



Jharkhand <jam.env2018@gmail.com>

Regarding compliance for the period April, 2023 to September, 2023 to the conditions of Environment Clearance for Expansion of existing 1,20,000 TPA Sponge Iron Plant by installation of new facilities for production of Steel Melting Shop for 1,08,000 TPA of Billets, Rolling mill (90,000 TPA), Iron Ore crushing & Beneficiation plant (2,70,000 TPA), Slag Crushing Plant (16,200 TPA), Captive Power Plant 18 MW (4X2MWWHRB :1X10 MW AFBC) and Briquetting unit for Iron ore fines(40,100 TPA).

1 message

Jharkhand <jam.env2018@gmail.com>

Mon, Dec 18, 2023 at 10:17 AM

To: ro.ranchi-mef@gov.in

Cc: rdkolkata.cpcb@gov.in, ranchijspcb@gmail.com, jspcb_hazaribagh@rediffmail.com

ASIPL/131/ 2023-24

05/12/2023

To,
The Additional Principal Chief Conservator of Forests (C),
Government of India,
Ministry of Environment, Forest & Climate Change,
Integrated Regional Office (Eastern Central Zone),
2nd Floor, Headquarter-Jharkhand State Housing Board,
Harmu Chowk, Ranchi, Jharkhand- 834002

Sub:-Regarding compliance for the period April, 2023 to September, 2023 to the conditions of Environment Clearance for Expansion of existing 1,20,000 TPA Sponge Iron Plant by installation of new facilities for production of Steel Melting Shop for 1,08,000 TPA of Billets, Rolling mill (90,000 TPA), Iron Ore crushing & Beneficiation plant (2,70,000 TPA), Slag Crushing Plant (16,200 TPA), Captive Power Plant 18 MW (4X2MWWHRB :1X10 MW AFBC) and Briquetting unit for Iron ore fines(40,100 TPA).

Ref: - Environment Clearance Letter No. F. NO. J-11011/205/2016-IA.II (I) Dated- 23rd July, 2018.

Dear Sir,

In reference to the above subject matter & reference letters, the point wise Half Yearly compliance status for the period of April, 2023 to September, 2023 is being submitted. The soft copy is also sent through e-mail for your kind perusal please.

Hope you will find this in order and oblige.

Thanking you.

Yours faithfully

For Alope Steels Industries Pvt Ltd.

 **ASIPL - EC Compliance - April 23 to September 23.pdf**
5869K

Aloke Steels Industries Private Limited

OFFICE

: OPP. ASHOK CINEMA,
RANCHI ROAD, MARAR -829 117
DIST. - RAMGARH (JHARKHAND)
: U27103JH2004PTC010725
: asipl.ramgarh@gmail.com

CIN
Email

WORKS :
Vill : Budhakhap
Post : Karma -829137
Dist.-Ramgarh,(Jharkhand)

Ref. No.....

ASIPL/131/ 2023-24

O/C

Date.....
05/12/2023

To,
The Additional Principal Chief Conservator of Forests (C),
Government of India,
Ministry of Environment, Forest & Climate Change,
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For Aloke Steels Industries Pvt Ltd.

Authorized Signatory

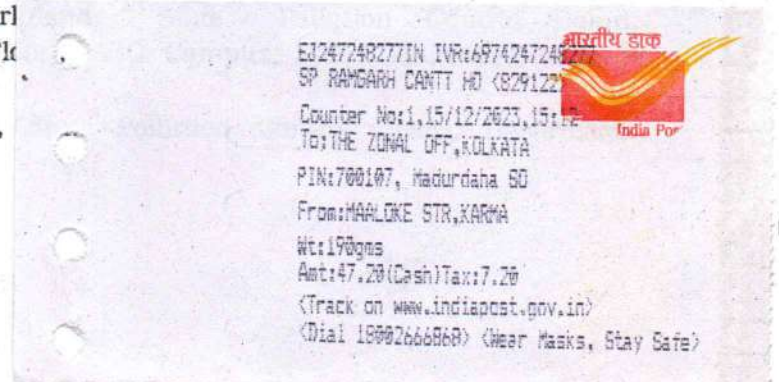
Enclosures: Compliance status Report.

Cc to:-

- 1) The Zonal office Incharge, Central Pollution Control Board, Southernd Conclave, Block 502, 5th & 6th Floors, 1582 Rajdanga Main Road, Kolkata - 700 107 (W. B.).
- 2) The Member Secretary, Jharl T.A. Division Building (Ground Flk 834004, Jharkhand.
- 3) Regional Officer, Regional Office, Jharkhand.



Jitendra
12/12/23





Online Consent Management & Monitoring System

Ministry of Environment, Forest and Climate Change
Government of India



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Welcome ALOKE STEELS INDUSTRIES PRIVATE LIMITED

Date : 5-12-2023

Your Compliance details has been Submitted. Your Acknowledgement Number is 17938747. Thank You!.

General

General Details

Industry Name: ALOKE STEELS INDUSTRIES PRIVATE LIMITED
Industry Address: VILL: BUDHAKHAP, PO: DIGWAR, RAMGARH
Industry Pin: 829137
Industry S.T.D. Code(Phone): 06553
Industry Phone No: 226846
Industry E-Mail Address: asipl.ramgarh@gmail.com
Occupier Name: KAMENDRA MISHRA
Occupier Designation: DIRECTOR
Occupier Address: NEAR PNB, MAIN ROAD
Occupier Pin: 829122
Occupier Mobile No:
Occupier Email Address: asipl.ramgarh@gmail.com
Industry Category: RED
Industry Type: Iron & Steel involving processing from ore/integrated steel plan
Last Consent Granted App. No:
Last Consent Granted Uploaded Certificate: [View Uploaded Certificate](#)
Last Consent Granted App. Type: CTO
Authorization to file Compliance: [View File](#)

Proposal No.	State	Proposal Name	Category	User Agency Name	Proposal Recieved on	File No	Date of grant
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General Condition:

[View](#)

Specific Condition:

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Environment Clearance Compliance Status
Period from April -2023 to September -2023

Name of Project:	Aloke Steels Industries Pvt. Ltd.
Capacity:	Expansion of existing 1,20,000 TPA Sponge Iron Plant by installation of new facilities for production of Steel Melting Shop for 1,08,000 TPA of Billets, Rolling mill (90,000 TPA), Iron Ore crushing & Beneficiation plant (2,70,000 TPA), Slag Crushing Plant (16,200 TPA), Captive Power Plant 18 MW (4X2 MW WHRB: 1X10 MW AFBC) and Briquetting unit for Iron ore fines (40,100 TPA).
Location:	Village - Budhakhap, P.O - Karma, Distt. - Ramgarh, Jharkhand.
EC letter No.	F. NO. J-11011/205/2016-IA.II (I) Dated- 23 rd July, 2018.

A. SPECIFIC CONDITION:

Sl.No	CONDITION	COMPLIANCE
i)	The project proponent shall revise the layout by removing the tailing pond, providing additional entry gate, sufficient parking area and green belt in 8.24 Ha, space for storage of filter cakes, etc.	Complied the layout is revised as directed.
ii)	The project proponent shall install the filter press/belt filter and make a filter cake of the tailing and sent to dispose to the users of the same.	Noted, will be complied with project installation.
iii)	The project proponent shall install the briquetting plant for briquetting / amalgamation of dust collected from air pollution control device including mill scales.	Noted, will be complied with project installation.
iv)	No ground water shall be extracted during construction and operation of the project.	Agree with. Surface Water drawl agreement executed with DVC for drawl of water from Damodar River.

GENERAL CONDITIONS:

S.No	CONDITION	COMPLIANCE
1	An amount of Rs 160 Lakhs proposed towards Corporate Environment Responsibility shall be utilized as capital expenditure in project mode. The project shall be completed in concurrence with the implementation of the expansion and estimated on the basis of Scheduled Rates.	Being complied, Unit has purchased Ambulance (24X7) for the villagers.

2	Green belt shall be developed in 8.24 Ha of the plant area with a native tree species in accordance with CPCB guidelines. The greenbelt shall inter alia cover the entire periphery of the plant.	Being complied, for 8.24 ha will be completed in due course.
3	The Capital cost Rs. 945.0 Lakhs and annual recurring cost Rs. 105.50 Lakhs towards the environment protection measures shall be earmarked separately. The funds so provided shall not be diverted for any other purpose.	Noted, will be complied in due course.
4	The project proponent shall (Air Quality Monitoring):	
a)	Install 24x7 continuous emission monitoring system at process stacks to monitor stacks emission with respect to standards prescribed in Environment (Protection) Rules 1986 (G.S.R 414 (E) dated 30 th May 2008 as amended from time to time S.O. 3305 (E) dated 7 th December 2015 (Thermal Power Plants) 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.	Being complied for existing coal based Sponge Iron plant online monitoring systems are installed for monitoring of PM & SO ₂ emission of stack and it is connected online with Central Pollution Control Board and Jharkhand State Pollution Control Board URL server. Compliance regarding expansion project we have noted and will comply in due course.
b)	Monitor fugitive emissions in the plant premises at least once in every quarter through laboratories recognized under Environment (Protection) Act, 1986 or NABL accredited laboratories.	Being complied for existing coal based Sponge Iron plant. Noted for compliance in expansion project. Fugitive monitoring test report is enclosed as Annexure – 1 .
c)	Install system carryout Continuous Ambient Air Quality monitoring for common/criterion parameters relevant to the main pollutants released (e.g. PM ₁₀ and PM _{2.5} in reference to PM emission, and SO ₂ and NO _x in reference to SO ₂ and NO _x emission) within and outside the plant area (at least at four location one within and three outside the plant area at an angle of 120° each), covering upwind and downwind direction; and	As per direction of Jharkhand State Pollution Control Board vide letter no B-19 issued on 28/02/2019, we have installed Continuous Ambient Air Quality Monitoring Station for PM 10 parameter and it is connected online with Jharkhand State Pollution Control Board URL server. Further we have order to install

		PM2.5, SO2 and NOx parameter to M/s Vasthi Instrument Private Limited.
d)	Submit monthly summary report of continuous stack emission and air quality monitoring and results of manual stack monitoring and manual monitoring of air quality/fugitive emission to Regional office of MoEF&CC, Zonal office of CPCB and Regional Office of SPCB along with six-Monthly monitoring report.	Monthly summary report is enclosed as Annexure – 2 . Noted for compliance in expansion project.
5	The project proponent shall (Water Quality Monitoring):	
a)	Install 24x7 continuous effluent monitoring system with respect to standards prescribed in Environment (Protection) Rules 1986 (G.S.R 414 (E) dated 30 th May 2008; S.O. 3305 (E) dated 7 th December 2015 (Thermal Power Plant) 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.	No industrial effluent is generated, domestic discharge are made in close circuit. In compliance to Zero Liquid Discharge (ZLD), the web camera and flow meter are installed and it is connected online with Central Pollution Control Board and Jharkhand State Pollution Control Board URL server. Noted for compliance in expansion project.
b)	Monitor regularly ground water quality at least twice a year (pre and post monsoon) at sufficient numbers of piezometers/sampling wells in the plant and adjacent areas through labs recognized under Environment (protection) Act, 1986 and NABL accredited laboratories; and	Being complied on regular basis. Ground Water quality monitoring report & Piezometer reading are enclosed as Annexure – 3 .
c)	Submit monthly summery report of continuous effluent monitoring and result of manual effluent testing and manual monitoring of ground water quality to Regional Office of SPCB along with six-monthly monitoring report.	No industrial effluent is generated, domestic discharge are made in close circuit. In compliance to Zero Liquid Discharge (ZLD), the web camera and flow meter are installed and it is connected online with Central Pollution Control Board and Jharkhand State Pollution Control Board URL server. Noted for compliance in

		expansion project.
6	The project proponent shall (Air Pollution Control):	
a)	Provide appropriate Air Pollution Control (APC) system for all the dust generating points including fugitive dust from all vulnerable sources, so as to comply prescribed stack emission and fugitive emission standards.	Being complied for existing plant, noted for compliance in expansion project.
b)	Provide leakage detection and mechanized bag cleaning facilities for better maintenance of bags;	Being complied for existing plant, noted for compliance in expansion project.
c)	Provide pollution control system in the steel plant as per the CREP Guidelines of CPCB;	Noted, will be complied in due course.
d)	Provide sufficient number of mobile or stationary vacuum cleaners to clean plant roads, shop floors, roofs regularly;	Adequate arrangement of cleaning and sprinkling of water has been made. Noted, will be complied in due course in expansion project.
e)	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 device in the process after briquetting/agglomeration;	Being complied for existing plant, noted for compliance in expansion project.
f)	Ensure covered transportation and conveying of ore, coal and other raw material to prevent spilling and dust generation;	Being complied for existing plant, noted for compliance in expansion project.
g)	Provide wind shelter fence and chemical spraying on the raw material stocks pipe.	For existing plant, units has provided coved storage shed have been provided for all raw materials like coal, Iron ore etc. Noted, will be complied in due course in expansion project.
7	The project proponent shall (Water pollution Control):	
a)	Adhere to 'Zero liquid discharge,;	Being complied for existing coal based sponge iron plant, noted for compliance in expansion project.
b)	Provide Sewage Treatment Plant for	Being complied for existing plant, noted for compliance in

	domestic wastewater ; and	expansion project.
c)	Provide garland drains and collected pits for each stock pipe to arrest the run-off in the event of heavy rains and to check the water pollution due to surface run-off.	Being complied for existing plant, noted for compliance in expansion project.
8	The project proponent shall (Water Conservation)	
a)	Practice rainwater harvesting to maximum possible extent; and	Being complied. Two nos. of rain water harvesting pit has been constructed for rain water harvesting.
b)	Make efforts to minimize water consumption in the steel plant complex by segregation of used water, practicing cascade use and by recycling treated water.	Being complied for existing plant, noted for compliance in expansion project.
9)	The project proponent shall (Energy Conservation):	
a)	Provide waste heat recovery system on the DRI kilns;	Being complied, installation of WHRB is the part of the project.
b)	Use dolochar generated for power generation;	Being complied, installation of AFBC is the part of the project.
c)	Provide solar power generation on roof tops of building, for solar light system for all common areas, street lights, parking around project area and maintain the same regularly ; and	Noted, will be complied in due course.
d)	Provide the project proponent for LED lights in their offices and residential areas;	Being complied for existing plant, noted for compliance in expansion project.
10	Used refractories shall be recycled as far as possible.	Noted, will be complied in due course.
11	The project proponent shall prepare GHG emission inventory for the plant and shall submit the programme for reduction of the same including carbon sequestration including plantation.	GHG emission inventory report is enclosed as Annexure – 4.
12	Emergency preparedness plan based on the Hazard identification and Risk Assessment (HIRA) and Disaster Management Plan shall be implemented.	Being complied for existing plant, noted for compliance in expansion project.
13	The project proponent shall carry out heat	In sponge iron unit PPE is

	stress analysis for the workmen who work in the high temperature work zone and provide Personal Protection Equipment (PPE) as per the norms of factory Act.	provided. The high temperature work zone of expansion unit will be complied in due course.
14	The project proponent shall adhere to the corporate environmental policy and system of the reporting of any infringement/non-compliance of EC condition at least once in a year to the Board of Directors and the copy of the board resolution shall be submitted to the MoEF&CC as a part of six-monthly report.	Noted, will be complied in due course.
15	All the recommendations made in the Charter on Corporate Responsibility for Environment Protection (CREP) for the steel plants shall be implemented.	Being complied on regular basis.
16	A dedicated environmental cell with qualified personnel shall be established. The head of the environment cell shall report directly to the head of the organization.	Organization of Environment Management Cell is enclosed as Annexure – 5 .
17	Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, Mobile STP, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.	Noted for compliance in due course with start of the construction activities.
18	The project authorities must strictly adhere to the stipulations made by the State Pollution Control Board and the State Government.	Noted, will be complied in due course.
19	No further expansion or modification in the plant shall be carried out without prior approval of the Ministry of Environment, Forest and Climate Change (MoEF&CC).	Noted, will be complied in due course.
20	The waste oil, grease and other hazardous waste shall be disposed of as per the Hazardous & Other waste (Management & Tranboundary Movement) Rules, 2016.	Being complied for existing plant, noted for compliance in expansion project.
21	The ambient noise levels should confirm to the standards prescribed under EPA Rules,	Being complied for existing coal based Sponge Iron plant. Test

	1989 viz. 75 dB during day time and 70 dB during night time.	monitoring report is enclosed as Annexure – 6 . Noted for compliance in expansion project.
22	Occupational health surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.	Periodical health check-up are being carried and record are maintained.
23	The project proponent shall also comply with all the environment protection measures and safeguards recommended in the EIA/EMP report.	Being complied for existing plant, noted for compliance in expansion project.
24	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 shall be submitted to the Ministry's Regional Office.	Noted, will be complied in due course.
25	Kitchen waste shall be composted or converted to biogas for further use.	Being complied for existing plant, noted for compliance in expansion project.
26	The project proponent shall (Post-EC monitoring):	
a)	Send a copy of environment clearance letter to the heads of Local Bodies, Panchayat, Municipal bodies and relevant offices of the Government;	Complied.
b)	Put on the clearance letter on the web site of the company for access to the public.	Complied. The copy of environment clearance letter is available on the web site of www.asipl.in .
c)	Inform the public through advertisement within seven days from the date of issue of the clearance letter, at least two local newspaper that are widely circulated in the region of which one shall be in the vernacular language that the project has been accorded environment clearance by the Ministry and copies of the clearance letter are available with the SPCB and may also be seen at Website of the Ministry of Environment, Forest and Climate Change (MoEF&CC) at http://envfor.nic.in .	Complied. The notice has been published (English language) in 2 newspapers "DainikJagran" dt-02/08/2018 and "PrabhatKhabar" dt-01/08/2018. As per direction it is published in the vernacular language in 2 newspapers "DanikJagaran" dt 15/07/2020 & "PrabhatKhabar"

		dt 12/07/2020. The copy of environment clearance letter is available on the web site of http://envfor.nic.in .
d)	Upload the status of compliance of the stipulated environment clearance conditions including results of monitored data on their website and update the same periodically;	Noted. Status of compliance available on the company web site www.asipl.in .
e)	Monitor the criteria pollutants level namely; PM ₁₀ , SO ₂ , NO _x (ambient levels as well as stack emission) 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;	Being complied for existing plant, noted for compliance in expansion project. Display board has been displayed on main gate.
f)	Submit six monthly reports on the status of the compliance of the stipulated environmental conditions including results of monitored data (both in hard copies as well as by e-mail) to the Regional Office of MoEF&CC, the respective Zonal Office of CPCB and the SPCB;	Noted, will be complied in due course. Compliance report submitting on regular basis to the Regional Office of MoEF&CC, the Zonal office of CPCB and the SPCB. Last six monthly submitted compliance reports with email copy enclosed as Annexure -7 .
g)	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;	Being complied for existing plant, noted for compliance in expansion project. Environment Statement Report has been uploaded on the company web site www.asipl.in . Environment Statement Report enclosed as Annexure -8 .
h)	Inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of commencing the land development work.	Noted, will be complied in due course.
24.0	The ministry may revoke or suspend the clearance, if implementation of any of the	Noted the content to adhere the compliance.

	above condition is not satisfactory.	
25.0	The ministry reserves the right to stipulate additional conditions if found necessary. The Company in a time bound manner shall implement these conditions.	Noted the content, will be complied in due course.
26.0	The project proponent shall abide by all the commitments and recommendations made in the EIA/EMP report and that during their presentation to the EAC. The commitment made by the project proponent to the issue raised during Public Hearing shall be implemented by the proponent.	Noted, will be complied in due course.
27.0	The above condition shall be enforced, inter-alia under the provisions of the Water (Prevention & Control of pollution) Act, 1974 the air (Prevention & Control of Pollution) Act, 1981, the environment (protection) Act, 1986, Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 and the Public Liability Insurance Act, 1991 along with their amendments and rules.	Noted the content, will be complied in due course.
28.0	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 the National Green Tribunal Act, 2010.	Noted the content to adhere the compliance.



ANALYTICAL & ENVIRONMENTAL ENGINEERING LABORATORY

Accredited by: - Jharkhand State Pollution Control Board (JSPCB)
 Certified by: - An ISO 9001:2015 & ISO 45001:2018

Test Report

Discipline	Chemical	Group	Atmospheric Pollution	Sample Description	Fugitive Dust Emission
Report Release Date	20 th October, 2023		Report ID	YBAEEL - 231011 - 144421 - F01	
W. Order/ JSPCB App. No.	ASIPL/111/2022-23		Work Order Date	06.01.2023	
Type of Industry (If any)	Sponge Iron Unit		Job code/ Ref. no.	YBAEEL/WA/LJA/Oct.-23/13	
Report Issue to	M/s Aloke Steel Industries Pvt. Ltd. Opp. Ashok Cinema, Ranchi Road Marar - 829117, Dist.- Ramgarh, Jharkhand.				
Sampling Period	18/10/2023	Mode of sample collection		By YBAEEL Team	
Sampling Protocol	IS:5182				
Sampling Locations	A. Product Handling Area		23°39'49"N, 85°33'05"E		
	B. Material Handling Area		23°39'43"N, 85°33'05"E		
Meteorological Cond. of Field	W.C.- Clear	RH % - 48	Temp. - 32°C	W.D.- East-West	
Sample receipt Date	18/10/2023	Analysis Started on	18/10/2023	Analysis completed on	20/10/2023

*****Test Results*****

Parameters	Test Methods	Units	Sampling Location		Limits
			Site A	Site B	
Particulate matter (RSPM)	Gravimetric Method	µg/m ³	1844.9	1623.6	2000

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

Limit is specified as	G.S.R. 414 (E), 30 th May, 2008
Abbreviation	MDL : Minimum detection limit, BDL : Below detection limit,
Env. Condition of Lab	Laboratory is maintaining, Temperature 27 ± 2°C and Relative Humidity 65 ± 5% in all testing areas as per IS 196:1966 (C).
Specific contractual notes	All values are expressed in as unit and results listed refer only to the tested sample and applicable parameter in Lab's Permanent Facility
	This report, in full or in part, shall not be used for advertising or as evidence in any court of law.
	This report cannot be reproduced, except when in full, without the written permission of the CEO.
	The samples collected shall be destroyed after 7 days from the date of issue of the certificate unless specified otherwise
	The liability of the laboratory is limited to the invoiced amount.
Remarks	All disputes are subjected to the Ranchi Jurisdiction. Samples comply with prescribed limits.

Sample Drawn By - Pawan Kumar Singh
 Tested By - Akash Khalkho (Lab Analyst)

Verified by Sumit Kant Srivastava (Sr. Lab Analyst)	Issued by Sanjeev Kumar Singh (Technical Manager)
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Authorized Signatory
 Atmospheric Pollution
 Yugantar Bharati Analytical &
 Environmental Engineering Laboratory

Branch Office :- Jamshedpur Dhanbad Hazaribag Pakur

Main Office : Namkum Post Office, Sidroul, Ranchi - 834010, Jharkhand

Ph : 098351-97960, 09304955304, Email - ybaeel@gmail.com, Web - https://ybaeel.in



ISO 45001:2015



ISO 9001:2015

Aloke Steels Industries Pvt. Ltd.**Village- Bhudhakhap, Post – Karma, Distt – Ramgarh, Jharkhand - 829137****Stack emission Report (PM All values in mg/Nm3)**

Sl. No.	Month	Stack 1	Stack 2
		PM	PM
1	April-23	93	89
2	May-23	91	86
3	June-23	90	88
4	July-23	86	88
5	August-23	88	87
6	September-23	92	92

Ambient Air Quality Monitoring

Location	Parameters	Unit	April-23	May-23	June-23	July-23	August-23	September-23
Nr. Main Gate	PM 10	µg/m ³	92	89	90	91	94	93
	PM 2.5		56	56	55	52	54	54
Nr. OHC	PM 10		87	94	93	93	83	82
	PM 2.5		51	55	54	58	51	53
Nr. North-west boundary wall	PM 10		90	92	93	91	90	89
	PM 2.5		57	54	56	56	55	56



ANALYTICAL & ENVIRONMENTAL ENGINEERING LABORATORY

Accredited by :- Jharkhand State Pollution Control Board (JSPCB)
Certified by :- An ISO 9001:2015 & ISO 45001:2018

Test Report

Report Release Date	22 nd October, 2023	Report ID	YBAEEL-231019-121424 -WL01
W. Order/ JSPCB App. No.	Via -Telephonic	Work Order Date	19.10.2023
Type of Industry(if any)	Sponge Iron Unit	Job code/ Ref. no.	YBAEEL/WAL/C/Oct.-23/15
Report Issue to	M/s Aloke Steels Industries Private Limited Budhakhap, Post - Karma - 829137, Dist. - Ramgarh, Jharkhand.		
Sampling Date	20/10/2023	Mode of sample collection	By YBAEEL Team
Meteorological Cond. of Field	W.C.- Clear	RH % - 57	Temp.- 26°C

*****Test Results*****

SI	Location	Ground Water Level (mbgl)
1.	Near Store	7.2

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

Abbreviation	MDL : Minimum detection limit, BDL : Below detection limit, MBGL : Meter below ground level.
Env. Condition of Lab	Laboratory is maintaining, Temperature 27 ± 2°C and Relative Humidity 65 ± 5% in all testing areas as per IS 196:1966 (C).
Specific contractual notes	All values are expressed in as unit and results listed refer only to the tested sample and applicable parameter in Lab's Permanent Facility This report, in full or in part, shall not be used for advertising or as evidence in any court of law. This report cannot be reproduced, except when in full, without the written permission of the CEO. The samples collected shall be destroyed after 15 days from the date of issue of the certificate unless specified otherwise The liability of the laboratory is limited to the invoiced amount. All disputes are subjected to the Ranchi Jurisdiction.
Remarks	-----

 Tested by Angad Munda (Field Analyst)	 Issued by Sangeet Kumar Singh (Technical Manager)
---	---

Technical Manager
Yugantar Bharati Analytical & Environmental Engineering Laboratory

Branch Office :- Jamshedpur Dhanbad Hazaribag Pakur

Main Office : Namkum Post Office, Sidroul, Ranchi - 834010, Jharkhand
Ph : 098351-97960, 09304955304, Email - ybaeel@gmail.com, Web - https://ybaeel.in



YUGANTAR BHARATI

ANALYTICAL & ENVIRONMENTAL ENGINEERING LABORATORY



Accredited by :- Jharkhand State Pollution Control Board (JSPCB)
Certified by :- ISO 9001:2015 & ISO 45001:2018

TC-4032



Test Report

ULR (Unique Lab Report) No.	T	C	4	0	3	2	2	3	0	0	0	0	0	1	4	4	3	F
Discipline	Chemical	Group	Water			Sample Description						Ground Water						
Report Release Date	26 th October, 2023					Report ID						YBAEEL-231019-121424-GW01						
W. Order/ JSPCB App. No.	Via - Telephonic					Work Order Date						19.10.2023						
Type of Industry (If any)	Sponge Iron Unit					Job code/ Ref. no.						YBAEEL/WAL/C/Oct.-23/10						
Report Issue to	M/s Aloke Steel Industries Pvt. Ltd. Opp. Ashok Cinema, Ranchi Road Marar - 829117, Dist.- Ramgarh, Jharkhand.																	
Sampling Date	20/10/2023					Mode of sample collection						By YBAEEL Team						
Sampling Protocol	IS : 17614 (Part-1): 2021					Sample Code						231021-GW-W01						
Sampling Location	Bore Well					Sampling Source						Ground Water						
Sample pkg. Condition	Sealed Pack in PP Bottle					Sample Quantity						3000 ml						
Meteorological Cond. of Field	W.C.- Clear					RH % - 57						Temp. - 26°C						
Sample receipt Date	21/10/2023			Analysis Started on			21/10/2023			Analysis completed on			26/10/2023					

*****Test Results*****

Sl	Parameter	Test Method	Units	Results	Limits
1.	pH value	IS 3025 (P-11):2022 (Electrometric Method)	pH	7.36	6.5-8.5
2.	Colour	IS 3025 (P-04):2021 (Visual Comparison Method)	Hazen	5	5-15
3.	Conductivity	IS 3025 (P-14):2013, RA 2019	µs/cm	550.0	--
4.	Turbidity	IS 3025 (P-10):2023 (Nephelometric Method)	NTU	1.0	1-5
5.	Total Alkalinity (as CaCO ₃)	IS 3025 (P-23):1986, RA 2019 (Indicator Method)	mg/l	180.0	200-600
6.	Total Hardness (as CaCO ₃)	IS 3025 (P-21):2009, RA 2019 (EDTA Method)	mg/l	206.0	200-600
7.	Total dissolved solids	IS 3025 (P-16):2023 (Gravimetric Method)	mg/l	322.0	500-2000
8.	Chlorine Residual	IS 3025 (P-26):2021 (Iodometric Method)	mg/l	BDL (MDL 0.07)	0.2-1
9.	Chloride (as Cl)	IS 3025 (P-32):1988, RA 2019 (Argentometric Method)	mg/l	12.0	250-1000
10.	Fluoride (as F ⁻)	APHA 4500 F-C 24 th edition 2023 (Ion Selective Electrode Method)	mg/l	1.12	1.0-1.5
11.	Nitrate (as NO ₃ ⁻ N)	APHA 4500 NO ₃ ⁻ (B) 24 th edition 2023 (UV Screening Method)	mg/l	0.96	45-No relaxation
12.	Sulphate (as SO ₄ ²⁻)	IS 3025 (P-24-Sec 1):2022 (Turbidity Method)	mg/l	20.2	200-400
13.	Calcium (as Ca)	IS 3025 (P-40): 1991, RA 2019 (EDTA Titrimetric Method)	mg/l	52.1	75-200
14.	Magnesium (as Mg)	APHA 3500 Mg B 24 th edition 2023	mg/l	18.4	30-100

Limit is specified as	IS 10500:2012, RA 2018.
Abbreviation	MDL : Minimum detection limit, BDL : Below detection limit.
Env. Condition of Lab	Laboratory is maintaining, Temperature 27 ± 2°C and Relative Humidity 65 ± 5% in all testing areas as per IS 196:1966 (C).
Specific contractual notes	All values are expressed in as unit and results listed refer only to the tested sample and applicable parameter in Lab's Permanent Facility This report, in full or in part, shall not be used for advertising or as evidence in any court of law. This report cannot be reproduced, except when in full, without the written permission of the CEO.. The samples collected shall be destroyed after 15 days from the date of issue of the certificate unless specified otherwise The liability of the laboratory is limited to the invoiced amount. All disputes are subjected to the Ranchi Jurisdiction.
Remarks	Sample complies with prescribed limits.

Sample Drawn By - Angad Munda
Tested By - Satyam Kumar (Lab Analyst)

Verified by Shivani Kumari Singh (Authorized Signatory)	Issued by Sanjeev Kumar Singh (Technical Manager)

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



Branch Office : Jharkhand Analytical & Environmental Engineering Laboratory, Dhanbad Hazaribag Pakur

Main Office : Namkum Post Office, Sidroul, Ranchi - 834010, Jharkhand

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Test Report

Discipline	Chemical	Group	Water	Sample Description	Ground Water
Report Release Date	26 th October, 2023		Report ID	YBAEEL-231019-121424-GW01	
W. Order/ JSPCB App. No.	Via - Telephonic		Work Order Date	19.10.2023	
Type of Industry (If any)	Sponge Iron Unit		Job code/ Ref. no.	YBAEEL/WA/L/C/Oct.-23/10	
Report Issue to	M/s Alope Steel Industries Pvt. Ltd. Opp. Ashok Cinema, Ranchi Road Marar - 829117, Dist.- Ramgarh, Jharkhand.				
Sampling Date	20/10/2023	Mode of sample collection	By YBAEEL Team		
Sampling Protocol	IS : 17614 (Part-1): 2021	Sample Code	231021-GW-W01		
Sampling Location	Bore Well	Sampling Source	Ground Water		
Sample pkg. Condition	Sealed Pack in PP Bottle	Sample Quantity	3000 ml		
Meteorological Cond. of Field	W.C.- Clear	RH % - 57	Temp. - 26°C		
Sample receipt Date	21/10/2023	Analysis Started on	21/10/2023	Analysis completed on	26/10/2023

*****Test Results*****

Sl	Parameter	Test Method	Units	Results	Limits
1.	Odour	IS 3025 (P-05):2018	--	Agree.	Agreeable
2.	Taste	IS 3025 (P-07 & 08):2017&2023	*-	Agree.	Agreeable
3.	Phosphate (as PO ₄ ³⁻)	IS 3025 (P-31/Sec1):2022 (Stannous Chloride Method)	mg/l	BDL (MDL 0.003)	--
4.	Cyanide(as CN ⁻)	IS 3025 (P-27/Sec1):2021 (Titrimetric Method)	mg/l	BDL (MDL 1.0)	0.05-No relaxation

Limit is specified as	IS 10500:2012, RA 2018.
Abbreviation	MDL : Minimum detection limit, BDL : Below detection limit,
Env. Condition of Lab	Laboratory is maintaining, Temperature 27 ± 2°C and Relative Humidity 65 ± 5% in all testing areas as per IS 196:1966 (C).
Specific contractual notes	All values are expressed in as unit and results listed refer only to the tested sample and applicable parameter in Lab's Permanent Facility This report, in full or in part, shall not be used for advertising or as evidence in any court of law. This report cannot be reproduced, except when in full, without the written permission of the CEO. The samples collected shall be destroyed after 15 days from the date of issue of the certificate unless specified otherwise The liability of the laboratory is limited to the invoiced amount. All disputes are subjected to the Ranchi Jurisdiction.
Remarks	Sample complies with prescribed limits.

Sample Drawn By - Angad Munda
Tested By - Satyam Kumar (Lab Analyst)

Verified by Shivani Kumari Singh (Authorized Signatory)	Issued by Sanjeev Kumar Singh (Technical Manager)
---	---

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

Branch Office: Yugantar Bharati Analytical & Environmental Engineering Laboratory Dhanbad Hazaribag Pakur

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ISO 45001:2018



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TC-4032

Test Report

ULR (Unique Lab Report) No.	T	C	4	0	3	2	2	3	0	0	0	0	0	1	4	4	4	F
Discipline	Chemical	Group	Residue in Water				Sample Description				Ground Water							
Report Release Date	26 th October, 2023					Report ID				YBAEEL-231019-121424-GW01								
W. Order/ JSPCB App. No.	Via - Telephonic					Work Order Date				19.10.2023								
Type of Industry(if any)	Sponge Iron Unit					Job code/ Ref. no.				YBAEEL/WA/L/R/Oct.-23/08								
Report Issue to	M/s Aloke Steel Industries Pvt. Ltd. Opp. Ashok Cinema, Ranchi Road Marar - 829117, Dist.- Ramgarh, Jharkhand.																	
Sampling Date	20/10/2023					Mode of sample collection				By YBAEEL Team								
Sampling Protocol	IS : 17614 (Part-1): 2021					Sample Code				231021-GW-W01								
Sampling Location	Bore Well					Sampling Source				Ground Water								
Sample pkg. Condition	Sealed Pack in PP Bottle					Sample Quantity				1000 ml								
Meteorological Cond. of Field	W.C.- Clear					RH % - 57				Temp. - 26°C								
Sample receipt Date	21/10/2023			Analysis Started on			21/10/2023			Analysis completed on			26/10/2023					

*****Test Results*****

Sl	Parameter	Test Method	Units	Results	Limits
1.	Arsenic (as As)	APHA 3114 C 24 th edition 2023 (Continuous Hydride Generation Method)	mg/l	BDL (MDL 0.003)	0.01-No relaxation
2.	Copper (as Cu)	APHA 3111 B 24 th edition 2023 (Direct Air Acetylene Flame Method)	mg/l	BDL (MDL 0.01)	0.05-1.5
3.	Iron (as Fe)	APHA 3111 B 24 th edition 2023 (Direct Air Acetylene Flame Method)	mg/l	0.26	1.0-No relaxation
4.	Lead (as Pb)	APHA 3111 B 24 th edition 2023 (Direct Air Acetylene Flame Method)	mg/l	BDL (MDL 0.02)	0.01-No relaxation
5.	Zinc (as Zn)	APHA 3111 B 24 th edition 2023 (Direct Air Acetylene Flame Method)	mg/l	0.18	5-15
6.	Cadmium (as Cd)	APHA 3111 B 24 th edition 2023 (Direct Air Acetylene Flame Method)	mg/l	BDL (MDL 0.02)	0.003-No relaxation
7.	Mercury (as Hg)	APHA 3112 B 24 th edition 2023 (Cold Vapour AAS Method)	mg/l	BDL (MDL 0.003)	0.001-No relaxation
8.	Chromium (as Cr)	APHA 3111 B 24 th edition 2023 (Direct Air Acetylene Flame Method)	mg/l	BDL (MDL 0.02)	0.05-No relaxation
9.	Nickel (as Ni)	APHA 3111 B 24 th edition 2023 (Direct Air Acetylene Flame Method)	mg/l	BDL (MDL 0.02)	0.02-No relaxation

Limit is specified as	IS 10500:2012, RA 2018.
Abbreviation	MDL : Minimum detection limit, BDL : Below detection limit.
Env. Condition of Lab	Laboratory is maintaining, Temperature 27 ± 2°C and Relative Humidity 65 ± 5% in all testing areas as per IS 196:1966 (C).
Specific contractual notes	All values are expressed in as unit and results listed refer only to the tested sample and applicable parameter in Lab's Permanent Facility This report, in full or in part, shall not be used for advertising or as evidence in any court of law. This report cannot be reproduced, except when in full, without the written permission of the CEO. The samples collected shall be destroyed after 15 days from the date of issue of the certificate unless specified otherwise The liability of the laboratory is limited to the invoiced amount. All disputes are subjected to the Ranchi Jurisdiction.
Remarks	Sample complies with prescribed limits.

Sample Drawn By - Angad Munda

Tested by Shivani Kumari Singh (Lab Analyst)	Verified & Issued by Sanjeev Kumar Singh (Technical Manager)

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



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Test Report

Discipline	Chemical	Group	Residue in Water	Sample Description	Ground Water
Report Release Date	26 th October, 2023		Report ID	YBAEEL-231019-121424-GW01	
W. Order/ JSPCB App. No.	Via - Telephonic		Work Order Date	19.10.2023	
Type of Industry (If any)	Sponge Iron Unit		Job code/ Ref. no.	YBAEEL/WA/L/R/Oct.-23/08	
Report Issue to	M/s Alope Steel Industries Pvt. Ltd. Opp. Ashok Cinema, Ranchi Road Marar - 829117, Dist.- Ramgarh, Jharkhand.				
Sampling Date	20/10/2023	Mode of sample collection	By YBAEEL Team		
Sampling Protocol	IS : 17614 (Part-1): 2021	Sample Code	231021-GW-W01		
Sampling Location	Bore Well	Sampling Source	Ground Water		
Sample pkg. Condition	Sealed Pack in PP Bottle	Sample Quantity	1000 ml		
Meteorological Cond. of Field	W.C.- Clear	RH % - 57	Temp. - 26°C		
Sample receipt Date	21/10/2023	Analysis Started on	21/10/2023	Analysis completed on	26/10/2023

*****Test Results*****

Sl	Parameter	Test Method	Units	Results	Limits
1.	Aluminium (as Al)	IS 3025 (P-55):2003, RA 2019 (Eriochrome Cyanine R Method)	mg/l	BDL (MDL 0.02)	0.03-0.2

Limit is specified as	IS 10500:2012, RA 2018.
Abbreviation	MDL : Minimum detection limit, BDL : Below detection limit.
Env. Condition of Lab	Laboratory is maintaining, Temperature 27 ± 2°C and Relative Humidity 65 ± 5% in all testing areas as per IS 196:1966 (C).
Specific contractual notes	All values are expressed in as unit and results listed refer only to the tested sample and applicable parameter in Lab's Permanent Facility This report, in full or in part, shall not be used for advertising or as evidence in any court of law. This report cannot be reproduced, except when in full, without the written permission of the CEO. The samples collected shall be destroyed after 15 days from the date of issue of the certificate unless specified otherwise The liability of the laboratory is limited to the invoiced amount. All disputes are subjected to the Ranchi Jurisdiction.
Remarks	Sample complies with prescribed limits.

Sample Drawn By - Angad Munda

Tested by	Verified & Issued by
Shivani Kumari Singh (Lab Analyst)	Sanjeev Kumar Singh (Authorized Signatory)

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

Yugantar Bharati Analytical & Environmental Engineering Laboratory

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ISO 45001:2018



ISO 9001:2015



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Accredited by: - Jharkhand State Pollution Control Board (JSPCB)

Certified by: - ISO 9001:2015 & ISO 45001:2018



TC-4032

Test Report

ULR (Unique Lab Report) No.		T	C	4	0	3	2	2	3	0	0	0	0	0	1	4	4	0	F
Discipline	Biological	Group	Water				Sample Description				Ground Water								
Report Release Date	26 th October, 2023					Report ID				YBAEEL-231019-121424-GW01									
W. Order/ JSPCB App. No.	Via - Telephonic					Work Order Date				19.10.2023									
Type of Industry (If any)	Sponge Iron Unit					Job code/ Ref. no.				YBAEEL/WA/L/M/Oct.-23/05									
Report Issue to	M/s Aloke Steel Industries Pvt. Ltd. Opp. Ashok Cinema, Ranchi Road Marar - 829117, Dist.- Ramgarh, Jharkhand.																		
Sampling Date	20/10/2023					Mode of sample collection				By YBAEEL Team									
Sampling Protocol	IS : 15185					Sample Code				231021-GW-W01									
Sampling Location	Bore Well					Sampling Source				Ground Water									
Sample pkg. Condition	Sealed Pack in PP Bottle					Sample Quantity				250 ml									
Meteorological Cond. of Field	W.C.- Clear					RH % - 57				Temp. - 26°C									
Sample receipt Date	21/10/2023			Analysis Started on			23/10/2023			Analysis completed on			25/10/2023						

*****Test Results*****

Sl	Parameter	Test Method	Units	Results	Limits
1.	Total coliform	APHA 9221B 24 th Edition 2023 (Multiple Tube Fermentation Technique)	MPN/100 ml	< 1.1	Shall not to be Detectable in any 100 ml sample
2.	Fecal coliform	APHA 9221E 24 th Edition 2023 (Thermotolerant (Fecal) Coliform Procedure)	MPN/100 ml	< 1.1	

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

Limit is specified as	IS 10500: 2012
Abbreviation	MDL : Minimum detection limit, BDL : Below detection limit. <1.8 / < 1.1 MPN/100 ml denotes that the presence probability of bacteria is absent in the tested sample.
Env. Condition of Lab	Laboratory is maintaining, Temperature 27 ± 2°C and Relative Humidity 65 ± 5% in all testing areas as per IS 196:1966 (C).
Specific contractual notes	All values are expressed in as unit and results listed refer only to the tested sample and applicable parameter in Lab's Permanent Facility. This report, in full or in part, shall not be used for advertising or as evidence in any court of law. This report cannot be reproduced, except when in full, without the written permission of the CEO. The samples collected shall be destroyed after 7 days from the date of issue of the certificate unless specified otherwise. The liability of the laboratory is limited to the invoiced amount. All disputes are subjected to the Ranchi Jurisdiction.
Remarks	Sample complies with prescribed limit.

Sample Drawn By - Angad Munda

Madhuri Sinha 26.10.23	Mukesh Kumar
Tested by	Verified & Issued by
Madhuri Sinha	Mukesh Kumar
(Lab Analyst)	(Authorized Signatory)

Authorized Signatory
Microbiological Section
Yugantar Bharati Analytical & Environmental Engineering Laboratory



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ISO 45001:2018

Report on GHG Emissions inventory & Its Reduction Including Carbon Sequestration through Plantation for Sponge Iron Plant

ALOKE STEELS INDUSTRIES PVT. LTD.

Vill: Budhakhap, P.O.: Digwar, Dist.: Ramgarh, Jharkhand



Prepared By



Institute for Environmental Management
Ranchi, Jharkhand, 834002

November – 2022

Preface

A report on GHG emission Inventory and its reduction including Carbon Sequestration through plantation for sponge iron plant has been prepared existing sponge iron plant of Alope Steels Industries Pvt. Ltd. (ASIPL) operating a Sponge Iron Plant having four (4) Nos .of coal based Rotary Kilns, each of 100 TPD capacity at village: Budhakhap, District: Digwar in the state of Jharkhand since 2004. The report is prepared based on the secondary data provided by ASIPL

Name and address of manufacturing facility:

Alope Steels Industries Pvt. Ltd.

At- Budhakhap, Post- Digwar - 829137,

Dist. - Ramgarh (Jharkhand)

E-mail: asipl.ramgarh@gmail.com

Within the ambit of this study, the following units were considered:

GHG emissions have been estimated considering a system boundary from gate-to-gate which is from raw materials entering a sponge iron plant producing sponge iron or DRI used for manufacturing of steel. The system boundary in this study include the

- Sponge Iron process

The purpose of this study is to highlight the potential areas of GHG emission of sponge iron production for reducing GHG emissions. The main sources of GHG emissions during sponge iron manufacturing are considered and the key groups of measures that can reduce the GHG emissions are identified.



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Chapter – 1

Introduction

The production of iron through direct reduction (Direct-Reduced Iron; DRI) involves the use of natural gas or coal to reduce iron ore to iron through carbothermic reactions at a temperature below its melting point, negating the need for a blast furnace as otherwise required. In India, around 25% of iron is produced through direct reduction. However, there is a high reliance on coal (79% of DRI production capacity) causing significant energy use and emissions from production. Also, a large portion of raw materials (especially coal) is imported due to low quality of domestic resources. Weighted average specific energy use and emissions is calculated for seven such clusters (using total cluster capacity), based on regional raw material qualities and transport distances from various mines, ports and beneficiation plants. The results suggest an overall specific (per tonne DRI) energy consumption of 27.24 GJ with an emission of 2.8 tCO₂eq, 2.6 kg NO_x, 1.8 kg SO_x and 1.4kg PM_{2.5}. The specific energy and emission values are used to calculate the total annual emissions by multiplying with the 2019 DRI production amount of 27.8 million tonnes. The annual midpoint and endpoint impacts as per ReCiPe 2016 (country-wise factors where applicable) are then calculated. The DRI industry causes 77.31 million tCO₂eq/year in global warming potential, 59.02 thousand tSO₂eq/year in acidification potential and 287.2 thousand tPM_{2.5}eq/year in fine dust formation potential. It is estimated to cause approximately 270,000 years of reduction in overall human life and 230 species years of species loss (mainly in terrestrial ecosystems). Different sensitivities are carried out to understand the impact of some key influencing parameters (effect of ore quality and coal quality, effect of imports of ore and coal). Some development scenarios, such as increasing coal washery capacity, shifting land transport from road to rail, increasing waste-heat recovery penetration, effect of stricter regulations, etc. are discussed, along with pathways for fuel-switching from coal to natural gas, and then from natural gas to hydrogen.

Aloke Steels Industries Pvt. Ltd. (AS IPL) is a registered company under the Company's Act. It is operating a Sponge Iron Plant having four (4) Nos .of coal based Rotary Kilns, each of 100 TPD capacity at village: Budhakhap, District: Digwar in the state of Jharkhand since 2004. Sponge Iron is presently sold to other steel producers for making finished steel products.



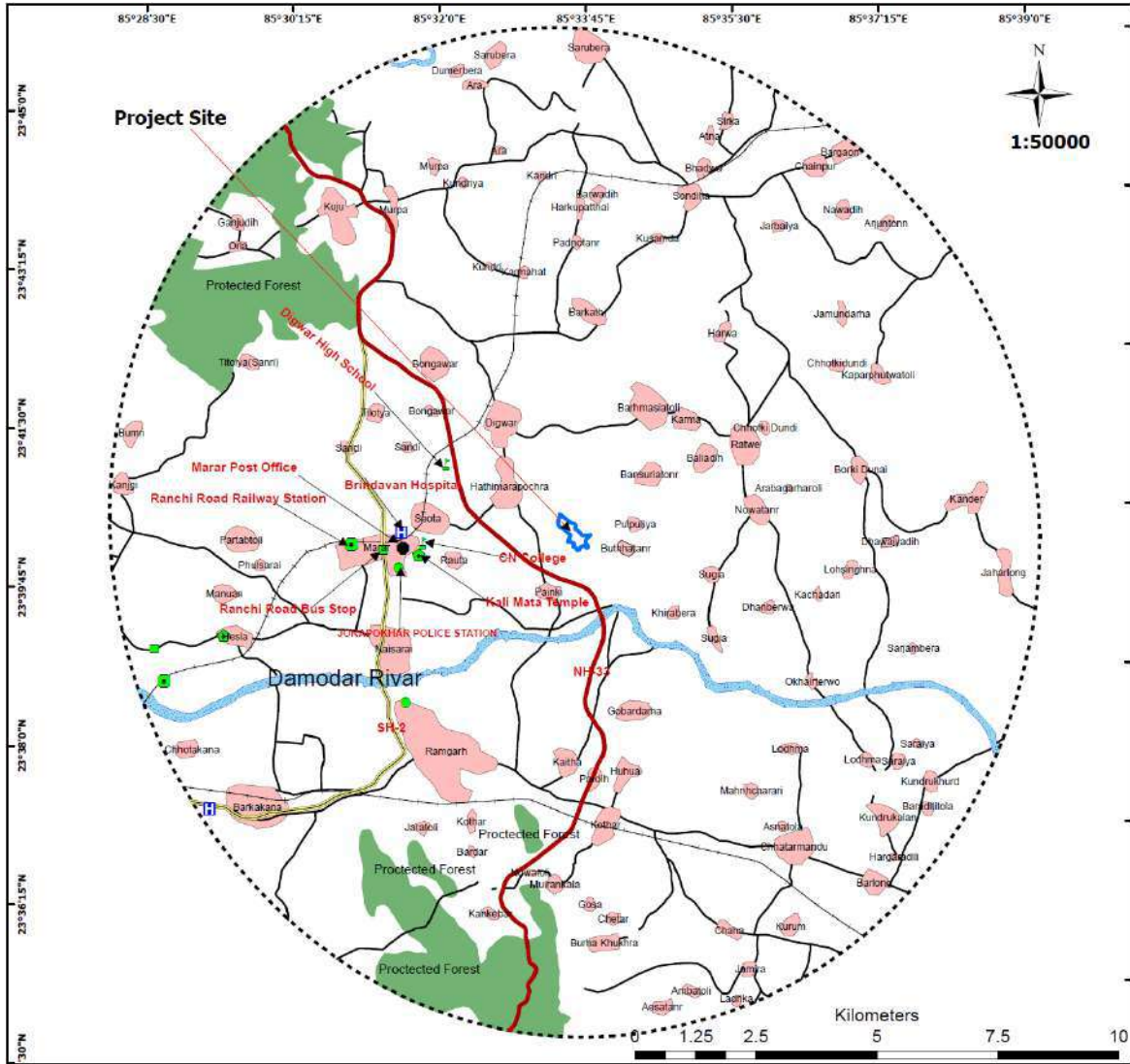
GHG emission inventory is comprised of carbon footprint analysis where it is historically been defined as "the inventory of greenhouse gas (GHG) emissions caused by an organization, event, product or person". In this report the estimation of carbon emission for sponge iron production, carbon budgeting/balancing, carbon sequestration activities and carbon offsetting strategies are discussed. GHG emission calculation has been carried out using IPCC guidelines as overall principal and following standard methodology of GHG protocol for GHG estimation. Estimations for this green field project are majorly for scope 1 where direct use of materials and energy for the plant is considered.

ASIPL has installed 4x100TPD (Sponge Iron plants) DRI Units at village: Budhakhap, District: Digwar in the state of Jharkhand since 2004 after getting NOC from Jharkhand Pollution Control Board (JSPCB) and subsequently Consent to Operate from JSPCB.

Now ASIPL intends to use the waste heat energy from the DRI units in Waste Heat Recovery Boilers and dolochar produced in plant in AFBC Boiler, supplemented by coal, for production of 18 MW power. A new 3 x 12T Induction furnace with 67,500 MTPA Rolling Mill and Iron Ore Cushing & Beneficiation facility, 201,000 TPA (throughput) and 12,000 TPA capacity Slag Crushing Plant are also proposed at at Plot No: 229, 234, 240, 226, 227,228, 239, 208, 242, 218, 225, 244, 223, 224, 236, 345, 338, 245, 235, 345, 272, 221,231, 230, 217, 214, 241, 237, 1088, 238, 258, 349, 243 and 216-219-220-232-233-246 in Burhakhap village, Ramgarh district in the state of JharkhandExpansion of Sponge Iron plant with addition of Power plant, SMS, Rebar Rolling Mill & Iron ore crushing & Beneficiation Facility



Fig.:1 Digitized Key plan of project site



Chapter - 2

Project Description

Overview of direct reduction process

The basic mechanism behind iron production involves two main pathways,

- i. Using a blast furnace (heated using coal or natural gas) for reduction of iron ore (iron oxides) into pig iron by reaction with coke and fluxes (usually limestone) (SAIL, 2012). The molten pig iron is then converted to steel (through the steelmaking process, usually with a basic oxygen furnace) or processed and sold as such. In 2019, 46.7% of India's steel industry utilized the blast furnace-basic oxygen furnace (BF-BOF) method (World Steel Association, 2019b).
- ii. Using coal (solid or gas) or reformed natural gas to perform a direct reduction of the iron ore into Direct-Reduced Iron (DRI) or Sponge iron at high heat (but below melting point) (Sarangi and Sarangi, 2011). The sponge iron is then converted to steel (with an electric arc or electric induction furnace) or processed and sold. The share of electric induction/arc furnace processes in India constituted 53.3% in 2019 (World Steel Association, 2019b).

The SL/RN process (developed by **S**teel Company of Canada, **L**urgi Chemie, **R**epublic Steel Company and **N**ational Lead Corporation in 1964) forms the basis of rotary kiln technologies used in India (Sarangi and Sarangi, 2011); the process uses a rotary kiln into which iron ore pellets, non-coking coal (for reduction) and limestone/dolomite (flux) is supplied. From the other end, air and coal (for combustion) are supplied. The resulting high temperatures (900 to 1020 °C) form a reducing atmosphere of CO which reduces the iron ores to sponge iron. The sponge iron is subsequently separated out of the remaining reaction products through magnetic separation. The kiln is inclined at an angle of ~2.5° to facilitate

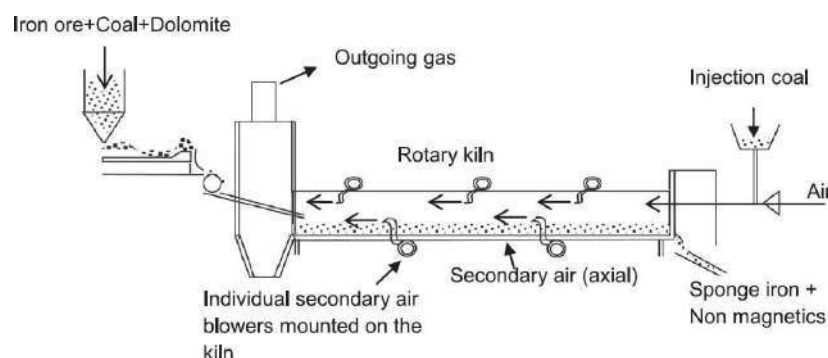
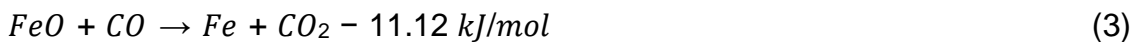
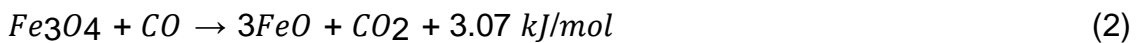


Figure 2: Rotary kiln (SL/RN process) (Source: Dey et al, 2015)

From the feed end to the exit. The rotary motion encourages even reaction of the charge through mixing with the reducing gases (Dey et al, 2015). The basic process is shown in Figure 2.

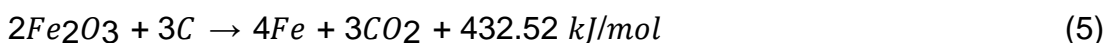
Around a third of the kiln length is typically required for preheating the charge consisting of iron ore, coal and dolomite. The dolomite flux is added to control sulphurisation. The coal supplied along with the ore is mainly meant to produce reducing gas by reacting with atmospheric oxygen at high temperature. In this stage, the iron ore (predominantly hematite - Fe₂O₃) is partially reduced to ferrous oxide. After reaching the ideal reaction temperature of 900-1100 °C, the ore is reduced to metal in the latter portion of the kiln through further reduction. The following are the main reactions taking place within the kiln, at a temperature of 1067 °C (Sarangi and Sarangi, 2011).



The CO required for the above reduction reactions is produced when fixed carbon of the feed-end coal reacts with CO₂ produced by the reductions, in a perpetual, reversible reaction called Boudouard reaction.



This reaction is crucial to maintaining the reducing atmosphere and kiln temperature. The ratio of CO/ (CO+CO₂) depends on the temperature inside the kiln; ideally a CO concentration of ~50-60% is maintained (Dey, Prasad and Singh, 2015) to ensure optimum reduction of ore. Since the forward reaction (4) is highly endothermic, it serves to maintain kiln temperature for a regulated combustion of injection coal. By combining the above reactions, we get



Note that only one part of CO produced in (4) is used for the reduction, whereas the other part is combusted into CO₂ resulting in a net output of CO₂ from the kiln. Various other reactions take place due to the combustion of injection coal fixed carbon and volatiles, causing the formation of additional CO and CO₂ along with H₂O and CH₄.



The sulphur present in coal is removed by dolomite, as the CaCO_3 and MgCO_3 decompose into CaO and MgO to act as desulphurising agents. The addition of dolomite is crucial to control the sulphur content in the DRI (to prevent embrittlement in steel production), and also to control SO_x emissions (Sarangi and Sarangi, 2011).

After the reduction process, the metal (now known as sponge iron or DRI) is separated from the remaining slag (consisting of coal char, unreacted coal, sulphurated dolomite) through magnetic separation. The product CO_2 reacts further with incoming/excess coal to produce more CO . Thus, for a low ash coal with high reactivity, the reduction efficiency will be higher as the quantity of coal input would be reduced. Also, the retaining time of the ore within the kiln can be lower, thus improving output (Dey et al, 2015).

Aloke Ispat Industries Pvt. Ltd. has installed 4x100TPD (Sponge Iron plants) DRI Units at village: Budhakhap, District: Digwar in the state of Jharkhand in the year 2004 after getting NOC from Jharkhand State Pollution Control Board (JSPCB).

ASIPL management has realized that for its business to survive, the Company should stop selling sponge iron and should produce TMT Reinforcement Bars as value added product and also take measures to reduce cost of production. The project is a stand-alone project for creating Steel Making facility at one location without dependence on other projects.

1. Installation of a Captive Power Plant of 18 MW Capacity to produce cheaper electrical power by utilizing;
 - Waste Heat from Sponge Iron Kiln Flue Gases.
 - Utilizing char produced as solid waste from Sponge Iron Production Process, to serve as a part of fuel for the proposed Power Plant.
 - Use of coal from captive mines of the group to meet the balance requirement of fuel for the Power Plant.



2. Install a Steel Melting Shop having Two (2) Nos. Induction Furnaces each of 12 Ton capacity and a 2-Strand 6/11 M Radius Continuous Casting Machine with an annual capacity of 72,000 Metric Tons of Billets using 80% Sponge Iron and 20% Scrap /Pig Iron as charge-mix.
3. Install 14 Strand Rolling Mill downstream of Continuous Casting of Steel Melt Shop to carry out direct rolling of hot billets without any additional heating in a Reheating Furnace. This will save on fuel cost of reheating the billets which has to be incurred if billets produced are cooled, transported and rolled in a rolling mill far away.
4. Iron Ore Crushing & Beneficiation Facility to process 201,000 T/year throughout of iron ore is proposed to be installed for providing beneficiated iron ore to the DRI Kilns for their optimum operation.

Table 2.1: Salient Features of the Project

S. No	Particulars	Details
1.	Latitude	23°39'46.33" N
2.	Longitude	85°33'10.04" E
3.	Altitude	260 m above MSL
4.	Toposheet	73 E/6 & 73 E/10
5.	Plot/Survey/Khasra No.	Plot No: 229, 234, 240, 226, 227, 228, 239, 208, 242, 218, 225, 244, 223, 224, 236, 345, 338, 245, 235, 345, 272, 221, 231, 230, 217, 214, 241, 237, 1088, 238, 258, 349, 243 and 216-219-220-232-233-246
6.	Seismicity	Area falls under least affected earthquakes zone III <i>Source-as per IS 1893 - 2002</i>
7.	Present land use	Within existing industrial premises
8.	Climatic condition (Annual Average)	Ambient Air temp 10o C to 37o C Avg. annual rainfall 1462.8 mm
9.	Nearest village/Habitation	Budhakhap- 01 km(Population-430) <i>Source: PCA Census 2011, Ramgarh district, Jharkhand state</i>
10.	Nearest Town	Ramgarh- 5 km
11.	Nearest Police Station	Ramgarh Police Station, 5.0 Km in SW
12.	Nearest Post office Ghutu Post office	Karma Post office - 1.5 Km in E direction from the project site.
13.	Nearest River	Damodar River - 1.5 km.



14.	Nearest Railway station	Ranchi Road Ramgarh- 4 km
15.	Nearest Temple	Kalimata Temple-2.8 km in W direction
16.	Nearest College	CN College -5.8 km in W direction
17.	Nearest Bus Stop	Digwar High School 2.6 km in NW direction
18.	Nearest Medical	Brindawan Hospital 4.1 km in W direction
19.	Nearest airport	Ranchi Airport, 50 km
20.	Sanctuaries /National Parks/ Biospheres, etc	Nil
21.	Topography	Gently undulating
22.	Defense Installations	Nil
23.	Historical Places	Chinnamasta Temple which is located 28.6 Km in E direction
24.	Reserve Forest/ Protected Forest	Ramgarh PF - 07 Km Gobardarha PF - 2.5 Km Kaitha PF - 03 Km
25.	Total Land Area	20.04 Acres (8.11 ha.)
26.	Total Water Requirement	Existing 1.5 (m ³ /day) Proposed 17 (m ³ /day)

		Surface water will be sourced through Damodar River for domestic and other allied uses in the plant.		
27.	Total Power Requirement	18.5 MW Power requirements at present are being met from DVC. After the commissioning of power plant the integrated unit will fulfil its power requirements from the 18 MW Captive power plant. Company has also installed 1×750 KVA 1×500 KVA DG sets.		
28.	Total Manpower	Existing 115	Proposed 500	Total 615
29.	Total capital cost	Existing (Crores) Rs. 38.17	Proposed (Crores) Rs. 169.50	Total (Crores) Rs.207.67



Power Plant Waste Heat Boilers AFBC Boiler	Total 18 MW	18 MW	18MW (Captive use)
Iron Ore Crushing & Beneficiation Plant	80 - 100 TPH single stream(throughput)	920 T	276,000 T
Slag Crushing Plant for SMS Slag	Single stream 8 TPH	55 T	162,00 T

Table 2.2: Summary of the Project (Existing & Proposed)

PRODUCTION FACILITY	PLANT SIZE	PRODUCTION(TPD)	PRODUCTION(TPA)
EXISTING			
Sponge Iron Plant	4x 100 T /day of DRI	400 TPD	120,000T
PROPOSED			
Steel Making Shop, Induction Furnaces and Billet Caster	3 x 12 T	360 T	108,000 T
Rolling Mill – TMT Rebar Mill	15 Stand Mill with Direct Hot Charging	300 T	90,000 T



SPONGE IRON PLANT (Existing)

Sponge Iron Plant is having Four (4) Nos. Coal Based Rotary Kilns each of 100 TPD Capacity, with an annual capacity of 120,000 Metric Tons. Sponge Iron Plant has its own material storage and handling facilities and other auxiliary plant units.

Process Description:

To produce sponge iron, sized lump ore is fed along with coal, and flux into the Rotary Kiln wherein iron ore gets converted to metallic iron. Flux helps in scavenging Sulphur content from coal. Brief features of the process are as follows:

- Kiln process of DRI production involves tumbling of iron ore with select grade of non-coking coal and dolomite in a rotary kiln.
- The kiln is supported on roller stations and rotated by means of a variable speed AC motor and girth gear mechanism. Refractory lined rotary kiln of suitable size is placed on two or four support stations and is kept inclined at 2.5 % slope.
- The transport rate of materials through the kiln can be controlled by varying its slope and speed of rotation. There are inlet and outlet cones at opposite ends of the kiln that are cooled by individual fans.
- The kiln shell is provided with small sampling ports, large ports for rapid removal of the contents in emergency or for lining repairs. Longitudinal positioning of the kiln on its riding rings is controlled hydraulically.
- The coal and iron ore are metered into the high end of the inclined kiln. A portion of the coal in pulverized form is also injected pneumatically from the discharge end. The burden first passes through a pre-heating zone where coal de-volatilization takes place and iron ore is heated to pre-



heating temperature for reduction.

- Temperature and process control in the kiln are carried out by installing suitable no. of air injection tubes made of heat-resistant steel. These are spaced evenly along the kiln length and countercurrent to the flow of iron ore. Tips of the air tubes are equipped with special internal swirls to improve uniformity of combustion.
- A central burner located at the kiln discharge end is used with LDO for heating the cold kiln. After initial heating, the fuel supply is turned off and the burner is used to inject air for coal combustion.
- The kiln temperatures are measured with fixed thermocouples and Quick Response Thermocouples (QRT). Fixed thermocouples are located along the length of the kiln to monitor temperature profile of kiln. Fixed thermocouples, at times, may give erratic readings due to coating with ash, ore or accretion. In such a case QRT are used to monitor the kiln temperatures.
- The product (DRI) is discharged from the kiln at about 1000°C. An enclosed chute at the kiln discharge end is used to transfer the hot DRI to a rotary cooler. The cooler is a horizontal revolving cylinder of appropriate size, wherein DRI is cooled indirectly by water spray on the cooler upper surface. The cooling water collected in troughs below is pumped to the cooling tower for recycling along with make-up water.
- DRI is cooled to about 100°C without exposure to atmospheric air. A grizzly in the chute removes accretions that are large enough to plug up or damage the cooler discharge mechanisms.
- The product is screened to remove the plus 30 mm DRI. The undersize — a mix of DRI, dolochar and coal ash are screened into +/- 3mm fractions. Each fraction passes through a magnetic separator. The non-magnetic portion of the plus 3 mm fraction is mostly char and can be used in AFBC Boiler for power generation.
- The nonmagnetic portion of -3mm fraction, mostly spent lime, ash and fine char is discarded.



- Magnetic portion of each fraction is DRI. Of this the +3mm fraction can be used directly for steel making and the finer fraction is either briquetted or collected in bags.
- The kiln waste gases leave at about 850-900°C. These are passed through dust settling chamber where heavier particles settle down due to sudden decrease in velocity of gases. The flue gases are then passed through an After Burning Chamber (ABC) where un-burnt combustibles are burnt by blowing excess air. The temperature of the after burner chamber, at times, is controlled by water sprays.
- Burnt gases are passed through a down duct into an evaporation cooler where its temperature is brought down and balance dust particles are separated through a pollution control equipment namely ESP / Bag filter/ scrubber. The gas is let off into the atmosphere through stack via ID fan.
- The thermal energy in outgoing flue gases is recovered through Waste Heat Recovery Boiler (WHRB) where sensible heat of the gases is extracted and then let off into the atmosphere after passing through pollution control equipment like ESP, ID fan and stack.

Table2.3: Raw Material Requirement for Existing Sponge Iron Plant

Unit	Installed Capacity	Working Days	Annual Production
Sponge Iron Plant	4x100 TPD	300	120,000 MT of Sponge Iron
Water Requirement	Make Up Water	300	247 m ³ /day
Power Requirement		300	950 KVA
Raw Material Requirement	Raw Material	Size (mm)	Quantity (MT/Annum)
	Iron Ore	5-18	58027
	Coal	20 & below	117665.78



Iron ore Pellets	5-10	107994.62
Dolomite/Limestone	2-4	1611.86

Process flow diagram of sponge iron plant is given below in

Figure 2.4. Raw Material Handling System.

Main Raw materials Iron Ore, Coal & Dolomite are fed to the ground hoppers with the help of Pay Loaders and Tippers and carried by belt conveyors to the Crusher House having Crusher for crushing and Vibrating Screen. Screened and Crushed Material carried out by belt Conveyers to the stock house having 2 days bins for Iron Ore, Feed coal, Dolomite, and Injection coal (Lumps and Fines). Injection Coal is screened in –5 mm. and –18mm sizes and stored in separate bins. The main raw material handling consists of iron ore crusher, vibrating screen and conveyor belts for preparation of raw material as mentioned above.



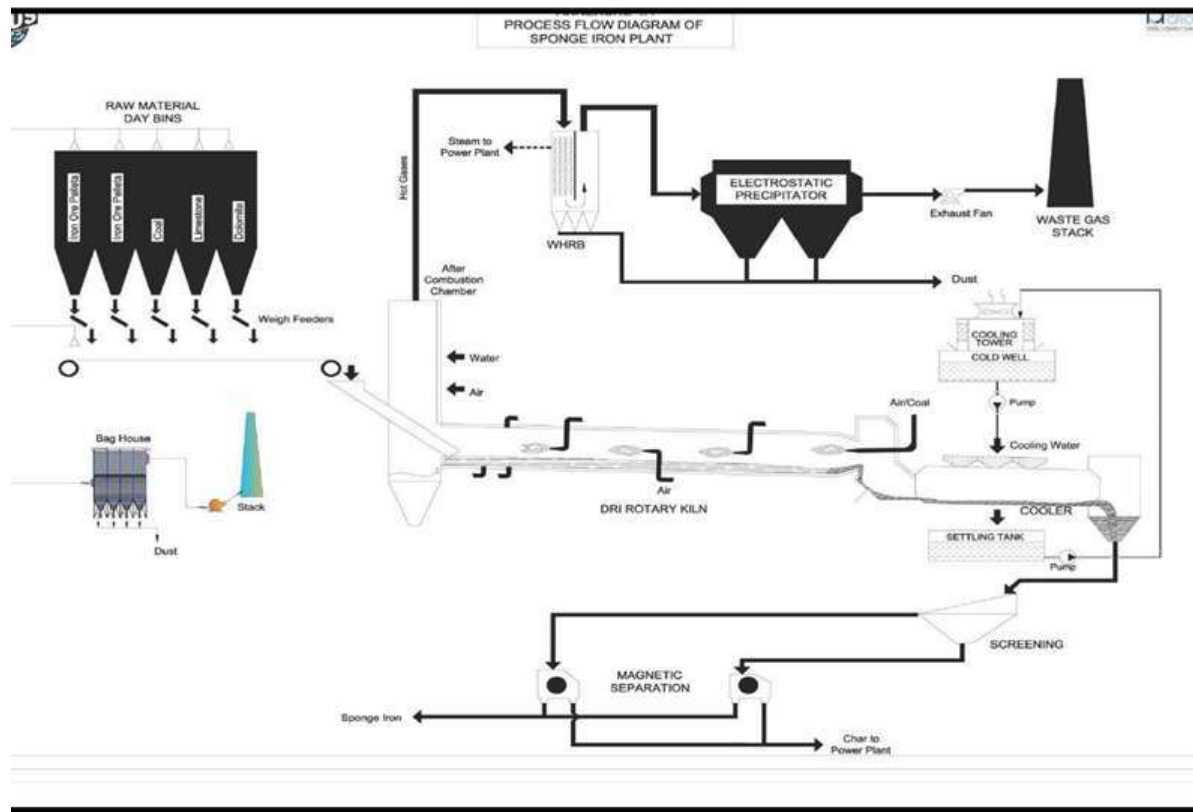


Figure3: Process flow diagram of Sponge Iron Plant

Brief outline for resource utilization

Resource utilization by optimization has been envisaged from design stage itself for plant related activities. The various resources likely to be used are detailed below.

- i) Iron ore
- ii) Coal
- iii) Dolomite
- iv) Water &
- v) Power

These resources are effectively used in the plant. Rainwater harvesting is being envisaged on large scale to utilize the rain water and reduce the water requirement from external sources. The effluent generated from various units will be treated and recycled back into system to ensure zero discharge.



Chapter – 3

Green House Gas Emissions

In this section emission of Green House Gases (GHG) has been calculated for the existing Sponge iron plant. GHG emissions have been estimated for the units involves in sponge iron production. GHG emission calculation has been done understanding the IPCC guidelines and following standard methodology of GHG protocol for GHG estimation. Calculations are done majorly for scope 1 where direct use of materials and energy for the proposed plant is considered.

Figure 4: Material flow for sponge iron plant

Section	Technology	Process flow
Sponge Iron plant	Coal Based Rotary Kiln Process	Feeding of RM to the Rotary Kiln through feed tube □ Cooling in the rotary cooler □ Screening magnetic separation of the product □ sponge iron Other outputs - Char

Table 3.1: Raw Material Requirement

Sponge Iron Plant (400 TPD / 120000 TPA) – EXISTING						
1	Iron Ore	0.72	570	58027	In-house from Beneficiation plant	---
2	IronOre pellets	1.34		107994.62		
3	Coal	1.46	480	117665.78	Different Collieries of CCL	Mode: Road, Rail Approx. - 150 KM
4	Dolomite	0.02	7.66	1611.86	Daltonganj, Jharkhand. Katni, M.P.	Mode: Road Daltonganj - 250 Km(appx.) Katni - 700 KM (appx.)
	TOTAL	3.5	1057.66	285297.78		



LAND USE

The total project area is about 20.04 acres (8.11 Ha.). The area will be used for construction and development of Production lines, Warehouses & Stores, Utilities, R&D, QC, Administrative Blocks and Common facilities etc., apart from the above, internal road sand green belt will be development as per the norms. About 10 acres (4.1 Ha.), after earmarking 1.0 acre for temporary ash store yard, will be developed as greenbelt.

This greenbelt will serve as a buffer between the peripheries and the industry, thereby controlling the air emissions and noise levels. The probable land use is given below in Table:

Table 3.2: Land Use of Plant Layout

SL No	TYPE OF USE	Area	
		Acres	Hectares
1	Existing Units (4 nos. Kiln of Sponge Iron)	7.01	2.84
2	Power Plant with WHRB	1.62	0.66
3	Steel Melting Shop	2.73	1.11
4	Rolling Mill	2.5	1.01
5	Iron Ore Beneficiation Plant	1.0	0.40
6	Slag Crushing Plant	0.8	0.32
7	Area Tailing Pond	0.69	0.28
8	Green Belt	10.78	4.36
9	Area for Parking	0.5	0.20
10	Vacant land	3.062	1.24
	Total Land Area	30.692	12.42

Table3.3: Emission factors of GHG gases from different energy fuel sources

Energy sources	kg CO ₂ /kg fuel	kg CH ₄ /kg fuel	kg N ₂ O/kg fuel
Coal	2.42	2.82E-04	4.00E-05
Electricity	0.43 kg CO ₂ /kwh	0.0223 kg CH ₄ /kwh	0.00342kg N ₂ O/kwh
Natural gas	2.69	2.40E-04	5.00E-06



Methodology for Estimating GHG Emissions

In this report, the system boundary is gate-to-gate which is from raw materials entering a coke oven to the steel leaving the continuous casting machine (Figure 4). The system boundary in this study includes the Coke oven, sintering, pelletizing, beneficiation, blast furnace, basic oxygen furnace, continuous casting, lime and dolo plant and captive power plant. The major GHG emissions i.e. CO₂, CH₄, and N₂O have been calculated and reported in the form of CO₂-equivalent. Within the defined system boundary, mass and energy inputs for the processes within the boundary are included.

CO₂ Emission:

The GHG emission has been estimated based on the mass and energy used in the individual process of steel manufacturing. The mass and energy data used in this study are specified for the major steel manufacturing processes including Coke oven, sintering, pelletizing, beneficiation, blast furnace, basic oxygen furnace, continuous casting, lime and dolo plant and captive power plant. CO₂ emissions have been calculated using carbon content data that are expressed on a mass or volume basis. (Equation no)

$$\text{Mass basis:} \quad E = A_f \cdot F_m \cdot E_b \cdot \frac{44}{12} \quad \text{---- 1}$$

$$\text{Volume basis:} \quad E = A_f \cdot F_{qv} \cdot E_b \cdot \frac{44}{12} \quad \text{---- 2}$$

Equation No. 1 & 2: Calculating CO₂ emissions using carbon content data that are expressed on a mass or volume basis

Where:

E = Amount of CO₂ emitted (metric tons)

$A_{f,v}$ = Volume of fuel consumed (e.g., liters, gallons, m³, etc.)

$A_{f,m}$ = Mass of fuel consumed (e.g., kg, short ton, etc.)



$F_{c,v}$ = Carbon content of fuel on a volume basis (e.g., short tons carbon / gallon)

$F_{c,m}$ = Carbon content of fuel on a mass basis (e.g., short tons carbon / short ton)

F_{OX} = Fraction oxidation factor

44/12 = the ratio of the molecular weight of carbon to that of CO₂.

$$E = A \cdot HV_f \cdot F_{c,h} \cdot F_{OX} \cdot \frac{44}{12} \quad \text{--- 3}$$

Equation No. 3: Calculating CO₂ emissions from stationary combustion sources using carbon content data expressed on an energy basis.

Where:

E = Amount of CO₂ emitted (metric tonnes)

A = Mass of fuel consumed (e.g., metric tonnes)

HV_f = Heating value of fuel (e.g., MJ/Kg or thousand Btu/lb)

$F_{c,h}$ = Carbon content of fuel on a heating value basis (e.g., short tons C/million Btu or metric tonnes C/GJ)

F_{OX} = Fraction oxidation factor

44/12 = The ratio of the molecular weight of carbon to that of CO₂.

CH₄ and N₂O emissions:

The N₂O and CH₄ emissions from Electricity Generation and Reheating Furnaces can be calculated using Equation 4.

$$E = \sum_f HHV_f \cdot EF \cdot GWP \quad \text{----- 4}$$

$$E = \sum_f HHV_f \cdot ESEF \cdot GWP \quad \text{----- 5}$$

Equation :: Calculating N₂O and CH₄ emissions



Where:

E = Amount of either N₂O or CH₄ emitted (metric tonnes CO₂-equivalent)

A_f = Amount of fuel combusted on a mass or volume basis

EF = fuel-specific emission factor

ESEF = Equipment-specific emission factor

GWP = 21 for CH₄ or 310 for N₂O

Table 3.4: Carbon contents for materials consumed in process sources

Process Materials	Carbon Content* (kg C/kg)
Blast Furnace Gas	0.17
Charcoal	0.91
Coal	0.67 ¹
Coal tar	0.62
Coke	0.83
Coke Oven gas	0.47
Coking Coal	0.73
Direct reduced Iron (DRI)	0.02
Dolomite	0.13
EAF Carbon Electrodes	0.82 ²
EAF Charge Carbon	0.83 ³
Fuel Oil	0.86 ⁴



Gas Coke	0.83
Hot Briquetted iron	0.02
Limestone	0.12
Natural Gas	0.73
Oxygen Steel Furnace Gas	0.35
Petroleum Coke	0.87
Purchased pig Iron	0.04
Scrap Iron	0.04
Steel	0.01

Table 3.5: Typical Values for CH₄ & N₂O contents for materials consumed in process sources

Fuel		Lower Heating Value(LHV)/Net Calorific Value (NCV) Basis				Higher Heating Value(HHV)/Gross Calorific Value (GCV) Basis			
		kg GHG / TJ fuel		kg GHG / ton fuel		kg GHG / TJ fuel		kg GHG / ton fuel	
		CH ₄	N ₂ O	CH ₄	N ₂ O	CH ₄	N ₂ O	CH ₄	N ₂ O
Crude oil and	Crude oil	3.000	0.600	0.134	0.027	2.850	0.570	0.127	0.025



derived substances	Orimulsion	3.000	0.6 00	0.08 7	0.017	2.85 0	0.5 70	0.08 3	0.017
	Natural Gas Liquids	3.000	0.6 00	0.14 0	0.028	2.85 0	0.5 70	0.13 3	0.027
	Motor Gasoline	3.000	0.6 00	0.14 0	0.028	2.85 0	0.5 70	0.13 3	0.027
	Aviation Gasoline	3.000	0.6 00	0.14 0	0.028	2.85 0	0.5 70	0.13 3	0.027
	Jet Gasoline	3.000	0.6 00	0.14 0	0.028	2.85 0	0.5 70	0.13 3	0.027
	Jet Kerosene	3.000	0.6 00	0.13 9	0.028	2.85 0	0.5 70	0.13 2	0.026
	Other Kerosene	3.000	0.6 00	0.13 8	0.028	2.85 0	0.5 70	0.13 1	0.026
	Shale oil	3.000	0.6 00	0.12 0	0.024	2.85 0	0.5 70	0.11 4	0.023
	Gas/.Diesel oil	3.000	0.6 00	0.13 6	0.027	2.85 0	0.5 70	0.12 9	0.026
	Residual Fuel oil	3.000	0.6 00	0.12 8	0.026	2.85 0	0.5 70	0.12 1	0.024
	Liquified Petroleum Gases	1.000	0.1 00	0.05 3	0.005	0.90 0	0.0 90	0.04 7	0.005
	Ethane	1.000	0.1 00	0.05 2	0.005	0.90 0	0.0 90	0.04 6	0.005



	Naphtha	3.000	0.600	0.141	0.028	2.850	0.570	0.134	0.027
	Bitumen	3.000	0.600	0.127	0.025	2.850	0.570	0.121	0.024
	Lubricants	3.000	0.600	0.127	0.025	2.850	0.570	0.121	0.024
	Petroleum coke	3.000	0.600	0.103	0.021	2.850	0.570	0.098	0.020
	Refinery feedstocks	3.000	0.600	0.136	0.027	2.850	0.570	0.129	0.026
	Refinery Gas	1.000	0.100	0.055	0.006	0.900	0.090	0.050	0.005
	Paraffin waxes	3.000	0.600	0.127	0.025	2.850	0.570	0.121	0.024
	White Spirit & SBP	3.000	0.600	0.127	0.025	2.850	0.570	0.121	0.024
	Other petroleum products	3.000	0.600	0.127	0.025	2.850	0.570	0.121	0.024
Coal and derived products	Anthracite	1.000	1.500	0.028	0.042	0.950	1.425	0.027	0.040
	Coking coal	10.000	1.500	0.297	0.045	9.500	1.425	0.282	0.042
	Other bituminous coal	10.000	1.500	0.272	0.041	9.500	1.425	0.258	0.039



Sub-bituminous coal	10.000	1.500	0.199	0.030	9.500	1.425	0.189	0.028
Lignite	10.000	1.500	0.125	0.019	9.500	1.425	0.119	0.018
Oil shale and tar sands	10.000	1.500	0.094	0.014	9.500	1.425	0.089	0.013
Brown coal briquettes	10.000	1.500	0.218	0.033	9.500	1.425	0.207	0.031
Patent fuel	10.000	1.500	0.218	0.033	9.500	1.425	0.207	0.031
Coke oven coke & lignite coke	10.000	1.500	0.297	0.045	9.500	1.425	0.282	0.042
Gas coke	1.000	0.100	0.030	0.003	0.950	0.095	0.028	0.003
Coal tar	10.000	1.500	0.295	0.044	9.500	1.425	0.280	0.042
Gas works gas	1.000	0.100	0.043	0.004	0.900	0.090	0.039	0.004
Coke oven gas	1.000	0.100	0.043	0.004	0.900	0.090	0.039	0.004
Blast furnace gas	1.000	0.100	0.003	0.000	0.900	0.090	0.002	0.000
Oxygen steel furnace gas	1.000	0.100	0.008	0.001	0.900	0.090	0.007	0.001



Natural Gas	Natural Gas	1.000	0.100	0.053	0.005	0.900	0.090	0.051	0.005
Non-biomass waste	Municipal wastes (non-biomass fraction)	30.000	4.000	0.316	0.042	28.500	3.800	0.300	0.040
	Industrial wastes	30.000	4.000	N/A	N/A	28.500	3.800	N/A	N/A
	Waste oils	30.000	4.000	1.269	0.169	28.500	3.800	1.206	0.161
Peat	Peat	2.000	1.500	0.021	0.015	1.900	1.425	0.020	0.015
Biomass waste	Wood/Wood waste	30.000	4.000	0.493	0.066	28.500	3.800	0.468	0.062
	Sulphite lyes (Black liquor)	3.000	2.000	0.037	0.025	2.850	1.900	0.035	0.024
	Other primary solid biomass fuels	30.000	4.000	0.366	0.049	28.500	3.800	0.348	0.046
	Charcoal	200.000	4.000	6.211	0.124	190.000	3.800	5.900	0.118
	Biogasoline	3.000	0.600	0.085	0.017	2.850	0.570	0.081	0.016
	Biodiesels	3.000	0.600	0.085	0.017	2.850	0.570	0.081	0.016



Other liquid biofuels	3.000	0.600	0.087	0.017	2.850	0.570	0.082	0.016
Landfill gas	1.000	0.100	0.056	0.006	0.900	0.090	0.050	0.005
Sludge gas	1.000	0.100	0.056	0.006	0.900	0.090	0.050	0.005
Other biogas	1.000	0.100	0.056	0.006	0.900	0.090	0.050	0.005
Municipal wastes (biomass fraction)	30.000	4.000	0.366	0.049	28.500	3.800	0.348	0.046



Chapter-4

Action plan for Carbon off-setting

Re-use of Steel Scrap in Basic Oxygen Furnace

Scrap is a term used to describe steel that has generated during the manufacture of steel products. While the term 'scrap' may lead one to believe this is a waste product, it is actually a valuable raw material used in every steelmaking process. In blast furnace (BF) steelmaking, each charge of the basic oxygen furnace, in which carbon carbon-rich pig iron is refined into crude steel, typically contains 8%-10% scrap. Scrap acts as a cooling agent, absorbing excess heat from the exothermic decarburization process, and also as a source of iron units. Reuse of scrap in BOF helps reducing greenhouse gas emissions.

Table4.1: Heating and cooling reactions of BOF

Heating Reactions	Cooling Reactions
$c + \frac{1}{2} o_2 \rightarrow co$	$Fe_2O_3 + 3C \rightarrow 2Fe + 3CO$
$co + \frac{1}{2} o_2 \rightarrow co_2$	
$Si + o_2 \rightarrow SiO_2$	$Fe_2O_3 + 3CO \rightarrow 2Fe + 3CO_2$
$Fe + \frac{1}{2} o_2 \rightarrow FeO$	
$2Mn + o_2 \rightarrow 2MnO$	
$4P + 5o_2 \rightarrow 2P_2 O_5$	



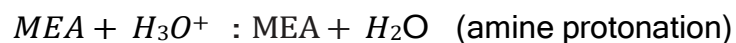
Reuse of internal heat for power generation

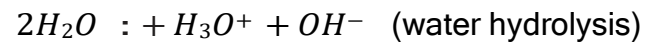
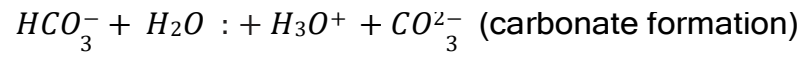
The proposed plant is designed for optimum use of the recovered energy of hot off gases from major units such as Blast furnace, Basic oxygen furnace and coke oven plant. A plant is designed to integrate 74 % of the heat generated from coke oven gas to sinter plant, pellet plant & continuous casting machine. Approx. 52 % of the total heat generated from blast furnace will be reused in blast furnace & 20 % of the generated heat will be integrated to sinter plant, pellet plant & continuous casting machine. The surplus gases available in these units will be re-used for power generation. Out of 600 MW, 293 MW power will be generated from internal process heat.

CO₂ capture

The uses of coal for generation of 600 MW electricity produce approximately 5 MT of CO₂ annually. CPP's are one of the major contributors of CO₂ emissions in any steel plant. In view to limit the release of CO₂ in atmosphere it is necessary to capture CO₂. There are several approaches for CO₂ capture out of which amine based CO₂ absorption systems are the most suitable for combustion based power plants. The amine based CO₂ absorption is easy to use and can be retrofitted to existing power plants. Absorption processes are based on thermally generable solvents, which have a strong affinity for CO₂. They are regenerated at elevated temperature. In view to limit the CO₂ release, It is suggested to install amine based CO₂ absorption unit at 600 MW CPP.

The equilibrium reactions describing the solution chemistry of CO₂ absorption with MEA





Chapter - 5

Terrestrial Sequestration

Terrestrial sequestration involves the capture and storage of carbon dioxide by plants and the storage of carbon in soil. During photosynthesis, carbon from atmospheric carbon dioxide is transformed into components necessary for plants to live and grow. As part of this process, the carbon present in the atmosphere as carbon dioxide becomes part of the plant: a leaf, stem, root, etc. Long-lived plants like trees might keep the carbon sequestered for a long period of time.

The existing greenbelt sure sequesters some amount of the carbon emitted through then industrial process. The greenbelt is spread over an area of 6.6 acres with total plantation of 4068 consisting of trees and shrubs. As the industry falls under the heavily polluted area, greenbelt needs to be enhanced and more trees are to be planted. Hence more carbon can be sequestered. New trees are suggested for plantation to cover approx. 40% of the total Plant Area.

Table 5.1: shows the existing greenbelt and its required expansion during the expansion phase:

Sl.no	Heading	Existing	Additional	Total
1.	Total Area	20.04 Acres	34.31 Acres	54.35 Acres
2.	Existing Greenbelt	6.6 Acres	---	6.6 Acres
3.	Existing no.of plants	4068	---	4068
4.	Greenbelt Enhancement Area	---	15.14 Acres	15.14 Acres
5.	No. of trees to be planted	---	9200	9200



Formula used for determination of Carbon sequestered by Trees

Step 1: Determine the total green weight of the tree:

The green weight is the weight of the tree when it is alive. First, you have to calculate the green weight of the above-ground weight as follows:

$$W_{\text{above-ground}} = 0.25 D^2 H \text{ (for trees with } D < 11)$$

$$W_{\text{above-ground}} = 0.15 D^2 H \text{ (for trees with } D > 11)$$

$$W_{\text{above-ground}} = \text{Above-ground weight in pounds}$$

D = Diameter of the trunk in inches

H = Height of the tree in feet

The root system weight is about 20% of the above-ground weight. Therefore, to determine the total green weight of the tree, multiply the above-ground weight by 1.2:

$$W_{\text{total green weight}} = 1.2 * W_{\text{above-ground}}$$

Step 2: Determine the dry weight of the tree

The average tree is 72.5% dry matter and 27.5% moisture. Therefore, to determine the dry weight of the tree, multiply the total green weight of the tree by 72.5%.

$$W_{\text{dry weight}} = 0.725 * W_{\text{total green weight}}$$

Step 3: Determine the weight of carbon in the tree

The average carbon content is generally 50% of the tree's dry weight total volume. Therefore, in determining the weight of carbon in the tree, multiply the dry weight of the tree by 50%.

$$W_{\text{carbon}} = 0.5 * W_{\text{dry weight}}$$

Step 4: Determine the weight of carbon dioxide sequestered in the tree

CO₂ has one molecule of Carbon and 2 molecules of Oxygen. The atomic weight of Carbon is 12 (u) and the atomic weight of Oxygen is 16 (u). The weight of CO₂ in trees is determined by the ratio of CO₂ to C is 44/12 = 3.67. Therefore, to determine the weight of carbon dioxide sequestered in the tree, multiply the weight of carbon in the tree by 3.67.

$$W_{\text{carbon-dioxide}} = 3.67 * W_{\text{carbon}}$$



Selection of the trees is based on:

1. Tolerance towards pollution.
2. Fast Growth
3. High sequestration potential.
4. Indigenously growing species.
5. No exotic species has been suggested.
6. Average Growth period to be three years.
7. No vulnerable or endangered species has been chosen.

Plantation Plant

Suggested plants are to be planted in a 3 tier system.

Tier I	Boundary Wall, 10-20 m width on all sides.	4500
Tier II	Administrative and other Buildings	2500
Tier III	Outside the boundary wall	2000

As per the study conducted the total carbon emissions mounts to 80593 MT for the year 2021-2022. In this respect the sequestered carbon is calculated to be 1.67% approximately. List of existing plant is attached as Annexure1 for >10 years, 5-10 years, < 5 years. Therefore a suitable plan has been suggested for plantation attempting to take this sequestration to the rise of 6.88% approximately in an average period of 3 Years (after completion of the Tier III Plantation). Plantation plan is attached as Annexure 1. When it comes to sequestration through afforestation, it is the best possible way to sequester carbon and reap other benefits as well. However sequestration has its limits, plantation within the plant limits the area of plantation and therefore sequestration is limited. However developing thicker greenbelt outside the plant boundaries around 10-20 m allows more sequestration. Keeping in mind the existing plantation also adds Significantly to the sequestration. Maintenance of the Greenbelt is another important aspect that can significantly impact the health of the plants, leading to maximum healthy growth. During construction phase due to excessive dust, a decline in survival rate was observed. It is hence suggested to go for expansion post construction.



Chapter - 6

Conclusions

The CO₂ emission intensity in Aloke Steel Industries Pvt. Ltd. has been calculated using ISO 14404 which is proposed by world steel Association. The CO₂ emission intensity in Aloke Steel Industries Pvt. Ltd is in optimum range and not harmful for environment. Still the plant has made a proposed plan to further reduce the CO₂ emission intensity. The Indian DRI industry consumes 8.8% of national annual industrial energy use and emits 11% of national annual CO₂ emissions. This represents a significant portion of the national contribution in terms of emissions and energy use. it is crucial to carefully examine the DRI industry for energy use and emissions abatement measures. The growing iron and steel industry in India is one of the key sectors to reform in order to meet the country's NDCs to the Paris Agreement, and the anticipated doubling of DRI capacity from 50 MTPA in 2018-19 to 114 MTPA by 2030-31 is further indication of the importance of this sector.

The iron making process is of key focus for reducing energy use, GHG, SO_x and PM_{2.5} emissions. There is a large contribution of NO_x emissions from transport at present.

The DRI process metrics suggest that in terms of efficiency, there is a potential for 20-30% improvement on average when considering the best technologies available. This can be brought about by improving the raw material quality, proper selection of materials and process parameters and waste-heat recovery, among others. To improve raw material quality, it is suggested to explore the expansion of domestic beneficiation capacity (particularly for coal) and reduce the import share to bring a gross benefit of up to 5% in GHG emissions and 6% in energy use. Newer and more efficient beneficiation technologies could be adopted to ensure sustainable growth. Land transport using trucks can be reduced in favor of railways to improve transport efficiency and reduce overall emissions by 1-2%. Improving regulations by revising the 12-year old emissions norms and bettering the monitoring framework by inducting CEMS can go a long way in preventing plants from flouting norms without detection and reprehension. Extending the PAT scheme with stricter targets and encouragement of adopting higher productivity, WHR systems and also for fuel switching could be greatly beneficial in accelerating development. Over the next decade, however, considering the broad limitations of raw material quality



Affordable natural gas network may be of significant potential for reduction in GHG emission from the DRI industry. In addition, capacity building must be taken up early on for accelerated hydrogen steel adoption. By enhancing research and development and deploying pilot production facilities, the overall infrastructure for a hydrogen economy can be stably built for ensured introduction of hydrogen-based steel in the coming decades. The hydrogen economy can revolutionize the industry by reducing GHG emissions by up to 94%.

In conclusion, short-term measures can be taken to increase coal-DRI performance to BAT standards. Over the medium term, natural gas adoption can be explored, whilst a suitable long-term goal is to introduce hydrogen and negate 300 million tonnes of GHG emissions, to enable truly sustainable development. A robust policy must be developed, and relevant stakeholders must be engaged in a timely manner to accelerate the GHG emission of this important industry and thus sustaining the economy over the long term.



CO₂ emissions data submission form for worldsteel sectoral approach

*Please do not change downloaded form

Site:	A IPL022
Organization:	A IPL
Year(Report period):	2022

Mandatory to fill-in
Stainless steel only
Fill-in if available
Protected calculation
Fixed value

Site structure (the number of operated units)

Coke battery		BF > 1000 m ³		Open hearth		Cold rolling		A&P lines	
Sinter plant		100<BF<1000		Hot rolling		HDG lines		Bright A lines	
Pellet plant		BF < 100 m ³		Lime kilns		EG lines		Batch Annealing	
Gas DRI		BOF shops		Oxygen plant		Tining lines		Argon/Oxy Decarb	
Coal DRI		EAF units		Power plant		Smelting Reduction		Vacuum Oxy Decarb	

BASIC information

Total coke production (dry t)	
Sinter production (t)	
Pellet production (t)	
Hot metal production (t)	
DRI production (t)	80,593
BOF crude steel production (t)	
Open Hearth crude steel production (t)	0
EAF crude steel production (t)	0
Carbon crude steel production (t)	0
Hot rolled steel production (t)	
Austenitic stainless steel production (t)	
Ferritic stainless steel production (t)	
Martensitic stainless steel production (t)	
Other stainless steel production (t)	
Stainless steel production (t)	0
Total Steel Production (t)	0
Total Ironmaking slag production (t)	
Total steelmaking slag production (t)	
Granulated Ironmaking slag production (t)	
Granulated Steelmaking slag production (t)	
Total Granulated slag production (t)	0
Hot rolled stainless steel production (t)	
Cold rolled stainless steel production (t)	
Iron supply from upstream (t)	
Purchased carbon steel scraps (t)	
Purchased stainless steel scraps (t)	
Home carbon steel scraps (t)	
Home stainless steel scraps (t)	
Cr-Ni type scraps (%)	
Cr type scraps (%)	
Burnt lime production (t)	
Power generation (MWh)	0
Data verified by external body	Yes



Electricity grid Information

Source of information	Energy Equivalent	Upstream CO ₂ value
	GJ/MWh	t CO ₂ /MWh
Global average grid mix	9.800	0.504
IEA yearly update global grid mix	9.800	0.476
National or regional regulator mix		
Site power supply contract mix		

Materials /Energies	Unit	Site data				Conversion factors		Calculation results				
		Purchased Procured	Sold Delivered	C content	Energy Equivalent	Emission Factor	Upstream CO ₂ value	Scope 1	Scope 1.1	Scope 2 emissions	Scope 3 emissions	Total Energy
				Site measurement				Direct emissions	emissions	t CO ₂	t CO ₂	
				t C/unit	GJ/unit	t CO ₂ /unit	t CO ₂ /unit	t CO ₂	t CO ₂	t CO ₂	t CO ₂	TJ
Iron ore	dry t	58,027		0.010		0.037		2,147			-	-
Coking coal	dry t			0.835	32.200	3.060		-			-	-
BF injection coal	dry t			0.806	31.100	2.953		-			-	-
Sinter/BOF coal	dry t			0.760	29.300	2.785		-			-	-
Steam coal	dry t	1,17,666		0.672	25.900	2.462		2,89,693			-	3,048
EAF coal	dry t			0.889	30.100	3.257		-			-	-
SR/DRI coal	dry t			0.806	31.100	2.953		-			-	-
Coke	dry t			0.889	30.100	3.257	0.224	-			-	-
Charcoal	dry t		55,545		18.800			-			-	1,044
Petroleum coke	t			0.850	31.935	3.115		-			-	-
Used plastic	t				46.000	2.416		-			-	-
Used tires	t				35.000	2.199		-			-	-
Heavy oil	m ³				37.700	2.907	0.276	-			-	-
Light oil	m ³				35.100	2.601	0.247	-			-	-
Kerosene	m ³				34.700	2.481	0.247	-			-	-
LPG	t				47.300	2.985		-			-	-
LNG	k.m ³ N			0.550	35.900	2.015	0.665	-			-	-
Natural gas	k.m ³ N			0.550	35.900	2.015	0.000	-			-	-
Green hydrogen	t				120.000		0.000	-			-	-
Blue hydrogen	t				120.000		1.800	-			-	-
Grey hydrogen	t				120.000		19.800	-			-	-
Fossil free biogas	t			0.751	50.400		0.000	-			-	-
Limestone	dry t			0.120		0.440		-			-	-
Burnt lime	t				4.500		0.950	-			-	-
Crude dolomite	dry t	1,612		0.130		0.476		767			-	-
Burnt dolomite	t				4.500		1.100	-			-	-
Sinter	t				2.450		0.262	-			-	-
Pellets	t	1,07,995			2.100		0.137	-			14,795	227
EAF electrodes	t					3.663	0.650	-			-	-
Low carbon iron units	t			0.047	20.900	0.172	1.855	-			-	-
Pig Iron	t	0		0.047	20.900	0.172	1.855	-			-	-
Cold Iron	t			0.047	20.900	0.172	1.855	-			-	-
Ni pig iron	t			0.005		0.018	5.200	-			-	-
Charcoal based pig iron	t			0.047	20.900	0.172	1.855	-			-	-
Biomass	t			0.476	15.600		0.000	-			-	-
Gas based DRI	t			0.020	14.100	0.073	0.780	-			-	-
Coal based DRI	t		0	0.020	17.900	0.073	1.210	-			-	-
Low carbon DRI	t			0.020	14.100	0.073	0.780	-			-	-
Ferro-Nickel	t			0.010		0.037	8.676	-			-	-
Nickel oxides	t			0.001		0.004	20.279	-			-	-
Nickel metal	t			0.001		0.004	13.579	-			-	-
Ferro-Chromium	t			0.075		0.275	5.987	-			-	-
Molybdenum oxides	t			0.001		0.004	6.500	-			-	-
Ferro-Molybdenum	t			0.005		0.018	8.500	-			-	-
Ferro-Manganese	t			0.050		0.183	2.789	-			-	-
Ferro-Silicon	t			0.001		0.004	4.000	-			-	-
Silico-Manganese	t			0.005		0.018	1.400	-			-	-
Silicon (Metal)	t			0.001		0.004	5.000	-			-	-
Electricity	MWh	5,855			9.800		0.504	-		2,951		57
Steam	t				3.800		0.195	-		-		-
Oxygen	k.m ³ N				6.900		0.355	-			-	-
Nitrogen	k.m ³ N				2.000		0.103	-			-	-



	Argon	k.m ³ N			2.000		0.103	-			-	-
	Coke oven gas	k.m ³ N		0.228	19.000	0.835	0.977	-	-	-	-	-
	Blast furnace gas	k.m ³ N		0.243	3.300	0.890	0.170	-	-	-	-	-
New	BOF gas	k.m ³ N		0.413	8.400	1.513	0.432	-	-	-	-	-
New	Waste heat	GJ			1.000		0.051	-	-	-	-	-
New	Ethanol	m ³		0.410	23.575		1.494	-	-	-	-	-
New	Methanol	m ³		0.293	15.662		1.369	-	-	-	-	-
New	Ammonia	t			37.500		1.600	-	-	-	-	-
	BF slag	t		24,350			0.550	-		-	13,393	-
	BOF slag	t		0			0.300	-		-	-	-
New	EAF slag	t					0.300	-		-	-	-
	CO2 to external use	t				1.000		-		-	-	-
New	Permanently sequestered C	t				1.000		-		-	-	-
	Coal tar	t			37.000		3.389	-		-	-	-
	Benzole	t			40.570		3.382	-		-	-	-
	w/o undecided credits	CO2 Intensity	-	tCO2/tCrudeSteel	Grand Total	3,10,353	tCO2	Sub Total	2,92,607	-	2,951	14,795
	w/ undecided credits	CO2 Intensity	-	tCO2/tCrudeSteel	Grand Total	2,96,960.00	tCO2	Sub Total	2,92,607	-	2,951	1,402
		CI by Slags	-	tCO2/tCrudeSteel	Slags	13,393.00	tCO2	Slags	-	-	-	13,393
		CI External CO2	-	tCO2/tCrudeSteel	External CO2	-	tCO2	External CO2	-	-	-	-
		Sequestered CI	-	tCO2/tCrudeSteel	Sequestered CO2	-	tCO2	Sequestered CO2	-	-	-	-
		CCU Products	-	tCO2/tCrudeSteel	CCU Products	-	tCO2	CCU Products	-	-	-	-
	Energy Intensity		-	GJ/tCrudeSteel								

Useful unit conversions

Volume	1	scf	0.026862	m ³ N
Volume	1	gal	0.003785	m ³
Weight	1	lb	0.453592	kg
Weight	1	nt	0.907184	mt
Energy	1	mmBTU	1.054349	GJ
Energy	1	mBTU/scf	39.251136	MJ/m ³ N
Energy	1	mBTU/nt	1.162222	MJ/mt
Energy	1	BTU/gal	0.278530	MJ/m ³

CO2 Intensity = (292607+2951-14795)/80593 =3.48

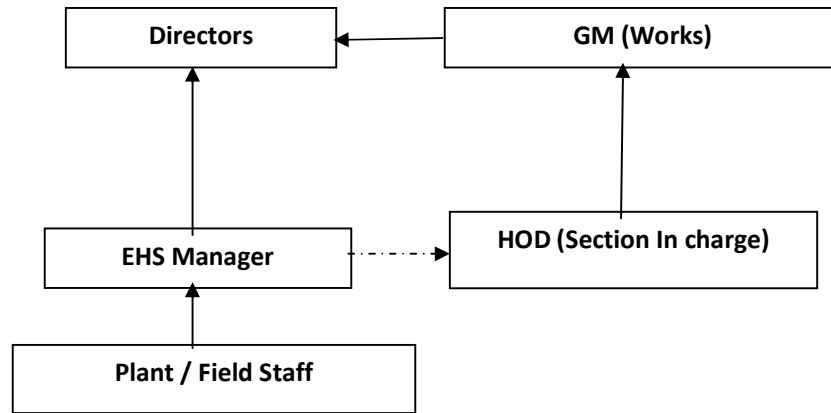


GREEN BELT PLANTATION PLAN FOR ASIPL AND ITS SEQUESTRATION POTENTIAL

Common Name	Plant Species	Family	Number	Average Height above the ground (feet)	Average Diameter of the trunk (inches)	Weight of the tree above ground (pounds)	Total Weight of the tree (pounds)	Dry weight of the tree (pounds)	Weight of the carbon present (pounds)	Weight of carbon dioxide sequestered (pounds)	Weight of the carbon sequestered (tonne)	Weight of the carbon sequestered (tonne/annum)
TREES												
False Ashoka	Monoon Longifolium	Annonaceae	500	49	20	2450000	2940000	2131500	1065750	3911302.5	1777.864773	592.6215909
Akashmoni	Acacia auriculiformis	Fabaceae	150	78	25	1828125	2193750	1590468.75	795234.375	2918510.156	1326.595526	442.1985085
Mimosa	Acacia farnesiana	Fabaceae	75	82	18	498150	597780	433390.5	216695.25	795271.5675	361.4870761	120.495692
Chiku	Achrassapota	Sapotaceae	150	75	20	1125000	1350000	978750	489375	1796006.25	816.3664773	272.1221591
	Ailanthus excels	Simaroubaceae	50	65	26.3	561998.125	674397.75	488938.3688	244469.1844	897201.9067	407.8190485	135.9396828
Siris	Albizia amara	Fabaceae	300	64	45	9720000	11664000	8456400	4228200	15517494	7053.406364	2351.135455
Frywood	Albizia lebbeck	Fabaceae	45	70	27	574087.5	688905	499456.125	249728.0625	916501.9894	416.5918134	138.8639378
Karoi	Albizia procera	Fabaceae	35	42	54	1071630	1285956	932318.1	466159.05	1710803.714	777.6380516	259.2126839
Milkwood	Alstoniascholaris	Apocynaceae	45	36	12	58320	69984	50738.4	25369.2	93104.964	42.32043818	14.10681273
Neem	Azadirachtaindica	Meliaceae	300	55	19	1489125	1786950	1295538.75	647769.375	2377313.606	1080.597094	360.1990313
Bidi leaf	Bauhinia recemosa	Fabaceae	75	16	10	30000	36000	26100	13050	47893.5	21.76977273	7.256590909
White Orchid	Bauhinia acuminata	Fabaceae	55	7	12	13860	16632	12058.2	6029.1	22126.797	10.057635	3.352545
Butterfly Tree	Bauhinia purpurea	Fabaceae	65	15	6	8775	10530	7634.25	3817.125	14008.84875	6.367658523	2.122552841
Shisham	Dalbergia sisoo	Fabaceae	150	76	70	13965000	16758000	12149550	6074775	22294424.25	10133.8292	3377.943068
Mango	Mangifera indica	Anacardiaceae	500	60	25	4687500	5625000	4078125	2039062.5	7483359.375	3401.526989	1133.84233
Chinaberry	Melia azadirachta	Meliaceae	50	50	24	360000	432000	313200	156600	574722	261.2372727	87.07909091
Yellow Flame	Peltophorumpterothecium	Fabaceae	75	60	35	1378125	1653750	1198968.75	599484.375	2200107.656	1000.048935	333.3496449
Manila Tamarind	Pithecellobium dulce	Fabaceae	75	45	20	337500	405000	293625	146812.5	538801.875	244.9099432	81.63664773
Java Plum	Syzygium cumini	Myrtaceae	45	47	25	330468.75	396562.5	287507.8125	143753.9063	527576.8359	239.8076527	79.93588423
Tulip Tree	Thespesia populnea	Malvaceae	45	62	32	714240	857088	621388.8	310694.4	1140248.448	518.2947491	172.7649164
Teak	Gmelina arborea	Lamiaceae	500	100	14	2450000	2940000	2131500	1065750	3911302.5	1777.864773	592.6215909
Indian Bael	Aegle marmelos	Rutaceae	30	26	8	12480	14976	10857.6	5428.8	19923.696	9.056225455	3.018741818
Banyan	Ficus benghalensis	Moraceae	35	87	112	9549120	11458944	8307734.4	4153867.2	15244692.62	6929.405738	2309.801913
			3350								38614.86321	12871.62107
Flowering trees												
Golden Shower	Cassia Fistula	Fabaceae	55	40	36	712800	855360	620136	310068	1137949.56	516.076898	172.0256327
Champak	Michelia champaca	Magnoliaceae	50	85	62	4084250	4901100	3553297.5	1776648.75	6520300.913	2957.052568	985.6841893
Coral Tree	Erythrina Blakei	Fabaceae	45	65	45	1480781.25	1776937.5	1288279.688	644139.8438	2363993.227	1072.105772	357.3685906
Mango-pine	Barringtonia Acutangula	Lecythidaceae	50	82	26	692900	831480	602823	301411.5	1106180.205	501.6690272	167.2230091
Yellow elder	Tecoma stans	Bignoniaceae	40	10	16	25600	30720	22272	11136	40869.12	18.5347483	6.178249433
Bottlebrush	Melaleuca citrina	Myrtaceae	60	25	24	216000	259200	187920	93960	344833.2	156.3869388	52.12897959
			300								5221.825952	1740.608651
												14612.22972



Organization of Environment Management Cell





CIN: U74999JH2018PTC011125

ENVIRONMENTAL LABORATORIES &

PLOT NO-30, MANSAROVAR ENCLAVE, TUPUDANA
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Email: info@elespl.co.in; eles.ranchi@gmail.com

Website : www.elespl.co.in

GST NO:- 20AAECE9713D1Z4 ☎ : 0651-2290103, 9931289451



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TEST REPORT

Test Report No. : ELES/RNC/2023/1000	Report Release Date : 11.04.2023
Application No. : 15893961	Application Date : 24.03.2023

CUSTOMER DETAILS		SAMPLE DETAILS	
Customer Name	: Alope Steels Industries Private Limited	Sampling Date	: 03.04.2023 to 04.04.2023
Address	: Vill- Budhakhap, PO- Digwar, Ramgarh, Dist- Ramgarh.	Sample Received Date	: 05.04.2023
		Type of Sample	: Ambient Air
Plant Status	: Operational	Sampling Procedure	: ELES/DOC/SMPL/02
		Sample Drawn By	: ELES Pvt. Ltd.
		Period of Analysis	: 05.04.2023 to 11.04.2023

METEOROLOGICAL INFORMATION

1	Average Temperature (°C) : 27	2	Barometric Pressure (mmHg) : 740
3	Relative Humidity (%) : 64	4	Weather Condition : Clear

Parameters	Particulate Matter (PM10)		Fine Particulate Matter (PM2.5)		Sulphur Di-Oxide (SO ₂)		Nitrogen Di-Oxide (NO ₂)			
	Test Protocol	IS 5182 (P-23)	IS 5182 (P-24)	IS 5182 (P-2)	IS 5182 (P-6)					
Locations	Limit	Unit	100	µg/m ³	60	µg/m ³	80	µg/m ³	80	µg/m ³
Near Main Gate	09:14 – 13:22	90	45	13.8	25.6					
	13:22 – 17:09									
	17:16 – 21:05	73				16.7	24.5			
	21:05 – 01:01									
	01:07 – 05:11	84				13.5	19.2			
	05:11 – 09:05							16.8	28.7	
Sample ID ELES/RNC/PCB/AA/0523	Average	82	45	14.5	25.0					
Near Occupational Health Center	09:29 – 13:25	69	36	15.3	24.8					
	13:25 – 17:13					10.7	28.3			
	17:20 – 21:13	58						13.8	23.7	
	21:13 – 01:19					65	7.2			18.8
	01:25 – 05:21	10.8						17.2		
	05:21 – 09:22					12.9	26.4			
Sample ID ELES/RNC/PCB/AA/0524	Average	64	36	11.8	23.2					

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GST NO:- 20AAECE9713D1Z4 | : 0651-2290103, 9931289451



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TEST REPORT

Test Report No. : ELES/RNC/2023/1000	Report Release Date : 11.04.2023
Application No. : 15893961	Application Date : 24.03.2023

Parameters		Particulate Matter (PM10)		Fine Particulate Matter (PM2.5)		Sulphur Di-Oxide (SO ₂)		Nitrogen Di-Oxide (NO ₂)		
Test Protocol		IS 5182 (P-23)		IS 5182 (P-24)		IS 5182 (P-2)		IS 5182 (P-6)		
Locations	Limit	Unit	100	µg/m ³	60	µg/m ³	80	µg/m ³	80	µg/m ³
North West Side of Plant	09:44 – 13:38		93	48	16.9	25.8				
	13:38 – 17:33									
	17:40 – 21:44		70				18.5	30.5		
	21:44 – 01:31									
	01:37 – 05:42		88				10.2	23.5		
	05:42 – 09:36									
Sample ID ELES/RNC/PCB/AA/0525	Average		84	48	15.1	26.4				

Authorized Signatory
SANDIP BERA
SENIOR MANAGER
ELES PVT. LTD.

****End of Report****

Authorized Signatory
Dr. Deependra Kumar Sinha
Ph. D. Environmental Engg.
ELES Pvt. Ltd. Technical Manager

Page 2 of 2

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Website : www.elespl.co.in
GST NO:- 20AAECE9713D124 Q : 0651-2290103, 9931289451

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TEST REPORT

Test Report No. : ELES/RNC/2023/1001	Report Release Date : 11.04.2023
Application No. : 15893961	Application Date : 24.03.2023

CUSTOMER DETAILS		SAMPLE DETAILS	
Customer Name : Alope Steels Industries Private Limited	Address : Vill- Budhakhap, PO- Digwar, Ramgarh, Dist- Ramgarh.	Sampling Date : 03.04.2023 to 04.04.2023	Sampling Received Date : 05.04.2023
Plant Status : Operational		Type of Sample : Ambient Noise	Sampling procedure : ELES/DOC/SMPL/03
		Sample Drawn By : ELES Pvt. Ltd.	Period of Analysis : 05.04.2023 to 11.04.2023

METEOROLOGICAL INFORMATION			
1	Average Temperature (°C) : 27	2	Barometric Pressure (mmHg) : 740
3	Relative Humidity (%) : 64	4	Weather Condition : Clear

Location	Unit	Test Protocol	Result			Regulatory Limit
			L _{Max}	L _{Min}	L _{eq}	
Near Main Gate	dB(A)	IS 9989:1981, RA 2020	L _{Max}	L _{Min}	L _{eq}	75 dB(A) Day Time & 70 dB(A) Night Time
Sample ID: ELES/RNC/PCB/AN/0526			74.4	48.1	65	
Near Occupational Health Center	dB(A)	IS 9989:1981, RA 2020	L _{Max}	L _{Min}	L _{eq}	
Sample ID: ELES/RNC/PCB/AN/0527			69.4	41.0	61	
North West Side of Plant	dB(A)	IS 9989:1981, RA 2020	L _{Max}	L _{Min}	L _{eq}	
Sample ID: ELES/RNC/PCB/AN/0528			71.8	42.5	63	


Authorized Signatory
SANDIP BERA
SENIOR MANAGER
ELES PVT. LTD.

****End of Report****


Authorized Signatory
Dr. Deependra Kumar Sinha
Ph. D. Environmental Engg.
ELES Pvt. Ltd. Technical Manager

Page 1 of 1

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TEST REPORT

Test Report No. : ELES/RNC/2023/1003	Report Release Date : 11.04.2023
Application No. : 15893961	Application Date : 24.03.2023

CUSTOMER DETAILS		SAMPLE DETAILS	
Customer Name	: Alope Steels Industries Private Limited	Sample Ref. No.	: ELES/RNC/PCB/SM/0543
Address	: Vill- Budhakhap, PO- Digwar, Ramgarh, Dist- Ramgarh.	Location	: Stack- 02 (Kiln 3&4)
Plant Status	: Operational	Sampling Date	: 04.04.2023
Period of Analysis	: 06.04.2023 to 11.04.2023	Sample Received Date	: 06.04.2023
		Type of Sample	: Flue Gas
		Sampling Procedure	: ELES/DOC/SMPL/02(A)
		Sample Drawn By	: ELES Pvt. Ltd.
		Sample Condition	: Sealed & Preserved

GENERAL INFORMATION

1	Particular of the Plant	: Sponge Iron
2	Emission Due to	: Burning of Coal
3	Stack Connected to	: ESP
4	Material of Construction of Duct	: M S
5	Stack Height from Ground Level (m)	: 55
6	Height of Sampling Port from Ground Level (m)	: 27
7	Inner Diameter of Stack at Sampling Point (m)	: 1.8
8	Shape of the Stack	: Circular
9	Working Load of the Stack	: N/A
10	Pollution Control System	: ESP
11	Ladder & Platform	: Permanent

FUEL CHARACTERISTICS DETAILS

1	Type of Fuel Used	: Coal
2	Fuel Consumption	: 3.5 TPH/Each Kiln
3	Calorific Value of Fuel (Kcal/Kg)	: N/A

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TEST REPORT

Test Report No. : ELES/RNC/2023/1003	Report Release Date : 11.04.2023
Application No. : 15893961	Application Date : 24.03.2023

Parameter	Unit	Test Protocol	Result
Particulate Matter (PM)	mg/Nm ³	IS 11255(Part 1):1985; RA 2019	84
Sulphur Di-Oxide (SO ₂)	mg/Nm ³	USEPA 6C : 2017	225
Oxides of Nitrogen (NO _x)	mg/Nm ³	USEPA 7E : 2020	69
Flue Gas Temperature	°C	IS 11255 (Part 3): 2008; RA 2018	181
Barometric Pressure	mmHg	IS 11255 (Part 3): 2008; RA 2018	738
Velocity of Flue Gas	m/sec	IS 11255 (Part 3): 2008; RA 2018	17.97
Quantity of Gas Flow	Nm ³ /hr	IS 11255 (Part 3): 2008; RA 2018	129514

Authorized Signatory
SANDIP BERA
SENIOR MANAGER
ELES PVT. LTD.

****End of Report****

Authorised Signatory
Dr. Deependra Kumar Sinha
Ph. D. Environmental Engg.
ELES Pvt. Ltd. Technical Manager



CIN: U74999JH2018PTC011125

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TEST REPORT

Test Report No. : ELES/RNC/2023/1002	Report Release Date : 11.04.2023
Application No. : 15893961	Application Date : 24.03.2023

CUSTOMER DETAILS		SAMPLE DETAILS	
Customer Name	: Alope Steels Industries Private Limited	Sample Ref. No.	: ELES/RNC/PCB/SM/0529
Address	: Vill- Budhakhap, PO- Digwar, Ramgarh, Dist- Ramgarh.	Location	: Stack- 01 (Kiln 1&2)
Plant Status	: Operational	Sampling Date	: 03.04.2023
Period of Analysis	: 05.04.2023 to 11.04.2023	Sample Received Date	: 05.04.2023
		Type of Sample	: Flue Gas
		Sampling Procedure	: ELES/DOC/SMPL/02(A)
		Sample Drawn By	: ELES Pvt. Ltd.
		Sample Condition	: Sealed & Preserved

GENERAL INFORMATION

1	Particular of the Plant	: Sponge Iron
2	Emission Due to	: Burning of Coal
3	Stack Connected to	: ESP
4	Material of Construction of Duct	: M S
5	Stack Height from Ground Level (m)	: 55
6	Height of Sampling Port from Ground Level (m)	: 27
7	Inner Diameter of Stack at Sampling Point (m)	: 1.8
8	Shape of the Stack	: Circular
9	Working Load of the Stack	: N/A
10	Pollution Control System	: ESP
11	Ladder & Platform	: Permanent

FUEL CHARACTERISTICS DETAILS

1	Type of Fuel Used	: Coal
2	Fuel Consumption	: 3.5 TPH/Each Kiln
3	Calorific Value of Fuel (Kcal/Kg)	: N/A

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TEST REPORT

Test Report No. : ELES/RNC/2023/1002	Report Release Date : 11.04.2023
Application No. : 15893961	Application Date : 24.03.2023

Parameter	Unit	Test Protocol	Result
Particulate Matter (PM)	mg/Nm ³	IS 11255(Part 1):1985; RA 2019	78
Sulphur Di-Oxide (SO ₂)	mg/Nm ³	USEPA 6C : 2017	212
Oxides of Nitrogen (NO _x)	mg/Nm ³	USEPA 7E : 2020	59
Flue Gas Temperature	°C	IS 11255 (Part 3): 2008; RA 2018	178
Barometric Pressure	mmHg	IS 11255 (Part 3): 2008; RA 2018	738
Velocity of Flue Gas	m/sec	IS 11255 (Part 3): 2008; RA 2018	17.94
Quantity of Gas Flow	Nm ³ /hr	IS 11255 (Part 3): 2008; RA 2018	129555

Authorized Signatory
SANDIP BERA
SENIOR MANAGER
ELES PVT. LTD.

****End of Report****

Authorised Signatory
Dr. Deependra Kumar Sinha
Ph. D. Environmental Engg.
ELES Pvt. Ltd. Technical Manager

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"Save Environment, Save Future"

Aloke Steels Industries Private Limited

REGD OFFICE

: OPP. ASHOK CINEMA,
RANCHI ROAD, MARAR -829 117
DIST. - RAMGARH (JHARKHAND)
: U27103JH2004PTC010725
: asipl.ramgarh@gmail.com

Email

WORKS:
Vill : Budhakhap
Post : Karma -829137
Dist.-Ramgarh,(Jharkhand)

Ref. No.....

ASIPL/041/ 2023-24

O/C

Date.....

22/06/2023

To,
The Additional Principal Chief Conservator of Forests (C),
Government of India,
Ministry of Environment, Forest & Climate Change,
Integrated Regional Office (Eastern Central Zone),
2nd Floor, Headquarter-Jharkhand State Housing Board,
Harmu Chowk, Ranchi, Jharkhand- 834002

Sub:-Regarding compliance for the period October, 2022 to March, 2023 to the conditions of Environment Clearance for Expansion of existing 1,20,000 TPA Sponge Iron Plant by installation of new facilities for production of Steel Melting Shop for 1,08,000 TPA of Billets, Rolling mill (90,000 TPA), Iron Ore crushing & Beneficiation plant (2,70,000 TPA), Slag Crushing Plant (16,200 TPA), Captive Power Plant 18 MW (4X2MWWHRB :1X10 MW (AFBC) and Briquetting unit for Iron ore fines(40,100 TPA).

Ref: - Environment Clearance Letter No. F. NO. J-11011/205/2016-IA.II (I) Dated- 23rd July, 2018.

Dear Sir,

In reference to the above subject matter & reference letters, the 'point wise Half Yearly compliance status for the period of October, 2022 to March, 2023 is being submitted. The soft copy is also sent through e-mail for your kind perusal please.

Hope you will find this in order and oblige.

Thanking you.

Yours faithfully

For Aloke Steels Industries Pvt Ltd.



Authorized Signatory

Enclosures: Compliance status Report,

Cc to:-

- 1) The Zonal office Incharge, Central Pollution Control Board, Southernd Conclave, Block 502, 5th & 6th Floors, 1582 Rajdanga Main Road, Kolkata - 700 107 (W. B.).
- 2) The Member Secretary, Jharkh T.A. Division Building (Ground Floor) 834004, Jharkhand.
- 3) Regional Officer, Regional Office, S Jharkhand.



R3383967061IN IVR:8274303967061

RL RAMGARH DANNT HO (829122)

Counter No:1,01/07/2023,18:44

To:THE REGIONAL,HAZARIBAGH

PIN:825001, Hazaribagh HO

From:ALOKE STEEL,KARMA

Wt:200ms

Amt:22.00(Cash)

Track on www.indiapost.gov.in

(Dial 18002668888) (Wear Mask, Stay Safe)





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- ▶ Delete InProgress LAB Applications
- ▶ View Notices 0



Welcome ALOKE STEELS INDUSTRIES PRIVATE LIMITED

Date : 26-6-2023

Your Compliance details has been Submitted. Your Acknowledgement Number is 16638987. Thank You!.

General

General Details

Industry Name:	ALOKE STEELS INDUSTRIES PRIVATE LIMITED
Industry Address:	VILL: BUDHAKHAP, PO: DIGWAR, RAMGARH
Industry Pin:	829137
Industry S.T.D. Code(Phone):	06553
Industry Phone No:	226846
Industry E-Mail Address:	asipl.ramgarh@gmail.com
Occupier Name:	KAMENDRA MISHRA
Occupier Designation:	DIRECTOR
Occupier Address:	NEAR PNB, MAIN ROAD
Occupier Pin:	829122
Occupier Mobile No:	
Occupier Email Address:	asipl.ramgarh@gmail.com
Industry Category:	RED
Industry Type:	Iron & Steel involving processing from ore/integrated steel plan
Last Consent Granted App. No:	<input type="text" value="13199098"/>
Last Consent Granted Uploaded Certificate:	View Uploaded Certificate
Last Consent Granted App. Type:	CTO
Authorization to file Compliance:	View File

Proposal No.	State	Proposal Name	Category	User Agency Name	Proposal Recieved on	File No	Date of grant

Environment Clearance letter issued vide F. NO. J-11011/205/2016-IA.II (I) Dated- 23rd July, 2018 from MOEF&CC, New Delhi.

General Condition:

[View](#)

Specific Condition:

[View](#)

Send us your feedback and suggestions



click here for any kind complaints or query



Regarding compliance for the period October, 2022 to March, 2023 to the conditions of Environment Clearance for Expansion of existing 1,20,000 TPA Sponge Iron Plant by installation of new facilities for production of Steel Melting Shop for 1,08,000 TPA of Billets, Rolling mill (90,000 TPA), Iron Ore crushing & Beneficiation plant (2,70,000 TPA), Slag Crushing Plant (16,200 TPA), Captive Power Plant 18 MW (4X2MWWHRB :1X10 MW AFBC) and Briquetting unit for Iron ore fines(40,100 TPA).

1 message

Jharkhand <jam.env2018@gmail.com>

Thu, Jul 6, 2023 at 4:45 PM

To: ro.ranchi-mef@gov.in

Cc: rdkolkata.cpcb@gov.in, ranchijspcb@gmail.com, jspcb_hazaribagh@rediffmail.com

ASIPL/041/ 2023-24

22/06/2023

To,
The Additional Principal Chief Conservator of Forests (C),
Government of India,
Ministry of Environment, Forest & Climate Change,
Integrated Regional Office (Eastern Central Zone),
2nd Floor, Headquarter-Jharkhand State Housing Board,
Harmu Chowk, Ranchi, Jharkhand- 834002

Sub:-Regarding compliance for the period October, 2022 to March, 2023 to the conditions of Environment Clearance for Expansion of existing 1,20,000 TPA Sponge Iron Plant by installation of new facilities for production of Steel Melting Shop for 1,08,000 TPA of Billets, Rolling mill (90,000 TPA), Iron Ore crushing & Beneficiation plant (2,70,000 TPA), Slag Crushing Plant (16,200 TPA), Captive Power Plant 18 MW (4X2MWWHRB :1X10 MW AFBC) and Briquetting unit for Iron ore fines(40,100 TPA).

Ref: - Environment Clearance Letter No. F. NO. J-11011/205/2016-IA.II (I) Dated- 23rd July, 2018.

Dear Sir,

In reference to the above subject matter & reference letters, the point wise Half Yearly compliance status for the period of October, 2022 to March, 2023 is being submitted. The soft copy is also sent through e-mail for your kind perusal please.

Hope you will find this in order and oblige.

Thanking you.

Yours faithfully

For Alope Steels Industries Pvt Ltd.

Authorized Signatory

Enclosures: Compliance status Report.

Cc to:-

- 1) The Zonal office Incharge, Central Pollution Control Board, Southernd Conclave, Block 502, 5th & 6th Floors, 1582 Rajdanga Main Road, Kolkata - 700 107 (W. B.).
- 2) The Member Secretary, Jharkhand State Pollution Control Board, T.A. Division Building (Ground Floor), HEC Campus, P.O. Dhurwa, Ranchi - 834004, Jharkhand.
- 3) Regional Officer, Regional Office, State Pollution Control Board, Hazaribagh, Jharkhand.



ASIPL_EC Compliance_Oct 22 to March 23.pdf

8824K

Aloke Steels Industries Private Limited

REGD OFFICE

OPP. ASHOK CINEMA,
RANCHI ROAD, MARAR -829 117
DIST. - RAMGARH (JHARKHAND)
: U27103JH2004PTC010725
: asipl.ramgarh@gmail.com

CIN

Email

WORKS :

Vill : Budhakhap
Post : Karma -829137
Dist.-Ramgarh,(Jharkhand)

Ref. No.....

Date.....

ASIPL/083/2023-24

14/09/2022

To,
The Member Secretary,
Jharkhand State Pollution Control Board,
HEC Campus, TA Division Building,
Durwa, Ranchi - 834 004.
Jharkhand

Sub: Submission of Environmental Statement Report from the period of April 2022 to March 2023 for our Coal based Sponge Iron.

Ref.:- CTO Ref. No.- JSPCB/HO/RNC/CTO-13199098/2022/1498, Dated 23/10/2022.

Dear Sir,

With reference to the above, we are enclosing herewith the Environmental Statement Report for the period from April 2022 to March 2023 of our Sponge Iron.

Please find above in order and do the needful.

Thanking you,

Yours faithfully,
For ALOKE STEELS INDUSTRIES PVT.LTD.



Manoj Kumar
Manager (Environment)

Encl: As above.

CC to: - The Regional Officer, Regional Office, State Pollution Control Board, Hazaribagh (Jharkhand)



ENVIRONMENTAL STATEMENT
Aloke Steels Industries Private Limited
Period from: April 2022 to March 2023

FORM - V

PART - A

1.	Name and address of the Owner / Occupier of the Industry operation or process	Aloke Steels Industries Pvt. Ltd. Occupier name – Kamendra Mishra Village – Budhakhap, P.O. – Digwar, Dist. – Ramgarh, Jharkhand – 829137
2.	Industry Category Primary (S.T.C. Code) Secondary (S.T.C. Code)	Red Category
3.	Production Capacity	Sponge Iron – 400 TPD
4.	Year of Establishment	06.05.2004
5.	Date of the last Environmental Statement Submitted	27/06/2022

PART - B

WATER AND RAW MATERIAL CONSUMPTION

(I) Water consumption in m³/day:

Process & Cooling	:	237.37 m ³ /day
Domestic	:	7.34 m ³ /day

Name of Product	Process Water Consumption per Unit of Product Output	
	During Previous Financial Year (2021-22)	During Current Financial Year (2022-23)
Sponge Iron	0.92	0.92

(II) RAW MATERIAL CONSUMPTION:

Name of Raw Material	Name of Product	Consumption of Raw Material Per Unit of Output	
		During Current Financial Year (2021-22)	During Current Financial Year (2022-23)
Iron ore	Sponge Iron	0.72	0.94
Iron Ore Pellet		1.34	1.20
Dolomite		0.02	0.02
Coal		1.46	1.23

(III) POWER CONSUMPTION (KWH/MT of Sponge Iron):

During Previous Financial Year (2021-22)	During Current Financial Year (2022-23)
72.65	72.48

(IV) TOTAL PRODUCTION (MT):

During Previous Financial Year (2021-22)	During Current Financial Year (2022-23)
80593.00	94018.00

PART - C**DISCHARGED TO ENVIRONMENTAL / UNIT OF OUTPUT**

Pollutants	Quantity of Pollutants Discharged (Mass/Day)	Concentration of Pollutants in Discharge (Mass/Volume)	Percentage of variation from prescribed standard with reasons
(a) Water	<ul style="list-style-type: none"> No industrial effluent is generated. In compliance to Zero Liquid Discharge (ZLD), the web camera and flow meter are also installed with online monitoring facilities. The waste water generated from the office toilet and mess has been discharged via septic tank and soaks pits. 		
(b) Air	<ul style="list-style-type: none"> Online continuous emission monitoring system of PM & SO2 are installed with web connectivity with CPCB & SPCB. Continuous Ambient Air Quality Monitoring System (CAAQMS) PM 10 parameter is installed. 		

PART - D

HAZARDOUS WASTE

(As specified under Hazardous Wastes (Management, Handling & Trans boundary Movement Rule, 2010)

Hazardous Waste	Total Quantity (Ltrs.)	
	During Current Financial Year (2021-22)	During Current Financial Year (2022-23)
a) From Process	Used gear oil and lubricant are stored in drum and used in different Chain Drive within plant campus. Hazardous waste authorization issued vide letter no JSPCB / HO /RNC/HWM-8150679/2021/13 dated 04/03/2021 valid up to 07/08/2025.	Used gear oil and lubricant are stored in drum and used in different Chain Drive within plant campus. Hazardous waste authorization issued vide letter no JSPCB / HO /RNC/HWM-8150679/2021/13 dated 04/03/2021 valid up to 07/08/2025.
(b) From Pollution Control Facilities	Not applicable	Not applicable

PART - E
SOLID WASTE

		Total Quantity (MT)	
		During Previous Financial Year (2021-22)	During Current Financial Year (2022-23)
(a)	From Process		
	1) Dolachar (Coal Chai)	55545.00	149124.00
	2) Other waste	24350.46	13210.250
(b)	Quantity recycled or re- utilized within the unit		
	1) Sold	65011.47	159572.790
	2) Dispose	-	-

PART – F

Please specify the characterization (in terms of composition and quantum) of hazardous as well as solid wastes and indicate disposal practice adopted for both the categories of wastes.

- Used gear oil and lubricant are stored in drum and used in different Chain Drive within plant campus.
- Coal Char (Chhai) and other wastes, the solid waste generated in process are being sold at present, the earlier stock of coal char are also being sold as per demand.

PART – G

Impact Of The Pollution Control Measures On Conservation Of Natural Resources And Consequently On The Cost Of Production

- Unit has installed four numbers of ESP at kiln stack- 1 & 2 to control stack emission.
- Unit has installed ten numbers of bag filters at various material transfer points to control fugitive emissions.
- Unit has installed eighty numbers of water sprinklers at various places within plant premises to control dust emission / fugitive emission from haul roads.
- All conveyor belts are covered with M.S.Plate.
- All raw materials are kept in covered shed.

PART – H

Additional Measures/Investments Proposal For Environment Protection Including Abatement of Pollution

- Plantation are made at plant site besides the boundary. We are also doing support for plantation in nearby village during rainy season every year. New plantations are also made every year in the plant during rainy season.
- EC issued vide letter no F.No.J-11011/205/2016-IA.II(I)dated – 23rd July,2018.
- The application of CTE has been applied before JSPCB vide application no 7886295 dated 21/03/2020.

PART – I

Any other particulates for improving the quality of environment

- Unit has installed two numbers of online Continuous Emission Monitoring System (CEMS) for measurement of particulate matter (PM) & SO₂.
- The web camera & flow meter has installed with online monitoring facilities.
- Continuous Ambient Air Quality Monitoring System (CAAQMS) PM 10 parameter has installed with online monitoring facilities.
- PM 2.5, SO₂ & NO_x- CAAQMS Parameter will be installed shortly.
- Unit has installed Telemetry System at One no. of Bore well and piezometer.
- Data of CEMS, Camera & flow meter are continuously updated on CPCB & SPCB server.
- The nine numbers of CCTV cameras has been installed within plant premises to monitor the operationalization status of Air pollution Control Devices.