी विकास
और गंगा संरक्षण विभाग
केन्द्रीय भूमि जल प्राधिकरण
Government of India
Ministry of Jal Shakti
Department of Water Resources,
River Development & Ganga Rejuvenation
Central Ground Water Authority

(भूजल निकासी हेतु अनापत्ति प्रमाण पत्र)
NO OBJECTION CERTIFICATE (NOC) FOR GROUND WATER ABSTRACTION

Project Name:	Hira Ferro Alloys Ltd		
Project Address:	Plot No-567b,568 And 553-b, Village-achholi		
Town:	Birgaon (m)	Block:	Dharsiwa
District:	Raipur	State:	Chhattisgarh
Pin Code:			
Communication Address:	Plot No- 490/1, 491/2, Urla Industrial Area, Urla Raipur Chhattisgarh, Urla Industrial Complex, Dharsiwa, Raipur, Chhattisgarh - 492003		
Address of CGWB Regional Office :	Central Ground Water Board North Central Chhattisgarh, 2nd Floor, Lk Corporate And Logistic Park, Dhamtari Road, Nh-30, Dumartarai, Raipur, Chhattisgarh - 492015		

1.	**NOC No.:**	CGWA/NOC/IND/REN/1/2024/10003	2.	**Date of Issuence**	04/10/2024
3.	Application No.:	21-4/670/CT/IND/2017	4.	Category: (GWRE 2023)	Critical
5.	Project Status:	Existing Ground Water	6.	NOC Type:	Renewal
7.	**Valid from:**	23/09/2024	8.	**Valid up to:**	22/09/2027

9. Ground Water Abstraction Permitted:

Fresh Water		Saline Water		Dewatering		Total	
m³/day	m³/year	m³/day	m³/year	m³/day	m³/year	m³/day	m³/year
100.00	36500.00					100.00	36500.00

10. Details of ground water abstraction /Dewatering structures

	Total Existing No.:3						**Total Proposed No.:0**					
	DW	DCB	BW	TW	MP	MPu	DW	DCB	BW	TW	MP	MPu
Abstraction Structure*	0	0	3	0	0	0	0	0	0	0	0	0

*DW- Dug Well; DCB-Dug-cum-Bore Well; BW-Bore Well; TW-Tube Well; MP-Mine Pit;MPu-Mine Pumps

11.	Ground Water Abstraction/Restoration Charges paid (Rs.):	438000.00
12.	Environment Compensation (if applicable) paid (Rs.):	0.00

13.	Number of Piezometers(Observation wells) to be constructed/ monitored & Monitoring mechanism.	No. of Piezometers	Monitoring Mechanism		
			Manual	DWLR**	DWLR With Telemetry
	**DWLR - Digital Water Level Recorder	1	0	1	0

18/11, जामनगर हाउस, मानसिंह रोड, नई दिल्ली - 110011 / 18/11, Jamnagar House, Mansingh Road, New Delhi-110011
Phone: (011) 23383561 Fax: 23382051, 23386743
Website: cgwa-noc.gov.in

(Compliance Conditions given overleaf)

This is an auto generated document & need not to be signed.

18/11, जामनगर हाउस, मानसिंह रोड, नई दिल्ली - 110011 / 18/11, Jamnagar House, Mansingh Road, New Delhi-110011
Phone: (011) 23383561 Fax: 23382051, 23386743
Website: cgwa-noc.gov.in

Validity of this NOC shall be subject to compliance of the following conditions:

Mandatory conditions:

1) Installation of tamper proof digital water flow meter with telemetry on all the abstraction structure(s) shall be mandatory for all users seeking No Objection Certificate and intimation regarding their installation shall be communicated to the CGWA within 30 days of grant of No Objection Certificate.

2) Proponents shall mandatorily get water flow meter calibrated from an authorized agency once in a year.

3) Construction of purpose-built observation wells (piezometers) for ground water level monitoring shall be mandatory as per Section 14 of Guidelines. Water level data shall be made available to CGWA through web portal. Detailed guidelines for construction of piezometers are given in Annexure-II of the guidelines.

4) Proponents shall monitor quality of ground water from the abstraction structure(s) once in a year. Water samples from bore wells/ tube wells / dug wells shall be collected during April/May every year and analysed in NABL accredited laboratories for basic parameters (cations and anions), heavy metals, pesticides/ organic compounds etc. Water quality data shall be made available to CGWA through the web portal.

5) In case of mining projects, additional key wells shall be established in consultation with the Regional Director, CGWB for ground water level monitoring four (4) times a year (January, May, August and November) in core as well as buffer zones of the mine.

6) In case of mining project the firm shall submit water quality report of mine discharge/ seepage from Govt. approved/ NABL accredited lab.

7) The firm shall report compliance of the NOC conditions online in the website (www.cgwa-noc.gov.in) within one year from the date of issue of this NOC.

8) Industries abstracting ground water in excess of 100 m 3 /d shall undertake annual water audit through certified auditors and submit audit reports within three months of completion of the same to CGWA. All such industries shall be required to reduce their ground water use by at least 20% over the next three years through appropriate means.

9) Application for renewal can be submitted online from 90 days before the expiry of NOC. Ground water withdrawal, if any, after expiry of NOC shall be illegal & liable for legal action as per provisions of Environment (Protection) Act, 1986.

10) This NOC is subject to prevailing Central/State Government rules/laws/norms or Court orders related to construction of tube well/ground water abstraction structure / recharge or conservation structure/discharge of effluents or any such matter as applicable.

General conditions:

11) No additional ground water abstraction and/or de-watering structures shall be constructed for this purpose without prior approval of the Central Ground Water Authority (CGWA).

12) The proponent shall seek prior permission from CGWA for any increase in quantum of groundwater abstraction (more than that permitted in NOC for specific period).

13) Proponents shall install roof top rain water harvesting in the premise as per the existing building bye laws in the premise.

14) The project proponent shall take all necessary measures to prevent contamination of ground water in the premises failing which the firm shall be responsible for any consequences arising thereupon.

15) In case of industries that are likely to contaminate the ground water, no recharge measures shall be taken up by the firm inside the plant premises. The runoff generated from the rooftop shall be stored and put to beneficial use by the firm.

16) Wherever feasible, requirement of water for greenbelt (horticulture) shall be met from recycled / treated waste water.

17) Wherever the NOC is for abstraction of saline water and the existing wells (s) is /are yielding fresh water, the same shall be sealed and new tubewell(s) tapping saline water zone shall be constructed within 3 months of the issuance of NOC. The firm shall also ensure safe disposal of saline residue, if any.

18) Unexpected variations in inflow of ground water into the mine pit, if any, shall be reported to the concerned Regional Director, Central Ground Water Board.

19) In case of violation of any NOC conditions, the applicant shall be liable to pay the penalties as per Section 16 of Guidelines.

20) This NOC does not absolve the proponents of their obligation / requirement to obtain other statutory and administrative clearances from appropriate authorities.

21) The issue of this NOC does not imply that other statutory / administrative clearances shall be granted to the project by the concerned authorities. Such authorities would consider the project on merits and take decisions independently of the NOC.

22) In case of change of ownership, new owner of the industry will have to apply for incorporation of necessary changes in the No Objection Certificate with documentary proof within 60 days of taking over possession of the premises.

23) This NOC is being issued without any prejudice to the directions of the Hon'ble NGT/court orders in cases related to ground water or any other related matters.

24) Proponents, who have installed/constructed artificial recharge structures in compliance of the NOC granted to them previously and have availed rebate of upto 50% (fifty percent) in the ground water abstraction charges/ground water restoration charges, shall continue to regularly maintain artificial recharge structures.

25) Industries which are likely to cause ground water pollution e.g. Tanning, Slaughter Houses, Dye, Chemical/ Petrochemical, Coal washeries, pharmaceutical, other hazardous units etc. (as per CPCB list) need to undertake necessary well head protection measures to ensure prevention of ground water pollution as per Annexure III of the guidelines.

26) In case of new infrastructure projects having ground water abstraction of more than 20 m3/day, the firm/entity shall ensure implementation of dual water supply system in the projects.

27) In case of infrastructure projects, paved/parking area must be covered with interlocking/perforated tiles or other suitable measures to ensure groundwater infiltration/harvesting.

28) In case of coal and other base metal mining projects, the project proponent shall use the advance dewatering technology (by construction of series of dewatering abstraction structures) to avoid contamination of surface water.

29) The NOC issued is conditional subject to the conditions mentioned in the Public notice dated 27.01.2021 failing which penalty/EC/cancellation of NOC shall be imposed as the case may be.
30) This NOC is issued subject to the clearance of Expert Appraisal Committee (EAC) (if applicable).
31) In the self-compliance report, the PP shall submit details of Drilling Agency/ Agencies, which has/ have constructed BW(s)/ TW(s) along with undertaking to the effect that all necessary measures have been taken as per directions of Hon'ble Supreme Court provided in Annexure-VII of guidelines dated 24.09.2020 in respect of abandoned/ failed BW(s)/ TW(s)/Piezometer(s), if any. The PP is advised to engage registered drilling agency/ agencies. In the event of any mishap/ unfortunate incident due to negligence in taking measures for prevention of accident due to falling in Bore Well, both PP and concerned drilling agency shall jointly be held responsible and penal action as per extant Government rules shall be taken.

(Non-compliance of the conditions mentioned above is likely to result in the cancellation of NOC and legal action against the proponent.)

CENTRAL GROUND WATER AUTHORITY

Department of Water Resources, River Development and Ganga Rejuvenation
Ministry of Jal Shakti, Govt. of India

Receipt

(As per the guideline Gazette Notification S.O. 3281(E) regarding the New Guidelines dated 24.09.2020 of CGWA, MoJS, Govt. of India)
https://cgwa-noc.gov.in

Application No,:	21-4/670/CT/IND/2017	Date of Issuence:04/10/2024
Name of Firm:	HIRA FERRO ALLOYS LTD	
AppType Category:	*Iron Steel bar*	
Application Type:	*Industrial*	
PAN/GSTIN No. of Firm/Individual:	/	

SN	Description	Amount (Rs.)
1.	Application Processing Fee	**5000.00**
2.	Ground Water Abstraction charges	**438000.00**
3.	Ground Water Restoration charges	**0**
4.	Environmental Compensation Charges (ECRGW) *(Date From to) Days-*	
5.	Penalty for non-Compliance of NOC conditions *Condition to be mentioned*	
6.	Adjustment Charges	
7.	Rebate	
8.	Charges for correction/modification in the existing issued No Objection Certificate	

S.No.	Description	Rate
(i)	Change in User ID	Rs. 1000
(ii)	Change in firm Name	Rs. 5000
(iii)	Extension of No Objection Certificate	Rs. 5000
(iv)	Issuance of duplicate No Objection Certificate	Rs. 5000
(v)	Issuance of corrigendum to No Objection Certificate	Rs. 5000
(vi)	Any other items/correction etc.	Rs. 500

Rs. Rupees Four Lakh Forty Three Thousand Only	**443000.00**

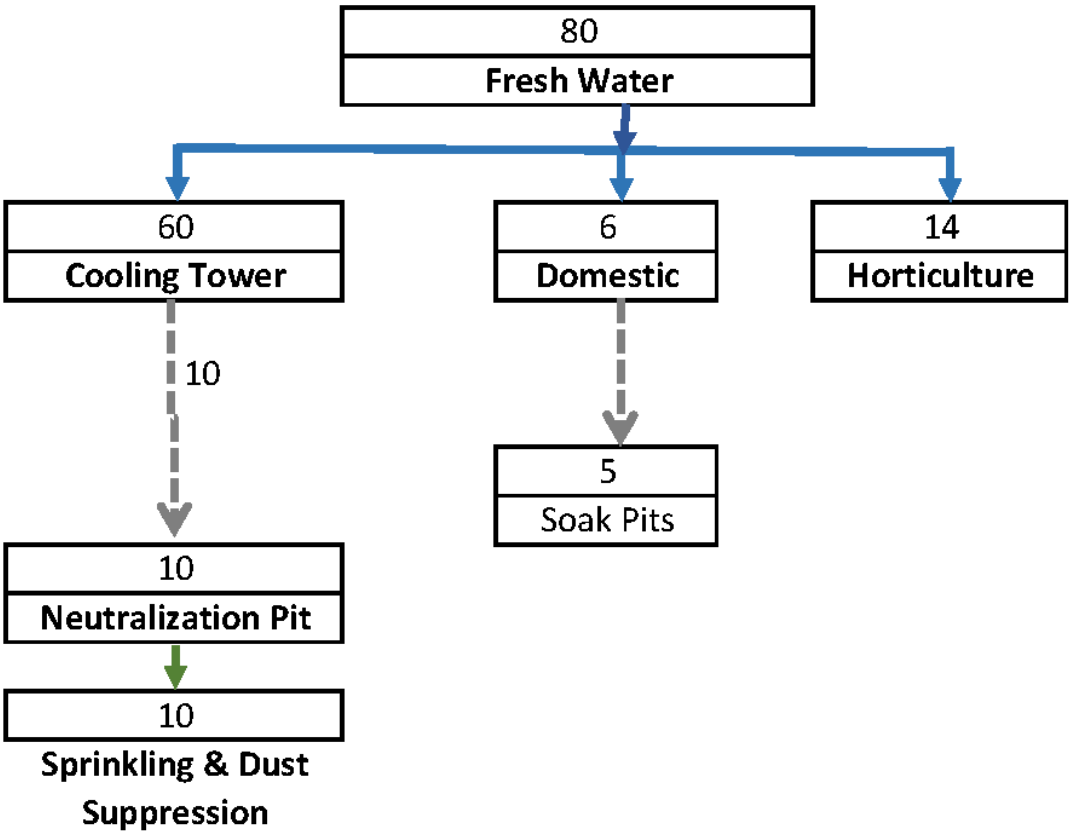
This is an system generated invoice, hence, does not require ink signed.

Term and conditions:

i. All disputes are subject to Delhi Jurisdiction.
ii. Any complaint in regard to the rates will not be entertained.

Member-Secretary
CGWA, New Delhi

Water Balance for HFAL Unit I



Annexure IV: Surface Water Monitoring

Advanced Environmental Testing And Research Lab P. Ltd.

CIN: U73100MP2002PTC015352 GSTIN: 23AAECA9188L1Z8

Approved: by Occupational Health &Safety Management (ISO45001:2018)
Approved: by National Accreditation Board for Testing and Calibration Laboratories
Approved: by Ministry of Environment, Forest and Climate Change (MoEF&CC)

Registered Office: 63/1, Kailash Vihar, Near Income Tax Office, City Center-II
Gwalior-474 011, M.P., India
☎0751-3566867, 2232177
Email:aelgwalior@gmail.comaetrl2016@gmail.com,aetrlcenter@gmail.com
Web: www,aetrl.com

TC-12780

5	Particulate Matter as PM	30.2	mg/Nm^3	50	IS 11255 (Part 01): 2019
6.	Oxygen (O2)	18.7	%	-	By Flue gas Analyser

***** End of Report*****

Checked By

Authorized Signatory

TEST REPORT

Report No.: AETRL/ SW-24122025/01			Date:		05/01/2026
Customer Name & Address	:	M/s Hira Ferro Alloys Limited (Unit - I) Plot No. 567/B, 568, 553/B, Urla Industrial Area, District – Raipur (C.G.)			
Date of Sample Collection	:	24/12/2025	Sampling Type	:	Grab
Date of Sample Received	:	30/12/2025	Sample ID	:	SW-24122025/01
Sampling Location	:	Near Store CSIDC Water pipe Point	Sample Description	:	Surface Water (CSIDC Water)
Sample Collected / Submitted by	:	Lab representative	Protocol used for Sampling	:	APHA 24thEdition
Quantity / No. of Sample	:	5 Litre/1Nos.	Analysis Started On	:	30/12/2025
Packing / Seal	:	Temp. Sealed	Analysis Completed On	:	05/01/2026

Water Analysis Results

S.No.	Name of Test	Method of Test	Test Result	Units	Limits as per IS:2296
1	pH	IS:3025 (Part-11)-2022	8.16	-	8.5
2	Taste	IS:3025 (Part-8)- 2023	Agreeable	-	-
3	Odour	IS:3025 (Part-5)- 2018	Odourless	-	Odour/ Odourless
4	Colour	IS:3025 (Part-4)- 2021	< 1.0	Hazen	10.0 (Max.)
5	Turbidity	IS:3025 (Part-10)- 2023	< 1.0	NTU	1.0 (Max.)
6	Total Dissolved Solids	IS:3025 (Part-16)- 2023	732	mg/L	500.0 (Max.)
7	Calcium (as Ca)	IS:3025 (Part-40)-2024	98	mg/L	80.10 (Max.)
8	Free Residual Chlorine	IS 3025 (Part-26)-2021	< 0.08	mg/L	-
9	Chlorides (as Cl-)	IS:3025 (Part-32)-2019	152	mg/L	250.0 (Max.)
10	Magnesium (as Mg)	IS:3025 (Part-46)-2023	27.8	mg/L	24.28 (Max.)
11	Total Alkalinity as calcium carbonate	IS:3025 (Part-23)-2023	122	mg/L	-
12	Total Hardness (as CaCO3)	IS:3025 (Part-21)-2023	359.2	mg/L	300.0 (Max.)

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Annexure V: Slag Monitoring

Advanced Environmental Testing And Research Lab P. Ltd.

CIN: U73100MP2002PTC015352 GSTIN: 23AAECA9188L1Z8

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Approved: by National Accreditation Board for Testing and Calibration Laboratories
Approved: by Ministry of Environment, Forest and Climate Change (MoEF&CC)

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TC-12780

TEST REPORT

Report No.: AETRL/ TCLP-26122025/01			Date:		0501/2026
Name & Address of Customer	:	M/s Hira Ferro Alloys Limited (Unit - I) Plot No. 567/B, 568, 553/B, Urla Industrial Area, District – Raipur (C.G.) 492003			
Sample Collection Date & Time	:	26/01/2025	Sampling Type	:	-
Sample Receipt Date	:	30/12/2025	Sample ID	:	TCLP-26122025/01
Sampling Location	:	TCLP test of Ferro Slag (Solid Waste)	Sample Description	:	Slag
Sample Collected / Submitted by	:	Lab representative	Protocol used for monitoring	:	NA
Quantity / No. of Sample	:	500mg/1Nos.	Analysis Started On	:	30/12/2025
Packing / Seal	:	Seal Pack	Analysis Completed On	:	05/01/2026
Environmental Condition during the test			Clear Sky		

TEST RESULTS (TCLP (Toxicity Characteristic Leaching Procedure) OF FERRO SLAG

SR.NO.	PARAMETER	UNIT	METHOD OF TEST	LIMIT SCHEDULE II *[See rule 3(1) (17) (ii)]*	RESULT
1	Manganese as Mn	mg/Kg	USEPA METHOD - 1311	10	3.9
2	Zinc as Zn	mg/Kg	USEPA METHOD - 1311	250	8.5
3	Lead as Pb	mg/Kg	USEPA METHOD - 1311	5	1.11
4	Cadmium as Cd	mg/Kg	USEPA METHOD - 1311	1.0	N.D.
5	Chromium as Cr	mg/Kg	USEPA METHOD - 1311	5.0	1.12
6	Arsenic as As	mg/Kg	USEPA METHOD - 1311	5.0	N.D.
7	Mercury as Hg	mg/Kg	USEPA METHOD - 1311	0.2	N.D.
8	Nickel as Ni	mg/Kg	USEPA METHOD - 1311	20.0	0.12
9	Aluminum as Al	mg/Kg	USEPA METHOD - 1311	-	N.D.

***** End of Report*****

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Authorized Signatory

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Web: www,aetrl.com

TC-12780

TEST REPORT

Report No.: AETRL/ TCLP-26122025/02			Date:		0501/2026
Name & Address of Customer	:	M/s Hira Ferro Alloys Limited (Unit - I) Plot No. 567/B, 568, 553/B, Urla Industrial Area, District – Raipur (C.G.) 492003			
Sample Collection Date & Time	:	26/01/2025	Sampling Type	:	-
Sample Receipt Date	:	30/12/2025	Sample ID	:	TCLP-26122025/02
Sampling Location	:	TCLP test of Dust (FeSi)	Sample Description	:	Slag
Sample Collected / Submitted by	:	Lab representative	Protocol used for monitoring	:	NA
Quantity / No. of Sample	:	500mg/1Nos.	Analysis Started On	:	30/12/2025
Packing / Seal	:	Seal Pack	Analysis Completed On	:	05/01/2026
Environmental Condition during the test			Clear Sky		

TEST RESULTS (TCLP (TOXICITY CHARACTERISTIC LEACHING PROCEDURE) OF DUST (FeSi))

SR.NO.	PARAMETER	UNIT	METHOD OF TEST	LIMIT SCHEDULE II *[See rule 3(1) (17) (ii)]*	RESULT
1	Manganese as Mn	mg/Kg	USEPA METHOD - 1311	10	1.9
2	Zinc as Zn	mg/Kg	USEPA METHOD - 1311	250	3.6
3	Lead as Pb	mg/Kg	USEPA METHOD - 1311	5.0	0.7
4	Cadmium as Cd	mg/Kg	USEPA METHOD - 1311	1.0	N.D.
5	Chromium as Cr	mg/Kg	USEPA METHOD - 1311	5	0.59
6	Arsenic as As	mg/Kg	USEPA METHOD - 1311	5.0	N.D.
7	Mercury as Hg	mg/Kg	USEPA METHOD - 1311	0.2	N.D.
8	Nickel as Ni	mg/Kg	USEPA METHOD - 1311	20.0	0.14
9	Aluminum as Al	mg/Kg	USEPA METHOD - 1311	-	N.D.

***** End of Report*****

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TEST REPORT

Report No.: AETRL/ TCLP-26122025/03			Date:		0501/2026
Name & Address of Customer	:	M/s Hira Ferro Alloys Limited (Unit - I) Plot No. 567/B, 568, 553/B, Urla Industrial Area, District – Raipur (C.G.) 492003			
Sample Collection Date & Time	:	26/01/2025	Sampling Type	:	-
Sample Receipt Date	:	30/12/2025	Sample ID	:	TCLP-26122025/03
Sampling Location	:	TCLP test of Silica Slag (Solid Waste)	Sample Description	:	Slag
Sample Collected / Submitted by	:	Lab representative	Protocol used for monitoring	:	NA
Quantity / No. of Sample	:	500mg/1Nos.	Analysis Started On	:	30/12/2025
Packing / Seal	:	Seal Pack	Analysis Completed On	:	05/01/2026
Environmental Condition during the test			Clear Sky		

TEST RESULTS (TCLP (Toxicity Characteristic Leaching Procedure) OF SILICA SLAG)

SR.NO.	PARAMETER	UNIT	METHOD OF TEST	LIMIT SCHEDULE II *[See rule 3(1) (17) (ii)]*	RESULT
1	Manganese as Mn	mg/Kg	USEPA METHOD - 1311	10	4.1
2	Zinc as Zn	mg/Kg	USEPA METHOD - 1311	250	8.2
3	Lead as Pb	mg/Kg	USEPA METHOD - 1311	5.0	1.1
4	Cadmium as Cd	mg/Kg	USEPA METHOD - 1311	1.0	N.D.
5	Chromium as Cr	mg/Kg	USEPA METHOD - 1311	5	1.13
6	Arsenic as As	mg/Kg	USEPA METHOD - 1311	5.0	N.D.
7	Mercury as Hg	mg/Kg	USEPA METHOD - 1311	0.2	N.D.
8	Nickel as Ni	mg/Kg	USEPA METHOD - 1311	20.0	0.16
9	Aluminum as Al	mg/Kg	USEPA METHOD - 1311	-	N.D.

***** End of Report*****

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TC-12780

TEST REPORT

Report No.: AETRL/ TCLP-26122025/04			Date:		0501/2026
Name & Address of Customer	:	M/s Hira Ferro Alloys Limited (Unit - I) Plot No. 567/B, 568, 553/B, Urla Industrial Area, District – Raipur (C.G.) 492003			
Sample Collection Date & Time	:	26/01/2025	Sampling Type	:	-
Sample Receipt Date	:	30/12/2025	Sample ID	:	TCLP-26122025/04
Sampling Location	:	TCLP test of Pig Iron (Solid Waste)	Sample Description	:	Slag
Sample Collected / Submitted by	:	Lab representative	Protocol used for monitoring	:	NA
Quantity / No. of Sample	:	500mg/1Nos.	Analysis Started On	:	30/12/2025
Packing / Seal	:	Seal Pack	Analysis Completed On	:	05/01/2026
Environmental Condition during the test			Clear Sky		

TEST RESULTS (TCLP (Toxicity Characteristic Leaching Procedure) OF PIG IRON SLAG)

SR.NO.	PARAMETER	UNIT	METHOD OF TEST	LIMIT SCHEDULE II *[See rule 3(1) (17) (ii)]*	RESULT
1	Manganese as Mn	mg/Kg	USEPA METHOD - 1311	10	3.1
2	Zinc as Zn	mg/Kg	USEPA METHOD - 1311	250	8.8
3	Lead as Pb	mg/Kg	USEPA METHOD - 1311	5.0	0.8
4	Cadmium as Cd	mg/Kg	USEPA METHOD - 1311	1.0	N.D.
5	Chromium as Cr	mg/Kg	USEPA METHOD - 1311	5	1.14
6	Arsenic as As	mg/Kg	USEPA METHOD - 1311	5.0	N.D.
7	Mercury as Hg	mg/Kg	USEPA METHOD - 1311	0.2	N.D.
8	Nickel as Ni	mg/Kg	USEPA METHOD - 1311	20.0	0.18
9	Aluminum as Al	mg/Kg	USEPA METHOD - 1311	-	N.D.

***** End of Report*****

Advanced Environmental Testing And Research Lab Private Limited Gwalior

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Annexure VI: Plantation Audit Report

PHYSICAL VERIFICATION MONITORING & EVALUATION OF PLANTATION

HIRA
GROWING STRONGER TOGETHER

M/s HIRA FERRO ALLOYS LTD (UNIT – I).

Plot No. 567/B, 568, 553/B, Urla Industrial Area, Urla, Distt - Raipur (C.G.)

Year – 2025

EVALUATION & VERIFICATION DONE

by

ARIF ALI

Rtd. Dy. CF. (SFS) CONSULTANT

(ENVIRONMENT AND FOREST) RAIPUR (C.G.)

7.6.2025

Arif Ali
Retd. DY. C.F. (SFS)
Consultant Env. & Forest
Raipur (C.G.)

EVALUATION AND VERIFICATION OF

GREEN BELT

M/s HIRA FERRO ALLOYS LIMITED (UNIT –I)

PLOT NO. 567/B, 568, 553/B, URLA INDUSTRIAL AREA, URLA RAIPUR (C.G.)

YEAR – 2025

Evaluation & Verification by: -

ARIF ALI

Rtd. Dy. CF. (SFS) Consultant

(Environment and Forest) Raipur (C.G.)

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1. EXECUTIVE SUMMARY

M/s Hira Ferro Alloys Ltd (Unit – I). located at Plot No. 567/B, 558, 553/B, Industrial Area, Urla Distt - Raipur (C.G.) is a production unit of ferro alloy (Through Submerged Arc Furnace route). The permitted land of the factory is 0.98513 hectares / 2.434 Acres. Company has developed green belt in an area around Approx. 1225.62 sqm /0.122562 hectares / 0.3028 Acres i.e., 12.4% of the area has been developed as green area within the premises. Moreover, an additional 2758 sqm/ 0.2758 hectares / 0.6815 Acres i.e., 28% of green area has been developed outside the premises at boundary wall of factory & at Urkura Site Land Which is allotted by Nagar Palik Nigam Birgoan. Approx. Hence 40% of plantation has been already developed at the boundary wall of the factory.

The environment clearance is granted by Ministry of Environment Forest and Climate Change, New Delhi and Latest Renewal of Consent of Operate is granted by CECB Raipur (C.G.) as also direction received from the regional office from time to time require as that plantation should be done by the industrial units within plant premises and nearby areas with local species covering 40% or 1/3rd of area. The green belt helps to capture the fugitive emission and attenuate the noise apart from improving the aesthetics of the region.

Physical verification and evaluation work has been done by our team in terms of number, girth of trees, height and survival percentage density and quality of plantation on 3rd week of May 2025.

1.1 INTRODUCTION

Hira Ferro Alloys Limited (Unit-I) is existing Ferro Alloys plant (through Submerged Arc Furnace route) at plot No. 567/B, 558, 553/B, Urla Industrial Area, Urla, Raipur, Chhattisgarh, 492003. The company was promoted by Shri Narayan Prasad Agrawal who is the Managing Director of Unit Under their active guidance the company has been continuously expanding and diversifying its activities and has recorded substantial growth.

OCCUPIER & FACTORY MANAGER OF THE UNIT

SHRI AJAY DUBEY (Director)
Hira Ferro Alloys Ltd. (Unit – II)
Plot No. 490/1, 491/2, Urla Industrial Complex, Urla Raipur (C.G.)
Pincode: 492003

Mail ID : ajay.dubey@hiragroup.com, tarun.kumar@hfal.in
Contact : +91- 8770008994, +91- 97555 22009
Phone No.- 0771- 4938401(O), M- +91 97555 22009

M/s Hira Ferro Alloys Limited (HFAL) is a certified ISO 9001:2015, ISO 14001:2015, OHSAS 18001:2007 company of Hira Group which is one of the leading business conglomerates in the state of Chhattisgarh. Hira Ferro Alloys Limited is a company of Hira Group which is one of the leading business conglomerates in the state of Chhattisgarh. The group is one of the largest group of Chhattisgarh with predominant interest in power generation, sponge iron, steel making, steel rolled products, ferro alloys and coal and iron ore mining and cement manufacture. The Group has vast experience in the projects of Ferro Alloys & Steel making among other products.
Hira Group of companies operate in eight business sectors viz. Sponge (DRI), Steel, Power, Ferro alloys, Cement, Real Estate, Pellets & Mining. The Group Combines unparalleled experience, across all related products through extensive research for cost effective production.

Hira Ferro Alloys Limited is the company registered under Companies Act, 1956 having present production capacity of Ferro Alloys: 10,500 metric tonnes per annum in the name of Hira Ferro Alloys Limited (Unit-I) along with ferro alloys production capacity of 50,000 metric tonnes per annum and/or Pig Iron – 70,000 metric tonnes per annum with 20 MW captive Power Plant in the name of Hira Ferro Alloys Limited (Unit-II) at Urla Industrial Area Raipur.

The industry currently manufactures Ferro Alloys (Silico Manganese/Ferro Manganese) having a total capacity of 10,500 TPA. The unit is operational as per the latest Consent to Operate issued by SPCB (CECB) vide Letter No. 4249/TS/CECB/2024 dated 16.08.2024 (valid up to 31.07.2025). The total plant area is 9851.30 (0.98513 Ha.). The site is self-sufficient with all the infrastructural facilities consisting of utilities, environment management, manufacturing area, OHC, full-fledged safety department, warehousing, and site technical management.

2 PLANTATION SITES:

Plantation work has been done along the plant boundary, inside the plant premises, roadside and the nearby Government Land Which is allotted by Nagar Palik Nigam Birgaov . Plantation survey has been carried out by our expert team with the help of M/s Hira Ferro Alloys Limited management and office staff. Following plantation sites have been planted by M/s Hira Ferro Alloys Limited.

(1) Plantation inside plant premises
(2) Plantation outside Boundary wall along with periphery.
(3) Government Land at Urkura site.

DISCUSSION WITH MANAGEMENT AND STAFF AS UNDER –

1. Mr. Niket Khandelwal (GM – Corporate Affairs)
2. Mr. Tarun Kumar (Asst. Manager – Corporate Affairs)

Area Statement:

Total plant Area : - 0.985 hectares / 2.434 Acres

Existing Green Belt Area inside Plant Premise: 1225.62 sqm /0.122562 hectares / 0.3028 Acres i.e., 12.4%

Existing Outside Plant Premises: Additional 2758 sqm/ 0.2758 hectares / 0.6815 Acres i.e., 28%.

Total Greenbelt Area : 3983.62 sqm / 0.398362 hectares / 0.9843 Acre i.e. 40 %

3. LOCATION OF PLANT AND ACCESSIBILLTY

The project site is located at Plot No. 567/B, 568, 553/B, Urla Industrial Area, District-Raipur, Chhattisgarh. The coordinates of the center of site are Latitude: 21°18'48.74"N & Longitude: 81°36'50.42"E. Land use and land cover of the site is Industrial. The existing unit is spread over an area of 9851.30 (0.98513 Ha.). The site is easily accessible via road and rail networks. The nearest road from the project is NH-30 located 1.6 km towards west direction. NH-30 is further connected to the Birgaon Main Road. Other highways and roads from the project are NH-53 located 7.8 km towards SW & NH-130B at 7.4 km towards SE direction. The nearest railway station from the project is Urkura Railway Station located 4.1 km towards SE direction. The nearest airport from the project is Raipur Airport located about 19 km away from site towards SE direction. Project being located near the Industrial area, many small to large scale industries are present in the area

4. PLANT PREMISES PLANTATION AREA

1. Main gate to ADM Office.
2. Near Store Area to Scrape Year
3. Materials gate to Weight Bridge
4. Whole Boundary Wall Area.
5. Near Metal Yard.

4.1. NEED OF GREEN BELT

Greenbelts are an effective mode of pollution and forming a sink of pollutants.
Leaves with their vast area in a tree crown, sorbs pollutants on their surface, thus effectively reduce pollutants concentration in the ambient air, often the absorbed pollutants are incorporated in the metabolic pathway and the air is purified. Plant grown to function as pollution sink are collectively referred as green belts. An important aspect of a greenbelt is that the plants are living organisms with their varied tolerance limit towards the air pollutants. A green belt is effective as a pollutants sink only within the tolerance limit of constituent plants. Planting few, known pollutant sensitive species along with the tolerant species within a green belt however, do carry out an important function of indicator species. Apart from function as pollution sink, green belt would provide the benefit like aesthetic improvement of the area and providing suitable habitats for animal and birds.

4.2 CHOOSING PLANTS FOR GREEN BELTS:

The main limitations for plants to function as scavenger of pollutants are plant interaction to air pollutants, sensivity to pollutants, climate condition and soil characteristics. While making choice of plant species for cultivation in greenbelts. Due consideration has to be given to the natural factors of bioclimate, Xerophytes plants are not necessary good for greenbelts they with their sunken stomata can with stand pollution by avoidance but are poor absorber of pollutants. Character of plants mainly considered for affecting absorption of pollutants gases and removal of dust particles are as follows.

4.3. FOR ABSORPTION OF GASES:

1. Tolerance towards pollutants in question, of concentration that are not high to be instantaneously lethal.
2. Longer duration of foliage.
3. Freely exposed foliage.
4. Adequate height of crown.
5. Openness of foliage in canopy.
6. Big leaves (long and broad laminar surface).
7. Large number of stomatal apertures.

4.4 FOR REMOVAL OF SUSPENDED PARTICULATE MATTER:

1. Height and spread of crown.
2. Leaves supported on firm petiole.
3. Abundance of surface on bark and foliage.
4. Roughness of bark.
5. Abundance of axillary hairs.
6. Hairs of scales on laminar surface.

MoEFCC (Ministry of Environment Forest and Climate Change) guidelines regarding green belt for industries – The environmental factors related to green belt with economic, social consideration are given below Land acquired shall be sufficiently large to provide shape for appropriate treatment of waste water, the treated waste water left after maximum possible reuse and recycle should be used to raise green belt and to create water body for aesthetic, recreation and if possible for agriculture. No forest land shall be converted into non forest activity for the sustenance or the industries. The green belt between to adjoining large scale industries shall be 1km. The green belt shall be 500 meters wide around the boundary limit of industry, for industry having odour problem it shall be 1 km wide.

In some environmental clearance issued for various types of projects by concerned regulatory authorities of central and state level, conditions reflected to green belt development of industrial projects mention that green belts of adequate width and density shall be provided 38% area to mitigate the effects off fugitive in emission all around the plant with local species in consultation with the DFO as per the CPB guidelines.

Development of green belt consisting of three tier along the periphery of the project with native species is most important. Guideline for any type of industry, green vegetation is beneficial many ways leading to conservation of biodiversity, retention of soil moisture, recharge of ground water and maintaining pleasant climate of the area. Providing possible habitat for birds and animal. Green belt minimizes the builds up pollution level in urban/industrial areas by acting as pollution sinks. The three tier green belt will absorb pollutant release from industrial activity into atmosphere helps in effective pollution control. The main advantages of green belt in and around the industry are to control air and noise pollution.

Trees helps in trapping particulate matter, removing co2 and other pollutants from air and by release o2 into the air there by improving the air quality. Green

belt reduce the intensity or should be reflect, refract or by absorb sound, if will function as barrier between industry and neighbourhood. The intensity reduction depends op on the distance sound has to travel from source and width as the green belt. Green belt also helps in soil erosion control through improvement of soil, quality and binding soil particles. It also contain water run offs and improve ground water infiltration and improving ground water recharge capacity. The green belt species should be selected based on the type/category of the industry and climatic conditions. Setting trees around and industry may not serve the purpose of green belt without considering the above elements.

5. PHYSICAL VERIFICATION AND EVALUATION OF GREEN BELT

For assessing the quality and quantity of green belt developed by M/s Hira Ferro Alloys Ltd (Unit – I). Our team visited the site on 3rd week of May 2025 and conduct all the necessary procedure to evaluate the green belt.

Tree Enumeration – Counting of all the trees and saplings carried out by direct field observation casualties were also recorded to calculate the survival percentage. Assessment of Health of Plantation – Generally health of plantation is assessed by measuring height and grith of trees. Height is measuring approximately and grith is measuring on following basis.

Table (1)

HEALTH	GIRTH
1.Upto 3year old tree	Girth is measuring 50 cm above the ground level
2.Upto 5year old trees	100 cm above the ground level
3.Older than 5 year	150 above the ground level

Survival percentage: The survival percentage of plantation is Calculated on the basis of the formula i.e.

$$\frac{\text{No. of living plants}}{\text{Total no. of plant planted}} \times 100$$

Density: - No of trees x Area

Grading of Plantation: -

A. Grading of project plantation on scale of 1 to 10

Qualitative	Survival	8.25
	Health of plantation	8.35
	Maintenance	8.75
	Sustainability	8..15

B. Grading of project plantation on scale of 1 to 10

Overall grading of plantation	Excellent	Very good	Good	Poor
	(8<10)	(5<8)	(3-5)	(>3)
		8.25		

Suggestion for Improvement

1. It is advice to adopt some fruit bearing and broad leaf trees.
2. The coal dust deposited in the leaves should be removed by washing the plants regularly.
3. Plant should be planted after one year age, Minimum 3' to 4' height.
4. Space between plants 2mx2m, 3mx3m and maximum 4mx4m according to maximum girth of trees after maturity.
5. Given priority to broader leaves plants.
6. Species – fast growing Species to be planted
7. Manure – Cow dung compost, Vermi compost for good edge Urea, DAP, Enzyme can be used.

5.1 PLANTED SPECIES AND MEASUREMENTS AT URKURA. (OUTSIDE PLANT PREMISES)

Table (2)

S.no.	Name of plant	Girth Class In CM			Total Number of Living plants
		0-20	21-40	41-60	
01	Gulmohar	285	00	00	**285**
02	Conocarpus	120	00	00	**120**
03	Badam	53	00	00	**53**
04	Peltaphorum	298	00	00	**298**
05	Jamun	12	00	00	**12**
06	Cassia siamia	22	00	00	**22**
07	Karanj	25	00	00	**25**
	Total	**815**	**00**	**00**	**815**

5.2 PLANTED SPECIES AND MEASUREMENTS AT INSIDE PLANT PREMISES AND BOUNDARY PERIPHERY.

S.no.	Name of plant	Girth Class In CM			Total Number of Living plants
		0-20	21-40	41-60	
01	Conocarpus	94	00	00	**94**
02	Nilgiri	20	00	00	**20**
03	Cassia siamia	21	00	00	**21**
04	Mahugani	23	00	00	**23**
05	Peltaphorum	22	00	00	**22**
06	Saptparni	14	00	00	**14**
07	Ashok	13	00	00	**13**
08	Sagon	12	00	00	**12**
09	Neem	35	00	00	**35**
10	Jamun	21	00	00	**21**
	Total	**275**	**00**	**00**	**275**

6. Enumeration Details of Tree Plantation in Premises of

M/S HIRA FERRO ALLOYS LTD (UNIT – I).

Plot No. 490/1, 491/2, Industrial Area Urla, Distt - Raipur (C.G.)

Year – 2025

1. Total area of the factory: - 0.98513 Hectares / 2.434 Acres
2. Green belt area (Inside + Outside): - 0.39834 Hectares/ 0.9843 Acres
3. Total No. Plants: 1,300 Numbers
4. Survival percentage: 84.23 %
5. Site suitability: Good
6. Density: - 1,020 Trees / acre

6.1 ALL TREES NAME AND QUANTITY

Table (3)

SR. No.	TREE NAME	NO. OF TREES INSIDE PLANT PREMISES AND BOUNDARY PERIPHERY	NO. OF TREES OUTSIDE PLANT PREMISES AT URKURA GOVT. LAND
1	CONOCARPUS	100	550
2	NILGIRI	20	--
3	CASSIA SHAMIYA	22	--
4	MAHOGANY	24	--
5	*PELTOPHORUM TREE*	23	--
6	BLACK BOARD/SAPTPARNI TREE	15	--
7	ASHOK	16	--
8	SAGON	16	--
9	GULMOHAR	--	40
10	NEEM	40	40
11	BARGAT	--	19

12	PIPAL	--	32
13	KARANJ	--	29
14	NARIYAL	--	11
15	JAMUN	24	22
16	BADAM	--	20
17	CHATIM	--	91
18	BOGAN BEL	--	15
19	AAM	--	20
20	SUBABUL	--	60
21	PALAS	--	22
22	PAPITA	--	10
23	MEHANDI	--	19
TOTAL		300	1000

% OF AREA GREEN BELT DEVELOPMENT					
S.No.	ALLOTED LAND BY NAGAR NIGAM	Total Available Land/ Alloted Land by Nagar Nigam (in Acre)	Total Plant Premises Area (in Acre)	Planted/ Green Belt developed Area (IN Acre)	% of Green Belt
1.	PLANT PREMISES & BOUNDARY WALL	2.434 Acres.	2.434	0.3028	12.44 %
5.	OTHER GOVT. LAND URKURA	4 Acres		0.6815	28 %
	TOTAL			0.9843	Approx. 40.44 %

Table: 4 Details of year wise plantation inside plant premises

S.No.	Plantation years	Total planted plants	Total Survival plants	Survival %
1.	FY 2007 - 2008 to FY 24-2025	300	275	91.66%

Table: 5 Details of year wise outside plantation, Urkura Government Land

S.No.	Plantation years	Total planted plants	Total Survival plants	Survival %
1.	FY 2023-24 To FY 2024-25	1000	815	81.50 %

Table: 6 Details of Total planted Plants within Plant premises & outside plantation, Plants Numbers and Percentage:

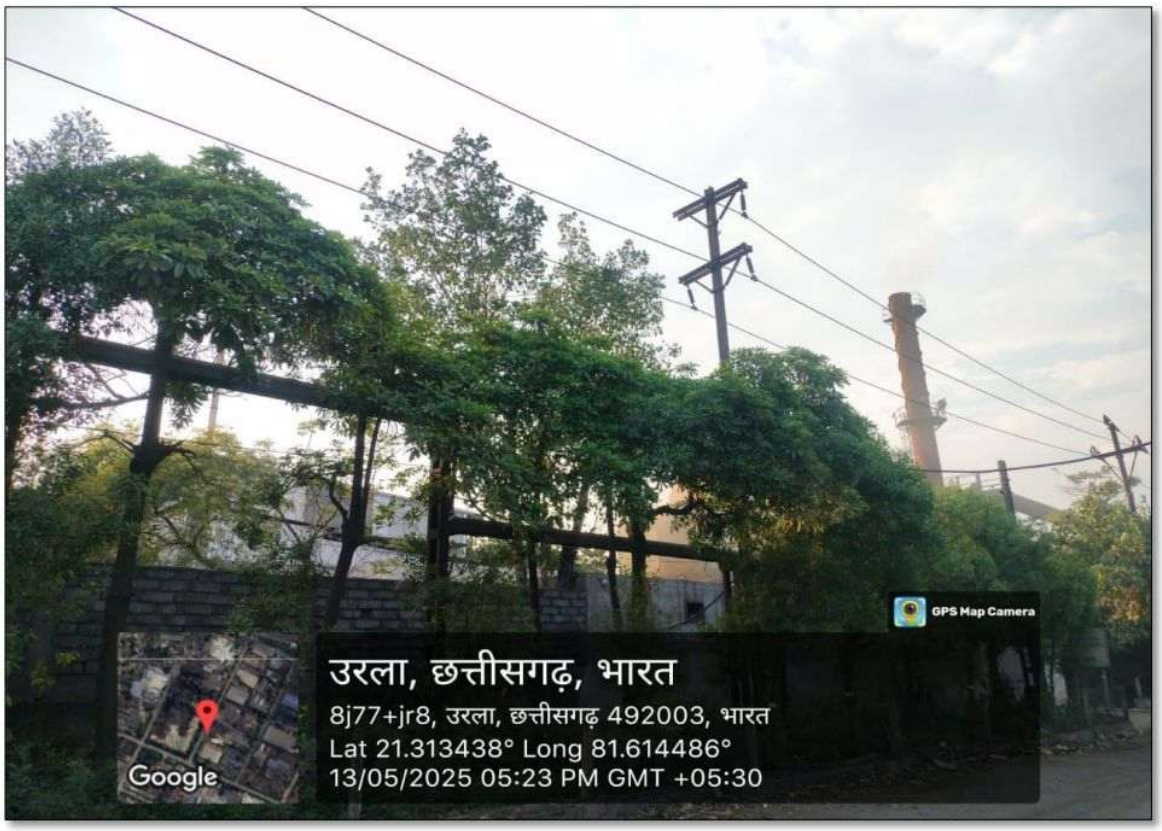
S.No.	Plantation years	Total planted plants	Total Survival plants	Survival %
1.	2008-2025	1300	1090	83.85 %

6.2 Conclusion/Result: M/s Hira Ferro Alloys Limited is working diligently on its tree plantation efforts within and outside the plant premises. Apart from gap filing, a total of 1300 saplings were planted in the year from FY 2007- 2008 to FY 2024-2025, in an area of about 0.9843 acres (Approx. 1 Acres), they have attempted to satisfy the statutory requirement of developing 40 % of the total land area as a green belt.

7. SUGGESTION FOR IMPROVEMENT

1) It is advice to adopt some fruit bearing and broad leaf trees.
2) The coal dust deposited in the leaves should be removed by washing the plants regularly.
3) Plant should be planted after one year age, Minimum 3’ to 4’ height.
4) Space between plants 2mx2m, 3mx3m and maximum 4mx4m according to maximum girth of trees after maturity.
5) Given priority to broader leaves plants.
6) Species – fast growing Species to be planted.
7) Manure – Cow dung compost, Vermi compost for good edge Urea, DAP,Enzyme can be used.

8. GREEN BELT DEVELOPMENT PHOTOGRAPHS INSIDE PLANT PREMISES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8j77+jr8, उरला, छत्तीसगढ़ 492003, भारत
Lat 21.313438° Long 81.614486°
13/05/2025 05:23 PM GMT +05:30
Google

GREEN BELT DEVELOPMENT PHOTOGRAPHS
OUTSIDE PLANT PREMISES
LOCATION: GOVERNMENT LAND AT URKURA SITE
ALLOTED BY NAGAR PALIK NIGAM BIRGAOV

कार्यालय नगर पालिक निगम, बीरगांव जिला-रायपुर (छ.ग.)

Email Id: birgaonmcp@gmail.com http://www.nagarnigambirgaon.com

कं./ 4972 /न.पा.नि./सी.एस.आर./वृक्षा.–2024–25 बीरगांव,दिनांक 28/01/2025

//प्रमाण–पत्र//

प्रमाणित किया जाता है कि **हीरा फेरो एलॉयस लिमिटेड, उरला इण्डस्ट्रियल काम्प्लेक्स, उरला रायपुर** द्वारा मान. एन.जी.टी. के आदेश के परिपालन में पर्यावरण संरक्षण–संवर्धन एवं हरियर छत्तीसगढ़ हेतु CSR मद से नगर पालिक निगम बीरगांव क्षेत्रान्तर्गत **मौजा उरकुरा** प.ह.नं. 40 खसरा नं. 341/1 एवं 341/2 का भाग लगभग 4.00 एकड़ क्षेत्र में वृक्षारोपण कार्य पूर्ण कर समुचित संधारण किया जा रहा है। कार्य संतोषप्रद है।

पर्यावरण संरक्षण–संवर्धन हेतु कंपनी के उक्त कार्य की सराहना करते हुये हम कंपनी के उज्जवल भविष्य की कामना करते हैं। आशा है आगे भी पर्यावरण संरक्षण–संवर्धन की दिशा में कार्य करते रहेंगे।

आयुक्त
नगर पालिक निगम बीरगांव
जिला–रायपुर (छ.ग.)

प्रति,

प्रबंध संचालक
हीरा फेरो एलॉयस लिमिटेड
उरला इण्डस्ट्रियल काम्प्लेक्स
उरला, रायपुर (छ.ग.)


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Lat 21.315015° Long 81.660317°
13/05/2025 01:35 PM GMT +05:30

ARIF ALI

Consultant Environment and Forest
K-6 Anupam Nagar Raipur Chhattisgarh (492001)

CERTIFICATE

This is to certify that M/s Hira Ferro Alloys Ltd (Unit – I). Located at Plot No. 567/B, 568, 553/B, Urla Industrial Area, Urla, Distt - Raipur (C.G.) has established its factory over an area of 0.98513 hectares (2.434 acres). As per the environmental guidelines, the company has developed green belt within the plant premises, covering an area of around 0.3028 acres (0.12245 hectares) in which around 300 numbers of trees has been planted. In addition to this 1000 numbers of trees has been planted at Urkura site on Government Land which is allotted by Nagar Palik Nigam Birgoav.. Thus around 1300 numbers of plants including inside and outside plantation have been planted, which is covering around 40% of the factory land area, with a plantation density of 1,020 trees per acre.

The green belt developed by the management is found to be satisfactory and is in compliance with the applicable environmental parameters.

07.06.2025

Place: Raipur (C.G.)

Arif Ali
Retd. DY. C.F. (SFS)
Consultant Env. & Forest
Raipur (C.G.)

Annexure VII: LCA Report

Life Cycle Impact Assessment Report

Expansion of Ferro Alloys Production Unit (Unit I)

at Urla Industrial Area, Chhattisgarh

ECO-ORBIT

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1 EXECUTIVE SUMMARY

This study was undertaken to assess the life cycle impact of Ferro Alloys production within the manufacturing process, analysing its environmental and resource implications from cradle to gate.

Environmental assessments for the production of Si-Mn, Fe-Mn, Fe-Si and Pig Iron using Ferro Melt Induction Furnaces typically focus on plant uptake and emissions. However, incorporating Life-Cycle Assessment (LCA) provides a more thorough evaluation by also considering the impacts throughout the production process. Therefore, utilizing LCA in product development, alongside traditional methods, is recommended for a more comprehensive assessment.

The results of the life cycle assessment for producing 1 ton of each product at the proposed expansion of the Ferro Alloys Production Unit (Unit I) of M/s Hira Ferro Alloys Limited, situated in Urla Industrial Area, Accholi Village, Raipur Tehsil, and District, Chhattisgarh, are detailed in the following chapters.

2 Introduction

In the production of Si-Mn, Fe-Mn, Fe-Si and Pig Iron, we have analysed both overall unit emissions and per-product emissions and evaluated the total emissions associated with production. The impacts of these emissions are discussed in the following study.

LCA Framework:

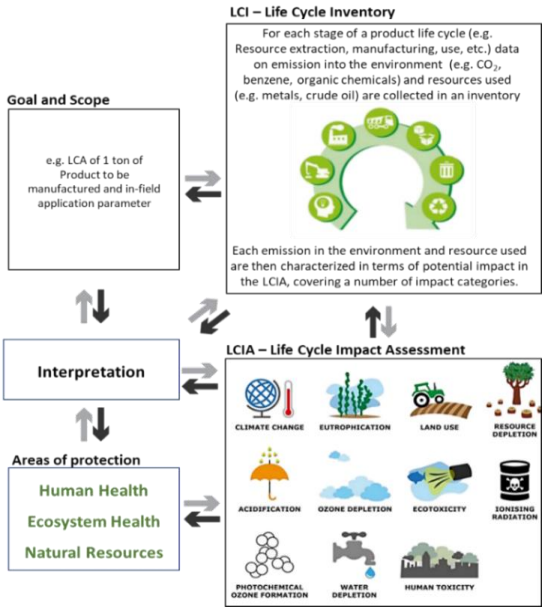
Goal and Scope definition is the LCA phase in which the aim of the study, and in relation to that, the breadth and depth of the study is established as per ISO 14044. It is the first phase of an LCA. The goal of the study includes the purpose of the study. The scope of the study includes function, functional unit, and reference flow, initial choices (system boundaries, data categories, inputs and outputs, data quality, critical review), critical review and other procedural aspects.

Life Cycle Assessment (LCA) is a step-by-step process for computing the lifetime environmental impact of a product or service. The complete process of LCA includes goal and scope definition, inventory analysis, impact assessment, and interpretation. The process is naturally iterative as the quality and extensiveness of data and its credibility is constantly being verified.

Life Cycle Inventory (LCI), which is the data collection portion of LCA. LCI is the straight-forward accounting of everything involved in the "system" of interest. It consists of detailed tracking of all the flows in and out of the product system, including raw resources or materials, energy by type, water, and emissions to air, water and land by specific substance. This kind of analysis can be extremely complex and may involve dozens of individual unit processes in a supply chain (e.g., the extraction of raw resources, various primary and secondary production processes, transportation, etc.) as well as hundreds of tracked substances.

Life Cycle Impact Assessment (LCIA). In LCIA, the inventory is analysed for environmental impact. For example, manufacturing a product may consume a known volume of natural gas (this data is part of the inventory); in the LCIA phase, the global warming impact from combustion of that fuel is calculated. There are various methods globally for categorizing and characterizing the life cycle impact of the flows to and from the environment, which can somewhat complicate the comparability of different LCA studies.

Figure 2-1 Life Cycle Assessment steps: goal and scope definition, life cycle inventory, life cycle impact assessment and interpretation



3 Methodology

This study was carried out to assess the life cycle impact of the 4 products to be manufactured at the facility.

1. Si-Mn
2. Fe-Mn
3. Fe-Si
4. Pig Iron

3.1 Software and Database Details

To evaluate the entire synthesis holistically, detailed foreground data and background data are necessary. In Figure, 3.1 the system boundary is shown schematically. Data regarding the production process and mass balance steps were obtained. All processes were modelled by considering the Ecoinvent version 3.10 database on SimaPro Software. In cases where no database was available reference published literature was used to create the reference flows and processes. Life cycle impact assessment (LCIA) was conducted by applying the LCIA methodology CML IA Baseline World 2000 for characterizing human toxicological and ecotoxicological impacts of emissions.

The inventory database comprises of input and output flows from different product systems including material, resources, energy and emission flows. The input inventory is based on the manufacturing data provided by the proponent and the LCA database available. The inventory was classified into the following groups: input materials, waste material and products & by products.

3.2 Goal and scope

The goal of this LCA study is to study the impacts of the production impact of 4 products for the proposed establishment of M/s Hira Ferro Alloys Limited.

3.3 Functional Unit

A functional unit describes a quantity of a product or product system on the basis of the performance it delivers in its end-use application. Functional units are foundational to LCA, as they enable objective comparisons across different products or systems that serve the same final function. For comparing the impact of products, a constant parameter is required for both materials, i.e. to achieve apple to apple comparison. The functional unit set was the production of 1 Ton of the product.

3.4 System boundary

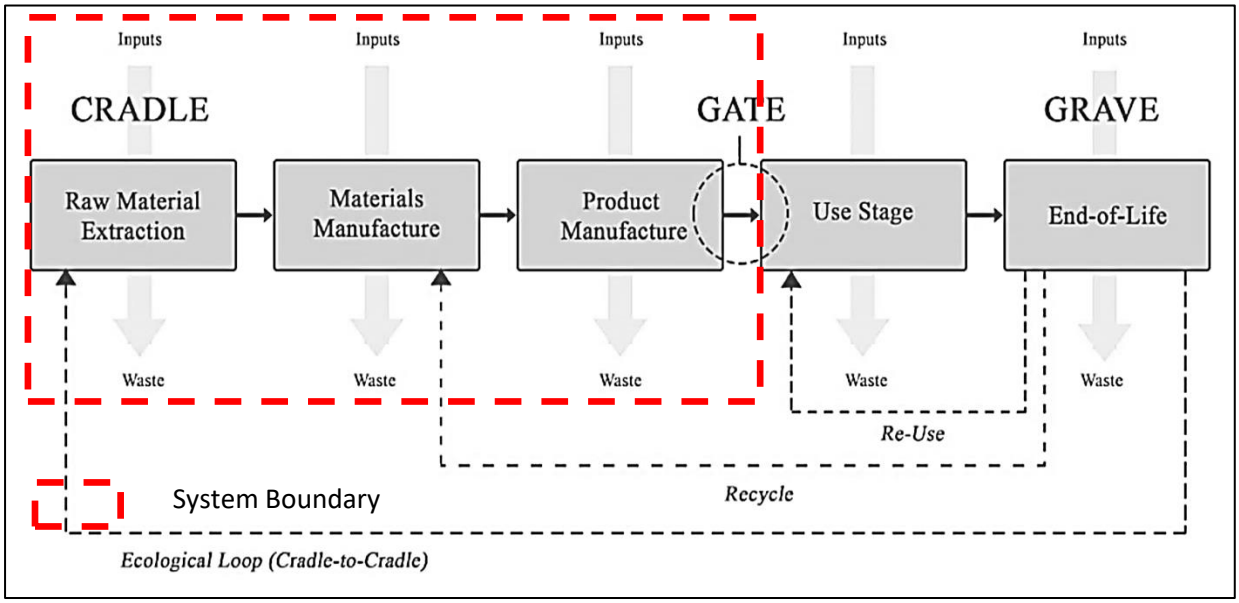
The LCA study included impact of the processes included in the life cycle of a product. This study was carried out from ‘cradle to gate’ that included the extraction and procurement of raw materials required for the production of chemicals, transportation of these raw materials to the production site, and manufacturing of the chemicals and its packaging and other secondary impacts of the distribution of the chemicals to different locations and end use of the product.

Figure 2-1 shows all the processes that are included while performing LCA. The waste generated after the use of pesticides is not considered under the scope of the present study. All the raw materials and chemicals required in the production and the energy consumption at all stages in the product's life cycle is considered while calculating its impact on the environment.

The system boundary definition is necessary in order to outline the processes which will be involved in, or omitted from the entire analysis. Depending on the start point and endpoint of the system boundary it will be defined as either of the following: cradle to grave, cradle to gate, gate to gate, gate to grave etc. Following Figure 3-1 illustrates the system boundary types.

For this study, a cradle-to-gate approach is followed, for the products which includes the environmental aspects and potential impacts throughout a product's life cycle from raw materials transportation, energy production chain, natural resources use and waste generation, production of the product, process wastes. The end use of the product also considered

Figure 3-1: System Boundaries in LCA



3.5 Life Cycle Inventory

Life Cycle Inventory (LCI) analysis involves creating an inventory of flows from and to nature (ecosphere) for a product system. It is the process of quantifying raw material and energy requirements, atmospheric emissions, land emissions, water emissions, resource uses, and other releases over the life cycle of a product or process. In other words, it is the aggregation of all elementary flows related to each unit process within a product system.

To develop the inventory, it is often recommended to start with a flow model of the technical system using data on inputs and outputs of the product system. The flow model is typically illustrated with a flow diagram that includes the activities that are going to be assessed in the relevant supply chain and gives a clear picture of the technical system boundaries. Generally, the more detailed and complex the flow diagram, the more accurate the study and results. The input and output data needed for the construction of the model is collected for all activities within the system boundary, including from the supply chain (referred to as inputs from the techno sphere).

3.6 Life cycle Impact Analysis

Life Cycle Inventory analysis is followed by life cycle impact assessment (LCIA). This phase of LCA is aimed at evaluating the potential environmental and human health impacts resulting from the elementary flows determined in the LCI. The ISO 14040 and 14044 standards require the following mandatory steps for completing an LCIA:

The Mandatory steps are selection, classification and characterization.

Selection includes choice of impact categories, category indicators, and characterization models. The impacts should be relevant to the geographical region of the study and justification for each chosen impact should be discussed. Often times in practice, this is completed by choosing an already existing LCIA method (e.g. CML-IA which is used for this study. It is an LCA methodology developed by the Center of Environmental Science (CML) of Leiden University in The Netherlands. In classification of inventory results, the LCI results are assigned to the chosen impact categories based on their known environmental effects. In practice, this is often completed using LCI databases or LCA software. Common impact categories include Global Warming, Ozone Depletion, Acidification, Human Toxicity, etc.

Characterization, which quantitatively transforms the LCI results within each impact category via "characterization factors" (also referred to as equivalency factors) to create "impact category indicators." In other words, this step is aimed at answering "how much does each result contribute to the impact category?" A main purpose of this step is to convert all classified flows for an impact into common units for comparison. For example, for Global Warming Potential, the unit is generally defined as CO_2-equiv or CO_2-e (CO_2 equivalents) where CO_2 is given a value of 1 and all other units are converted respective to their related impact.

Table 3-1: Impact categories and category indicators

Indicators	Impact Category	Unit	Description
Midpoint Indicators	Global warming potential (GWP 100a)	kg CO_2eq	Indicator of potential global warming due to emissions of greenhouse gases to air.
	Terrestrial ecotoxicity	Kg 1,4-DBeq	Impact on land-dependent organisms and their environment
	Human Toxicity	kg 1,4-DBeq	Impact on humans of toxic substances emitted to the environment. Divided into non-cancer and cancer related toxic substances.
	Fresh water aquatic ecotoxicity	kg 1,4-DBeq	Impact on freshwater organisms of toxic substances emitted to the environment.
	Acidification	kg SO_2eq	Indicator of the potential acidification of soils and water due to the release of gases such as nitrogen oxides and sulphur oxides
	Eutrophication	kg PO_4^{3-}eq	Indicator of the enrichment of the fresh water ecosystem with nutritional elements, due to the emission of nitrogen or phosphor containing compounds

3.7 Interpretation

Life cycle interpretation is a systematic technique to identify, quantify, check, and evaluate information from the results of the life cycle inventory and/or the life cycle impact assessment. The results from the inventory analysis and impact assessment are summarized during the interpretation phase. The outcome of the interpretation phase is a set of conclusions and recommendations for the study.

A key purpose of performing life cycle interpretation is to determine the level of confidence in the final results and communicate them in a fair, complete, and accurate manner. Interpretation begins with understanding the accuracy of the results, and ensuring they meet the goal of the study. This is accomplished by identifying the data elements that contribute significantly to each impact category, evaluating the sensitivity of these significant data elements, assessing the completeness and consistency of the study, and drawing conclusions and recommendations based on a clear understanding of how the LCA was conducted and the results were developed.

Specifically, the goal of the LCA interpretation phase is to identify the activities that have the most environmental negative impact on land, sea, and air resources. Once the identification is done mitigation measures for the same may be recommended for reduction of these impacts.

4 Project Details

4.1 Project description

M/s Hira Ferro Alloys Limited manufacturing unit has proposed Si-Mn, Fe-Mn, Fe-Si and Pig Iron production at Urla, Chhattisgarh. The total production capacity of the plant will be 18,000 TPA Si-Mn or 29,000 TPA Fe-Mn or 9,000 TPA Fe-Si or 30,000 TPA Pig Iron.

The project will be involved in the production of Si-Mn, Fe-Mn, Fe-Si, Pig Iron. Following is the list of proposed products considered for LCA analysis.

Table 4-1 List of proposed products and production details

Sr. No	Name of Product	Proposed capacity (Ton/ Annum)
1	Si-Mn	18000
2	Fe-Mn	29000
3	Fe-Si	9000
4	Pig Iron	30000

5 LCA and LCIA

5.1 Goal and Scope

5.1.1 Goal

1) To ascertain the emissions and their impacts from the production process of 4 products at the Chhattisgarh Unit of M/s Hira Ferro Alloys Limited to be located at Urla Industrial Area, Chhattisgarh.
2) To assess the reductions achieved due to the different mitigation measures in the midpoint impact categories

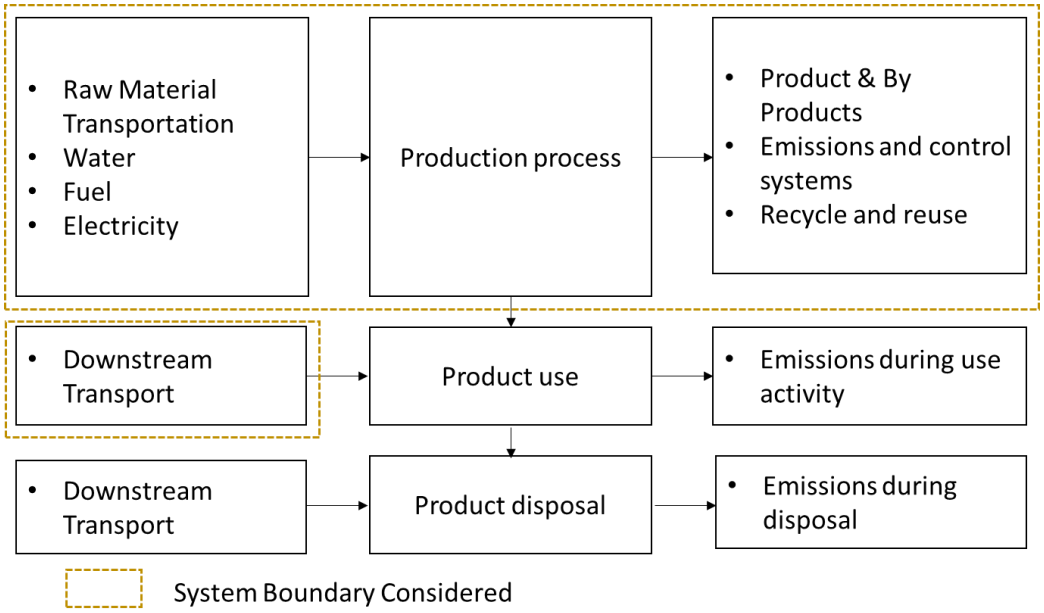
5.1.2 Scope

The function of the system is the production of Ferro Alloys. The functional unit thus is considered as production of 1 ton of product.

5.1.3 System Boundary

This study covers the raw material transportation to the manufacturing site, the production process of the process, downstream transportation of the product, and emissions from end-use. This study excludes the packaging at the user's side and the product packaging disposal after use.

Figure 5-1 System Boundary



5.1.4 Data Assumptions

The preliminary assumptions are based on the stages and impact categories selected as well as general assumptions about the future stages of the life cycle, e.g., disposal routes, types of transport etc. Following are the specific LCA assumptions for this study:

- The primary data regarding the quantity of raw materials, electricity, steam, water requirement quantities and other resource consumption were provided by the client. Most of the background data for the raw materials and resources was available in the Ecoinvent 3.10 database.
- Transport distances for raw materials are based on the data provided in the EIA Report.

- For upstream transportation of raw materials and downstream transportation of the product, a freight lorry with a 7.5 to 16-ton capacity and Euro 6 standards (equivalent to Indian Bharat Stage VI) from the Ecoinvent database is considered for study.
- For hazardous waste transport, a freight lorry with a 3.5 to 7-ton capacity and Euro 6 standards (equivalent to Indian Bharat Stage VI) from the Ecoinvent database is considered for study.
- For downstream transportation of the final product, the road transport distance is considered to be 500 km.
- For hazardous waste transportation, the road transport distance is considered to be 50 km.
- The electricity mix data in the Ecoinvent 3.10 database used in SimaPro 9.6 is country and region-specific for the western Grid of India, which is used for the study.
- The power Consumption (kWh) Per MT of product is considered from the EIA Report
- The Power is purchased from CPP of Unit II. Since Unit 1 & Unit 2 are under the ownership of M/s Hira Ferro Alloys Limited, Urla the emissions of power generation are considered under scope 1
- The power requirement for the existing facility is 4 MW which is being met through Unit II captive power plant and CSPDCL. Therefore, coal and Dolochar is considered as fuel source for electricity in process.
- The coal required for electricity is calculated based on a rate of 1.003 metric tons per megawatt-hour (MT/MWh) of coal and 0.06 metric tons per megawatt-hour (MT/MWh) of Dolochar, assuming that all the required electricity is generated in the captive power plant, as specified in Chapter 2 of the EIA.
- In the SimaPro software for the proposed case, 50% of the electricity is generated from a coal-based Captivce e Power Plant, while 50% is sourced from the electricity grid. For the base case, 100% of the electricity is sourced from the Captive Power Plant
- In emissions to air, the emissions from coal combustion from CPP and the emission from process are considered.
- The packaging material is not considered, as the product is transported in covered trucks.

5.2 Life Cycle Analysis

The life cycle analysis of the 04 products was done using LCIA methodology (CML IA Baseline World 2000). The result of each product is shown below:

5.2.1 Si-Mn

The total production capacity is 18000 ton/Annum.

Table 5-1 Mass Balance of the Product Si-Mn Proposed Case Manufacturing Process

	Mass flow	Input in MT				Output	MT
Mass Flow (Fuel)	Coal	1.91	→	Formation of Product Si-Mn	→	Si-Mn	**1**
	Dolochar	0.01	→		→	CO_2 Coal Combustion (kg)	4679.03
Non-Mass Flow	Electricity from CPP (kWh)	1900	→		→	CH_4(kg)	0.49
	Electricity from CSPDC (kWh)	1900	→		→	N_2O(kg)	0.07
	Transport (upstream) (tkm)	1782.6	→		→	CO_2 Process Emission	0.16
	Transport (downstream) (tkm)	500	→				
	Hazardous (downstream) (tkm)	50	→				

Figure 5-2 Impact categories of life cycle of 1MT of Si-Mn Proposed Case

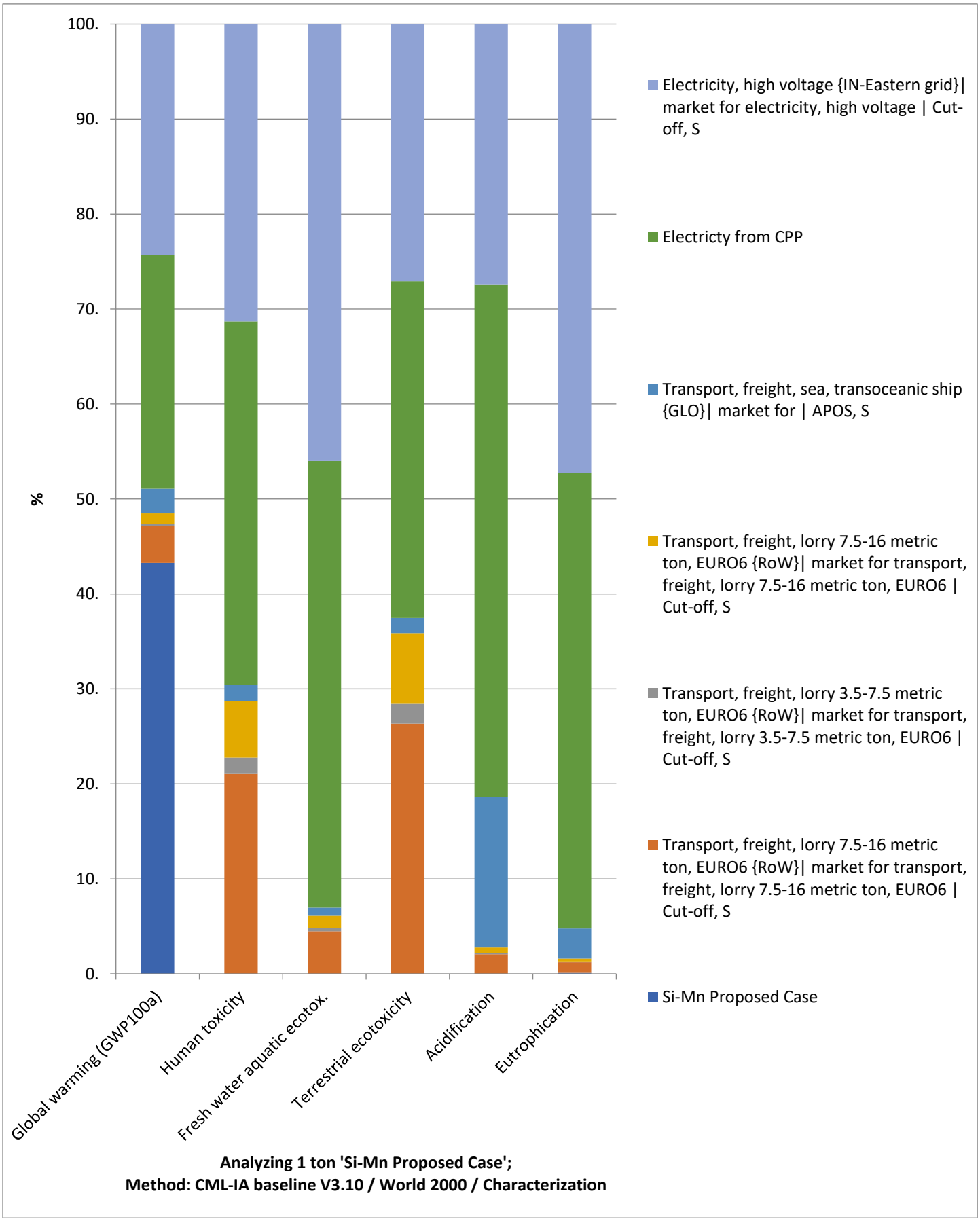


Table 5-2 **LCIA Result of 1 MT of Si-Mn Proposed Case**

Impact category	Global warming potential (GWP 100a)	Human Toxicity	Fresh water aquatic ecotoxicity	Terrestrial ecotoxicity	Acidification	Eutrophication
Unit	**kg CO_2 eq**	**kg 1,4-DB eq**	**kg 1,4-DB eq**	**Kg 1,4-DBeq**	**kg SO_2 eq**	**kg PO_4^{3-}eq**
Si-Mn	4871.30	0.00	0.00	0.00	0.00	0.02
Transport (upstream) (tkm)	435.33	1417.76	174.70	9.19	0.80	0.23
Hazardous (downstream) (tkm)	29.45	116.60	14.42	0.75	0.06	0.02
Transport (downstream) (tkm)	122.11	397.66	49.00	2.58	0.22	0.06
Transport Sea (upstream) (tkm)	293.57	116.00	33.49	0.56	6.15	0.65
Electricity from CPP (kWh)	2772.87	2580.53	1831.71	12.36	20.97	9.77
Electricity from CSPDC (kWh)	2735.02	2109.48	1792.07	9.45	10.64	9.63
Total	**11259.64**	**6738.03**	**3895.40**	**34.88**	**38.84**	**20.37**

Figure 5-3 Carbon footprint Emissions and classifications per for Life Cycle of 1MT Si-Mn Proposed Case

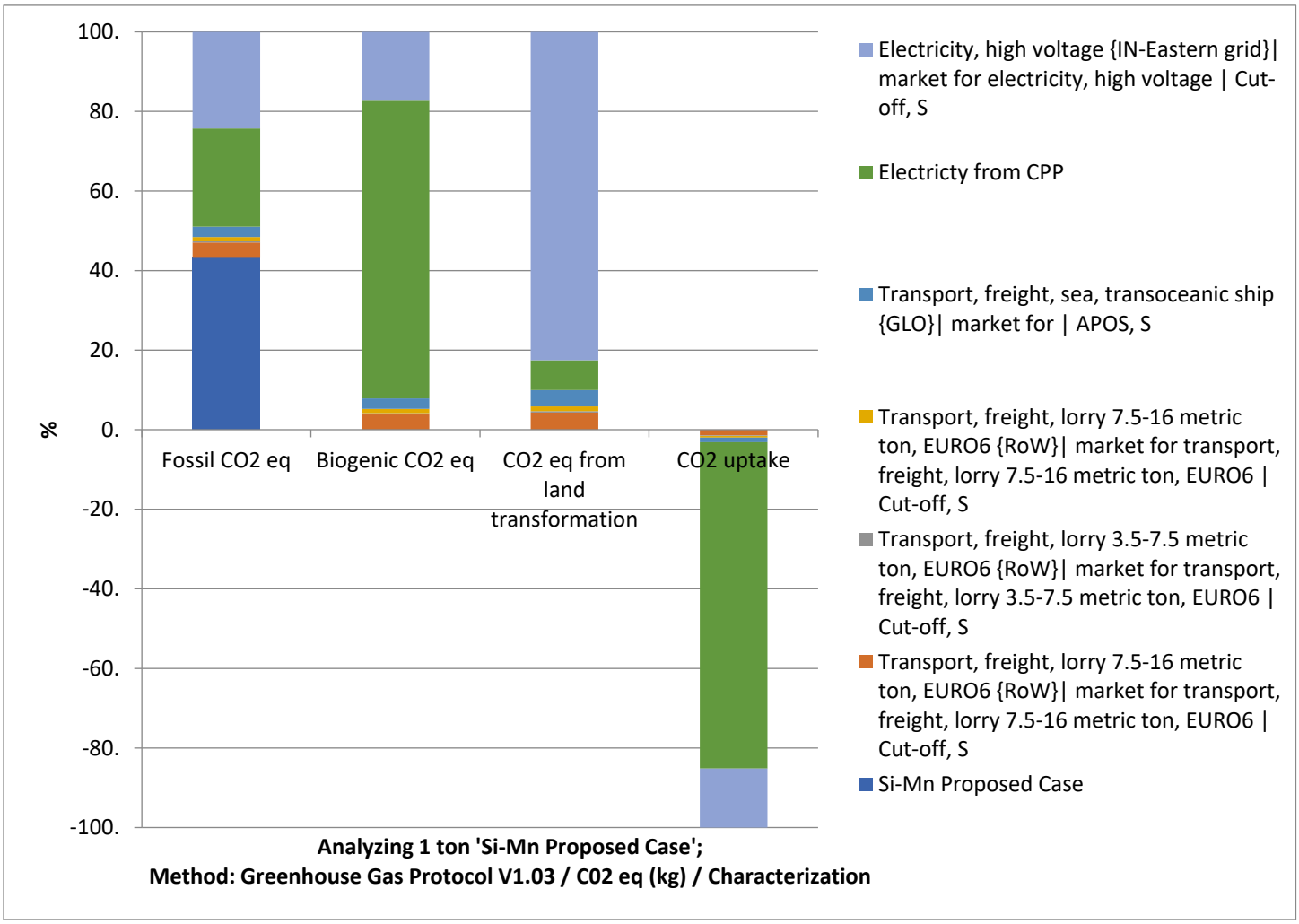


Table 5-3 Scoping of Si-Mn Proposed Case for 1 MT

Scoping	Emissions in $kgCO_2eq$	Percent contribution	Contributing Parameter
Scope 1	4871.30	43%	Coal and dolochar combustion for the generation of electricity
Scope 2	2735.02	24%	Electricity from Grid supply
Scope 3	3653.33	32%	Coal embodied energy and Transportation.
Total	**11259.64**	**100%**	

Interpretation of Results:

The major contributors to the overall GWP are:

1. Coal Combustion: The combustion of coal generates carbon dioxide (CO2), which is the primary greenhouse gas emitted from burning fossil fuels. Additionally, coal burning releases a variety of airborne pollutants, including sulphur dioxide, nitrogen oxides, particulate matter, mercury, lead, and other heavy metals. These pollutants contribute to environmental issues such as acid rain, smog, haze, and global warming. They pose significant risks to human health, potentially causing respiratory issues, asthma, cardiovascular problems, cancer, neurological disorders, and premature death. Moreover, coal combustion can lead to the contamination of water and soil, contribute to the corrosion of pipelines, and disrupt the food chain. The pollutants can leach into water sources and soil, affecting ecosystems and agricultural productivity.

2. Coal and Dolochar Embodied Energy: Coal mining can cause significant damage to land, surface waters, and groundwater, resulting in widespread environmental contamination and habitat destruction. This disruption can adversely affect plants, animals, and human communities by degrading ecosystems and altering natural processes. Additionally, coal mining and combustion produce coal ash, which often contains hazardous contaminants such as mercury, cadmium, and arsenic. If coal ash is not managed properly, these pollutants can leach into waterways, contaminate drinking water and groundwater, and become airborne, posing further risks to both environmental and public health.
3. Electricity from Grid: In 2020, India's electricity generation produced 41.7% more greenhouse gases compared to the global average. This is largely due to the fact that 77% of the country's electricity is derived from fossil fuels. Coal-based power generation alone contributes to 40% of India's total greenhouse gas emissions. The process of power generation, particularly from coal, can release hazardous metals and pollutants into water bodies. For example, coal ash, which is disposed of in millions of tons each year, can contain dangerous contaminants such as mercury, cadmium, and arsenic. Additionally, the construction and upkeep of transmission lines can have detrimental effects on the environment. These activities can lead to the destruction of plant and animal life and disrupt natural habitats.

Figure 5-4 Carbon footprint Emissions and classifications per for Life Cycle of 1MT Si-Mn Base Case

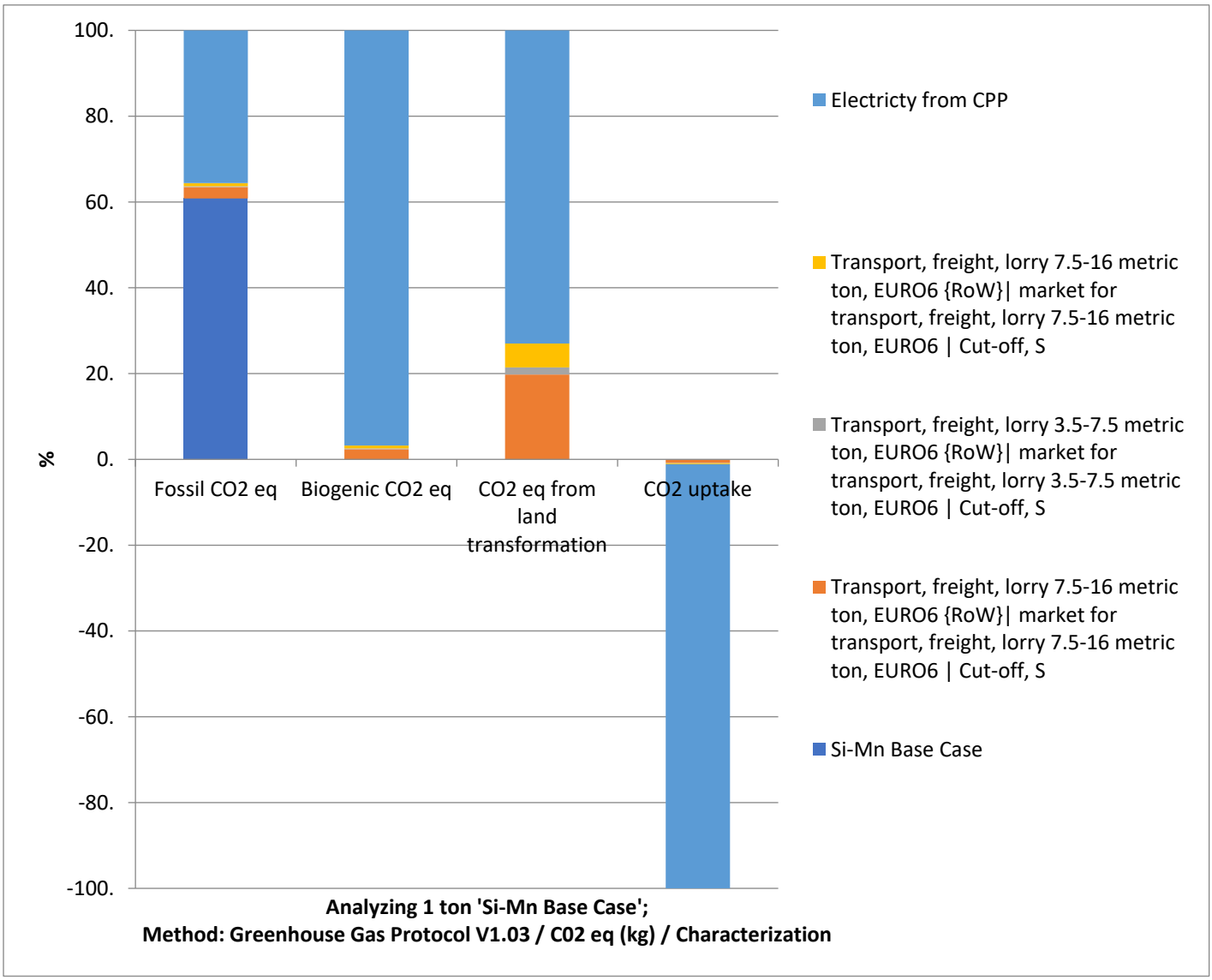


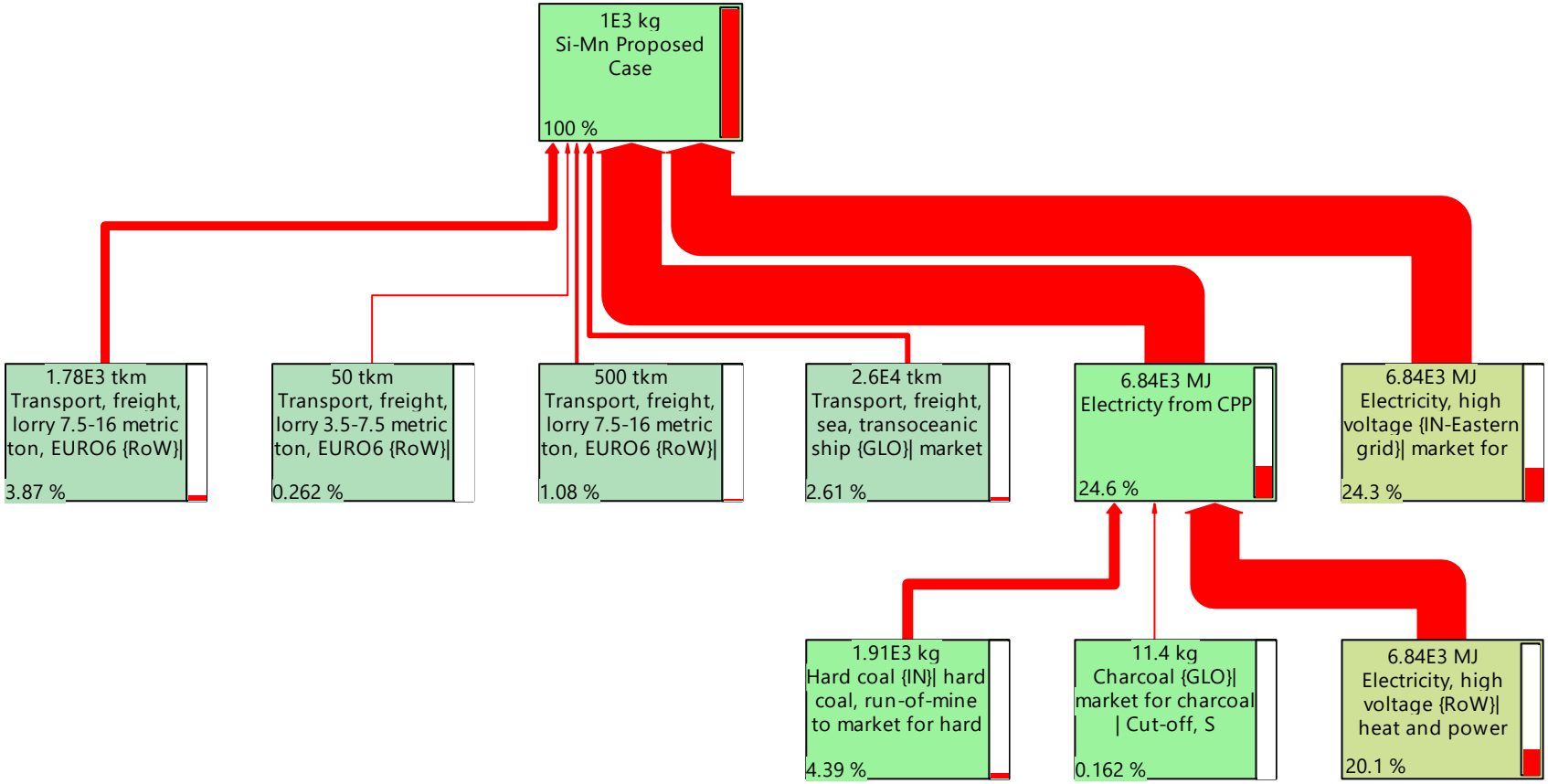
Table 5-4 Scoping of Si-Mn Base Case for 1 MT

Scoping	Emissions in $kgCO_2eq$	Percent contribution	Contributing Parameter
Scope 1	10024.65	61%	Coal and dolochar combustion for the generation of electricity
Scope 2	0.00	0%	Electricity from Grid supply
Scope 3	6323.07	39%	Coal and dolochar embodied energy and Transportation.
Total	**16347.72**	**100%**	

Table 5-5:Product Life Cycle Stagewise Results of Si-Mn Proposed Case

Sr. No.	Life Cycle Stages	Global warming (GWP100 a)	Human toxicity	Freshwater aquatic ecotox.	Terrestrial ecotoxicity	Acidification	Eutrophication
	Unit	**kg CO2 eq**	**kg 1,4-DB eq**	**kg 1,4-DB eq**	**kg 1,4-DB eq**	**kg SO2 eq**	**kg PO_4^{3-}eq**
Raw Material Processing & Raw Material Transport							
1	Raw material– Transport Upstream (Road and Sea)	728.90	1533.75	208.19	9.74	6.95	0.87
2	Coal and Dolochar Embodied Energy	2772.87	2580.53	1831.71	12.36	20.97	9.77
Manufacturing Process							
3	Coal and Dolochar combustion for the generation of electricity & Process Emission	4871.30	0.00	0.00	0.00	0.00	0.02
4	Electricity	2735.02	2109.48	1792.07	9.45	10.64	9.63
Downstream Transportation							
5	Product - Downstream Transportation by Road	122.11	397.66	49.00	2.58	0.22	0.06
6	Hazardous Waste Transportation by Road	29.45	116.60	14.42	0.75	0.06	0.02

Figure 5-5 Process Flow for Si-Mn in SimaPro



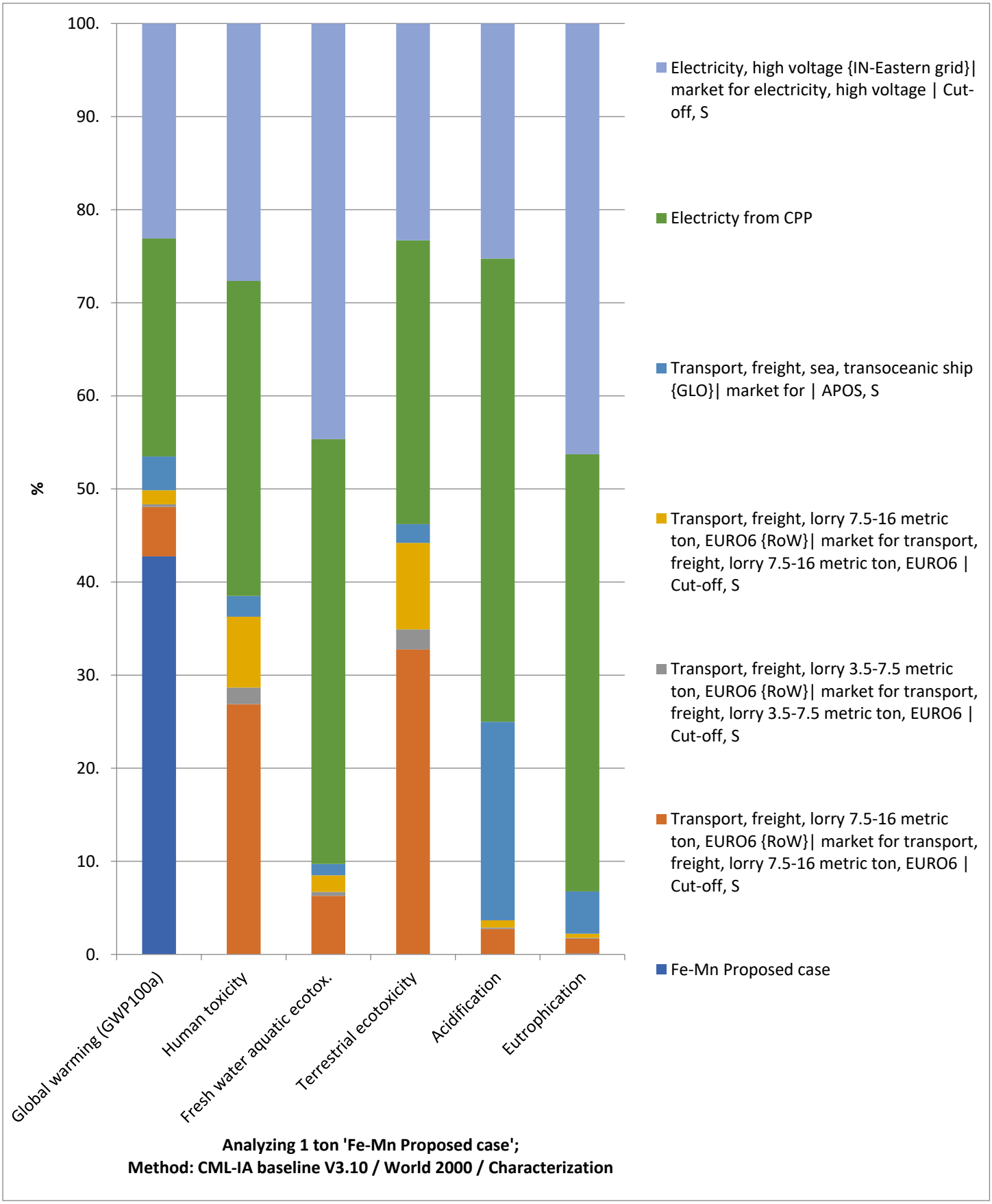
5.2.2 Fe-Mn

The total production capacity is 29000 ton/Annum.

Table 5-6:Mass Balance of the Fe-Mn Proposed Case Manufacturing Process

	Mass flow	Input in MT				Output	MT
Mass Flow (Fuel)	Coal	1.30	→	Formation of Product Fe-Mn	→	Fe-Mn	**1**
	Dolochar	0.01	→		→	CO_2 Coal Combustion (kg)	3201.44
Non-Mass Flow	Electricity from CPP (kWh)	1300	→		→	CH_4(kg)	0.34
	Electricity from CSPDC (kWh)	1300	→		→	N_2O(kg)	0.05
	Transport (upstream) (tkm)	1763.1	→		→	CO_2 Process Emission	0.24
	Transport (downstream) (tkm)	500	→				
	Hazardous (downstream) (tkm)	40	→				
	Transport (Sea) (downstream) (tkm)	26,006.7	→				

Figure 5-6 Impact categories of life cycle of 1MT of Fe-Mn Proposed Case



Analyzing 1 ton 'Fe-Mn Proposed case';
Method: CML-IA baseline V3.10 / World 2000 / Characterization

Table 5-7 LCIA Result of 1 MT of Fe-Mn Proposed Case

Impact category	Global warming potential (GWP 100a)	Human Toxicity	Fresh water aquatic ecotoxicity	Terrestrial ecotoxicity	Acidification	Eutrophication
Unit	**kg CO_2 eq**	**kg 1,4-DB eq**	**kg 1,4-DB eq**	**Kg 1,4-DBeq**	**kg SO_2 eq**	**kg PO_4^{3-}eq**
Fe-Mn	3464.21	0.00	0.00	0.00	0.00	0.01
Transport (upstream) (tkm)	430.57	1402.25	172.79	9.09	0.79	0.23
Hazardous (downstream) (tkm)	23.56	93.28	11.53	0.60	0.05	0.01
Transport (downstream) (tkm)	122.11	397.66	49.00	2.58	0.22	0.06
Transport Sea (upstream) (tkm)	293.57	116.00	33.49	0.56	6.15	0.65
Electricity from CPP (kWh)	1897.22	1765.63	1253.28	8.46	14.35	6.68
Electricity from CSPDC (kWh)	1871.33	1443.33	1226.16	6.46	7.28	6.59
Total	**8102.57**	**5218.15**	**2746.25**	**27.74**	**28.84**	**14.23**

Figure 5-7 Carbon footprint Emissions and classifications per for Life Cycle of 1MT Fe-Mn Proposed Case

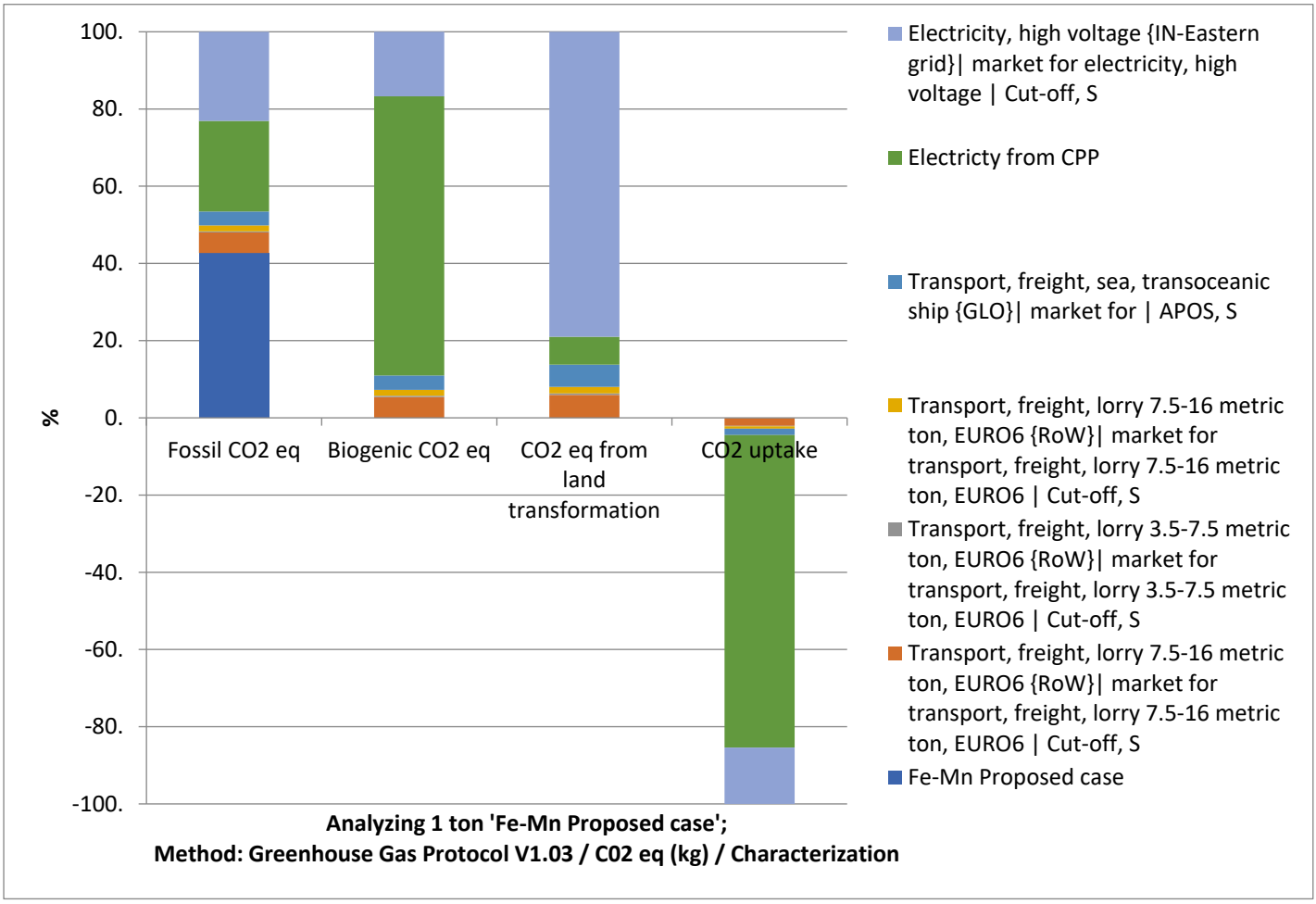


Table 5-8 Scoping of Fe-Mn Proposed Case for 1 MT

Scoping	Emissions in $kgCO_2eq$	Percent contribution	Contributing Parameter
Scope 1	3464.21	43%	Coal and Dolochar combustion for the generation of electricity
Scope 2	1871.33	23%	Electricity from Grid Supply
Scope 3	2767.03	34%	coal embodied energy, transportation
Total	**8102.57**	**100%**	

Interpretation of Results:

The major contributors to the overall GWP are:

1. Coal Combustion: The combustion of coal generates carbon dioxide (CO2), which is the primary greenhouse gas emitted from burning fossil fuels. Additionally, coal burning releases a variety of airborne pollutants, including sulphur dioxide, nitrogen oxides, particulate matter, mercury, lead, and other heavy metals. These pollutants contribute to environmental issues such as acid rain, smog, haze, and global warming. They pose significant risks to human health, potentially causing respiratory issues, asthma, cardiovascular problems, cancer, neurological disorders, and premature death. Moreover, coal combustion can lead to the contamination of water and soil, contribute to the corrosion of pipelines, and disrupt the food chain. The pollutants can leach into water sources and soil, affecting ecosystems and agricultural productivity.

2. Coal and Dolochar Embodied Energy: Coal mining can cause significant damage to land, surface waters, and groundwater, resulting in widespread environmental contamination and habitat destruction. This disruption can adversely affect plants, animals, and human communities by degrading ecosystems and altering natural processes. Additionally, coal mining and combustion produce coal ash, which often contains hazardous contaminants such as mercury, cadmium, and arsenic. If coal ash is not managed properly, these pollutants can leach into waterways, contaminate drinking water and groundwater, and become airborne, posing further risks to both environmental and public health.
3. Electricity from Grid: In 2020, India's electricity generation produced 41.7% more greenhouse gases compared to the global average. This is largely due to the fact that 77% of the country's electricity is derived from fossil fuels. Coal-based power generation alone contributes to 40% of India's total greenhouse gas emissions. The process of power generation, particularly from coal, can release hazardous metals and pollutants into water bodies. For example, coal ash, which is disposed of in millions of tons each year, can contain dangerous contaminants such as mercury, cadmium, and arsenic. Additionally, the construction and upkeep of transmission lines can have detrimental effects on the environment. These activities can lead to the destruction of plant and animal life and disrupt natural habitats.

Figure 5-8 Carbon footprint Emissions and classifications per for Life Cycle of 1MT Fe-Mn Base Case

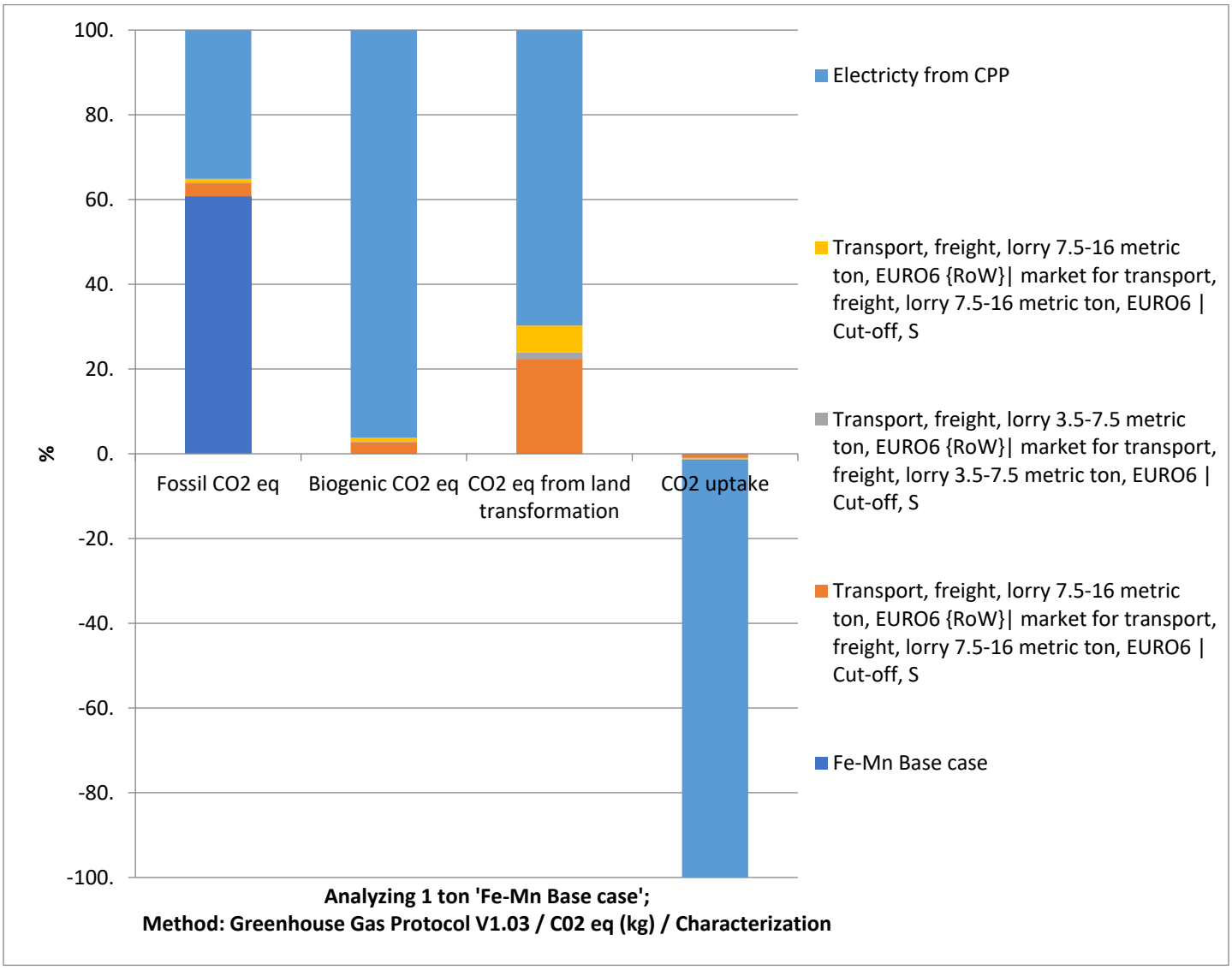


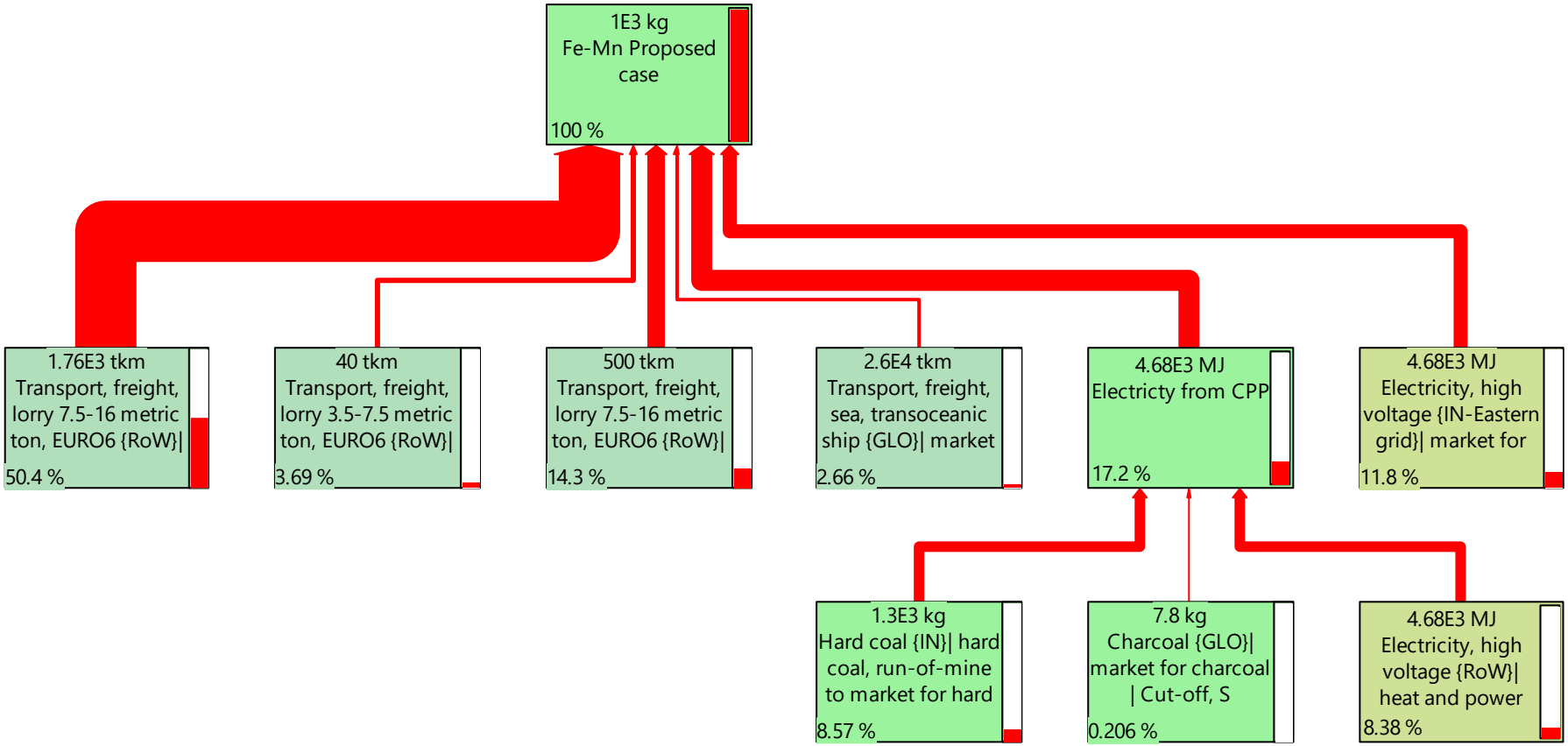
Table 5-9 Scoping of Fe-Mn *Base Case* for 1 MT

Scoping	Emissions in $kgCO_2eq$	Percent contribution	Contributing Parameter
Scope 1	8469.78	61%	Coal and Dolochar combustion for the generation of electricity
Scope 2	0.00	0%	Electricity from Grid Supply
Scope 3	5362.41	39%	coal and Dolochar embodied energy, transportation
Total	**13832.19**	**100%**	

Table 5-10:Product Life Cycle Stage Wise Results of Fe-Mn Proposed Case

Sr. No.	Life Cycle Stages	Global warming (GWP100a)	Human toxicity	Freshwater aquatic ecotox.	Terrestrial ecotoxicity	Acidification	Eutrophication
	Unit	**kg CO2 eq**	**kg 1,4-DB eq**	**kg 1,4-DB eq**	**kg 1,4-DB eq**	**kg SO2 eq**	**kg PO_4^{3-}eq**
Raw Material Processing & Raw Material Transport							
1	Raw material– Transport Upstream (Road and Sea)	724.14	1518.25	206.28	9.64	6.94	0.87
2	Coal and Dolochar Embodied Energy	1897.22	1765.63	1253.28	8.46	14.35	6.68
Manufacturing Process							
3	Coal and Dolochar combustion for the generation of electricity & Process Emission	3464.21	0.00	0.00	0.00	0.00	0.01
4	Electricity from Supply Grid	1871.33	1443.33	1226.16	6.46	7.28	6.59
Downstream Transportation							
5	Product - Downstream Transportation by Road	122.11	397.66	49.00	2.58	0.22	0.06
6	Hazardous Waste Transportation by Road	23.56	93.28	11.53	0.60	0.05	0.01

Figure 5-9 Process Flow for Fe-Mn in SimaPro



5.2.3 Fe-Si

The total production capacity is 9000 ton/Annum.

Table 5-11 Mass Balance of the Product Fe-Si Manufacturing Process

	Mass flow	Input in MT				Output	MT
Mass Flow (Fuel)	Coal	4.01	→	Formation of Product Fe-Si	→	Fe-Si	**1**
	Dolochar	0.02	→		→	CO_2 Coal Combustion (kg)	9850.58
Non-Mass Flow	Electricity from CPP (kWh)	4000	→		→	CH_4(kg)	1.04
	Electricity from CSPDC (kWh)	4000	→		→	N_2O(kg)	0.16
	Transport (upstream) (tkm)	167.4	→		→	CO_2 Process Emission	0.06
	Transport (downstream) (tkm)	500	→				
	Hazardous (downstream) (tkm)	6.25	→				

Figure 5-10 Impact categories of life cycle of 1MT of Fe-Si

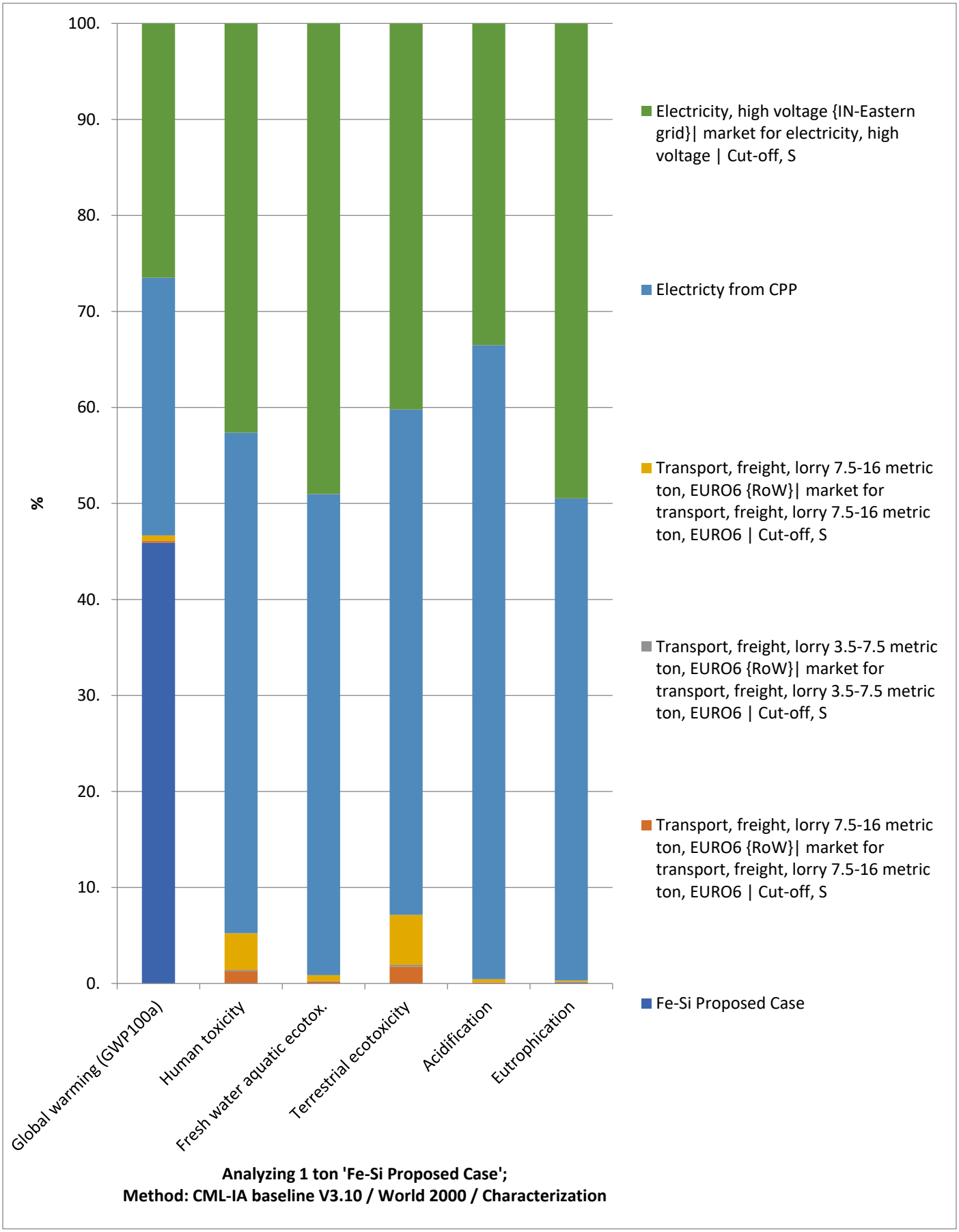


Table 5-12 LCIA Result of 1 MT of Product Fe-Si

Impact category	Global warming potential (GWP 100a)	Human Toxicity	Fresh water aquatic ecotoxicity	Terrestrial ecotoxicity	Acidification	Eutrophication
Unit	**kg CO_2 eq**	**kg 1,4-DB eq**	**kg 1,4-DB eq**	**Kg 1,4-DBeq**	**kg SO_2 eq**	**kg PO_4^{3-}eq**
Fe-Si	9982.10	0.00	0.00	0.00	0.00	0.04
Transport (upstream) (tkm)	40.88	133.14	16.41	0.86	0.07	0.02
Hazardous (downstream) (tkm)	3.68	14.58	1.80	0.09	0.01	0.00
Transport (downstream) (tkm)	122.11	397.66	49.00	2.58	0.22	0.06
Electricity from CPP (kWh)	5837.62	5432.71	3856.23	26.03	44.15	20.57
Electricity from CSPDC (kWh)	5757.93	4441.00	3772.79	19.89	22.40	20.27
Total	**21744.31**	**10419.09**	**7696.23**	**49.45**	**66.86**	**40.97**

Figure 5-11 Carbon footprint Emissions and classifications per for Life Cycle of 1MT of Fe-Si

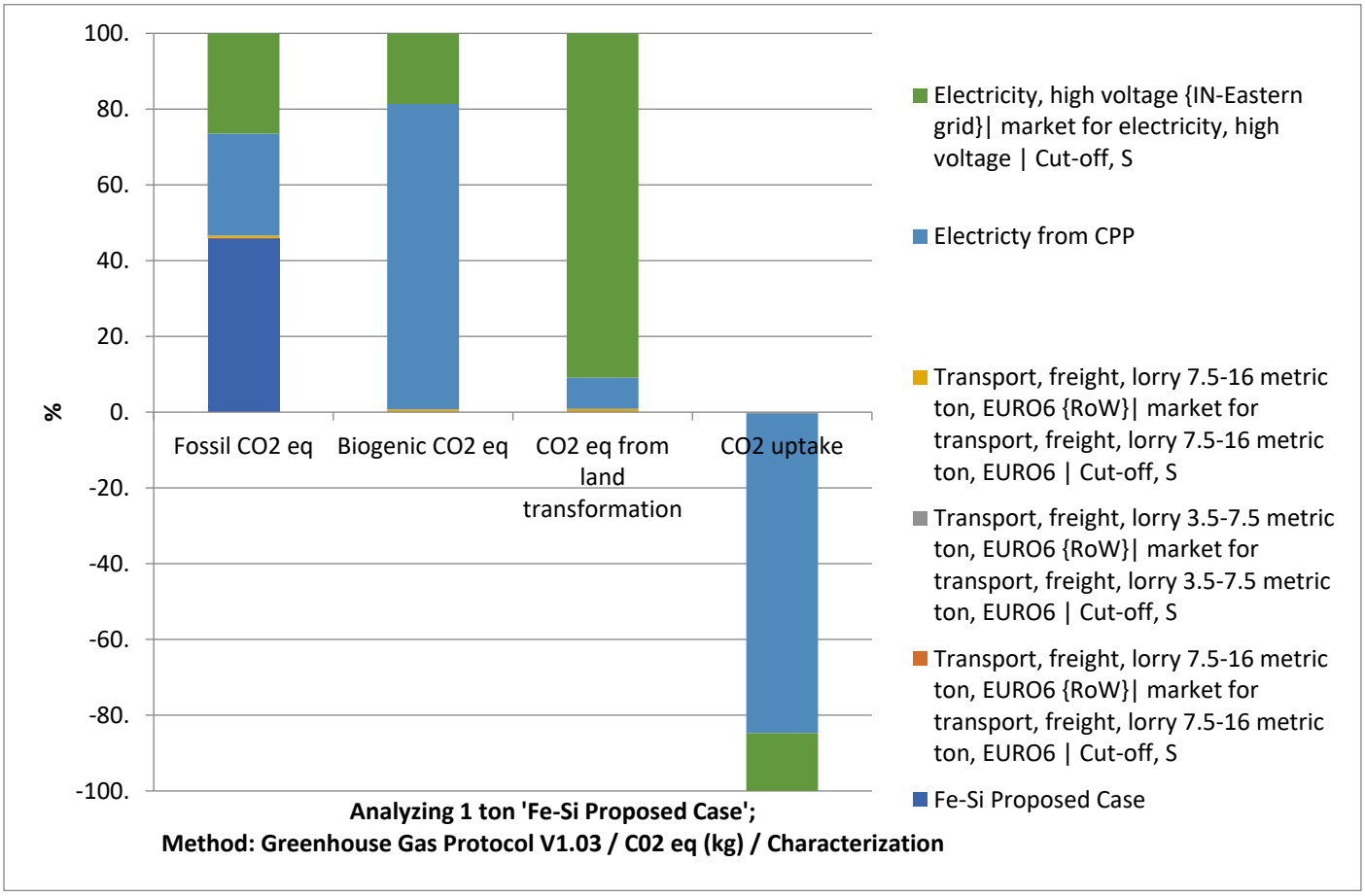


Table 5-13 Scoping of Fe-Si for 1 MT

Scoping	Emissions in $kgCO_2eq$	Percent contribution (%)	Contributing Parameter
Scope 1	9982.10	46%	Coal and Dolochar combustion for the generation of electricity
Scope 2	5757.93	26%	Electricity from supply grid
Scope 3	6004.28	28%	coal embodied energy, transportation
Total	**21744.31**	**100%**	

Interpretation of Results:

The major contributors to the overall GWP are:

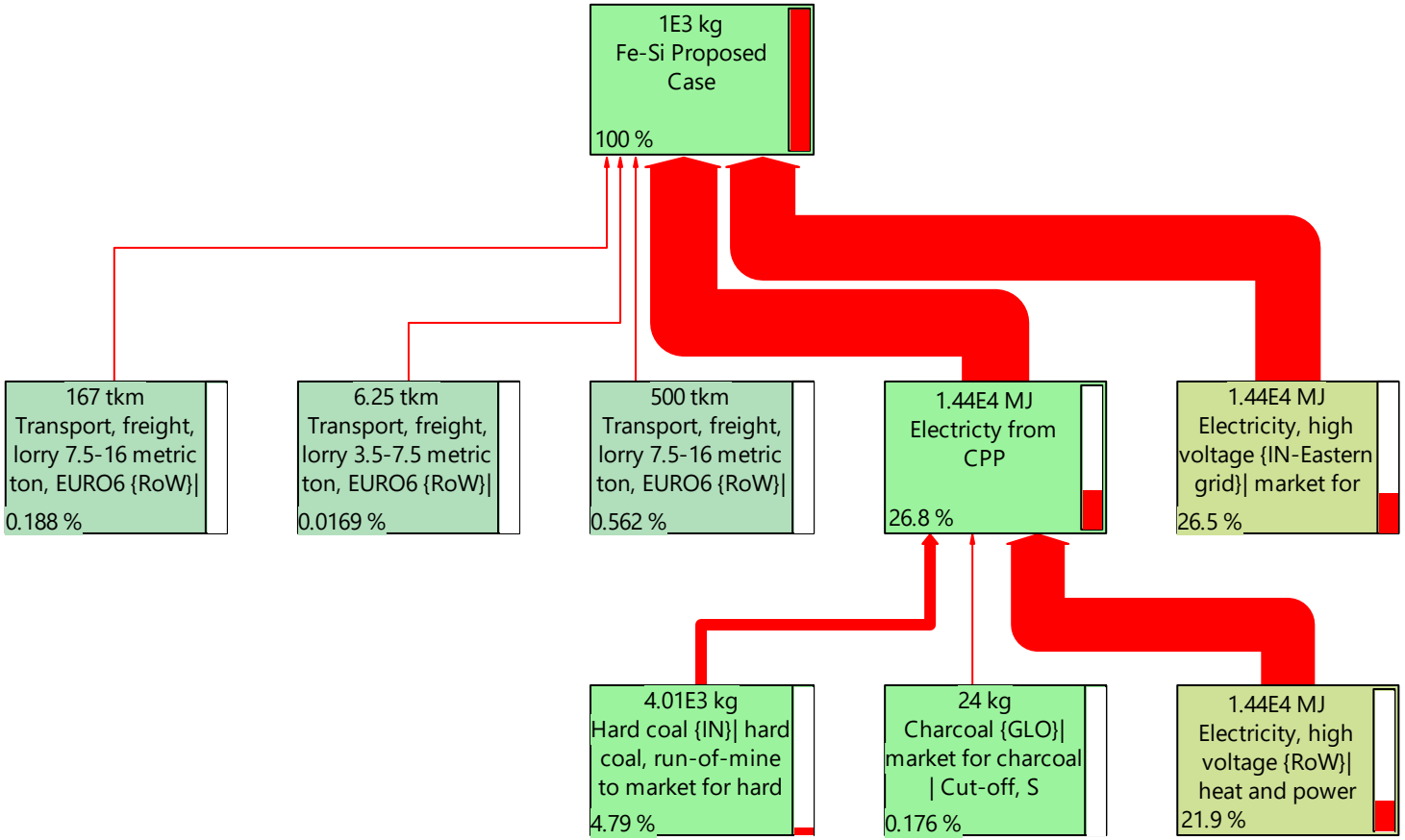
1. Coal Combustion: The combustion of coal generates carbon dioxide (CO2), which is the primary greenhouse gas emitted from burning fossil fuels. Additionally, coal burning releases a variety of airborne pollutants, including sulfur dioxide, nitrogen oxides, particulate matter, mercury, lead, and other heavy metals. These pollutants contribute to environmental issues such as acid rain, smog, haze, and global warming. They pose significant risks to human health, potentially causing respiratory issues, asthma, cardiovascular problems, cancer, neurological disorders, and premature death. Moreover, coal combustion can lead to the contamination of water and soil, contribute to the corrosion of pipelines, and disrupt the food chain. The pollutants can leach into water sources and soil, affecting ecosystems and agricultural productivity.

2. Coal and Dolochar Embodied Energy: Coal mining can cause significant damage to land, surface waters, and groundwater, resulting in widespread environmental contamination and habitat destruction. This disruption can adversely affect plants, animals, and human communities by degrading ecosystems and altering natural processes. Additionally, coal mining and combustion produce coal ash, which often contains hazardous contaminants such as mercury, cadmium, and arsenic. If coal ash is not managed properly, these pollutants can leach into waterways, contaminate drinking water and groundwater, and become airborne, posing further risks to both environmental and public health.
3. Electricity from Grid: In 2020, India's electricity generation produced 41.7% more greenhouse gases compared to the global average. This is largely due to the fact that 77% of the country's electricity is derived from fossil fuels. Coal-based power generation alone contributes to 40% of India's total greenhouse gas emissions. The process of power generation, particularly from coal, can release hazardous metals and pollutants into water bodies. For example, coal ash, which is disposed of in millions of tons each year, can contain dangerous contaminants such as mercury, cadmium, and arsenic. Additionally, the construction and upkeep of transmission lines can have detrimental effects on the environment. These activities can lead to the destruction of plant and animal life and disrupt natural habitats.

Table 5-14: Product Life Cycle Stage Wise Results of Fe-Si

Sr. No.	Life Cycle Stages	Global warming (GWP100a)	Human toxicity	Freshwater aquatic ecotox.	Terrestrial ecotoxicity	Acidification	Eutrophication
	Unit	**kg CO2 eq**	**kg 1,4-DB eq**	**kg 1,4-DB eq**	**kg 1,4-DB eq**	**kg SO2 eq**	**kg PO_4^{3-}eq**
Raw Material Processing & Raw Material Transport							
1	Raw material– Transport Upstream (Road)	40.88	133.14	16.41	0.86	0.07	0.02
2	Coal and Dolochar Embodied Energy	5837.62	5432.71	3856.23	26.03	44.15	20.57
Manufacturing Process							
3	Coal and Dolochar combustion for the generation of electricity & Process Emission	9982.10	0.00	0.00	0.00	0.00	0.04
4	Electricity from Supply Grid	5757.93	4441.00	3772.79	19.89	22.40	20.27
Downstream Transportation							
5	Product - Downstream Transportation by Road	122.11	397.66	49.00	2.58	0.22	0.06
6	Hazardous Waste Transportation by Road	3.68	14.58	1.80	0.09	0.01	0.00

Figure 5-12 Process Flow for Fe-Si in SimaPro



5.2.4 Pig Iron

The total production capacity is 30000 ton/Annum.

Table 5-15 Mass Balance of the Product Pig Iron Manufacturing Process

	Mass flow	Input in MT				Output	MT
Mass Flow	Coal	1.25	→	Formation of Product Pig Iron	→	Pig Iron	**1**
	Dolochar	0.01	→		→	CO_2 Coal Combustion (kg)	3078.31
Non-Mass Flow	Electricity from CPP (kWh)	1250	→		→	CH_4(kg)	0.33
	Electricity from CSPDC (kWh)	1250	→		→	N_2O(kg)	0.05
	Transport (upstream) (tkm)	478.1	→		→	CO_2 Process Emission	0.21
	Transport (downstream) (tkm)	500	→				
	Hazardous (downstream) (tkm)	20	→				

Figure 5-13 Impact categories of life cycle of 1MT of Pig Iron

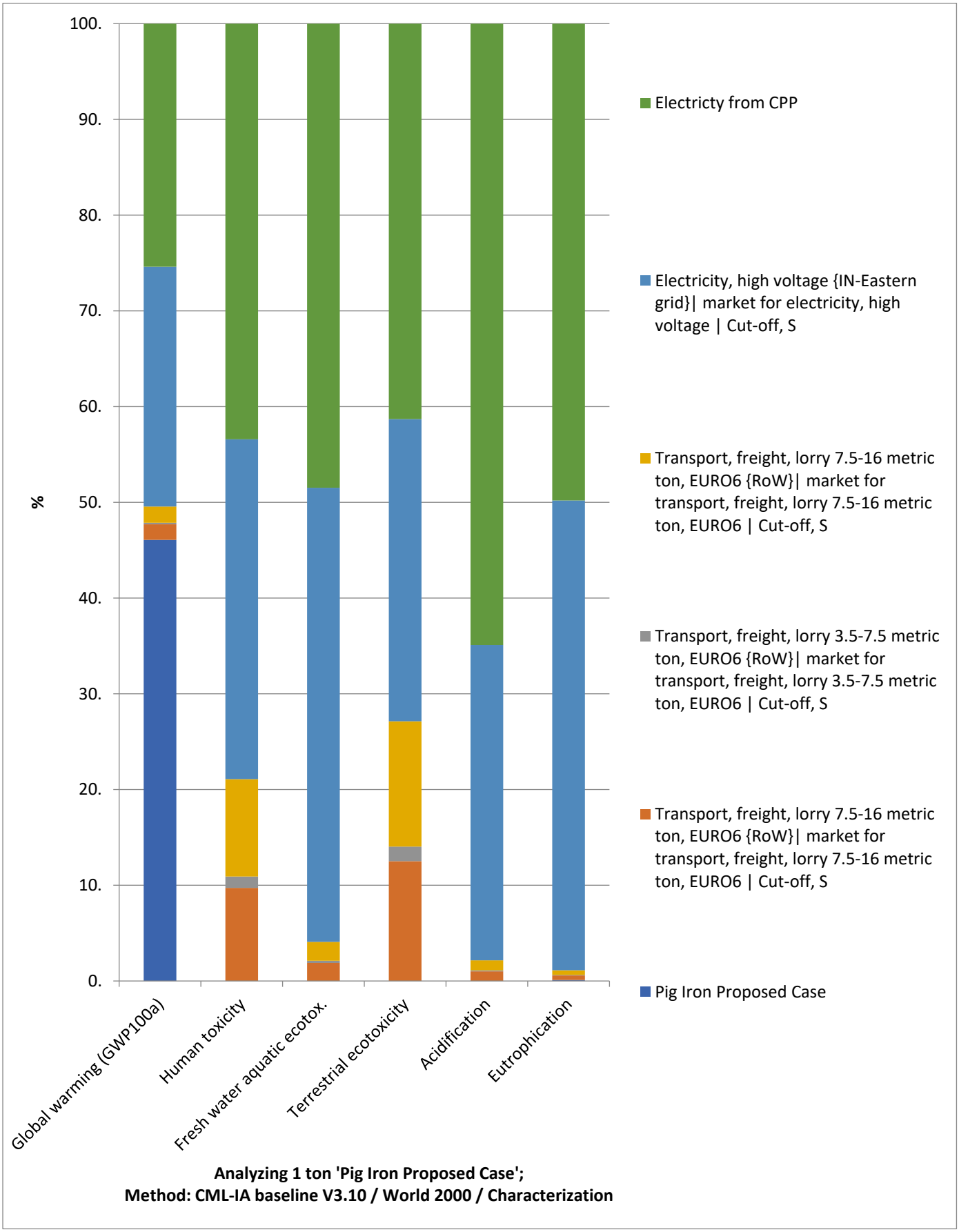


Table 5-16 LCIA Result of 1 MT of Product Pig Iron

Impact category	Global warming potential (GWP 100a)	Human Toxicity	Fresh water aquatic ecotoxicity	Terrestrial ecotoxicity	Acidification	Eutrophication
Unit	**kg CO_2 eq**	**kg 1,4-DB eq**	**kg 1,4-DB eq**	**Kg 1,4-DBeq**	**kg SO_2 eq**	**kg PO_4^{3-}eq**
Pig Iron	3310.80	0.00	0.00	0.00	0.00	0.01
Transport (upstream) (tkm)	116.76	380.25	46.86	2.46	0.21	0.06
Hazardous (downstream) (tkm)	11.78	46.64	5.77	0.30	0.02	0.01
Transport (downstream) (tkm)	122.11	397.66	49.00	2.58	0.22	0.06
Electricity from CSPDC (kWh)	1799.35	1387.81	1179.00	6.21	7.00	6.33
Electricity from CPP (kWh)	1824.25	1697.72	1205.07	8.13	13.80	6.43
Total	**7185.05**	**3910.09**	**2485.69**	**19.69**	**21.26**	**12.91**

Figure 5-14 Carbon footprint Emissions and classifications per for Life Cycle of 1MT of Pig Iron

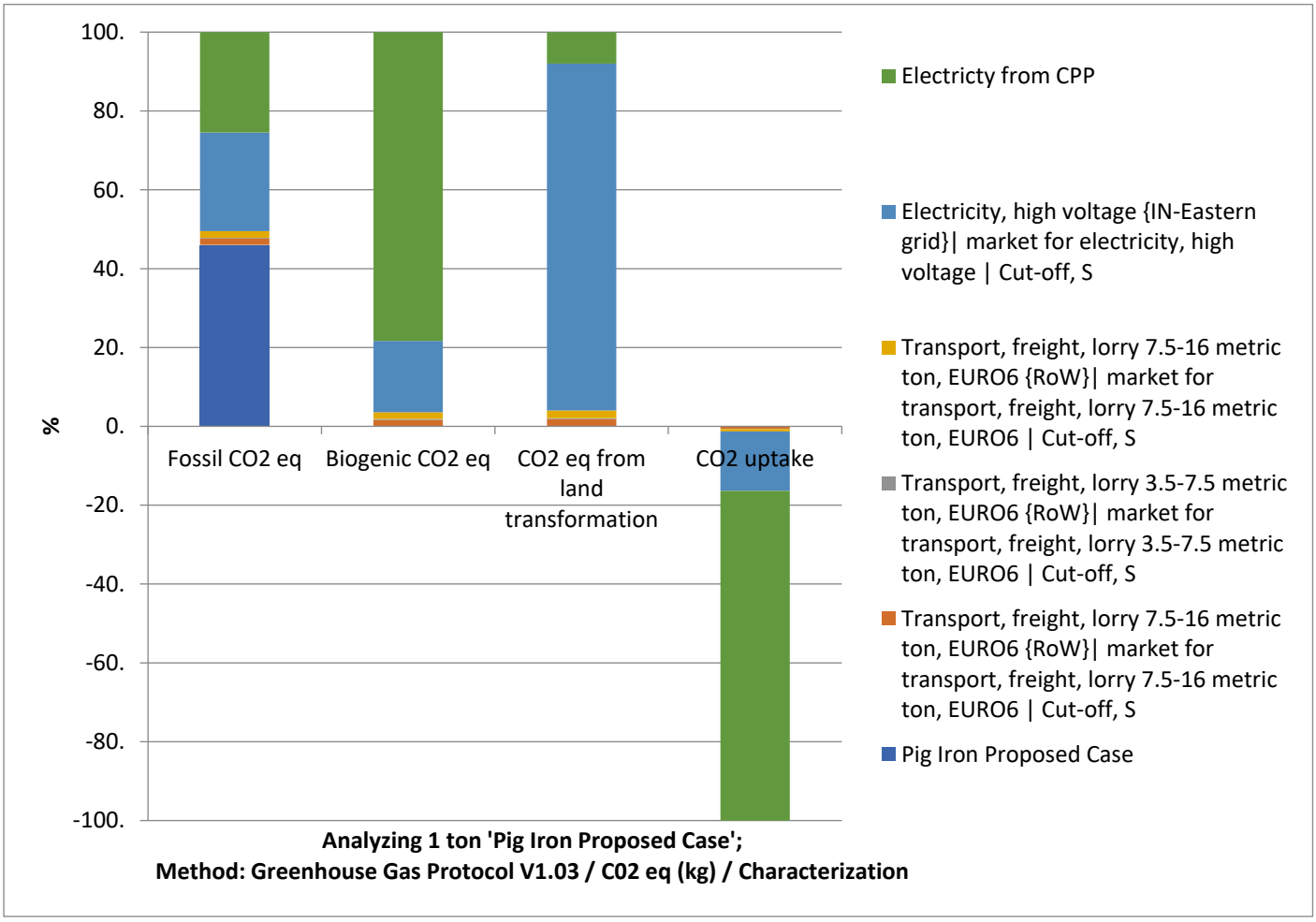


Table 5-17 Scoping of Pig Iron for 1 MT

Scoping	Emissions in $kgCO_2eq$	Percent contribution (%)	Contributing Parameter
Scope 1	3310.80	46%	Coal and Dolochar combustion for the generation of electricity
Scope 2	1799.35	25%	Electricity from supply grid
Scope 3	2074.90	29%	Coal embodied energy, transportation
Total	**7185.05**	**100%**	

Interpretation of Results:

The major contributors to the overall GWP are:

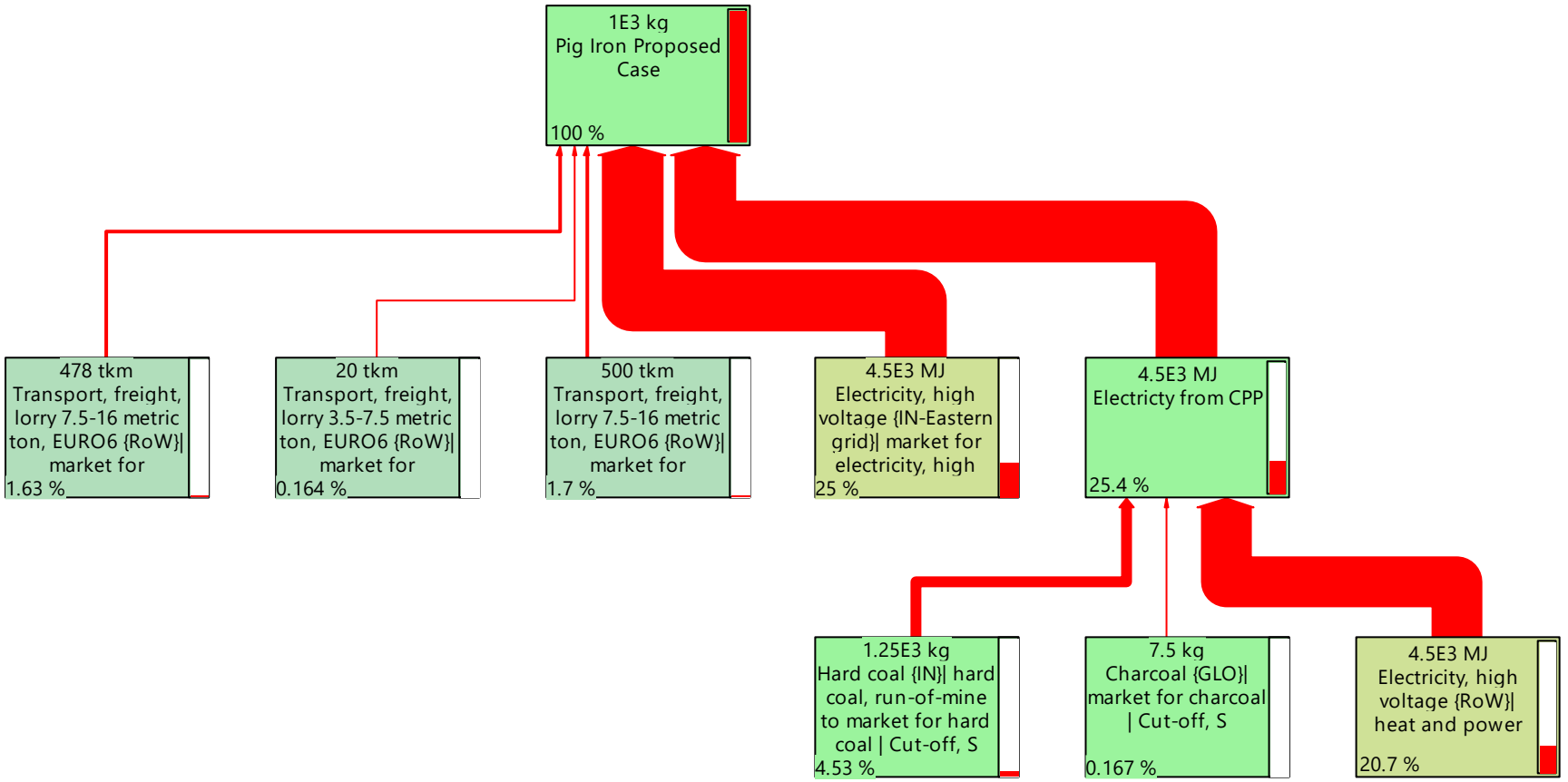
1. Coal Combustion: The combustion of coal generates carbon dioxide (CO2), which is the primary greenhouse gas emitted from burning fossil fuels. Additionally, coal burning releases a variety of airborne pollutants, including sulfur dioxide, nitrogen oxides, particulate matter, mercury, lead, and other heavy metals. These pollutants contribute to environmental issues such as acid rain, smog, haze, and global warming. They pose significant risks to human health, potentially causing respiratory issues, asthma, cardiovascular problems, cancer, neurological disorders, and premature death. Moreover, coal combustion can lead to the contamination of water and soil, contribute to the corrosion of pipelines, and disrupt the food chain. The pollutants can leach into water sources and soil, affecting ecosystems and agricultural productivity.

2. Coal and Dolochar Embodied Energy: Coal mining can cause significant damage to land, surface waters, and groundwater, resulting in widespread environmental contamination and habitat destruction. This disruption can adversely affect plants, animals, and human communities by degrading ecosystems and altering natural processes. Additionally, coal mining and combustion produce coal ash, which often contains hazardous contaminants such as mercury, cadmium, and arsenic. If coal ash is not managed properly, these pollutants can leach into waterways, contaminate drinking water and groundwater, and become airborne, posing further risks to both environmental and public health.
3. Electricity from Grid: In 2020, India's electricity generation produced 41.7% more greenhouse gases compared to the global average. This is largely due to the fact that 77% of the country's electricity is derived from fossil fuels. Coal-based power generation alone contributes to 40% of India's total greenhouse gas emissions. The process of power generation, particularly from coal, can release hazardous metals and pollutants into water bodies. For example, coal ash, which is disposed of in millions of tons each year, can contain dangerous contaminants such as mercury, cadmium, and arsenic. Additionally, the construction and upkeep of transmission lines can have detrimental effects on the environment. These activities can lead to the destruction of plant and animal life and disrupt natural habitats.

Table 5-18: Product Life Cycle Stage Wise Results of Pig Iron

Sr. No.	Life Cycle Stages	Global warming (GWP100a)	Human toxicity	Freshwater aquatic ecotox.	Terrestrial ecotoxicity	Acidification	Eutrophication
	Unit	**kg CO2 eq**	**kg 1,4-DB eq**	**kg 1,4-DB eq**	**kg 1,4-DB eq**	**kg SO2 eq**	**kg PO_4^{3-}eq**
Raw Material Processing & Raw Material Transport							
1	Raw material– Transport Upstream (Road)	116.76	380.25	46.86	2.46	0.21	0.06
2	Coal and Dolochar Embodied Energy	1824.25	1697.72	1205.07	8.13	13.80	6.43
Manufacturing Process							
3	Coal and Dolochar combustion for the generation of electricity and Process Emissions	3310.80	0.00	0.00	0.00	0.00	0.01
4	Electricity from Supply Grid	1799.35	1387.81	1179.00	6.21	7.00	6.33
Downstream Transportation							
5	Product - Downstream Transportation by Road	122.11	397.66	49.00	2.58	0.22	0.06
6	Hazardous Waste Transportation by Road	11.78	46.64	5.77	0.30	0.02	0.01

Figure 5-15 Process Flow for Pig Iron in SimaPro



6 Hotspot Analysis

6.1 Hotspot Analysis

Hotspot analysis is conducted subsequent to performing Life Cycle Assessment (LCA) on products, considering their environmental impact stemming from raw material embodied carbon, manufacturing processes, and waste generation.

The resulting output serves to pinpoint potential solutions and prioritize actions, particularly focusing on the most substantial economic, environmental, governance, ethical, and social sustainability impacts or benefits linked to the product.

This analysis helps identify key areas requiring urgent interventions or improvements, enabling a focused and efficient strategy to improve overall sustainability performance. By focusing on critical areas highlighted in the hotspot analysis, organizations can make informed decisions to maximize positive impacts and reduce negative ones, thereby promoting a more sustainable and responsible product.

The hotspot analysis can be utilized as follows:

i. Prioritize key issues such as waste, water, and materials of concern.
ii. Direct focus to the appropriate life cycle stage, including material acquisition, manufacturing, use, and end of life.
iii. Target the relevant stakeholders such as producers, manufacturers, suppliers, retailers, and customers to evaluate, influence, and implement solutions.
iv. Understand the implications of trade-offs effectively.
v. Allocate resources like time and money efficiently to actions.

The hotspot analysis of the products are as follows:

Table 6-1 Hotspot Analysis

Sr. No.	Product	LCIA Normalised Highest impact	Hotspot activities or materials
1	Si-Mn	1. Human Toxicity 2. Fresh Water aquatic Ecotoxicity 3. Global Warming Potential	1. Electricity from CPP 2. Electricity from Grid 3. Coal Combustion
2	Fe-Mn	1. Human Toxicity 2. Fresh Water aquatic Ecotoxicity 3. Global Warming Potential	1. Electricity from CPP 2. Electricity from Grid 3. Coal Combustion
3	Fe-Si	1. Human Toxicity 2. Fresh Water aquatic Ecotoxicity 3. Global Warming Potential	1. Electricity from CPP 2. Electricity from Grid 3. Coal Combustion
4	Pig Iron	1. Human toxicity 2. Fresh water aquatic Ecotoxicity. 3. Global warming (GWP100a)	1. Electricity from CPP 2. Electricity from Grid 3. Coal Combustion

7 Scoping of Proposed and Base Case

The proposed case, which incorporates electricity from CPP and Grid with mitigation measures, is compared to the base case where these measures are not applied. This comparison highlights the effectiveness of mitigation strategies in optimizing energy use and reducing potential impacts. In the proposed case, 50% of electricity is sourced from CPP and 50% from the Grid, with mitigation measures applied, while in the base case, electricity is sourced without considering any mitigation measures.

Table 7-1:Reduction in Scope wise Emissions of Si-Mn for1 MT

Emissions in $kgCO_2eq$	Scope 1	Scope 2	Scope 3	Total
Existing	10024.65	0.00	6323.07	**16347.72**
Proposed Case	4871.3	2735.02	3653.33	**11259.64**
Percent Reduction (%)	51%	-	42%	**31%**
Contributing Parameter	Coal and Dolochar combustion for the generation of electricity	Electricity from the supply grid	Coal & Dolochar embodied energy, transportation	

Table 7-2:Reduction in Scope wise Emissions of Fe-Mn for1 MT

Emissions in $kgCO_2eq$	Scope 1	Scope 2	Scope 3	Total
Existing Case	8469.78	0.00	5362.41	**13832.19**
Proposed Case	3464.21	1871.33	2767.03	**8102.57**
Percent Reduction (%)	59%	-	48%	**41%**
Contributing Parameter	Coal and Dolochar combustion for the generation of electricity	Electricity from the supply grid	Coal & Dolochar embodied energy, transportation	

8 Environmental Cost Benefit Analysis

8.1 Environmental Prices

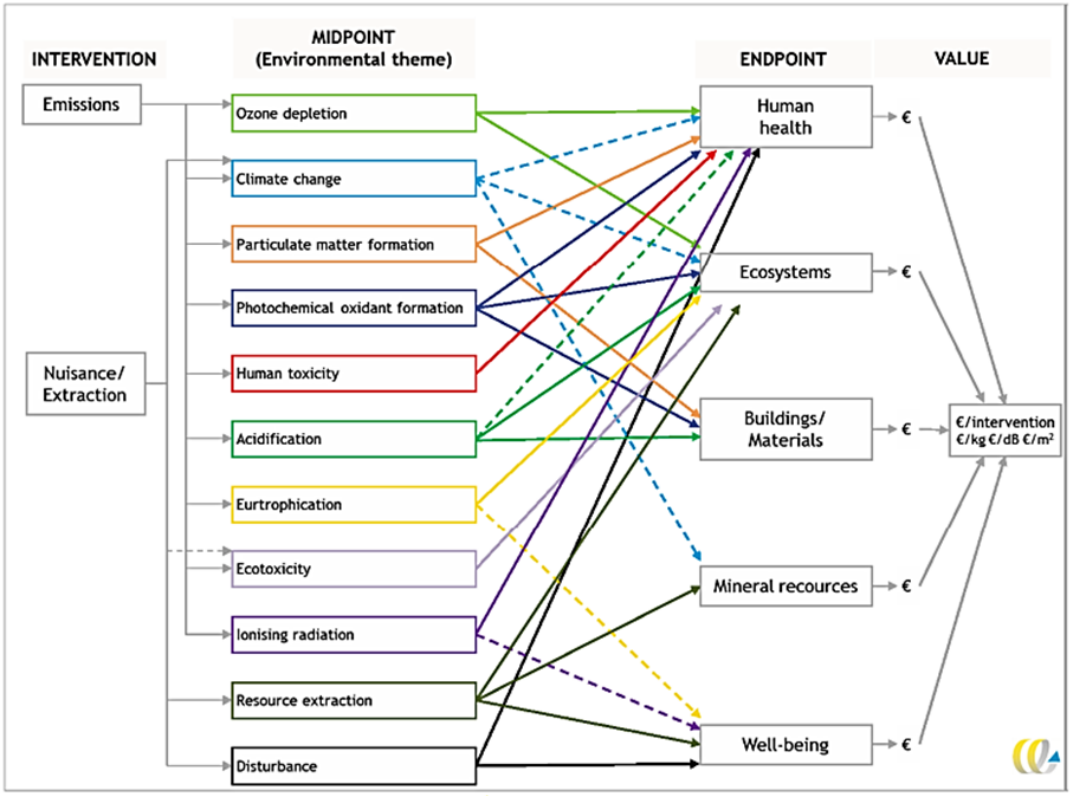
Environmental prices are indices expressing the willingness-to-pay for less environmental pollution in Euros per kilo pollutant. Environmental prices thus indicate the loss of economic welfare that occurs when one additional kilo of the pollutant enters the environment. In many cases they equal external costs. These prices can also be calculated for immaterial forms of pollution like noise nuisance and ionizing radiation, then being expressed in Euros per unit nuisance or exposure. Since a market for environmental quality is lacking, environmental prices cannot be observed directly, i.e. empirically, but must be calculated using the results of studies on human preferences for avoiding the impacts of pollution.

In the damage-cost approach an attempt is made to estimate the 'demand function' for environmental quality. This function hinges on how much people are prepared to pay for environmental quality: how much of their income they are willing to sacrifice for an additional unit of environmental quality. This is referred to as the willingness-to-pay (WTP). An alternative option is to consider how much people are prepared to pay to accept environmental damage: their willingness-to-accept (WTA). The concepts of WTP and WTA are thus both defined in terms of individual preference. Estimation of WTP can be approached in various ways, falling into two basic categories: – revealed preferences, emerging from the choices people actually make; – stated preferences, derived from questionnaires that measure people's WTP for maintaining or improving environmental quality. These methods have already been discussed in detail in the previous section.

Environmental Prices is a method developed by CE Delft for expressing environmental impacts in monetary terms. Environmental prices thus indicate the loss of economic welfare that occurs when one additional kilogram of the pollutant finds its way into the environment. Development of the Environmental Prices consisted of five steps:

- Updating monetary values of the endpoint categories on basis of literature, General SCBA Guidelines and Discount Rate Working Group;
- Updating the impact pathway analyses, which specify the relationship between emissions in the Netherlands and impacts on endpoints;
- Valuation of pollutants on basis of inputs from the previous steps and literature;
- Allocation of those pollutants to midpoint impact categories;
- Deriving weighted average value for damage to midpoint categories in order to calculate the damage cost for each substance characterised and midpoint damage factors.

Figure 8-1: Total Economic Framework Calculation



The environmental costs were converted to the national currency and adjusted for the inflation rate to the present year.

8.1.1 Conversion and adjustment for inflation and currency

€1 in 2015 is equivalent in purchasing power to about €1.20 today, an increase of €0.20 over 8 years. The euro had an average inflation rate of 2.30% per year between 2015 and today, producing a cumulative price increase of 19.98%.

This means that today's prices are 1.20 times as high as average prices since 2015, according to the European Central Bank consumer price index. A euro today only buys 83.33% of what it could buy back then.

The inflation rate in 2015 was 0.03%. The current inflation rate compared to last year is now 0.14%. If this number holds, the rate of inflation is so negligible that €1 today will roughly maintain its value.

Conversion Euro to Rupees is 89.68 say Rs.90. Hence the conversion for Euro to Rupees with adjustment for inflation from 2015 is Rs. 108.

8.1.2 Comparative study on application in field

Material recovery, reuse, recycling and use of renewable energy are the mitigation measures considered. Hence by comparison and considering the reduction of impact the cost benefit analysis is worked out.

Based on the assumptions & mitigation measured the products were analysed for the base and proposed case. For the proposed base case the mitigation measures were considered whereas for the base case, it was excluded. The mitigation measures are as follows:

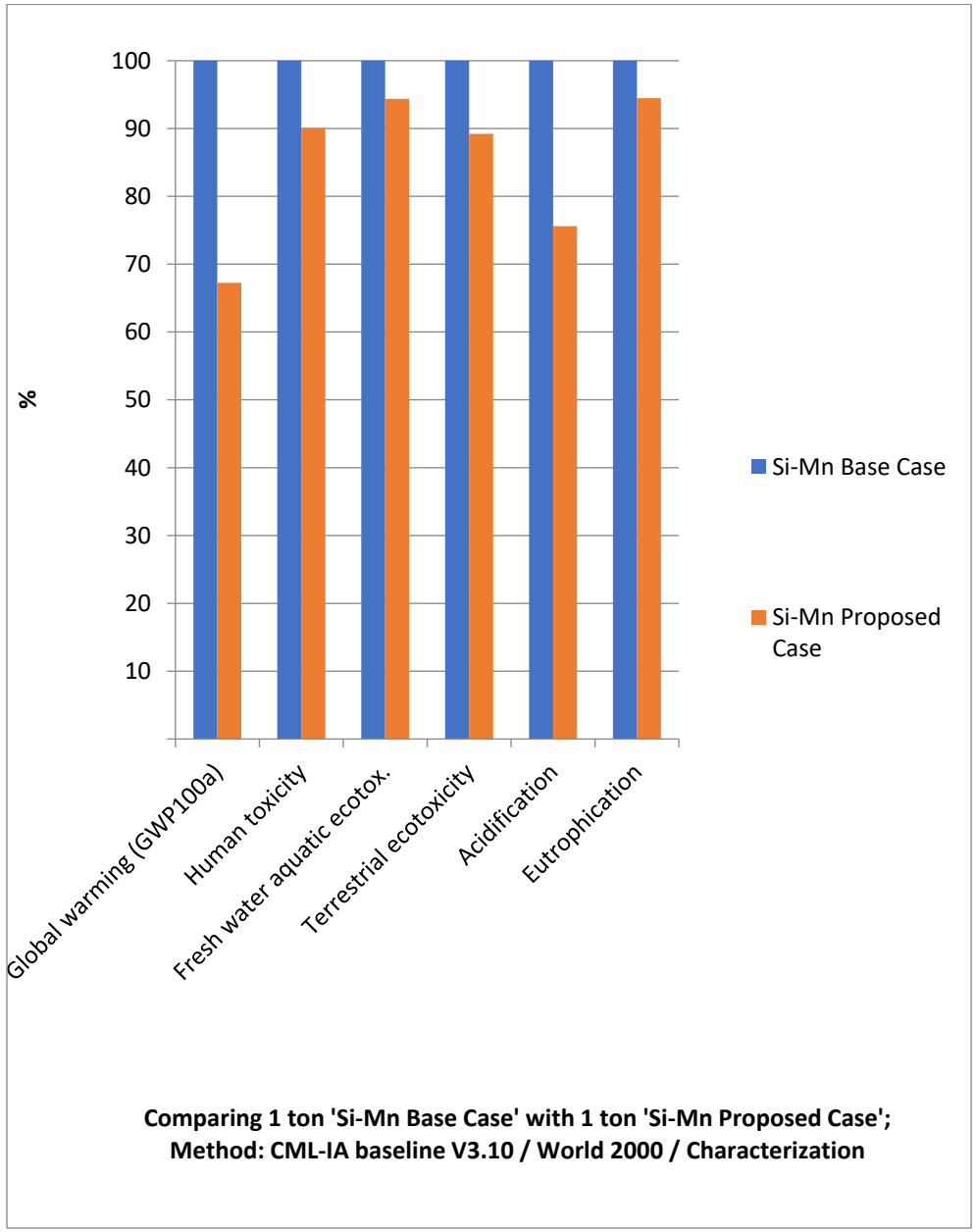
- The Electricity from CPP and Grid
- The Power Consumption Per MT of Product in Existing Case

Table 8-1Reduced Impact due to Mitigation Measures

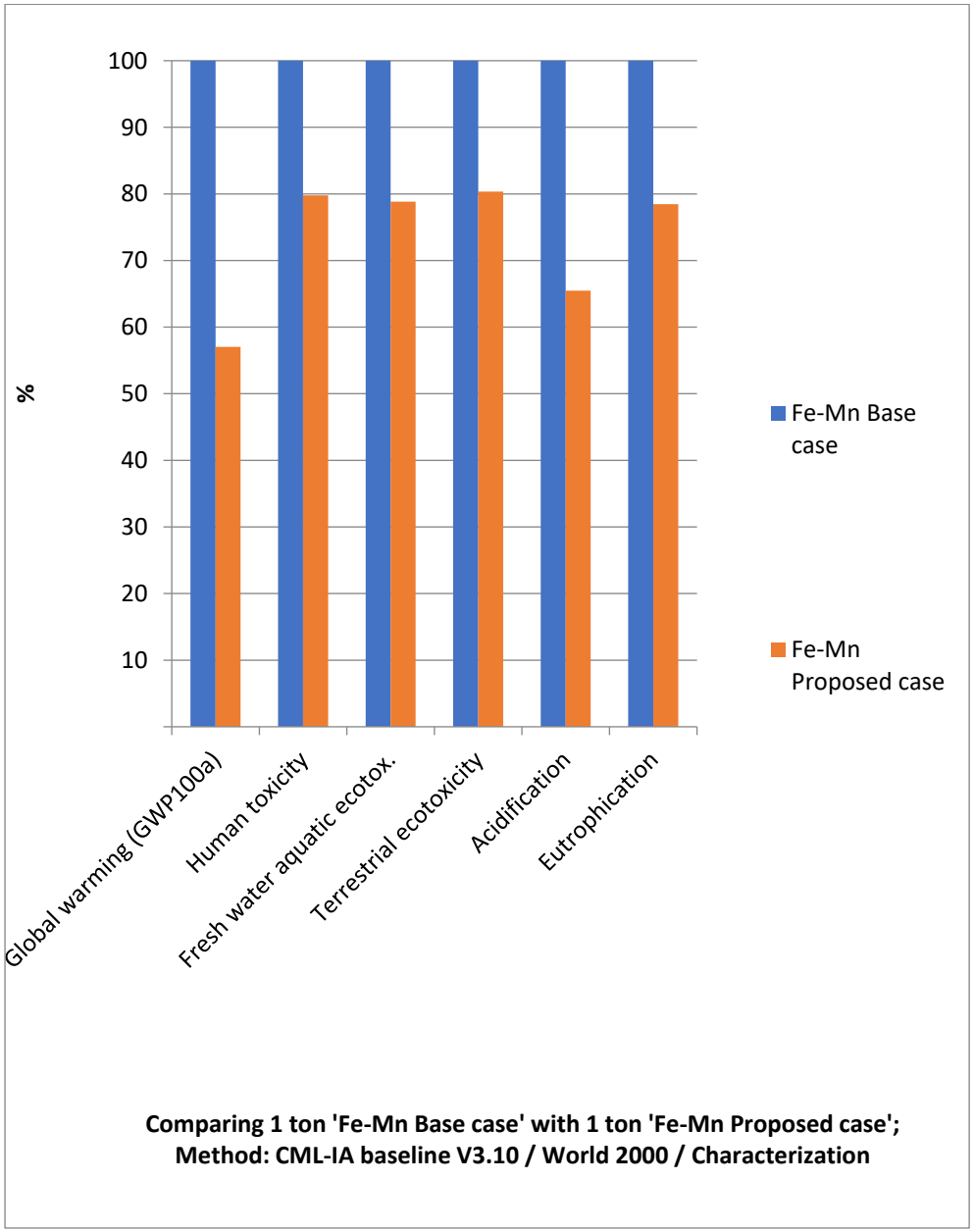
Sr. No.	Product	Global warming (GWP100a)	Human toxicity	Fresh water aquatic ecotox.	Terrestrial ecotoxicity	Acidification	Eutrophication
	Unit	kg CO_2eq	kg 1,4-DBeq	kg 1,4-DBeq	kg 1,4-DBeq	kg SO_2eq	kg PO_4^{3-}eq
1	Si-Mn	5186.93	626.69	198.96	3.66	6.38	0.55
2	Fe-Mn	5811.32	1207.28	704.14	6.23	9.05	3.26

Table 8-2 Cost Benefit Analysis of All Products

Sr. No.	Product	Global warming (GWP100a)	Human toxicity	Fresh water aquatic ecotox.	Terrestrial ecotoxicity	Acidification	Eutrophication
	Unit	kg CO_2eq	kg 1,4-DBeq	kg 1,4-DBeq	kg 1,4-DBeq	kg SO_2eq	kg PO_4^{3-}eq
	Values Euro/kg	0.06	0.16	0.04	8.89	8.12	1.90
	Values Rs/kg	6.11	17.06	3.99	960.12	876.96	205.20
1	Si-Mn	31692.13	10691.40	793.85	3514.32	5598.38	112.52
2	Fe-Mn	35507.17	20596.19	2809.53	5984.72	7935.75	669.58
Total		70786.73	67199.30	31287.59	3603.38	9499.03	13534.14



Comparing 1 ton 'Si-Mn Base Case' with 1 ton 'Si-Mn Proposed Case';
Method: CML-IA baseline V3.10 / World 2000 / Characterization



Comparing 1 ton 'Fe-Mn Base case' with 1 ton 'Fe-Mn Proposed case';
Method: CML-IA baseline V3.10 / World 2000 / Characterization

8.1.3 Database

Environmental prices are indices expressing the willingness-to-pay for less environmental pollution in Euros per kilo pollutant. Environmental prices thus indicate the loss of economic welfare that occurs when one additional kilo of the pollutant enters the environment. In many cases they equal external costs. These prices can also be calculated for immaterial forms of pollution like noise nuisance and ionizing radiation, then being expressed in Euros per unit nuisance or exposure. Since a market for environmental quality is lacking, environmental prices cannot be observed directly, i.e. empirically, but must be calculated using the results of studies on human preferences for avoiding the impacts of pollution.

In the damage-cost approach an attempt is made to estimate the 'demand function' for environmental quality. This function hinges on how much people are prepared to pay for environmental quality: how much of their income they are willing to sacrifice for an additional unit of environmental quality. This is referred to as the willingness-to-pay (WTP). An alternative option is to consider how much people are prepared to pay to accept environmental damage: their willingness-to-accept (WTA). The concepts of WTP and WTA are thus both defined in terms of individual preference. Estimation of WTP can be approached in various ways, falling into two basic categories: – revealed preferences, emerging from the choices people actually make; – stated preferences, derived from questionnaires that measure people's WTP for maintaining or improving environmental quality. These methods have already been discussed in detail in the previous section.

The environmental costs were converted to the national currency and adjusted for the inflation rate to the present year.

8.1.4 Conclusion

A positive cost indicates benefit derived from the preferred option with mitigation measures over the base case. This cost saving indicates the benefits of application on the eco system and the environment considering the environmental costing achieved from the expenditure required in terms of health costs, pollution treatment costs, remediation costs, ecological damage costs, compensation costs and cost of remedial measures. So, application of mitigation measures over base case will save an environmental damage worth approximately **Rs. 1,25,905 for 2 products per ton.**

9 Mitigation Measure

9.1 Mitigation Measures

Following is the mitigation measures taken for reduction of GHG emissions**.**

1. Sequestration through plantation of 1006 No of trees

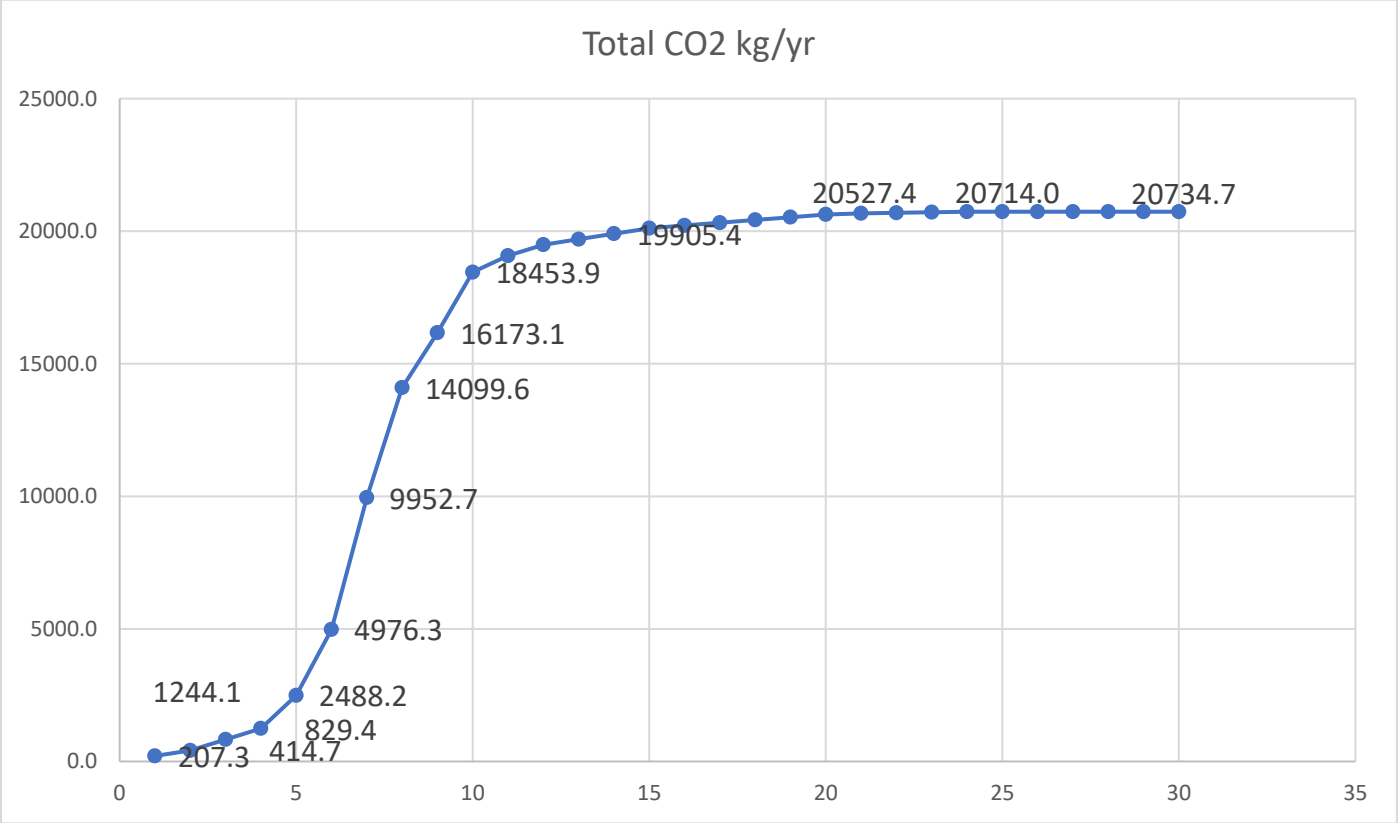
9.1.1 Annual Sequestration Calculations

As per the methodology of IISc Indian institute of Science Bangalore published by Springer in the book Carbon Inventory Methods (Authors: Rabindranath and Ostwald), the year wise carbon sequestration of each species is calculated. For the proposed trees, the year of plantation when the sequestration is negligible to 10 years of age (for average sequestration rate on full growth) the sequestration rate is calculated based on the methodology mentioned.

From 0 to 7-10 years the rate of sequestration per year goes on increasing with increase in biomass, for most of the species the rate of sequestration becomes stable after 10 years. The year-wise increase in height and girth for each species was considered from data published by FRI Dehradun and other Indian publications. For this existing tree data for similar species were collected, every individual plant diameter or girth at breast height (GBH) and height was measured. Wood density as per species was considered. The Above ground and below ground biomass were calculated, from which the carbon content was determined. Considering the age of the tree, annual amount of carbon dioxide sequestered was calculated for fully grown trees.

Similar methodology is followed in CPCB study of “Assessment of Carbon Sequestration Ability of Trees for Adopting in Green Belt of Cement Industries in Karnataka” “Carbon Inventory Methods” methodology: The height and girth at breast height (GBH) of tree are measured. Later, the parameters like Volume, Mass, Wood density, Above and Below ground biomass, Total biomass and Total carbon were calculated as per the standard methods given by Ravindranath and Ostwald. The wood density values were obtained for each of the tree species or in case density was not available, 0.6 was accepted as wood density. Wood density was also referred from data published by FRI.

Figure 9-1:Year Wise Carbon Savings due to carbon sequestration



- **Outside Plant Premise Tree List:**

Table 9-1: Annual Carbon Sequestration through Plantation

Sr. No.	Trees		Qty	CO_2	CO_2	Total CO_2
	Botanical Name	Common Name	No.	kg	kg/ yr	kg/yr
1	Conocarpus lancifolius	Conocarpus	450	219.74	21.97	9888.39
2	Delonix regia	Gulmohar	25	276.31	27.63	690.78
3	Azadirachta indica	Neem	30	276.31	27.63	828.94
4	Ficus benghalensis	ARGAT	9	390.65	39.07	351.59
5	Ficus religiosa	Pipal	22	276.31	27.63	607.89
6	Millettia pinnata	Karanj	29	219.74	21.97	637.25
7	Cocos nucifera	Nariyal	1	251.13	25.11	25.11
8	Syzygium cumini	Jamun	12	276.31	27.63	331.57
9	Terminalia catappa	Badam	10	97.12	9.71	97.12
10	Alstonia scholaris	Chatim	81	130.80	13.08	1059.47
11	Aegle marmelos	Bogan Bel	5	69.76	6.98	34.88
12	Mangifera indica	Aam	10	58.86	5.89	58.86
13	Leucaena leucocephala	Subabul	50	158.27	15.83	791.33
14	Butea monosperma	PALAS	12	197.83	19.78	237.40
15	Carica papaya	Papita	1	130.80	13.08	13.08
16	Lawsonia inermis	Mehandi	9	19.07	1.91	17.17
Total			**756**			**15670.83**

- **Inside Plant Premise Tree List:**

Table 9-2:Annual Carbon Sequestration through Plantation

Sr. No.	Trees		Qty	CO_2	CO_2	Total CO_2
	Botanical Name	Common Name	No.	kg	kg/ yr	kg/yr
1	Conocarpus lancifolius	Conocarpus	80	219.74	21.97	1757.94
2	Eucalyptus globulus	NILGIRI	15	171.46	17.15	257.18
3	Thailand Shower	CASSIA SHAMIYA	22	152.60	15.26	335.72
4	Swietenia macrophylla	MAHOGANY	24	171.46	17.15	411.49
5	yellow poinciana	PELTOPHORUM	23	294.73	29.47	677.89
6	Azadirachta indica	Neem	21	163.50	16.35	343.35
7	Indian devil tree	BLACK BOARD	15	171.46	17.15	257.18
8	Saraca asoca	ASHOK	16	130.80	13.08	209.28
9	Tectona Grandis	SAGON	16	197.83	19.78	316.53
10	Syzygium cumini	Jamun	18	276.31	27.63	497.36
Total			**250**			**5063.92**

10 Reference

- ✓ *LCA Software- SimaPro 9.6*
- ✓ *Databases – Ecoinvent 3.10 V*
- ✓ *GHG Protocol Manuals - Product Inventory*
- ✓ *Environmental Prices CE Delft*
- ✓ *The Economics of Ecosystems and Biodiveristy, UNEP*
- ✓ *Contingent Valuation: A Comprehensive Bibliography and History. Cheltenham: Edward Elgar*
- ✓ *https://usetox.org/*

Annexure VIII: Stack Monitoring

Advanced Environmental Testing And Research Lab P. Ltd.

CIN: U73100MP2002PTC015352 GSTIN: 23AAECA9188L1Z8

Approved: by Occupational Health &Safety Management (ISO45001:2018)
Approved: by National Accreditation Board for Testing and Calibration Laboratories
Approved: by Ministry of Environment, Forest and Climate Change (MoEF&CC)

Registered Office: 63/1, Kailash Vihar, Near Income Tax Office, City Center-II
Gwalior-474 011, M.P., India
☎0751-3566867, 2232177
Email:aelgwalior@gmail.comaetrl2016@gmail.com,aetrlcenter@gmail.com
Web: www,aetrl.com

TC-12780

D	Silence zone	50	40

***** End of Report*****

Checked By

Authorized Signatory

TEST REPORT

Report No.: AETRL/ S-23122025/01			Date:		05/01/2026
Name & Address of Customer	:	M/s Hira Ferro Alloys Limited (Unit - I) Plot No. 567/B, 568, 553/B, Urla Industrial Area, District – Raipur (C.G.)			
Sample Collection Date & Time	:	23/12/2025 11.00 am to 11:30 am	Sampling Type	:	Isokinetic
Sample Receipt Date	:	30/12/2025	Sample ID	:	S-23122025/01
Sampling Location	:	Bag Filter Stack	Sample Description	:	Stack Emission Stack height: Below Ground Level 32 meter, above factory room – 30.5 m Stack Dia – 1.6 mtr Used of fuel – Electricity
Sample Collected / Submitted by	:	Lab representative	Protocol used for monitoring	:	IS:11255 (part 1,3)
Quantity / No. of Sample	:	1 Thimble	Analysis Started On	:	30/12/2025
Packing / Seal	:	Temp. Sealed	Analysis Completed On	:	05/01/2026
Environmental Condition during the test			Clear sky		

STACK EMISSION MONITOIRNG RESULT

Sr. No.	Parameter	Result	Unit	CPCB Standard (mg/Nm^3)	Protocol used for Analysis
1	Ambient Temperature	26.4	°C	-	IS 11255 (Part 03): 2018
2	Stack Temperature	112	°C	-	IS 11255 (Part 03): 2018
3	Velocity	11.6	m/s	-	IS 11255 (Part 03): 2018
4	Volumetric Flow Rate	83880	Nm^3/hr	-	CPCB Guideline

Notes:

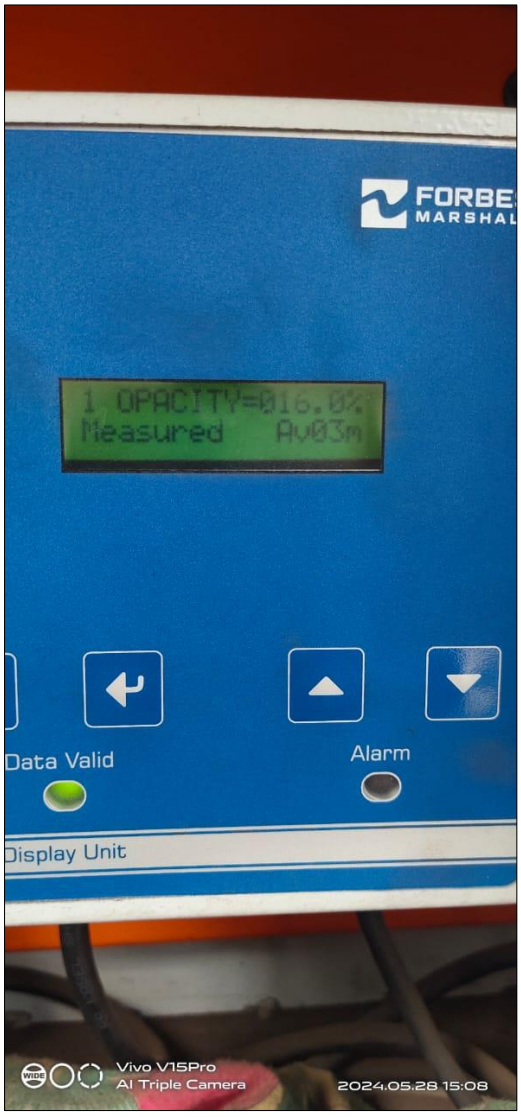
1. The results given above are related to the tested sample, as received & mentioned parameters. The customer asked for the above tests only.
2. Responsibility of the Laboratory is limited to the invoiced amount only.
3. This test report will not be generated again, either wholly or in part, without prior written permission of the laboratory.
4. This test report will not be used for any publicity/legal purpose.
5. The test samples will be disposed off after two weeks from the date of issue of test report, unless until specified by the customer

Annexure IX: CAAQMS and CEMS

HIRA FERRO ALLOYS LIMITED (UNIT –I)

PHOTOGRPHS OF OPACITY METER


CAUTION
CAUTION
CAUTION
CAUTION
Vivo V15Pro
AI Triple Camera
2024.05.28 15:09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Measured Av03m
Data Valid
Alarm
Display Unit
Vivo V15Pro
AI Triple Camera
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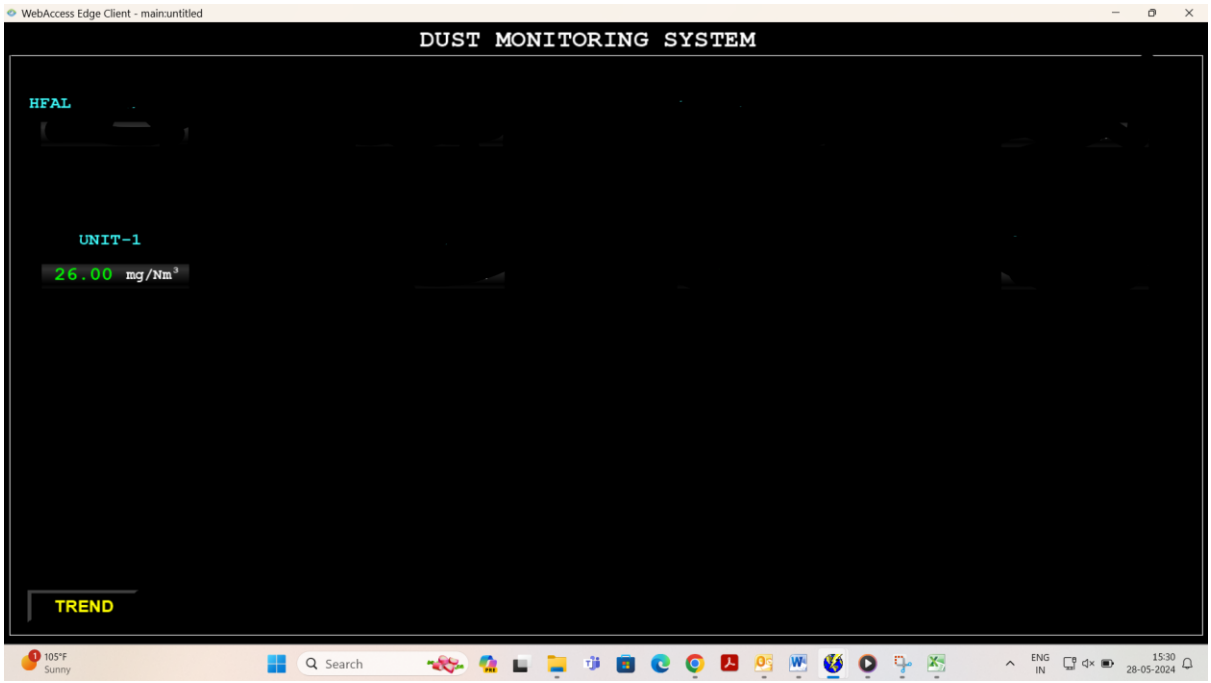
WebAccess Edge Client - main:untitled
DUST MONITORING SYSTEM
HFAL
UNIT-1
26.00 mg/Nm³
TREND
105°F
Sunny
Search
ENG
IN
15:30
28-05-2024

Annexure X: Ambient Air Monitoring Report

Advanced Environmental Testing And Research Lab P. Ltd.

CIN: U73100MP2002PTC015352 GSTIN: 23AAECA9188L1Z8

Approved: by Occupational Health &Safety Management (ISO45001:2018)
Approved: by National Accreditation Board for Testing and Calibration Laboratories
Approved: by Ministry of Environment, Forest and Climate Change (MoEF&CC)

Registered Office: 63/1, Kailash Vihar, Near Income Tax Office, City Center-II
Gwalior-474 011, M.P., India
☎0751-3566867, 2232177
Email:aelgwalior@gmail.comaetrl2016@gmail.com,aetrlcenter@gmail.com
Web: www,aetrl.com

TC-1278O

TEST REPORT

Report No.: AETRL/AA-23122025/01			Date:		05/01/2026
Name & Address of Customer	:	M/s Hira Ferro Alloys Limited (Unit - I) Plot No. 567/B, 568, 553/B, Urla Industrial Area, District – Raipur (C.G.) Pin - 492003			
Sample Collection Date	:	23/12/2025 to 24/12/2025	Sampling Type	:	NA
Sample Receipt Date	:	30/12/2025	Sample ID	:	AA-23122025/01
Sampling Location	:	Near Time Office	Sample Description	:	Ambient Air
Sample Collected / Submitted by	:	Lab Representative	Protocol used for monitoring	:	IS 5182 (Part - 14)
Quantity / No. of Sample	:	One Ambient Air	Analysis Started On	:	30/12/2025
Packing / Seal	:	Temp. Sealed	Analysis Completed On	:	05/01/2026
Meteorological condition during monitoring			Clear sky		

AMBIENT AIR TEST RESULTS

Sr. No.	Parameter	Result	Unit	Protocol used for Analysis	NAAQS
1	Particulate Matters PM10	82	$\mu g/m^3$	IS 5182 (Part 23) 2022	100(Max.)
2	Particulate Matters PM2.5	36	$\mu g/m^3$	IS 5182 (Part 24) 2024	60(Max.)
3	Sulphur Dioxide as SO_2	11.4	$\mu g/m^3$	IS 5182 (Part 2) 2023	80(Max.)
4	Nitrogen Dioxide as NO_2	22.4	$\mu g/m^3$	IS 5182 (Part 6) 2022	80(Max.)
5	Carbon Monoxide as CO	0.29	mg/m^3	IS 5182 (Part 10) 2022	4.0(Max.)

***** End of Report*****

Advanced Environmental Testing And Research Lab Private Limited Gwalior

Checked By

Authorized Signatory

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Advanced Environmental Testing And Research Lab P. Ltd.

CIN: U73100MP2002PTC015352 GSTIN: 23AAECA9188L1Z8

Approved: by Occupational Health &Safety Management (ISO45001:2018)
Approved: by National Accreditation Board for Testing and Calibration Laboratories
Approved: by Ministry of Environment, Forest and Climate Change (MoEF&CC)

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Web: www,aetrl.com

TC-12780

TEST REPORT

Report No.: AETRL/AA-25122025/02			Date:		05/01/2026
Name & Address of Customer	:	M/s Hira Ferro Alloys Limited (Unit - I) Plot No. 567/B, 568, 553/B, Urla Industrial Area, District – Raipur (C.G.) Pin - 493223			
Sample Collection Date	:	25/12/2025 to 26/12/2025	Sampling Type	:	NA
Sample Receipt Date	:	30/12/2025	Sample ID	:	AA-25122025/02
Sampling Location	:	Near ADM	Sample Description	:	Ambient Air
Sample Collected / Submitted by	:	Lab Representative	Protocol used for monitoring	:	IS 5182 (Part - 14)
Quantity / No. of Sample	:	One ambient air	Analysis Started On	:	30/12/2025
Packing / Seal	:	Temp. Sealed	Analysis Completed On	:	05/01/2026
Meteorological condition during monitoring			Clear sky		

AMBIENT AIR TEST RESULTS

Sr. No.	Parameter	Result	Unit	Protocol used for Analysis	NAAQS
1	Particulate Matters PM10	79	$\mu g/m^3$	IS 5182 (Part 23) 2022	100(Max.)
2	Particulate Matters PM2.5	35	$\mu g/m^3$	IS 5182 (Part 24) 2024	60(Max.)
3	Sulphur Dioxide as SO_2	10.2	$\mu g/m^3$	IS 5182 (Part 2) 2023	80(Max.)
4	Nitrogen Dioxide as NO_2	23.4	$\mu g/m^3$	IS 5182 (Part 6) 2022	80(Max.)
5	Carbon Monoxide as CO	0.36	mg/m^3	IS 5182 (Part 10) 2022	4.0(Max.)

***** End of Report*****

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TC-12780

TEST REPORT

Report No.: AETRL/AA-25122025/03			Date:		05/01/2026
Name & Address of Customer	:	M/s Hira Ferro Alloys Limited (Unit - I) Plot No. 567/B, 568, 553/B, Urla Industrial Area, District – Raipur (C.G.) Pin - 493223			
Sample Collection Date	:	25/12/2025 to 26/12/2025	Sampling Type	:	NA
Sample Receipt Date	:	30/12/2025	Sample ID	:	25122025/03
Sampling Location	:	Near Hopper Area	Sample Description	:	Ambient Air
Sample Collected / Submitted by	:	Lab Representative	Protocol used for monitoring	:	IS 5182 (Part - 14)
Quantity / No. of Sample	:	One ambient air	Analysis Started On	:	30/12/2025
Packing / Seal	:	Temp. Sealed	Analysis Completed On	:	05/01/2026
Meteorological condition during monitoring			Clear sky		

AMBIENT AIR TEST RESULTS

Sr. No.	Parameter	Result	Unit	Protocol used for Analysis	NAAQS
1	Particulate Matters PM10	76	$\mu g/m^3$	IS 5182 (Part 23) 2022	100(Max.)
2	Particulate Matters PM2.5	32	$\mu g/m^3$	IS 5182 (Part 24) 2024	60(Max.)
3	Sulphur Dioxide as SO_2	10.2	$\mu g/m^3$	IS 5182 (Part 2) 2023	80(Max.)
4	Nitrogen Dioxide as NO_2	21.4	$\mu g/m^3$	IS 5182 (Part 6) 2022	80(Max.)
5	Carbon Monoxide as CO	0.32	mg/m^3	IS 5182 (Part 10) 2022	4.0(Max.)

***** End of Report*****

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TEST REPORT

Report No.: AETRL/AA-23122025/04			Date:		05/01/2026
Name & Address of Customer	:	M/s Hira Ferro Alloys Limited (Unit - I) Plot No. 567/B, 568, 553/B, Urla Industrial Area, District – Raipur (C.G.) Pin - 492003			
Sample Collection Date	:	23/12/2025 to 24/12/2025	Sampling Type	:	NA
Sample Receipt Date	:	30/12/2025	Sample ID	:	AA-23122025/04
Sampling Location	:	Weighbridge	Sample Description	:	Ambient Air
Sample Collected / Submitted by	:	Lab Representative	Protocol used for monitoring	:	IS 5182 (Part - 14)
Quantity / No. of Sample	:	One Ambient Air	Analysis Started On	:	30/12/2025
Packing / Seal	:	Temp. Sealed	Analysis Completed On	:	05/01/2026
Meteorological condition during monitoring			Clear sky		

AMBIENT AIR TEST RESULTS

Sr. No.	Parameter	Result	Unit	Protocol used for Analysis	NAAQS
1	Particulate Matters PM10	78	$\mu g/m^3$	IS 5182 (Part 23) 2022	100(Max.)
2	Particulate Matters PM2.5	34	$\mu g/m^3$	IS 5182 (Part 24) 2024	60(Max.)
3	Sulphur Dioxide as SO_2	10.8	$\mu g/m^3$	IS 5182 (Part 2) 2023	80(Max.)
4	Nitrogen Dioxide as NO_2	23.4	$\mu g/m^3$	IS 5182 (Part 6) 2022	80(Max.)
5	Carbon Monoxide as CO	0.34	mg/m^3	IS 5182 (Part 10) 2022	4.0(Max.)

***** End of Report*****

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Annexure XI: Fugitive Emission Monitoring Report

Advanced Environmental Testing And Research Lab P. Ltd.

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TC-12780

TEST REPORT

Report No.: AETRL/FE-24122025/01			Date:		05/01/2026
Name & Address of Customer	:	M/s Hira Ferro Alloys Limited (Unit - I) Plot No. 567/B, 568, 553/B, Urla Industrial Area, District – Raipur (C.G.)			
Sample Collection Date	:	24/12/2025	Sampling Type	:	NA
Sample Receipt Date	:	30/12/2025	Sample ID	:	FE-24122025/01
Sampling Location	:	Main Gate	Sample Description	:	Fugitive emission
Sample Collected / Submitted by	:	Lab representative	Protocol used for monitoring	:	IS 5182 (Part - 14)
Quantity / No. of Sample	:	One/ Fugitive emission	Analysis Started On	:	30/12/2025
Packing / Seal	:	Temp. Sealed	Analysis Completed On	:	05/01/2026
Meteorological condition during monitoring			Clear sky		

TEST RESULTS FUGITIVE EMISSION

Sr. No.	Parameter	Result	Unit	Protocol used for Analysis	Limit
1	Total Suspended Particulate matter (SPM)	745	$\mu g/m^3$	EPA METHOD IO 2.1	2000

***** End of Report*****

Checked By

Authorized Signatory

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TC-12780

TEST REPORT

Report No.: AETRL/FE-25122025/02			Date:		05/01/2026
Name & Address of Customer	:	M/s Hira Ferro Alloys Limited (Unit - I) Plot No. 567/B, 568, 553/B, Urla Industrial Area, District – Raipur (C.G.)			
Sample Collection Date	:	25/12/2025	Sampling Type	:	NA
Sample Receipt Date	:	30/12/2025	Sample ID	:	FE-25122025/02
Sampling Location	:	Material Gate	Sample Description	:	Fugitive emission
Sample Collected / Submitted by	:	Lab representative	Protocol used for monitoring	:	IS 5182 (Part - 14)
Quantity / No. of Sample	:	One/ Fugitive emission	Analysis Started On	:	30/12/2025
Packing / Seal	:	Temp. Sealed	Analysis Completed On	:	05/01/2026
Meteorological condition during monitoring			Clear sky		

TEST RESULTS FUGITIVE EMISSION

Sr. No.	Parameter	Result	Unit	Protocol used for Analysis	Limit
1	Total Suspended Particulate matter (SPM)	795	$\mu g/m^3$	EPA METHOD IO 2.1	2000

***** End of Report*****

Checked By

Advanced Environmental Testing And Research Lab Private Limited Gwalior

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TC-12780

TEST REPORT

Report No.: AETRL/FE-26122025/03			Date:		05/01/2026
Name & Address of Customer	:	M/s Hira Ferro Alloys Limited (Unit - I) Plot No. 567/B, 568, 553/B, Urla Industrial Area, District – Raipur (C.G.)			
Sample Collection Date	:	26/12/2025	Sampling Type	:	NA
Sample Receipt Date	:	30/12/2025	Sample ID	:	FE-26122025/03
Sampling Location	:	Near Coal Yard	Sample Description	:	Fugitive emission
Sample Collected / Submitted by	:	Lab representative	Protocol used for monitoring	:	IS 5182 (Part - 14)
Quantity / No. of Sample	:	One/ Fugitive emission	Analysis Started On	:	30/12/2025
Packing / Seal	:	Temp. Sealed	Analysis Completed On	:	05/01/2026
Meteorological condition during monitoring			Clear sky		

TEST RESULTS FUGITIVE EMISSION

Sr. No.	Parameter	Result	Unit	Protocol used for Analysis	Limit
1	Total Suspended Particulate matter (SPM)	825	$\mu g/m^3$	EPA METHOD IO 2.1	2000

***** End of Report*****

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Advanced Environmental Testing And Research Lab Private Limited Gwalior

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Annexure XII: Bag Filter Dust

Technical specification of Bag Filters at Unit I

S. No.	Description	Specification (5 MVA)	Specification (11 MVA)
1	Filtering Media	Polyester Needle felt non-woven filter bag	Polyester Needle felt non-woven filter bag
2	No. Of Chamber	6	8
3	No. Of Bag Per Chamber	168	168
4	Total No. of Bags	1008	1344
5	Total Nos. Of Filter	1008	1344
6	Dia Of Filter Bag	150 mm	150 mm
7	Filter Bag Length	4200 mm	4000 mm
8	Filtering Area Per Bag	2014546 mm^2 / (2 m^2)	2014546 mm^2 / (2 m^2)
9	Total Filtering Area (Online)	1008 x 2 m^2	1344 x 2 m^2
10	Fan Capacity	125000 m^3/hrs	80,0000 m^3/Hrs x 2
11	Inlet Dust Load	2.6 gmNm^3	2.5 gm/Nm^3
12	Outlet Dust Load	< 50 mg/Nm^3	< 50 mg/Nm^3

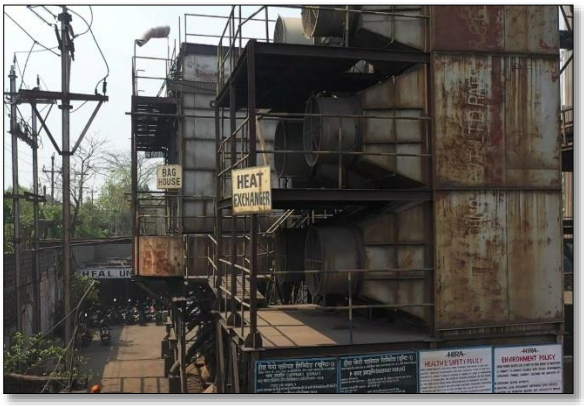
Photograph of Bag Filter System

Annexure XIII: Photographs of APCS

HIRA FERRO ALLOYS LIMITED (UNIT I)

Plot No. 567/B, 568, 553/B,Urla Industrial Area,District – Raipur (C.G.)

PHOTOGRAPHS OF POLLUTION CONTROL SYSTEM

BEFORE MODIFICATION	AFTER MODIFICATION
  	  

Annexure XIV: Bag Filter Performance

Advanced Environmental Testing And Research Lab P. Ltd.

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13	Sulphate (as SO4)	IS:3025 (Part-24/Sec-1) 2022	46.3	mg/L	400.0 (Max.)
14	E. Coliform	IS : 15185:2016	Absent	Per 100 ml	Shall Not detectable in any 100 ml sample
15	Total Coliform	IS : 15185:2016	Absent	Per 100 ml	Shall Not detectable in any 100 ml sample

***** End of Report*****

Checked By

Authorized Signatory

TEST REPORT

Report No.: AETRL/ BF-25012025/01			Date:		05/01/2026
Customer Name & Address	:	M/s Hira Ferro Alloys Limited (Unit - I) Plot No. 567/B, 568, 553/B, Urla Industrial Area, District – Raipur (C.G.)			
Date of Sample Collection	:	26/01/2025	Sampling Type	:	Isokinetic
Date of Sample Received	:	30/12/2025	Sample ID	:	BF-26012025/01
Sampling Location	:	Bag Filter_5 MAV SAF	Sample Description	:	Bag Filter
Sample Collected / Submitted by	:	Lab Team	Protocol used for Sampling	:	CPCB Guideline
Quantity / No. of Sample	:	1Nos.	Analysis Started On	:	30/12/2025
Packing / Seal	:	Temp. Sealed	Analysis Completed On	:	05/01/2026
Environmental Condition during the test			Clear Sky		

Bag Filter Performance Report-5 MVA SAF

ZSr. No.	Parameter	Unit	Desing parameter	Operating Condition	Remarks/Observation
1	Bag Filter Chamber	Nos	06	05	Temporarily 1 chamber was not in line during monitoring period due to timer problem
2	Filter Bag in each Chamber	Nos	168	168	NA
3	Total Filter bags	Nos	1008	1008	NA
4	Filter bag design	-	Polyester Needle Felt	Polyester Needle Felt	NA
5	Filter bag dia	mm	150*4200	150*4200	NA
6	Cleaning system	-	Pulse Jet	Pulse Jet	NA
7	Solenoid valve	mm	40	40	NA

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TC-12780

8	Mode of operation DP/Timer	-	DP	Time	In all the bag filter chambers DP transmitter not working Bag filter is operating in time mode.
9	Solenoid valve in bag filter	Nos	84	70	01 chamber solenoid valves not in operation due to timer panel problem
10	Operating pressure	Kg/cm	5	5	-

***** Report continued*****

Checked By

Authorized Signatory

TEST REPORT

Report No.: AETRL/ BF-25012025/01			Date:		05/01/2026
Customer Name & Address	:	M/s Hira Ferro Alloys Limited (Unit - I) Plot No. 567/B, 568, 553/B, Urla Industrial Area, District – Raipur (C.G.)			
Date of Sample Collection	:	26/01/2025	Sampling Type	:	Isokinetic
Date of Sample Received	:	30/12/2025	Sample ID	:	BF-26012025/01
Sampling Location	:	Bag Filter_5 MAV SAF	Sample Description	:	Bag Filter
Sample Collected / Submitted by	:	Lab Team	Protocol used for Sampling	:	CPCB Guideline
Quantity / No. of Sample	:	1Nos.	Analysis Started On	:	30/12/2025
Packing / Seal	:	Temp. Sealed	Analysis Completed On	:	05/01/2026
Environmental Condition during the test			Clear Sky		

Bag Filter Performance Report-5 MVA SAF

Sr. No.	Parameter	Unit	Desing parameter	Operating Condition	Remarks/Observation
11	ID Fan Flow rate	Nm3	125000	85450	NA
12	ID Fan RPM	RPM	980	895	NA
13	Bag Filter outlet static Pressure	mmw	500	280	NA
14	Bag Filter inlet Static Pressure	mmw	-	62	Low suction pressure at bag filter inlet
15	Differential pressure (DP) across bag filter	mmw	120	187	Differential pressure higher side
16	Bag filter Inlet temp	Deg c	-	158	Design inlet temperature not available at site

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Annexure XV: Water Sprinkler Photographs

HIRA FERRO ALLOYS LIMITED UNIT I

PLOT NO. 567/B, 568, 553/B, URLA INDUSTRIAL COMPLEX, URLA RAIPUR CHHATTISGARH

WATER SPRINKLER PHOTOGRAPHS

HIRA FERRO ALLOYS LIMITED UNIT I

PLOT NO. 567/B, 568, 553/B, URLA INDUSTRIAL COMPLEX, URLA RAIPUR CHHATTISGARH

WATER SPRINKLER PHOTOGRAPHS

Annexure XVI: Action Plan for Pollution Control System

HIRA FERRO ALLOYS LIMITED

Plot No. 567/B, 568, 553/B, URLA INDUSTRIAL AREA, URLA RAIPUR CHHATTISGARH

ACTION PLAN FOR THE POLLUTION CONTROL SYSTEM TO ACHIEVE STACK EMISSIONS BELOW 30 Mg/Nm³

Improving the filtration capacity of a bag house (fabric filter) means gas flow handling without exceeding emission limits or causing high pressure drop. Below is some of the practical, plant-oriented checklist, commonly applied in Ferro-alloy units and other Furnaces.

1. Reduce Air-to-Cloth (A/C) Ratio.

Filtration capacity is directly linked to A/C ratio.

Actions:

- Increase number of bags
- Increase bag length (e.g., 4.5 m → 6 m)
- Add additional bag house compartment
- Reduce excess air ingress (false air)

Typical thumb rules:

- Pulse jet bag house: 1.0 – 1.5 m/min
- Reverse air (RABH) : 0.5 – 1.0 m/min
- Lower A/C ratio = higher effective capacity & lower emissions

2. Improve Bag Cleaning Efficiency

Poor cleaning causes choking → high DP → low capacity.

Optimize:

- Pulse pressure (Compressed Air) : 5–7 kg/cm²
- Pulse duration: 100–150 ms
- Cleaning sequence (row-wise, online)
- Cleaning based on ΔP control, not timer only

Check:

- Choked or blinded bags
- Solenoid valves & diaphragms
- Compressed air Pressure /moisture/oil

3. Upgrade Filter Media (Very Effective)

Older fabric limits capacity.

Upgrade options:

- Polyester → PTFE membrane bags
- Antistatic bags (for high resistivity dust)
- Higher GSM felt (550–600 GSM)

Benefits:

- Higher filtration velocity
- Lower pressure drop
- Better fine dust capture (<30 mg/Nm³)

4. Improve Gas Distribution inside Beg house

Uneven flow reduces usable cloth area.

Actions:

- Install / repair existing inlet baffles plates.
- Improve diffuser plates
- Seal hopper leakage
- Eliminate short-circuiting zones

5. Control Gas Temperature & Moisture

Moisture causes bag blinding.

Maintain:

- Gas temp 20–25°C above dew point
- Avoid cold air ingress inside the bag House.
- Insulate ducts, bag house & hopper

6. Reduce Dust Load at Baghouse Inlet

Lower inlet loading = higher capacity.

Methods:

- Improve cyclone efficiency upstream
- Reduce fuel fines
- Optimize combustion / furnace operation

7. Maintain Hopper & Dust Discharge System

Dust accumulation increases re-entrainment.

Ensure:

- Rotary valves / screw conveyors working
- No hopper choking
- Continuous ash evacuation

8. Improve Sealing & Reduce False Air

False air increases volume without filtration.

Check:

- Expansion joints
- Access doors
- Tube sheet leakage
- Damper seals

9. Operational & Monitoring Improvements

Continuous ΔP monitoring

Trend bag DP vs. time

IMPLEMENTATION FOR THE POLLUTION CONTROL SYSTEM TO ACHIEVE EMISSIONS BELOW 30 Mg/Nm³

To reduce bag house emissions from ~50 mg/Nm³ to ~30 mg/Nm³ without changing the air-to-cloth ratio, the most effective strategy usually lies in upgrading to more efficient filter media rather than just relying on conventional fabrics. With the same cloth area and airflow, the media type and surface characteristics strongly influence capture efficiency and hence emissions.

Standard needle-felt or woven fabrics depend on dust cake buildup for filtration. Fine particles — especially in the sub-10 µm range — are harder to collect on these fabrics, and emissions tend to be higher unless the media is enhanced. Advanced media with finer pore structure or surface membranes can hold dust on the surface rather than in the depth of the fabric, improving efficiency and lowering emissions with the same air-to-cloth ratio.

Recommended Fabric Media for Lower Emissions (≈30 mg/Nm³)

1. PTFE Membrane Laminated Fabrics (Best Upgrade)

A micro porous PTFE membrane bonded to the base felt provides surface filtration — dust stays on the surface, not inside the felt.

Benefit: Significantly higher fine-particle capture efficiency; many installations report emissions well below 30 mg/Nm³ and can even achieve <10 mg/Nm³ is possible with proper maintenance.

Upgrading existing polyester bags to PTFE membrane versions often yields the largest emission drop without changing system airflow or cloth area.

Improved capture of smaller particles compared to standard polyester.

✔ Cleaning mechanism: Pulsed jet cleaning works best with PTFE membranes due to reduced dust penetration.

Maintenance is critical:

Even the best media won't perform if pulse cleaning, pressure drop, or bag integrity are poor. Ensuring proper pulse timing and periodic inspection improves actual capture efficiency and stabilizes emissions.

Summary – Best Choice for 50 → 30 mg/Nm³

Technical specification of Bag Filters

S. No.	Description	Specification (5 MVA)	Specification (11 MVA)
1	Filtering Media	Polyester Needle felt	Polyester Needle felt

S. No.	Description	Specification (5 MVA)	Specification (11 MVA)
		non-woven filter bag	non-woven filter bag
2	No. Of Chamber	6	8
3	No. Of Bag Per Chamber	168	168
4	Total No. of Bags	1008	1344
5	Total Nos. Of Filter	1008	1344
6	Dia Of Filter Bag	150 mm	150 mm
7	Filter Bag Length	4200 mm	4000 mm
8	Filtering Area Per Bag	2014546 mm^2 / (2 m^2)	2014546 mm^2 / (2 m^2)
9	Total Filtering Area (Online)	1008 x 2 m^2	1344 x 2 m^2
10	Fan Capacity	125000 m^3/hrs	80,0000 m^3/Hrs x 2
11	Inlet Dust Load	2.6 gmNm^3	2.5 gm/Nm^3
12	Outlet Dust Load	< 50 mg/Nm^3	< 50 mg/Nm^3

Annexure XVII: Ground Water Monitoring

Advanced Environmental Testing And Research Lab P. Ltd.

CIN: U73100MP2002PTC015352 GSTIN: 23AAECA9188L1Z8

Approved: by Occupational Health &Safety Management (ISO45001:2018)
Approved: by National Accreditation Board for Testing and Calibration Laboratories
Approved: by Ministry of Environment, Forest and Climate Change (MoEF&CC)

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Web: www,aetrl.com

TC-12780

TEST REPORT

Report No.: AETRL/ GW-24122025/01			Date:		05/01/2026
Customer Name & Address	:	M/s Hira Ferro Alloys Limited (Unit- I) Plot No. 567/B, 568, 553/B, Urla Industrial Area, District – Raipur (C.G.)			
Date of Sample Collection	:	24/12/2025	Sampling Type		Grab
Date of Sample Received	:	30/12/2025	Sample ID	:	GW-24122025/01
Sampling Location	:	Borewell- 01	Sample Description	:	Ground Water
Sample Collected / Submitted by	:	Lab representative	Protocol used for Sampling	:	APHA 24th Edition
Quantity / No. of Sample	:	2Liter/1Nos.	Analysis Started On	:	30/12/2025
Packing / Seal	:	Temp. Sealed	Analysis Completed On	:	05/01/2026
Type of Container	:	Plastic Container	Environmental Condition	:	Clear sky

TEST RESULTS WASTEWATER

S. No.	Name of Test	Method of Test	Test Result	Units	Limits as per IS:2296
Chemical Testing					
Ground Water					
1	pH	IS:3025 (Part-11)-2022	7.49	-	8.5
2	Taste	IS:3025 (Part-8)- 2023	Agreeable	-	-
3	Odour	IS:3025 (Part-5)- 2018	Odourless	-	Odour/ Odourless
4	Colour	IS:3025 (Part-4)- 2021	BLQ (< 1.0)	Hazen	10.0 (Max.)
5	Turbidity	IS:3025 (Part-10)- 2023	BLQ (< 1.0)	NTU	1.0 (Max.)
6	Total Dissolved Solids	IS:3025 (Part-16)- 2023	772	mg/L	500.0 (Max.)
7	Calcium (as Ca)	IS:3025 (Part-40)-2024	118	mg/L	80.10 (Max.)
8	Free Residual Chlorine	IS 3025 (Part-26)-2021	BLQ (< 0.08)	mg/L	-
9	Chlorides (as Cl-)	IS:3025 (Part-32)-2019	16.0	mg/L	250.0 (Max.)
10	Magnesium (as Mg)	IS:3025 (Part-46)-2023	17.9	mg/L	24.28 (Max.)
11	Total Alkalinity	IS:3025 (Part-23)-2023	248	mg/L	-
12	Total Hardness (as CaCO3)	IS:3025 (Part-21)-2023	366	mg/L	300.0 (Max.)
13	Sulphate (as SO4)	IS:3025 (Part-24/Sec-1) 2022	85.8	mg/L	400.0 (Max.)
14	E. Coliform	IS : 15185:2016	Absent	Per 100 ml	Shall not detectable in any 100 ml sample
15	Total Coliform	IS : 15185:2016	Absent	Per 100 ml	Shall not detectable in any 100 ml sample

**** End of Report*****

Notes:

1. The results given above are related to the tested sample, as received & mentioned parameters. The customer asked for the above tests only.
2. Responsibility of the Laboratory is limited to the invoiced amount only.
3. This test report will not be generated again, either wholly or in part, without prior written permission of the laboratory.
4. This test report will not be used for any publicity/legal purpose.
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Advanced Environmental Testing And Research Lab P. Ltd.

CIN: U73100MP2002PTC015352 GSTIN: 23AAECA9188L1Z8

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Web: www,aetrl.com

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Authorized Signatory

TEST REPORT

Report No.: AETRL/ GW-24122025/02			Date:		05/01/2026
Customer Name & Address	:	M/s Hira Ferro Alloys Limited (Unit- I) Plot No. 567/B, 568, 553/B, Urla Industrial Area, District – Raipur (C.G.)			
Date of Sample Collection	:	24/12/2025	Sampling Type		Grab
Date of Sample Received	:	30/12/2025	Sample ID	:	GW-24122025/02
Sampling Location	:	Borewell- 02	Sample Description	:	Ground Water
Sample Collected / Submitted by	:	Lab representative	Protocol used for Sampling	:	APHA 24th Edition
Quantity / No. of Sample	:	2Liter/1Nos.	Analysis Started On	:	30/12/2025
Packing / Seal	:	Temp. Sealed	Analysis Completed On	:	05/01/2026
Type of Container	:	Plastic Container	Environmental Condition	:	Clear sky

TEST RESULTS WASTEWATER

S. No.	Name of Test	Method of Test	Test Result	Units	Limits as per IS:2296
Chemical Testing					
Ground Water					
1	pH	IS:3025 (Part-11)-2022	7.53	-	8.5
2	Taste	IS:3025 (Part-8)- 2023	Agreeable	-	-
3	Odour	IS:3025 (Part-5)- 2018	Odourless	-	Odour/ Odourless
4	Colour	IS:3025 (Part-4)- 2021	BLQ (< 1.0)	Hazen	10.0 (Max.)
5	Turbidity	IS:3025 (Part-10)- 2023	BLQ (< 1.0)	NTU	1.0 (Max.)
6	Total Dissolved Solids	IS:3025 (Part-16)- 2023	802	mg/L	500.0 (Max.)
7	Calcium (as Ca)	IS:3025 (Part-40)-2024	122	mg/L	80.10 (Max.)
8	Free Residual Chlorine	IS 3025 (Part-26)-2021	BLQ (< 0.08)	mg/L	-
9	Chlorides (as Cl-)	IS:3025 (Part-32)-2019	18	mg/L	250.0 (Max.)
10	Magnesium (as Mg)	IS:3025 (Part-46)-2023	18.3	mg/L	24.28 (Max.)
11	Total Alkalinity	IS:3025 (Part-23)-2023	248	mg/L	-
12	Total Hardness (as CaCO3)	IS:3025 (Part-21)-2023	366	mg/L	300.0 (Max.)
13	Sulphate (as SO4)	IS:3025 (Part-24/Sec-1) 2022	85.8	mg/L	400.0 (Max.)
14	E. Coliform	IS : 15185:2016	Absent	Per 100 ml	Shall not detectable in any 100 ml sample
15	Total Coliform	IS : 15185:2016	Absent	Per 100 ml	Shall not detectable in any

Notes:

1. The results given above are related to the tested sample, as received & mentioned parameters. The customer asked for the above tests only.
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Annexure XVIII: Noise Monitoring

Advanced Environmental Testing And Research Lab P. Ltd.

CIN: U73100MP2002PTC015352 GSTIN: 23AAECA9188L1Z8

Approved: by Occupational Health &Safety Management (ISO45001:2018)
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TC-12780

					100 ml sample

**** End of Report*****

Advanced Environmental Testing And Research Lab Private Limited Gwalior

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Authorized Signatory

TEST REPORT

Report No.: AETRL/ N-23122025/01			Date:		05/01/2026
Name & Address of Customer	:	M/s Hira Ferro Alloys Limited (Unit - I) Plot No. 567/B, 568, 553/B, Urla Industrial Area, District – Raipur (C.G.)			
Sample Collection Date	:	23/12/2025 to 24/12/2025	Sampling Type	:	NA
Sample Receipt Date	:	30/12/2025	Sample ID	:	N-23122025/01
Sampling Location	:	Ground Hopper Area	Sample Description	:	Ambient Noise Monitoring
Sample Collected/ Submitted by	:	Lab Representative	Protocol used for monitoring	:	IS 9989-2023
Analysis Started On	:	30/12/2025	Analysis Completed On	:	05/01/2026
Meteorological condition during monitoring	:	Clear Sky	Actual duration of Monitoring, (Hrs.)	:	24 Hrs.

TEST RESULTS AMBIENT NOISE

S. No.	Parameters	Test Method	Test Results		Units
			Day Time (6:00 am to 10:00 pm)	Nighttime (10:00 pm to 6:00 am)	
Discipline: Atmospheric Pollution					
1	Leq max.	IS-9989	61.8	46.2	dB (A)
2	Leq min.	IS-9989	52.1	39.1	dB (A)
3	Leq Day	IS-9989	57.0		dB (A)
4	Leq Night	IS-9989	42.2		dB (A)

Ambient Noise Quality Standards as per Noise Pollution (Regulation and control) Rules, 2000

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

Notes:

1. The results given above are related to the tested sample, as received & mentioned parameters. The customer asked for the above tests only.
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5. The test samples will be disposed off after two weeks from the date of issue of test report, unless until specified by the customer

Advanced Environmental Testing And Research Lab P. Ltd.

CIN: U73100MP2002PTC015352 GSTIN: 23AAECA9188L1Z8

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TEST REPORT

Report No.: AETRL/ N-23122025/02			Date:		05/01/2026
Name & Address of Customer	:	M/s Hira Ferro Alloys Limited (Unit - I) Plot No. 567/B, 568, 553/B, Urla Industrial Area, District – Raipur (C.G.)			
Sample Collection Date	:	23/12/2025 to 24/12/2025	Sampling Type	:	NA
Sample Receipt Date	:	30/12/2025	Sample ID	:	N-23122025/02
Sampling Location	:	Furnace Area	Sample Description	:	Ambient Noise Monitoring
Sample Collected/ Submitted by	:	Lab Representative	Protocol used for monitoring	:	IS 9989-2023
Analysis Started On	:	30/12/2025	Analysis Completed On	:	05/01/2026
Meteorological condition during monitoring	:	Clear Sky	Actual duration of Monitoring, (Hrs.)	:	24 Hrs.

TEST RESULTS AMBIENT NOISE

S. No.	Parameters	Test Method	Test Results		Units
			Day Time (6:00 am to 10:00 pm)	Nighttime (10:00 pm to 6:00 am)	
Discipline: Atmospheric Pollution					
1	Leq max.	IS-9989	66.7	49.0	dB (A)
2	Leq min.	IS-9989	53.8	41.4	dB (A)
3	Leq Day	IS-9989	60.9		dB (A)
4	Leq Night	IS-9989	45.6		dB (A)

Ambient Noise Quality Standards as per Noise Pollution (Regulation and control) Rules, 2000

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

Notes:

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TEST REPORT

Report No.: AETRL/ N-24122025/03			Date:		05/01/2026
Name & Address of Customer	:	M/s Hira Ferro Alloys Limited (Unit - I) Plot No. 567/B, 568, 553/B, Urla Industrial Area, District – Raipur (C.G.)			
Sample Collection Date	:	24/12/2025 to 25/12/2025	Sampling Type	:	NA
Sample Receipt Date	:	30/12/2025	Sample ID	:	N-24122025/03
Sampling Location	:	Near CHP Area	Sample Description	:	Ambient Noise Monitoring
Sample Collected/ Submitted by	:	Lab Representative	Protocol used for monitoring	:	IS 9989-2023
Analysis Started On	:	30/12/2025	Analysis Completed On	:	05/01/2026
Meteorological condition during monitoring	:	Clear Sky	Actual duration of Monitoring, (Hrs.)	:	24 Hrs.

TEST RESULTS AMBIENT NOISE

S. No.	Parameters	Test Method	Test Results		Units
			Day Time (6:00 am to 10:00 pm)	Nighttime (10:00 pm to 6:00 am)	
Discipline: Atmospheric Pollution					
1	Leq max.	IS-9989	64.2	50.2	dB (A)
2	Leq min.	IS-9989	54.4	44.2	dB (A)
3	Leq Day	IS-9989	60.9		dB (A)
4	Leq Night	IS-9989	46.6		dB (A)

Ambient Noise Quality Standards as per Noise Pollution (Regulation and control) Rules, 2000

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

Notes:

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TEST REPORT

Report No.: AETRL/ N-24122025/04			Date:		05/01/2026
Name & Address of Customer	:	M/s Hira Ferro Alloys Limited (Unit - I) Plot No. 567/B, 568, 553/B, Urla Industrial Area, District – Raipur (C.G.)			
Sample Collection Date	:	24/12/2025 to 25/12/2025	Sampling Type	:	NA
Sample Receipt Date	:	30/12/2025	Sample ID	:	N-24122025/04
Sampling Location	:	Near Admin Building	Sample Description	:	Ambient Noise Monitoring
Sample Collected/ Submitted by	:	Lab Representative	Protocol used for monitoring	:	IS 9989-2023
Analysis Started On	:	30/12/2025	Analysis Completed On	:	05/01/2026
Meteorological condition during monitoring	:	Clear Sky	Actual duration of Monitoring, (Hrs.)	:	24 Hrs.

TEST RESULTS AMBIENT NOISE

S. No.	Parameters	Test Method	Test Results		Units
			Day Time (6:00 am to 10:00 pm)	Nighttime (10:00 pm to 6:00 am)	
Discipline: Atmospheric Pollution					
1	Leq max.	IS-9989	57.8	47.6	dB (A)
2	Leq min.	IS-9989	42.8	41.2	dB (A)
3	Leq Day	IS-9989	53.6		dB (A)
4	Leq Night	IS-9989	43.9		dB (A)

Ambient Noise Quality Standards as per Noise Pollution (Regulation and control) Rules, 2000

Area Code	Category of Area/Zone	Limits in dB (A) Leq*	
		Day Time	Nighttime
A	Industrial area	75	70
B	Commercial area	65	55
C	Residential area	55	45

Notes:

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D	Silence zone	50	40

***** End of Report*****

Checked By

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TEST REPORT

Report No.: AETRL/ N-25122025/05			Date:		05/01/2026
Name & Address of Customer	:	M/s Hira Ferro Alloys Limited (Unit - I) Plot No. 567/B, 568, 553/B, Urla Industrial Area, District – Raipur (C.G.)			
Sample Collection Date	:	25/12/2025 to 26/12/2025	Sampling Type	:	NA
Sample Receipt Date	:	30/12/2025	Sample ID	:	N-25122025/05
Sampling Location	:	Near Store	Sample Description	:	Ambient Noise Monitoring
Sample Collected/ Submitted by	:	Lab Representative	Protocol used for monitoring	:	IS 9989-2023
Analysis Started On	:	30/12/2025	Analysis Completed On	:	05/01/2026
Meteorological condition during monitoring	:	Clear Sky	Actual duration of Monitoring, (Hrs.)	:	24 Hrs.

TEST RESULTS AMBIENT NOISE

S. No.	Parameters	Test Method	Test Results		Units
			Day Time (6:00 am to 10:00 pm)	Nighttime (10:00 pm to 6:00 am)	
Discipline: Atmospheric Pollution					
1	Leq max.	IS-9989	56.4	48.2	dB (A)
2	Leq min.	IS-9989	41.2	40.6	dB (A)
3	Leq Day	IS-9989	52.4		dB (A)
4	Leq Night	IS-9989	43.2		dB (A)

Ambient Noise Quality Standards as per Noise Pollution (Regulation and control) Rules, 2000

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

Notes:

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Advanced Environmental Testing And Research Lab P. Ltd.

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Authorized Signatory

TEST REPORT

Report No.: AETRL/ N-25122025/06			Date:		05/01/2026
Name & Address of Customer	:	M/s Hira Ferro Alloys Limited (Unit - I) Plot No. 567/B, 568, 553/B, Urla Industrial Area, District – Raipur (C.G.)			
Sample Collection Date	:	25/12/2025 to 26/12/2025	Sampling Type	:	NA
Sample Receipt Date	:	30/12/2025	Sample ID	:	N-25122025/06
Sampling Location	:	Near time office	Sample Description	:	Ambient Noise Monitoring
Sample Collected/ Submitted by	:	Lab Representative	Protocol used for monitoring	:	IS 9989-2023
Analysis Started On	:	30/12/2025	Analysis Completed On	:	05/01/2026
Meteorological condition during monitoring	:	Clear Sky	Actual duration of Monitoring, (Hrs.)	:	24 Hrs.

TEST RESULTS AMBIENT NOISE

S. No.	Parameters	Test Method	Test Results		Units
			Day Time (6:00 am to 10:00 pm)	Nighttime (10:00 pm to 6:00 am)	
Discipline: Atmospheric Pollution					
1	Leq max.	IS-9989	58.4	46.8	dB (A)
2	Leq min.	IS-9989	43.1	42.5	dB (A)
3	Leq Day	IS-9989	54.2		dB (A)
4	Leq Night	IS-9989	43.0		dB (A)

Ambient Noise Quality Standards as per Noise Pollution (Regulation and control) Rules, 2000

Area Code	Category of Area/Zone	Limits in dB (A) Leq*	
		Day Time	Nighttime
A	Industrial area	75	70
B	Commercial area	65	55
C	Residential area	55	45

Notes:

1. The results given above are related to the tested sample, as received & mentioned parameters. The customer asked for the above tests only.
2. Responsibility of the Laboratory is limited to the invoiced amount only.
3. This test report will not be generated again, either wholly or in part, without prior written permission of the laboratory.
4. This test report will not be used for any publicity/legal purpose.
5. The test samples will be disposed off after two weeks from the date of issue of test report, unless until specified by the customer

Annexure XIX: Waste Oil Storage

HIRA FERRO ALLOYS LIMITED UNIT I

PLOT NO. 567/B, 568, 553/B, URLA INDUSTRIAL COMPLEX, URLA RAIPUR CHHATTISGARH

WASTE OIL STORAGE AREA PHOTOGRAPHS

Annexure XX: E-waste Agreement

SERVICES AGREEMENT(MUI)

THIS SERVICES AGREEMENT (The "Agreement") is entered in to this 14/07/2023, by and between

M/s STAR E PROCESSORS having consent from Chhattisgarh Pollution Control Board as Recycler baring Authorized No,216/ HO/ E-Waste/ CECB/ 2023, having its principal place of business at Kh. No. 1273, Pehchan No. 75/10/22, Mandir Hasaud, Arang, Raipur, Chhattisgarh 492101 baring GST No. 22ADKFS8428B1Z6. Herein, after termed as RECYCLER.

And

M/s HIRA FERRO ALLOYS LIMITED, plot No. 491/1, 492/2,491/2, urla Industrial Area Complex Unit-II, Urla, Raipur, Raipur, Chhattisgarh, 492003 22AAACH5697M2Z6

WHEREAS, the Recycler desires to contract with Seller to sale the recyclable material such as Electronic Waste, in accordance with terms of this Agreement.

NOW THEREFORE, in consideration of the above Recitals, which are hereby incorporated into the below Agreement, and in consideration of the mutual promises made herein,

1. Scope. Recycler agrees to purchase Material from Seller from time to time. Recycler acknowledges that the Services performed under this Agreement will be done using Recycler own equipment at Manufacturer's place of business. There is no compulsion for Recycler to accept the material which is offered to him. The recycler holds the right to reject the material. Recycler agrees to dispose the E-Waste safely as per CECB norms. Recycler will also issue certificate declaring the safe disposal of E-Waste collated from Seller site.

2. Compensation. For supply of every consignment the Recycler shall pay Seller for the material supplied as per the rate mutually agreed at that time. The Seller will submit invoice, which will describe the material supplied pursuant to this Agreement. Invoices will be reviewed by Recycler and make the payment for the same within 15 days from the date of receipt of Invoice. Value of the material will be decided based on market value at the time of sale of material.

3. All components and materials to be transported are packed appropriately:

(1) Considering the risk, they could pose during transportation to health, safety or the environment.
(2) To the level of care warranted by its intended use-
(3) Transporters meet the legal requirements under Motor Vehicles Act-2019 to transport the components and materials

4. Term. The term of this Agreemnt shall be from 14/07/2023 to 13/07/2027. The Agreement may be terminated through the termination provisions provided herein.

Office Address: 307, Avior, Nirmal Galaxy, LBS Marg, Mulund West, Mumbai – 400080. Ph: +91 22 67255080 / 81 / 82 /83
Plant Address: Plot No 1273 , Village Baktara. P.O . Godi., Tashil Arang., Dist. Raipur - 492101., Chhattisgarh
Website : www.stareprocessors.com | **Email Id :** stareprocessors@gmail.com | **Toll Free No. :** 1800 891 7656

5. Termination. Recycler and Seller may terminate this Agreement at any time by giving the other party written notice of not less than sixty (60) days.

IN WITNESS WHEREOF, the parties have caused their duly authorized representatives to sign this **SERVICES AGREEMENT** as of the date first written above.

M/s STAR E PROCESSORS **M/s HIRA FERRO ALLOYS LIMITED**

By: RISHI TANDON

STAR E PROCESSORS

Partner

HIRA FERRO ALLOYS LTD. URLA RAIPUR

Authorized signatory

Annexure XXI: Health Hygiene Report

INDUSTRIAL HYGIENE SURVEY

at

HIRA FERRO ALLOY LIMITED – UNIT 1
Plot No. 567/B, 568, 553/B, URLA INDUSTRIAL AREA
URLA, DIST – RAIPUR CHHATTISGAHR

7th MARCH 2025

Survey conducted
by
Arvind Industrial Hygiene
Consultancy
Raipur [C.G.]

Arvind Industrial Hygiene Consultancy

Ref. No- Arvind Ind. Hygiene/2025/46 **Date: -7-03-2025**

To,
HOD, Safety
Hira Ferro Alloys Ltd. (Unit–I)
PlotNo.567/B,568,553/B, Urla Industrial Area
District- Raipur, Chhattisgarh- 492003
Urla Industrial Complex
Raipur - 492003

Sub–Industrial Hygiene Survey at Hira Ferro Alloys Limited, Unit-1.

Reference –Ferro /24-25/SO/0687 dated 26.02.2025

Dear Sir,

With reference to the above an Industrial hygiene survey was conducted at different locations of Hira Ferro Alloys Limited (Unit – I) area on 7th March 2025.The survey work was coordinated by Mr. Shivraj Verma, Safety Officer from Safety department. Please find a report of the survey for your information and necessary action.

Arvind Industrial Hygiene Consultancy
Director

Dr. A.K. Verma, M.Sc. Ph.D.
Director & Competent Person Under CG Govt.
Arvind Industrial Hygiene Consultancy, Raipur (C.G.)

Arvind Industrial Hygiene Consultancy
Raipur
(C.G.)
C-19, Tagore Nagar

STUDY FINDINGS – AT A GLANCE

HAZARD	NO. OF SAMPLES	EXCEEDED TLV
Respirable Dust (P)	03	00
Noise (P)	02	00
Noise (A)	04	01
Heat Stress	02	00
Walking Illumination	03	00
Total	14	(7%) 01

(P) - PERSONAL SAMPLING
Overall, 7% deviation from the TLV data in the current survey.

HIRA FERROALLOYS LIMITED (Unit –I)

Introduction - Hira Ferro Alloys Limited (HFAL) is a certified ISO 9001:2015, ISO 14001:2015, ISO 45001company of Hira Group which is one of the leading business conglomerates in the state of Chhattisgarh. The group is one of the largest groups of Chhattisgarh with predominant interest in power generation, sponge iron, steel making, steel rolled products, Ferro alloys and coal and iron ore mining and cement manufacture. The group has vast experience in Ferro Alloys & Steel making projects among other products.

Hira Ferro Alloys Limited (Unit – I) has an operational Ferro alloy manufacturing unit located at Plot No. 567/B, 568, 553/B, Urla Industrial Area, District-Raipur, Chhattisgarh. The industry currently manufactures Ferro Alloys (Silico Manganese/Ferro Manganese) having a total capacity of 10,500 TPA. The total plant area is 9851.30 (0.98513 Ha.). The unit has one Submerged Arc Furnace (SAF) having capacity of 5 MVA.

The process of Ferro alloys production comes under Hazardous process as per the factory act 1948 amended in 1987. Monitoring of these contaminants by approved method and keeping Their concentration within TLV in the working environment is mandatory to comply the section 87 & 41F of the factory act. The process of ferro alloy production generates dust, heat stress, fumes & noise in the working environment. These occupational health hazards may cause adverse health effect among employees during prolong exposure if proper control measures are not implemented at the work place.

The plant is working under the flagship of Hira group of industries having other units of power and steel also. In HFAL Unit - I there are 32 regular employees and 25 contractual workers working at different sections of the plant. The plant is certified with ISO 9001, ISO 14001, ISO 45001 management system for assuring best possible occupational health and environment conditions inside the plant.

The industrial hygiene survey was conducted at the various identified locations of the plant. This survey provides input for the assessment of occupational health risk among the workers, which may help subsequently for taking control measures in the work place. The data collected is useful to correlate the health of employees with their occupation, improvement of working environment and work to become conducive to safety and health.

In the plant the shop floor layout including housekeeping, safety signage's displayed at various locations, were appreciable. The spacious and open lands caping inside the plant covering with greenery was also very much appreciable from environment point of view.

Objective-The objective of this study was to monitor and to assess the level of dust, noise, Heat stress & Illumination in the different locations of the plant and to suggest remedial measures to make the environment congenial and conducive.

Technical information:

(a) **Threshold limit value**– TLVs refers to air borne concentration of substancesfor8 hrs. Work days to which nearby all workers maybe repeatedly exposed day after day without having any adverse health effect.

(b) **TWA**– The time weighted average concentration permit excursions above the limits, provided they are compensated by equivalent excursion below the limit during the work day.

(c) **Decibel db-** A unit used to express sound intensity. Minimum difference in loudness that is usually perceptible. The general relationship is L=10q/qo(dB). One decibel is one tenth of a bel and it is the preferred unit for noise measurement.

(d) **Sound pressure level Spl** – The level in decibel of a sound is 20 times the logarithm to the base 10 of the ratio of the pressure of this sound to the reference sound pressure. The unit gives idea about the effect of noise on ear drum.

(e) **Equivalent noise exposure Leq** – Equivalent exposure for extended period of time, provided there is no change in the noise because of the interference. It gives the assessment of noise dose as per ISO -1999, for hearing conservation purpose. Useful for calculating TLV/TWA for noise dose of exposed employees.

(f) **Sound emission level SEL** – The unit gives the assessment of noise intensity generating from the source or machine. The parameter is useful for adopting engineering control measures in the work place.

(g) **Personal monitoring** – Sampling of employees exposed to various pollutants by fixing sampler in the breathing zone.

(h) **ExposureTime**–The length of individual employee's exposure maybe limited as administrative control. There are shorter exposure times for higher sound levels.

Permitted noise exposure time or PT can be calculated for the measured sound level and it may be used as an administrative control measure to minimize the exposure level. PT can be calculated from the following formula PT $=8/2^{(L-90)/5}$

(i) **Respirable Dust (0.1 -5 micron)** – The dust of the above size sus [pended in the air for prolonged period of time and has a tendency to deposit in the alveoli chamber of the lungs. From naked eye one can see only the dust size of above 7 micron.

(g) Wet Bulb Globe Temperature (WBGT): It is the recognized index for monitoring dry & hot atmosphere in industry compliance with ISO Standard.

WBGT Index -Wet bulb globe temperature is an agreed international standard (ISO-7243) on heat stress which was published in 1982, and accepted by most of the countries in the world. Its TLVs have been established by American Conference of Government and Industrial Hygienist (ACGIH). This index is being used for judgment of the severity of thermal environment and the risk for heat causalities. The combination that was best related to the human response was found to be: WBGT= 0.7tnw + 0.2tq + 0.1tdb

Tnw-Natural wet bulb temp, tg -Globe temp, tdb -Dry bulb temp. This is the best index to be used in conjunction with Air velocity and Relative humidity (RH %) or vapor pressure at NTP.

What is HEAT STRESS Heat may occur in environment with high air temperature, high thermal radiations like Foundries, Smelter, refineries, Steel plant, Ceramic factories & high level of humidity for example Rotary kiln boiler turbines & laundries or at work place where high activity level (Increasing metabolic rate) are needed. When heat stress from the thermal environment is imposed on the human body, there will be resulting strain in the body. This may result in physiological reactions such as increased skin temperature, sweat productions, increased heart rate and higher core temperature. Under severe conditions the strain may attain such a magnitude as to cause health impairment & death.

The heat stress imposed on the body by a certain environment is often evaluated by a heat stress index which by a single value combines the influence of one or more of the environmental factors as air temperature, mean radiant temperature, air velocity, relative humidity, activity & clothing. WBGT index is the most commonly used

internationally standardized index for monitoring heat stress in hot & dry environment. Some other index is CET, P4SR, ET etc. In India although there is a reference of many studies mentioned above on measurement of Heat Stress in various Industries, but there is a few (finger counted) study published on the health effect of heat stress (heat strain) National Institute of OH, Ahmedabad Anjali Naget.al have published a study on effect of heat stress in Am. Ind. Hygiene. Asso. Journal. The purpose of this present study was to monitor Heat Stress in the identified locations of the plant and to suggest preventive & control measures to reduce the heat stress in the work place.

Heat Exchange & Heat Balance-

The heat stress on the human body results from two types of heat load

External Heat-Environmental heat

Internal Heat-Metabolic heat

External heat load results basically from Mechanism of conduction, convection and radiation internal heat generated from human body due to intra cellular oxidative process (metabolism) which is combination of heat generated by the basal metabolism and resulting from physical activity. In order to maintain the internal thermal balance, the metabolic heat load must be dissipated and this can be achieved through conduction, convections & radiation, (depending on the environment conditions) the body may gain or loss heat through this mechanism. The evaporation of 1 ltr. of sweat removes 580 kcal heats from the body, to the surrounding environment

Heat Balance Heat exchanges between the human body & its environment follow certain physical laws & can be expressed by the following equation.

Heat Gain Heat loss.

M+-W plus/minus C*d plus /minus C*v plus /minus R- E=0

M-Metabolic rate, W -Heat| gain due to work, Cd –conduction Cv- convecliorusi R-Radiation, E - E Evaporation

The amount of heat gain by the body of the exposed worker should be lost by the evaporation, so that heat stress is not caused.

Material & Methods - Monitoring of various health hazards was carried out by measuring the factors present in the environment through sampling. The survey was conducted at various locations identified after interaction with the safety department of the plant. The instruments used were portable and battery operated with direct reading LCD display type. Different physical & chemical hazards were monitored by using area sampling and personal sampling techniques. The identification of the exposed employees were done on the basis of data collection, its analysis and comparison with threshold limit values of respective hazards.

Respirable Dust-The respirable dust concentration was monitored with the help of Personal air sampler (APEX II Casella London Make). The instrument was attached in the working locations of the plant. Air containing respirable dust was drawn through the sampling head (Cyclone 225-8-01) at the rate of 2.2 ltr./mts. Suction is provided by a pump driven by a D.C. motor from are chargeable Ni MH battery which lasts up to 10 hrs. The breathing zone samples were collected during the normal working hours. of the individual. The instrument was removed after 8hrs. and dust concentration was calculated on the basis of weight difference of the filter paper (PVC Membrane filter 37 mm dia). The internationally approved NIOSHmethod0600 was used to evaluate the dust concentration in mg/m^3 of air.

Noise - Noise level measurement was done with the help of sound level meter type 62 X Casella London make. Parameters like Spl, Leq and SEL were recorded near the different machines following the OSHA guidelines for noise sampling (1 mtr. away from the machine and at the place where worker is sitting during the duty hrs.). Area of maximum noise and safe zone were identified using noise mapping technique. Removed to assess their actual exposure.

Heat Stress - Heat stress was measured in terms of wet bulb globe temperature (WBGT) which is the ISO recognized scale for measurement of heat stress in dry and hot atmosphere. The instrument WBGT heat stress monitor was used for this purpose. Heat stress was measured in the area where workers may at times be exposed to radiant/convective heat. Mean WBGT and relative humidity with air velocity was evaluated using Anemometer. The data collected was compared with the threshold limit value of the respective hazards. Some of the important aspect like use of PPEs, exposure pattern of the workers, ventilation and lighting system was also recorded during survey. Relative humidity on the furnace floor was measured by using whirling psychomotor.

Illumination - Illumination measurement was done with lux meter which gives assessment of brightness in the unit area of work place in lux. The degree of safety with which a task is performed depends in large part on the quality of illumination and on visual capacities The visibility of an object can be altered in many ways. One of the most important factors is the contrast of the luminance's due to reflection factors, to shadows or to color of the object itself and to the reflection factors of the color. What the eye really perceives are the differences of luminance between an object and its surroundings. In the night illumination is mostly influenced by the air density, environmental contaminations and quality of lamps Human eye can accommodate wavelength of 380-760 nm. Illumination survey was conducted in the work place after the sunset, when there was no contribution of day light factor. The lighting system General lighting, localized lighting and local lighting were taken into the consideration during survey. The data collected was compared with the reference values adopted by IFA. These values are also applicable under the factory act.

OBSERVATIONS:

Table-1
Respirable Dust Personal Sampling Instrument Used – Casella Apex 2 IS Plus, Serial no. 4914858 Calibration date – 20.11.2024

S.N	Name	Designation	Location	Conc. Mg/m3	TLV Mg/m3
1.	Bhuwan lal Sonvani	Crane Operator	Furnace floor	1.20	3
2.	Vinod Verma	Shift in-charge	Furnace Area	0.87	3
3.	Bhupesh Sahu	Operator	Furnace	2.7 (Metal Fume)	5

TLV Metal Fume5 mg/m3, Mineral dust3 mg/m^3

Table-2
Noise Personal Sampling, Noise Dosimeter, Instrument Serial No.– Q -662236 Calibration date - 07.11.2024

S.N	Name	Designation	Location	Noise Leq	TLV dB
1.	Rajesh Yadav	Operator	Compressor House	84	85
2.	Pramod Tiwari	Sift In-charge	Furnace Area	81	85

*IFA Guidelines same as OHSA – 85 dB (A) for 8 hrs.
In the above location human exposure is Max. 10-20 min. However, they are strictly regular using Ear plugs in High noise area, NRR:29 dB ,11dB adjusted to each data, provided workers using ear plugs.

Table-3
Noise level survey (Area sampling), Instrument– SL -4022, Calibration 7.11.24 Acoustic Calibrator 120/1, ANSI – S1. 40-2006

S.N	Location	Noise dB(A) SpL	Noise dB(A) Leq	Noise dB(A) SEL	TLV dB(A)
1.	Furnace floor 5 MVA	83	81	87	85
2.	Inside control room	74	72	77	85
3.	Compressor room. PV 01,02	**87**	85	91	85
4.	Mechanical workshop	78	76	80	85

Table-4
Heat Stress Measurement Instrument– WBGT Monitor Leutron, Mode HT -30, Calibration date 7.11.2024

S.N	Location	D	W	Radiant Heat^{0}C	WBGT	% Excess	TLV
1.	Furnace floor 5 MVA	39	19	40	25.0	NIL	29.5
2.	Workers Rest place	32	18	37	23.7	NIL	29.5

*Air velocity (mean) –Turbine Hall– Air velocity >1.5 m/Sec.
Relative Humidity 46 – 49 %, Oxygen 20.9%. TLV Reference 50% work /Rest basis.

Table – 5
Illumination level Lux Meter Leutron Model LX 103, R Range 0 - 50,000 Lux, Calibration date 16.1.2024

S. N.	Location	Lux	Requirement lux IFA
1.	Inside furnace control room	250	32
2.	Workshop Lathe m/c area	160	32
3.	All along furnace floor	85	32

Results & Discussion– The study was conducted in the selected locations of the plant. The area of furnace floor, workshop, compressor room were covered in the study .There are only one furnace of 5 MVA was operating at the time of study.

The plant having all the pollution control system working properly on the place. The process of various section is being controlled from centralized control room Worker's exposure were found to be negligible in the field area.

Respirable Dust – Respirable dust exposure measurement was done at 2 locations and all found to be within TLV norms. (table 1)

Noise– Noise level area sampling was done at 4 locations, out of that noise level was observed above TLV inside the compressor room. Personal exposure was assessed for 2 employees of furnace floor and compressor area and found to be within TLV. Compressor operator has to visit time to time in the compressor room, his exposure is not continuous for 8 hrs. Rest of the samples were found within TLV. (Table 2& 3).

Heat Stress -Heat stress in terms of mean WBGT was measures at 2 locations and found to be TLV norms. Heat related precautions like protective coat Goggle, drinking water facilities being Provided at the work place. (table4)

Illumination – Illumination survey was conducted at 3 locations light intensity at all the locations were found to be adequate and as per the norms of IFA. (table 5).

Recommendations–

1. Use of ear plug while entering inside the compressor room. Use of approved dust mask to be ensured at furnace floor.
2. Light intensity to be improved inside furnace control room.
3. PPEs (Dust mask, hand gloves and safety shoes) to be ensured for the workers at the work place

Arvind Industrial Hygiene Consultancy
Director

Dr. A. K. Verma, M.Sc. Ph.D.
Director & Competent Person under CG Govt.
Arvind Industrial Hygiene Consultancy, Raipur (C.G.)

Arvind Industrial Hygiene Consultancy
Raipur (C.G.)
C-19, Tagore Nagar

Pump (1)

www.casellasolutions.com

CASELLA
A DIVISION OF TSI

Certificate of Conformity and Calibration

Instrument Type Apex2Plus I.S Personal Sampling Pump
Serial Number 4914858
Firmware Version 209.087.16.00

Applicable standards:-

ISO 13137: 2013- Workplace Atmospheres: Pumps for Personal Sampling of Chemical and Biological Agents

Test Conditions:-

Temperature	22	°C
Humidity	40	%RH
Pressure	998	mBar

Test Engineer:- Ghanshyam Kumar

Date of Issue:- 20/11/2024
Due Date :- 19/11/2025

Equipment Used

Air Flow Calibrator:
Type: BGI Challenger **Serial Number:** EQ11364

Declaration of conformity

This test certificate confirms that the instrument specified above has been successfully tested to comply with the manufacturer's published specifications.

Tests are performed using equipment traceable to national standards in accordance with Casella's ISO 9001:2015 quality procedures.
This product is certified as being compliant to the requirements of the CE Directive.

Test and Calibration Results :-

General tests

Item	*Measured value*	*Lower Limit*	*Upper Limit*	*Status*
Pump temperature (°C)	29.6	0	45	Pass
Battery voltage - CELL1 (V)	4.1	3.6	4.2	Pass
Battery voltage - CELL2 (V)	4.0	3.6	4.2	Pass
General hardware	N/A	N/A	N/A	Pass
Bluetooth communication	N/A	N/A	N/A	Pass

General tests All Tests Pass

Flow rate accuracy

Set flow point (litres/min)	*Measured flow rate (litres/min)*	*Error (%)*	*Error Limits (%)*		*Status*
			Min	*Max*	
5.00	4.90	-2.00%	-5%	5%	Pass
4.00	4.00	0.00%	-5%	5%	Pass
3.00	3.00	0.00%	-5%	5%	Pass
2.00	2.05	2.50%	-5%	5%	Pass

Flow rate accuracy All Tests Pass

Flow control accuracy

Set flow point (litres/min)	Inlet pressure loading (cm H_2O)	*Measured flow rate (litres/min)*	*Error (%)*	*Error Limits (%)*		*Status*
				Min	*Max*	
2.00	0	1.96	Ref.	Ref.	Ref.	Ref.
2.00	41	1.96	-2.05%	-5%	5%	Pass

Flow control accuracy All Tests Pass

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Tested to Apex2 test sheet TP525 revision 11-00

Pump -(2)

www.casellasolutions.com

CASELLA
A DIVISION OF TSI

Certificate of Conformity and Calibration

Instrument Type Apex2Plus I.S Personal Sampling Pump
Serial Number 4021886
Firmware Version 209.087.16.00

Applicable standards:-

ISO 13137: 2013- Workplace Atmospheres: Pumps for Personal Sampling of Chemical and Biological Agents

Test Conditions:-

Temperature	22	°C
Humidity	40	%RH
Pressure	998	mBar

Test Engineer:- Ghanshyam Kumar

Date of Issue:- 20/11/2024
Due Date :- 19/11/2025

Equipment Used

Air Flow Calibrator:
Type: BGI Challenger **Serial Number:** EQ11364

Declaration of conformity

This test certificate confirms that the instrument specified above has been successfully tested to comply with the manufacturer's published specifications.

Tests are performed using equipment traceable to national standards in accordance with Casella's ISO 9001:2015 quality procedures.
This product is certified as being compliant to the requirements of the CE Directive.

Test and Calibration Results :-

General tests

Item	Measured value	Lower Limit	Upper Limit	Status
Pump temperature (°C)	29.5	0	45	Pass
Battery voltage - CELL1 (V)	4.0	3.6	4.2	Pass
Battery voltage - CELL2 (V)	3.9	3.6	4.2	Pass
General hardware	N/A	N/A	N/A	Pass
Bluetooth communication	N/A	N/A	N/A	Pass

General tests All Tests Pass

Flow rate accuracy

Set flow point (litres/min)	Measured flow rate (litres/min)	Error (%)	Error Limits (%)		Status
			Min	Max	
5.00	4.88	-2.40%	-5%	5%	Pass
4.00	3.98	-0.50%	-5%	5%	Pass
3.00	3.05	1.67%	-5%	5%	Pass
2.00	1.99	-0.50%	-5%	5%	Pass

Flow rate accuracy All Tests Pass

Flow control accuracy

Set flow point (litres/min)	Inlet pressure loading (cm H_2O)	Measured flow rate (litres/min)	Error (%)	Error Limits (%)		Status
				Min	Max	
2.00	9	1.96	Ref.	Ref.	Ref.	Ref.
2.00	41	1.96	-2.05%	-5%	5%	Pass

Flow control accuracy All Tests Pass

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Tel: +91 9560079584
E-mail:ghanshyam_singh@tsi.com

Tested to Apex2 test sheet TP525 revision 11-00

Pump (8)

www.casellasolutions.com

CASELLA
A DIVISION OF TSI

Certificate of Conformity and Calibration

Instrument Type Apex2Std. I.S Personal Sampling Pump
Serial Number 1414952
Firmware Version 209.087.16.00

Applicable standards:-

ISO 13137: 2013- Workplace Atmospheres: Pumps for Personal Sampling of Chemical and Biological Agents

Test Conditions:-

Temperature	22	°C
Humidity	48	%RH
Pressure	998	mBar

Test Engineer:- Ghanshyam Kumar

Date of Issue:- 20/11/2024
Due Date :- 19/11/2025

Equipment Used

Air Flow Calibrator:
Type: BGI Challenger **Serial Number:** EQ11364

Declaration of conformity

This test certificate confirms that the instrument specified above has been successfully tested to comply with the manufacturer's *published specifications*.

Tests are performed using equipment traceable to national standards in accordance with Casella's ISO 9001:2015 quality procedures.
This product is certified as being compliant to the requirements of the CE Directive.

Test and Calibration Results :-

General tests

Item	*Measured value*	*Lower Limit*	*Upper Limit*	*Status*
Pump temperature (°C)	29.7	0	45	Pass
Battery voltage - CELL1 (V)	4.0	3.6	4.2	Pass
Battery voltage - CELL2 (V)	4.1	3.6	4.2	Pass
General hardware	N/A	N/A	N/A	Pass
Bluetooth communication	N/A	N/A	N/A	Pass

General tests All Tests Pass

Flow rate accuracy

Set flow point (litres/min)	*Measured flow rate (litres/min)*	*Error (%)*	*Error Limits (%)*		*Status*
			Min	*Max*	
5.00	4.93	-2.00%	-5%	5%	Pass
4.00	4.03	0.00%	-5%	5%	Pass
3.00	3.03	0.00%	-5%	5%	Pass
2.00	2.05	2.50%	-5%	5%	Pass

Flow rate accuracy All Tests Pass

Flow control accuracy

Set flow point (litres/min)	Inlet pressure loading (cm H_2O)	*Measured flow rate (litres/min)*	*Error (%)*	*Error Limits (%)*		*Status*
				Min	*Max*	
2.00	9	1.96	Ref.	Ref.	Ref.	Ref.
2.00	41	1.96	-2.05%	-5%	5%	Pass

Flow control accuracy All Tests Pass

Casella UK
Regent House, Wolseley Road,
Kempston, Bedford
MK42 7JY
United Kingdom
Tel: +44 (0) 1234 844100
E-mail: info@casellasolutions.com

Casella C/o TSI Incorporated
500 Cardigan Road
Shoreview
MN 55126
USA
Tel: +1 651-490-2860
E-mail: Answers@tsi.com

Casella India
TSI Instruments India Pvt Ltd.
Office no 1203, 12th floor,
Eros corporate park, IMT,
Manesar, Sector2, Gurugram,
Haryana 122050, India
Tel: +91 9560075994
E-mail ghanshyam.singh@tsi.com

Tested to Apex2 test sheet TPS25 revision 11-00

Quality Solutions Industries Pvt. Ltd.
(Formerly Known As Quality Solutions India)
AN ISO 9001-2015 REGISTERED
Since-1998
Integral Certification (P) Ltd.

CALIBRATION CERTIFICATE

Date of Issue	09-11-2024	**Certificate No.**	QSI/2290/24/11
Date of Calibration	07-11-2024	**ULR Number**	CC271724000002290F
Suggested Due Date	06-11-2025	**SRF No. / Date**	2290 / 04-11-2024
Customer Details		**Calibrated At**	At Lab
M/s. Arvind Industrial Hygine Consultancy.		**Condition on Receipt**	Satisfactory
		Environmental Temperature	20° C ± 2° C
Add: C-19, Tagore Nagar, Raipur, Chhattisgarh.		**Relative Humidity**	50 ± 10 % RH
		Calibration Method	IS-15575 (PART 1)
		Calibration Procedure No.	QMP-25(WI-21M)

Details of Unit Under Calibration (UUC)

Name	**Noise Dosimeter**	**Model / Type**	----
Range	70 -130 dB	**Sr. No.**	----
Least Count	0.1 dB	**ID No.**	**Q662236**
Make	Lutron	**Location**	----

Details of Standard Used

Instrument Name	Certificate No	Valid Upto	Calibrated By
Sound Level Calibrator	ME08107	18.08.2025	NABL LAB CC-2864

Calibration Results

OBSERVATIONS A-Weighting @1kHz

Range-dB	STANDARD VALUE – dB	U.U.C VALUE - dB	± Expanded Uncertainty At approximately 95% Confidence Level- dB	coverage factor
70-130	94.18	93.7	1.37	k = 2
	113.92	113.7	1.37	k = 2

OBSERVATIONS C-Weighting @1kHz

Range-dB	STANDARD VALUE – dB	U.U.C VALUE - dB	± Expanded Uncertainty At approximately 95% Confidence Level- dB	coverage factor
70-130	94.18	94.3	1.37	k = 2
	113.92	114.4	1.37	k = 2

UUC:- Unit Under Calibration
Traceability of Standard(s) : The Standard Used for calibration is traceable to National Standards
Note : Acceptance Norms of CUSTOMER (As per Manufacturers Specification), Overall : ±3.5db @1kHz
The results of Instt. Meet with in above acceptance norms.
RESULT: Results of Instt. compliance to required specification (Acceptance Norms of CUSTOMER), Results Found : OK
Employee ID :- QS-012

Calibrated By
Shri Ram Dhiman
(Technical Executive)

Approved By
Ajay Kumar Singh
(Technical Manager)

NATIONAL AWARD WINNER

Address - Plot No: X-04, Sector-76, BPTP, Faridabad, 121 006 Haryana (INDIA)
Ph.: +91-129-4065432 Mobile : +91-9868069836, 9891912871 | E-mail :qsi_fbd@rediffmail.com, info@qsiglobal.in | Website : www.qualitysolutions.in

Quality Solutions Industries Pvt. Ltd.
(Formerly Known As Quality Solutions India)
ACCREDITED BY NABL (A Constituent Board of QCI, Deptt. of Industrial Policy & Promotion, Govt. of India)
ISO/IEC 17025:2017- ACCREDITED LABORATORY
Customer Connect with us
Since-1998

CALIBRATION CERTIFICATE

Date of Issue	09-11-2024	**Certificate No.**	QSI/2289/24/11
Date of Calibration	07-11-2024	**ULR Number**	CC271724000002289F
Suggested Due Date	06-11-2025	**SRF No. / Date**	2289 / 04-11-2024
Customer Details		**Calibrated At**	At Lab
M/s. Arvind Industrial Hygine Consultancy.		**Condition on Receipt**	Satisfactory
		Environmental Temperature	20° C ± 2° C
Add: C-19, Tagore Nagar, Raipur, Chhattisgarh.		**Relative Humidity**	50 ± 10 % RH
		Calibration Method	IS-15575 (PART 1)
		Calibration Procedure No.	QMP-25(WI-21M)

Details of Unit Under Calibration (UUC)

Name	**Sound Level Meter**	**Model / Type**	SL-4022
Range	30 -130 dB	**Sr. No.**	----
Least Count	0.1 dB	**ID No.**	**AIHC/SLM-01**
Make	Lutron	**Location**	----

Details of Standard Used

Instrument Name	Certificate No	Valid Upto	Calibrated By
Sound Level Calibrator	ME08107	18.08.2025	NABL LAB CC-2864

Calibration Results

OBSERVATIONS A-Weighting @1kHz

Range-dB	STANDARD VALUE – dB	U.U.C VALUE - dB	± Expanded Uncertainty At approximately 95% Confidence Level-dB	coverage factor
50-100	94.18	93.9	1.37	k = 2
80-130	94.18	93.9	1.37	k = 2
	113.92	113.9	1.37	k = 2

OBSERVATIONS C-Weighting @1kHz

Range-dB	STANDARD VALUE – dB	U.U.C VALUE - dB	± Expanded Uncertainty At approximately 95% Confidence Level-dB	coverage factor
50-100	94.18	94.1	1.37	k = 2
80-130	94.18	94.1	1.37	k = 2
	113.92	114.2	1.37	k = 2

UUC:- Unit Under Calibration
Traceability of Standard(s) : The Standard Used for calibration is traceable to National Standards
Note : Acceptance Norms of CUSTOMER (As per Manufacturers Specification), Overall : ±3.5db @1kHz
The results of Instt. Meet with in above acceptance norms.
RESULT: Results of Instt. compliance to required specification (Acceptance Norms of CUSTOMER), Results Found : OK
Employee ID :- QS-012

Calibrated By
Shri Ram Dhiman
(Technical Executive)

Approved By
Ajay Kumar Singh
(Technical Manager)

Address - Plot No: X-04, Sector-76, BPTP, Faridabad, 121 006 Haryana (INDIA)
Ph.: +91-129-4065432 Mobile : +91-9868069836, 9891912871 | E-mail :qsi_fbd@rediffmail.com, info@qsiglobal.in | Website : www.qualitysolutions.in

Quality Solutions Industries Pvt. Ltd.

(Formerly Known As Quality Solutions India)

AN ISO 9001-2015 REGISTERED

Customer Connect with us Since-1998

ICL Integral Certification (P) Ltd.

NATIONAL AWARD WINNER

CALIBRATION CERTIFICATE

Date of Issue	09-11-2024	**Certificate No.**	QSI/2293/24/11
Date of Calibration	07-11-2024	**ULR Number**	CC271724000002293F
Suggested Due Date	06-11-2025	**SRF No. / Date**	2293 / 05-11-2024
Customer Details		**Calibrated At**	At Lab
M/s. Arvind Industrial Hygine Consultancy.		**Condition on Receipt**	Satisfactory
		Environmental Temperature	24° C ±3° C
Add: C-19, Tagore Nagar, Raipur, Chhattisgarh.		**Relative Humidity**	50 ±10% RH
		Calibration Method	IS-5725/2480
		Calibration Procedure No.	QMP-25(WI-01) TH

Details of Unit Under Calibration (UUC)

Name	**Digital Heat Strees Meter**	**Model / Type**	HT-30 / ----
Range	0 to 50° C, 0 - 100% RH	**Sr. No.**	----
Least Count	0.1° C, 1% RH	**ID No.**	**AIHC/DHSM-01**
Make	Extech	**Location**	----

Details of Standard Used

Name	Certificate No.	Valid upto	Traceable to
Temperature & Humidity Meter with Sensor	L23112501-01	24.11.2024	NABL LAB CC-3172

Calibration Results

TEMP. @ 50% RH				% RH @25°C		
Sr. No.	U.U.C Value (°C)	Average Standard Value (°C)	Error (°C)	U.U.C Value (RH%)	Average Standard Value (RH%)	Error (RH%)
1	15.3	15.13	0.17	37	36.81	0.19
2	19.8	19.53	0.27	62	61.62	0.38
3	20.5	20.15	0.35	89	88.57	0.43
4	21.2	20.83	0.37			
5	30.6	30.13	0.47			
6	40.4	39.71	0.69			

UUC:- Unit Under Calibration
Temperature Scale : International Temperature Scale-1990
Measurement uncertainty is estimated at a level of confidence of approx. 95% with a coverage factor k=2 is ±1.32°C & ±2.45 % RH
Format no : F01(QMP-21) -7.8, Issue no/ Date: 01/ 01/11/2019, Revision no/Date: 00 / 01/11/2019
Employee ID :- QS-030

Calibrated By
Manoj Kumar
(Technical Executive)

NATIONAL AWARD WINNER

Approved By
Sushma Yadav
(Technical Manager)

Address - Plot No: X-04, Sector-76, BPTP, Faridabad, 121 006 Haryana (INDIA)
Ph.: +91-129-4065432 Mobile : +91-9868069836, 9891912871 | E-mail :qsi_fbd@rediffmail.com, info@qsiglobal.in | Website : www.qualitysolutions.in

CERTIFICATE

This is to Certify that the
Quality Management System
of

ARVIND INDUSTRIAL HYGIENE CONSULTANCY

C-19, TAGORE NAGAR, RIPUR- 492 001(C.G) INDIA

has been independently assessed and is compliant with the requirements of

ISO 9001:2015

This Certificate is applicable to the following product or service ranges:

PROVIDING INDUSTRIAL HYGIENE CONSULTANCY TO INDUSTRIES

:: Certificate No :: IN10511A

Date of initial registration	**01 May 2018**
Date of this certificate	**04 May 2024**
Recertification Due / Certificate expiry	**30 April 2027**

This Certificate is property of Certiva Limited Certifications and remains valid subject to satisfactory surveillance audits.

Director

Certiva Limited
3rd Floor, 207 Regent Street, London, W1B 3HH, UK
Tel : + 44 203 514 3425 Phone: +44 704 204 2076
Fax : +44 845 874 1820
E-mail : enquiry@certiva.uk Web: www.certiva.uk
Company Number : 9799171

www.qabcb.com

For precise and updated information concerning the present certificate visit at www.certiva.uk

Integral Certification Ltd.

Certificate OF REGISTRATION

This is to Certify that the Management System of

ARVIND INDUSTRIAL HYGIENE CONSULTANCY

C-19, TAGORE NAGAR, RAIPUR-492 001,
CHHATTISGARH (INDIA)

has been found to conform to the Occupational Health & Safety Management System standard:

ISO 45001:2018

This certificate is valid for the following scope of operations:

PROVIDING INDUSTRIAL HYGIENE CONSULTANCY
SERVICES TO INDUSTRIES

Certificate No.: 09111887C-1

Date of initial registration	*Date of this Certificate*	*Recertification Due*
01 July 2024	*01 July 2024*	*30 June 2027*

This Certificate remains valid subject to satisfactory surveillance audits.

Accreditation

EGAC Accredited
MSCB
CAB # 011201

MEMBER OF MULTILATERAL RECOGNITION ARRANGEMENT IAF

Director

ICL/FM-001/REV07

For verification and updated information concerning the present certificate visit to www.iclcert.com
This certificate is property of Integral Certification Ltd. and shall be returned immediately when demanded.

Integral Certification Ltd.
International Office: 45, Middle Hillgate Stockport, Greater Manchester SK1 3DG
Contact No.: +44 7404823687
(Company Number 15218428 in England and Wales)
Integral Certification Pvt. Ltd.
Corporate Office: 301, U-60 (3rd Floor), Shakarpur, Laxmi Nagar, Delhi-110092, India
Contact No.: +91-9319332223
Email: Info@iclcert.com Website: www.iclcert.com

ICL®
Integral Certification Ltd.

Certificate OF REGISTRATION

This is to Certify that the Management System of

ARVIND INDUSTRIAL HYGIENE CONSULTANCY

C-19, TAGORE NAGAR, RAIPUR-492 001,
CHHATTISGARH (INDIA)

has been found to conform to the Environmental Management System standard:

ISO 14001:2015

This certificate is valid for the following scope of operations:

PROVIDING INDUSTRIAL HYGIENE CONSULTANCY
SERVICES TO INDUSTRIES

Certificate No.: 09111887B

Date of initial registration	*Date of this Certificate*	*Recertification Due*
01 July 2024	*01 July 2024*	*30 June 2027*

This Certificate remains valid subject to satisfactory surveillance audits.

Accreditation

EGAC Accredited
MSCB
CAB # 011201

IAF MEMBER OF MULTILATERAL RECOGNITION ARRANGEMENT

Director

ICL/FM-001/REV07

For verification and updated information concerning the present certificate visit to www.iclcert.com
This certificate is property of Integral Certification Ltd. and shall be returned immediately when demanded.

Integral Certification Ltd.
International Office: 45, Middle Hillgate Stockport, Greater Manchester SK1 3DG
Contact No.: +44 7404823687
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Corporate Office: 301, U-60 (3rd Floor), Shakarpur, Laxmi Nagar, Delhi-110092, India
Contact No.: +91-9319332223
Email: Info@iclcert.com Website: www.iclcert.com

DIRECTORATE OF INDUSTRIAL HEALTH & SAFETY
CHHATTISGARH, RAIPUR

2nd Floor, 3rd Block, Indrawati Bhawan, Atal Nagar Raipur

No. DIHS/C.G./RPR/C.C.//4437270336A **Raipur,Dated 06/02/2025**

CERTIFICATE OF COMPETENCY

This is to certify that **Arvind Industrial Hygiene Consultancy, C-19, Tagore Nagar, Raipur (C.G)** to be a competent person for the purpose of carrying out tests, examinations, inspections and certification for such precautions against dangerous fumes, ventilation system as required under various schedule framed under sec-87, used in factories located in the State of Chhattisgarh used in factories for the **person named as SAKET KUMARSHRIVASTAVA Section 36 and 87** and the Rules made there under of Factories Rules 1962 for the period from **06/02/2025** To **05/02/2026**. This certificate is issued subject to the conditions stipulated here under :-

CONDITIONS

1. The examinations and inspections shall be carried out in accordance with the provisions of the Act and the Rules made there under.
2. Tests, examination and inspections shall be carried out under direct supervision of the competent person.
3. Copies of examination certificate issued by you after due examination are to be marked to the Inspector of Factories concerned in all cases where defects are noticed and repairs are ordered or any alterations are imposed on its use.
4. The Chief Inspector of Factories, Chhattisgarh State, Raipur reserves the right to revoke, renew or amend this order at any time after giving opportunity of hearing.
5. All the testing facilities at the disposal of the competent person/institution/Association shall be maintained in good working order.
6. Any change in testing facilities (either addition or deletion) shall be intimated to the Chief Inspector of Factories, C.G. immediately.

Alarmelmanga i D

Digitally signed by Alarmelmangai D
Date: 2025.02.06 13:55:30 +05'30'

Chief Inspector of Factories
Govt. of Chhattisgarh Raipur

No. DIHS/C.G./RPR/C.C.//4437270336A **Raipur,Dated 06/02/2025**

Copy forwarded to :-

1. Shri **Arvind Industrial Hygiene Consultancy**, **C-19, Tagore Nagar, Raipur (C.G)** in reference to application dated 14/01/2025
2. Dy.Director, Industrial Health & Safety, H.Q/ D.D.Raipur/ D.D.Hygiene Lab/ Bilaspur/ Durg/ Raigarh/ Korba/ Rajnandgaon, Assistant Director , Industrial Health & Safety, Janjgir -Champa, Balodabazar for Information.

Alarmelmangai D

Digitally signed by Alarmelmangai D
Date: 2025.02.06 13:55:46 +05'30'

Chief Inspector of Factories
Govt. of Chhattisgarh Raipur

..... END OF REPORT.....

Annexure XXII: Sample Heath Records

unit I

Form 21
[Prescribed under Rule (19)]
Health Register

(In respect of persons employed in occupations declared to be dangerous operationsunder Section 87)

Name of Worker……JUBESH NISHAD .....Age/ Sex…46Y/M……
Name of Company……HIRA FERRO ALLOYS LTD.....Employee Code…. ……
Nature of occupatioN…....FURNISH.....Date……23/05/25……Annexure

PRE-EMPLOYMENT & PERIODIC MEDICAL EXAMINATION

(1) GENERAL EXAMINATION:

Height 160 cm, Weight 61 kg BMI… 20.3 Chest
Inspiration..99….cm, Expiration 96 cm
Throat...NORMAL.... Tongue……MOIST…Tonsils…N/A……
Teeth ..NORMAL..... Gums……NORMAL……
Thyroid……NORMAL……
Lymph nodes……NORMAL…… ……
Additional finding.....N/A.....

(2) CARDIO-VASCULAR SYSTEM:

Pulse 81 mt. Regular/Irregular Peripheral Pulse-felt/not felt
BP.124/74……. min Hg Heart Sound: NORMAL.....
Murmur, If any...NO..... Additional finding (s), if any .....NO.....

(3) RESPIRATORY SYSTEM:

Shape of Chest: .....**NORMAL**.... Tubular…… Chest movements: …. **Symmetrical**
…… Trachea..... **Centrally**……. Breath sound **Vesicular**

(4) GASTRO-INTESTINAL SYSTEM:

Liver.....NP…… Spleen.....NP……
Any abdominal lumps: NO

(5) EXAMINATION OF EYES:

External Exam -NORMAL... Squint: ..... NO.....
Nystagmus: …… NO .....Fundus L/R
Night Blindness.....NO……
Colour vision- Normal
Individual colour identification- Normal

Distance vision (without glasses) Right..6/6.... Left
…6/6…… (with glasses) Right…… Left
……

Near-vision (without glasses) Right…N/8……
Left…N/8…… (with glasses) Right … ….. Left……

(6) EXAMINATION OF EAR NOSE & THROAT:

External Examination: .....**NAD**……

(7) GENITO URINARY SYSTEM:

Hernia - NO..... Hydrocele- NO
Cryptorchidism-NO Phimosis.....NO
Signs of STD.....NO .....

Varicocele - NO
Varicose veins- NO

Other Examinations for Females:
Menarche..... yr. G. Para.....Menstrual irregularity..... if any

INVESTIGATIONS
(8) Lab Investigations:

Haemogram
Blood Group.....B+..... Rh factor.....POSITIVE..... Hb 12.9 gm%
RBC .....4.74.....Platelet Count.....258
TLC.....7.37..... DLC: - .....

Renal profile
Blood Urea: ...22... S. Creatinine:0.74

Hepatic profile - S G O T...15. S G P T ...18. Alkaline Phosphat.. 67..... S. Bilirubin 0.57

Lipid Profile:
Serum Cholesterol ....168.....Triglycerides.....147.....HDL.....38.....LDL.....101.....

Metabolic
Blood Sugar.....72.....Blood Sugar PP.....S. Uric Acid.....5.1

Urine: Albumin....NIL.....**Sugar** ....NIL.....**Microscopy**.....
Stool: .....

(10) Other Investigation

11) Pulmonary Function Test

	FCV	FEV 1	FEV 1/ FVC
PREDICATED	3.84	3.23	80.01
MEASURED	4.73	4.65	98.31
% OF PREDICATED	123.31	143.96	122.87

12) Audiometry examination

PTA	**Lt. Ear -21 dB**	**Rt. Ear-21 dB**
Remark	**NORMAL**	

PTA of both ears at frequency ..... Cycles/sec

13. Details of Other specific medical examination carried out as mentioned in the respective schedules of 107 of C.G. Factory rules 1962-

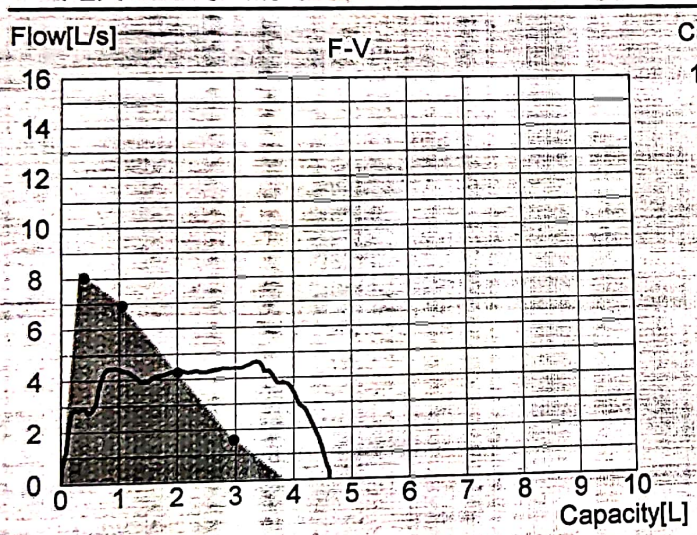
For, Hira Ferro Alloys Ltd.
Factory Medical Officer
Dr Sushil Kumar Adapa
(MBBS & AFIH)
Reg No. : APMC/FMR/90920

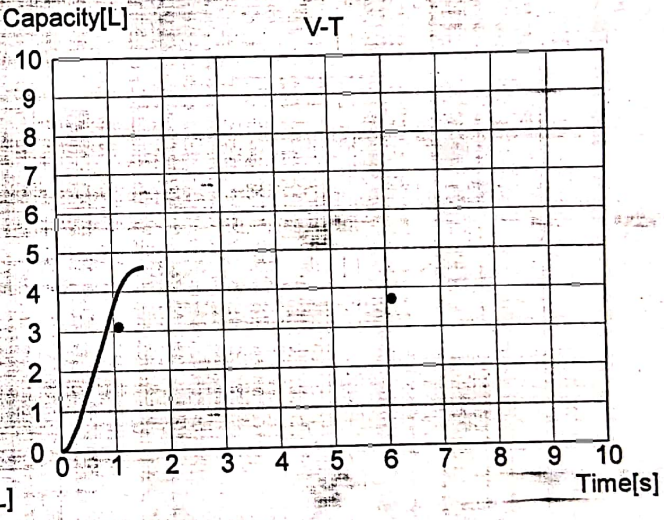
Signature (with date) of Factory Medical Officer

Signature (with date) Certifying surgeon

Case number:
Name:MR JUBESH NISHAD
Gender:Male Age:40 Height:160 cm Weight:61 kg
Smoke:No BDT:No Equation:ECSC Phone:
Test date:2025-05-23 18:31:18
Medical history:

Parameter	Unit	MEAS	PRED	PRED%	LLN	BDT diff	BDT rate
FVC	L	4.73	3.84	123.31%	2.83	-	-
FEV1	L	4.65	3.23	143.96%	2.39	-	-
FEV1/FVC	%	98.31	80.01	122.87%	68.22	-	-
PEF	L/s	5.02	8.25	60.82%	6.26	-	-
FEF2575	L/s	4.39	4.08	107.49%	2.37	-	-
FEF25	L/s	4.38	7.11	61.64%	4.29	-	-
FEF50	L/s	4.41	4.47	98.57%	2.30	-	-
FEF75	L/s	4.49	1.80	250.00%	0.51	-	-
EV	ml	398.00(8.41%FVC)	-	-	-	-	-
FET	s	1.58	6.00	26.33%	-	-	-
EOTV	ml	2924.00	-	-	-	-	-
PEFT	ms	941.00	-	-	-	-	-





Test result: Spirometry all the parameter are Normal

Operator:

DR. KAMBLEY RAMU WATUJI
Physician REG NO-MC-7823/2018
MBBS, MD
DEPARTMENT-CHEST & PULMONARY

Reporting date: 2025-05-22

Device ID: PULMO022489

RAIPUR INSTITUTE OF MEDICAL SCIENCES

Bhansoj Road, Off. NH-6, Gram-Godhi, Raipur (C.G.)
Tel.: 91-0771-3053060-87, Fax : 91-0771-3053088-89, www.rimsindia.ac.in
Department of ENT

AUDIOLOGICAL EVALUATION

OPD No. .....

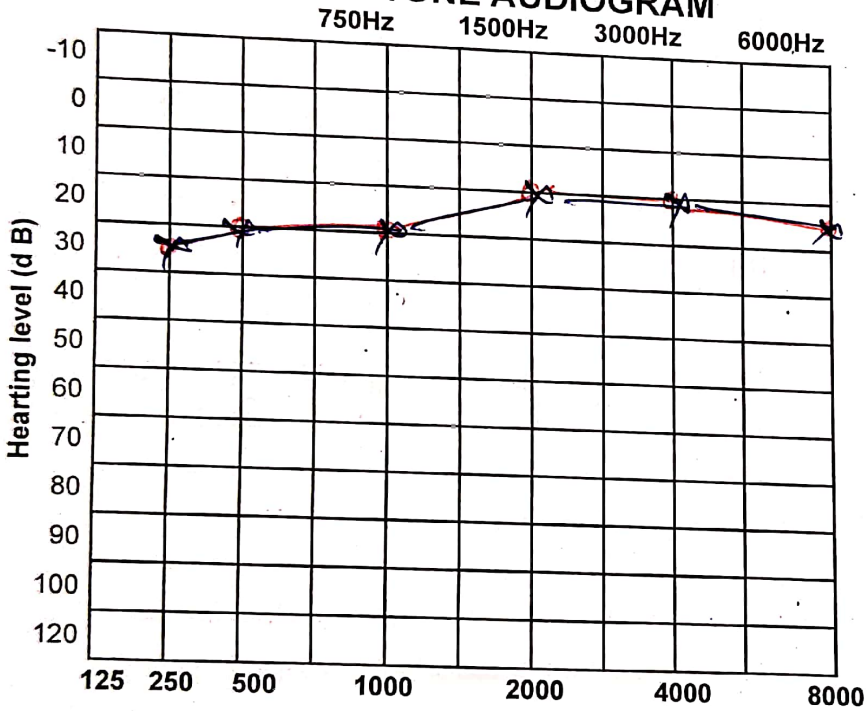
Name ..... Mr. Jubesh Nishad ..... Date 28/08/25 ..... Audio No. .....

Address ..... Age / Sex 46 / M

Tested by ..... Audiometer Used ..... Ph. No. 7772855190

Complaint :- Per/Post Treatment .....

PURE TONE AUDIOGRAM



KEY OF SYMBOLS

Right	Air Conditions	Left
	Unmasked Three Hold Masked Three Should	
No Responce		
	Unmasked Three Hold Masked Three Should	
Bone Conducts		
	Unmasked Three Hold Masked Three Should	
No Responce		
	Unmasked Three Hold Masked Three Should	
Sound Field		
Response	S	
No Response	S	
Audio Metric		

TEST / EAR	RINNE T.F.T.	WEBER T.F.T.	AUDIOMETRIC WEBER		
			500	1000	2000
RT.					
LT.					

SPEECH AUDIOMETRY

	PTA (db HL)	SRT (db HL)	SDT (db HL)	SDS %	MCL	UCL
RIGHT EAR	21 dB					
LEFT EAR	21 dB					

TEST CONDITION

PROVISTIONAL DIAGNOSIS :

Right Ear :- Normal hearing sensitivity

Left Ear :- Normal hearing sensitivity

Recommendation :-

Nitinwre

DR. NITINWRE ASHOK ZADBAJI
REG NO-54603
MBBS ENT
DEPARTMENT - ENT
AUDIOLOGIST

24 Hour Helpline

RAIPUR INSTITUTE OF MEDICAL SCIENCE

Bhansoj Road Off NH -6, Raipur 0771 - 3053060

PATIENT NAME	JUBESH NISHAD	AGE/SEX	46Y/MALE
LAB NO.		PATIENT ID NO.	
REF BY DR.	RIMS	OPD/IPD NO.	
WARD		SAMPLE RECEIVING DATE	23-05-2025
SPECIMEN	SERUM	REPORT RELEASING DATE	23-05-2025

BIOCHEMISTRY REPORT

LIPID PROFILE-

Test Name	Observed Value	Reference Range
Total Cholesterol	168	Desirable <200 mg/dL Borderline High 200- 239 mg/dL High Risk >239 mg/dL
Triglycerides	147	Optimal <150 mg/dL Borderline High 150-199 mg/dL High 200-499 mg/dL Very high > 500 mg/dL
HDL Cholesterol	38	Male: 35-79.5 mg/dL, Female: 42-88 mg/dL
LDL Cholesterol	101	Optimal <100 mg/Dl Above Optimal 100-129 mg/Dl Borderline High 130-159 mg/Dl High 160-189 mg/Dl Very High >190 mg/Dl
Very Low Density Lipoproteins (VLDL)	29	20-40 mg/Dl
CHOL/HDL Ratio	4.4	3.3-4.4
LDL/HDL Ratio	2.6	0.5-3.0

Test done on random sample. kindly correlate clinically...!!

RAIPUR INSTITUTE OF MEDICAL SCIENCE RIMS

Technician
(Reports Checked By)

Consultant
Clinical biochemistry laboratory

Note: These reports are for assisting Doctors/Physicians in their Treatment and Not for Medico-legal purposes and should be correlated clinically.

DEPARTMENT OF BIOCHEMISTRY

PATIENT NAME	MR JUBESH NISHAD	AGE/SEX	46Y/M
LAB NO.		PATIENT ID NO.	
REF BY DR.	RIMS	OPD/IPD NO.	
WARD		SAMPLE RECEIVING DATE	23/05/2025
SPECIMEN	BLOOD	REPORT RELEASING DATE	23/05/2025

BLOOD SUGAR FASTING & PP

INVESTIGATION	RESULT	REFERENCE RANGE
Sample Type		
FASTING BLOOD SUGAR	77	70-100 mg/dL
BLOOD SUGAR PP	99	100-140 mg/dL

Clinical Note :
Elevated glucose levels (hyperglycernia) are the most aften encounterd clinical in the setting of diabetes mellitus but they may also occur with pancreatic neoplasms , hyperthyroisism and adrenocortical dysfunction. Decreased glucose levels (hypoglycemia) may result from endogenous or exogenous insulin excess,prolonged starvation,or liver desease

Fasting glucose	2 hours pp glucose	Diagnosis
<100	<140	Normal
100 to 125	140 to 199	Pre diabetes
>126	>200	Diabetes

A level of 126 mg/dL or above , confirmed by repeating the test on another day , means a person has diabetes IGT (2 hrs post meal),means a personhas an increased risk of developing type 2 diabetes but does not have it yet a 2 hour glucose level of 200 mg/dL or above ,confirmed by repeating the test on another day ,means a person has diabetes

-----End of report -----

Technician
(Reports checked by

consultant
clinical biochemistry labortory

NOTE-These reports are for assisting doctors in their treatment and not for medico-legal purposes and should be correlated clinically

RAIPUR INSTITUTE OF MEDICAL SCIENCES
24 Hour Helpline, Health For All 0771 – 3268844,
Bhansoj Road, Off NH -6, Raipur

PATIENT NAME	TUBESH NISHAD	AGE/SEX	46Y/MALE
LAB NO.		PATIENT ID NO.	
REF BY DR.	RIMS	OPD/IPD NO.	
WARD	CAMP	SAMPLE RECEIVING DATE	23/05/2025
SPECIMEN	BLOOD	REPORT RELEASING DATE	24/05/2025

HAEMATOLOGY REPORT

TEST NAME	OBSERVED VALUE	NORMAL VALUE
BLOOD GROUP & RH	"B" POSITIVE	(Slides Method)

CHECKED BY

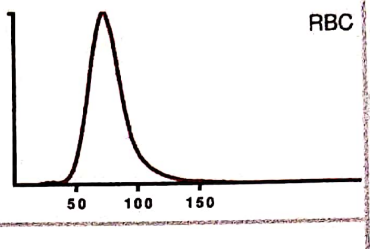
ASSITANT PROFESSOR

Note: These reports are for assisting Doctors/Physicians in their Treatment and Not for Medico-legal purposes and should be correlated clinically.

Results

Run Date	24/05/2025 11:29:41 AM	**Operator**	ABX
Last Name		**Sample ID**	AUTO_SID0063
First Name	TUBESH NISHAD	**Department**	
Gender	Male	**Age** 46 Y	**Physician**	
Patient ID	AUTO_PID06930	**Type**	Man
Date of birth			
Sample comments			

				Range
RBC	4.74		$10^6/\mu L$	4.20 - 6.00
HGB	12.9	l	g/dL	13.0 - 17.0
HCT	38.4	l	%	39.0 - 52.0
MCV	81.1		µm³	76.0 - 100.0
MCH	27.3		pg	26.0 - 34.0
MCHC	33.6		g/dL	32.0 - 35.0
RDW-CV	15.3		%	11.0 - 16.0
RDW-SD	46.2		µm³	37.0 - 49.0



Recommended actions

Slide review

Alarms

WBC

LYM Interference

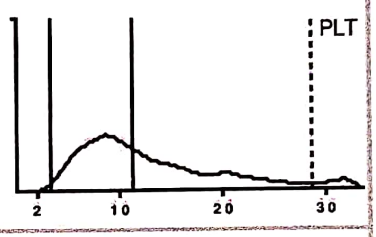
PLT

RBC PLT Interference

Susp. Pathologies

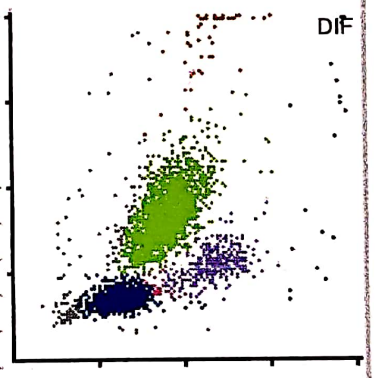
PLT aggregate or NRBC ?

				Range
PLT	258	*	$10^3/\mu L$	150 - 400
PCT	0.30	*	%	0.15 - 0.40
MPV	11.7	h*	µm³	8.0 - 11.0
PDW	23.1	h*	µm³	11.0 - 22.0
P-LCC	116		$10^3/\mu L$	44 - 140
P-LCR	44.7		%	18.0 - 50.0



				Range
WBC	7.37	*	$10^3/\mu L$	3.50 - 10.00

	#		Range	%		Range
NEU	4.01	*	1.60 - 7.00	54.7	*	40.0 - 73.0
LYM	2.72	*	1.00 - 3.00	37.1	*	15.0 - 45.0
MON	0.46	*	0.20 - 0.80	6.2	*	4.0 - 12.0
EOS	0.08	*	0.00 - 0.50	1.1	*	0.5 - 7.0
BAS	0.07	*	0.00 - 0.15	0.9	*	0.0 - 2.0
LIC	0.03	*	0.00 - 0.10	0.4	*	0.0 - 1.0



Slide Review

Neutrophil	Myeloblast	Anisocytosis
Lymphocyte	Promyelocyte	Hypochromia
Monocyte	Myelocyte	Polychromasia
Eosinophil	Metamyelocyte	Poikilocytosis
Basophil	Blast	Microcytosis
Atypical Lymphocyte	Target Cell	Macrocytosis
Other	Sickle Cell	Platelet Clumps

Reviewed on _____ by _____ Signature

PASTEUR INSTITUTE OF MEDICAL SCIENCES RIMS

DEPARTMENT OF MICROBIOLOGY

Patient`s Name	TUBESH NISHAD	**AGE/SEX**	46/MALE
Lab No		**PATIENT ID**	
Ref by Dr.	RIMS	**OPD /IPD:**	
Ward	CAMP	**Sample Receiving Date**	23/05/2025
Specimen	Serum	**Report Releasing Date**	24/05/2025

SEROLOGILCAL TEST REPORT

S. No.	TEST	METHOD	RESULT
31.	ASO Titer	Latex Agglutination Test	
2.	CRP	Quantative Test	
3.	RA Factor	Latex Agglutination Test	
4	Dengue Test	Rapid Card Test	
5.	Widal Test	Slide Agglutination Test	
6.	Direct Coombs Test	Agglutination Test	
7.	In-direct Coombs Test	Agglutination Test	
8.	VDRL Antigen Test	Rapid Card Test	
9.	HbsAg	Rapid Card Test	NON-REACTIVE
10.	Anti-HCV	Rapid Card Test	
11.	HIV 1 &2	Rapid Card Test	
Please Note:-Kindly correlate clincally.			

RAIPUR INSTITUTE OF MEDICAL SCIENCES

TECH. SIGN

MICROBIOLOGIST

RAIPUR INSTITUTE OF MEDICAL SCIENCES

Bhansoj Road Off NH-06 Village Godhi,
Raipur (C.G.), 492101,India

Tel: 1800-208-1088 ,Email - info@rimsindia.ac.in

DEPARTMENT OF PATHOLOGY

URINE REPORT

C.R. No.	: 2305251141 / Jubesh	Lab No	: 20250524134	Collected	: 24-05-2025
Name	: MR. JUBOSH NISHAD	Age/Sex	: 46 Year / M	Received	: 24-05-2025
Guardian	: S/O MR			Reported	: 24-05-2025
Department	: General Medicine				

Tests		Result
Physical Examination		
Color		Pale Yellow
Volume		20
Appearance		Clear
Chemical Examination		
Albumin		NIL
Sugar		NIL
Ketone		-
Microscopic Examination		
Pus Cells	0 - 5	2-4
Epithelial Cells	0 - 5	2-4
RBC		Absent
Crystals		Absent
Bacteria		Absent
Cast		-
Others		-

********** End of Report **********

RAIPUR INSTITUTE OF MEDICAL SCIENCES RIMS

Technician

Print Date : 24/5/2025

Consultant Pathologist

This is a professional opinion and can not be used for medico legal purposes.

RAIPUR INSTITUTE OF MEDICAL SCIENCES

Bhansoj Road Off NH -6, Raipur 0771 - 3053060

24 Hour Helpline

PATIENT NAME	TUBESH NISHAD	AGE/SEX	46Y/MALE
LAB NO.		PATIENT ID NO.	
REF BY DR.	RIMS	OPD/IPD NO.	
WARD	URLA	SAMPLE RECEIVING DATE	23-05-2025
SPECIMEN	SERUM	REPORT RELEASING DATE	23-05-2025

BIOCHEMISTRY REPORT

LIVER FUNCTION TEST

Test Name	Observed Value	Reference Range
Bilirubin Total	0.57	Upto 1.2 mg/dl
Bilirubin Direct	0.24	Upto 0.4 mg/dL
Bilirubin Indirect	0.33	0.2-0.8 mg/dL
S.G.O.T. (AST)	15	M:Upto 35 & F:Upto 31 IU/L
S.G.P.T. (ALT)	18	M:Upto 45 & F:Upto 34 IU/L
Alkaline Phosphatase	67	53-128 IU/L
S. LDH		2-12yrs: 180-360 & 12-60 yrs: 125-220 IU/L

SERUM PROTEINS

Total Protein		6.0-8.0 g/dL
Serum Albumin		3.5-5.5 g/dL
Serum Globulin		2.5-3.5.g/dL
A:G Ratio		1.2-1.5:1

RENAL FUNCTION TEST

B.Urea	22	15-40 mg/dL
S.Creatinine	0.74	F: 0.6-1.2 & M: 0.7-1.4 mg/dL
Uric Acid	5.1	F: 2.6-6.0 & M: 3.5-7.2 mg/dL

Calcium		9.0-11.0 mg/dL
Phosphorus		2.5-4.5 mg/dL
Magnesium		1.8-2.2 mg/dl

PANCREATIC FUNCTION TEST

S. Lipase		Upto 60 U/L
S. Amylase		Upto 80 U/L

BLOOD GLUCOSE

Blood Glucose, Random	72	70-140 mg/dL
Blood Glucose, Fasting		70-100 mg/dL
Blood Glucose, Post-Prandial		100-140 mg/dL

SERUM ELECTROLYTES

S. Sodium (Na+)		135-145 mmol/L
S. Potassium (K+)		3.5-5.0 mmol/L
S. Ca++		1.3-1.5 mmol/L
Iron		ug/dl

Kindly correlate clinically...tks

RAIPUR INSTITUTE OF MEDICAL SCIENCES RIMS

Technician
(Reports Checked By)

Consultant
Clinical biochemistry laboratory

Note: These reports are for assisting Doctors/Physicians in their Treatment and Not for Medico-legal purposes and should be correlated clinically.

RIMS HOSPITAL URLA

(A unit of LORD BUDDHA EDUCATIONAL SOCIETY)

Health For All

PT. NAME : MR. JUBESH NISHAD
PATIENT ID : RIMS/
REF. DR. / DEPT : RIMS HOSPITAL, URLA (OPD)

AGE / SEX: 46 Y/M
DATE:23-05- 2025

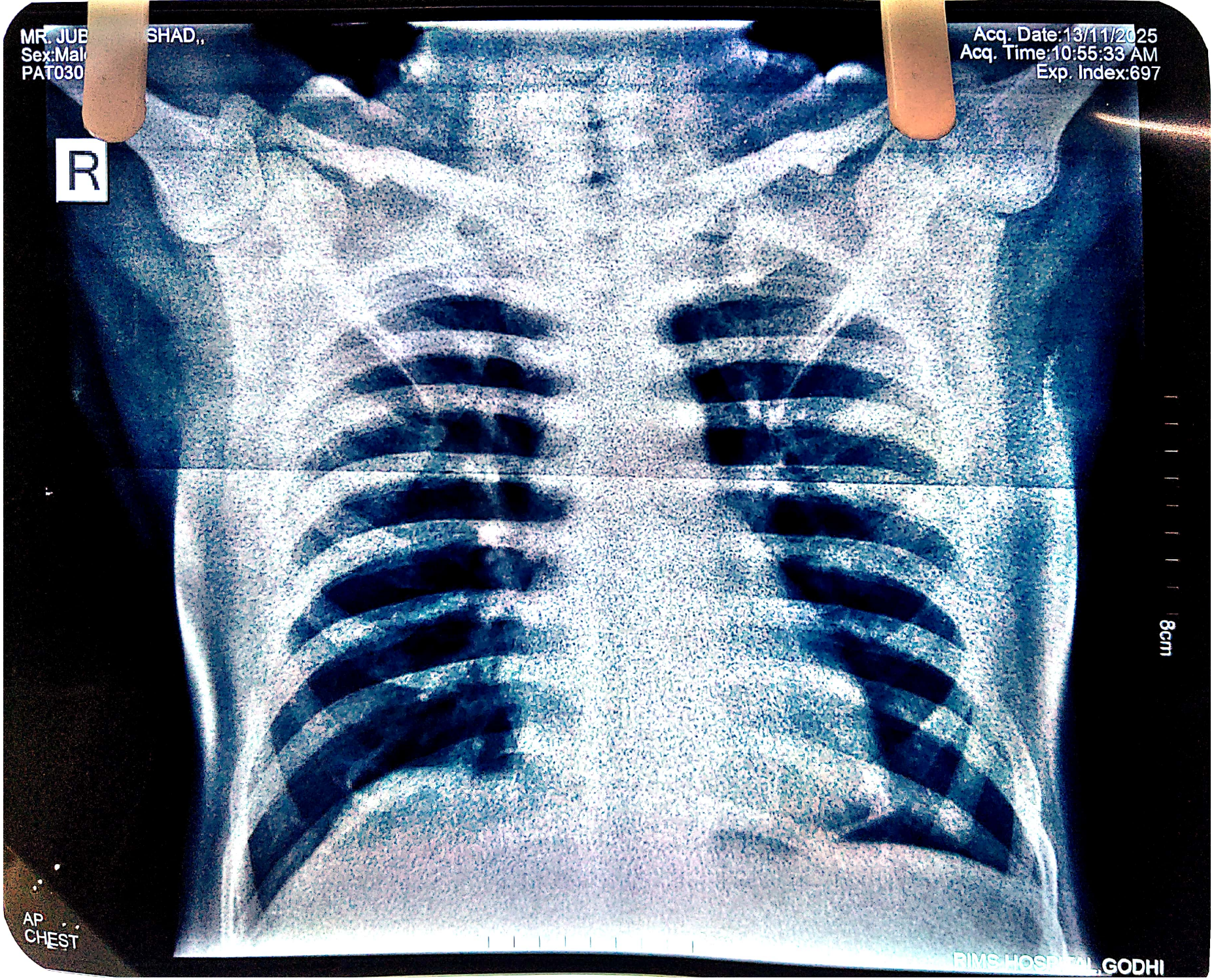
X RAY CHEST (PA VIEW)

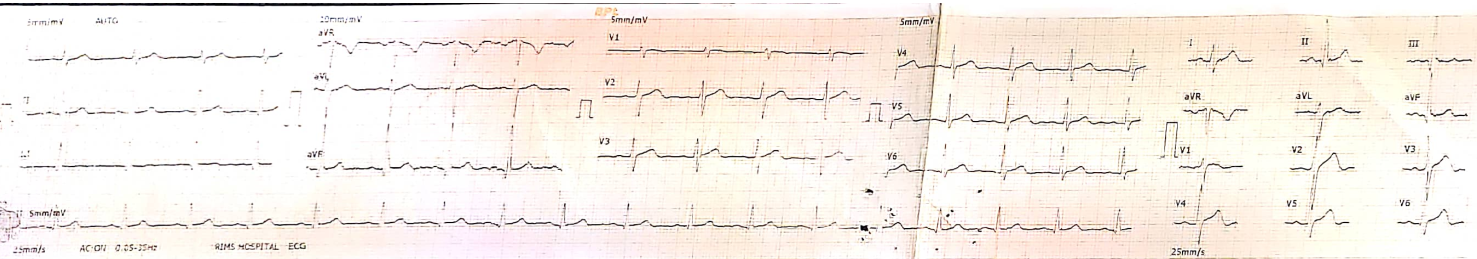
- Trachea is central.
- Lung fields are clear bilaterally.
- No evidence of consolidation, collapse, or effusion.
- Cardiac silhouette is normal in size and contour.
- Mediastinal contours are normal.
- Diaphragmatic domes are normal in position and outline.
- Costophrenic angles are sharp.
- Bony thorax appears intact, no fractures seen.

ADVISED: Clinical correlation.

DR. KASHINATH SARKAR
REG NO-C.G M C 3357/2011
MBBS
DEPARTMENT - RADIOLOGYA

RESIDENT DOCTOR





2025-5-23 15:34:31

ID 00002397

ID Card: ______

Name: ______ Gender: ______

Age: ______ Height(cm): ______

Weight(Kg): ______ BP(mmHg): /

HR .... bpm 81

P-R .... ms 136

Q-R-S .... ms 103

QT/QTc .... ms [illegible]

P/QRS/T AXES .... deg 50/83/[illegible]

RV5/SV1 .... mV 1.47/0.39

RV5+SV1 .... mV 1.86

*The result must be confirmed by doctor!

Report Confirmed by:RAMKRISHNA

<< Conclusion >>

801 Sinus Rhythm

** NORMAL ECG **

Dr [illegible]
MD Medicine
Reg.No.-CGMC-463/2005
Raipur Institute of Medical Sciences

PT. NAME : MR.JUBEDH NISHAD
PATIENT ID : RIMS/
REF. DR. / DEPT : RIMS HOSPITAL, URLA (OPD)

AGE / SEX:46 Y / M
DATE:23/5/ 2025

SONOGRAPHY OF WHOLE ABDOMEN

LIVER: The liver is normal in size, shape and has smooth margins. It is uniformly isoechoeic with normal echotexture. No SOL is seen. Intra-hepatic biliary radicals are not dilated.

GALL BLADDER: The gall bladder is well distended. No intra-luminal calculi or mass lesion is seen. Its wall thickness is normal.

COMMON BILE DUCT & PORTAL VEIN: The common bile duct is normal in caliber. No calculi are seen in it. The portal vein is normal in calibre and course.

SPLEEN: The spleen is normal in size and shape. Its echotexture is homogeneous. No evidence of focal lesion is noted.

PANCREAS: The pancreas is normal in size, shape, contours and echotexture. No evidence of solid or cystic mass lesion is noted.

KIDNEYS: Both kidneys have normal cortical echotexture and have smooth margins. Cortico-medullary differentiation is maintained.
Right kidney measures ~ 9.4x3.7 cms. No calculus or hydronephrosis seen in right kidney.

Left kidney measures ~ 11.4x5.2 cms. No calculus or hydronephrosis seen in left kidney.

URINARY BLADDER: The urinary bladder is well distended. It shows uniformly thin walls and sharp mucosa. No intra-luminal calculus or diverticulum is seen.

PROSTATE: The prostate is normal in size and measures ~ 12cc in volume. No focal lesion seen.

No free fluid is seen in the peritoneal cavity at the time of examination.

PROVISIONAL IMPRESSION :

- **No significant abnormality detected.**

ADVISED: Clinical correlation.

DR. KASHI NATH SARKAR
REG NO-C.G.M.C 3357/2011
MBBS
DEPARTMENT - RADIOLOGYA

DR.KASHINATH SARKAR
MBBS, MD RADIODIAGNOSIS

Annexure XXIII: HFAL Environment Policy

HIRA FERRO ALLOYS

HIRA FERRO ALLOYS LIMITED

ENVIRONMENT POLICY

HIRA FERRO ALLOYS LTD. UNIT-I A unit of Hira group of industries is committed to conduct business with strong environmental conscience towards community, customer and employees by:

- Conserving natural resources.
- Executing Clean Development Mechanism (CDM) project.
- Adopting and promoting industry best practices to improve our environmental performance.
- Continuous monitoring and protecting air, water and soil.
- Complying with all relevant legislation and regulation on Environmental protection.
- Promoting transformation of solid waste into more value added product.
- Applying stringent control to reduce generation of hazardous waste.
- Accelerating the forestation and water harvesting.
- To conduct environment awareness training program through experts.

DATE: - 21-08-2024

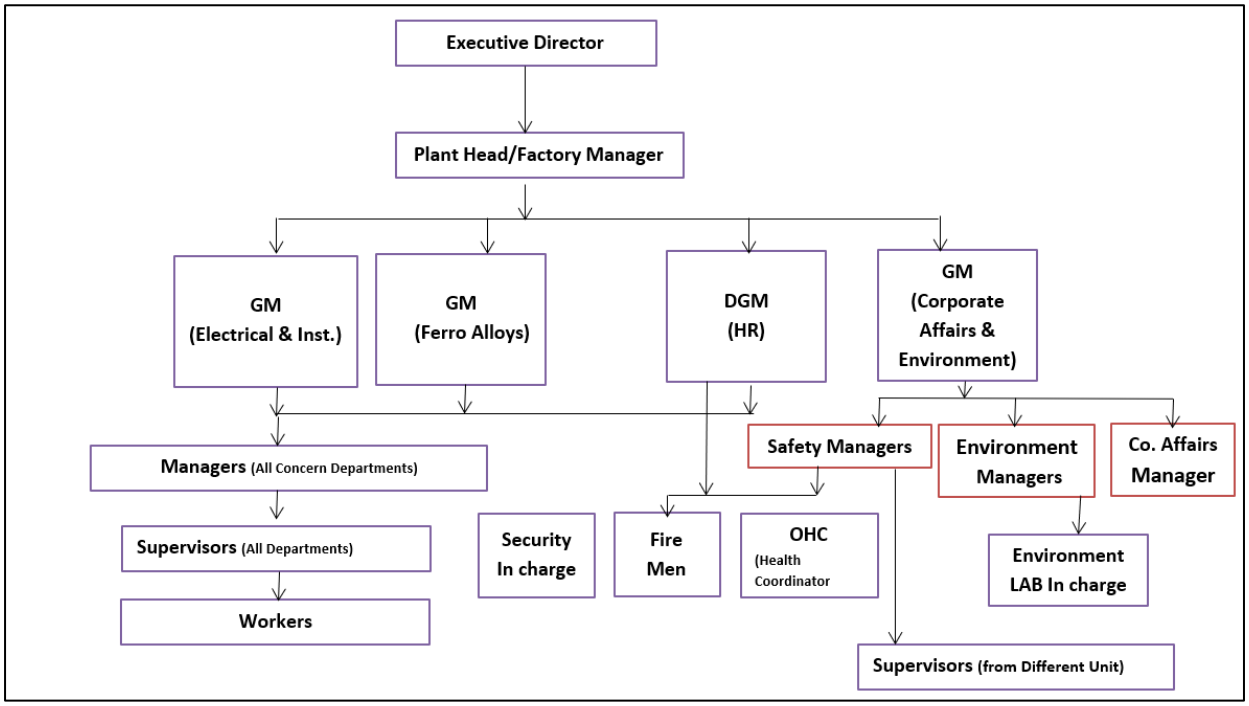
Director

HIRA FERRO ALLOYS LTD. INDIA RAIPUR (C.G.)

Hira Ferro Alloys Limited
An ISO 9001:2015, ISO 14001:2015 and OHSAS 18001:2007 certified company
CIN - U27101CT1984PLC005837
Registered Office : Plot No. 567-B
Works : Plot No. 490/1, 490/2, 491, 567-B, 568, 553-B, Urla Industrial Complex, Raipur - 492003 Chhattisgarh, India
P: +91 771 4082450-51 F: +91 771 4082452
Corporate Office : Ground Floor, Hira Arcade, Near New Bus Stand, Pandri, Raipur - 492004, Chhattisgarh, India
P: +91 771 4082470, F: +91 771 4082742
www.hfal.in, www.hiragroup.com

Annexure XXIV: Environment Management Cell

Hierarchy and Roles/Responsibilities of Environmental Management Cell



Hierarchy of Environmental Management Cell

The cell is responsible for monitoring of the plant Environment & related systems including.

i. Regular Environment Monitoring.
ii. Compliances for Water, Air, Noise and Hazardous waste management.
iii. Collection & disposal of Hazardous waste, with proper inventory & disposal record.
iv. Operation & maintenance of wastewater treatment scheme
v. Keeping watch & maintaining zero liquid discharge.
vi. Metering of Raw water abstraction & consumption, treated water inlet & outlet, etc.
vii. Metering & preparation of records for Energy consumption for wastewater management.
viii. Monitoring & reporting any leakage & spillage for reducing pollution, contamination in the environment.
ix. Maintaining greenery & suitable use of horticulture land.
x. Keeping watch on the RHP pit status & maintenance.
xi. Organizing training programs & awareness about the environment & pollution control measures.
xii. Keeping the management updated on regular basis about the conclusions / results of monitoring activities and proposes measures to improve environment preservation and protection.
xiii. Conducting internal & external Environment audits to ensure that recommended Environment measures are followed.
xiv. Conducting and submit annual Environmental Audit report.
xv. Timely renewal of Consolidated Consents & Authorization is also taken care of.

xvi. Submitting environmental monitoring report to SPCB. Data monitored by the cell is submitted to the Board regularly and as per the requirement of SPCB. The cell also takes mitigative or corrective measures as suggested by the Board.

xvii. Monitoring of ground water level & submission of report in SPCB.

Annexure XXV: Newspaper Advertisement and EC Display

'Bring Justice Varma's verdicts under probe'

Bar body demanded to draw impeachment proceedings against Justice Varma.

Press Trust Of India

PRAYAGRAJ: The Allahabad High Court Bar Association on Monday demanded the scrutiny of judgments of Justice Yashwant Varma, subjected to an enquiry over the alleged discovery of huge cash from his residential home, and opposed his proposed repatriation to his parent Allahabad High Court. The bar body further sought the Chief Justice of India to "immediately recommend" to the government to draw impeachment proceedings against Justice Varma. Speaking to mediapersons, bar body president Anil Tiwari referred to a number of resolutions which said, "The High Court Bar Association opposes any proposed transfer of Justice Yashwant Varma to Allahabad High Court or its Lucknow bench or to any other High Court."

The bar body's resolution added, "All the judgements delivered by Justice Yashwant Varma during his tenure of a judge at Allahabad High Court and Delhi High Court be reviewed in order to inspire confidence of people at large to regain public faith in the judicial system. The manner in which this is to be done, is to be decided by the Supreme Court as we have full trust in our judge." A Supreme Court collegium on Monday recommended the judge's transfer to the Centre.

The alleged cash discovery happened following a fire at Varma's Lutyens Delhi residence at around 11.35 pm on March 14, prompting the fire officials to rush to the spot and douse it. The apex court collegium headed by CJI Sanjiv Khanna and the Delhi High Court subsequently issued a series of directives, including the withdrawal of judicial work from Justice Varma on Monday. The bar body further said, "The CJI should immediately permit the filing of FIR and investigation by the CBI, ED and other investigative agencies with full permission to the investigative agencies to apply the law of the land to every offender."

'Clarify position on Aurangzeb'

NEW DELHI: The BJP on Monday flayed the Samajwadi Party (SP) over its Rajya Sabha MP Ramji Lal Suman's remarks on legendary Mewar King Rana Sanga and asked the Congress to clarify its position on the row over the legacy of Chhatrapati Shivaji and Mughal emperor Aurangzeb. Speaking in the Rajya Sabha on March 21, Suman had called Mewar ruler Rana Sanga a "traitor" and said Hindus are his descendants. Addressing a press conference at the BJP headquarters, senior party leader and former Union minister Ravi Shankar Prasad questioned the "silence" of the Congress over a recent incident of violence in Nagpur over a demand for the removal of Aurangzeb's tomb in Chhatrapati Sambhajinagar in Maharashtra.

'Followed rule of '80 pc social work in my career'

Press Trust Of India

Dy CM Eknath Shinde pledged to continue working for common man.

MUMBAI: Maharashtra Deputy Chief Minister Eknath Shinde on Monday said he has followed the principle of ''80 per cent social work and 20 per cent politics'' of Shiv Sena founder Bal Thackeray in his career and pledged to continue working for the common man. Shinde's remarks came after the state assembly passed a unanimous resolution congratulating him for receiving the 'Adya Jagatguru Shri Sant Tukaram Maharaj Puraskar', a prestigious award from the Warkari (devotees of Lord Vitthal) community, earlier this month. The resolution comes amid a row over stand-up comedian Kunal Kamra's alleged defamatory remarks against Shiv Sena leader Shinde, with Chief Minister Devendra Fadnavis demanding an apology from Kamra for "insulting" his deputy even as the opposition came out in support of the controversial comic. Shinde has not yet responded to the controversy.

FASTFACTS

- Need to make common man a superman and improve the people's lives.

NEWSLINE

AMARAVATI

'Prevent water scarcity'

Andhra Pradesh Chief Minister N Chandrababu Naidu on Monday directed officials to ensure that no region in the state faces a drinking water shortage this summer.

Naidu reviewed the summer preparedness plan with officials from multiple departments and stressed the need for proactive measures to mitigate the impact of heat waves.

"The government must take all necessary steps to prevent water scarcity and heat wave-related deaths," the CM said in a press release.

देश

उवाच

"आपदा प्रबंधन संशोधन विधेयक के प्रावधानों में अधिकारों के केन्द्रीकरण पर जोर दिया गया है और इसमें जवाबदेही की कमी है। विधेयक में नए शहरी आपदा प्रबंधन प्राधिकरण का गठन नौकरशाही का हस्तक्षेप बढाने के लिए किया गया है जो अनावश्यक है।"

–नीरज डांगी, कांग्रेस नेता

तापमान	अधिकतम	न्यूनतम
दिल्ली	35.0	20.0
मुंबई	30.0	26.0
कोलकाता	30.0	24.0
चेन्नई	30.0	26.0

सरकार ने समाज को बांटने, नफरत फैलाने के अलावा कोई काम नहीं किया : अखिलेश यादव

योगी सरकार के आठ साल पूरे होने पर कसा तंज

लखनऊ, 25 मार्च (एजेंसियां)। समाजवादी पार्टी के राष्ट्रीय अध्यक्ष एवं पूर्व मुख्यमंत्री अखिलेश यादव ने मंगलवार को योगी सरकार पर हमला बोलते हुए कहा कि राज्य में भारतीय जनता पार्टी (भाजपा) सरकार ने अपने पूरे कार्यकाल में समाज को बांटने और नफरत फैलाने के अलावा कोई काम नहीं किया। यादव ने मुख्यमंत्री योगी आदित्यनाथ की सरकार के आठ साल पूरे होने पर यह बात कही। उन्होंने कहा कि राज्य में झूठ, लूट और बेईमानी की नीति पर चलते हुए भाजपा सरकार ने प्रदेश को महंगाई, बेरोजगारी और अराजकता के अंधकार में धकेल दिया है। सरकारी धन के दुरुपयोग और झूठे प्रचार से भाजपा सरकार भ्रष्टाचार, ध्वस्त कानून व्यवस्था और नाकामियों को छिपाना चाहती है, लेकिन जनता सब जानती है। वह भाजपा को 2027 के विधानसभा चुनाव में सबक सिखाने को तैयार बैठी है। उत्तर प्रदेश स्वास्थ्य, शिक्षा, रोजगार हर मानक में पिछड़ता जा रहा है। कानून व्यवस्था की स्थिति लगातार खराब होती जा रही है। बेटियों, महिलाओं के साथ अपराध की घटनाओं में उत्तर प्रदेश सबसे ऊपर पहुंच गया है। प्रदेश के विभिन्न जिलों से छेड़खानी की घटनाएं सामने आ रही है। उन्होंने कहा कि अस्पतालों में दवा, इलाज और जांच की सुविधाएं नहीं हैं। मेडिकल कॉलेज के नाम पर अधूरी बिल्डिंग खंडहर होती दिखाई देती है। निवेश के नाम पर इस सरकार में संगठित भ्रष्टाचार चल रहा है। कमीशन लेकर जेबें को भरा जा रहा हैं। अब समझ में आया कि भाजपा सरकार में इन्वेस्ट समिट क्यों कराई जाती रही है, इसके पीछे निवेश नहीं कमीशनखोरी का भाजपाई लालच काम करता है। यादव ने कहा कि भाजपा सरकार की गलत नीतियों से हर वर्ग परेशान है। जनता 2027 के चुनाव में भाजपा को सत्ता से हटाकर इस कुशासन का अंत कर देगी। सपा अध्यक्ष ने कहा कि भाजपा सरकार ने किसानों की आय दोगुनी करने, निवेश और जीरो टॉलरेंस के नाम पर प्रदेश की जनता को धोखा देने का काम किया है। पूरे प्रदेश में अन्याय, अत्याचार चरम पर है। गरीबों को न्याय नहीं मिल रहा है। सत्ता के संरक्षण में दबंगों की दादागीरी चल रही है। सत्ताशीर्ष से लेकर थाने, तहसील तक अधिकारी, कर्मचारी भ्रष्टाचार में लिप्त है। हर काम में कमीशनखोरी और मुनाफाखोरी की इंतिहा हो गई है। यादव ने कहा कि झूठे विज्ञापनों से चाहे भाजपा सरकार जितने बड़े-बड़े दावे कर ले, जमीनी हकीकत का सभी को अच्छी तरीके से पता है।

राज्य में झूठ, लूट और बेईमानी की नीति पर चलते हुए भाजपा सरकार ने प्रदेश को महंगाई, बेरोजगारी व अराजकता के अंधकार में धकेला : अखिलेश

उप्र सरकार का विकास उत्सव, एक जुमला बनकर रह गया

देवरिया। कांग्रेस के राष्ट्रीय प्रवक्ता अखिलेश प्रताप सिंह ने यहां उत्तर प्रदेश सरकार के आठ साल के कार्यकाल को विकास उत्सव पर तंज कसते हुए कहा कि उनका यह विकास उत्सव मात्र एक जुमला बनकर रह गया है। सिंह मंगलवार को कहा कि उत्तर प्रदेश सरकार अपने आठ साल के कार्यकाल को विकास उत्सव मना रही है, जबकि सच्चाई इसके उलट है। उन्होंने कहा कि देवरिया सहित प्रदेश में विकास एक जुमला बनकर रह गया है। उन्होंने कहा कि प्रधानमंत्री नरेन्द्र मोदी और मुख्यमंत्री योगी आदित्यनाथ ने देवरिया की तीन चीनी मिलों को छह माह में चालू करने की घोषणा सात साल पहले की थी, जो अभीतक नहीं चली और जुमला साबित हुई है। उन्होंने कहा कि केन्द्रीय सड़क व परिवहन मंत्री नितिन गडकरी और उप मुख्यमंत्री केशव प्रसाद मौर्य ने 2018 में देवरिया बाईपास/रिंग रोड का शिलान्यास किया था, जो अभीतक नहीं बना। उन्होंने कहा कि देवरिया के तत्कालीन सांसद कलराज मिश्र ने केन्द्रीय विद्यालय भवन का शिलान्यास किया था। जो अभीतक बनना ही नहीं शुरू हुआ है। उन्होंने कहा कि प्रधानमंत्री मोदी जी ने तीन साल पहले कुशीनगर हवाई अड्डे का उद्घाटन किया था और कहा था कि यहां कई यात्री विमान रोज आयेंगे, लेकिन उद्घाटन के कुछ महीने बाद से ही कुशीनगर एयरपोर्ट बंद है। सिंह ने कहा कि देवरिया बस अड्डा जीर्ण-शीर्ण है। देवरिया में सदर अस्पताल नहीं है।

जम्मू-कश्मीर के अतिरिक्त रेजिडेंट कमिश्नर को नोटिस

श्रीनगर, 25 मार्च (एजेंसियां)। केंद्रीय प्रशासनिक न्यायाधिकरण (कैट), श्रीनगर ने न्यायिक कार्यवाही में हस्तक्षेप के आरोप में जम्मू-कश्मीर के अतिरिक्त रेजिडेंट कमिश्नर को कारण बताओ नोटिस जारी किया है। कैट ने उन्हें उन कर्मचारियों को परेशान करने से भी बचने का निर्देश दिया, जिन्होंने अपनी शिकायतों का निवारण के लिए न्यायाधिकरण में याचिका दायर की है। यह मामला निजामुद्दीन खान द्वारा सामान्य प्रशासनिक विभाग (जीएडी) के खिलाफ दायर याचिका से संबंधित है, जिसमें 13 फरवरी, 2025 को जारी एक अधिसूचना को चुनौती दी गई है। न्यायाधिकरण ने पहले अधिकारियों को अगले आदेश तक अधिसूचना पर आगे बढ़ने से रोक लगी दी थी। आवेदकों ने आरोप लगाया कि कैट का दरवाजा खटखटाने के बाद, उन्हें अतिरिक्त रेजिडेंट कमिश्नर द्वारा कारण बताओ नोटिस भेजा गया, जिसमें दो दिनों के भीतर स्पष्टीकरण मांगा गया। उन्होंने दावा किया कि यह उत्पीड़न और प्रतिशोध की कार्रवाई थी, क्योंकि उनमें से कुछ को बाद में स्थानांतरित कर दिया गया और उन्हें अपने आधिकारिक आवास खाली करने के लिए कहा गया। एमएस लतीफ, सदस्य (जे) और प्रशांत कुमार, सदस्य (ए) की एक पीठ ने पिछले सप्ताह प्रथम दृष्टया साक्ष्य में पाया कि अतिरिक्त रेजिडेंट कमिश्नर द्वारा जम्मू-कश्मीर उच्च न्यायालय के रजिस्ट्रार न्यायिक को भेजे गए पत्र में कार्यवाही को प्रभावित करने की कोशिश की गई।

संसद से

देश में दो लाख बहुउद्देशीय सहकारी समितियां होंगी स्थापित : अमित शाह

केंद्रीय गृह और सहकारिकता मंत्री अमित शाह ने मंगलवार को लोकसभा में कहा कि सरकार ने देशभर में दो लाख बहुउद्देशीय पैक्स, डेयरी और मात्स्यिकी सहकारी समितियों की स्थापना की योजना को मंजूरी दी है, जिसे राष्ट्रीय कृषि और ग्रामीण विकास बैंक राष्ट्रीय डेयरी विकास बोर्ड, राष्ट्रीय मत्स्यकी विकास बोर्ड एवं राज्य सरकारों के सहयोग से क्रियान्वित किया जा रहा है। भाजपा के बृजमोहन अग्रवाल द्वारा संसद में प्रश्नकाल के दौरान छत्तीसगढ़ में सहकारी बैंकों, छोटे किसान-व्यापारियों के आर्थिक विकास और डेयरी सहकारी समितियों को मजबूत बनाने से संबंधित सवाल के उत्तर में श्री शाह ने अपने जवाब में कहा कि केंद्र सरकार छत्तीसगढ़ समेत पूरे देश में सहकारी बैंकों और छोटे किसानों-व्यापारियों को सशक्त करने के लिए व्यापक प्रयास कर रही है।

बॉयलर विधेयक पर चर्चा के दौरान भोपाल गैस कांड की आई याद

लोकसभा में बॉयलर विधेयक में चर्चा के दौरान भोपाल गैस कांड की यादें उभर आयीं और विपक्ष के कई सदस्यों ने देश के औद्योगिक इकाइयों में बॉयलरों के डिजायन के ऑडिट करने एवं बॉयलरों के संचालन, देखरेख में कुशल एवं प्रशिक्षित इंजीनियरों एवं कामगारों की नियुक्ति पर बल दिया। समाजवादी पार्टी के आनंद भदौरिया ने चर्चा में भाग लेते हुए कहा कि सरकार की मंशा है कि विदेशी एवं बड़े उद्योगपतियों को सुविधा दे कर छोटे एवं मझोले उद्योगपतियों को नुकसान पहुंचाने की है। बॉयलर पर पुराने ढांचे को थोपना चाहती है। जापान ने इसे रद्द करके कार्यक्षेत्र सुरक्षा कानून के दायरे में लाया है। यदि अंधाधुंध लाइसेंस बांटे गये तो फिर दुर्घटनाएं होंगी।

आपदा प्रबंधन संशोधन विधेयक को गृह मंत्रालय की समिति में भेजा जाए : विपक्ष

विपक्षी सदस्यों ने आपदा प्रबंधन संशोधन विधेयक को बिना गहन विचार विमर्श के राज्यसभा में पेश किए जाने का आरोप लगाते हुए इसे समुचित विचार विमर्श के लिए गृह मंत्रालय की संबद्ध समिति में भेजे जाने की मांग की वहीं सत्ता पक्ष ने राज्य सरकारों पर राज्य के स्तर पर राष्ट्रीय आपदा मोचन बल की बटालियनों का गठन न करने का आरोप लगाया। पश्चिम बंगाल के रीताब्रता बनर्जी ने मंगलवार को सदन में विधेयक पर चर्चा में हिस्सा लेते हुए कहा कि सरकार इस विधेयक को बिना समुचित विचार विमर्श के पेश कर रही है। इस विधेयक में प्राकृतिक आपदाओं से निपटने तथा उनके कारण पैदा होने वाली चुनौतियों के समाधान के बारे में गहन विचार विमर्श नहीं किया गया है। यह विधेयक करोड़ों लोगों के जीवन को प्रभावित करता है और इसलिए इसे समीक्षा के लिए गृह मंत्रालय की संबद्ध समिति में भेजा जाना चाहिए।

मिड डे मील के साथ ही स्कूलों में हो पर्याप्त सुविधा : तृणमूल कांग्रेस

स्कूलों में बच्चों को दिए जाने वाले मिड-डे मील को ज्यादा उपयोगी बनाने और उनके लिए शिक्षा की सुविधा को ज्यादा बेहतर बनाने का मुद्दा उठाते हुए कहा गया है कि छात्रों को मिड डे मील के साथ ही पर्याप्त शिक्षा सुविधा भी उपलब्ध कराई जानी चाहिए। तृणमूल कांग्रेस की शताब्दी रॉय ने शून्यकाल में यह मुद्दा उठाया और कहा कि उनके संसदीय क्षेत्र के एक सेंट्रल स्कूल में पर्याप्त सुविधाएं नहीं हैं। उनका कहना था कि बच्चे सिर्फ मिड डे मील के लिए स्कूल आएं यह पर्याप्त नहीं हैं बल्कि उन्हें पढाया भी जाना चाहिए। इस स्कूल में एक ही अध्यापक है और वह स्कूल आते भी हैं कि नहीं इस बारे में कोई पूछने वाला नहीं है।

पशुधन से जुड़े देश के दस करोड़ किसान जिसमें सत्तर फीसदी महिलाएं : राजीव रंजन

सरकार ने मंगलवार को लोकसभा में कहा कि देश में दस करोड़ किसान पशुधन से जुड़े हैं जिनमें सत्तर फीसदी महिलाएं शामिल है जिससे उनको रोजगार और और पोषण मिल रहा है। केन्द्रीय मत्स्य पशुपालन और डेयरी मंत्री राजीव रंजन सिंह उर्फ लल्लन सिंह ने प्रश्नकाल के एक दौरान एक पूरक प्रश्न के जवाब में कहा कि देश भर में दस करोड़ किसान पशुधन से जुड़े हैं जिनमें सत्तर प्रतिशत महिलाएं है।

सार संक्षेप

गुलमर्ग में वायुसेना के पूर्व सैनिक का खोया बैग बरामद

श्रीनगर। जम्मू-कश्मीर पुलिस ने बारामुल्ला जिले के गुलमर्ग के स्की रिसॉर्ट में वायुसेना के एक पूर्व सैनिक का खोया हुआ बैग बरामद किया है। पुलिस ने बताया कि पंजाब के मोहाली निवासी भारतीय वायुसेना के ग्रुप कैप्टन अजीत सिंह (सेवानिवृत्त) अपने परिवार के साथ गुलमर्ग में दौरे पर थे, सोमवार को उनका बैग खो गया जिसमें 37 हजार रुपए नकद और अन्य दस्तावेज थे। पुलिस ने बताया कि बारामुल्ला पुलिस ने तुरंत कार्रवाई करते हुए समर्पित प्रयासों के साथ एक त्वरित खोज अभियान शुरू किया, खोया हुआ बैग ढूंढ लिया गया और उसे सुरक्षित रूप से ग्रुप कैप्टन और उनके परिवार को सौंप दिया गया।

बिहार के सरकारी विभागों में हुआ व्यर्थ खर्च : सीएजी

पटना, 25 मार्च (एजेंसियां)। नियंत्रक एवं महालेखा परीक्षक (सीएजी) की ताजा रिपोर्ट ने बिहार सरकार के अलग-अलग विभागों में योजना और व्यवहार्यता के अभाव में हुए व्यर्थ खर्च को उजागर किया है। उप मुख्यमंत्री एवं वित्त मंत्री सम्राट चौधरी ने मंगलवार को विधानसभा में 31 मार्च 2022 को समाप्त वर्ष के लिए सीएजी की रिपोर्ट पेश की। रिपोर्ट में कहा गया है कि नीरा परियोजना सहित कई परियोजनाओं में 11.68 करोड़ रुपए का बेकार खर्च किया गया है। रिपोर्ट के अनुसार, नीरा परियोजना को बिना उचित योजना के शुरू करने से 11.68 करोड़ रुपये का नुकसान हुआ। इसमें अप्रयुक्त भवनों, संयंत्रों और मशीनरी पर खर्च, रेफ्रिजरेटेड वैन की खरीद पर 1.10 करोड़ रुपए का अनावश्यक व्यय और गुड़ उत्पादन में 2.03 करोड़ रुपए की हानि शामिल है।

रिपोर्ट में कहा गया है कि एनएनपी के तहत योजनाओं को तीन बैचों मार्च 2017, मार्च 2019 और मार्च 2020 में पूरा करना था लेकिन दिसंबर 2022 तक कोई भी बैच पूरी तरह लागू नहीं हुआ। परियोजना की कुल लागत का 50 प्रतिशत यानी 803 करोड़ रुपये विश्व बैंक से मिलने थे लेकिन केवल 326.10 करोड़ रुपये ही प्राप्त हुए। शेष 476.90 करोड़ रुपये की सहायता कार्यान्वयन में सुस्ती और खर्च में कमी के चलते गंवा दी गई। रिपोर्ट के अनुसार, एनएनपी के 64.21 करोड़ रुपए को संचालन-रखरखाव (ओएंडएम) और गैर-पात्र योजनाओं में डायवर्ट किया गया। इसके अलावा घोघा घाट (पश्चिम चंपारण) और सिलाव (नालंदा) में 19.44 करोड़ रुपये की मुख्य पाइपलाइन बिछाई गई, जो बेकार साबित हुई क्योंकि सतही जल के बजाय भूजल का उपयोग किया गया। रिपोर्ट में कहा गया कि इसी तरह रजौली (नवादा), घोघा घाट और सिलाव में 4.11 करोड़ रुपए के 24123 मल्टी-जेट वाटर मीटर बेकार हो गए क्योंकि विभाग ने जून 2021 में प्रति कनेक्शन 30 रुपये की निश्चित दर तय की। साथ ही पांच डिवीजनों में जरूरत से ज्यादा क्षमता वाले एलिवेटेड सर्विस रिजर्वायर (ईएसआर) पर 3.57 करोड़ रुपये का अतिरिक्त खर्च किया गया। रिपोर्ट में कहा गया है कि बेगूसराय जिले के मझौल अनुमंडलीय अस्पताल के निर्माण पर 4.89 करोड़ रुपये खर्च किए गए लेकिन पिछले दस साल से यह भवन बेकार पड़ा है और जर्जर हो रहा है।

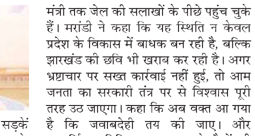
- **नीर निर्मल परियोजना के कार्यान्वयन में बड़ी लापरवाही को किया उजागर**
- **वित्त मंत्री सम्राट चौधरी ने विधानसभा में पेश की सीएजी की रिपोर्ट**

बिहार राज्य फसल सहायता योजना का कोई डेटाबेस नहीं

पटना। नियंत्रक एवं महालेखा परीक्षक (सीएजी) ने बिहार सरकार की फसल सहायता योजना में गंभीर खामियों को उजागर करते हुए बताया कि सहकारिता विभाग के पास इस योजना को प्रभावी ढंग से लागू करने, निगरानी करने और संतोषजनक कवरेज सुनिश्चित करने के लिए संभावित लाभार्थियों का कोई डेटाबेस नहीं था। उप मुख्यमंत्री एवं वित्त मंत्री सम्राट चौधरी ने विधानसभा में 31 मार्च 2022 को समाप्त वर्ष के लिए सीएजी की प्रदर्शन और अनुपालन लेखापरीक्षा रिपोर्ट पेश की। इसमें खुलासा हुआ कि 50 लाख 91 हजार 243 सत्यापित आवेदनों में से 52 प्रतिशत यानी 26 लाख 30 हजार 462 आवेदन खारिज कर दिए गए।

झारखंड के सरकारी टेंडर प्रक्रिया में पारदर्शिता का घोर अभाव : बाबूलाल मरांडी

रांची, 25 मार्च (एजेंसियां)। झारखंड में भाजपा के प्रदेश अध्यक्ष एवम नेता प्रतिपक्ष बाबूलाल मरांडी ने मंगलवार को राज्य की सरकारी टेंडर प्रक्रिया पर सवाल खड़ा किया। मरांडी ने कहा कि झारखंड में सरकारी टेंडर आवंटन प्रक्रिया की पारदर्शिता लगातार संदेह के घेरे में रही है। महालेखाकार की जांच में यह सामने आया है कि पेयजल स्वच्छता, ग्रामीण कार्य विकास, गृह कारा एवं आपदा प्रबंधन जैसे दर्जनों विभागों में एक ही आई पी एड्रेस से टेंडर भरे गए, जिससे स्पष्ट है कि ठेके पहले से ही तय होते हैं।कहा कि पूरी प्रक्रिया सिर्फ औपचारिकता होती है। अपने करीबी लोगों को लाभ पहुंचाने के लिए नियमों की धज्जियां उड़ाई जा रही हैं। उन्होंने कहा कि जब टेंडर आवंटन में इतनी अनियमितता होगी, तो सरकारी योजनाओं और परियोजनाओं की गुणवत्ता पर भी इसका सीधा असर पड़ेगा। नतीजा यह है कि जलमीनार ध्वस्त हो रहे हैं, सड़कें महीनों में ही जर्जर हो जाती हैं। भ्रष्टाचार के आरोपों में इंजीनियर, अधिकारी से लेकर मंत्री तक जेल की सलाखों के पीछे पहुंच चुके हैं। मरांडी ने कहा कि यह स्थिति न केवल प्रदेश के विकास में बाधक बन रही है, बल्कि झारखंड की छवि भी खराब कर रही है। अगर भ्रष्टाचार पर सख्त कार्रवाई नहीं हुई, तो आम जनता का सरकारी तंत्र पर से विश्वास पूरी तरह उठ जाएगा। कहा कि अब वक्त आ गया है कि जवाबदेही तय की जाए। और पारदर्शिता सुनिश्चित कर जनता के पैसों की लूट को रोका जाए।



S.No	Notice Subject	Link
18	The details of CSR Expenditure during the FY 2024-25	Read
19	Notice of AGM 2025	Read
20	Draft Letter of Appointment as an Independent Director XX.09.2025	Read
21	Environmental Clearance HIRA FERRO UNIT II	Read
22	Environmental Clearance HIRA FERRO UNIT 1	Read
23	Notice of AGM 2024	Read
24	Draft Letter of Appointment as an Independent Director	Read
25	Letter of offer	Read
26	Public Announcement	Read

Annexure XXVI: Nagar Nigam Submission

HIRA

HIRA FERRO ALLOYS

COPY

HFAL/ENV/25-26/49

DATE: - 16.05.2025

प्रति,
आयुक्त महोदय जी
नगरपालिक निगम बीरगांव
जिला - रायपुर, छत्तीसगढ़

विषय: मेसर्स हीरा फेरो एलॉयस लिमिटेड (यूनिट-I) द्वारा फेरो एलॉयस उत्पादन क्षमता में विस्तार हेतु पर्यावरणीय स्वीकृति की प्रति प्रस्तुत करने बाबत ।

सन्दर्भ : पर्यावरणीय स्वीकृति File No: IA-J-11011/153/2022-IA-II (Ind-I) दिनांक 20.03.2025

आदरणीय महोदय,

उपरोक्त विषयान्तर्गत ,आपको सूचित किया जाता है कि भारत सरकार, पर्यावरण वन जलवायु परिवर्तन मंत्रालय द्वारा जारी ई.आ.ए नोटिफिकेशन 2006 (यथा-संशोधित) के अंतरगर्त **File No: IA-J-11011/153/2022-IA-II (Ind-I) दिनांक 20.03.2025** के द्वारा हमारे प्लांट मेसर्स हीरा फेरो एलॉयस लिमिटेड (यूनिट-I), प्लाट नंबर 567/B, 568, 553/B, उरला इण्डस्ट्रीयल एरिया, ग्राम-अछोली, जिला-रायपुर (छ.ग.) में स्थापित परियोजना में क्षमता विस्तार के तहत फर्नेस कॉन्फ़िगरेशन में विस्तार/संशोधन (1 X 5 MVA से 1 X 11 MVA) और फेरो एलॉयस उत्पादन क्षमता में विस्तार - SiMn- 10,500 TPA से 18,000 TPA, और/या FeMn 10,500 से 29,000 TPA और/या Pig Iron - 30,000 TPA और/या FeSi - 9,000 TPA प्रस्तुत परियोजना हेतु पर्यावरण स्वीकृति प्रदाय किया गया है । जिसकी प्रतिलिपि आपके समक्ष अवलोकनार्थ प्रस्तुत है। तथा इसकी मूल प्रति पर्यावरण वन एवं जलवायु परिवर्तन मंत्रालय के वेबसाइट https://parivesh.nic.in/ तथा प्रतिलिपि सदस्य सचिव, छत्तीसगढ़ पर्यावरण संरक्षण मंडल तथा क्षेत्रीय कार्यालय, छत्तीसगढ़ पर्यावरण संरक्षण मंडल रायपुर छत्तीसगढ़ अवलोकनार्थ प्रस्तुत है ।

यह आपकी जानकारी और अभिलेख के लिए है, और कृपया इसकी प्राप्ति की पावती देने की कृपा करें ।

"धन्यवाद"

भवदीय

वास्ते , हीरा फेरो एलॉयस लिमिटेड (यूनिट-I)

for,

अधिकृत हस्ताक्षरकर्ता

HIRA FERRO ALLOYS LTD. ★ INDIA ★ RAIPUR (C.G.)

नगर पालिक निगम बीरगांव ★ 16/05/25 ★ जिला-रायपुर (छ.ग.)

Hira Ferro Alloys Limited
An ISO 9001:2015, ISO 14001:2015 and OHSAS 18001:2007 certified company
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