GIRIDHAN METAL

GIRIDHAN METAL PRIVATE LIMITED

CIN: U27320WB2019PTC234675

Registered Office : 'Premlata', 39, Shakespeare Sarani, 2nd Floor, Kolkata - 700017, WB, India

Ref No. GMPL/25-26/MoEF&CC/07 Date: 28.11.2025

To,
The IGF & In charge
GOI, MoEF&CC,
Integrated Regional Office, Kolkata
IB-198, Salt Lake City, Sector-III
Kolkata – 700106

Ref: Ministry's EC No IA-J-11011/366/2010-IA-II(IND-I) dated 15th July, 2024.

Sub: Submission of Six Monthly Compliance Report of Environmental Clearance.

Respected Sir,

With reference to above, we are submitting herewith the six-monthly compliance report of Environmental Clearance (Period April 2025 to September 2025) of M/s Giridhan Metal Private Limited, Jamuria Industrial Estate, P.O- Nandi, P.S-Jamuria, Dist.-Paschim Bardhaman, West Bengal-713344 as per the directives of Ministry of Environment, Forest and Climate Change, Government of India. Point-wise compliance status report along with the latest environment monitoring data is enclosed for your kind perusal.

Hard copy of the report has not been sent following MoEF&CC direction vide File No. 106-12/EPE Dated 11.05.2020. Hope you will find the same in order.

Kindly acknowledge our submission.

List of annexures are given bellow:

Annexure - 01 – Village Ambient Air Monitoring Reports

Annexure - 02 - Plantation Photographs

Annexure - 03 - CER Activity Details

Annexure - 04 - Water tanker Photographs

Annexure - 05 - RCC & Paver block road Photographs

Annexure - 06 - Consent to Establish

Annexure - 07 - Stack Analysis Report

Annexure - 08 - Ambient Air Report

Annexure - 09 - Fugitive Emission Report

Annexure - 10 - Pollution Control System

Annexure - 11 - Covered canopy Photographs

Annexure - 12 - SMS Pollution Control System Photographs

Annexure - 13 - Water Sprinkler Photographs

Annexure - 14 - Gigging Plant Photographs

Annexure - 15 - SEAF Photographs

Annexure - 16 - SMS Stack monitoring Report

Annexure - 17 - Village Ground Water Report

Annexure - 18 - Garland Drain Photographs

Annexure - 19 - ETP photographs

Annexure - 20 - Ambient Noise report

Annexure - 21 - Heat Stress Report

Annexure - 22 - Solar Panel Photographs

Annexure - 23 - MOU-Fly Ash, Bed Ash

Annexure - 24 - Order from ECL Agent to GMPL

Annexure - 25 - GHG emission inventory

Annexure - 26 - HIRA (Hazardous Identifications of Risk Assessment)

Annexure - 27 - Health Register

Annexure - 28 - Corporate Environment Policy

Annexure - 29 - News Paper

Annexure - 30 - EC Intimation Letter

Annexure - 31 - LED Display Photographs

Annexure - 32 - EC Uploaded Acknowledgement

Annexure - 33 -Environment Statement_2023-24

Annexure - 34 - Public Hearing Commitment and Action Plan

Thanking you.

Your sincerely,

GIRIDHAN METAL PVT. LTD. Jamuria

Sanjay Agarwal

Director

CC: Environmental Engineer, West Bengal Pollution Control Board, Asansol Regional Office, K.S.T.P., Dr. B. C. Roy Road, P.O.-Dhadka, Asansol – 713302

GIRIDHAN METAL PRIVATE LIMITED

JamuriaIndustrial Estate, Jaluria,Vill-Ikra&Damodarpur, Dist-PaschimBardhaman, West Bengal

Name of the Project: Expansion of Integrated Steel Plant: Sponge Iron from 3,18,000 TPA to 9,12,000 TPA, MS Billets from 3,72,300 TPA to 4,96,500 TPA, Rolling Mill from 3,00,000 TPA to 4,00,000 TPA, Submerged Arc Furnace from 30,000 TPA (Fe-Mn/Si-Mn) to 82,300 TPA Fe-Mn or 56,200 TPA Si-Mn or 56,200 Fe-Cr or 48,100 Si-Cr or 43,100 TPA Fe-Si or 82,300 TPA Pig Iron with proposed Electric Arc Furnace (25,000 TPA), Captive Power Plant (42 to 102 MW) including WHRB (21 to 81 MW) by additional installation of 60 MW WHRB by M/s. Giridhan Metal Private Limited, located at Jamuria Industrial Estate, Village Ikra & Damodarpur, Tehsil Jamuria, District Paschim Bardhaman, West Bengal

Clearance Letter/s No. and date: IA-J-11011/366/2010-IA-II(IND-I) dated 15th July 2024

Period of Compliance Report: April 2025 to September 2025

Specific Conditions:		
Sl. No.	**Condition**	**Compliance thereof**
i)	This Environmental clearance is granted subject to final outcome of Hon'ble Supreme Court of India, Hon'ble High Court, Hon'ble NGT and any other Court of Law, if any, as may be applicable to this project.	Noted.
ii)	The project proponent shall comply with all the environmental protection measures and safeguards proposed in the documents submitted to the Ministry. All the recommendations made in the EIA/EMP in respect of environmental management, and risk mitigation measures relating to the project shall be implemented.	It shall be complied with. GMPL is in the process of complying with the environmental protection measures and safeguards in accordance to proposed documents submitted to the Ministry. The recommendation made in the EIA/EMP for environmental management, risk mitigation measures relating the new project are under implementation and shall be implemented with implementation of new projects.
iii)	The project proponent shall utilize modern technologies for capturing of carbon emitted and shall also develop carbon sink/carbon sequestration resources capable of capturing more than emitted. The implementation report shall be submitted to the IRO, MoEF&CC in this regard.	GMPL shall ensure to adapt best available technologies available in the market. Our efforts are/shall be to reduce the carbon footprint with best possible efforts and it is being/shall be incorporated at initial stage of project implementation and discussions with technology providers. We shall ensure the dense afforestation and its proper maintenance as a major carbon sequestration resource. Company has also planned for installation of additional solar panel for generation of renewable energy.
iv)	Damodarpur Village is adjacent in NW, Sekpur Village (0.5 km, E), Akhalpur Village (0.59 km, WSW), Ikra Village (0.88 km, SE), Mandalpur Village (1 km, SW) exists along with other sensitive areas within the study area of the project site. Proponent shall take appropriate environmental safeguard measures to minimise	As an environmental safeguard GMPL has already taken initiative dense plantation to strengthen the greenbelt at the boundary wall of the plant. GMPL already provided air pollution control system (5-fields ESP, well equipped with modern & pulse jet type, PTFE membrane filter, bag filter, dry fog system, primary and secondary suction hood etc.) to reduce air

	the impact on the habitation of the locals. The project proponent needs to strengthen green belt all around the plant area to reduce the dust pollution. The PP shall also include some of these locations in its environmental monitoring programme.	pollution to minimize the impact on the habitation of the locals. Latest ambient air quality monitoring report is attached herewith is **Annexure – 01.**
V)	As reported, there are several water bodies within the study area of the project site. A robust and full proof Drainage Conservation scheme to protect the natural drainage and its flow parameters; along with Soil conservation scheme and multiple Erosion control measures shall be implemented.	It is being/shall also be implemented for expansion project.
vi)	Total water requirement is after expansion is estimated as 6730 m3/day that will be obtained from Surface Water (River Damodar) through Damodar Valley Corporation (DVC). PP shall obtain necessary permission from the Competent Authority in this regard.	Compiled.
vii)	Three tier Green Belt shall be developed in atleast 40% of the project area, as committed, in the monsoon season of 2024, of adequate width and tree density shall not be less than 2500 per ha. Survival rate of green belt developed shall be monitored on periodic basis to ensure that damaged plants are replaced with new plants in the subsequent years. PP shall also develop greenbelt in the form of shelter belt comprising of total of 6 rows of 2x2 m plantation with tall trees & broad leaves with thick canopy along with windshield inside the plant premises to act as green barrier for air pollution & noise levels towards sensitive areas nearby project site. Additionally, thick plantation of 5000 trees in the nearby villages and schools, rainwater harvesting pond etc. in the ensuing monsoon. Compliance status in this regard, shall be submitted to concerned Regional Office of the MoEF&CC.	Currently, we have planted approx. 32745 nos. of trees within the plant premises. Covering the area as stipulated. Survival rate of green belt developed is approx. 90% and damaged plants are replaced with new plants with an immediate effect. We also develop greenbelt in the form of shelter belt comprising of total of 6 rows of 2x2 m plantation with tall trees & broad leaves with thick canopy along with windshield inside the plant premises to act as green barrier for air pollution & noise levels towards sensitive areas nearby project site. We also started mass plantation program nearby villages. Some photographs are also attached herewith as **Annexure – 02.**
viii)	All the commitments made towards socio-economic development of the nearby villages shall be satisfactorily implemented. The action plan based on the social impact assessment study of the project as per the EMP in accordance to the Ministry's OM dated 30.09.2020 amounting to Rs. 16 Crores shall be strictly implemented and progress shall be submitted to the Regional Office of MoEF&CC.	The commitment made by GMPL related socio economic development for the nearby villages including the commitments made during previous EC has been implemented and progress report being submitted to the Regional Office of MoEF&CC. The company has already spent Rs. 185.81 lacs towards CER activities. The balance amount shall be spent shortly. The details of the expenditure have been attached as **Annexure – 03.**

ix)	The project proponent shall undertake village adoption programme and prepare and implement the action plan to develop them into a model village.	GMPL has started the developmental activities in the village proposed to be adopted and it shall be implanted with robust plan on top priority. Company has dedicated CSR team to after the welfare and developmental activities in the surrounding of the plant. Some photographs related to work done are attached as **Annexure – 03.**
x)	PP shall comply with the recommendations as stated in the report from Jadavpur University, Kolkata regarding the construction activities of Railway Siding with wagon tippler.	The report as submitted by Jadavpur university is being properly followed and changes as recommended are being implemented along with the construction work.
xi)	PP shall prepare an action plan for improving the housekeeping of the plant premises and implement it strictly.	GMPL has prepare a dedicated housekeeping audit team to review the housekeeping entire the plant premise including work zone and office area are on monthly basis to improve the housekeeping of the plant premises. All recommendations which are being provided by the Audit team are being implemented on the top priority basis.
xii)	PP shall undertake strict measures to reduce the dust emissions and pollution level in the project premises.	GMPL has provided a water tanker in the project area and road adjacent to the project area on regular basis to reduce the dust emission. The photographs are attached herewith as **Annexure - 04**
xiii)	There are two patches of road around 40 m length and 20 m width inside the plant area which shall be concreted/paved within a time frame of 3 months as committed.	GMPL has completed concreting of approx. more than 90% internal roads where heavy vehicle movements are exercised and concreting of balance roads are under progress. The company has completed the paver blocking of around 80% of area where heavy vehicle movements are not envisaged. Along with paver blocking company has also done the concreting of many workplace areas of the plant. Some photographs are attached as **Annexure-05** With regards to the two patches inside the plant premises in project area is under concreting with the implementation of expansion project.
xiv)	The PP shall provide additional drinking water facility of approx. 18000 Liters per day in the adjacent Damodarpur village within three months.	Will be complied.
xv)	PP shall install a permanent fencing around the temple, school within a timeframe of three months, as committed.	Complied.
xvi)	PP shall improve the infrastructure in the adjacent village within a stipulated time period.	GMPL has already started the developmental activities in the village. All infrastructure facilities in the nearby villages are being taken care of.

General Conditions

I. Statutory compliance

Sl No.	Condition	Compliance thereof
i)	The Environment Clearance (EC) granted to the project/ activity is strictly under the provisions of the EIA Notification, 2006 and its amendments issued from time to time. It does not tantamount/ construe to approvals/ consent/ permissions etc., required to be obtained or standards/conditions to be followed under any other Acts/Rules/Subordinate legislations, etc., as may be applicable to the project.	Noted. After getting Environmental Clearance, GMPL has obtained the Consent to Establish (CTE) form West Bengal pollution control Board. Copy of CTE is attached as **Annexure - 06**
ii)	This Environmental clearance is granted subject to final outcome of Hon'ble Supreme Court of India, Hon'ble High Court, Hon'ble NGT and any other Court of Law, if any, as may be applicable to this project.	Noted & agreed.
II.	**Air quality monitoring and preservation**	
i)	The project proponent shall install 24x7 continuous emission monitoring system at process stacks to monitor stack emission as well as 04 Nos. Continuous Ambient Air Quality Station (CAAQMS) for monitoring AAQ parameters with respect to standards prescribed in Environment (Protection) Rules 1986 as amended from time to time. The CEMS and CAAQMS shall be connected to SPCB and CPCB online servers and calibrate these systems from time to time according to equipment supplier specification through labs recognized under Environment (Protection) Act, 1986 or NABL accredited laboratories	We have installed 24x7 continuous emission monitoring system at process stacks to monitor stack emission. GMPL have considered manual monitoring of stacks by NABL accredited laboratory, and the latest result is attached herewith as **Annexure - 07** CAAQMS, has also been installed. The CEMS and CAAQMS have been connected to CPCB online server and links have been sent to SPCB. GMPL have considered 3 sites for manual Ambient Air Quality Monitoring covering 120^{o} of the plant premises by NABL accredited laboratory and the latest results are attached herewith as **Annexure – 08.**
ii)	The project proponent shall carryout Continuous Ambient Air Quality monitoring for common/criterion parameters relevant to the main pollutants released (e.g. PM10 and PM2.5 in reference to PM emission, and SO2 and NOx in reference to SO2 and NOx emissions) within and outside the plant area (at least at four locations one within and three outside the plant area at an angle of 120° each), covering upwind and downwind directions.	Ambient Air Quality monitoring being carried in consideration of maximum ground level concentration of PM10, PM2.5, SO2 and NOx. Latest Ambient Air Quality Monitoring report is enclosed as **Annexure - 08**
iii)	The project proponent shall 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.	GMPL have been monitoring the fugitive emission on quarterly basis by NABL accredited & WBPCB recognized laboratory. The latest reports are attached herewith as **Annexure – 09.**

iv)	Sampling facility at process stacks shall be provided as per CPCB guidelines for manual monitoring of emissions.	In all stack sampling facility are available for manual stack emission monitoring.
v)	Appropriate Air Pollution Control (APC) system shall be provided for all the dust generating points including fugitive dust from all vulnerable sources, so as to comply prescribed stack emission and fugitive emission standards.	GMPL has provided appropriate air pollution control systems in all the dust generating points to comply the stack emission and fugitive emission standard. 1. The 350 TPD& 600 TPD DRI is well equipped with 5-fields ESP. 2. The boiler is well equipped with 5-field ESP. 3. Ferro Alloy plant is well equipped with modern & pulse jet type, PTFE membrane filter. 4. Cooler discharge, surge bin, product separation area, product house area and every junction of DRI unit is well equipped with bag filter to control fugitive emissions. 5. Dry fog system has been installed in entire coal circuit area to control the fugitive emissions. 6. Primary as well as secondary suction hoods are installed and connected with modern & pulse jet type, PTFE membrane filter bag for steel smelting shop. Photographs of APC systems are attached herewith as **Annexure – 10.** It is being/shall also be implemented for expansion project.
vi)	The project proponent shall provide leakage detection and mechanized bag cleaning facilities for better maintenance of bags.	Mechanized bag cleaning facilities with Purging facility is being adopted for better operation of bag houses. Also, GMPL is adopting TPM (Autonomous Maintenance) in all pollution equipment.
vii)	Sufficient number of mobile or stationery vacuum cleaners shall be provided to clean plant roads, shop floors, roofs, regularly.	GMPL have already road sweeping machine for plant road. Vacuum cleaner for shop floors cleaning has also been arranged.
viii)	Ensure covered transportation and conveying of raw material to prevent spillage and dust generation. The project proponent use leak proof trucks/dumpers carrying coal and other raw materials and cover them with tarpaulin.	The entire conveyors (raw materials & products) are covered by canopy and transportation of raw materials & products are also being done in fully covered conditions to prevent spillage and fugitive dust generation. Photographs of covered conveyors are attached herewith as **Annexure – 11.**
ix)	Recycle and reuse iron ore fines, coal and coke fines, lime fines and such other fines collected in the pollution control devices and vacuum cleaning devices in the process after briquetting/ agglomeration.	It is being/shall be complied.
x)	The project proponent shall provide primary and secondary fume extraction system at all heat treatment furnaces.	Steel Melting Shop is well connected with primary and secondary fume extraction system. Photographs showing primary & secondary extraction system are attached herewith as **Annexure – 12.**
xi)	Wind shelter fence and chemical spraying shall be provided on the raw material stock piles.	Wind shelter fence, chemical spraying are not applicable. The entire raw material stock piles have been kept inside covered sheds.

xii)	Design the ventilation system for adequate air changes as per prevailing norms for all tunnels, motor houses, Oil Cellars.	GMPL does not have any tunnels, motor houses & Oil Cellars, hence, ventilation systems for adequate air changes are not required.
xiii)	Pollution control system in the plant shall be provided as per the CREP Guidelines of CPCB.	It is being/shall be complied.
xiv)	The project proponent shall adopt the Clean Air practices like mechanical collectors, wet scrubbers, fabric filters (bag houses), electrostatic precipitators, combustion systems (thermal oxidizers), condensers, absorbers, adsorbers, and biological degradation. Controlling emissions related to transportation shall include emission controls on vehicles as well as use of cleaner fuels. Sufficient numbers of additional truck mounted Fog/Mist water cannons shall be procured and operated regularly inside the project premises and also in the surrounding villages to arrest suspended dust in the atmosphere.	GMPL has already installed de-dusting systems like bag filters and 5 Field ESPs for an effective control of dust emissions. Dust extraction system has been provided at the transfer points attached with bag filter units for intermediate bin, product house etc. Dust conveying system from cooler discharge to ABC have been provided with each DRI Kiln. Wet scrubbers are provided at DRI Kiln, sufficient no. of Fixed type water mounted sprinklers for dust suppression in raw material & and product handling areas along the conveyor, finished product house area, cooler discharge, Coal Handling Plant (CHP), along with Kiln axis and all other strategic locations. GMPL have deployed movable water tankers and road sweeping machine for dust cleaning on the road and to minimizing fugitive emissions. Pollution control facilities mist water cannons suggested shall also be procured for suspended dust suppression in the plant surroundings.
xv)	Bag filters shall be cleaned regularly and efficiency of bag filter system shall be monitored at regular intervals.	Company has technically qualified team for each & every separate division for operation, maintenance and monitoring of bag filter efficiency and other pollution control device on regular basis.
xvi)	Water Sprinklers/Water mist system shall be installed near raw material yards, operational units and other strategic locations to control fugitive emissions from the plant.	GMPL has installed sufficient no. of water sprinklers for proper water spaying to control dust emission from raw material yard, operational units, and other dust prone areas. Photographs are attached as **Annexure – 13.** It is being/shall also be implemented for expansion project.
xvii)	The particulate matter emissions from the process stacks shall be less than 30 mg/Nm3 and measures shall be undertaken as per the submitted action plan. Efficient Air monitoring equipment shall be installed.	It shall be complied with under implementation and to be implemented projects. Existing projects complies with emission standards as stipulated in previous EC and by West Bengal Pollution Control Board
xviii)	Following additional arrangements to control fugitive dust shall be provided: a) Fog / Mist Sprinklers at all on bulk raw material storage area (at the transfer points) like Iron Ore, Coal and for Fly Ash and similar solid waste storage areas. b) Proper covered vehicle shall be used while transport of materials.	Sufficient no. of Fixed type water sprinklers for dust suppression in raw material & product handling areas along the conveyor, finished product house area, cooler discharge, Coal Handling Plant (CHP), along with Kiln axis Coal, Iron Ore, Fly Ash handling area and all other dust prone areas. Installation of Fog/mist sprinklers shall also be incorporated in existing & units with expansion project.

	c) Wheel washing mechanism shall be provided in entry and exit gates with complete recirculation system.	Materials being transported in covered vehicle. Wheel washing mechanism with complete recirculation system shall be provided at suitable location as per directions.
xix)	Briquetting and Jigging plant shall be installed in Ferro Alloys Plant.	Jigging plant has already been installed. Photographs of the same are attached herewith as **Annexure – 14.** GMPL will not be producing Ferro Chrome; hence briquetting plant is not required.
xx)	The PP shall minimize the evaporation losses in jigging operation to less than 10% using suitable advanced process.	Noted. To minimize the water consumption, recycle and reuse practice has been adapted. Treated wastewater is used for jigging operation.
xxi)	The 4th hole extraction system shall be provided in the Sub Merged Arc Furnaces and EAF.	GMPL has already installed Closed Type Submerged Arc Furnace with 4^{th} hole extraction system. Photographs are attached herewith as **Annexure – 15.** And shall also be provided with upcoming installation of SAF.
xxii)	Industry is going to use silica quartz in large quantities and going to produce Silico Manganese and Ferro Silicon alloy steel. Therefore, it is necessary to control silica/quartz exposures at production Departments, not only emission norms as per Indian Factories Act. The permissible limit for silica/quartz should be within 10 mg/m3 for total dust as per Indian Factories Act. Therefore, it is recommended to monitor personal and area exposures for silica quartz dust in the process plants.	Noted. Personnel's working for the production of Silico Manganese and Ferro Silicon being/shall be provided the PPEs like dust masks eyes safety goggles as protective measures. It has been monitored as per direction and Indian Factories Act and results are found within the norms.
xiii)	During operational phase at Captive Power Plant, Action Plan to monitor coke/coal dust exposures in different process plants using personal and area air samplers and to compare with permissible limits as per Indian Factories Act, 1948 shall be implemented.	GMPL has engaged NABL accredited laboratory for check the level of fugitive emission. Latest fugitive emission monitoring report is attached as **Annexure – 09.**
xxiv)	The coal dust should be monitored at coal unloading, crushing, furnace areas and should be within 2 mg/m3, respirable dust fraction containing less than 5% quartz as per Indian Factories Act, 1948.	Will be complied.
xxv)	Online stack monitoring system for IF and RHF shall be installed and monitoring report shall be submitted to the concerned Regional Office of the MoEF&CC along with the six monthly compliance report.	Noted & Will be complied. Latest stack monitoring report for SMS is attached as **Annexure - 16**
xxvi)	Low NOx Burners will be installed at Reheating Furnace for control of Gaseous emissions generated while using PNG.	Noted & Will be complied.

xxvii)	CO sensors with alarms must be installed in the Plant at strategic locations.	Noted & Will be complied
III.	**Water quality monitoring and preservation**	
i)	The project proponent shall install 24x7 continuous effluent monitoring system with respect to standards prescribed in Environment (Protection) Rules 1986 as amended from time to time and connected to SPCB and CPCB online servers and calibrate these system from time to time according to equipment supplier specification through labs recognized under Environment (Protection) Act, 1986 or NABL accredited laboratories.	We have installed 24x7 continuous effluent monitoring system. The treated effluent shall be recycled and reused. The continuous effluent monitoring system is well connected with CPCB server and the link has shared with the SPCB.
ii)	The project proponent shall 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.	GMPL is monitoring regularly ground water quality twice a year (pre- and post-monsoon) in adjacent villages. Latest test results of groundwater monitoring in surrounding villages are attached herewith as **Annexure – 17.**
iii)	Garland drains and collection pits shall be provided for each stock pile to arrest the run-off in the event of heavy rains and to check the water pollution due to surface run off.	All the stockyards are having impervious flooring and covered, and the garland drains are being provided around the sheds to trap run off materials. The photograph of garland drain is attached herewith as **Annexure – 18.**
iv)	Water meters shall be provided at the inlet to all unit processes in the plants.	GMPL has provided the water meter to assess the water utilization by individual units of operation, however it shall be evaluated and ensure to comply for lacking if any. It shall also be implemented with expansion project.
v)	The project proponent shall make efforts to minimise water consumption in the plant complex by segregation of used water, practicing cascade use and by recycling treated water.	Regular monitoring being done. Recycle and reuse practice have been adapted and no effluent discharge outside the factory premises. Efforts being/shall be made to minimize the water intake through minimum recycle and reuse practices.
vi)	The proposed project shall be designed as "Zero Liquid Discharge" Plant. ETP shall be installed and there shall be no discharge of effluent from the plant. Domestic effluent shall be treated in Sewage Treatment Plant. Suitable measures shall be adopted for sewage water handling to ensure no contamination of any kind of water body.	Effluent, generated from entire plant is being treated in Effluent Treatment Plant of capacity 1540 KLD and reused inside the plant premises. The photographs of ETP is attached herewith as **Annexure – 19.**
vii)	All stockyards shall have impervious flooring and shall be equipped with water spray system for dust suppression. Stock yards shall also have garland drains and catch pits to trap the run off material and shall be implemented as per the action plan submitted in EIA/EMP report.	All the stockyards are having impervious flooring and covered, and the garland drains are being provided around the sheds to trap run off materials. The photograph of garland drain is attached herewith as **Annexure – 18.**

viii)	Rain water harvesting shall be implemented to recharge/harvest water as per the action plan submitted in the EIA/EMP report.	As per action plan submitted in EIA/EMP report, GMPL shall implement the rain water harvesting to harvest the rain water.
ix)	The project proponent shall provide the ETP for effluents of rolling mills to meet the standards prescribed in G.S.R 277 (E) 31st March 2012 (applicable to IF/EAF) as amended from time to time.	ETP has been installed and treated water is being reused. The treated water meets the prescribed standard.
x)	Air Cooled condensers shall be used in the captive power plant.	Air cooled condensers have been installed in captive power plant.
IV.	**Noise monitoring and preservation**	
i)	Noise pollution shall be monitored as per the prescribed Noise Pollution (Regulation and Control) Rules, 2000 and amendments thereof, and report in this regard shall be submitted to Regional Officer of the Ministry as a part of six-monthly compliance report.	Noise level monitoring is being carried out on quarterly basis by NABL accredited laboratory. The latest test reports are attached herewith as **Annexure –20.**
ii)	The ambient noise levels should conform to the standards prescribed under E(P)A Rules, 1986 viz. 75 dB(A) during day time and 70 dB(A) during night time.	Noted. The latest ambient noise monitoring reports are attached herewith as **Annexure – 20.**
iii)	PP shall identify extreme hot areas through heat stress survey as well as noise monitoring within process plants to ensure that workers not exposed above 90 dBA levels as per Factories Act, 1948.	Heat stress analysis has been done, and the reports are attached herewith as **Annexure – 21.**
V.	**Energy Conservation measures**	
i)	Use torpedo ladle for hot metal transfer as far as possible. If ladles not used, provide covers for open top ladles.	The top of the ladles used for metal transfer in SMS being covered with redex powder to prevent the heat loss. Molten metal is kept bellow top allowance level in the ladle for safe handling and transfer.
ii)	Restrict Gas flaring to < 1%.	Noted & Will be complied
iii)	Provide solar power generation on roof tops of buildings, for solar light system for all common areas, street lights, parking around project area and maintain the same regularly;	The company is committed to maximize energy conservation measures to minimize energy consumption. For the same, GMPL has installed Solar Power 01 MW on rooftop. Photographs are attached herewith as **Annexure – 22.** LED lights have been provided in entire plant area including buildings & offices.
iv)	Provide LED lights in their offices and residential areas.	Noted & Will be complied.
v)	The project proponent shall provide waste heat recovery system (pre-heating of combustion air) at the flue gases of reheating furnaces.	GMPL has already implemented and installed WHRB (Waste Heat Recovery Boilers) with existing DRIs for better utilization of waste heat for power generation. It shall also be implemented with expansion project.
vi)	Practice hot charging of slabs and billets/blooms as far as possible.	It is being followed.

vii)	Ensure installation of regenerative type burners on all reheating furnaces.	GMPL shall adopt latest technology of burners, and it will be implemented in all reheating furnace.
viii)	The project proponent shall provide waste heat recovery system on the DRI Kilns.	It already provided and installed with all DRI kilns.
ix)	The dolochar generated shall be used for power generation.	Dolochar generated from DRI plant being utilized in CPP plant as a raw material of the power plant for captive power generation.
x)	Tar shall be recovered from producer gas and shall be sold to registered processors and phenolic water shall be incinerated in After Burn Chamber (ABC) of DRI kilns.	Noted. It shall be complied.
xi)	The PP shall implement the guidelines on sponge iron plants issued by the CPCB/SPCB in this regard.	Noted. It is being/shall be complied.
VI.	**Waste management**	
i)	Oil Collection pits shall be provided in oil cellars to collect and reuse/recycle spilled oil.	It is being/shall be complied for collection of spillage oil for further recycle/reuse.
ii)	Kitchen waste shall be composted or converted to biogas for further use.	Kitchen waste generated from plant premises is being converted to biogas through 100kg biogas plant.
iii)	100% utilization of fly ash shall be ensured. All the fly ash shall be provided to cement and brick manufacturers for further utilization and Memorandum of Understanding in this regard shall be submitted to the Ministry's Regional Office.	The fly ash generated from CFBC boiler will be used sent to nearby cement and bricks manufacturing plant. GMPL has done MoU with fly ash bricks manufacturers like M/s Shree Swastick Industries, M/s Sri OM Industries, M/s Damodar Ispat Ltd. etc. The copies of MoUs are attached herewith as **Annexure –23.**
iv)	The Plastic Waste Management Rules 2016, inter-alia, mandated banning of identified Single Use Plastic (SUP) items with effect from 01/07/2022. In this regard, CPCB has issued a direction to all the State Pollution Control Boards (SPCBs)/Pollution Control Committees (PCCs) on 30/06/2022 to ensure the compliance of Notification published by Ministry on 12/08/2021. The technical guidelines issued by the CPCB in this regard is available at https://cpcb.nic.in/technical-guidelines-3/. All the project proponents are hereby requested to sensitize and create awareness among people working within the Project area as well as its surrounding area on the ban of SUP in order to ensure the compliance of Notification published by this Ministry on 12/08/2021. A report, along with photographs, on the measures taken shall also be included in the six monthly compliance report being submitted by the project proponents.	Noted. It is being/shall be complied. Use of single use plastic is completely banned inside the plant premises. Our Environment personnel are regularly creating awareness among people working within the factory premises to avoid single use plastic (SUP) items. Further campaigning against SUP shall be conducted for more effective compliance of guidelines and Notification dated 12/08/2021 of Hon'ble Ministry.
v)	A proper action plan must be implemented to dispose of the electronic waste generated in the industry	Electronic waste generated being disposed of through authorized vendor.

vi)	Solid waste utilization a) PP shall install a slag crusher to convert steel slag into aggregate for use in construction industry, fine sand for use as flux in steel plant, sand in brick making and as lime in cement making. b) PP shall recycle/reuse solid waste generated in the plant as far as possible. c) Used refractories shall be recycled as far as possible.	Fly ash/APCD Dust is being/will be consumed in the plant is being/will be dumped in abandoned OCP of Eastern Coalfields Limited (ECL). Greement between GMPL and ECL attached as **Annexure - 24.** IF Slag is being/will be sent to contractors for river sand substitute and/or landfilling after iron separation. Silico-manganese slag used for land filling. Fly ash generated from CFBC CPP is being/will be sent to brick manufacturing unit for brick manufacturing. Bottom Ash from CFBC CPP is being/will be sent to cement industries to make Portland cement.
VII. Green Belt		
i)	The project proponent shall prepare GHG emissions inventory for the plant and shall submit the programme for reduction of the same including carbon sequestration by trees.	GHG emissions inventory and its reduction programme including carbon sequestration by trees for the existing plant has been carried out. The report is attached herewith as **Annexure –25.**
ii)	Project proponent shall submit a study report on Decarbonisation program, which would essentially consist of company's carbon emissions, carbon budgeting/ balancing, carbon sequestration activities and carbon capture, use and storage and offsetting strategies. Further, the report shall also contain time bound action plan to reduce its carbon intensity of its operations and supply chains, energy transition pathway from fossil fuels to Renewable energy etc. All these activities/ assessments should be measurable and monitor able with defined time frames.	It shall be complied. Carbon footprint and carbon sequestration report of GMPL has been prepared. The report is attached herewith as **Annexure – 25**
iii)	Greening and Paving shall be implemented in the plant area to arrest soil erosion and dust pollution from exposed soil surface.	GMPL has completed concreting of approx. more than 90% internal roads where heavy vehicle movements are exercised, and concreting of balance roads are under progress. The company has completed the paver blocking of around 80% of area where heavy vehicle movements are not envisaged. Along with paver blocking company has also done the concreting of many workplace areas of the plant. Some photographs are attached as **Annexure- 05.** Greening of the plant area is also taken as drive of greenbelt & green cover development program and it shall be continued. Greenbelt photographs are attached as **Annexure – 02.**
VIII. Public hearing and Human health issues		
i)	Emergency preparedness plan based on the Hazard identification and Risk Assessment (HIRA) and Disaster Management Plan shall be implemented.	Hazard Identification and Risk Assessment (HIRA) and Disaster Management Plan are being implemented. HIRA with DMP is attached herewith as **Annexure-26.**
ii)	The project proponent shall carry out heat stress analysis for the workmen who work in high	Heat stress analysis has been done and the reports are attached herewith as **Annexure- 21.**

	temperature work zone and provide Personal Protection Equipment (PPE) as per the norms.	
iii)	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, creche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.	It is being/shall be complied.
iv)	Occupational health surveillance of the workers shall be done on a regular basis and records maintained.	Occupational health surveillance of the workers is being done and records maintained as per Factory Act. Sample report of employee is attached herewith as **Annexure – 27.**
I. Environment Management		
i)	The project proponent shall comply with the provisions contained in this Ministry's OM vide F.No. 22-65/2017-IA.III dated 30/09/2020. As part of Corporate Environment Responsibility (CER) activity, company shall adopt nearby villages based on the socio-economic survey and undertake community developmental activities in consultation with the village Panchayat and the District Administration as committed.	The company has spent Rs. 185.81 lacs towards CER activities. The balance amount shall be spent shortly. The details of the expenditure have been attached as **Annexure – 03.**
ii)	The company shall have a well laid down environmental policy duly approve by the Board of Directors. The environmental policy should prescribe for standard operating procedures to have proper checks and balances and to bring into focus any infringements/deviation/violation of the environmental / forest / wildlife norms / conditions. The company shall have defined system of reporting infringements / deviation / violation of the environmental / forest / wildlife norms / conditions and / or shareholders / stake holders. The copy of the board resolution in this regard shall be submitted to the MoEF&CC as a part of six-monthly report.	GMPL has a well laid down environmental policy duly approved by the Board of Directors. The policy is attached herewith as **Annexure- 28.**
iii)	A separate Environmental Cell both at the project and company head quarter level, with qualified personnel shall be set up under the control of senior Executive, who will directly to the head of the organization.	A separate Environmental Cell has been prepared at the project and company head quarter level with qualified personnel, headed by director of the company.
iv)	Performance test shall be conducted on all pollution control systems every year and report shall be submitted to Integrated Regional Office of the MoEF&CC.	It is being/shall be complied. NABL accredited third party monitoring being conducted periodically to evaluate the emission level of pollution control systems i.e. ESPs and bag filters.

		Latest Stack monitoring reports is enclosed as **Annexure-07.**
II.	**Miscellaneous**	
i)	The project proponent shall make public the environmental clearance granted for their project along with the environmental conditions and safeguards at their cost by prominently advertising it at least in two local newspapers of the District or State, of which one shall be in the vernacular language within seven days and in addition this shall also be displayed in the project proponent's website permanently.	M/s Giridhan Metal Private Limited has advertised public notice regarding Environment Clearance on 19th July 2024 in two local newspapers "Anandabazar Patrika" (vernacular language-Bengali) and "The Telegraph" (English). The scanned copies of newspaper are attached herewith as **Annexure – 29.** The Environment Clearance has also been uploaded in company's website – https://www.giridhanmetal.com
ii)	The copies of the environmental clearance shall be submitted by the project proponents to the Heads of local bodies, Panchayats and Municipal Bodies in addition to the relevant offices of the Government who in turn has to display the same for 30 days from the date of receipt.	The copy of environmental clearance has been submitted to Heads of local bodies of "Asansol Municipal Corporation", "Asansol Durgapur Development Authority", "District Magistrate Office" "District Industries Centre (DIC) office" and "Asansol Zilla Parishad Office". The letter with speed post documents are attached herewith as **Annexure – 30.**
iii)	The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and update the same on half-yearly basis.	Complied
iv)	The project proponent shall monitor the criteria pollutants level namely; PM10, SO2, NOx (ambient levels as well as stack emissions) or critical sectoral parameters, indicated for the projects and display the same at a convenient location for disclosure to the public and put on the website of the company.	The Digital Board has been installed and the Photo of the same has been attached as **Annexure – 31.**
v)	Action plan for developing connecting and internal road in terms of MSA as per IRC guidelines shall be implemented	Internal plant roads are made keeping in view of abstractions free movement within the plant premises. of MSA as per IRC guidelines shall be implemented and followed with implementation project.
vi)	The project proponent shall submit six-monthly reports on the status of the compliance of the stipulated environmental conditions on the website of the ministry of Environment, Forest and Climate Change at environment clearance portal.	The six-monthly reports on the status of the compliance of the stipulated environmental conditions on website of Ministry of Environment, Forest & Climate Change has been uploaded regularly. The copy of acknowledgement is attached herewith as **Annexure – 32.**
vii)	The project proponent shall submit the environmental statement for each financial year in Form-V to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently and put on the website of the company	GMPL has submitted the environment statement to State Pollution Control Board for 2023-24 FY. The environment statement is also putted on company's website https://www.giridhanmetal.com. The environment statement attached herewith as **Annexure – 33.**

viii)	The project proponent shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities, commencing the land development work and start of production operation by the project.	The date of financial closure was 21st December 2021.
ix)	The project proponent shall abide by all the commitments and recommendations made in the EIA/EMP report, commitment made during Public Hearing and also that during their presentation to the Expert Appraisal Committee.	The commitments made during Public Hearing and its compliances are attached herewith as **Annexure – 34.**
x)	The recommendations of the approved Site-Specific Wildlife Management Plan (in case of involvement of Schedule-I species) shall be implemented in consultation with the State Forest Department. The implementation report shall be furnished along with the six-monthly compliance report to the concerned Regional Office of the MoEF&CC.	GMPL is not involved with Schedule – I species.
xi)	The PP shall put all the environment related expenditure, expenditure related to Action Plan on the PH issues, and other commitments made in the EIA/EMP Report etc. in the company web site for the information to public/public domain. The PP shall also put the information on the left over funds allocated to EMP and PH as committed in the earlier ECs and shall be carried out and spent in next three years, in the company web site for the information to public/public domain.	Noted. It shall be complied as per directions.
xii)	No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment, Forests and Climate Change (MoEF&CC).	Noted & agreed.
xiii)	The Regional Office of this Ministry shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer (s) of the Regional Office by furnishing the requisite data / information/monitoring reports.	Agreed & complied

Qualissure Laboratory Services

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Email : qualissure@gmail.com; info@qualissure.com; Mob.No. 98312 87086 ; 9830093976 TC-6271

DOC NO : QLS/SAMP/08-A/00

TEST REPORT

Name & Address Of the Customer :		
M/s. Giridhan Metal Pvt. Ltd. Jamuria Industrial Estate, Damodarpur, Jamuria P.O.- Nandi, Paschim Bardhaman, Pin : 713 344	Report No. Date Sample No. Sample Description Date of Performance(s) Sample Mark Ref No. Date	: QLS/24/A/25-26/C/49 : 08.11.2025 : QLS/24/A/25-26/49 : Ambient Air : 30.10-06.11.2025 : Mondalpur Village : 9400000240, Dated-05.04.2025

Analysis Result

Location : Mondalpur Village			Date of sampling : 24-25.10.2025	
Sampling Done by: S.Poddar/P.Mandal			Sampling done as per : CPCB Guidelines (Volume-1)	
Environmental Condition : Clear & Sunny				
Sl. No.	**POLLUTANT**	**RESULT**	**LIMIT**	**METHOD OF TEST REFERENCE**
1	Particulate matter (<10µm) in µg/m³	113	100	IS 5182 (Part-23) Reff 2022
2	Particulate matter (<2.5µm) in µg/m³	54	60	IS 5182 (Part-24) Reff 2024
3	Sulphur dioxide (SO_2) in µg/m³	9.5	80	IS 5182(Part -2) Reff 2023
4	Nitrogen dioxide (NO_2) in µg/m³	31.0	80	IS 5182 (Part -6) Reff 2017
5	Carbon Monoxide (CO) in mg /m³	0.927	2	IS 5182 (Part -10) Reff 2019
6	Ammonia (NH_3) in µg/m³	36.4	400	IS 5182 (Part-25) Reff 2018
7	Ozone (O_3) in µg/m³	35.2	180	IS 5182 (Part-9) Reff 2019
8	Lead (Pb) in µg/m³	0.08	1	IS 5182 (Part-22) Reff 2019
9	Nickel (Ni) in ng/m³	6.8	20	IS 5182 (Part-26) Reff 2020
10	Arsenic (As) in ng/m³	<1.0	6	Air Sampling, 3rd Edn. Method 402 and APHA 23rd Edition Part 3114B
11	Benzene (C_6H_6) in µg/m³	<2.0	5	IS 5182 (Part-11) Reff 2022
12	Benzo (a) pyrene in ng/m³	<1.0	1	IS 5182 (Part-12) Reff 2019
NOTE: Limit as per CPCB notification, New Delhi, 18th November 2009, for Ambient air quality.				

Report Prepared By :

for **Qualissure Laboratory Services**
Reviewed & Authorized By

Benimadhab Gorai, Chemist
(Authorized Signatory)

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DOC NO : QLS/SAMP/08-A/00

TEST REPORT

Name & Address Of the Customer :		
M/s. Giridhan Metal Pvt. Ltd. Jamuria Industrial Estate, Damodarpur, Jamuria P.O.- Nandi, Paschim Bardhaman, Pin : 713 344	Report No. Date Sample No. Sample Description Date of Performance(s) Sample Mark Ref No. Date	: QLS/24/A/25-26/C/50 : 08.11.2025 : QLS/24/A/25-26/50 : Ambient Air : 30.10-06.11.2025 : Ikra Village : 9400000240, Dated-05.04.2025

Analysis Result

Location : Ikra Village	Date of sampling : 25-26.10.2025
Sampling Done by: S.Poddar/P.Mandal	Sampling done as per : CPCB Guidelines (Volume-1)
Environmental Condition : Clear & Sunny	

Sl. No.	POLLUTANT	RESULT	LIMIT	METHOD OF TEST REFERENCE
1	Particulate matter (<10µm) in µg/m³	65	100	IS 5182 (Part-23) Reff 2022
2	Particulate matter (<2.5µm) in µg/m³	34	60	IS 5182 (Part-24) Reff 2024
3	Sulphur dioxide (SO_2) in µg/m³	7.2	80	IS 5182(Part -2) Reff 2023
4	Nitrogen dioxide (NO_2) in µg/m³	23.0	80	IS 5182 (Part -6) Reff 2017
5	Carbon Monoxide (CO) in mg /m³	0.664	2	IS 5182 (Part -10) Reff 2019
6	Ammonia (NH_3) in µg/m³	13.4	400	IS 5182 (Part-25) Reff 2018
7	Ozone (O_3) in µg/m³	30.6	180	IS 5182 (Part-9) Reff 2019
8	Lead (Pb) in µg/m³	<0.02	1	IS 5182 (Part-22) Reff 2019
9	Nickel (Ni) in ng/m³	<4.0	20	IS 5182 (Part-26) Reff 2020
10	Arsenic (As) in ng/m³	<1.0	6	Air Sampling, 3rd Edn. Method 402 and APHA 23rd Edition Part 3114B
11	Benzene (C_6H_6) in µg/m³	<2.0	5	IS 5182 (Part-11) Reff 2022
12	Benzo (a) pyrene in ng/m³	<1.0	1	IS 5182 (Part-12) Reff 2019

NOTE: Limit as per CPCB notification, New Delhi, 18th November 2009, for Ambient air quality.

Report Prepared By :

for **Qualissure Laboratory Services**
Reviewed & Authorized By

Benimadhab Gorai, Chemist
(Authorized Signatory)

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TC-6271

DOC NO : QLS/SAMP/08-A/00

TEST REPORT

Name & Address Of the Customer : **M/s. Giridhan Metal Pvt. Ltd.** Jamuria Industrial Estate, Damodarpur, Jamuria P.O.- Nandi, Paschim Bardhaman, Pin : 713 344	Report No. Date Sample No. Sample Description Date of Performance(s) Sample Mark Ref No. Date	: QLS/24/A/25-26/C/51 : 08.11.2025 : QLS/24/A/25-26/51 : Ambient Air : 30.10-06.11.2025 : Akhalpur Village : 9400000240, Dated-05.04.2025

Analysis Result

Location : Akhalpur Village | Date of sampling : 25-26.10.2025

Sampling Done by: S.Poddar/P.Mandal | Sampling done as per : CPCB Guidelines (Volume-1)

Environmental Condition : Clear & Sunny

Sl. No.	POLLUTANT	RESULT	LIMIT	METHOD OF TEST REFERENCE
1	Particulate matter (<10µm) in µg/m³	74	100	IS 5182 (Part-23) Reff 2022
2	Particulate matter (<2.5µm) in µg/m³	35	60	IS 5182 (Part-24) Reff 2024
3	Sulphur dioxide (SO_2) in µg/m³	7.7	80	IS 5182(Part -2) Reff 2023
4	Nitrogen dioxide (NO_2) in µg/m³	24.6	80	IS 5182 (Part -6) Reff 2017
5	Carbon Monoxide (CO) in mg /m³	0.755	2	IS 5182 (Part -10) Reff 2019
6	Ammonia (NH_3) in µg/m³	15.5	400	IS 5182 (Part-25) Reff 2018
7	Ozone (O_3) in µg/m³	26.8	180	IS 5182 (Part-9) Reff 2019
8	Lead (Pb) in µg/m³	<0.02	1	IS 5182 (Part-22) Reff 2019
9	Nickel (Ni) in ng/m³	<4.0	20	IS 5182 (Part-26) Reff 2020
10	Arsenic (As) in ng/m³	<1.0	6	Air Sampling, 3rd Edn. Method 402 and APHA 23rd Edition Part 3114B
11	Benzene (C_6H_6) in µg/m³	<2.0	5	IS 5182 (Part-11) Reff 2022
12	Benzo (a) pyrene in ng/m³	<1.0	1	IS 5182 (Part-12) Reff 2019

NOTE: Limit as per CPCB notification, New Delhi, 18th November 2009, for Ambient air quality.

Report Prepared By :

for **Qualissure Laboratory Services**
Reviewed & Authorized By

Benimadhab Gorai, Chemist
(Authorized Signatory)

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Analysis Result

Location : Sekpur Village	Date of sampling : 26-27.10.2025
Sampling Done by: S.Poddar/P.Mandal	Sampling done as per : CPCB Guidelines (Volume-1)
Environmental Condition : Clear & Sunny	

Sl. No.	POLLUTANT	RESULT	LIMIT	METHOD OF TEST REFERENCE
1	Particulate matter (<10µm) in µg/m³	60	100	IS 5182 (Part-23) Reff 2022
2	Particulate matter (<2.5µm) in µg/m³	26	60	IS 5182 (Part-24) Reff 2024
3	Sulphur dioxide (SO_2) in µg/m³	6.4	80	IS 5182(Part -2) Reff 2023
4	Nitrogen dioxide (NO_2) in µg/m³	22.7	80	IS 5182 (Part -6) Reff 2017
5	Carbon Monoxide (CO) in mg /m³	0.641	2	IS 5182 (Part -10) Reff 2019
6	Ammonia (NH_3) in µg/m³	<10.0	400	IS 5182 (Part-25) Reff 2018
7	Ozone (O_3) in µg/m³	25.2	180	IS 5182 (Part-9) Reff 2019
8	Lead (Pb) in µg/m³	<0.02	1	IS 5182 (Part-22) Reff 2019
9	Nickel (Ni) in ng/m³	<4.0	20	IS 5182 (Part-26) Reff 2020
10	Arsenic (As) in ng/m³	<1.0	6	Air Sampling, 3rd Edn. Method 402 and APHA 23rd Edition Part 3114B
11	Benzene (C_6H_6) in µg/m³	<2.0	5	IS 5182 (Part-11) Reff 2022
12	Benzo (a) pyrene in ng/m³	<1.0	1	IS 5182 (Part-12) Reff 2019

NOTE: Limit as per CPCB notification, New Delhi, 18th November 2009, for Ambient air quality.

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for **Qualissure Laboratory Services**
Reviewed & Authorized By

Benimadhab Gorai, Chemist
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Name & Address Of the Customer : **M/s. Giridhan Metal Pvt. Ltd.** Jamuria Industrial Estate, Damodarpur, Jamuria P.O.- Nandi, Paschim Bardhaman, Pin : 713 344	Report No. Date Sample No. Sample Description Date of Performance(s) Sample Mark Ref No. Date	: QLS/24/A/25-26/C/53 : 08.11.2025 : QLS/24/A/25-26/53 : Ambient Air : 30.10-06.11.2025 : Damodarpur Village : 9400000240, Dated-05.04.2025

Analysis Result

Location : Damodarpur Village	Date of sampling : 26-27.10.2025
Sampling Done by: S.Poddar/P.Mandal	Sampling done as per : CPCB Guidelines (Volume-1)
Environmental Condition : Clear & Sunny	

Sl. No.	POLLUTANT	RESULT	LIMIT	METHOD OF TEST REFERENCE
1	Particulate matter (<10µm) in µg/m³	118	100	IS 5182 (Part-23) Reff 2022
2	Particulate matter (<2.5µm) in µg/m³	55	60	IS 5182 (Part-24) Reff 2024
3	Sulphur dioxide (SO_2) in µg/m³	9.9	80	IS 5182(Part -2) Reff 2023
4	Nitrogen dioxide (NO_2) in µg/m³	28.5	80	IS 5182 (Part -6) Reff 2017
5	Carbon Monoxide (CO) in mg /m³	0.984	2	IS 5182 (Part -10) Reff 2019
6	Ammonia (NH_3) in µg/m³	37.2	400	IS 5182 (Part-25) Reff 2018
7	Ozone (O_3) in µg/m³	38.5	180	IS 5182 (Part-9) Reff 2019
8	Lead (Pb) in µg/m³	0.10	1	IS 5182 (Part-22) Reff 2019
9	Nickel (Ni) in ng/m³	7.4	20	IS 5182 (Part-26) Reff 2020
10	Arsenic (As) in ng/m³	<1.0	6	Air Sampling, 3rd Edn. Method 402 and APHA 23rd Edition Part 3114B
11	Benzene (C_6H_6) in µg/m³	<2.0	5	IS 5182 (Part-11) Reff 2022
12	Benzo (a) pyrene in ng/m³	<1.0	1	IS 5182 (Part-12) Reff 2019

NOTE: Limit as per CPCB notification, New Delhi, 18th November 2009, for Ambient air quality.

Report Prepared By :

for **Qualissure Laboratory Services**
Reviewed & Authorized By

Bishnupriya Banerjee, Chemist
(Authorized Signatory)

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Greenbelt Development


GMR


Supreme


5th June
THEME:

GIRIDHAN METAL

Corporate Environmental Responsibility

Dredging of Pond and Construction of Bathing Ghat at Damodarpur Village

- The Dredging of two big Ponds at Damodarpur village has been dredged and cutting of the soil and clearing of debris along with construction of two Ghats for both Male and Female villagers separately.

- Project: INR **31,64,500/-**

DURGA DALAN TEMPLE

- Construction of Permanent Shed at the ancient Durga Dalan Temple at Bijpur village which was a longtime demand of local villagers as they were unable worship due to scorching heat during summers and heavy rains during the rainy season the villagers.

  Project Cost: INR. **14,80,000/-**

GIRIDHAN METAL

Renovation of Bijpur Shamashan Kali Mandir with construction of Tin Shed

Considering the demand of the local Adivasi Villagers from Bijpur, Mithapur, Balanpur and surrounding areas the Temple have been fully renovated along with construction of Tis Shed for Cremation during Rainy season.

Project Cost: INR **12,20,000/-**

Free Medical Check Up Camp and Free Eye Testing Camp

- In continuation to our MISSION HEALTH we have organized a full day Free Medical Check Up Camp with Blood Test, ECG, Blood Pressure, Diabetes etc. and Free Eye Testing Camp along with Micro Surgery and Distribution of free spectacles for the Adivasi and Local villagers from the surrounding villages around 550 no.s including Damodarpur, Simultala, Rajaramdanga, Sekhpur etc.

Project Cost: INR **6,50,000/-**

- Free Medical Camp

Press Media

गिरिधन मेटल ने लगाया हेल्थ चेकअप कैंप

जामुड़िया. इकड़ा औद्योगिक क्षेत्र के लौह व इस्पात कारखाने गिरिधन मेटल की ओर से अपने निगमित सामाजिक दायित्व (सीएसआर) के तहत श्रमिकों व आसपास के लोगों के लिए स्वास्थ्य जांच शिविर लगाया गया. यह पहल शुक्रवार को कोलकाता के एक स्वास्थ्य केंद्र के सहयोग से की गयी.

शिविर में कोलकाता से आयी 16 सदस्यीय मेडिकल टीम ने अपनी सेवाएं दीं. इलाज के लिए आये सभी लोगों को मुफ्त दवाएं भी दी गयीं. मेगा शिविर में कुल 552 लोगों की आंखों की जांच की गयी, 250 लोगों की सामान्य स्वास्थ्य जांच की गयी. 230 लोगों के रक्तचाप का परीक्षण किया गया. 265 लोगों के ब्लड शुगर का स्तर मापा गया और 65 लोगों की इसीजी की गयी. गिरिधन मेटल के उद्यमियों ने जोर दिया कि वे कारखाने के श्रमिकों और क्षेत्र की आम जनता की सेहत को अधिक महत्व देते हैं. वे नियमित रूप से वर्ष के विभिन्न समयों पर, ऐसे स्वास्थ्य जांच शिविर लगाते रहते हैं. फैक्टरी के अधिकारियों ने यह भी बताया कि आंखों की जांच के दौरान यदि किसी को मोतियाबिंद या अन्य गंभीर नेत्र-विकार दिखता है, तो उन्हें सर्जरी के लिए कोलकाता ले जाया जायेगा और सर्जरी के जरिये मुफ्त में लेंस लगाया जायेगा. कार्यक्रम में कंपनी के निदेशक संजय अग्रवाल, अन्य निदेशक एमके शेषाद्रि, वरिष्ठ डीजीएम मानव संसाधन आशीष पांडेय, सीएसआर प्रमुख इशांत जैन और उप-प्रबंधक पंकज सिंह समेत कई गणमान्य मौजूद थे. यह पहल गिरिधन मेटल की समुदाय कल्याण और स्वास्थ्य सेवा के प्रति गहरी प्रतिबद्धता को दर्शाती है.

खेलकूद व शिक्षा को गिरिधन मेटल्स का प्रोत्साहन

सीएसआर पहल

प्रतिनिधि, जामुड़िया

गिरिधन मेटल्स के कार्यक्रम मे फुटबॉलर्स व अतिथि.

गिरिधन मेटल्स प्राइवेट लिमिटेड ने अपने कॉर्पोरेट सामाजिक दायित्व(सीएसआर) के तहत दामोदरपुर क्षेत्र में शिक्षा व खेलकूद को बढ़ावा देने के लिए विशेष कार्यक्रम आयोजित किया. इस पहल से स्थानीय फुटबॉल खिलाड़ियों और स्कूली बच्चों में नयी ऊर्जा का संचार हुआ. इस कार्यक्रम के दौरान, दामोदरपुर आदिवासी फुटबॉल क्लब के खिलाड़ियों को खेल को बेहतर बनाने के लिए फुटबॉल, स्पोर्ट्स शूज, टी-शर्ट्स और अन्य खेल सामग्री वितरित की गई वह पाकर खिलाड़ियों में खुशी का माहौल देखा गया. कंपनी ने बताया कि उनका लक्ष्य केवल लौह उत्पादन करना नहीं, बल्कि ग्रामीण युवाओं में खेल भावना को प्रोत्साहित करना और उन्हें बेहतर सुविधाएं उपलब्ध कराना भी है. साथ ही दामोदरपुर आदिवासी प्राथमिक विद्यालय के बच्चों को भी जरूरी शैक्षणिक सामग्री दी गई। इनमें कॉपी, पेन-पेंसिल, रबर, शार्पनर और अन्य स्टेशनरी शामिल थी. कंपनी का मानना है कि यह पहल बच्चों की पढ़ाई को प्रोत्साहित करेगी और उनके उज्ज्वल भविष्य की राह को मजबूत बनायेगी. इस पहल को सफल बनाने में अहम भूमिका निभाने के लिए कंपनी के मुख्य अधिकारियों को विशेष धन्यवाद दिया गया, जिनमें निदेशक संजय अग्रवाल, नवीन शर्मा (कमर्शियल हेड), आशीष पांडेय(एचआर हेड), मच्छेंद्र कुमार(इलेक्ट्रिक हेड), इशांत जैन (सीएसआर अफिसर) व पंकज सिंह (डिप्टी मैनेजर) शामिल थे.

sanmarg NETWORK

फुटबॉल खिलाड़ियों व बच्चों को मिली नई ऊर्जा

वितरण करते कंपनी के पदाधिकारी

सन्मार्ग संवाददाता

जामुड़िया : गिरिधन मेटल ने अपने कॉर्पोरेट सामाजिक उत्तरदायित्व के तहत दामोदरपुर क्षेत्र में शिक्षा और खेल को बढ़ावा देने के लिए कार्यक्रम आयोजित किया। दामोदरपुर आदिवासी फुटबॉल क्लब मैदान में खिलाड़ियों को फुटबॉल, स्पोर्ट्स शूज, टी-शर्ट्स और अन्य खेल सामग्री दी गई। वहीं आदिवासी प्राथमिक विद्यालय के बच्चों को कॉपियां, पेन-पेंसिल व अन्य स्टेशनरी सामग्री प्रदान की गई। कंपनी प्रबंधन का कहना है कि शिक्षा और खेल समाज के विकास के मजबूत आधार हैं और इस दिशा में उनके प्रयास आगे भी जारी रहेंगे। इस मौके पर विशेष योगदान देने वालों में संजय अग्रवाल (पूर्णकालिक निदेशक), नवीन शर्मा (कॉमर्शियल हेड), आशीष पांडे (एचआर हेड), मंछेदा कुमार (इलेक्ट्रिक हेड), इशांत जैन (सीएसआर ऑफिसर) और पंकज सिंह (डिप्टी मैनेजर) उपस्थित थे।

कारखाने ने किया ग्रामीणों व कर्मचारियों का नि:शुल्क स्वास्थ्य परीक्षण

जामुड़िया प्रतिनिधि। सीएसआर के तहत गिरिधन मेटल नामक लोहा-इस्पात कारखाने ने शुक्रवार को कर्मचारियों और आसपास के ग्रामीणों के लिए निःशुल्क स्वास्थ्य शिविर का आयोजन किया। यह आयोजन इकरा शिल्प तालुक स्थित कारखाने परिसर में किया गया, जिसमें कोलकाता के एक स्वास्थ्य केंद्र की टीम ने चिकित्सा सेवाएं प्रदान कीं।

इस अवसर पर 16 डॉक्टरों की टीम ने 552 लोगों की आँखों की जाँच, 250 का सामान्य स्वास्थ्य परीक्षण, 230 का रक्तचाप मापन, 265 का डायबिटीज टेस्ट और 65 का ईसीजी किया। साथ ही, मरीजों को निःशुल्क दवाएं भी वितरित की गईं। कारखाना प्रबंधन ने बताया कि जिन लोगों की आँखों में मोतियाबिंद या अन्य गंभीर समस्या पाई गई, उन्हें कोलकाता ले जाकर निःशुल्क ऑपरेशन करवाया जाएगा और लेंस भी दिया जाएगा। संस्था के निदेशक संजय अग्रवाल, एस.के. शेषाद्रि, सीनियर डीजीएम (मानव संसाधन) आशीष कुमार पांडे, सीएसआर हेड ईशांत जैन और डिप्टी मैनेजर पंकज सिंह ने इस कार्यक्रम में विशेष रूप से भाग लिया। उन्होंने बताया कि वे नियमित रूप से ऐसे स्वास्थ्य शिविर आयोजित करते हैं ताकि कर्मचारियों और स्थानीय निवासियों को बेहतर चिकित्सा सुविधाएँ मिल सकें।

रिमांड शेष होने के बाद शुक्रवार महकमा अदालत में पेश किया, जहां से दुर्गापुर थाना की पुलिस दो दिनों के लिए पुलिस रिमांड पर ले लिया। दोनों आरोपी शहर के माया बाजार इलाके के रहने वाले है।

सीएसआर के तहत दामोदरपुर में खेल सामग्रियों का वितरण

जामुड़िया।

गिरिधन मेटल प्राइवेट लिमिटेड ने अपने कॉर्पोरेट सामाजिक उत्तरदायित्व (सीएसआर) के तहत दामोदरपुर क्षेत्र में शिक्षा और खेल को बढ़ावा देने के लिए विशेष कार्यक्रम आयोजित किया। कार्यक्रम के अंतर्गत दामोदरपुर आदिवासी फुटबॉल क्लब मैदान में खिलाड़ियों को फुटबॉल, स्पोर्ट्स शूज, टी-शर्ट्स एवं अन्य खेल सामग्री वितरित की गई। कंपनी का उद्देश्य ग्रामीण युवाओं में खेल भावना को प्रोत्साहित करना और उन्हें बेहतर सुविधाएं उपलब्ध कराना है। साथ ही, दामोदरपुर आदिवासी प्राथमिक विद्यालय के बच्चों को कॉपियां, पेन-पेंसिल, रबर, शार्पनर एवं अन्य स्टेशनरी सामग्री प्रदान की गई। इस पहल से बच्चों की पढ़ाई को प्रोत्साहन मिलेगा और उनके उज्ज्वल भविष्य की राह मजबूत होगी। कंपनी का मानना है कि शिक्षा और खेल दोनों ही समाज के विकास के महत्वपूर्ण स्तंभ हैं। मौके पर पूर्णकालिक निदेशक संजय अग्रवाल, कमर्शियल हेड नवीन शर्मा, एचआर हेड आशीष पांडे, इलेक्ट्रिक हेड मंछेदा कुमार, सीएसआर ऑफिसर इशांत जैन, डिप्टी मैनेजर पंकज सिंह मौजूद थे।

Mass Plantation of 11000 trees at Damodarpur, Sekhpur and surrounding villages and at Avenue Plantation at the roads approaching the villages by Local Adivasi villagers.

Project Cost: INR **11,68,000/-**

Construction of 340 mtr Concrete Road at surrounding villages

- We have constructed around 340 mtr Concrete “Pakka” road at the surrounding villages based on the demand of the local villagers as due to unavailability of roads the villagers.
- Project Cost: **INR 48,00,000/-**

- **Distribution of Jersey, Sports Shoes, Gloves, Football** and all related sports accessories Distributed at Tilka Manjhi Adivasi Foot Ball Club at Damodarpur
- Project Cost: INR **1,15,800/-**

Construction, Modification and Fabrication of the houses of local resident Adivasi villagers at the Damodarpur village

Project Cost: **INR 9,75,000/-**

- **Distribution of Books** at Vivekananda Library and Tilka Manjhi Adivasi Para at Jamuria and Damodarpur village.
- **Distribution of Stationeries**, White Boards, School Bags, Books etc. at the Adivasi Schools to the students.
- Project Cost: **INR 1,05,000/-**

Donation for Construction of New Temple - Sripur

- Project Cost: **INR 5,00,000/-**

Construction of New Temple at Damodarpur Village

- Project Cost: **INR 11,00,000/-**

Construction of Pakka Concrete Drain at Damodarpur,Aatpara Bauripara, Sekhpur, Simultala and surrounding villages

- Project Cost: **INR 32,58,000/-**

We uplift every section of the society and extend a helping hand where it matters most.

Distribution of Wheel Chairs to Specially abled childrens and adults at J.K, Nagar, Slum Area.

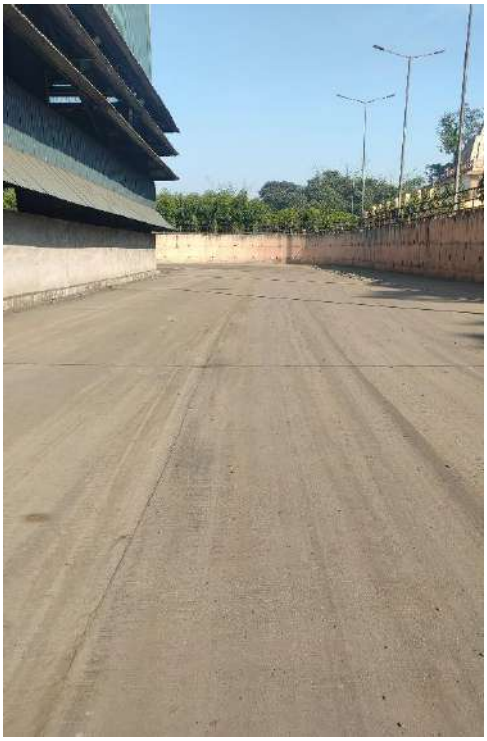
Project Cost: INR **45000/-**

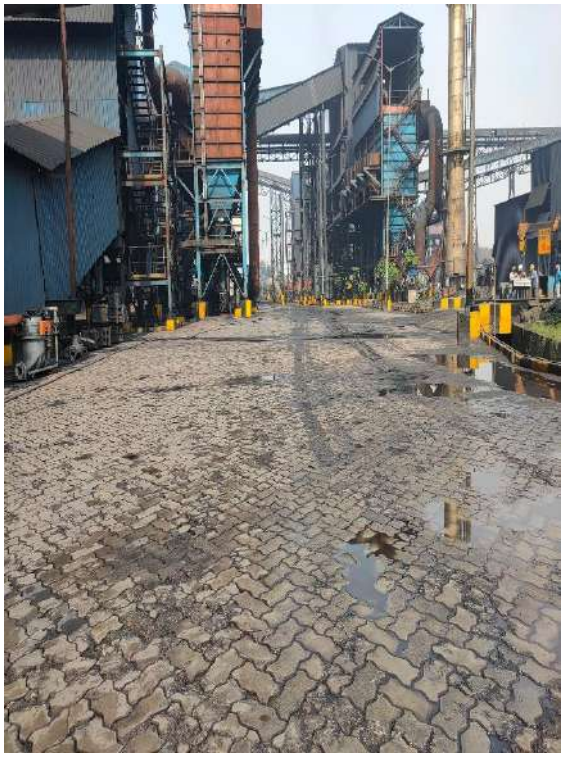
Total Project Cost

Sl. No.	CER Activities	Amount
1	Dredging of Pond and Construction of Bathing Ghat at Damodarpur Village	31,64,500
2	Durga Dalan, Bijpur	14,80,000
3	Renovation of Bijpur Shamashan Kali Mandir with construction of Tin Shed	12,20,000
4	Free Medical Check Up Camp and Free Eye Testing Camp	6,50,000
5	Mass Plantation of 11000 trees	11,68,000
6	Construction of 340 mtr Concrete Road at surrounding villages	48,00,000
7	Distribution of Jersey, Sports Shoes, Gloves, Football	1,15,800
8	Distribution of Books and Stationeries	1,05,000
9	Distribution of Wheel Chairs	45,000
10	Donation for Construction of New Temple - Sripur	5,00,000
11	Donation for Construction of New Temple - Damodarpur Village	11,00,000
12	Construction of Pakka Concrete Drain at Damodarpur,AatparaBauripara, Sekhpur, Simultala and surrounding villages	32,58,000
13	Construction, Modification and Fabrication of the houses at the Damodarpur village	9,75,000
Total	INR	1,85,81,300

Water Tanker

RCC & Paver Block Road



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Government of West Bengal

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Authorised Signatory
(E-signed)
Department of IT&E

WEST BENGAL POLLUTION CONTROL BOARD
Paribesh Bhawan, 10A, Block LA, Sector III
Salt Lake City, Bidhan Nagar, Kolkata – 700 106, INDIA
Website : www.wbpcb.gov.in, e-mail : wbpcbnet@wbpcb.gov.in

Validity Period :30/07/2024 To 31/07/2031

Category: RED

Application Type: CTE

CTE No.: WBPCB/5507639/2024 **Date: 30/07/2024**

Sub : Consent to Establish (CTE) under Section 25 & 26 of the Water (Prevention and Control of Pollution) Act, 1974 as amended and Section 21 of the Air (Prevention and Control of Pollution) Act, 1981 as amended.

Ref.: Application No. 5507639

To,

M/s Giridhan Metal Private Limited
Jamuria Industrial Estate, Village – Ikra & Damodarpur, Tehsil – Jamuria, Dist – Paschim Bardhaman, West Bengal.

The West Bengal Pollution Control Board (hereinafter referred to as the State Board) hereby grants Consent to Establish (CTE) from environmental point under Section 25 & 26 of the Water (Prevention and Control of Pollution) Act, 1974, as amended and Section 21 of the Air (Prevention and Control of Pollution) Act, 1981 as amended and rules and orders made thereunder for proposed expan unit of **Giridhan Metal Private Limited** at **Jamuria Industrial Estate, Village – Ikra & Damodarpur, Tehsil – Jamuria, Dist – Paschim Bardhaman, West Bengal.** for the following activities :

Sl.No.	Name of Activitiy,Product and/or By-Product	Production Capacity
1	Sponge Iron	594000 Metric Tonnes/Year
2	MS Billets	124200 Metric Tonnes/Year
3	WHRB (126 TPH x 2)	60 Megawatt
4	Rolled/Bars/Light Structure	100000 Metric Tonnes/Year
5	From 3x5.5 MVA SAF (F-Mn/Si-Mn/Fe-Cr/Si-Cr/Fe-Si/Pig Iron)	52300 Metric Tonnes/Year
6	From 2x10 Ton EAF (Low Carbon Fe-Cr)	25000 Metric Tonnes/Year

Total cost of the Project (in Lakhs)	**86000.0**

(A) General Conditions :

(1) The quality of sewage and industrial effluent to be discharged from the factory shall satisfy the permissible limits as per norms and Environment (Protection) Rules 1986.

(2) The unit shall apply to the State Board for Consent to operate according to the provisions of the Water (Prevention & Control of Pollution) Act, 1974 as amended and the Air (Prevention & Control Pollution) Act, 1981 as amended prior to commencement of activities of the unit.

(3) The unit shall comply with the following Environmental Acts and Rules and its amendment as applicable

(i) The Water (Prevention and Control of Pollution) Act, 1974 .

(ii) The Air (Prevention and Control of Pollution) Act, 1981

(iii) The Environment (Protection) Act, 1986

(iv) The Public Liability Insurance Act, 1991

(v) The Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989

(vi) The Ozone Depleting Substances (Regulation and Control) Rules, 2000

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(vii) The Batteries (Management and Handling) Rules, 2022

(viii) The Noise Pollution (Regulation and Control) Rules, 2000

(ix) The Bio-medical Wastes Management Rules, 2016

(x) The Hazardous Wastes (Management and Transboundary Movement) Rules, 2016

(xi) The Plastic Waste Management Rules, 2016

(xii) The Solid Waste Management Rules, 2016

(xiii) The E-Waste (Management Rules), 2022

(xiv) The Construction and Demolition Waste Management Rules, 2016

(4) The State Board reserves the right to review, amend, suspend, revoke etc. this consent for establishment and the same shall be binding on the unit.

(5) The unit shall obtain permission/clearance from the other competent authorities, as applicable and such permissions may be required at the time of submitting application for Consent to operate.

(6) The unit shall abide by the stipulations as may be prescribed by any authority / local body / government departments etc.

(7) Suitable measures to treat the effluent and emission shall be adopted in order to reduce the pollution load so that the quality of the effluent and emission from the unit always conforms to the relevant permissible standards.

(8) No equipment/machinery, emission and effluent generation/discharge source etc. shall be installed/modified without prior approval of the State Board.

(B) Special Conditions:

Please refer to Annexure 1, 2 & 3 (Pages 1-9).

Any Violation of the aforesaid Conditions shall entail cancellation of this Consent to Establish

For and on behalf of West Bengal Pollution Control Board

30/07/2024

Chief Engineer
Environment Impact Management Cell

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Annexure – 1 to **CTE No. – WBPCB/5507693/2024**

Special conditions issued to: **M/s Giridhan Metal Private Limited** located at Jamuria Industrial Estate, Village – Ikra & Damodarpur, Tehsil – Jamuria, Dist – Paschim Bardhaman, West Bengal. (Expansion project).

Unit configuration and capacity

S. No.	Plant Equipment/ Facility	Existing facilitiesas per EC dated 8th April, 2021 and subsequent amended dated 16th Jan, 2023		As per CTO		Proposed Unit		Total (Existing + Proposed)		Remarks
		Config	Prod (TPA)	Config	Prod (TPA)	Config	Prod (TPA)	Config	Prod (TPA)	
1.	Sponge Iron (DRIPlant)	1x 350 & 1x 600 TPD DRI Plant	318000 TPA	1x 350 & 1x 600 TPD DRI Plant	318000 TPA	2x 900 TPD	594000 TPA	(1x 350 + 1x 600 + 2x 900 TPD DRI Plant)	912000 TPA	Product - Sponge Iron
2.	MS Billets (Induction Furnace with LF & CCM)	6x20 Ton IF (Induction Furnace) & 1X30 Ton LF (Ladle Furnace)	372300 TPA	6x20 Ton IF (Induction Furnace) & 1X30 Ton LF (Ladle Furnace)	372300 TPA	2x20 Ton IF (Induction Furnace)	124200 TPA	{8x20 Ton IF (Induction Furnace) & 1x30 Ton LF (Ladle Furnace) }	496500 TPA	Product - MS Billets
3.	RollingMill	310 TPD & 625 TPD of rolled/bars/light structure	300000 TPA	310 TPD & 625 TPD of rolled/bars/light structure	300000 TPA	By adding new stand in existing premises	100000 TPA	1x1250 TPD of rolled/bars/light structure	400000 TPA	Product - Flat & Rolled Product
4.	Submerged Arc Furnace (SAF)	2x9 MVA of Fe-Mn/ Si-Mn	30000 TPA	2x9 MVA of Fe-Mn/ Si-Mn	30000 TPA	3x5.5 MVA (Fe-Mn/ Si-	52,300 TPA	2X9 + 3x5.5 MVA of Fe-	82,300 TPA Ferro	Product - Ferro Manganese or
						Mn/Fe-Cr/Si-Cr)		Mn/ Si-Mn/Fe-Cr/Si-Cr	Manganese or 56,200 TPA Silico Manganese or 56,200 Ferro	Product - Silico manganese or Ferro Chrome or Silico Chrome or

S. No.	Plant Equipment/ Facility	Existing facilitiesas per EC dated 8th April, 2021 and subsequent amended dated 16th Jan, 2023		As per CTO		Proposed Unit		Total (Existing + Proposed)		Remarks
		Config	Prod (TPA)	Config	Prod (TPA)	Config	Prod (TPA)	Config	Prod (TPA)	
									Chrome or 48,100 Silico Chrome or 43,100 TPA Ferro Silicon or 82,300 TPA Pig Iron	Ferro Siliconor Pig Iron (Only product intercha ngeability by changing charge mix)
5.	ElectricArc Furnace (EAF)	---	---	---	---	2x10 MT	25000 TPA	2x10 MT	25000 TPA	Product - 25000 TPA Alloys Metal (To be used for as interme diary product)
6.	Waste Heat Recovery Boiler (WHRB)	35 TPH & 70 TPH	21 MW	35 TPH & 70 TPH		2 x 126 TPH	60 MW	(1x35 + 1x70 + 2x126 TPH)	81 MW	Product - Power

Annexure – 2 to **CTE No. – WBPCB/5507693/2024**

Special conditions issued to: **M/s Giridhan Metal Private Limited** located at Jamuria Industrial Estate, Village – Ikra & Damodarpur, Tehsil – Jamuria, Dist – Paschim Bardhaman, West Bengal (Expansion project).

Sl. No.	Emission Sources	Air Pollution Control System	Stack (Nos. & height from GL. in m.)
Sponge Iron Plant			
1	Rotary Kiln with WHRB (2x900TPD)	Individual assembly of WHRB of capacity – 126TPH each, followed by individual ESP and common stack for 2x900 TPD DRI kiln	01 no, 85m (for 2x900 TPD kiln)
		Individual bag filters with individual stack to be installed for cooler discharge, I-bin of 2x900 TPD DRI.	02 no, 30m (for 900 TPD kiln each)
		Individual bag filters with individual stack to be installed for product separation, product house of 2x900 TPD DRI.	02 no, 30m (for 900 TPD kiln each)
Captive Power			
2	WHRB (2x126 TPH for each 900TPD DRI Kiln) (60MW)	----	----
Induction Furnace (IF)			
3	2x20Ton Induction Furnace	2x20Ton IF attached with the assembly of spark arrestor and bag filter with stack of existing IF (6x20Ton)	01 no, 30m (Common with existing stack of 6x20Ton IF)
Rolling Mill			
4	0.1MTPA Hot Rolling Mill	----	----
Ferro Alloys Plant			
5	3x5.5MVA SAF (Fe-Mn/Si-Mn/Fe-Cr/Si-Cr/Fe-Si/Pig Iron)	Individual assembly of spark arrestor and bag filter for each furnace followed by common stacks for each assembly at 2x5.5 MVA and 1x5.5 MVA SAF	02 no, 30m each
6	2x10Ton EAF (Low Carbon Fe-Cr)	Individual assembly of spark arrestor and bag filter with common stack	01 no, 30m
DG Set			
7	DG Set – 1x750KVA, 3x2000KVA & 1x500KVA	Individual DG Set to be provided with proper air pollution control device, acoustic enclosure and stack	05 nos, 05m for 1x750KVA, 10m for 3x2000KVA and 05m for 1x500 KVA DG sets

Annexure – 3 to **CTE No. – WBPCB/5507693/2024**

Special conditions issued to: **M/s Giridhan Metal Private Limited** located at Jamuria Industrial Estate, Village – Ikra & Damodarpur, Tehsil – Jamuria, Dist – Paschim Bardhaman, West Bengal (Expansion project).

A) Specific Condition:

i. The project proponent shall utilize modern technologies for capturing of carbon emitted and shall also develop carbon sink/carbon sequestration resources capable ofcapturing more than emitted. The implementation report shall be submitted to the IRO,MoEF&CC & WBPCB in this regard.

ii. Damodarpur Village is adjacent in NW, Sekpur Village (0.5 km, E), Akhalpur Village (0.59 km, WSW), Ikra Village (0.88 km, SE), Mandalpur Village (1 km, SW) exists along with other sensitive areas within the study area of the project site. Proponent shall take appropriate environmental safeguard measures to minimise the impact on the habitation of the locals. The project proponent needs to strengthen green belt all around the plant area to reduce the dust pollution. The PP shall also include some of these locations in its environmental monitoring programme.

iii. There are several water bodies within the study area of the project site. A robust and full proof Drainage Conservation scheme to protect the natural drainage and its flow parameters; along with Soil conservation scheme and multiple Erosion control measures shall be implemented.

iv. Total water requirement is after expansion is estimated as 6730 m3/day that will be obtained from Surface Water (River Damodar) through Damodar Valley Corporation (DVC). PP shall obtain necessary permission from the Competent Authority in this regard.

v. Three tier Green Belt shall be developed in atleast 40% of the project area, in the monsoon season of 2024, of adequate width and tree density shall not be less than 2500 per ha. Survival rate of green belt developed shall be monitored on periodic basis to ensure that damaged plants are replaced with new plants in the subsequent years. PP shall also develop greenbelt in the form of shelter belt comprising of total of 6 rows of 2x2 m plantation with tall trees & broad leaves with thick canopy along with windshield inside the plant premises to act as green barrier for air pollution & noise levels towards sensitive areas nearby project site. Additionally, thick plantation of 5000 trees in the nearby villages and schools, rainwater harvesting pond etc. in the ensuing monsoon. Compliance status in this regard, shall be submitted to concerned Regional Office of the MoEF&CC & WBPCB.

vi. All the commitments made towards socio-economic development of the nearby villages shall be satisfactorily implemented. The action plan based on the social impact assessment study of the project as per the EMP in accordance to the Ministry's OM dated 30.09.2020 amounting to Rs. 16 Crores shall be strictly implemented and progress shall be submitted to the Regional Office of MoEF&CC & WBPCB.

vii. The project proponent shall undertake village adoption programme and prepare and implement the action plan to develop them into a model village.

viii. PP shall comply with the recommendations as stated in the report from Jadavpur University, Kolkata regarding the construction activities of Railway Siding with wagon tippler.

ix. PP shall prepare an action plan for improving the housekeeping of the plant premises and implement it strictly.

x. PP shall undertake strict measures to reduce the dust emissions and pollution level in the project premises.

xi. There are two patches of road around 40 m length and 20 m width inside the plant area which shall be concreted/paved within a time frame of 3 months as committed.

xii. The PP shall provide additional drinking water facility of approx. 18000 Liters per day in the adjacent Damodarpur village within three months.

xiii. PP shall install a permanent fencing around the temple, school within a timeframe of three months, as committed.

xiv. PP shall improve the infrastructure in the adjacent village within a stipulated time period.

Annexure – 3 to **CTE No. – WBPCB/5507693/2024**

Special conditions issued to: **M/s Giridhan Metal Private Limited** located at Jamuria Industrial Estate, Village – Ikra & Damodarpur, Tehsil – Jamuria, Dist – Paschim Bardhaman, West Bengal (Expansion project).

B) General Conditions

I. Air quality monitoring and preservation

i. The project proponent shall install 24x7 continuous emission monitoring system at process stacks to monitor stack emission as well as 04 Nos. Continuous Ambient Air Quality Station (CAAQMS) for monitoring AAQ parameters with respect to standards prescribed in Environment (Protection) Rules 1986 as amended from time to time. The CEMS and CAAQMS shall be connected to SPCB and CPCB online servers and calibrate these systems from time to time according to equipment supplier specification through labs recognized under Environment (Protection) Act, 1986 or NABL accredited laboratories.

ii. The project proponent shall carryout Continuous Ambient Air Quality monitoring for common/criterion parameters relevant to the main pollutants released (e.g. PM10 and PM2.5 in reference to PM emission, and SO2 and NOx in reference to SO2 and NOx emissions) within and outside the plant area (at least at four locations one within and three outside the plant area at an angle of 120° each), covering upwind and downwind directions.

iii. The project proponent shall 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.

iv. Sampling facility at process stacks shall be provided as per CPCB guidelines for manual monitoring of emissions.

v. Appropriate Air Pollution Control (APC) system shall be provided for all the dust generating points including fugitive dust from all vulnerable sources, so as to comply prescribed stack emission and fugitive emission standards.

vi. The project proponent shall provide leakage detection and mechanized bag cleaning facilities for better maintenance of bags.

vii. Sufficient number of mobile or stationery vacuum cleaners shall be provided to clean plant roads, shop floors, roofs, regularly.

viii. Ensure covered transportation and conveying of raw material to prevent spillage and dust generation. The project proponent use leak proof trucks/dumpers carrying coal and other raw materials and cover them with tarpaulin.

ix. Recycle and reuse iron ore fines, coal and coke fines, lime fines and such other fines collected in the pollution control devices and vacuum cleaning devices in the process after briquetting/ agglomeration.

x. The project proponent shall provide primary and secondary fume extraction system at all heat treatment furnaces.

xi. Wind shelter fence and chemical spraying shall be provided on the raw material stock piles.

xii. Design the ventilation system for adequate air changes as per prevailing norms for all tunnels, motor houses, Oil Cellars.

xiii. Pollution control system in the plant shall be provided as per the CREP Guidelines of CPCB.

xiv. The project proponent shall adopt the Clean Air practices like mechanical collectors, wet scrubbers, fabric filters (bag houses), electrostatic precipitators, combustion systems (thermal oxidizers), condensers, absorbers, adsorbers, and biological degradation. Controlling emissions related to transportation shall include emission controls on vehicles as well as use of cleaner fuels. Sufficient numbers of additional truck mounted Fog/Mist water cannons shall be procured and operated regularly inside the project premises and also in the surrounding villages to arrest suspended dust in the atmosphere.

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xv. Bag filters shall be cleaned regularly and efficiency of bag filter system shall be monitored at regular intervals.

xvi. Water Sprinklers/Water mist system shall be installed near raw material yards, operational units and other strategic locations to control fugitive emissions from the plant.

xvii. **The particulate matter emissions from the process stacks shall be less than 30 mg/Nm3. Efficient Air monitoring equipment shall be installed**.

xviii. Following additional arrangements to control fugitive dust shall be provided:

a. Fog / Mist Sprinklers at all on bulk raw material storage area (at the transfer points) like Iron Ore, Coal and for Fly Ash and similar solid waste storage areas.

b. Proper covered vehicle shall be used while transport of materials.

c. Wheel washing mechanism shall be provided in entry and exit gates with complete recirculation system.

xix. Briquetting and Jigging plant shall be installed in Ferro Alloys Plant.

xx. The PP shall minimize the evaporation losses in jigging operation to less than 10% using suitable advanced process.

xxi. The 4th hole extraction system shall be provided in the Sub Merged Arc Furnaces and EAF.

xxii. Industry is going to use silica quartz in large quantities and going to produce Silico Manganese and Ferro Silicon alloy steel. Therefore, it is necessary to control silica/quartz exposures at production Departments, not only emission norms as per Indian Factories Act. The permissible limit for silica/quartz should be within 10 mg/m3 for total dust as per Indian Factories Act. Therefore, it is recommended to monitor personal and area exposures for silica quartz dust in the process plants.

xxiii. The coal dust should be monitored at coal unloading, crushing, furnace areas and should be within 2 mg/m3, respirable dust fraction containing less than 5% quartz as per Indian Factories Act, 1948.

xxiv. Online stack monitoring system for IF and RHF shall be installed and monitoring report shall be submitted to the concerned Regional Office of the MoEF&CC & WBPCB along with the six monthly compliance report.

xxv. Low NOx Burners will be installed at Reheating Furnace for control of Gaseous emissions generated while using PNG.

xxvi. CO sensors with alarms must be installed in the Plant at strategic locations.

II. Water quality monitoring and preservation

i. The project proponent shall install 24x7 continuous effluent monitoring system with respect to standards prescribed in Environment (Protection) Rules 1986 as amended from time to time and connected to SPCB and CPCB online servers and calibrate thesesystems from time to time according to equipment supplier specification through labs recognized under Environment (Protection) Act, 1986 or NABL accreditedlaboratories.

ii. The project proponent shall monitor regularly ground water quality at least twice a year (pre- and post-monsoon) at sufficient numbers of piezometers/sampling wells inthe plant and adjacent areas through labs recognized under Environment (Protection)Act, 1986 and NABL accredited laboratories.

iii. Garland drains and collection pits shall be provided for each stock pile to arrest the run-off in the event of heavy rains and to check the water pollution due to surface runoff.

iv. Water meters shall be provided at the inlet to all unit processes in the plants.

Annexure – 3 to **CTE No. – WBPCB/5507693/2024**

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v. The project proponent shall make efforts to minimise water consumption in the plantcomplex by segregation of used water, practicing cascade use and by recycling treatedwater.

vi. The proposed project shall be designed as "Zero Liquid Discharge" Plant. ETP shall be installed and there shall be no discharge of effluent from the plant. Domestic effluent shall be treated in Sewage Treatment Plant. Suitable measures shall be adopted for sewage water handling to ensure no contamination of any kind of water body.

vii. All stockyards shall have impervious flooring and shall be equipped with water spraysystem for dust suppression. Stock yards shall also have garland drains and catch pitsto trap the run off material and shall be implemented.

viii. The project proponent shall provide the ETP for effluents of rolling mills to meet thestandards prescribed in G.S.R 277 (E) 31st March 2012 (applicable to IF/EAF) as amended from time to time.

ix. Air Cooled condensers shall be used in the captive power plant.

III. Noise monitoring and prevention

i. Noise pollution shall be monitored as per the prescribed Noise Pollution (Regulationand Control) Rules, 2000 and amendments thereof, and report in this regard shall be submitted to Regional Officer of the Ministry & WBPCB as a part of six-monthly compliance report.

ii. The ambient noise levels should conform to the standards prescribed under E(P)A Rules, 1986 viz. 75 dB(A) during day time and 70 dB(A) during night time.

iii. PP shall identify extreme hot areas through heat stress survey as well as noise monitoring within process plants to ensure that workers not exposed above 90 dBA levels as per Factories Act, 1948.

IV. Energy Conservation measures

i. Use torpedo ladle for hot metal transfer as far as possible. If ladles not used, provide covers for open top ladles.

ii. Restrict Gas flaring to < 1%.

iii. Provide solar power generation on roof tops of buildings, for solar light system for allcommon areas, street lights, parking around project area and maintain the same regularly;

iv. Provide LED lights in their offices and residential areas.

v. The project proponent shall provide waste heat recovery system (pre-heating ofcombustion air) at the flue gases of reheating furnaces.

vi. Practice hot charging of slabs and billets/blooms as far as possible.

vii. Ensure installation of regenerative type burners on all reheating furnaces.

viii. The project proponent shall provide waste heat recovery system on the DRI Kilns.

ix. The dolochar generated shall be used for power generation.

x. Tar shall be recovered from producer gas and shall be sold to registered processorsand phenolic water shall be incinerated in After Burn Chamber (ABC) of DRI kilns.

xi. The PP shall implement the guidelines on sponge iron plants issued by theCPCB/SPCB in this regard.

V. Waste management

i. Oil Collection pits shall be provided in oil cellars to collect and reuse/recycle spilledoil.

ii. Kitchen waste shall be composted or converted to biogas for further use.

iii. 100% utilization of fly ash shall be ensured. All the fly ash shall be provided to cementand brick manufacturers for further utilization and Memorandum of Understanding inthis regard shall be submitted to the Ministry's Regional Office & WBPCB.

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iv. The Plastic Waste Management Rules 2016, inter-alia, mandated banning of identifiedSingle Use Plastic (SUP) items with effect from 01/07/2022. In this regard, CPCB hasissued a direction to all the State Pollution Control Boards (SPCBs)/Pollution Control Committees (PCCs) on 30/06/2022 to ensure the compliance of Notification publishedby Ministry on 12/08/2021. The technical guidelines issued by the CPCB in this regardis available at https://cpcb.nic.in/technical-guidelines-3/. All the project proponents are hereby requested to sensitize and create awareness among people working withinthe Project area as well as its surrounding area on the ban of SUP in order to ensure the compliance of Notification published by this Ministry on 12/08/2021. A report, along with photographs, on the measures taken should be submitted.

v. A proper action plan must be implemented to dispose of the electronic waste generated in the industry.

vi. Solid waste utilization

a. PP shall install a slag crusher to convert steel slag into aggregate for use in construction industry, fine sand for use as flux in steel plant, sand in brick makingand as lime in cement making.

b. PP shall recycle/reuse solid waste generated in the plant as far as possible.

c. Used refractories shall be recycled as far as possible.

VI. Green Belt

i. The project proponent shall prepare GHG emissions inventory for the plant and shallsubmit the programme for reduction of the same including carbon sequestration by trees.

ii. Project proponent shall submit a study report on Decarbonisation program, which would essentially consist of company's carbon emissions, carbon budgeting/ balancing, carbon sequestration activities and carbon capture, use and storage and offsetting strategies. Further, the report shall also contain time bound action plan to reduce its carbon intensity of its operations and supply chains, energy transition pathway from fossil fuels to Renewable energy etc. All these activities/ assessments should be measurable and monitor able with defined time frames.

iii. Greening and Paving shall be implemented in the plant area to arrest soil erosion anddust pollution from exposed soil surface.

VII. Public hearing and Human health issues

i. Emergency preparedness plan based on the Hazard identification and Risk Assessment (HIRA) and Disaster Management Plan shall be implemented.

ii. The project proponent shall carry out heat stress analysis for the workmen who workin high temperature work zone and provide Personal Protection Equipment (PPE) as per the norms.

iii. Provision shall be made for the housing of construction labour within the site with allnecessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobileSTP. Safe drinking water, medical health care, creche etc. The housing may be in theform of temporary structures to be removed after the completion of the project.

iv. Occupational health surveillance of the workers shall be done on a regular basis and records maintained.

VIII. Environment Management

i. The project proponent shall comply with the provisions contained in this Ministry's OM vide F. No. 22-65/2017-IA.III dated 30/09/2020. As part of Corporate Environment Responsibility (CER) activity, company shall adopt nearby villages based on the socio-economic survey and undertake community developmental activities in consultation with the village Panchayat and the District Administration as committed.

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Special conditions issued to: **M/s Giridhan Metal Private Limited** located at Jamuria Industrial Estate, Village – Ikra & Damodarpur, Tehsil – Jamuria, Dist – Paschim Bardhaman, West Bengal (Expansion project).

ii. The company shall have a well laid down environmental policy duly approve by the Board of Directors. The environmental policy should prescribe for standard operatingprocedures to have proper checks and balances and to bring into focus any infringements/deviation/violation of the environmental / forest / wildlife norms / conditions. The company shall have defined system of reporting infringements / deviation / violation of the environmental / forest / wildlife norms / conditions and / or shareholders / stake holders. The copy of the board resolution in this regard shall be submitted to the MoEF&CC & WBPCB as a part of six-monthly report.

iii. A separate Environmental Cell both at the project and company head quarter level, with qualified personnel shall be set up under the control of senior Executive, who will directly to the head of the organization.

iv. Performance test shall be conducted on all pollution control systems every year and report shall be submitted to Integrated Regional Office of the MoEF&CC & WBPCB.

C) Miscellaneous

1. No additional machinery / equipment can be installed without permission from the Board.
2. All conditions of the Environmental Clearance issued by MoEF&CC, GoI **vide EC Identification no. EC24A1001WB5293926N, File No. IA-J-11011/366/2010-IA-II(IND-I) dated 15.07.2024** should be strictly complied with.
3. The PP has to obtain necessary land conversion from the competent authority for the entire project area prior to starting of construction activity.
4. The conveyor belt for transferring materials to be covered.
5. Good house-keeping to be maintained.
6. All requisite permissions / compliance / certificates / licenses from the Competent Authority shall be obtained.
7. Consent to Operate & Hazardous Waste Authorization to be obtained from the State Board before operation of the unit.
8. This NOC is valid up to **31/07/2031** for setting up the proposed project.

Qualissure Laboratory Services

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TC-6271

DOC NO : QLS/SAMP/08-B/00

TEST REPORT

Name & Address Of the Customer :		
M/s. Giridhan Metal Pvt. Ltd. Jamuria Industrial Estate, Damodarpur, Jamuria P.O. - Nandi, Paschim Bardhaman, Pin : 713 344	Report No. Date Sample No. Sample Description Date of Performance(s) Sample Mark Ref No. Date	: QLS/24/A/25-26/C/43 : 07.11.2025 : QLS/24/A/25-26/43 : Stack Flue Gas : 31.10.2025-06.11.2025 : SEAF-1 (2 X 5.5 MVA) : 9400000031, Dated-27.05.2024

Analysis Result

Date & Time of Sampling : 27.10.2025 at 11:00 hrs. Sampling done by : S.Poddar	Sampling Procedures : EPA/IS		
A : General Information of Stack:			
1 Stack connected to	: SEAF-1 (2 X 5.5 MVA)		
2 Emission due to	: Reduction Of Mn Ore & Quartz		
3 Material of construction of Stack	: M.S		
4 Shape of Stack	: Circular		
5 Whether stack is provided with permanent platform	: Yes		
6 Generation Capacity	: ----		
B : Physical Characteristic of Stack:			
1 Height of Stack from ground level	: 40.0 m		
2 Diameter of Stack at bottom	: ----		
3 Diameter of Stack at sampling point	: 1.8 m		
4 Height of the sampling point from ground level	: 27.0 m		
5 Area of Stack	: 2.54 m^2		
C : Analysis/Characteristic of Stack:			
1 Fuel used : ----	2. Fuel consumption : ----		
D : Results of Sampling & Analysis of gaseous Emission:	**RESULT**	**METHOD**	**LIMIT**
1 Temperature of emission (°C)	: 78	EPA Part 2	---
2 Barometric pressure (mm of Hg)	: 754	EPA Part 2	---
3 Velocity of gas (m/sec)	: 10.68	EPA Part 2	---
4 Quantity of gas flow (Nm^3/hr)	: 82483	EPA Part 2	---
5 Concentration of Carbon monoxide(%v/v)	: <0.2	IS:13270-1992, Reaf : 2019	---
6 Concentration of Carbon dioxide(%v/v)	: <0.2	IS:13270-1992, Reaf : 2019	---
7 Concentration of Sulphur dioxide (mg/Nm^3)	: 77.9	EPA Part-6	---
8 Concentration of Oxides of Nitrogen (mg/Nm^3)	: 42.2	EPA Part-7	---
9 Concentration of Particulate Matters (mg/Nm^3)	: 14	EPA Part 5	30
E : Pollution Control Device :			
Details of pollution control devices attached with the stack	: Bag Filter		
F : Remarks: Nil			
Note: 1) Equipment Name/ID	: Stack Sampler & Velocity Monitor		
2) Model No	: APM-160		
3) Make-	: Lata Envirotech Services		
4) Sl No-	: 82-DTF-2016		
5) Calibration valid Up to	: 07.08.2026		

Report Prepared By :

for Qualissure Laboratory Services
Reviewed & Authorized By

Benimadhab Gorai, Chemist
(Authorized Signatory)

----- End of the Report-----

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Qualissure Laboratory Services

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DOC NO : QLS/SAMP/08-B/00

TEST REPORT

Name & Address Of the Customer :		
M/s. Giridhan Metal Pvt. Ltd. Jamuria Industrial Estate, Damodarpur, Jamuria P.O. - Nandi, Paschim Bardhaman, Pin : 713 344	Report No. Date Sample No. Sample Description Date of Performance(s) Sample Mark Ref No. Date	: QLS/24/A/25-26/C/44 : 07.11.2025 : QLS/24/A/25-26/44 : Stack Flue Gas : 31.10.2025-06.11.2025 : SEAF-2 (1 X 5.5 MVA) : 9400000031, Dated-27.05.2024

Analysis Result

Date & Time of Sampling : 27.10.2025 at 12:45 hrs. | Sampling Procedures : EPA/IS
Sampling done by : S.Poddar

A : General Information of Stack:				
1	Stack connected to	: SEAF -2 (1 X 5.5 MVA)		
2	Emission due to	: Reduction Of Mn Ore & Quartz		
3	Material of construction of Stack	: M.S		
4	Shape of Stack	: Circular		
5	Whether stack is provided with permanent platform	: Yes		
6	Generation Capacity	: ----		
B : Physical Characteristic of Stack:				
1	Height of Stack from ground level	: 40.0 m		
2	Diameter of Stack at bottom	: ----		
3	Diameter of Stack at sampling point	: 1.8 m		
4	Height of the sampling point from ground level	: 27.0 m		
5	Area of Stack	: 2.54 m^2		
C : Analysis/Characteristic of Stack:				
1	Fuel used : ----	2. Fuel consumption : ----		
D : Results of Sampling & Analysis of gaseous Emission:		**RESULT**	**METHOD**	**LIMIT**
1	Temperature of emission (°C)	: 87	EPA Part 2	---
2	Barometric pressure (mm of Hg)	: 754	EPA Part 2	---
3	Velocity of gas (m/sec)	: 11.37	EPA Part 2	---
4	Quantity of gas flow (Nm^3/hr)	: 85618	EPA Part 2	---
5	Concentration of Carbon monoxide(%v/v)	: <0.2	IS:13270-1992, Reaf : 2019	---
6	Concentration of Carbon dioxide(%v/v)	: <0.2	IS:13270-1992, Reaf : 2019	---
7	Concentration of Sulphur dioxide (mg/Nm^3)	: 37.4	EPA Part-6	---
8	Concentration of Oxides of Nitrogen (mg/Nm^3)	: 72.2	EPA Part-7	---
9	Concentration of Particulate Matters (mg/Nm^3)	: 28	EPA Part 5	30
E : Pollution Control Device :				
	Details of pollution control devices attached with the stack	: Bag Filter		
F : Remarks: Nil				
Note: 1) Equipment Name/ID		: Stack Sampler & Velocity Monitor		
2) Model No		: APM-160		
3) Make-		: Lata Envirotech Services		
4) Sl No-		: 82-DTF-2016		
5) Calibration valid Up to		: 07.08.2026		

Report Prepared By :

for **Qualissure Laboratory Services**
Reviewed & Authorized By

Benimadhab Gorai, Chemist
(Authorized Signatory)

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DOC NO : QLS/SAMP/08-B/00

TEST REPORT

Name & Address Of the Customer :		
M/s. Giridhan Metal Pvt. Ltd. Jamuria Industrial Estate, Damodarpur, Jamuria P.O. - Nandi, Paschim Bardhaman, Pin : 713 344	Report No. Date Sample No. Sample Description Date of Performance(s) Sample Mark Ref No. Date	: QLS/24/A/25-26/C/45 : 07.11.2025 : QLS/24/A/25-26/45 : Stack Flue Gas : 31.10.2025-06.11.2025 : DRI-350 TPD & 600 TPD : 9400000031, Dated-27.05.2024

Analysis Result

Date & Time of Sampling : 27.10.2025 at 13:30 hrs.
Sampling done by : S.Poddar
Sampling Procedures : EPA/IS

A : General Information of Stack:

1	Stack connected to	: 600 TPD & 350 TPD DRI attached with common stack through WHRB
2	Emission due to	: Combustion of Coal & Reduction of Fe Ore
3	Material of construction of Stack	: RCC
4	Shape of Stack	: Circular
5	Whether stack is provided with permanent platform	: Yes
6	Generation Capacity	: Rated – 350 TPD & 600 TPD

B : Physical Characteristic of Stack:

1	Height of Stack from ground level	: 80.0 m
2	Diameter of Stack at bottom	: ----
3	Diameter of Stack at sampling point	: 4.0 m
4	Height of the sampling point from ground level	: 35.0 m
5	Area of Stack	: 12.57 m^2

C : Analysis/Characteristic of Stack:

1 Fuel used : Coal 2. Fuel consumption : ----

D : Results of Sampling & Analysis of gaseous Emission:

		RESULT	METHOD	LIMIT
1	Temperature of emission (°C)	: 120	EPA Part 2	---
2	Barometric pressure (mm of Hg)	: 754	EPA Part 2	---
3	Velocity of gas (m/sec)	: 11.21	EPA Part 2	---
4	Quantity of gas flow (Nm^3/hr)	: 381666	EPA Part 2	---
5	Concentration of Carbon monoxide(%v/v)	: <0.2	IS:13270-1992, Reaf : 2019	---
6	Concentration of Carbon dioxide(%v/v)	: 5.4	IS:13270-1992, Reaf : 2019	---
7	Concentration of Sulphur dioxide (mg/Nm^3)	: 60.9	EPA Part-6	100
8	Concentration of Oxides of Nitrogen (mg/Nm^3)	: 72.9	EPA Part-7	100
9	Concentration of Particulate Matters (mg/Nm^3)	: 23 at 6 % of CO_2	EPA Part 5	30

E : Pollution Control Device :
Details of pollution control devices attached with the stack : ESP

F : Remarks: Nil

Note:		
1)	Equipment Name/ID	: Stack Sampler & Velocity Monitor
2)	Model No	: APM-160
3)	Make-	: Lata Envirotech Services
4)	Sl No-	: 82-DTF-2016
5)	Calibration valid Up to	: 07.08.2026

Report Prepared By :

for Qualissure Laboratory Services
Reviewed & Authorized By

Benimadhab Gorai, Chemist
(Authorized Signatory)

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DOC NO : QLS/SAMP/08-B/00

TEST REPORT

Name & Address Of the Customer :		
M/s. Giridhan Metal Pvt. Ltd. Jamuria Industrial Estate, Damodarpur, Jamuria P.O. - Nandi, Paschim Bardhaman, Pin : 713 344	Report No. Date Sample No. Sample Description Date of Performance(s) Sample Mark Ref No. Date	: QLS/24/A/25-26/C/46 : 07.11.2025 : QLS/24/A/25-26/46 : Stack Flue Gas : 31.10.2025-06.11.2025 : SMS : 9400000031, Dated-27.05.2024

Analysis Result

Date & Time of Sampling : 29.10.2025 at 10:45 hrs.
Sampling done by : S.Poddar

Sampling Procedures : EPA/IS

A : General Information of Stack:				
1	Stack connected to	: SMS (No. of Furnace-1,2,3,4,5,6)		
2	Emission due to	: Melting of Scrap Materials		
3	Material of construction of Stack	: M.S		
4	Shape of Stack	: Circular		
5	Whether stack is provided with permanent platform	: Yes		
6	Generation Capacity	: 20 X 6 Ton		
B : Physical Characteristic of Stack:				
1	Height of Stack from ground level	: 30.0 m		
2	Diameter of Stack at bottom	: ----		
3	Diameter of Stack at sampling point	: 3.79 m		
4	Height of the sampling point from ground level	: 18.0 m (Appx.)		
5	Area of Stack	: 11.28 m^2		
C : Analysis/Characteristic of Stack:				
1	Fuel used : ----	2. Fuel consumption : ----		
D : Results of Sampling & Analysis of gaseous Emission:		**RESULT**	**METHOD**	**LIMIT**
1	Temperature of emission (°C)	: 60	EPA Part 2	---
2	Barometric pressure (mm of Hg)	: 754	EPA Part 2	---
3	Velocity of gas (m/sec)	: 9.37	EPA Part 2	---
4	Quantity of gas flow (Nm^3/hr)	: 337922	EPA Part 2	---
5	Concentration of Carbon monoxide(%v/v)	: <0.2	IS:13270-1992, Reaf : 2019	---
6	Concentration of Carbon dioxide(%v/v)	: <0.2	IS:13270-1992, Reaf : 2019	---
7	Concentration of Sulphur dioxide (mg/Nm^3)	: ----	EPA Part-6	---
8	Concentration of Oxides of Nitrogen (mg/Nm^3)	: ----	EPA Part-7	---
9	Concentration of Particulate Matters (mg/Nm^3)	: 16	EPA Part 5	30
E : Pollution Control Device :				
	Details of pollution control devices attached with the stack	: Bag Filter		
F : Remarks: Nil				
Note: 1) Equipment Name/ID		: Stack Sampler & Velocity Monitor		
2) Model No		: APM-160		
3) Make-		: Lata Envirotech Services		
4) Sl No-		: 82-DTF-2016		
5) Calibration valid Up to		: 07.08.2026		

Report Prepared By :

for Qualissure Laboratory Services
Reviewed & Authorized By

Benimadhab Gorai, Chemist
(Authorized Signatory)

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TC-6271

DOC NO : QLS/SAMP/08-B/00

TEST REPORT

Name & Address Of the Customer :		
M/s. Giridhan Metal Pvt. Ltd. Jamuria Industrial Estate, Damodarpur, Jamuria P.O. - Nandi, Paschim Bardhaman, Pin : 713 344	Report No. Date Sample No. Sample Description Date of Performance(s) Sample Mark Ref No. Date	: QLS/24/A/25-26/C/47 : 07.11.2025 : QLS/24/A/25-26/47 : Stack Flue Gas : 31.10.2025-06.11.2025 : CFBC Boiler : 9400000031, Dated-27.05.2024

Analysis Result

Date & Time of Sampling : 29.10.2025 at 12:10 hrs. Sampling done by : S.Poddar	Sampling Procedures : EPA/IS		
A : General Information of Stack:			
1 Stack connected to	: CFBC Boiler		
2 Emission due to	: Combustion of Coal		
3 Material of construction of Stack	: RCC		
4 Shape of Stack	: Circular		
5 Whether stack is provided with permanent platform	: Yes		
6 Generation Capacity	: 32 TPH		
B : Physical Characteristic of Stack:			
1 Height of Stack from ground level	: 80.0 m		
2 Diameter of Stack at bottom	: ----		
3 Diameter of Stack at sampling point	: 2.0 m		
4 Height of the sampling point from ground level	: 35.0 m		
5 Area of Stack	: 3.14 m^2		
C : Analysis/Characteristic of Stack:			
1 Fuel used : Coal	2. Fuel consumption : ----		
D : Results of Sampling & Analysis of gaseous Emission:	**RESULT**	**METHOD**	**LIMIT**
1 Temperature of emission (^oC)	: 140	EPA Part 2	---
2 Barometric pressure (mm of Hg)	: 754	EPA Part 2	---
3 Velocity of gas (m/sec)	: 10.37	EPA Part 2	---
4 Quantity of gas flow (Nm^3/hr)	: 83966	EPA Part 2	---
5 Concentration of Carbon monoxide(%v/v)	: <0.2	IS:13270-1992, Reaf : 2019	---
6 Concentration of Carbon dioxide(%v/v)	: 8.4	IS:13270-1992, Reaf : 2019	---
7 Concentration of Sulphur dioxide (mg/Nm^3)	: 91.1 at 6% O_2	EPA Part-6	100
8 Concentration of Oxides of Nitrogen (mg/Nm^3)	: 77.8 at 6% O_2	EPA Part-7	100
9 Concentration of Mercury ($\mu g/Nm^3$)	: <0.1	EPA Part-29	30
10 Concentration of Particulate Matters (mg/Nm^3)	: 24 at 6% O_2	EPA Part 5	30
E : Pollution Control Device :			
Details of pollution control devices attached with the stack	: ESP		
F : Remarks: Nil			
Note: 1) Equipment Name/ID	: Stack Sampler & Velocity Monitor		
2) Model No	: APM-160		
3) Make-	: Lata Envirotech Services		
4) Sl No-	: 82-DTF-2016		
5) Calibration valid Up to	: 07.08.2026		

Report Prepared By :

for **Qualissure Laboratory Services**
Reviewed & Authorized By

Benimadhab Gorai, Chemist
(Authorized Signatory)

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TC-6271

DOC NO : QLS/SAMP/08-B/00

TEST REPORT

Name & Address Of the Customer :		
M/s. Giridhan Metal Pvt. Ltd.	Report No.	: QLS/24/A/25-26/C/48
Jamuria Industrial Estate,	Date	: 07.11.2025
Damodarpur, Jamuria	Sample No.	: QLS/24/A/25-26/48
P.O. - Nandi,	Sample Description	: Stack Flue Gas
Paschim Bardhaman,	Date of Performance(s)	: 31.10.2025-06.11.2025
Pin : 713 344	Sample Mark	: Product Handling & Separation House
	Ref No. Date	: 9400000031, Dated-27.05.2024

Analysis Result

Date & Time of Sampling : 29.10.2025 at 14:00 hrs.
Sampling done by : S.Poddar

Sampling Procedures : EPA/IS

A : General Information of Stack:

1	Stack connected to	: Product Handling & Separation House of DRI 350 & 600 TPD
2	Emission due to	: Process Activity
3	Material of construction of Stack	: M.S
4	Shape of Stack	: Circular
5	Whether stack is provided with permanent platform	: Yes
6	Generation Capacity	: ----

B : Physical Characteristic of Stack:

1	Height of Stack from ground level	: 30.0 m
2	Diameter of Stack at bottom	: ----
3	Diameter of Stack at sampling point	: 1.7 m
4	Height of the sampling point from ground level	: 25.0 m (Approx)
5	Area of Stack	: 2.2707 m^2

C : Analysis/Characteristic of Stack:

1 Fuel used : ---- 2. Fuel consumption : ----

D : Results of Sampling & Analysis of gaseous Emission:

		RESULT	METHOD	LIMIT
1	Temperature of emission (°C)	: 48	EPA Part 2	---
2	Barometric pressure (mm of Hg)	: 754	EPA Part 2	---
3	Velocity of gas (m/sec)	: 10.54	EPA Part 2	---
4	Quantity of gas flow (Nm^3/hr)	: 79373	EPA Part 2	---
5	Concentration of Carbon monoxide(%v/v)	: <0.2	IS:13270-1992, Reaf : 2019	---
6	Concentration of Carbon dioxide(%v/v)	: <0.2	IS:13270-1992, Reaf : 2019	---
7	Concentration of Sulphur dioxide (mg/Nm^3)	: ----	EPA Part-6	---
8	Concentration of Oxides of Nitrogen (mg/Nm^3)	: ----	EPA Part-7	---
9	Concentration of Particulate Matters (mg/Nm^3)	: 17	EPA Part 5	30

E : Pollution Control Device :

Details of pollution control devices attached with the stack : Bag Filter

F : Remarks: Nil

Note: 1) Equipment Name/ID : Stack Sampler & Velocity Monitor
2) Model No : APM-160
3) Make- : Lata Envirotech Services
4) Sl No- : 82-DTF-2016
5) Calibration valid Up to : 06.08.2026

Report Prepared By :

for Qualissure Laboratory Services
Reviewed & Authorized By

Benimadhab Gorai, Chemist
(Authorized Signatory)

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TC-6271

DOC NO : QLS/SAMP/08-A/00

TEST REPORT

Name & Address Of the Customer :		
M/s. Giridhan Metal Pvt. Ltd. Jamuria Industrial Estate, Damodarpur, Jamuria P.O.- Nandi, Paschim Bardhaman, Pin : 713 344	Report No. Date Sample No. Sample Description Date of Performance(s) Sample Mark Ref No. Date	: QLS/24/A/25-26/C/33 : 07.11.2025 : QLS/24/A/25-26/33 : Ambient Air : 30.10-06.11.2025 : Near Old Admin Building : 9400000240, Dated-05.04.2025

Analysis Result

Location : Near Old Admin Building			Date of sampling : 27-28.10.2025	
Sampling Done by: D. Sahoo/ P.Mandal			Sampling done as per : CPCB Guidelines (Volume-1)	
Environmental Condition : Clear and Sunny				
Sl. No.	**POLLUTANT**	**RESULT**	**LIMIT**	**METHOD OF TEST REFERENCE**
1	Particulate matter (<10µm) in µg/m³	76	100	IS 5182 (Part-23) Reff 2022
2	Particulate matter (<2.5µm) in µg/m³	38	60	IS 5182 (Part-24) Reff 2024
3	Sulphur dioxide (SO_2) in µg/m³	6.7	80	IS 5182(Part -2) Reff 2023
4	Nitrogen dioxide (NO_2) in µg/m³	25.7	80	IS 5182 (Part -6) Reff 2017
5	Carbon Monoxide (CO) in mg /m³	0.755	2	IS 5182 (Part -10) Reff 2019
6	Ammonia (NH_3) in µg/m³	27.4	400	IS 5182 (Part-25) Reff 2018
7	Ozone (O_3) in µg/m³	31.6	180	IS 5182 (Part-9) Reff 2019
8	Lead (Pb) in µg/m³	0.02	1	IS 5182 (Part-22) Reff 2019
9	Nickel (Ni) in ng/m³	5.1	20	IS 5182 (Part-26) Reff 2020
10	Arsenic (As) in ng/m³	<1.0	6	Air Sampling, 3rd Edn. Method 402 and APHA 23rd Edition Part 3114B
11	Benzene (C_6H_6) in µg/m³	<2.0	5	IS 5182 (Part-11) Reff 2022
12	Benzo (a) pyrene in ng/m³	<1.0	1	IS 5182 (Part-12) Reff 2019
NOTE: Limit as per CPCB notification, New Delhi, 18th November 2009, for Ambient air quality.				

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for **Qualissure Laboratory Services**
Reviewed & Authorized By

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(Authorized Signatory)

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TC-6271

DOC NO : QLS/SAMP/08-A/00

TEST REPORT

Name & Address Of the Customer :		
M/s. Giridhan Metal Pvt. Ltd. Jamuria Industrial Estate, Damodarpur, Jamuria P.O.- Nandi, Paschim Bardhaman, Pin : 713 344	Report No. Date Sample No. Sample Description Date of Performance(s) Sample Mark Ref No. Date	: QLS/24/A/25-26/C/34 : 07.11.2025 : QLS/24/A/25-26/34 : Ambient Air : 30.10-06.11.2025 : Near Ferro Office : 9400000240, Dated-05.04.2025

Analysis Result

Location : Near Ferro Office	Date of sampling : 27-28.10.2025
Sampling Done by: D. Sahoo/ P.Mandal	Sampling done as per : CPCB Guidelines (Volume-1)
Environmental Condition : Clear and Sunny	

Sl. No.	POLLUTANT	RESULT	LIMIT	METHOD OF TEST REFERENCE
1	Particulate matter (<10µm) in µg/m³	87	100	IS 5182 (Part-23) Reff 2022
2	Particulate matter (<2.5µm) in µg/m³	55	60	IS 5182 (Part-24) Reff 2024
3	Sulphur dioxide (SO_2) in µg/m³	8.4	80	IS 5182(Part -2) Reff 2023
4	Nitrogen dioxide (NO_2) in µg/m³	28.1	80	IS 5182 (Part -6) Reff 2017
5	Carbon Monoxide (CO) in mg /m³	0.972	2	IS 5182 (Part -10) Reff 2019
6	Ammonia (NH_3) in µg/m³	29.1	400	IS 5182 (Part-25) Reff 2018
7	Ozone (O_3) in µg/m³	35.3	180	IS 5182 (Part-9) Reff 2019
8	Lead (Pb) in µg/m³	0.04	1	IS 5182 (Part-22) Reff 2019
9	Nickel (Ni) in ng/m³	6.3	20	IS 5182 (Part-26) Reff 2020
10	Arsenic (As) in ng/m³	<1.0	6	Air Sampling, 3rd Edn. Method 402 and APHA 23rd Edition Part 3114B
11	Benzene (C_6H_6) in µg/m³	<2.0	5	IS 5182 (Part-11) Reff 2022
12	Benzo (a) pyrene in ng/m³	<1.0	1	IS 5182 (Part-12) Reff 2019

NOTE: Limit as per CPCB notification, New Delhi, 18th November 2009, for Ambient air quality.

Report Prepared By :

for **Qualissure Laboratory Services**
Reviewed & Authorized By

Benimadhab Gorai, Chemist
(Authorized Signatory)

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TC-6271

DOC NO : QLS/SAMP/08-A/00

TEST REPORT

Name & Address Of the Customer : **M/s. Giridhan Metal Pvt. Ltd.** Jamuria Industrial Estate, Damodarpur, Jamuria P.O.- Nandi, Paschim Bardhaman, Pin : 713 344	Report No. Date Sample No. Sample Description Date of Performance(s) Sample Mark Ref No. Date	: QLS/24/A/25-26/C/35 : 07.11.2025 : QLS/24/A/25-26/35 : Ambient Air : 30.10-06.11.2025 : ETP Plant : 9400000240, Dated-05.04.2025

Analysis Result

Location : ETP Plant	Date of sampling : 28-29.10.2025
Sampling Done by: D. Sahoo/ P.Mandal	Sampling done as per : CPCB Guidelines (Volume-1)
Environmental Condition : Clear and Sunny	

Sl. No.	POLLUTANT	RESULT	LIMIT	METHOD OF TEST REFERENCE
1	Particulate matter (<10µm) in µg/m³	68	100	IS 5182 (Part-23) Reff 2022
2	Particulate matter (<2.5µm) in µg/m³	34	60	IS 5182 (Part-24) Reff 2024
3	Sulphur dioxide (SO_2) in µg/m³	6.1	80	IS 5182(Part -2) Reff 2023
4	Nitrogen dioxide (NO_2) in µg/m³	24.8	80	IS 5182 (Part -6) Reff 2017
5	Carbon Monoxide (CO) in mg /m³	0.686	2	IS 5182 (Part -10) Reff 2019
6	Ammonia (NH_3) in µg/m³	26.7	400	IS 5182 (Part-25) Reff 2018
7	Ozone (O_3) in µg/m³	29.7	180	IS 5182 (Part-9) Reff 2019
8	Lead (Pb) in µg/m³	<0.02	1	IS 5182 (Part-22) Reff 2019
9	Nickel (Ni) in ng/m³	4.8	20	IS 5182 (Part-26) Reff 2020
10	Arsenic (As) in ng/m³	<1.0	6	Air Sampling, 3rd Edn. Method 402 and APHA 23rd Edition Part 3114B
11	Benzene (C_6H_6) in µg/m³	<2.0	5	IS 5182 (Part-11) Reff 2022
12	Benzo (a) pyrene in ng/m³	<1.0	1	IS 5182 (Part-12) Reff 2019

NOTE: Limit as per CPCB notification, New Delhi, 18th November 2009, for Ambient air quality.

Report Prepared By :

for **Qualissure Laboratory Services**
Reviewed & Authorized By

Benimadhab Gorai, Chemist
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----- *End of the Report*-----

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TC-6271

DOC No. -QLS/SAMP/01-A/00

TEST REPORT

Name & Address Of the Customer : **M/s. Giridhan Metal Pvt. Ltd.** Jamuria Industrial Estate, Damodarpur, Jamuria P.O.- Nandi, Paschim Bardhaman, Pin : 713 344	Report No.	: QLS/24/A/25-26/C/36-41
	Date	: 07.11.2025
	Sample No.	: QLS/24/A/25-26/36-41
	Date of Performance(s)	: 30.10-06.11.2025
	Sample Description	: Fugitive Air
	Ref No. Date	: 9400000240, Dated-05.04.2025

Analysis Result of Fugitive Air

Sampling Done by: D.Sahoo/P.Mandal		Sampling done as per : CPCB Guidelines (Volume-1)	
Environmental Condition : Clear and Sunny			
Sample No.	**Location**	**Date of Sampling**	**(RPM) in µg/m³**
36	NEAR I BIN AREA (600 TPD DRI)	27.10.2025	601
37	Product House (Common 350 TPD DRI & 600 TPD DRI)		531
38	Near CPP Area		706
39	Cooler Discharge Area (350 TPD DRI)		597
40	Near Ferro Plant Area	28.10.2025	541
41	CHP Area (CPP)		915
NOTE:- Nil			

Report Prepared By :

for Qualissure Laboratory Services
Reviewed & Authorized By

Benimadhab Gorai, Chemist
(Authorized Signatory)

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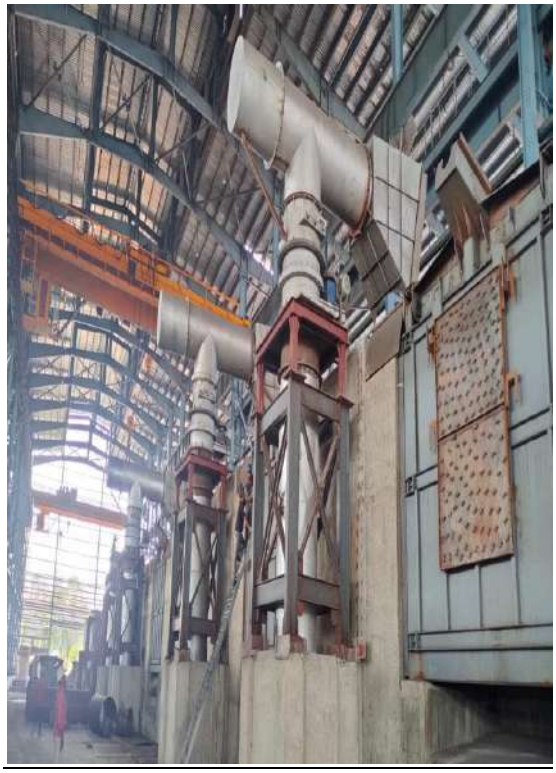
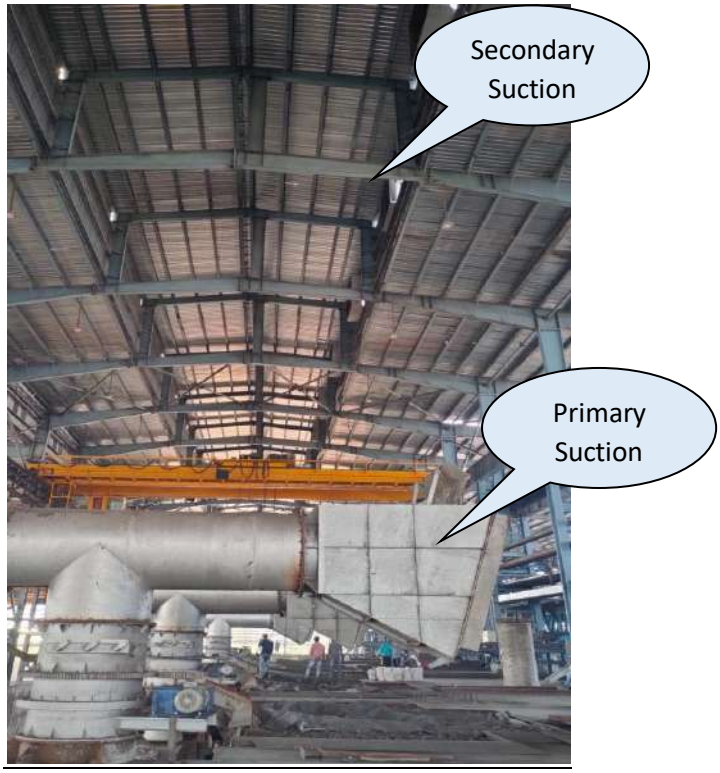
5 field ESP connected with 350 TPD DRI through WHRB

5 field ESP connected with 600 TPD DRI through WHRB

Bag Filter connected with 2x9 MVA SEAF

5 field ESP for CFBC Boiler



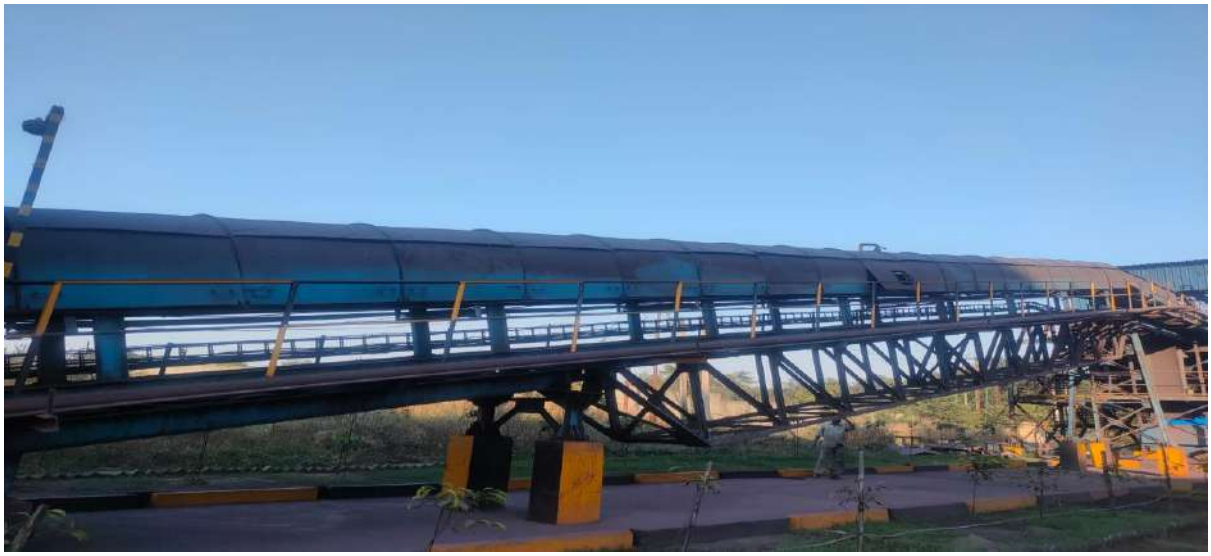


Bag Filter for Steel Smelting Shop

Bag filter connected with CD & I-Bin of 300 TPD DRI

Bag filter connected with CD & I-bin of 600 TPD DRI

Bag Filter Connected with DRI 300 & 600 TPD (product separation & dispatch



Closed Conveyor for raw materials handling

Pneumatic dust conveying system for fine dust

Dry fog system installed in coal handling system

Road sweeping machine to control fugitive dust from road during transportation

Raw material storage shed

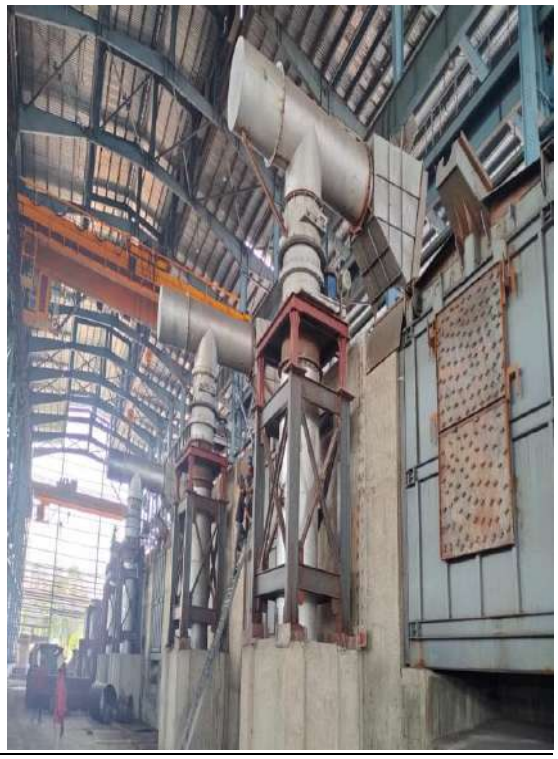
Water tanker for sprinkling on road of project site

Water Sprinkler on road of plant site

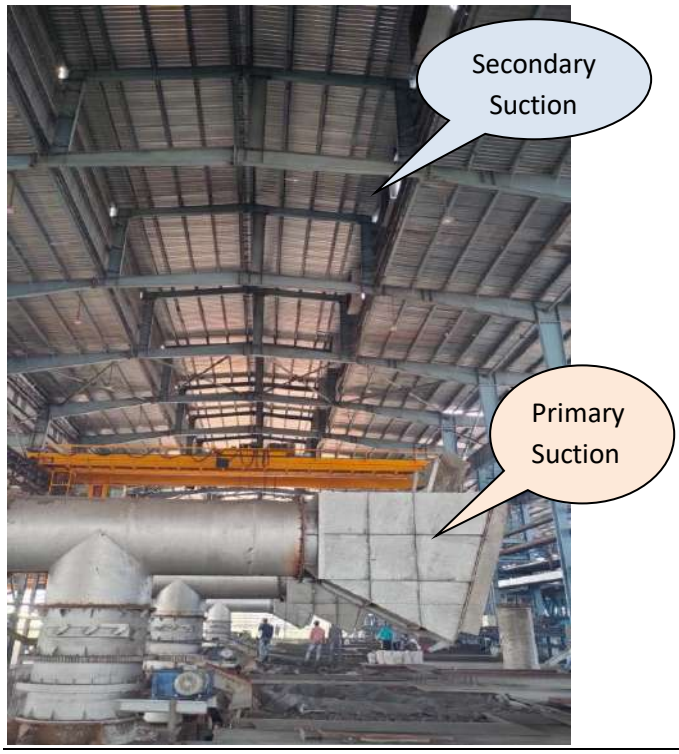
Covered raw material handling

Primary & Secondary Extraction System connected with 06x20T Induction Furnace

Bag filter with chimney connected with 6x20T Induction Furnace



Induction furnace connected with primary hood



Primary & secondary suction connected with induction

.

Water Sprinkler

Jigging Plant

Furnace – 1

Furnace - 2

Qualissure Laboratory Services

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Email :qualissure@gmail.com; info@qualissure.com ; Mob.No. 98312 87086 ; 9830093976 TC-6271

DOC NO : QLS/SAMP/08-B/00

TEST REPORT

Name & Address Of the Customer :		
M/s. Giridhan Metal Pvt. Ltd. Jamuria Industrial Estate, Damodarpur, Jamuria P.O. - Nandi, Paschim Bardhaman, Pin : 713 344	Report No. Date Sample No. Sample Description Date of Performance(s) Sample Mark Ref No. Date	: QLS/24/A/25-26/C/46 : 07.11.2025 : QLS/24/A/25-26/46 : Stack Flue Gas : 31.10.2025-06.11.2025 : SMS : 9400000031, Dated-27.05.2024

Analysis Result

Date & Time of Sampling : 29.10.2025 at 10:45 hrs.
Sampling done by : S.Poddar

Sampling Procedures : EPA/IS

A : General Information of Stack:				
1	Stack connected to	: SMS (No. of Furnace-1,2,3,4,5,6)		
2	Emission due to	: Melting of Scrap Materials		
3	Material of construction of Stack	: M.S		
4	Shape of Stack	: Circular		
5	Whether stack is provided with permanent platform	: Yes		
6	Generation Capacity	: 20 X 6 Ton		
B : Physical Characteristic of Stack:				
1	Height of Stack from ground level	: 30.0 m		
2	Diameter of Stack at bottom	: ----		
3	Diameter of Stack at sampling point	: 3.79 m		
4	Height of the sampling point from ground level	: 18.0 m (Appx.)		
5	Area of Stack	: 11.28 m^2		
C : Analysis/Characteristic of Stack:				
1	Fuel used : ----	2. Fuel consumption : ----		
D : Results of Sampling & Analysis of gaseous Emission:		**RESULT**	**METHOD**	**LIMIT**
1	Temperature of emission (°C)	: 60	EPA Part 2	---
2	Barometric pressure (mm of Hg)	: 754	EPA Part 2	---
3	Velocity of gas (m/sec)	: 9.37	EPA Part 2	---
4	Quantity of gas flow (Nm^3/hr)	: 337922	EPA Part 2	---
5	Concentration of Carbon monoxide(%v/v)	: <0.2	IS:13270-1992, Reaf : 2019	---
6	Concentration of Carbon dioxide(%v/v)	: <0.2	IS:13270-1992, Reaf : 2019	---
7	Concentration of Sulphur dioxide (mg/Nm^3)	: ----	EPA Part-6	---
8	Concentration of Oxides of Nitrogen (mg/Nm^3)	: ----	EPA Part-7	---
9	Concentration of Particulate Matters (mg/Nm^3)	: 16	EPA Part 5	30
E : Pollution Control Device :				
	Details of pollution control devices attached with the stack	: Bag Filter		
F : Remarks: Nil				
Note: 1) Equipment Name/ID		: Stack Sampler & Velocity Monitor		
2) Model No		: APM-160		
3) Make-		: Lata Envirotech Services		
4) Sl No-		: 82-DTF-2016		
5) Calibration valid Up to		: 07.08.2026		

Report Prepared By :

for Qualissure Laboratory Services
Reviewed & Authorized By

Benimadhab Gorai, Chemist
(Authorized Signatory)

----- End of the Report-----

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TC-6271

DOC NO : QLS/SAMP/08-D/00

TEST REPORT

Name & Address Of the Customer : **M/s. Giridhan Metal Pvt. Ltd.** Jamuria Industrial Estate, Damodarpur, Jamuria P.O.- Nandi, Paschim Bardhaman, Pin : 713 344	ULR No. Report No. Date Sample No. Sample Description Sample Mark/Location Sample Drawn On Date of Performance(s) Sampling Method Ref No. Date	: TC627125000004498F : QLS/24/W/25-26/C/520 : 08.11.2025 : QLS/24/W/25-26/520 : Ground Water : Ikra Village Borewell : 24.10.2025 : 30.10.2025-07.11.2025 : IS 17614(P-5 & P-25) 2021 & 2022 : 9400000240, Dated-05.04.2025

Analysis Result

(A) Microbiological Analysis

Sl.No.	Characteristic	Limit as Per IS 10500 :2012 Amd. 2	Test Method	Result
1.	E.Coli/100ml	Not Detectable	IS 15185-2016 (RA 2021)	Not Detected
2.	Total Coliform Bacteria/100ml	Not Detectable	IS 15185-2016 (RA 2021)	Not Detected
3.	Faecal Coliform/100ml	---	IS 1622-1981 (RA 2019)	<2

(B) Chemical Analysis

Sl.No.	Test Parameter	Test Method	As per Drinking Water Standard: IS:10500, 2012 Amd. 1 , 2& 3		Result
			Acceptable Limit	Permissible Limit	
1.	Colour in Hazen Units	IS 3025 (Part 4): 2021	5	15	<5
2.	Odour	IS 3025(Part 5)- 2018	Agreeable	Agreeable	Agreeable
3.	Taste	IS 3025 : Part 8 : 2023	Agreeable	Agreeable	Agreeable
4.	pH Value at 25°C	IS 3025 (Part 11) 2022	6.5-8.5	No Relaxation	7.63
5.	Turbidity in NTU	IS 3025 (Part 10) 2023	1	5	<1.0
6.	Total Dissolved Solids (as TDS) in mg/l	IS 3025(Part 16) 2023	500	2000	492
7.	Aluminium (as Al) in mg/l	IS 15302: 2003 (RA 2019)	0.03	0.2	<0.01
8.	Ammonia as NH_3 in mg/l	IS 3025 (Part 34): 1988;RA:2019	0.5	No Relaxation	<0.1
9.	Anionic Detergents(as MBAS) in mg/l	IS 13428-2005(Annex K) ; RA:2018	0.2	1.0	<0.02
10.	Boron(as B) in mg/l	IS 13428-2005(Annex L); RA:2018	0.5	2.4	<0.5
11.	Calcium(as Ca) in mg/l	IS 3025 (Part 40) 2024	75	200	90.3
12.	Chloride(as Cl) in mg/l	IS 3025 (Part 32)-1988, RA: 2019	250	1000	83.5
13.	Copper(as Cu) in mg/l	IS 3025 (Part 42): 1992 ; RA 2019	0.05	1.5	<0.02
14.	Fluoride(as F) in mg/l	APHA 24th Edition 2023, 4500 F D	1.0	1.5	0.26
15.	Free Residual Chlorine in mg/l	IS 3025 (Part 26) 2021	0.2	1.0	<0.1
16.	Iron (as Fe) in mg/l	IS 3025(Part 53) 2003 RA: 2019	1.0	No Relaxation	0.44
17.	Magnesium(as Mg) in mg/l	APHA 24th Edition- 2023, 3500 Mg	30	100	24.7
18.	Manganese (as Mn) in mg/l	IS 3025 (Part 59): 2023	0.1	0.3	<0.02
19.	Mineral Oil in mg/l	IS 3025 (Part 39): 2021	1.0	No Relaxation	<0.5
20.	Molybdenum as Mo in mg/l	APHA 24th Edition, 2023, 3113B	0.07	No Relaxation	<0.05
21.	Nitrate (as NO_3) in mg/l	IS 3025 (Part 34)-1986 RA: 2019	45	No Relaxation	<0.5
22.	Phenolic Compounds(as C_6H_5OH) in mg/l	IS 3025 (Part 43) Sec 1, 2022	0.001	0.002	<0.001
23.	Selenium(as Se) in mg/l	IS 15303-2003; RA : 2018	0.01	No Relaxation	<0.01
24.	Sulphate (as SO_4) in mg/l	IS 3025 (Part 24) Sec 1, 2022	200	400	41.3
25.	Alkalinity(as $CaCO_3$)in mg/l	IS 3025 (Part 23) 2023	200	600	285.2
26.	Total Hardness (as $CaCO_3$) in mg/l	IS 3025 (Part 21)-2009, RA: 2023	200	600	328.7
27.	Cadmium(as Cd) in mg/l	IS 3025(Part 41) 2023	0.003	No Relaxation	<0.002
28.	Cyanide(as CN) in mg/l	IS 3025(Part 27)-1986;RA: 2019	0.05	No Relaxation	<0.02
29.	Lead(as Pb) in mg/l	IS 3025(Part 47)-1994;RA: 2019	0.01	No Relaxation	<0.01
30.	Mercury(as Hg) in mg/l	IS 3025(Part 48)-1994;RA: 2019	0.001	No Relaxation	<0.001
31.	Arsenic(as As) in mg/l	IS 3025 (Part 37) 2022	0.01	No Relaxation	<0.01
32.	Zinc(as Zn) in mg/l	IS 3025(Part 49)-1994;RA: 2019	5	15	<0.02
33.	Total Chromium (as Cr) in mg/l	IS 3025 (Part 52): 2003 (RA 2019)	0.05	No Relaxation	<0.05

Report Prepared By:

for Qualissure Laboratory Services
Reviewed & Authorized By

S. Chakraborty
Soumy Chakraborty, Microbiologist
(Authorized Signatory)

-------End of the Report-------

for Qualissure Laboratory Services
Reviewed & Authorized By

Bishnupriya Banerjee, Chemist
(Authorized Signatory)

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Email : qualissure@gmail.com; info@qualissure.com ; Mob.No. 98312 87086 ; 9830093976
TC-6271

DOC NO : QLS/SAMP/08-D/00

TEST REPORT

Name & Address Of the Customer : **M/s. Giridhan Metal Pvt. Ltd.** Jamuria Industrial Estate, Damodarpur, Jamuria P.O.- Nandi, Paschim Bardhaman, Pin : 713 344	ULR No.	: TC627125000004499F
	Report No.	: QLS/24/W/25-26/C/521
	Date	: 08.11.2025
	Sample No.	: QLS/24/W/25-26/521
	Sample Description	: Ground Water
	Sample Mark/Location	: Damodarpur Village Borewell
	Sample Drawn On	: 24.10.2025
	Date of Performance(s)	: 30.10.2025-07.11.2025
	Sampling Method	: IS 17614(P-5 & P-25) 2021 & 2022
	Ref No. Date	: 9400000240, Dated-05.04.2025

Analysis Result

(A) Microbiological Analysis

Sl.No.	Characteristic	Limit as Per IS 10500 :2012Amd. 2	Test Method	Result
1.	E.coli/100ml	Not Detectable	IS 15185-2016 (RA 2021)	Not Detected
2.	Total Coliform Bacteria/100ml	Not Detectable	IS 15185-2016 (RA 2021)	Not Detected
3.	Faecal Coliform/100ml	---	IS 1622-1981 (RA 2019)	<2

(B) Chemical Analysis

Sl.No.	Test Parameter	Test Method	As per Drinking Water Standard: IS:10500, 2012 Amd. 1 , 2& 3		Result
			Acceptable Limit	Permissible Limit	
1.	Colour in Hazen Units	IS 3025 (Part 4): 2021	5	15	<5
2.	Odour	IS 3025(Part 5)- 2018	Agreeable	Agreeable	Agreeable
3.	Taste	IS 3025 : Part 8 : 2023	Agreeable	Agreeable	Agreeable
4.	pH Value at 25°C	IS 3025 (Part 11) 2022	6.5-8.5	No Relaxation	7.48
5.	Turbidity in NTU	IS 3025 (Part 10) 2023	1	5	<1.0
6.	Total Dissolved Solids (as TDS) in mg/l	IS 3025(Part 16) 2023	500	2000	508
7.	Aluminium (as Al) in mg/l	IS 15302: 2003 (RA 2019)	0.03	0.2	<0.01
8.	Ammonia as NH_3 in mg/l	IS 3025 (Part 34): 1988;RA:2019	0.5	No Relaxation	<0.1
9.	Anionic Detergents(as MBAS) in mg/l	IS 13428-2005(Annex K) ; RA:2018	0.2	1.0	<0.02
10.	Boron(as B) in mg/l	IS 13428-2005(Annex L); RA:2018	0.5	2.4	<0.5
11.	Calcium(as Ca) in mg/l	IS 3025 (Part 40) 2024	75	200	98.2
12.	Chloride(as Cl) in mg/l	IS 3025 (Part 32)-1988, RA: 2019	250	1000	81.6
13.	Copper(as Cu) in mg/l	IS 3025 (Part 42): 1992 ; RA 2019	0.05	1.5	<0.02
14.	Fluoride(as F) in mg/l	APHA 24th Edition 2023, 4500 F D	1.0	1.5	0.36
15.	Free Residual Chlorine in mg/l	IS 3025 (Part 26) 2021	0.2	1.0	<0.1
16.	Iron (as Fe) in mg/l	IS 3025(Part 53) 2003 RA: 2019	1.0	No Relaxation	0.71
17.	Magnesium(as Mg) in mg/l	APHA 24th Edition- 2023, 3500 Mg	30	100	25.7
18.	Manganese (as Mn) in mg/l	IS 3025 (Part 59): 2023	0.1	0.3	<0.02
19.	Mineral Oil in mg/l	IS 3025 (Part 39): 2021	1.0	No Relaxation	<0.5
20.	Molybdenum as Mo in mg/l	APHA 24th Edition, 2023, 3113B	0.07	No Relaxation	<0.05
21.	Nitrate (as NO_3) in mg/l	IS 3025 (Part 34)-1986 RA: 2019	45	No Relaxation	<0.5
22.	Phenolic Compounds(as C_6H_5OH) in mg/l	IS 3025 (Part 43) Sec 1, 2022	0.001	0.002	<0.001
23.	Selenium(as Se) in mg/l	IS 15303-2003; RA : 2018	0.01	No Relaxation	<0.01
24.	Sulphate (as SO_4) in mg/l	IS 3025 (Part 24) Sec 1, 2022	200	400	51.4
25.	Alkalinity(as $CaCO_3$)in mg/l	IS 3025 (Part 23) 2023	200	600	331.2
26.	Total Hardness (as $CaCO_3$) in mg/l	IS 3025 (Part 21)-2009, RA: 2023	200	600	352.4
27.	Cadmium(as Cd) in mg/l	IS 3025(Part 41) 2023	0.003	No Relaxation	<0.002
28.	Cyanide(as CN) in mg/l	IS 3025(Part 27)-1986;RA: 2019	0.05	No Relaxation	<0.02
29.	Lead(as Pb) in mg/l	IS 3025(Part 47)-1994;RA: 2019	0.01	No Relaxation	<0.01
30.	Mercury(as Hg) in mg/l	IS 3025(Part 48)-1994;RA: 2019	0.001	No Relaxation	<0.001
31.	Arsenic(as As) in mg/l	IS 3025 (Part 37) 2022	0.01	No Relaxation	<0.01
32.	Zinc(as Zn) in mg/l	IS 3025(Part 49)-1994;RA: 2019	5	15	<0.02
33.	Total Chromium (as Cr) in mg/l	IS 3025 (Part 52): 2003 (RA 2019)	0.05	No Relaxation	<0.05

Report Prepared By:

for Qualissure Laboratory Services
Reviewed & Authorized By

Soumy Chakraborty, Microbiologist
(Authorized Signatory)

-------End of the Report-------

for Qualissure Laboratory Services
Reviewed & Authorized By

Bishnupriya Banerjee, Chemist
(Authorized Signatory)

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TC-6271

DOC NO : QLS/SAMP/08-D/00

TEST REPORT

Name & Address Of the Customer : **M/s. Giridhan Metal Pvt. Ltd.** Jamuria Industrial Estate, Damodarpur, Jamuria P.O.- Nandi, Paschim Bardhaman, Pin : 713 344	ULR No.	: TC627125000004500F
	Report No.	: QLS/24/W/25-26/C/522
	Date	: 08.11.2025
	Sample No.	: QLS/24/W/25-26/522
	Sample Description	: Ground Water
	Sample Mark/Location	: Mondalpur Village Borewell
	Sample Drawn On	: 24.10.2025
	Date of Performance(s)	: 30.10.2025-07.11.2025
	Sampling Method	: IS 17614(P-5 & P-25) 2021 & 2022
	Ref No. Date	: 9400000240, Dated-05.04.2025

Analysis Result

(A) Microbiological Analysis

Sl.No.	Characteristic	Limit as Per IS 10500 :2012Amd. 2	Test Method	Result
1.	E.coli/100ml	Not Detectable	IS 15185-2016 (RA 2021)	Not Detected
2.	Total Coliform Bacteria/100ml	Not Detectable	IS 15185-2016 (RA 2021)	Not Detected
3.	Faecal Coliform/100ml	---	IS 1622-1981 (RA 2019)	<2

(B) Chemical Analysis

Sl.No.	Test Parameter	Test Method	As per Drinking Water Standard : IS:10500, 2012 Amd. 1 , 2& 3		Result
			Acceptable Limit	Permissible Limit	
1.	Colour in Hazen Units	IS 3025 (Part 4): 2021	5	15	<5
2.	Odour	IS 3025(Part 5)- 2018	Agreeable	Agreeable	Agreeable
3.	Taste	IS 3025 : Part 8 : 2023	Agreeable	Agreeable	Agreeable
4.	pH Value at 25°C	IS 3025 (Part 11) 2022	6.5-8.5	No Relaxation	7.64
5.	Turbidity in NTU	IS 3025 (Part 10) 2023	1	5	<1.0
6.	Total Dissolved Solids (as TDS) in mg/l	IS 3025(Part 16) 2023	500	2000	544
7.	Aluminium (as Al) in mg/l	IS 15302: 2003 (RA 2019)	0.03	0.2	<0.01
8.	Ammonia as NH_3 in mg/l	IS 3025 (Part 34): 1988;RA:2019	0.5	No Relaxation	<0.1
9.	Anionic Detergents(as MBAS) in mg/l	IS 13428-2005(Annex K) ; RA:2018	0.2	1.0	<0.02
10.	Boron(as B) in mg/l	IS 13428-2005(Annex L); RA:2018	0.5	2.4	<0.5
11.	Calcium(as Ca) in mg/l	IS 3025 (Part 40) 2024	75	200	96.6
12.	Chloride(as Cl) in mg/l	IS 3025 (Part 32)-1988, RA: 2019	250	1000	99.1
13.	Copper(as Cu) in mg/l	IS 3025 (Part 42): 1992 ; RA 2019	0.05	1.5	<0.02
14.	Fluoride(as F) in mg/l	APHA 24th Edition 2023, 4500 F D	1.0	1.5	0.48
15.	Free Residual Chlorine in mg/l	IS 3025 (Part 26) 2021	0.2	1.0	<0.1
16.	Iron (as Fe) in mg/l	IS 3025(Part 53) 2003 RA: 2019	1.0	No Relaxation	0.80
17.	Magnesium(as Mg) in mg/l	APHA 24th Edition- 2023, 3500 Mg	30	100	28.5
18.	Manganese (as Mn) in mg/l	IS 3025 (Part 59): 2023	0.1	0.3	<0.02
19.	Mineral Oil in mg/l	IS 3025 (Part 39): 2021	1.0	No Relaxation	<0.5
20.	Molybdenum as Mo in mg/l	APHA 24th Edition, 2023, 3113B	0.07	No Relaxation	<0.05
21.	Nitrate (as NO_3) in mg/l	IS 3025 (Part 34)-1988 RA: 2019	45	No Relaxation	<0.5
22.	Phenolic Compounds(as C_6H_5OH) in mg/l	IS 3025 (Part 43) Sec 1, 2022	0.001	0.002	<0.001
23.	Selenium(as Se) in mg/l	IS 15303-2003; RA : 2018	0.01	No Relaxation	<0.01
24.	Sulphate (as SO_4) in mg/l	IS 3025 (Part 24) Sec 1, 2022	200	400	53.7
25.	Alkalinity(as $CaCO_3$)in mg/l	IS 3025 (Part 23) 2023	200	600	349.6
26.	Total Hardness (as $CaCO_3$) in mg/l	IS 3025 (Part 21)-2009, RA: 2023	200	600	360.4
27.	Cadmium(as Cd) in mg/l	IS 3025(Part 41) 2023	0.003	No Relaxation	<0.002
28.	Cyanide(as CN) in mg/l	IS 3025(Part 27)-1986;RA: 2019	0.05	No Relaxation	<0.02
29.	Lead(as Pb) in mg/l	IS 3025(Part 47)-1994;RA: 2019	0.01	No Relaxation	<0.01
30.	Mercury(as Hg) in mg/l	IS 3025(Part 48)-1994;RA: 2019	0.001	No Relaxation	<0.001
31.	Arsenic(as As) in mg/l	IS 3025 (Part 37) 2022	0.01	No Relaxation	<0.01
32.	Zinc(as Zn) in mg/l	IS 3025(Part 49)-1994;RA: 2019	5	15	<0.02
33.	Total Chromium (as Cr) in mg/l	IS 3025 (Part 52): 2003 (RA 2019)	0.05	No Relaxation	<0.05

Report Prepared By:

for **Qualissure Laboratory Services**
Reviewed & Authorized By

S. Chakraborty
Soumy Chakraborty, Microbiologist
(Authorized Signatory)

-------End of the Report--------

for **Qualissure Laboratory Services**
Reviewed & Authorized By

Bishnupriya Banerjee, Chemist
(Authorized Signatory)

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Garland Drain

Effluent Treatment Plant (1540 KLD)

Qualissure Laboratory Services

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Email : qualissure@gmail.com; info@qualissure.com; Mob.No. 98312 87086 ; 9830093976
TC-6271

DOC NO : QLS/SAMP/08-C/00

TEST REPORT

Name & Address Of the Customer :		
M/s. Giridhan Metal Pvt. Ltd. Jamuria Industrial Estate, Damodarpur, Jamuria P.O.: Nandi, Paschim Bardhaman, Pin : 713 344	Report No.	: QLS/24/A/25-26/C/42
	Date	: 07.11.2025
	Sample No.	: QLS/24/A/25-26/42(A-D)
	Sample Description	: Noise Monitoring
	Date of Performance(s)	: 30.10-06.11.2025
	Ref No. Date	: 9400000031, Dated-27.05.2024

Monitoring Result of Noise

Sampling Done By: D. Sahoo/P.Mandal

Sampling Guideline : As per IS: 9989: 1981 (RA-2020)

Sample No	Date of Monitoring	Location	Leq dB (A) Day Time	Leq dB (A) Night Time
42A	27-28.10.2025	Near Old Admin Building	58.9	49.3
42B		Near Ferro Plant	62.3	46.8
42C	28-29.10.2025	Near ETP	59.9	46.5
42D		Near Main Gate	63.1	48.9

Code/ Category	Leq dB Day Time(A)	Leq dB Night Time(A)
A/Industrial	75	70
B/Commercial	65	55
C/Residential	55	45
D/Ecological Sensitive	50	40

NOTE:
Day Time : 06.00 Hr. – 22.00 Hr.
Night Time : 22.00 Hr. – 06.00 Hr.

Report Prepared By :

for **Qualissure Laboratory Services**
Reviewed & Authorized By

Benimadhab Gorai, Chemist
(Authorized Signatory)

----- End of the Report-----

- ***The results relate only to the item(s) tested.***
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- ***The reserved part of sample(s), except perishable sample(s), shall be retained for 30 days from the date of issue of the Test Report.***

REPORT OF

"WORK ZONE MONITORING"

for

GIRIDHAN METAL PRIVATE LIMITED

JAMURIA INDUSTRIAL ESTATE, P.O. NANDI, P.S. JAMURIA, JAMURIA,
Dist.: PASCHIM BARDHAMAN, PIN 713344, WEST BENGAL, INDIA.

PERIOD : MAY, 2025

Conducted By

psi
SINCE 1981
PIONEER SAFETY INDUSTRIES

PIONEER SAFETY INDUSTRIES

(An ISO 9001:2015 Company)
"YASHODA BUSINESS CENTRE", 85, BENTINCK STREET, 5TH FLOOR, ROOM NO. 9, KOLKATA 700 001.
MOBILE : 9433120475 / 8017006820
E-mail : pioneersafetyindustries@gmail.com / subhrodaspioneer@rediffmail.com
www.pioneersafetyindustries.co.in

Acknowledgement

We express our sincere thanks to the management and employees of **GIRIDHAN METAL PRIVATE LIMITED** for their manufacturing plant situated at **JAMURIA INDUSTRIAL ESTATE, P.O.: NANDI, P.S.: JAMURIA, JAMURIA, DIST.: PASCHIM BARDHAMAN, PIN : 713 344, WEST BENGAL, INDIA** for their co-operation and total help without which **WORK ZONE MONITORING** could not have been possible. The courtesy and cordiality extended to the audit team is highly appreciated.

PIONEER SAFETY INDUSTRIES

INTRODUCTION :

GIRIDHAN METAL PRIVATE LIMITED for their manufacturing plant situated at **JAMURIA INDUSTRIAL ESTATE, P.O.: NANDI, P.S.: JAMURIA, JAMURIA, DIST.: PASCHIM BARDHAMAN, PIN : 713 344, WEST BENGAL, INDIA** requested to **PIONEER SAFETY INDUSTRIES** to conduct the survey of work environment monitoring at their works for assessment of Air borne contaminates accordingly the monitoring (as per your scope the said job) was completed as per requirement of Factories Rules. The entire site examinations were completed on **15.05.2025** results of the monitoring have reported.

STANDARDS :

Factories Acts 1948, under Sec7A (2)e

West Bengal Factories Rules 1958. Rules 13(B)2

SCOPE OF WORK :

Heat Stress.

Date of Inspection : 15.05.2025

OBSERVATION :

Results as mention in which are annexed herewith reveal the under noted. Heat Stress has been found to be within permission limit in general.

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INSTRUMENT USED :

- Globe Thermometer
- Digital Anemometer
- Dry & wet Bulb

RECOMMENDATION :

- Working personal should be protected with suitable safety appliances for protection against dust and gases.
- Periodical assessment of the work environment is suggested for better control of work zone environment and protection of working personnel.
- Advised the working personal to use PPEs DUST MUSK, EAR MUFF, EAR PLUG at high noise zone.

PIONEER SAFETY INDUSTRIES Kolkata

Form 30
Register Containing particular of monitoring of work environment required under section 7-A (2)(E) of the Act

Name of the Factory : GIRIDHAN METAL PRIVATE LIMITED
Factory Address : JAMURIA INDUSTRIAL ESTATE, P.O.: NANDI, P.S.: JAMURIA, JAMURIA, DIST.: PASCHIM BARDHAMAN, PIN : 713344, WEST BENGAL, INDIA.
Particulars of sampling : HEAT STRESS

Location/ Operation monitored	Identified Contaminates	Date of Monitoring	Air borne Contaminates				TWA Contaminates as given in Schedule-II	Sampling instrument used and method	Number of workers exposed at the location being monitored		Remarks	Signature of Persons taking samples	Name (in block letters)
			No. of Reading	Unit	Range	Average			Continuous Exposure	Short time Exposure			
DRI KILN PLATFROM NO – 1 (QRT AREA)	Heat Stress	15.05.2025	4	0C	27.4 27.8 28.1 28.4	27.9	31 0C	Globe and Wet Bulb thermometer	04	02	Below TLV		BHOLANATH SAMANTA & SANJOY DAS
DRI KILN PLATFROM NO – 2 (QRT AREA)	Heat Stress	15.05.2025	4	0C	28.3 28.7 28.9 29.1	28.8	31 0C	Globe and Wet Bulb thermometer	04	02	Below TLV		BHOLANATH SAMANTA & SANJOY DAS
FERRO FURNACE FLOOR	Heat Stress	15.05.2025	4	0C	28.2 28.6 28.9 29.7	28.9	31 0C	Globe and Wet Bulb thermometer	05	02	Below TLV		BHOLANATH SAMANTA & SANJOY DAS
FERRO TAPPING AREA	Heat Stress	15.05.2025	4	0C	26.5 27.2 27.5 27.9	27.3	31 0C	Globe and Wet Bulb thermometer	07	02	Below TLV		BHOLANATH SAMANTA & SANJOY DAS

NB: TLV: Threshold Limit Values

PIONEER SAFETY INDUSTRIES Kolkata

(Authorised Signatory)
SK. ABDUL FARUK
B. Tech (Chemical)

Form 30
Register Containing particular of monitoring of work environment required under section 7-A (2)(E) of the Act

Name of the Factory : GIRIDHAN METAL PRIVATE LIMITED
Factory Address : JAMURIA INDUSTRIAL ESTATE, P.O.: NANDI, P.S.: JAMURIA, JAMURIA, DIST.: PASCHIM BARDHAMAN, PIN : 713344, WEST BENGAL, INDIA.
Particulars of sampling : HEAT STRESS

Location/ Operation monitored	Identified Contaminates	Date of Monitoring	Air borne Contaminates				TWA Contaminates as given in Schedule-II	Sampling Instrument used and method	Number of workers exposed at the location being monitored		Remarks	Signature of Persons taking samples	Name (in block letters)
			No. of Reading	Unit	Range	Average			Continuous Exposure	Short time Exposure			
SMS FURNACE FLOOR	Heat Stress	15.05.2025	4	0C	27.6 27.9 28.3 28.7	28.1	31 0C	Globe and Wet Bulb thermometer	12	02	Below TLV		BHOLANATH SAMANTA & SANJOY DAS
CCM FLOOR (SMS)	Heat Stress	15.05.2025	4	0C	24.8 25.4 25.7 25.9	25.5	31 0C	Globe and Wet Bulb thermometer	10	03	Below TLV		BHOLANATH SAMANTA & SANJOY DAS
CPP (CFBC 0 Mtr.)	Heat Stress	15.05.2025	4	0C	23.1 23.6 24.5 24.8	24.0	31 0C	Globe and Wet Bulb thermometer	08	01	Below TLV		BHOLANATH SAMANTA & SANJOY DAS
TG FLOOR (9Mtr.)	Heat Stress	15.05.2025	4	0C	23.8 24.6 24.9 25.2	24.6	31 0C	Globe and Wet Bulb thermometer	03	01	Below TLV		BHOLANATH SAMANTA & SANJOY DAS

NB: TLV: Threshold Limit Values

PIONEER SAFETY INDUSTRIES Kolkata

(Authorised Signatory)
SK. ABDUL FARUK
B. Tech (Chemical)

Form 30
Register Containing particular of monitoring of work environment required under section 7-A (2)(E) of the Act

Name of the Factory : GIRIDHAN METAL PRIVATE LIMITED
Factory Address : JAMURIA INDUSTRIAL ESTATE, P.O.: NANDI, P.S.: JAMURIA, JAMURIA, DIST.: PASCHIM BARDHAMAN, PIN : 713344, WEST BENGAL, INDIA.
Particulars of sampling : HEAT STRESS

Location/ Operation monitored	Identified Contaminates	Date of Monitoring	Air borne Contaminates				TWA Contaminates as given in Schedule-II	Sampling Instrument used and method	Number of workers exposed at the location being monitored		Remarks	Signature of Persons taking samples	Name (in block letters)
			No. of Reading	Unit	Range	Average			Continuous Exposure	Short time Exposure			
LLING MILL COLD SEAR	Heat Stress	15.05.2025	4	0C	26.2 26.7 27.3 27.8	27.0	31 0C	Globe and Wet Bulb thermometer	10	03	Below TLV		BHOLANATH SAMANTA & SANJOY DAS
ROLLING MILL BILLET CHAIN TRANSFER AREA	Heat Stress	15.05.2025	4	0C	27.1 27.6 27.8 28.2	27.7	31 0C	Globe and Wet Bulb thermometer	20	05	Below TLV		BHOLANATH SAMANTA & SANJOY DAS

NB: TLV: Threshold Limit Values

(Authorised Signatory)
SK. ABDUL FARUK
B. Tech (Chemical)

PIONEER SAFETY INDUSTRIES Kolkata

TABLE 1

Threshold Limit Values for Heat Stress Exposure as per Occupational Safety and Health Administration				
% Work	Workload			
	Light	Moderate	Heavy*	Very Heavy*
75 to 100% (Continuous)	31.0°C	28.0°C	N/A	N/A
50 to 75%	31.0°C	29.0°C	27.5°C	N/A
25 to 50%	32.0°C	30.0°C	29.0°C	28.0°C
0 to 25%	32.5°C	31.5°C	30.5°C	30.0°C

*Criteria values are not provided for Heavy/Very Heavy work for continuous and 25% rest because of the extreme physical strain. Detailed job hazard analyses and physiological monitoring should be used for these cases rather than these screening criteria.

PIONEER SAFETY INDUSTRIES Kolkata

PHOTOGRAPHS OF WORK ZONE MONITORING

DRI KILN PLATFROM NO – 1 (QRT AREA)

TG FLOOR (9Mtr.)

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PHOTOGRAPHS OF WORK ZONE MONITORING

FERRO FURNACE FLOOR

FERRO TAPING AREA

PIONEER SAFETY INDUSTRIES Kolkata

PHOTOGRAPHS OF WORK ZONE MONITORING

ROLLING MILL BILLET CHAIN TRANSFER AREA

ROLLING MILL COLD SEAR

PIONEER SAFETY INDUSTRIES Kolkata

PHOTOGRAPHS OF WORK ZONE MONITORING

Acknowledgement

The Team is grateful to the management and employees of **GIRIDHAN METAL PRIVATE LIMITED** for their manufacturing plant situated at **JAMURIA INDUSTRIAL ESTATE, P.O.: NANDI, P.S.: JAMURIA, JAMURIA, DIST.: PASCHIM BARDHAMAN, PIN : 713344, WEST BENGAL, INDIA** for extending their full corporation during the period of conducting the examination.

Acknowledgement

The Team is grateful to the management and employees of **GIRIDHAN METAL PRIVATE LIMITED** for their manufacturing plant situated at **JAMURIA INDUSTRIAL ESTATE, P.O.: NANDI, P.S.: JAMURIA, JAMURIA, DIST.: PASCHIM BARDHAMAN, PIN : 713344, WEST BENGAL, INDIA** for extending their full corporation during the period of conducting the examination.

PIONEER SAFETY INDUSTRIES Kolkata

Conclusion

On the basis of the assessment of the hazard control arrangement as noted under various parts and considering the observations on the Work Zone Monitoring as stated when concluded it is found that sincere attention is paid by the management for the safety and health of its employees.

However, it may please be noted that there is always a scope of further improvement.

Monitored by –

SK. Abdul Farur

(Authorised Signatory)

SK. ABDUL FAR...
B. Tech (Chemical)

PIONEER SAFETY INDUSTRIES Kolkata

Prepared by : -

PIONEER SAFETY INDUSTRIES

PIONEER SAFETY INDUSTRIES

COMPETENT AUTHORITY

Approved by Chief Inspector of Factories, Govt. of West Bengal under Factories Act Under Section 21 (2), 28, 29, 31 and 36 (6 & 112) of the Factories Act

SAFETY AUDIT, ELECTRICAL SAFETY AUDIT, WORK ZONE MONITORING, JOB SAFETY ANALYSIS, HIRA / HAZOP STUDY, STABILITY TEST & CERTIFICATION, FIRE SAFETY CERTIFICATION, SAFETY TRAINING, NDT AND DP TEST

: OFFICE :
"YASHODA BUSINESS CENTRE", 85, Bentinck Street, 5th Floor, Room No. 9, Kolkata – 700 001.
Mobile : 8583992136 / 7003065634 / 9433120475
E-mail : pioneersafetyindustries@gmail.com

Photographs of Solar Power

NU VISTA LIMITED
(Formerly Emami Cement Limited)

NUVOCO
Shaping a new world

To
The Director
Giridhan Metal Private Limited
Jamuria Industrial Estate, Po. Nandi,
Ps. Jamuria, Dist. Paschim Bardhaman,
West Bengal - 713344

Sub: MoU for procurement of Fly Ash @ 45400 MT/Annum and Bottom Ash 19500 MT/Annum for production of Cement.

Respected Sir / Madam,

With reference to the above subject, our management has decided to procure Fly Ash @ 45400 MT/Annum and Bottom Ash 19500 MT/Annum w.e.f 01st January 2025 for production of Cement as per our multiple discussions had with you and after analysis of fly ash and bottom ash generated through your Power Plant.

This will be cost effective for both of us as your plant is located within the distance of 50 Km radius.

Thanking you in anticipation for your extended co-operation to execute this MoU that will be helpful for both of us in terms of cost benefit and availability of RM for us and disposal of fly ash for yours.

Looking forward for better relationship in future as well.

Yours faithfully

M/s NU Vista Limited'
(Formerly Emami Cement Limited)
Panagarh Cement Division.
Panagarh Industrial Park,
West Bengal-713148.

Mobile : 7063281706
7908160258

Maa RakhaKali Enterprise

GST IN : - 19ABLFM8725A1Z4

Vill. - Monoharbohal, P.O.- Ethora, P.S.- Barabani, Dist.- Paschim Bardhaman - 713359

Ref. No. ..... *Date* 05/01/2024

To,
The Giridhan Metal Private Limited
Jamuria Industrial Estate, P.O.: Nandi
P.S. Jamuria, Dist.- Paschim Bardhaman
West Bengal-713344

Kind Attn.: Director

Dear Sir,

As per our last meeting held on dated 02nd January'2024, we are desirous of purchasing the following materials from your organization as per market rate prevailing at that time or as mutually agreed.

1. Power Plant Fly Ash – 3000 Ton per month (annually 36000 MT approx..) for manufacturing of Fly Ash Bricks.
2. Power Olant Bed Materials – 1000 Ton per month (annually 12,000 MT approx.) for manufacturing of Paver Block.

We would request you that you may send the above material at our plant premises situated at MANOHARBOHAL.

Thanking you
With Regards,
For Maa Rakhakali Enterprise

Maa Rakhakali Enterprise

GSTIN: 19AAUFM2450O1ZE

Mob: 9732239603, 9933551352

M/S MICO ASH BRICKS

Manufacturer of Fly Ash Bricks

Gourangdi(Rupnarayanpur Road), Panuria, Burdwan,Pin- 713315, W.B.

email : rajuchodhury@gmail.com

Dated: 05/01/2024

To,
The Giridhan Metal Private Limited
Jamuria Industrial Estate, P.O.: Nandi
P.S. Jamuria, Dist.- Paschim Bardhaman
West Bengal-713344

Kind Attn.: Director

Dear Sir,

As per our last meeting held on dated 02nd January'2024, we are desirous of purchasing the following materials from your organization as per market rate prevailing at that time or as mutually agreed.

1. Power Plant Fly Ash - 3000 Ton per month (annually 36000 MT approx..) for manufacturing of Fly Ash Bricks.
2. Power Olant Bed Materials - 1000 Ton per month (annually 12,000 MT approx.) for manufacturing of Paver Block.

We would request you that you may send the above material at our plant premises situated at PANURIA.

Thanking you
With Regards,
For Mico Ash Bricks

(Authorized Signatory)

M/S. MICO ASH BRICKS
Partner

JEO FLY ASH BRICKS

GSTIN: 19AASFJ6037A1Z9

VILL.: MANOHARBAHAL, P.O.: ETHORA, P.S.: ASANSOL NORTH
DIST.: PASCHIM BURDWAN, PIN:713359,

MOBILE: +91-99335-51352

Dated: 05/01/2024

To,
The Giridhan Metal Private Limited
Jamuria Industrial Estate, P.O.: Nandi
P.S. Jamuria, Dist.- Paschim Bardhaman
West Bengal-713344

Kind Attn.: Director

Dear Sir,

As per our last meeting held on dated 02nd January'2024, we are desirous of purchasing the following materials from your organization as per market rate prevailing at that time or as mutually agreed.

1. Power Plant Fly Ash – 3000 Ton per month (annually 36000 MT approx..) for manufacturing of Fly Ash Bricks.
2. Power Olant Bed Materials – 1000 Ton per month (annually 12,000 MT approx.) for manufacturing of Paver Block.

We would request you that you may send the above material at our plant premises situated at MANOHARBOHAL.

Thanking you
With Regards,
For Jeo Fly Ash Bricks

(Authorized Signatory)

JEO FLY ASH BRICKS
Subrata Majhi

SHREE SWASTICK INDUSTRIES
39 G.T. Road, Bansra More P.O. Searsole Rajbari - 713358, Raniganj, Dist. Burdwan (W.B.)
Contact: (+91) 94340 34806 | shree_swastick@yahoo.com | www.shreeswastick.com
Manufacturers of cement bricks, paver blocks, designer tiles and precast products

Ref: SSI/23-24/APR/21-3
Date: 21-04-2023

To,
M/s. Giridhan Metal Private Limited
Jamuria Industrial Estate, Po. Nandi
P.s. Jamuria, Dist- Paschim Burdwan
(W.B) Pincode-713344

Kind. Attn: Director

Dear Sir,

As Discussed with you we are desirous of purchasing the following materials from your upcoming project as per market rate prevailing at that time or as mutually agreed.

1. Power Plant Fly Ash – Forty Five to Fifty thousand tons per annum.

We would request you that whenever your plant commenced production we should be given priority to lift the aforesaid material.

Thanking You
Yours Faithfully

For Shree Swastick Industries

Eastern Coalfields Limited
(A Subsidiary of Coal India Ltd.)
Office of the Agent, Nimcha Group of Mines, Satgram Area
PO. Searsole, Pin – 713358, Dist. Burdwan (WB)

No. ECL/NIMCHA/OCP/ABND-039/23-24 Dated: 10.11.2023

To
The Director
Giridhan Metal Private Limited
Jamuria Industrial Estate, Po. Nandi,
PS. Jamuria, Dist. Paschim Bardhaman,
West Bengal - 713344

Sub: Allotment of abandoned OCP for filling

Sir,

With reference to your letter No. Nil dated 22/09/2023 we would like to inform you that the abandoned (O.C.P) near Dag No. 3, J.L No. 11, at Damalia can be used for filling of Fly Ash / Solid Waste materials discharged from your Plant.

You are further requested to take all due care of environmental aspects of the concerned area while disposing the Fly Ash/Solid Wastes in the Abandoned OCPs. Note that management shall not be responsible for any incident/accident or any non-compliances during the dumping of your above mentioned wastes.

Agent
Nimcha Mining Office
Agent
Nimcha Mining Office

Copy for your kind information:

GM (M&S) HQ, Sanctoria, Dishergarh

STUDY REPORT

ON

DE-CARBONISATION PROGRAM

FOR

EXISTING Steel Plant
by
M/s GIRIDHAN METAL PVT LIMITED
At

Jamuria Industrial Area,
Village-Ikra and Damodarpur
Tehsil-Jamuria, Dist- Paschim Bardhaman,
West Bengal

PREPARED BY

RECYCLING AND ENVIRONMENT INDUSTRY ASSOCIATION OF INDIA

Email: reiarecycle@gmail.com
Mobile:+919818049505 / 01144781917
Aug , 2023

TABLE OF CONTENTS

****

PART I

1.1 Introduction

United Nations Intergovernmental Panel on Climate Change (IPCC) has issued warning that the Climate Resilient Development is difficult at the present levels of temperature of the globe. If the global warming results in temperature increase beyond 1.5°C (2.7°F), further energy intensive development will be extremely difficult. This significant conclusion emphasizes the need for a climate policy that prioritizes equity and justice, adequate finance, technology transfer and interventions, political commitment, and collaboration, which necessarily shall contribute to more successful climate change adaptation and emissions reductions.

Steel plays a crucial role in building a sustainable global economy, but its manufacturing is the fifth largest contributor to global GHG emissions. De-carbonization of the steel sector is therefore a global concern and a big challenge. This industry is under tremendous pressure to improve upon its energy intensity to reduce GHG emissions and to further utilize CO_2 captured for useful purposes or go for long term sequestration to fix it in nature's cycle.

This report describes the methods for GHG inventorisation for an existing steel plant of M/s Girdhan Metals Private Limited at Jamuria WB and the measures proposed to be adopted to mitigate GHG emissions from the project along with the carbon capture, storage and CO_2 sequestration strategies.

1.2 Carbon Emissions: different scopes of emissions

According to the Organizational Foot Printing Standard -ISO 14064-1, GHG emissions are categorised into 3 scopes :

Scope 1 emissions:

This includes the direct emissions that result from activities within the organization's control, e.g., on-site electricity generation, combustion in furnaces, heating/cooling operations at site; company-owned vehicles, fugitive emissions (e.g., refrigerants,emissions from fire extinguishers, refrigerators, circuit breakers etc).

Scope 2 emissions:

This includes indirect emissions from any electricity or heat or compressed air consumed that has been imported from outside the factory.

Scope 3 emissions:

This includes all of the indirect emissions that occur in the value chain, weighted according to the company's contribution. e.g., purchased goods and

services, employee commuting, business travel, upstream emissions from fuel extraction, waste management, T&D losses and electricity consumption and Ozone Depleting Substances refill for Work from Home. Scope 3 emissions are a consequence of the activities of the company, but occur from sources not owned or controlled by the company. Some examples of Scope 3 activities are extraction and production of purchased materials; transportation of purchased fuels & raw materials and use of products and services from outside. There are generally following categories of activities under Scope 3 ;

Category 1: Purchased goods and services,
Category 2: Capital goods purchased,
Category 3: Upstream transportation and distribution,
Category 4: Solid Waste disposal outside plant premises,
Category 5: Business travel,
Category 6: Employee commuting,
Category 7: Upstream leased assets,
Category 8: Downstream transportation and distribution,
Category 9: Processing of sold products,
Category 10: Use of sold products,
Category 11: End-of-life treatment of sold products,
Category 12: Downstream leased assets,
Category 13: Franchises,
Category 14: Investments,
Category 15: Emissions during "Work from Home", etc.

According to the GHG Corporate Protocol, all organizations should quantify Scope 1 and 2 emissions when reporting and disclosing GHG emissions, while quantification of Scope 3 emissions is voluntary and may be reported by companies to identify the greatest GHG reduction opportunities across their value chain which in turn makes business activities more sustainable and competitive. Latest trend in the industry is to quantify GHG emissions for Scope 3 as far as possible.

1.3 Methodologies for GHG Emission calculations as:

Scope 1

The methodology used for GHG emissions calculations for use of fossil fuels and refrigerants is briefly described in IPCC emission factor guide book available on IPCC website and or GHG protocol website for different types of fuels ie, coal, coke, liquid fuels, NG, LPG, LNG, ODS etc. Emission Factors are available from the following reference attached as Annexure I;

https://www.epa.gov/sites/default/files/2021-04/documents/emission-factors_apr2021.pdf

Scope 2: External Electricity Consumption:

This may be noted that emission factor for electricity, can be obtained from CEA web site given below (Attached as Annexure II); The average grid factor for India for 2020-21 is 0.790 tCO2 per MWH.

https://cea.nic.in/wp-content/uploads/tpecc/2022/02/User_Guide_ver_17_2021.pdf

For imported steam and compressed air, the supplier of these utilities should provide information on CO_2 emission per NM^3 of steam or compressed air.

Scope 3:

Upstream Transportation and Distribution: Emissions due to upstream transportation in tCO_2e = "Total distance travelled * Emission Factor".The emission Factors are available in Annexure III; Downstream Transportation and Distribution: Emissions due to downstream transportation of products in tCO_2e = "Total distance travelled * Emission Factor" but the same has not been considered in present scope as the destinations for the products after leaving the factory gate are not available. Scope 3 emissions for employees commute based on certain assumptions are presented in spreadsheets attached.

1.4 Carbon Neutrality

Carbon neutrality refers to a balance between carbon emissions and carbon absorption from the atmosphere in carbon sinks. General strategy to be adopted by the project proponent to reduce GHG emissions and absorb carbon is defined below;

Scope 1 Emissions Reduction

a. **Reduce fuel consumption and improve operational energy efficiency.**
b. **Capital investments in newer, more energy-efficient equipment/technologies to lower operating costs while also lowering emissions.**
c. **Conducting energy audits at workplaces where electricity and fuel consumption is high in order to identify better alternatives and save money on energy consumption.**
d. **For carbon neutrality, CER may be considered to be purchased based on calculated footprint. CERs are electronic certificates issued for greenhouse gas emission reductions from CDM project activities or programmes of activities (PoAs) in accordance with CDM rules and requirements.**

Scope 2 Emissions Reduction

It may be noted that when Project Proponent buy Renewable Energy credits (RECs), they would enable more clean energy projects to supply power to the grid where they operate. Grid operators want to buy the cheapest power possible because energy from wind and solar plants is frequently less expensive than energy from coal-burning plants. As a result, by purchasing RECs, Project Proponent shall effectively be reducing carbon emissions by reducing brown power intake from the grid.

Scope 3 Emission Reduction

Optimisation of employee commute, business travel, rail transport, local Out sourcing are some of the measures taken to reduce scope 3 emissions. Vocal for local is the business policy of Proponent.

******

PART II

PROJECT DETAILS

2.1 TYPE OF THE PROJECT

The company GMPL is having an existing Integrated Steel Plant (Sponge Iron - 3,18,000 TPA ; MS Billets -3,72,300 TPA , Rolling Mill -3,00,000 TPA; Submerged Arc Furnaces (SAF) - 30,000 TPA (Fe-Mn/Si-Mn) , Captive Power Plant 42 MW including Waste Heat Recovery Boiler (WHRB) (21 MW) at Jamuria Industrial Estate, Village Ikra & Damodarpur, Tehsil Jamuria, District Paschim Bardhaman, West Bengal.

The existing plant area is 31.75 hectares (78.44 acres);

2.2 MAGNITUDE OF THE OPERATION

Size or magnitude of operation for the project and its expansion project is given below:

Table: 2.1 Details of expansion

	Existing Units as per EC J-11011/366/2010-IA. II(I) dated 8th April, 2021 as amended on 16th Jan, 2023		Capacity as per Granted CTO
Name	Configuration	Production (TPA)	Production (TPA)
Sponge Iron (DRI Plant)	1 x 350 &1 x 600 TPD DRI Plant	3,18,000 TPA	3,18,000 TPA (330 days/365 days)
MS Billets (Induction Furnace with LF & CCM)	6 x 20 Ton IF (Induction Furnace) & 1X30 Ton LF (Ladle Furnace)	3,72,300 TPA	3,72,300 TPA
Rolling Mill	Rolled bars/light structure	3,00,000 TPA	3,00,000 TPA
Submerged Arc Furnace (SAF)	2 x 9 MVA of Fe-Mn/Si-Mn	30,000 TPA	30,000 TPA
Waste Heat Recovery	35 TPH & 70 TPH	21 MW	35 TPH & 70 TPH

Boiler (WHRB)			
Captive Power Plant	1x 32 TPH & 50 TPH FBC boiler	21 MW	21 MW (1x82 TPH FBC boiler)
Billet Caster	2x2 Strand	-	2x2 Strand

Source: *Pre-feasibility Report*

2.3 Material Requirements for the Project

The project requirement such as raw material, water, power, manpower with source of supply is described in the section below:

2.3.1 Raw Material Requirement for the Project

The basic raw material for the manufacturing of Steel is Iron Ore Lumps/Fines which is being/will be sourced from nearby markets by rail/road. Details regarding quantity of raw materials required their source along with mode of transportation for expansion project have been tabulated below:

Table 2.2 Raw Material Requirement

S. No.	Required raw material	Quantity and Source of raw material TPA		Mode of transportation	Distance from plant site,Km
I	Sponge Iron				
1.	Iron Ore	4,77,000	Odisha & Jharkhand	Rail/Road	250-280
2.	Coal Imported	2,00,340	Overseas	Road/Rail from Port	300
	Indian Coal for DRI	85,860	ECL,	Rail/Road	60-80
3	Dolomite	11,130	Bhutan	Rail/Road	900-920

II	Steel Meting Shop				
1	Pig Iron	53,000	TATA Steel, SAIL,	Rail/Road	150-170
2	Sponge Iron (DRI)- In house	318000	Own	Own	Nil
3	Sponge Iron (DRI)- Purchased	47000	Nearby Mills	Road	50
4	Scrap	32180	Market	Rail/Road	300
5	Ferro Alloys	4,840	Own	Own	Own
III	Caster				
1	Liquid Steel	3,72,300	Own Production		
IV	Ferro Alloys				
1	Mn Ore	75,000	Odisha	Rail/Road	900-950
2	Coal	12600			
3	Coke	12600	Local	Road	50
3	Electrode Paste	600	Maharashtra	Road	500
4	Dolomite	8,000	Bhutan	Rail/Road	900-920
V	Power Plant				
7	Coal for CPP	75,000	CIL	Rail/Road	60-80

2.3.2 Water Requirement

Total make-up water requirement for Existing plant is 4178 KLD which will be sourced from Surface Water (River Damodar) through Damodar Valley Corporation (DVC)) and Asansol Municipal Corporation. The water is being/will be supplied from Damodar river.

2.3.3 Power Requirement & D.G set Details

The existing power requirement is 84.3 MW. Own generation is 42 MW. 14.4 MW is connected with Ferro Alloy plant.

DG Set Details

Three Numbers 2000 KVA DG Sets with 10 m stack height above roof level have been installed in existing plant. DG set are used only as an emergency back-up system.

2.3.4 Manpower Requirement

Manpower of the existing plant is 2003 persons (408 persons regular & 1595 persons contractual).

2.4 MAJOR EQUIPMENT AND MACHINERIES

2.4.1 TECHNOLOGY &PROCESS DESCRIPTION

Plant consists of following unit operation steps:

- Direct Reduced Iron (DRI) in DRI Plant
- SMS - Induction Furnace (IF) , LRF and Continuous Caster
- Rolling Mills
- Ferro Alloy Plant
- Power Plant

A. DRI Plant (1 x 350 +3 x 600 TPD)

Table 2.3 Material Balance for DRI Kilns (Maximum for all Kilns)

Input in PA		Output in TPA	
Pellet/Iron Ore	4,77,000	DRI	3,18,000

Imported coal (70%)	2,00,340	Char	47,700
Indian coal (30%)	85,860	APC Dust	51,675
Combustion air	13,64,220	Flue gas	17,19,225
Dolomite	11,130	Kiln Accretion	1,950
Total	21,38,550	Total	21,38,550

B. Steel Melt Shop (SMS)

6 Nos of Induction furnaces of capacity 20 T each have been installed.

LRF of Capacity 30 T for treatment and temperature adjustment of liquid steel tapped from induction furnaces is installed..

Double Strand Medium Speed Modular Billet Caster (4 x 2 Strand). In general 130 mm billets shall be processed.

Table 2.4 Material Balance for Induction Furnace

Existing: 6 x 20 T IF (Max)

Input in TPA		Output in TPA	
Pig Iron	53,000	Liquid steel	3,72,300
DRI (Captive)	3,18,000	Slag	52,120
DRI Purchased	47000		
Ferro Alloys (Si-Mn)	4,800	Fume	30,560
Scrap	32,180	-	-
Total	4,54,980	Total	4,54,980

C. Rolling Mills

Major Equipment & Specifications/Scope of Supply –

Rebar Mill –1 x 3,00,000 TPA

D. Ferro Alloys (2x9MVA)

Table 2.5 Material Balance for Fe-Mn/Si-Mn production

Mn Ore	75,000	Ferrol Alloys	30,000
Dolomite	8,000	Slag	28,500
Coke	12,600	Gaseous Emission	50,440
Coal	12,600		
Electrode Paste	600		
Total	1,08,940	Total	1,08,940

2.5. Solid & Hazardous Waste Management

The details are tabulated below: -

Table 2..7- Solid & Hazardous Waste Quantity & Management Scheme

Solid& Hazardous waste	Generated from	Quantity (TPA) Existing	Utilization Measures
CPP Fly ash	Captive Power plant	45,267	Used for making fly ash brick in nearby bricks manufacturing unit.
CPP Bottom ash		19,400	Use for making paver block. Supplied to cement plant to make Portland cement production.
Fe-Mn Slag	Ferro Alloy Plant	28500	Used for Si-Mn production.
IF slag	Induction furnace	54192	River sand substitute, land fill after iron separation.
Dolochar	Sponge Iron Plant	47700	Use in FBC for power generation & in sister concerned company
Kiln Accretion	Sponge Iron	1950	Road Making & Land fill
Mill scale & scrap	Rolling Mill	12210	To be fully consumed in plant
APC Dust	DRI Kilns	46,215	Dumped in abandoned OCP of Eastern coalfields Limited (ECL)
ETP Sludge	ETP	10	Disposed off at Secured landfill site through authorized and approved vendor
Used oil and grease	Maintenance	10	Sold to Authorized vendor.

No hazardous waste is being /will be generated except the Used oil and oily waste which is being/will be collected in drums, temporarily stored at earmarked place stored as per Hazardous & Other Waste (Management & Trans-boundary Movement) Rules,2016 and is being /will be sold to the authorized CPCB recyclers/pre-processors. ETP Sludge will be disposed off

at Secured land fill site through authorized and approved vendor. Contaminated cotton and wiping clothes collected from all units will be incinerated in the CPP as fuel.

2.6. Greenbelt Development & Plantation

Existing green belt is developed in 10.42 hectares (32.82% of the total area) by planting trees to the tune of 2500 trees/ha.

2.7 HSD Consumption

Estimated HSD consumption per year

Particulars	Existing
Consumption in Charging, RM handling by heavy vehicles inside the plant	148600 L
Consumption in DG set testing	1296 L
Actual consumption on DG when power is unavailable	14240 L
DRI – Light up	20000 L
CFBC – Start up	6000 L
Total	190136 L

2.8 Fire Extinguisher (CO_2)

Capacity of Cylinder	Quantity (Nos.)
10 Kgs	4
9.50 Kgs	6
6.50 Kgs	41
2 Kgs	2
9 Kgs	25

2.9 Refrigerant Consumption

- GMPL do not use SF6 in their Breakers. All breakers are 11 KV.
- There are no chillers in the plant.
- Installed capacity of Air conditioners - 612 Tonnes
  Gas R-410A, R-407 is being used in ACs

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PART III - GHG INVENTORISATION AND MITIGATION STRATEGY

3.1 Identification of GHG Sources in the Plant

3.1.1 The GHG emission and removal activities of the existing plant in general, are presented in the table below:

S. No.	GHG Emission related Activity	Scope
1	Coal, LPG, FO, LDO, Diesel consumption in furnaces and Diesel/Petrol consumption in internal vehicles.	Scope 1
2	LAM Coke and other reducing agents and raw materials consumption in process	Scope 1
3	Coal used in Thermal Power generation and DRI at site	Scope 1
4	Diesel Consumption in DG Sets and start up for Boilers	Scope 1
5	Fugitive emissions from chillers if installed	Scope 1
6	CO2 type fire extinguishers refilled	Scope 1
7	Use of Refrigerants in AC and Refrigerators.	Scope1
8	HF6 consumption (if used in HV breakers)	Scope 1
9	Electricity purchased from grid	Scope 2
10	Steam, Compressed air purchased from outside	Scope 2
11	Employees Commute	Scope 3
12	Transportation of Raw materials from nearest Source to the Plant	Scope 3
13	Any other activity from Section 2 Scope 3 of Part I of this report	Scope 3
14	Renewable Energy Purchase	Scope 2
15	Green Belt credits	Scope 1
16	Plantation outside	Scope 3

3.1.2 Likely Credits/Removal Activities

a) Green Belt Development.
b) 100 % Solid Waste utilisation as Substitute to valuable minerals
c) Use of Renewable Energy (5% REC credits)
d) Hot charging of billets/slabs
e) Waste heat recovery from SAFs
f) Plantation out side the factory premises.
g) Rainwater harvesting.
h) CO2 Capture and Storage.

3.2 Selection of GHG Quantification Methodology

The methodologies used are based on factors presented in the Inter governmental Panel on Climate Change (IPCC) 2006 "Guidelines for National Greenhouse Gas Inventories, 2006" and subsequent revisions. The report is based on calculation "GHG activity data multiplied by GHG emission factor". The Plant has identified its GHG emission sources and sinks according to scope of emissions i.e. Scope 1, Scope 2 and Scope 3 from its organisation boundary which are categorised as follows:

The links for accessing the emission factors are given in Part I of this report.

3.3 Summary of GHG Emissions from the Existing Plant

SUMMARY OF GHG EMISSIONS FROM EXISTING PLANT OF GIRDHAN METAL PVT LIMITED

A- STEEL MAKING AND ROLLING INCLUDING CPP AND UTILITIES

	Unit- T CO2 /Year Existing Plant
Scope 1 Process Emissions	847699
Scope 1 Fuel at Site	490950
Scope 1 Air conditioning	498
Scope 2 Grid Electricity	166630
TOTAL	1505777
Credits	106419
Net Emissions	1401358
Crude Steel Production TPA MTPA	372300
Specific CO2 Emission, tCO2/tcs	3.76

B. FERRO ALLOYS PRODUCTION

Scope 1 Process Emissions	68164
Scope 2 Grid Electricity	86003
TOTAL	154167
FA Production, MTPA	30000
Specific CO2 Emission, tCO2/tcs	5.1

C. SCOPE 3 EMISSIONS.

Employees Commute	5.4

Transport of Raw Materials to Plant	**Steel**	**34**
Transport of Raw Materials to Plant	**FA**	**11.6**

3.4 GHG Emission Reduction Strategy

A. The facilities for GHG mitigation by resource conservation, energy recovery and GHG reduction are suggested as follows;

a. **Heat Recovery from flue gases of SAF for pre heating of the charge.**
b. **Dry gas cleaning of SAF Flue gases and recovery of Heat.**
c. **4th Hole extraction system in the SAF helps increase the energy efficiency of the furnaces.**
d. **Increased hot charging of billets to minimize the heat requirement for rolling.**
e. **Installation of Recuperator in RHF**
f. **100 % solid waste utilization to conserve resources by installation of briquetting and micro pelletising facilities for fines collected from PCDs and road /floor sweeping.**
g. **Carbon capture shall be explored subject to end user/ identification of storage locations and collaboration.**

OBSERVATIONS:

h. **Coal Consumption in DRI is on higher side , specifically when 70% imported coal having low ash is being used.**
i. **Pellet/Iron ore consumption per ton of DRI is around 1.6 T/ton of DRI. This is higher than the current practices in good operation plants.**
j. **Coke/Coal consumption in FAP is on higher side. Specific CO2 emission from FA Plant is high.**

B. Green Belt Credit

The plantation and green belt development will also be taken care in the plant and the space reserved for plantation will be more than 40% of the total plant area i.e. >34 Acres. Project Proponent will take-up extensive green belt development by planting about 1000 trees per Ac. it has been proposed to develop 15 meters wide green belt along the periphery inside the factory premises.

On an average, one acre of new forest can sequester about 2.5 tons of carbon annually. Young trees absorb CO2 at a rate of 6 kg per tree each year. Trees reach their most productive stage of carbon storage at about 10 years at which point they are estimated to absorb 22 kg of CO2 per year. At that rate, they release enough oxygen back into the atmosphere to support two human beings. Planting 100 million trees could reduce an estimated 18

million tons of carbon per year and consequently save American consumers $4 billion each year on utility bills.

http://urbanforestrynetwork.org/benefits/air%20quality.htm

C. Energy Transition from Fossil Fuel to Green Energy

The use of green hydrogen as fuel could help phase out coal, and enable India to move towards net-zero emissions. India has announced its commitment to reach net-zero greenhouse gas (GHG) emissions by 2070. GMPL will take necessary steps to adopt hydrogen based steel making technology as soon as the same is available at affordable cost.

D. GHG Emission Reduction, Carbon Capture & Storage and Utilisation of CO2.

a. GHG Emission Reduction

The existing plant has been implemented using state-of-the art technologies for optimum consumption of fossil fuel based energy and other resources. In addition, a very compact layout has been planned for the project to minimise in plant transportation and handling of raw materials and products. All raw materials and utilities shall be purchased from vendors/partners after ensuring that they also follow sustainable environment and energy management practices. GMPL plant shall be certified to ISO 14001 and ISO 50001 Management Systems.

The fines and scrap generated during the process are being recycled within the plant for use in the production process. Water consumption would also be optimised to reduce pumping energy consumption. Energy conservation and energy recovery facilities to be installed along with main plant and equipment shall be commissioned with the main plant. These facilities are summarised below:

1. **Hot charging of billets to minimise the heat requirement for rolling.**
2. **Waste heat recovery from SAF**
3. **Use of high pressure steam from WHRB to maximise power recovery in DRI kilns .**
4. **Installation of LED lights and solar power generation on Roof Tops.**
5. **Use of variable speed drives to reduce power consumption in units operating on variable loads.**
6. **Use of large capacity loaders, dumpers, ladles and transport vehicles to reduce fuel consumption.**
7. **Maximum solid waste utilisation to conserve resources by installation of briquetting facilities for fines collected from PCDs and road /floor sweeping.**

8. **Use of Slag in cement plants to enhance circular economy and reduce the emissions in cement sector thereby PP can claim credits for such sold quantities as per applicable emission factors).**
9. **Additional measures planned to reduce carbon dioxide emissions are elaborated in Section below;**

b. Carbon Capture and Use

Carbon Capture practice is picking up in steel industry. DRI flue gases could be explored for CO_2 recovery using absorption or adsorption technologies and potentially used in downstream industry and also in the steel plant for following purposes;

1. **Conditioning of SMS slag in presence of steam to convert the slag into concrete or slag sand for use in construction industry.**
2. **Conditioning of SMS slag with CO_2 to make it suitable for use in Cement making.**
3. **Sale to companies manufacturing CO_2 extinguishers.**
4. **Sale to companies making precipitated Calcium Carbonate used as base for most of the medicine tablets.**
5. **Synthesis of CO_2 into ethanol > This technology has been studied and pilot facility being set up by ArcelorMittal, Europe. Upon successful demonstration and commercial scale up, can be explored by PP**

c. Carbon Sequestration

Carbon sequestration offers greater hope for addressing the issue of controlling Global Warming. The following practices shall be adopted by PP to initiate carbon sequestration:

1. **In immediate future 40 % percent of the plant area shall be covered under green belt with tree density of 2500 trees per ha.**
2. **In collaboration with local forest department trees shall be planted by PP in degraded forest land.**

GMPL remains committed to the nation's pledge of achieving carbon neutrality by 2070. Even after 2030, we will continue our efforts to bring down the emission intensity at the same or much faster rate.

3.5 Quality Assurance /Quality Control

To ensure the credibility of the inventory, rigorous QA/QC procedures shall be followed to ensure the accuracy, transparency, and verifiability of the estimates.

The following issues shall be addressed:

1. **GMPL shall ensure that the best and most accurate emission**

factors are being used. Custom emission factors shall be calculated as far as possible. The methodology used to compute the company or plant specific custom emission factors shall be documented and strictly followed with necessary QA/QC checks, in line with IPCC guidelines.

2. If plant-specific information on the amount of coke used as reducing agent is available, this information shall be used. However, if this is not available, coke and petroleum consumption on a company-wide basis shall be used to estimate the mass of reducing agent.

3. **Plant and company-wide activity data shall be checked to ensure that there is no double accounting.**
4. **Experts involved in GHG accounting shall be trained to account for energy consumption as per WSA and BEE guidelines.**

3.6 Reporting and Documentation

GMPL is interested in auditing and certifying their GHG emissions. In order to ensure that estimates are verifiable, quantitative input data used to develop emission estimates shall be clearly documented, including listing of the relevant year. Records shall be maintained. Standard Operating Procedure shall be developed for calculations and data collection for verification and auditing of GHG inventory.

Emission Factors for Greenhouse Gas Inventories

Last Modified: 1 April 2021

Red text indicates an update from the 2020 version of this document.

Typically, greenhouse gas emissions are reported in units of carbon dioxide equivalent (CO_2e). Gases are converted to CO_2e by multiplying by their global warming potential (GWP). The emission factors listed in this document have not been converted to CO_2e. To do so, multiply the emissions by the corresponding GWP listed in the table below.

Gas	100-Year GWP
CH_4	25
N_2O	298

Source: Intergovernmental Panel on Climate Change (IPCC), Fourth Assessment Report (AR4), 2007. See the source note to Table 11 for further explanation.

Table 1 Stationary Combustion

Fuel Type	Heat Content (HHV)	CO_2 Factor	CH_4 Factor	N_2O Factor	CO_2 Factor	CH_4 Factor	N_2O Factor
	mmBtu per short ton	kg CO_2 per mmBtu	g CH_4 per mmBtu	g N_2O per mmBtu	kg CO_2 per short ton	g CH_4 per short ton	g N_2O per short ton
Coal and Coke							
Anthracite Coal	25.09	103.69	11	1.6	2,602	276	40
Bituminous Coal	24.93	93.28	11	1.6	2,325	274	40
Sub-bituminous Coal	17.25	97.17	11	1.6	1,676	190	28
Lignite Coal	14.21	97.72	11	1.6	1,389	156	23
Mixed (Commercial Sector)	21.39	94.27	11	1.6	2,016	235	34
Mixed (Electric Power Sector)	19.73	95.52	11	1.6	1,885	217	32
Mixed (Industrial Coking)	26.28	93.90	11	1.6	2,468	289	42
Mixed (Industrial Sector)	22.35	94.67	11	1.6	2,116	246	36
Coal Coke	24.80	113.67	11	1.6	2,819	273	40
Other Fuels - Solid							
Municipal Solid Waste	9.95	90.70	32	4.2	902	318	42
Petroleum Coke (Solid)	30.00	102.41	32	4.2	3,072	960	126
Plastics	38.00	75.00	32	4.2	2,850	1,216	160
Tires	28.00	85.97	32	4.2	2,407	896	118
Biomass Fuels - Solid							
Agricultural Byproducts	8.25	118.17	32	4.2	975	264	35
Peat	8.00	111.84	32	4.2	895	256	34
Solid Byproducts	10.39	105.51	32	4.2	1,096	332	44
Wood and Wood Residuals	17.48	93.80	7.2	3.6	1,640	126	63
	mmBtu per scf	kg CO_2 per mmBtu	g CH_4 per mmBtu	g N_2O per mmBtu	kg CO_2 per scf	g CH_4 per scf	g N_2O per scf
Natural Gas							
Natural Gas	0.001026	53.06	1.0	0.10	0.05444	0.00103	0.00010
Other Fuels - Gaseous							
Blast Furnace Gas	0.000092	274.32	0.022	0.10	0.02524	0.000002	0.000009
Coke Oven Gas	0.000599	46.85	0.48	0.10	0.02806	0.000288	0.000060
Fuel Gas	0.001388	59.00	3.0	0.60	0.08189	0.004164	0.000833
Propane Gas	0.002516	61.46	3.0	0.60	0.15463	0.007548	0.001510
Biomass Fuels - Gaseous							
Landfill Gas	0.000485	52.07	3.2	0.63	0.025254	0.001552	0.000306
Other Biomass Gases	0.000655	52.07	3.2	0.63	0.034106	0.002096	0.000413
	mmBtu per gallon	kg CO_2 per mmBtu	g CH_4 per mmBtu	g N_2O per mmBtu	kg CO_2 per gallon	g CH_4 per gallon	g N_2O per gallon
Petroleum Products							
Asphalt and Road Oil	0.158	75.36	3.0	0.60	11.91	0.47	0.09
Aviation Gasoline	0.120	69.25	3.0	0.60	8.31	0.36	0.07
Butane	0.103	64.77	3.0	0.60	6.67	0.31	0.06
Butylene	0.105	68.72	3.0	0.60	7.22	0.32	0.06
Crude Oil	0.138	74.54	3.0	0.60	10.29	0.41	0.08
Distillate Fuel Oil No. 1	0.139	73.25	3.0	0.60	10.18	0.42	0.08
Distillate Fuel Oil No. 2	0.138	73.96	3.0	0.60	10.21	0.41	0.08
Distillate Fuel Oil No. 4	0.146	75.04	3.0	0.60	10.96	0.44	0.09
Ethane	0.068	59.60	3.0	0.60	4.05	0.20	0.04
Ethylene	0.058	65.96	3.0	0.60	3.83	0.17	0.03
Heavy Gas Oils	0.148	74.92	3.0	0.60	11.09	0.44	0.09
Isobutane	0.099	64.94	3.0	0.60	6.43	0.30	0.06
Isobutylene	0.103	68.86	3.0	0.60	7.09	0.31	0.06
Kerosene	0.135	75.20	3.0	0.60	10.15	0.41	0.08
Kerosene-Type Jet Fuel	0.135	72.22	3.0	0.60	9.75	0.41	0.08
Liquefied Petroleum Gases (LPG)	0.092	61.71	3.0	0.60	5.68	0.28	0.06
Lubricants	0.144	74.27	3.0	0.60	10.69	0.43	0.09
Motor Gasoline	0.125	70.22	3.0	0.60	8.78	0.38	0.08
Naphtha (<401 deg F)	0.125	68.02	3.0	0.60	8.50	0.38	0.08
Natural Gasoline	0.110	66.88	3.0	0.60	7.36	0.33	0.07
Other Oil (>401 deg F)	0.139	76.22	3.0	0.60	10.59	0.42	0.08
Pentanes Plus	0.110	70.02	3.0	0.60	7.70	0.33	0.07
Petrochemical Feedstocks	0.125	71.02	3.0	0.60	8.88	0.38	0.08
Propane	0.091	62.87	3.0	0.60	5.72	0.27	0.05
Propylene	0.091	67.77	3.0	0.60	6.17	0.27	0.05
Residual Fuel Oil No. 5	0.140	72.93	3.0	0.60	10.21	0.42	0.08
Residual Fuel Oil No. 6	0.150	75.10	3.0	0.60	11.27	0.45	0.09
Special Naphtha	0.125	72.34	3.0	0.60	9.04	0.38	0.08
Unfinished Oils	0.139	74.54	3.0	0.60	10.36	0.42	0.08
Used Oil	0.138	74.00	3.0	0.60	10.21	0.41	0.08
Biomass Fuels - Liquid							
Biodiesel (100%)	0.128	73.84	1.1	0.11	9.45	0.14	0.01
Ethanol (100%)	0.084	68.44	1.1	0.11	5.75	0.09	0.01
Rendered Animal Fat	0.125	71.06	1.1	0.11	8.88	0.14	0.01
Vegetable Oil	0.120	81.55	1.1	0.11	9.79	0.13	0.01
Biomass Fuels - Kraft Pulping Liquor, by Wood Furnish							
North American Softwood		94.4	1.9	0.42			
North American Hardwood		93.7	1.9	0.42			
Bagasse		95.5	1.9	0.42			
Bamboo		93.7	1.9	0.42			
Straw		95.1	1.9	0.42			

Source:

Federal Register EPA; 40 CFR Part 98; e-CFR, (see link below). Table C-1, Table C-2 (as amended at 81 FR 89252, Dec. 9, 2016), Table AA-1 (78 FR 71965, Nov. 29, 2013).

https://www.ecfr.gov/cgi-bin/text-idx?SID=ae265d7d6f98ec86fcd8640b9793a3f6&mc=true&node=pt40.23.98&rgn=div5#ap40.23.98_19.1

Note: Emission factors are per unit of heat content using higher heating values (HHV). If heat content is available from the fuel supplier, it is preferable to use that value. If not, default heat contents are provided.

Table 2 Mobile Combustion CO_2

Fuel Type	kg CO_2 per unit	Unit
Aviation Gasoline	8.31	
Biodiesel (100%)	9.45	gallon
Compressed Natural Gas (CNG)	0.05444	scf
Diesel Fuel	10.21	gallon
Ethanol (100%)	5.75	gallon
Kerosene-Type Jet Fuel	9.75	gallon
Liquefied Natural Gas (LNG)	4.50	gallon
Liquefied Petroleum Gases (LPG)	5.68	gallon
Motor Gasoline	8.78	gallon
Residual Fuel Oil	11.27	gallon

Source:
Federal Register EPA; 40 CFR Part 98; e-CFR, (see link below). Table C-1 (as amended at 81 FR 89252, Dec. 9, 2016).
https://www.ecfr.gov/cgi-bin/text-idx?SID=ae265d7d6f98ec86fcd8640b9793a3f6&mc=true&node=pt40.23.98&rgn=div5#ap40.23.98_19.1
LNG: The factor was developed based on the CO_2 factor for Natural Gas factor and LNG fuel density from GREET1_2020.xlsx Model, Argonne National Laboratory.

Table 3 Mobile Combustion CH_4 and N_2O for On-Road Gasoline Vehicles

Vehicle Type	Year	CH_4 Factor (g / mile)	N_2O Factor (g / mile)
Gasoline Passenger Cars	1973-74	0.1696	0.0197
	1975	0.1423	0.0443
	1976-77	0.1406	0.0458
	1978-79	0.1389	0.0473
	1980	0.1326	0.0499
	1981	0.0802	0.0626
	1982	0.0795	0.0627
	1983	0.0782	0.0630
	1984-93	0.0704	0.0647
	1994	0.0617	0.0603
	1995	0.0531	0.0560
	1996	0.0434	0.0503
	1997	0.0337	0.0446
	1998	0.0240	0.0389
	1999	0.0215	0.0355
	2000	0.0175	0.0304
	2001	0.0105	0.0212
	2002	0.0102	0.0207
	2003	0.0095	0.0181
	2004	0.0078	0.0085
	2005	0.0075	0.0067
	2006	0.0076	0.0075
	2007	0.0072	0.0052
	2008	0.0072	0.0049
	2009	0.0071	0.0046
	2010	0.0071	0.0046
	2011	0.0071	0.0046
	2012	0.0071	0.0046
	2013	0.0071	0.0046
	2014	0.0071	0.0046
	2015	0.0068	0.0042
	2016	0.0065	0.0038
	2017	0.0054	0.0018
	2018	0.0052	0.0016
Gasoline Light-Duty Trucks (Vans, Pickup Trucks, SUVs)	1973-74	0.1908	0.0218
	1975	0.1634	0.0513
	1976	0.1594	0.0555
	1977-78	0.1614	0.0534
	1979-80	0.1594	0.0555
	1981	0.1479	0.0660
	1982	0.1442	0.0681
	1983	0.1368	0.0722
	1984	0.1294	0.0764
	1985	0.1220	0.0806
	1986	0.1146	0.0848
	1987-93	0.0813	0.1035
	1994	0.0646	0.0982
	1995	0.0517	0.0908
	1996	0.0452	0.0871
	1997	0.0452	0.0871
	1998	0.0412	0.0787
	1999	0.0333	0.0618
	2000	0.0340	0.0631
	2001	0.0221	0.0379
	2002	0.0242	0.0424
	2003	0.0221	0.0373
	2004	0.0115	0.0088
	2005	0.0105	0.0064
	2006	0.0108	0.0080
	2007	0.0103	0.0061
	2008	0.0095	0.0036
	2009	0.0095	0.0036
	2010	0.0095	0.0035
	2011	0.0096	0.0034
	2012	0.0096	0.0033
	2013	0.0095	0.0035
	2014	0.0095	0.0033
	2015	0.0094	0.0031
	2016	0.0091	0.0029
	2017	0.0084	0.0018
	2018	0.0081	0.0015
Gasoline Heavy-Duty Vehicles	<1981	0.4604	0.0497
	1982-84	0.4492	0.0538
	1985-86	0.4090	0.0515
	1987	0.3675	0.0849
	1988-1989	0.3492	0.0933
	1990-1995	0.3246	0.1142
	1996	0.1278	0.1680
	1997	0.0924	0.1726
	1998	0.0655	0.1750
	1999	0.0648	0.1724
	2000	0.0630	0.1660
	2001	0.0577	0.1468
	2002	0.0634	0.1673
	2003	0.0602	0.1553
	2004	0.0298	0.0164
	2005	0.0297	0.0083
	2006	0.0299	0.0241
	2007	0.0322	0.0015
	2008	0.0340	0.0015
	2009	0.0339	0.0015
	2010	0.0320	0.0015
	2011	0.0304	0.0015
	2012	0.0313	0.0015
	2013	0.0313	0.0015
	2014	0.0315	0.0015
	2015	0.0332	0.0021
	2016	0.0321	0.0061
	2017	0.0329	0.0084
	2018	0.0326	0.0082
Gasoline Motorcycles	1960-1995	0.0899	0.0087
	1996-2018	0.0672	0.0069

Source: EPA (2020) Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2018. All values are calculated from Tables A-106 through A-110.

Table 4 Mobile Combustion CH_4 and N_2O for On-Road Diesel and Alternative Fuel Vehicles

Vehicle Type	Fuel Type	Vehicle Year	CH_4 Factor (g / mile)	N_2O Factor (g / mile)
Passenger Cars	Diesel	1960-1982	0.0006	0.0012
		1983-1995	0.0005	0.0010
		1996-2006	0.0005	0.0010
		2007-2018	0.0302	0.0192
Light-Duty Trucks	Diesel	1960-1982	0.0011	0.0017
		1983-1995	0.0009	0.0014
		1996-2006	0.0010	0.0015
		2007-2018	0.0290	0.0214
Medium- and Heavy-Duty Vehicles	Diesel	1960-2006	0.0051	0.0048
		2007-2018	0.0095	0.0431
Light-Duty Cars	Methanol		0.0080	0.0060
	Ethanol		0.0080	0.0060
	CNG		0.0820	0.0060
	LPG		0.0080	0.0060
	Biodiesel		0.0300	0.0190
Light-Duty Trucks	Ethanol		0.0120	0.0110
	CNG		0.1230	0.0110
	LPG		0.0120	0.0130
	LNG		0.1230	0.0110
	Biodiesel		0.0290	0.0210
Medium-Duty Trucks	CNG		4.2000	0.0010
	LPG		0.0140	0.0340
	LNG		4.2000	0.0430
	Biodiesel		0.0090	0.0010
Heavy-Duty Trucks	Methanol		0.0750	0.0280
	Ethanol		0.0750	0.0280
	CNG		3.7000	0.0010
	LPG		0.0130	0.0260
	LNG		3.7000	0.0010
	Biodiesel		0.0090	0.0430
Buses	Methanol		0.0220	0.0320
	Ethanol		0.0220	0.0320
	CNG		10.0000	0.0010
	LPG		0.0340	0.0170
	LNG		10.0000	0.0010
	Biodiesel		0.0090	0.0430

Source: EPA (2020) Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2018. All values are calculated from Tables A-109 through A-112.

Table 5 Mobile Combustion CH_4 and N_2O for Non-Road Vehicles

Vehicle Type	Fuel Type	CH_4 Factor (g / gallon)	N_2O Factor (g / gallon)
Ships and Boats	Residual Fuel Oil	0.55	0.55
	Gasoline (2 stroke)	9.54	0.06
	Gasoline (4 stroke)	4.88	0.23
	Diesel	0.31	0.50
Locomotives	Diesel	0.80	0.26
Aircraft	Jet Fuel	0	0.30
	Aviation Gasoline	7.06	0.11
Agricultural Equipment[A]	Gasoline (2 stroke)	12.96	0.06
	Gasoline (4 stroke)	7.24	0.21
	Diesel	0.28	0.49
	LPG	2.19	0.39
Agricultural Offroad Trucks	Gasoline	7.24	0.21
	Diesel	0.13	0.49
Construction/Mining Equipment[B]	Gasoline (2 stroke)	12.42	0.07
	Gasoline (4 stroke)	5.58	0.20
	Diesel	0.20	0.47
	LPG	1.05	0.41
Construction/Mining Offroad Trucks	Gasoline	5.58	0.20
	Diesel	0.13	0.49
Lawn and Garden Equipment	Gasoline (2 stroke)	15.57	0.06
	Gasoline (4 stroke)	5.84	0.18
	Diesel	0.33	0.47
	LPG	0.35	0.41
Airport Equipment	Gasoline	2.58	0.25
	Diesel	0.17	0.49
	LPG	0.33	0.41
Industrial/Commercial Equipment	Gasoline (2 stroke)	15.14	0.06
	Gasoline (4 stroke)	5.48	0.20
	Diesel	0.23	0.47
	LPG	0.44	0.41
Logging Equipment	Gasoline (2 stroke)	12.03	0.08
	Gasoline (4 stroke)	6.71	0.18
	Diesel	0.10	0.49
Railroad Equipment	Gasoline	5.78	0.19
	Diesel	0.44	0.42
	LPG	1.20	0.41
Recreational Equipment	Gasoline (2 stroke)	7.81	0.03
	Gasoline (4 stroke)	8.45	0.19
	Diesel	0.41	0.41
	LPG	2.98	0.38

Source: EPA (2020) Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2018. All values are calculated from Tables A-113 through A-114.

Notes:

[A] Includes equipment, such as tractors and combines, as well as fuel consumption from trucks that are used off-road in agriculture.

[B] Includes equipment, such as cranes, dumpers, and excavators, as well as fuel consumption from trucks that are used off-road in construction.

Table 6 Electricity

eGRID Subregion	Total Output Emission Factors			Non-Baseload Emission Factors		
	CO_2 Factor (lb / MWh)	CH_4 Factor (lb / MWh)	N_2O Factor (lb / MWh)	CO_2 Factor (lb / MWh)	CH_4 Factor (lb / MWh)	N_2O Factor (lb / MWh)
AKGD (ASCC Alaska Grid)	1,114.4	0.098	0.013	1,333.0	0.123	0.017
AKMS (ASCC Miscellaneous)	549.3	0.026	0.004	1,520.2	0.067	0.012
AZNM (WECC Southwest)	952.3	0.068	0.010	1,445.3	0.100	0.014
CAMX (WECC California)	453.2	0.033	0.004	964.0	0.058	0.007
ERCT (ERCOT All)	868.6	0.057	0.008	1,277.2	0.083	0.012
FRCC (FRCC All)	861.0	0.055	0.007	1,029.5	0.054	0.007
HIMS (HICC Miscellaneous)	1,185.6	0.143	0.022	1,549.5	0.107	0.018
HIOA (HICC Oahu)	1,694.5	0.185	0.028	1,704.1	0.158	0.025
MROE (MRO East)	1,502.6	0.147	0.022	1,577.7	0.145	0.021
MROW (MRO West)	1,098.4	0.119	0.017	1,806.8	0.188	0.027
NEWE (NPCC New England)	488.9	0.077	0.010	839.9	0.089	0.012
NWPP (WECC Northwest)	715.2	0.068	0.010	1,617.5	0.156	0.022
NYCW (NPCC NYC/Westchester)	553.8	0.021	0.002	1,016.2	0.022	0.002
NYLI (NPCC Long Island)	1,209.0	0.157	0.020	1,300.6	0.044	0.005
NYUP (NPCC Upstate NY)	232.3	0.017	0.002	890.2	0.047	0.006
New Region PRMS (Puerto Rico Miscellaneous)	1,537.3	0.084	0.013	1,587.9	0.055	0.010
RFCE (RFC East)	695.0	0.053	0.007	1,237.9	0.089	0.012
RFCM (RFC Michigan)	1,189.3	0.114	0.016	1,766.9	0.177	0.025
RFCW (RFC West)	1,067.7	0.099	0.014	1,831.6	0.178	0.026
RMPA (WECC Rockies)	1,242.6	0.117	0.017	1,578.8	0.126	0.018
SPNO (SPP North)	1,070.0	0.112	0.016	1,958.6	0.200	0.029
SPSO (SPP South)	1,002.0	0.070	0.010	1,543.7	0.108	0.015
SRMV (SERC Mississippi Valley)	806.8	0.043	0.006	1,200.1	0.068	0.010
SRMW (SERC Midwest)	1,584.4	0.169	0.025	1,960.9	0.216	0.031
SRSO (SERC South)	969.2	0.071	0.010	1,389.5	0.101	0.015
SRTV (SERC Tennessee Valley)	949.7	0.087	0.013	1,565.2	0.139	0.020
SRVC (SERC Virginia/Carolina)	675.4	0.058	0.008	1,349.2	0.118	0.017
US Average	884.2	0.075	0.011	1,420.2	0.114	0.016

Source: EPA eGRID2019, February 2021

Note: Total output emission factors can be used as default factors for estimating GHG emissions from electricity use when developing a carbon footprint or emissions inventory. Annual non-baseload output emission factors should not be used for those purposes, but can be used to estimate GHG emissions reductions from reductions in electricity use.

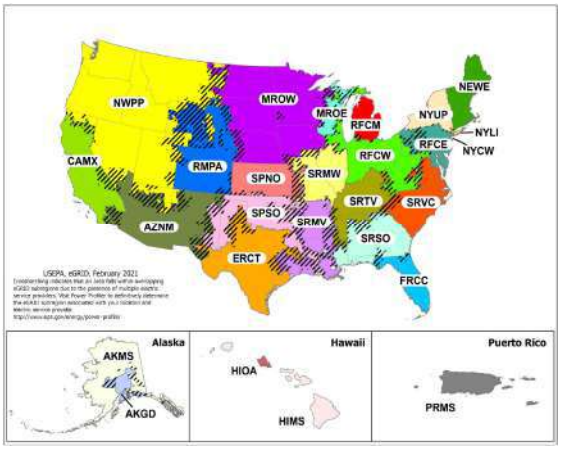

Table 7 Steam and Heat

	CO_2 Factor (kg / mmBtu)	CH_4 Factor (g / mmBtu)	N_2O Factor (g / mmBtu)
Steam and Heat	66.33	1.250	0.125

Note: Emission factors are per mmBtu of steam or heat purchased. These factors assume natural gas fuel is used to generate steam or heat at 80 percent thermal efficiency.

Scope 3 Emission Factors

Scope 3 emission factors provided below are aligned with the Greenhouse Gas Protocol Technical Guidance for Calculating Scope 3 Emissions, version 1.0 (Scope 3 Calculation Guidance). Where applicable, the specific calculation method is referenced. Refer to the Scope 3 Calculation Guidance for more information (http://www.ghgprotocol.org/scope-3-technical-calculation-guidance).

Table 8 Scope 3 Category 4: Upstream Transportation and Distribution and Category 9: Downstream Transportation and Distribution

These factors are intended for use in the distance-based method defined in the Scope 3 Calculation Guidance. If fuel data are available, then the fuel-based method should be used, with factors from Tables 2 through 5.

Vehicle Type	CO_2 Factor (kg / unit)	CH_4 Factor (g / unit)	N_2O Factor (g / unit)	Units
Medium- and Heavy-Duty Truck	1.407	0.013	0.033	vehicle-mile
Passenger Car [A]	0.341	0.009	0.008	vehicle-mile
Light-Duty Truck [B]	0.464	0.012	0.010	vehicle-mile
Medium- and Heavy-Duty Truck	0.211	0.0020	0.0049	ton-mile
Rail	0.022	0.0017	0.0005	ton-mile
Waterborne Craft	0.036	0.0116	0.0016	ton-mile
Aircraft[C]	1.160	0.0000	0.0357	ton-mile

Source:
CO_2, CH_4, and N_2O emissions data for road vehicles are from Table 2-13 of the EPA (2020) Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2018.
Vehicle-miles and passenger-miles data for road vehicles are from Table VM-1 of the Federal Highway Administration Highway Statistics 2018.
CO2e emissions data for non-road vehicles are based on Table A-124 of the EPA (2020) Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2018, which are distributed into CO2, CH4, and N2O emissions based on fuel/vehicle emission factors.
Freight ton-mile data for non-road vehicles are from Table 1-50 of the Bureau of Transportation Statistics, National Transportation Statistics for 2020 (Data based on 2018).

Notes:
Vehicle-mile factors are appropriate to use when the entire vehicle is dedicated to transporting the reporting company's product. Ton-mile factors are appropriate when the vehicle is shared with products from other companies.
[A] Passenger car: includes passenger cars, minivans, SUVs, and small pickup trucks (vehicles with wheelbase less than 121 inches).
[B] Light-duty truck: includes full-size pickup trucks, full-size vans, and extended-length SUVs (vehicles with wheelbase greater than 121 inches).
[C] Aircraft: updates due to a methodology change.

Table 9 Scope 3 Category 5: Waste Generated in Operations and Category 12: End-of-Life Treatment of Sold Products

These factors are intended for use in the waste-type-specific method or the average-data method defined in the Scope 3 Calculation Guidance for category 5 and category 12. Choose the appropriate material and disposal method from the table below. For the average-data method, use one of the mixed material types, such as mixed MSW.

	Metric Tons CO_2e / Short Ton Material					
Material	**Recycled[A]**	**Landfilled[B]**	**Combusted[C]**	**Composted[D]**	**Anaerobically Digested (Dry Digestate with Curing)**	**Anaerobically Digested (Wet Digestate with Curing)**
Aluminum Cans	0.06	0.02	0.01	NA	NA	NA
Aluminum Ingot	0.04	0.02	0.01	NA	NA	NA
Steel Cans	0.32	0.02	0.01	NA	NA	NA
Copper Wire	0.18	0.02	0.01	NA	NA	NA
Glass	0.05	0.02	0.01	NA	NA	NA
HDPE	0.21	0.02	2.80	NA	NA	NA
LDPE	NA	0.02	2.80	NA	NA	NA
PET	0.23	0.02	2.05	NA	NA	NA
LLDPE	NA	0.02	2.80	NA	NA	NA
PP	NA	0.02	2.80	NA	NA	NA
PS	NA	0.02	3.02	NA	NA	NA
PVC	NA	0.02	1.26	NA	NA	NA
PLA	NA	0.02	0.01	0.17	NA	NA
Corrugated Containers	0.11	0.90	0.05	NA	NA	NA
Magazines/Third-class mail	0.02	0.42	0.05	NA	NA	NA
Newspaper	0.02	0.35	0.05	NA	NA	NA
Office Paper	0.02	1.25	0.05	NA	NA	NA
Phonebooks	0.04	0.35	0.05	NA	NA	NA
Textbooks	0.04	1.25	0.05	NA	NA	NA
Dimensional Lumber	0.09	0.17	0.05	NA	NA	NA
Medium-density Fiberboard	0.15	0.07	0.05	NA	NA	NA
Food Waste (non-meat)	NA	0.58	0.05	0.15	0.14	0.11
Food Waste (meat only)	NA	0.58	0.05	NA	0.14	0.11
Beef	NA	0.58	0.05	0.15	0.14	0.11
Poultry	NA	0.58	0.05	0.15	0.14	0.11
Grains	NA	0.58	0.05	0.15	0.14	0.11
Bread	NA	0.58	0.05	0.15	0.14	0.11
Fruits and Vegetables	NA	0.58	0.05	0.15	0.14	0.11
Dairy Products	NA	0.58	0.05	0.15	0.14	0.11
Yard Trimmings	NA	0.33	0.05	0.19	0.11	NA
Grass	NA	0.26	0.05	0.19	0.09	NA
Leaves	NA	0.26	0.05	0.19	0.13	NA
Branches	NA	0.53	0.05	0.19	0.16	NA
Mixed Paper (general)	0.07	0.80	0.05	NA	NA	NA
Mixed Paper (primarily residential)	0.07	0.77	0.05	NA	NA	NA
Mixed Paper (primarily from offices)	0.03	0.75	0.05	NA	NA	NA
Mixed Metals	0.23	0.02	0.01	NA	NA	NA
Mixed Plastics	0.22	0.02	2.34	NA	NA	NA
Mixed Recyclables	0.09	0.68	0.11	NA	NA	NA
Food Waste	NA	0.58	0.05	0.15	NA	NA
Mixed Organics	NA	0.48	0.05	0.17	NA	NA
Mixed MSW	NA	0.52	0.43	NA	NA	NA
Carpet	NA	0.02	1.68	NA	NA	NA
Desktop CPUs	NA	0.02	0.40	NA	NA	NA
Portable Electronic Devices	NA	0.02	0.89	NA	NA	NA
Flat-panel Displays	NA	0.02	0.74	NA	NA	NA
CRT Displays	NA	0.02	0.64	NA	NA	NA
Electronic Peripherals	NA	0.02	2.23	NA	NA	NA
Hard-copy Devices	NA	0.02	1.92	NA	NA	NA
Mixed Electronics	NA	0.02	0.87	NA	NA	NA
Clay Bricks	NA	0.02	NA	NA	NA	NA
Concrete	0.01	0.02	NA	NA	NA	NA
Fly Ash	0.01	0.02	NA	NA	NA	NA
Tires	0.10	0.02	2.21	NA	NA	NA
Asphalt Concrete	-	0.02	NA	NA	NA	NA
Asphalt Shingles	0.03	0.02	0.70	NA	NA	NA
Drywall	NA	0.02	NA	NA	NA	NA
Fiberglass Insulation	0.05	0.02	NA	NA	NA	NA
Vinyl Flooring	NA	0.02	0.29	NA	NA	NA
Wood Flooring	NA	0.18	0.08	NA	NA	NA

Source: EPA, Office of Resource Conservation and Recovery (February 2016) Documentation for Greenhouse Gas Emission and Energy Factors used in the Waste Reduction Model (WARM). Factors from tables provided in the Management Practices Chapters and Background Chapters. WARM Version 15, November 2020 Update. Additional data provided by EPA, WARM-15 Background Data.

Notes: These factors do not include any avoided emissions impact from any of the disposal methods. All the factors presented here include transportation emissions, which are optional in the Scope 3 Calculation Guidance, with an assumed average distance traveled to the processing facility. AR4 GWPs are used to convert all waste emission factors into CO_2e.

[A] Recycling emissions include transport to recycling facility and sorting of recycled materials at material recovery facility.
[B] Landfilling emissions include transport to landfill, equipment use at landfill and fugitive landfill CH_4 emissions. Landfill CH_4 is based on typical landfill gas collection practices and average landfill moisture conditions.
[C] Combustion emissions include transport to combustion facility and combustion-related non-biogenic CO_2 and N_2O
[D] Composting emissions include transport to composting facility, equipment use at composting facility and CH_4 and N_2O emissions during composting.

Table 10 Scope 3 Category 6: Business Travel and Category 7: Employee Commuting

These factors are intended for use in the distance-based method defined in the Scope 3 Calculation Guidance. If fuel data are available, then the fuel-based method should be used, with factors from Tables 2 through 5.

Vehicle Type	CO_2 Factor (kg / unit)	CH_4 Factor (g / unit)	N_2O Factor (g / unit)	Units
Passenger Car [A]	0.341	0.009	0.008	vehicle-mile
Light-Duty Truck [B]	0.464	0.012	0.010	vehicle-mile
Motorcycle	0.189	0.070	0.007	vehicle-mile
Intercity Rail - Northeast Corridor [C]	0.058	0.0055	0.0007	passenger-mile
Intercity Rail - Other Routes [C]	0.150	0.0117	0.0038	passenger-mile
Intercity Rail - National Average [C]	0.113	0.0092	0.0026	passenger-mile
Commuter Rail [D]	0.143	0.0119	0.0029	passenger-mile
Transit Rail (i.e. Subway, Tram) [E]	0.106	0.0095	0.0013	passenger-mile
Bus	0.054	0.0206	0.0009	passenger-mile
Air Travel - Short Haul (< 300 miles)	0.206	0.0071	0.0065	passenger-mile
Air Travel - Medium Haul (>= 300 miles, < 2300 miles)	0.131	0.0006	0.0042	passenger-mile
Air Travel - Long Haul (>= 2300 miles)	0.161	0.0006	0.0051	passenger-mile

Source:
CO_2, CH_4, and N_2O emissions data for highway vehicles are from Table 2-13 of the EPA (2020) Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2018.
Vehicle-miles and passenger-miles data for highway vehicles are from Table VM-1 of the Federal Highway Administration Highway Statistics 2018.
Fuel consumption data and passenger-miles data for rail are from Tables A.14 to A.16 and C.9 to C.11 of the Transportation Energy Data Book: Edition 39. Fuel consumption was converted to emissions by using fuel and electricity emission factors presented in the tables above.
Intercity Rail factors from personal communication with Amtrak (Laura Fotiou), March 2020. These are based on 2019 values.
Air Travel factors from 2020 Guidelines to Defra / DECC's GHG Conversion Factors for Company Reporting. Version 1.0 July 2020.

Notes:
[A] Passenger car: includes passenger cars, minivans, SUVs, and small pickup trucks (vehicles with wheelbase less than 121 inches).
[B] Light-duty truck: includes full-size pickup trucks, full-size vans, and extended-length SUVs (vehicles with wheelbase greater than 121 inches).
[C] Intercity rail: Amtrak long-distance rail between major cities. Northeast Corridor extends from Boston to Washington D.C. Other Routes are all routes outside the Northeast Corridor.
[D] Commuter rail: rail service between a central city and adjacent suburbs (also called regional rail or suburban rail).
[E] Transit rail: rail typically within an urban center, such as subways, elevated railways, metropolitan railways (metro), streetcars, trolley cars, and tramways.

Global Warming Potentials

Table 11 Global Warming Potentials (GWPs)

Gas	100-Year GWP
N_2O	298
HFC-23	14,800
HFC-32	675
HFC-41	92
HFC-125	3,500
HFC-134	1,100
HFC-134a	1,430
HFC-143	353
HFC-143a	4,470
HFC-152	53
HFC-152a	124
HFC-161	12
HFC-227ea	3,220
HFC-236cb	1,340
HFC-236ea	1,370
HFC-236fa	9,810
HFC-245ca	693
HFC-245fa	1,030
HFC-365mfc	794
HFC-43-10mee	1,640
SF_6	22,800
NF_3	17,200
CF_4	7,390
C_2F_6	12,200
C_3F_8	8,830
c-C_4F_8	10,300
C_4F_{10}	8,860
C_5F_{12}	9,160
C_6F_{14}	9,300
$C_{10}F_{18}$	>7,500

Source:
100-year GWPs from IPCC Fourth Assessment Report (AR4), 2007. IPCC AR4 was published in 2007 and is among the most current and comprehensive peer-reviewed assessments of climate change. AR4 provides revised GWPs of several GHGs relative to the values provided in previous assessment reports, following advances in scientific knowledge on the radiative efficiencies and atmospheric lifetimes of these GHGs and of CO_2. Because the GWPs provided in AR4 reflect an improved scientific understanding of the radiative effects of these gases in the atmosphere, the values provided are more appropriate for supporting the overall goal of organizational GHG reporting than the Second Assessment Report (SAR) GWP values previously used in the Emission Factors Hub.
While EPA recognizes that Fifth Assessment Report (AR5) GWPs have been published, in an effort to ensure consistency and comparability of GHG data between EPA's voluntary and non-voluntary GHG reporting programs (e.g. GHG Reporting Program and National Inventory), EPA recommends the use of AR4 GWPs. The United States and other developed countries to the UNFCCC have agreed to submit annual inventories in 2015 and future years to the UNFCCC using GWP values from AR4, which will replace the current use of SAR GWP values. Utilizing AR4 GWPs improves EPA's ability to analyze corporate, national, and sub-national GHG data consistently, enhances communication of GHG information between programs, and gives outside stakeholders a consistent, predictable set of GWPs to avoid confusion and additional burden.

Table 12 Global Warming Potentials (GWPs) for Blended Refrigerants

ASHRAE #	100-year GWP	Blend Composition
R-401A	16	53% HCFC-22 , 34% HCFC-124 , 13% HFC-152a
R-401B	14	61% HCFC-22 , 28% HCFC-124 , 11% HFC-152a
R-401C	19	33% HCFC-22 , 52% HCFC-124 , 15% HFC-152a
R-402A	2,100	38% HCFC-22 , 6% HFC-125 , 2% propane
R-402B	1,330	6% HCFC-22 , 38% HFC-125 , 2% propane
R-403B	3,444	56% HCFC-22 , 39% PFC-218 , 5% propane
R-404A	3,922	44% HFC-125 , 4% HFC-134a , 52% HFC 143a
R-406A	0	55% HCFC-22 , 41% HCFC-142b , 4% isobutane
R-407A	2,107	20% HFC-32 , 40% HFC-125 , 40% HFC-134a
R-407B	2,804	10% HFC-32 , 70% HFC-125 , 20% HFC-134a
R-407C	1,774	23% HFC-32 , 25% HFC-125 , 52% HFC-134a
R-407D	1,627	15% HFC-32 , 15% HFC-125 , 70% HFC-134a
R-407E	1,552	25% HFC-32 , 15% HFC-125 , 60% HFC-134a
R-408A	2,301	47% HCFC-22 , 7% HFC-125 , 46% HFC 143a
R-409A	0	60% HCFC-22 , 25% HCFC-124 , 15% HCFC-142b
R-410A	2,088	50% HFC-32 , 50% HFC-125
R-410B	2,229	45% HFC-32 , 55% HFC-125
R-411A	14	87.5% HCFC-22 , 11 HFC-152a , 1.5% propylene
R-411B	4	94% HCFC-22 , 3% HFC-152a , 3% propylene
R-413A	2,053	88% HFC-134a , 9% PFC-218 , 3% isobutane
R-414A	0	51% HCFC-22 , 28.5% HCFC-124 , 16.5% HCFC-142b
R-414B	0	5% HCFC-22 , 39% HCFC-124 , 9.5% HCFC-142b
R-417A	2,346	46.6% HFC-125 , 5% HFC-134a , 3.4% butane
R-422A	3,143	85.1% HFC-125 , 11.5% HFC-134a , 3.4% isobutane
R-422D	2,729	65.1% HFC-125 , 31.5% HFC-134a , 3.4% isobutane
R-423A	2,280	47.5% HFC-227ea , 52.5% HFC-134a ,
R-424A	2,440	50.5% HFC-125, 47% HFC-134a, 2.5% butane/pentane
R-426A	1,508	5.1% HFC-125, 93% HFC-134a, 1.9% butane/pentane
R-428A	3,607	77.5% HFC-125 , 2% HFC-143a , 1.9% isobutane
R-434A	3,245	63.2% HFC-125, 16% HFC-134a, 18% HFC-143a, 2.8% isobutane
R-500	32	73.8% CFC-12 , 26.2% HFC-152a , 48.8% HCFC-22
R-502	0	48.8% HCFC-22 , 51.2% CFC-115
R-504	325	48.2% HFC-32 , 51.8% CFC-115
R-507	3,985	5% HFC-125 , 5% HFC143a
R-508A	13,214	39% HFC-23 , 61% PFC-116
R-508B	13,396	46% HFC-23 , 54% PFC-116

Source:
100-year GWPs from IPCC Fourth Assessment Report (AR4), 2007. See the source note to Table 11 for further explanation. GWPs of blended refrigerants are based on their HFC and PFC constituents, which are based on data from http://www.epa.gov/ozone/snap/refrigerants/refblend.html.

Annexure III- Conversion Factors and Emission factors

A Conversion Factors used;

1. MMBTU per short Ton = 278x10 (-)^{6}Kcal/Kg
2. One BTU= 252 Calorie
3. One Calorie= 4.184 Joules

B. GHG emissions during Transportation by

a) Employees Travel by two wheelers;
   i. CO_2 - 0.11 gms/km
   ii. CH_4 - 0.005 gms/km
   iii. N2O- 0.0005 gms/km
b) Material Transport by Trucks of 20 T capacity
   i. CO_2- 0.90 gms/km
   ii. CH_4 -0.009 gms/km
   iii. N2O- 0.006 gms/km

C. Emission Factors tCO_2/t of material

1. Anthracite-2.86
2. Coal (Industry Sector)- 2.116 tCo2/short Ton of Coal=2.33 T/MT of Coal
3. Coking Coal- 2.819 ton/Short Ton of Coking Coal= 3.1 Ton/ton of coking Coal
4. Lime Stone - 0.44
5. Dolomite-0.47
6. Slag- 0.56

D. GHG Credits from use of: tCO_2/t

a) Iron ore tailings in Cement making- 0.56
b) Fly ash in Cement making- 0.56
c) EAF slag in Cement making-0.56

E. Emission factors for Different Fuels

S.No	Parameter	Value	Unit	Remarks/Source
1	CO_2 emission factor of diesel	74.1	tCO_2/TJ	IPCC 2006 Guidelines for National Greenhouse Gas Inventories, 2006 (http://www.ipcc-nggip.iges.or.jp/public/2006gl/vol2.html), Table 1.4 - Default CO_2 emission factors for combustion
2	CH_4 Default emissions for diesel	3	$kgCO_2/TJ$	IPCC 2006 Guidelines for National Greenhouse Gas Inventories, 2006 (http://www.ipcc-nggip.iges.or.jp/public/2006gl/vol2.html) Table 2.2 - Default emission factors for stationarycombustion in the energy industry
3	N_2O Default emissions for diesel	0.6	$kgCO_2/TJ$	IPCC 2006 Guidelines for National Greenhouse Gas Inventories, 2006 (http://www.ipcc-nggip.iges.or.jp/public/2006gl/vol2.html) Table 2.2 - Default emission factors for stationarycombustion in the energy industry
4	Effective CO_2 emission factors in coal (Thermal)	95.8	tCO_2/TJ	CEA Baseline CO_2 database for Indian Power Sector (http://cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver10.pdf)
5	CH_4 Default emissions for coal	1	$kgCO_2/TJ$	IPCC 2006 Guidelines for National Greenhouse Gas Inventories, 2006 (http://www.ipcc-nggip.iges.or.jp/public/2006gl/vol2.html) Table 2.2 - Default emission factors for stationarycombustion in the energy industry

6	N_2O emission factor for coal	1.5	$kgCO_2/TJ$	IPCC 2006 Guidelines for National Greenhouse Gas Inventories, 2006 (http://www.ipcc-nggip.iges.or.jp/public/2006gl/vol2.html) Table 2.2 - Default emission factors for stationary combustion in the energy industry
7	CO_2 emission factor in Natural Gas	56.1	tCO_2/TJ	IPCC 2006 Guidelines for National Greenhouse GasInventories, 2006 (http://www.ipcc-nggip.iges.or.jp/public/2006gl/vol2.html) Table 1.4 - Default CO_2 emission factors for combustion
8	CH_4 Default Emission for NaturalGas	1	$kgCO_2/TJ$	IPCC 2006 Guidelines for National Greenhouse Gas Inventories, 2006 (http://www.ipcc-nggip.iges.or.jp/public/2006gl/vol2.html) Table 2.2 - Default emission factors for stationarycombustion in the energy industry
9	N_2O emission factors for Natural Gas	0.1	$kgCO_2/TJ$	IPCC 2006 Guidelines for National Greenhouse Gas Inventories, 2006 (http://www.ipcc-nggip.iges.or.jp/public/2006gl/vol2.html) Table 2.2 - Default emission factors for stationarycombustion in the energy industry

Emission Factors for Steel Plant materials

https://www.climate-policy-watcher.org/emission-factors/choice-of-emission-factors-tier-1-method.html

Sinter Purchase- 0.20 tCO_2 /T sinter
Pig Iron- - 1.35 tCO_2 /T sinter
DRI - 0.70 tCO_2 /T DRI
Pellet - 0.03 tCO_2 /T Pellet
Scrap -0.04 tCO_2 /T scrap

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CO_2 Baseline Database for the Indian Power Sector

User Guide

Version 17.0

OCTOBER 2021

Government of India
Ministry of Power
Central Electricity Authority
Sewa Bhawan, R.K.Puram,
New Delhi-66

Revision History of the Database

Version No.	Date of Publication	Main Revisions Compared to Previous Version
1.0 Draft	October 2006	- Draft for Stakeholder Consultation
1.0	November 2006	- Added data on 10 stations which had been in exclusion worksheet of draft database - Adjusted values to latest IPCC Guidance (IPCC 2006 Guidelines for National Greenhouse Gas Inventories) where IPCC defaults are used
1.1	December 2006	- Adjusted fuel emission factor of lignite to be in line with Initial National Communication figures
2.0	June 2007	- Added data for FY 2005-06, including new stations and units commissioned during 2005-06 - Some retroactive changes to data for FY 2000-01 to 2004-05
3.0	December 2007	- Added data for FY 2006-07, including new stations and units commissioned during 2006-07 - Adapted calculations and User Guide to ensure consistency with new CDM methodologies: ACM0002 Version 07, and Tool to Calculate the Emission Factor for an Electricity System (Version 01.1, EB 35 Annex 12)
4.0	October 2008	- Added data for FY 2007-08, including new stations and units commissioned during 2007-08 - Adjusted delineation of regional grids - Adjusted IPCC-based fuel emission factors to account for uncertainty in line with EB 35 Annex 12
5.0	November 2009	- Added data for FY 2008-09, including new stations and units commissioned during 2008-09
6.0	March 2011	- Added data for FY 2009-10, including new stations and units commissioned during 2009-10
7.0	January 2012	- Added data for FY 2010-11, including new stations and units commissioned during 2010-11
8.0	January 2013	- Added data for FY 2011-12, including new stations and units commissioned during 2011-12 - From FY 2011-12, scope of database is restricted to stations exceeding 25 MW - Retroactive changes: Three units in NEWNE region identified as CDM units, leading to minor change in build margin for FY 2010-11
9.0	December 2013	- Added data for FY 2012-13, including new stations and units commissioned during 2012-13 - Retroactive changes: Nine units identified as CDM units, leading to changes in build margins back to FY 2009-10 - Updated GCVs of five stations back to FY 2008-09
10.0	December 2014	- Added data for FY 2013-14, including new stations and units commissioned during 2013-14 - Introduced distinction between Indian and imported coal as from FY 2013-14 - Retroactive changes to previous FY due to: identification of CDM units, identification of waste heat recovery steam turbines, harmonization of GCV for oil used as secondary fuel - One station was reclassified from SR to NEWNE region
11.0	April 2016	- Added data for FY 2014-15, including new stations and units commissioned during 2014-15 - Introduced integrated Single Indian Grid (NEWNE and Southern are now synchronized) - Export of power to Bangladesh also considered in the Import/Export data.
12.0	May 2017	- Added data for FY 2015-16, including new stations and units commissioned during 2015-16
13.0	June 2018	- Added data for FY 2016-17, including new stations and units commissioned during 2016-17 - Export of power to Myanmar also considered in the Import/Export data.
14.0	December 2018	- Added data for FY 2017-18, including new stations and units commissioned during 2017-18
15.0	December 2019	- Added data for FY 2018-19, including new stations and units commissioned during 2018-19
16.0	March 2021	- Added data for FY 2019-20, including new stations and units commissioned during 2019-20 - Some retroactive changes to data for FY 2018-19
17.0	October 2021	- Added data for FY 2020-21, including new stations and units commissioned during 2020-21

Expert Team Contributing to the Database

Central Electricity Authority:

Mr. Dhiraj Kumar Srivastava, Chief Engineer (TE&TD) Mr. J.N. Prasad Chief Engineer-In charge (TPE&CC)

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Contents

Summary

Since the emergence of the Kyoto Protocol and its Clean Development Mechanism (CDM), energy projects lowering the carbon intensity of the electricity grid can generate additional revenues from carbon credits. Methodologies approved by the CDM Executive Board have to be applied to determine the resulting emission reductions, using the "baseline" CO_2 emission factor of the relevant geographical area.

In order to facilitate adoption of authentic baseline emissions data and also to ensure uniformity in the calculations of CO_2 emission reductions by CDM project developers, Central Electricity Authority (CEA) has compiled a database containing the necessary data on CO_2 emissions for all grid-connected power stations in India.

All regional grids have been integrated as a single Indian Grid covering all the states in December 2013. Small power exchanges also take place with the neighbouring countries Bhutan, Nepal, Bangladesh and Myanmar. For the unified grid, the main emission factors are calculated in accordance with the relevant CDM methodologies. CEA will continue updating the database at the end of each fiscal year.

1. The prevailing baseline emissions based on the data for the FY 2020-21 are shown in Table S-1. The calculations are based on generation, fuel consumption and fuel quality data obtained from the power stations. Typical standard data were used only for a few stations where information was not available from the station. Cross-border electricity transfers were also taken into account for calculating the CO_2 emission baseline.

Table S-1: Weighted average emission factor, simple operating margin (OM), build margin (BM) and combined margin (CM) of the Indian Grid for FY 2020-21 (adjusted for cross-border electricity transfers), in t CO_2/MWh

Average	OM	BM	CM
0.79	**0.94**	**0.87**	**0.90**

Average is the average emission of all stations in the grid, weighted by net generation.

OM is the average emission from all stations excluding the low cost/must run sources.

BM is the average emission of the 20% (by net generation) most recent capacity addition in the grid.

CM is a weighted average of the OM and BM (here weighted 50: 50).

1 Background and Objective

Purpose of the CO_2 Database

The Clean Development Mechanism (CDM) under the Kyoto Protocol to United Nations Framework Convention on Climate Change (UNFCCC) provides an opportunity for the Indian power sector to earn revenue through the reduction of greenhouse gas emissions (GHG), particularly carbon dioxide (CO_2). India has tremendous potential for CDM projects. Power generation based on higher efficiency technologies such as supercritical technology, integrated gasification combined cycle, and renovation and modernisation of old thermal power plants, co-generation along with renewable energy sources are some of potential candidates for CDM in the power sector. Energy efficiency and conservation projects also present themselves as eligible CDM projects, as these would also result in energy savings and displace associated CO_2 emissions which otherwise would be produced by grid-connected power stations.

The CDM has by now become an established mechanism for crediting climate friendly projects. Projects involving displacement or saving of grid electricity must calculate their emission reductions based on a grid emission factor, which needs to be determined in accordance with the rules set by the CDM Executive Board. Central Electricity Authority (CEA) accordingly took up to compile a database for all grid-connected power stations in India. The purpose of the database is to establish authentic and consistent quantification of the CO_2 emission baseline, which can be readily used by CDM project developers in the Indian power sector. This would enhance the acceptability of Indian projects and would also expedite the clearance/approval process. The baseline emissions for the Indian Grid are given in Section 5 (Results) of this User Guide. The complete updated CO_2 Database (Microsoft Excel File) and this User Guide along with all previous versions is available on the website of Central Electricity Authority: www.cea.nic.in.

The purpose of this User Guide is to provide a ready reference to the underlying calculations and assumptions used in the CO_2 database and to summarise the key results.

Official Status of the Database

The database is an official publication of the Government of India for the purpose of CDM baselines. It is based on the most recent data available with the Central Electricity Authority.

Consistency of the Database with CDM Methodologies

Under the CDM, emission reductions must be quantified using an approved methodology. Key examples of such methodologies include AMS-I.D and ACM0002 for grid-connected power generation from renewable sources in small- and large-scale projects, respectively. The latest versions of all approved CDM methodologies are available at the official CDM website, http://cdm.unfccc.int.

In addition, the CDM Executive Board has adopted a methodological tool to facilitate the calculation of baseline emission factors for electricity grids.[1] This tool, which is referred to as the Grid Tool in this user guide, has become the main reference for CDM methodologies involving baseline emission factors for power grids, such as ACM0002.

This version of the database is designed to be consistent with version 7.0 of the Tool to calculate the emission factor for an electricity system published by the CDM Executive Board.

Installed Capacity

As a result of the impressive growth attained by the Indian Power Sector, the installed capacity has grown from mere 1,713 MW in 1950 to 382,151.22 MW as on 31.03.2021. Sector-wise details of installed capacity are shown in Table 1.

Table 1: Sector- wise installed capacity (MW) as on 31.03.2021

Sector	Thermal					Nuclear	Hydro	RES	Total
	Coal	Lignite	Gas	Diesel	Total				
State	65931.50	1150.00	7087.36	236.01	74404.86	0.00	27069.50	2395.27	103869.64
Central	62570.00	3640.00	7237.91	0.00	73447.91	6780.00	15646.72	1632.30	97506.93
Private	74173.00	1830.00	10598.74	273.70	86875.45	0.00	3493.00	90406.21	180774.66
All India	202674.50	6620.00	24924.01	509.71	234728.22	6780.00	46209.22	94433.79	382151.22

Note: These capacities are not identical with those listed in the Excel database, because the database excludes renewable, few small diesel and steam units.

It is evident from Table 1 that the installed capacity is predominantly coal based and therefore, is a major source of carbon dioxide emissions in India. Hence, there exists scope for reducing the CO_2 emissions in the country by way of fuel substitution, increased use of renewable energy sources, and also by improving the thermal efficiency of power generation.

[1] Tool to calculate the emission factor for an electricity system (Version 7.0). See http://cdm.unfccc.int

Indian Grids

Historically, the Indian power system was divided into five independent regional grids, namely Northern, Eastern, Western, Southern, and North-Eastern. Each grid covered several states (see Table 2). Since August 2006, however, all regional grids except the Southern Grid had been integrated and were operating in synchronous mode, i.e. at same frequency. Consequently, the Northern, Eastern, Western and North-Eastern grids were treated as a single grid named as NEWNE grid from FY 2007-08 onwards for the purpose of this CO_2 Baseline Database. As of 31 December 2013, the Southern grid has also been synchronised with the NEWNE grid, hence forming one unified Indian Grid.

Power generation and supply within the Indian Grid is managed by Regional Load Dispatch Centres (RLDC). The National Power Committee (NPC) and Regional Power Committees (RPCs) provide a common platform for discussion and solution to the national and regional problems relating to the grid. Each state meets their demand with their own generation facilities and also with allocation from power plants owned by the central sector such as NTPC and NHPC etc. and IPP's being operated by private sector. Specific quotas are allocated to each state from the central sector power plants. Depending on the demand and generation, there are cross-border electricity exports and imports (e.g. from Bhutan, Nepal, Bangladesh and Myanmar).

Table 2: Geographical scope of the Indian electricity grid

INDIAN GRID				
Northern	**Eastern**	**Western**	**North-Eastern**	**Southern**
Chandigarh	Bihar	Chhattisgarh	Arunachal Pradesh	Andhra Pradesh
Delhi	Jharkhand	Gujarat	Assam	Karnataka
Haryana	Orissa	Daman & Diu	Manipur	Kerala
Himachal Pradesh	West Bengal	Dadar & Nagar Haveli	Meghalaya	Tamil Nadu
Jammu & Kashmir	Sikkim	Madhya Pradesh	Mizoram	Puducherry
Punjab	Andaman-Nicobar*	Maharashtra	Nagaland	Lakshadweep*
Rajasthan		Goa	Tripura	Telengana
Uttar Pradesh				
Uttarakhand				

**The union territories Andaman and Nicobar Islands and Lakshadweep islands are not connected to the National grid. The power generation and distribution systems of these territories is served by standalone systems.*

2 How to Use the Database

Structure of the Database

Emission reductions from CDM projects in the power sector are calculated based on the net electricity generated by the project and the difference between the emissions factors (in t CO_2/MWh) of the baseline and the project activity. The baseline emission factor reflects the carbon intensity of the displaced grid electricity. This baseline emission factor can be derived from the data provided in the CO_2 Database.

Specifically, the database contains the following elements:

- Worksheet "Data" provides the net generation and the absolute and specific CO_2 emissions of each grid-connected power station (see Section 4 for exceptions). It also indicates which stations and units were included in the operating margin and build margin, respectively.
- Worksheet "Results" provides the most commonly used aggregate emission factors. These are calculated from the station data in accordance with the most recent Grid Tool.[2] The emission factors are explained in more detail in the next section.
- Worksheet "Abbreviations" explains the abbreviations used in the "Data" worksheet.
- Worksheet "Assumptions" shows the assumptions that were used for the calculation of the CO_2 emissions at station and unit level, where the information was not provided by the station.
- Worksheet "Transfers" shows the cross-border power transfers.

Different Types of Emission Factors

The CDM methodologies which have been approved to date by the CDM Executive Board distinguish a range of different emission factors. In the Indian context, the following four are most relevant, and were therefore calculated for the Indian Grid based on the underlying station data:

Weighted average:
The weighted average emission factor describes the average CO_2 emitted per unit of electricity generated in the grid. It is calculated by dividing the absolute CO_2 emissions of all power stations by the total net generation. Net generation from so-called low-cost/must-run sources is included in the denominator. In India, hydro and nuclear stations qualify as low-cost/must-run sources.

Simple operating margin (OM):
The operating margin describes the average CO_2 intensity of the existing stations in the grid which are most likely to reduce their output if a CDM project supplies electricity to the grid (or reduces consumption of grid electricity). "Simple" denotes one out of four possible variants listed in the Grid Tool for calculating the operating margin.[3] Furthermore, option A has been selected as the required disaggregated data is available in India.

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[2] *Tool to calculate the emission factor for an electricity system* (Version 7.0). See http://cdm.unfccc.int

[3] The two variants "Simple adjusted operating margin" and "Dispatch data analysis operating margin" cannot currently be applied in India due to lack of necessary data.

The simple operating margin is the weighted average emissions rate of all generation sources *except* so-called low-cost or must-run sources (hydro and nuclear stations) and are excluded). The operating margin, therefore, can be calculated by dividing the grid's total CO_2 emissions by the net generation of all thermal stations. In other words, it represents the weighted average emissions rate of all thermal stations.

Values for operating margins given in this User Guide and the Database are always based on the "ex post" option as set out in the Grid Tool.[4]

Build margin (BM):
The build margin reflects the average CO_2 intensity of newly built power stations that will be (partially) replaced by a CDM project. In accordance with the Grid Tool, the build margin is calculated in this database as the average emissions intensity of the 20% most recent capacity additions in the grid based on net generation. The build margin generally covers units commissioned in the last five years.

Combined margin (CM):
The combined margin is a weighted average of the simple operating margin and the build margin. By default, both margins have equal weights (50%). However, CDM project developers may choose to argue for different weights. In particular, for intermittent and non-dispatchable generation types such as wind and solar photovoltaic, the Grid Tool allows to weigh the operating margin and build margin at 75% and 25%, respectively. However, the combined margins shown in the database are calculated based on equal weights.

In line with the Grid Tool, if a station is registered as a CDM activity, it is excluded from the build margin but not from the operating margin.[5]

[4] See *Tool to calculate the emission factor for an electricity system* (Version 7.0).

[5] See *Tool to calculate the emission factor for an electricity system* (Version 7.0), pp. 16 and pp 25 point (f)

3 Scope of Database

The database includes all grid-connected power stations having an installed capacity above 25 MW.[6] The data covers power stations of both public utilities and independent power producers (IPPs).

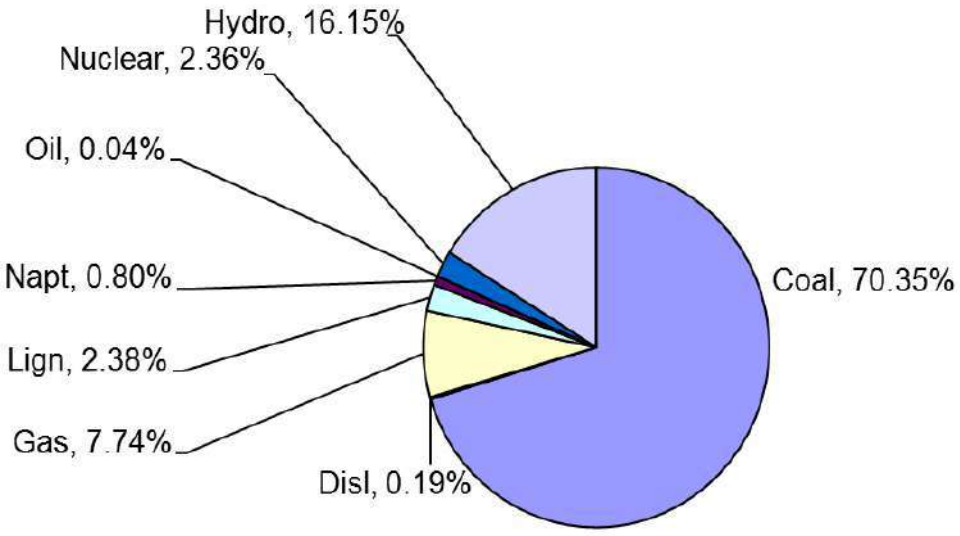

Figure 1: Breakdown of generation capacity covered by the database. The total corresponds to 287,783 MW as on 31.03.2021

The following power stations are currently not accounted for in the database:

- Small decentralised generation sets;
- Stations or units installed in Andaman and Nicobar Islands and Lakshadweep;
- Captive power stations: As on 31 March 2021, the aggregate installed capacity of captive stations in industries having demand of 1 MW and above was 77,000 MW (provisional figure). The generation of these stations in FY 2020-21 was 200,000 GWh (provisional figure). The data of captive plants could not be added in this database in absence of the data availability.
- Non-conventional renewable energy stations: These include hydro stations up to 25 MW, as well as all wind, biomass and solar photovoltaic stations. The installed, grid-connected capacity of these sources was 94,433.79 MW as on 31.03.2021.[7] The generation from these non-conventional renewable energy sources in FY 2020-21 was 144,247.51GWh.

[6] Previously, the database covered grid-connected power stations having an installed capacity above 3 MW in case of hydro and above 10 MW for all other plant types. Monitoring of stations up to 25 MW was discontinued from FY 2011-12. For archiving and consistency reasons, 70 of these small stations will remain in the database without new data entries.

[7] Ministry of New and Renewable Energy. The capacity figure may differ from CEA reported figure of installed capacity.

4 Data and Calculation Approach

This section gives an overview on the base data, annual data as well as the approaches used to calculate station-level and unit-level CO_2 emissions.

4.1 Base Data

The following base data parameters were collected for all the stations listed in the CO_2 database:

- **S No:**

  The Station Numbers start at 1 and proceed alphabetically for all stations. All units of a station have the same station number. Numbers may change in future database versions due to insertion of new stations.

- **Station Name:**

  Name of the power station. The station names have been arranged in alphabetical order.

- **Unit Number:**

  The units of a station are numbered serially starting with 1. Stations are attributed with unit number 0 for the purpose of calculations.

- **Commissioning Date:**

  The commissioning date is provided for each unit. Commissioning dates are important for the determination of the build margin.

- **Capacity:**

  Capacity data is based on declared rated capacities in MW for each unit as of 31st March 2021.

- **State:**

  State where the power station is located.

- **Sector:**

  This denotes whether the station is operated by the central sector, the state authorities, or the private sector.

- **System:**

  A list of the systems including abbreviations and full names is provided in Appendix A.

- **Type:**

  Indicates the type of the station, viz. thermal, nuclear, and hydro.

- **Fuel:**

  Fuel 1 and Fuel 2 indicates the main fuels used for power generation at each station. For example, in coal-based stations, Coal is indicated as Fuel 1 and Oil as Fuel 2.

4.2 Annual Data

The annual data columns in the database provide the following: net generation in GWh of the station, absolute carbon dioxide emissions in metric tonnes, and specific carbon dioxide emissions in t CO_2/MWh, for the five fiscal years 2016-17 to 2020-21. In addition, there are columns to indicate whether the station is included in the operating margin in the respective year, and an additional column indicating which units are included in the build margin. If a unit is part of a registered CDM activity, it is excluded from the build margin, and the CDM registration number is indicated in the respective column.

CEA has compiled the CO_2 Database based upon generation, fuel consumption and fuel gross calorific value (GCV) data furnished by each power station. In cases where the station could not provide reliable data for all the relevant parameters, assumptions were made as described below. Further details on the assumptions made are provided in Appendix B.

a) Assumptions at Station Level

At the station level, the following assumptions were made where the relevant data could not be provided by a station:

Net generation:
For hydro stations, only gross generation was available, but not net generation data. Therefore, the CEA standard value for auxiliary power consumption in hydro units (0.5%) was applied to derive the net generation from the gross generation data reported by the stations. Likewise, CEA standard values for auxiliary power consumption had to be applied for some thermal stations.

Gross Calorific Value (GCV):
Default values were used for some thermal stations where station-specific GCVs were not available.

If the station consists just of one unit, the assumptions at unit level were applied to the station level.

b) Assumptions at Unit Level

At unit level, the following assumptions were made for those units falling into the build margin (i.e. the most recently built units comprising 20% of net generation):

Gross generation:
For some stations, gross generation data were not available at unit level. Therefore, the plant load factor of the respective station was used to derive the gross generation of the units. For units commissioned after the start of the relevant fiscal year, the gross generation was further adjusted pro rata the number of days since commissioning.

Net generation:
Net generation data is increasingly being reported at unit level by thermal stations. Two distinct approaches were applied to estimate net generation where unit level data was not available.

1. The auxiliary consumption (in % of gross generation) of the unit was assumed to be equal to that of the respective stations in the following cases:

i. All units of a station fall into the build margin; or

ii. All units of a station have the same installed capacity; or

iii. The units in the station have different capacities but do not differ with respect to the applicable standard auxiliary consumption; or

iv. If the default auxiliary power consumption for that type of generation unit is higher than the observed auxiliary power consumption of the station concerned, and the relevant unit is among the largest in that station.

2. In a few other cases, standard values for auxiliary consumption adopted by CEA were applied.

Fuel consumption and GCV:
In case fuel consumption and GCV are not reported at unit level by thermal stations, the specific CO_2 emissions of the units coming in the build margin could usually be assumed to be equal to the values of the respective station. See Section 4.3 for details.

4.3 Calculation of CO_2 Emissions

Calculation Approach – Station Level

CO_2 emissions of thermal stations were calculated using the formula below:

$$AbsCO_2(station)_y = \sum_{i=1}^{2} FuelCon_{i,y} \times GCV_{i,y} \times EF_i \times Oxid_i \qquad (1)$$

Where:

$AbsCO_{2,y}$	Absolute CO_2 emission of the station in the given fiscal year 'y'
$FuelCon_{i,y}$	Amount of fuel of type i consumed in the fiscal year 'y'
$GCV_{i,y}$	Gross calorific value of the fuel i in the fiscal year 'y'
EF_i	CO_2 emission factor of the fuel i based on GCV
$Oxid_i$	Oxidation factor of the fuel i

The emission and oxidation factors used in the CO_2 Database are provided in Appendix B.

The emission factors for Indian coal and lignite were based on the values provided in India's Initial National Communication under the UNFCCC (Ministry of Environment & Forests, 2004). The emission factor for coal is supported by the results of an analysis of approx. 120 coal samples collected from different Indian coal fields. Since the values in the National Communication are based on the NCV (Net Calorific Value), they were converted to GCV basis using a formula also furnished in the National Communication. For all other fuels as well as for imported coal, default emission factors were derived from the IPCC 2006 Guidelines.[8] In line with the Grid Tool, the low end values of the 95% confidence intervals indicated by IPCC were used.[9] The IPCC default factors were converted to GCV basis using IEA default conversion factors.

The oxidation factor for Indian coal and lignite was derived from an analysis performed with data on the unburnt carbon content in the ash from various Indian coal-fired power stations. The value of 98% is consistent with the default value provided in the IPCC 1996 Guidelines.[10] For all other fuels as well as imported coal, default values provided in the more recent IPCC 2006 Guidelines were used.

Specific CO_2 emissions of stations ($SpecCO_2\ (station)_y$) were computed by dividing the absolute emissions ($AbsCO_2\ (station)_y$) estimated above by the station's net generation ($NetGen(station)_y$).

$$SpecCO_2(station)_y = \frac{AbsCO_2(station)_y}{NetGen(station)_y} \qquad (2)$$

[8] 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2: Energy, Table 1.4

[9] In accordance with the *Tool to calculate the emission factor for an electricity system, Version 7.0*

[10] IPCC 1996 Revised Guidelines for National Greenhouse Gas Inventories, Volume 3 (Reference Manual), p.1.13

In FY 2020-21, fuel consumption was not available for few stations. In these cases, conservative standard values have been applied for calculation of specific emissions of the respective station.

Calculation Approach – Unit Level

Unit-level CO_2 emissions were calculated only for the units falling in the build margin.

Wherever reliable fuel consumption data was available at unit level, it was used for determining the emissions of units falling in the build margin, in the same way as for the station emissions. This applies for an increasing number of thermal units, especially new and large coal-fired stations.

In the remaining cases where unit-level fuel consumption was not available, the absolute CO_2 emissions of thermal units ($AbsCO_2\ (unit)_y$) were derived by multiplying the specific emissions ($SpecCO_2\ (unit)_y$) with the net generation of each unit ($NetGen(unit)_y$), where net generation was obtained as described in Section 4.2:

$$AbsCO_2(unit)_y = SpecCO_2(unit)_y \times NetGen\ (unit)_y \qquad (3)$$

Two distinct approaches were applied for determining the specific emissions of these units:

1. A unit was assumed to have the same specific emissions as the corresponding station in the following three cases:

i. If all units of a station fall into the build margin;

ii. If all units of a station have the same installed capacity;

iii. If the default specific emissions for the respective unit is higher than the corresponding station's specific emissions, and the concerned unit is capacity-wise among the largest of the station.

The large majority of units for which fuel consumption was not reported fall in one of the above-mentioned three categories.

2. In the remaining cases, the specific emissions of the units were derived from conservative standard heat rate values (see Appendix B).

4.4 Adjustment for Cross-Border Electricity Transfers

The weighted average emission factors and operating margins of the Indian Grid were adjusted for cross-border electricity imports and exports, in line with the Grid Tool:

- The relevant amounts of electricity imported and exported are listed in the database work-sheet “Transfers”;
- The CO_2 emissions associated with these imports were quantified based on the simple operating margin of the exporting grid.[11]

4.5 Conservativeness

The need to ensure conservativeness of calculations in situations of uncertainty is a fundamental principle in the CDM. Assumptions are conservative if they tend to reduce the number of emission reductions being credited to a CDM project activity. The following approaches and assumptions contribute to the conservativeness of the database:

- The quality of station-level data was ensured through extensive plausibility testing and interaction with the station operators.
- In cases of data gaps at station level, standard data from CEA were used. For example, standard auxiliary power consumption was assumed for few coal-fired stations. Comparison with monitored values shows that these standard values are rather conservative, i.e. they lead to a somewhat lower heat rate and hence lower emissions than observed in many stations.
- The fuel emission factors and oxidation factors used are generally consistent with IPCC defaults and relevant EB guidance. For Indian coal, the emission factor provided in India’s Initial National Communication was used (95.8 t CO_2/TJ on NCV basis). The oxidation factor of 0.98 used for Indian coal appears to be conservative in light of recent efficiency improvements in coal-fired generation. All other fuel emission factors represent the lower limits of the respective 95% confidence intervals indicated by IPCC, as required by the CDM Executive Board.[12]
- The scope of the database remains conservative because of the exclusion of captive power stations, which are generally thermal stations. As detailed in Section 3, generation from these captive stations remains far greater than the generation from non-conventional renewable energy stations, which are also excluded. The overall effect of these restrictions in scope is that the weighted average emission factor will tend to be slightly understated.

[11] This corresponds to Options a)+b) listed in the Grid Tool, (Version 7.0), p. 10 & 11

[12] See *Tool to calculate the emission factor for an electricity system* (Version 7.0), p.35

5 Results

Worksheet “Results” in the database provides the net generation and CO_2 emissions data and the resulting emission factors for the Indian Grid in the fiscal years 2016-17 to 2020-21. The emission factors are also reproduced in Appendix C. The values are rounded off at two decimals. See database file for additional decimals.

5.1 Results for Fiscal Year 2020-21

Table 3 indicates the development of total emissions over the last five years covered by the database.

Table 3: Total emissions of the power sector for the FY 2016-17 to 2020-21, in million tonnes CO_2

2016-17	2017-18	2018-19	2019-20	2020-21
888.34	922.18	960.90	928.14	910.02

Percent Increase or Decrease as compared to previous year:

2016-17	2017-18	2018-19	2019-20	2020-21
4.97%	3.81%	4.20%	-3.41%	-1.95%

Table 4 shows the emission factors for FY 2020-21 both excluding and including cross-border power transfers.

Table 4: Weighted average emission factor, simple operating margin (OM), build margin (BM) and combined margin (CM) of the Indian Grid for FY 2020-21 (not adjusted and adjusted for cross-country electricity transfers), in t CO_2/MWh

	Average	OM	BM	CM
Excluding cross-border power transfers	**0.79**	**0.95**	**0.87**	**0.91**
Including cross-border power transfers	**0.79**	**0.94**	**0.87**	**0.90**

Percent Increase or Decrease as compared to previous year:

	Average	OM	BM	CM
Excluding cross-border power transfers	**-0.63%**	**-1.26%**	**-0.34%**	**-0.82%**
Including cross-border power transfers	**-0.90%**	**-1.57%**	**-0.34%**	**-0.98%**

A comparison of both cases in Table 4 shows that cross border electricity transfers did not have a significant influence on the emission factors in 2020-21.

Table 5 shows the weighted average specific emissions for fossil fuel-fired power stations in the Indian Grid.

Table 5: Weighted average specific emissions for fossil fuel-fired stations in FY 2020-21, in t CO_2/MWh

Coal	Diesel	Gas*	Lignite	Oil
0.97	**0.58**	**0.42**	**1.30**	**-**

Percent Increase or Decrease as compared to previous year:

Coal	Diesel	Gas*	Lignite	Oil
-0.86%	**0.08%**	**-2.75%**	**-4.64%**	**-**

* Only gas-fired stations that do not use any other fuel. Stations that use naphtha, diesel or oil as a second fuel are excluded from the weighted average.

Note: Stations for which assumptions had to be made are included in this analysis (see Section 4 for details).

5.2 Developments over Time

Figure 2 shows the capacity additions from FY 2000-01 to FY 2020-21. The yearly additions of coal-based capacity increased significantly over the period from FY 2000-01 to FY 2015-16, whereas it decreased significantly over the period from FY 2016-17 to FY 2020-21. Hydro, & Gas-based capacity addition also decreased significantly from 2017-18 onwards in the Indian Grid, while the additions in other generation capacities is zero.

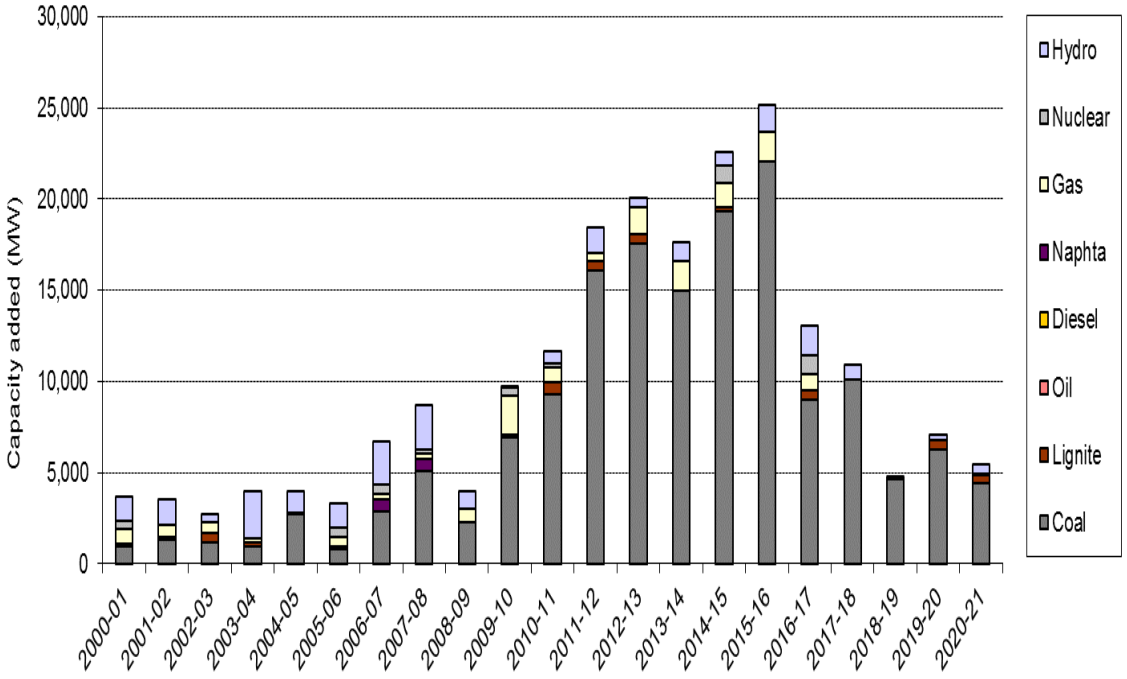

Figure 1: Breakdown of new added capacity covered by the database over the period 2000-01 to 2020-21.

Figure 2 shows the development of the weighted average emission factor over the period from FY 2016-17 to FY 2020-21 (see Appendix C for values before import adjustment). The weighted average has reduced marginally in FY 2020-21. This was mainly due to the decrease in lignite and naphtha-based generation in FY 2020-21.

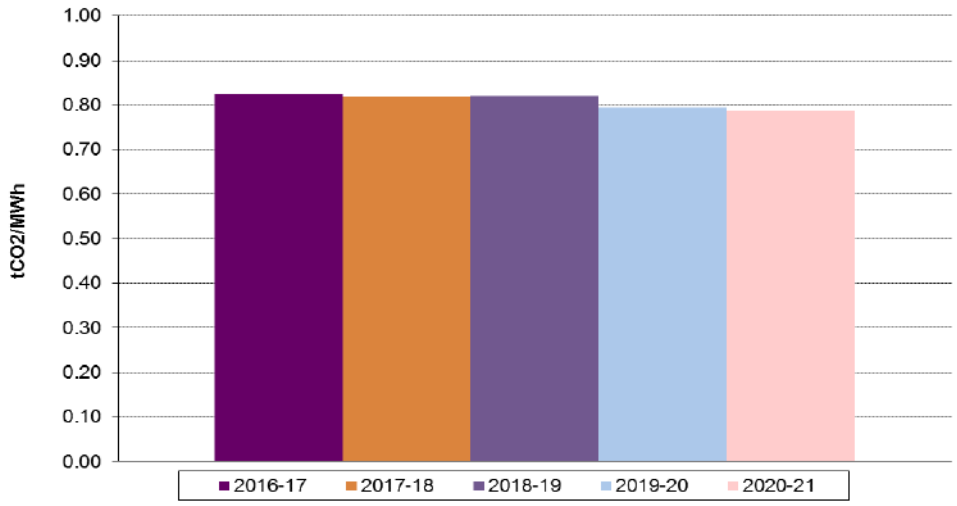

Figure 2: Development of the weighted average emission factor (adjusted for electricity transfers) for the Indian Grid over the period 2016-17 to 2020-21

Figure 4 illustrates the development of the import-adjusted operating margins over the period from FY 2016-17 to FY 2020-21 (see Appendix C for values before import adjustment). In 2020-

21 the import-adjusted operating margin decreased marginally due to operationalization of many high efficiency super-critical thermal power plants.

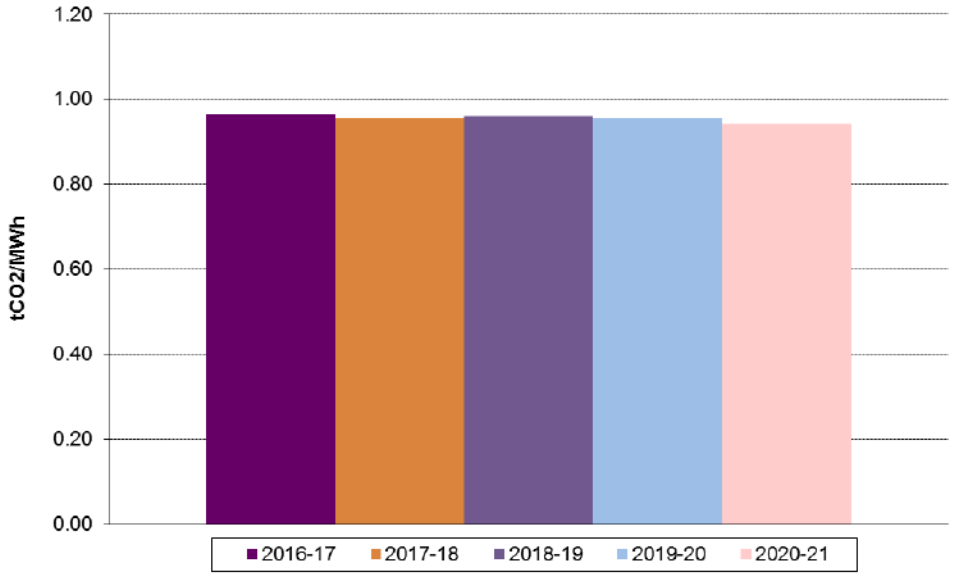

Figure3: Development of the operating margin (adjusted for electricity transfers) for the Indian Grid over the period 2016-17 to 2020-21.

Figure 4 shows the build margins for the five fiscal years 2016-17 to 2020-21. The distinction between Indian and imported coal introduced from FY 2013-14 onwards led to a slight decrease in the build margin till 2017-18, due to the lower emission factor applied to imported coal in accordance with the CDM rules.

The build margin which was showing a decreasing trend till 2017-18 has increased marginally during 2018-19 due to more share of domestic coal and less share of imported coal. During 2019-20 and 2020-21 the build margin decreased marginally again due to the increase in the share of imported coal (see figure 6).

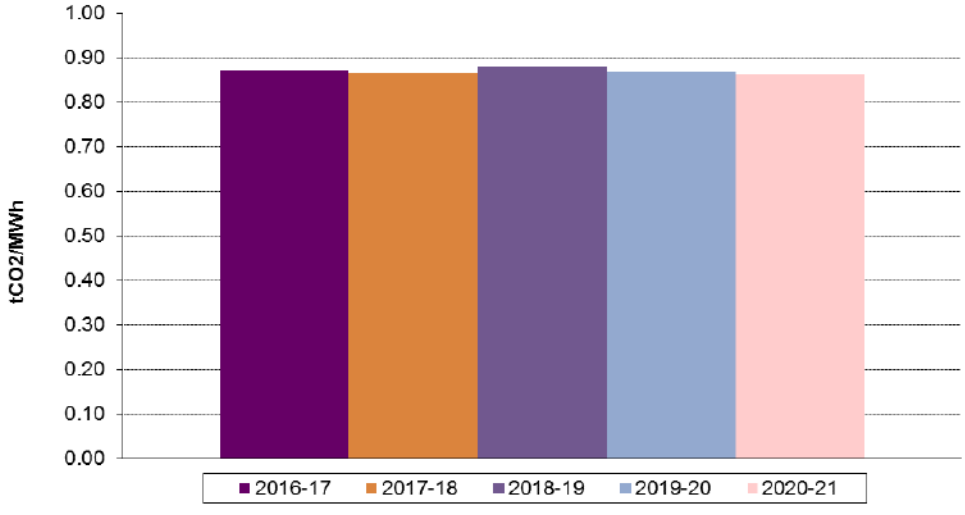

Figure 4: Development of the build margins over the period 2016-17 to 2020-21.

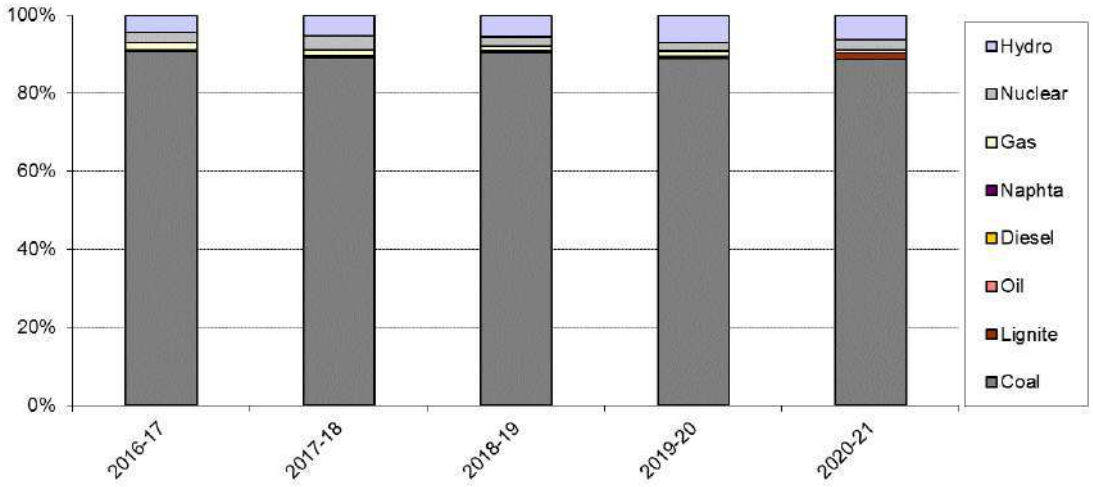

Figure 5: Breakdown of the build margins by fuel type (shares based on net generation)

Figure 6 shows the trends in the import-adjusted combined margins in the period 2016-17 to 2020-21. The combined margin decreased during 2016-17, 2017-18 and 2019-20 and 2020-21. It was mainly due to decrease in operating margin and build margin. The combined margin increased marginally during 2018-19 due to increase in both the operating and build margins

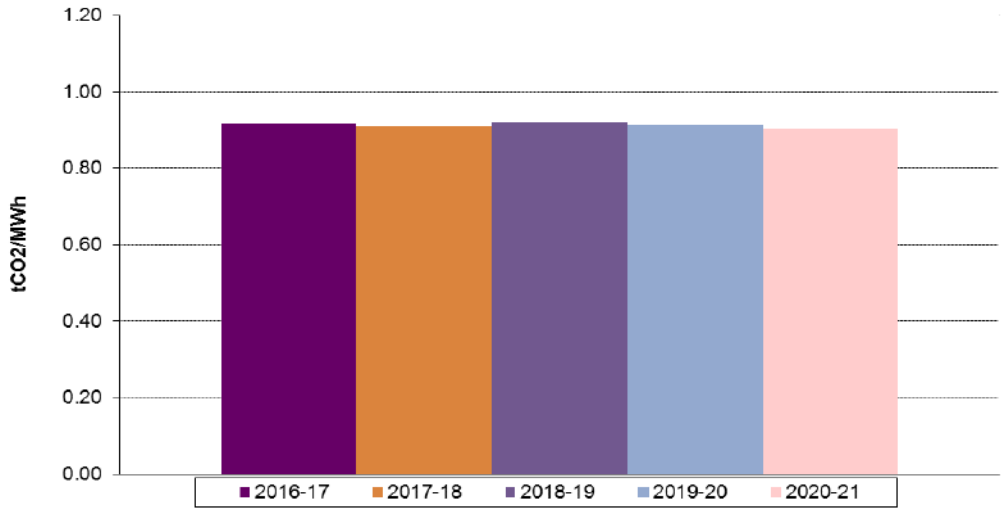

Figure 6: Development of the combined margin (adjusted for electricity transfers) for the Indian Grid over the period 2016-17 to 2020-21

5.3 Changes compared to Previous Database Versions

In comparison with the previous version of the Database (Version 16.0), this updated Version 17.0 includes the following changes:

- Added data for FY 2020-21, including new stations and units commissioned during 2020-21.
- The revised emission factors are provided in Appendix C and in the Database file.

6 User Examples

This section provides two illustrative examples of how the CO_2 Database can be applied. The examples are based on hypothetical renewable energy projects

Project A is a grid-connected 5 MW small hydropower station located in the State of Assam. The station will be commissioned in 2022. Annual net generation is projected at approx. 17'500 MWh.

- The project qualifies as a small-scale CDM activity since its capacity is below the 15 MW threshold. Hence it will use the latest version of CDM methodology AMS-I.D for grid-connected renewable electricity generation.
- Methodology AMS-I.D gives two options for determining the baseline emission factor: Either the weighted average emissions, or the combined margin of the grid. In this example, it is assumed that the promoters choose the weighted average option. In addition, it is assumed that the promoters choose to adjust the weighted average emission factor for electricity imports, despite the fact that this is not mandatory under AMS-I.D.
- In the PDD, the expected emission reductions achieved by the hydro station are projected based on the expected annual generation, and the import-adjusted weighted average emission factor for the Indian Grid in the most recent year for which data is available (2020-21). The corresponding value is 0.79 t CO_2/MWh. Hence the absolute emission reductions are projected at 0.79 * 17'500 = 13,766 t CO_2/yr. The emission reductions are equal to the baseline emissions, since the project does not result in greenhouse gas emissions of its own.
- In accordance with AMS-I. D, the promoters will determine the *actual* baseline emission factor *ex post.* The actual emission reductions will then be calculated in each year of the crediting period based on the observed net generation and the weighted average emission factor for the respective year.[13] The latter would be published annually by CEA.

Project B is a 100 MW grid-connected wind farm located in the State of Tamil Nadu. The project will be commissioned in 2022. Average net supplies to the grid are projected at 312,500 MWh per year.

- The project exceeds the 15 MW threshold and thus qualifies as a large-scale CDM activity. Hence it is eligible to use the latest version of methodology ACM0002 for grid-connected power generation from renewable energy sources.
- Under ACM0002, the combined margin approach is mandatory.
- In contrast to the first example, the promoters decide to fix the baseline emission factor *ex ante.* That is, the baseline emission factor is determined based on the most recent data available, and remains fixed for the duration of the crediting period. The actual emission reductions will be calculated in each year based on the observed net generation and the predefined baseline emission factor.
- For this *ex ante*-option, the Grid Tool referred to in the methodology ACM0002 requires that the operating margin be calculated as the generation-weighted average of the three most recent years (here 2018-19 to 2020-21).[14] The operating margin to be applied thus works out to 0.953 t CO_2/MWh.

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[13] The emission factor of the previous year may be used instead. See *Tool to calculate the emission factor for an electricity system* (Version 7.0), p.16

[14] See *Tool to calculate the emission factor for an electricity system* (Version 7.0), p.16

- Since wind is an intermittent energy source, the promoter is allowed to assign a weight of 75% to the operating margin, and 25% to the build margin. The resulting combined margin is 0.931 t CO_2/MWh (75% x 0.953 + 25% x 0.865) for the FY 2020-21). This value is used for projecting the emission reductions in the PDD as well as for calculating the actual emission reductions.

The two CDM project activities are summarised in Table 6 below.

Table 6: Illustration on how to use the CO_2 Database for calculating the emission reductions of CDM projects

	Project A	**Project B**
Project Info		
Type:	Hydro station	Wind park
Size:	5 MW (small-scale according to CDM criteria)	100 MW (large-scale according to CDM criteria)
Projected Generation (net):	17’500 MWh /yr	312’500 MWh/yr
Commissioning year:	2022	2022
Year of CDM registration:	2022	2022
Grid :	Indian	Indian
CDM methodology:	AMS-I.D / Version 19	ACM0002 / Version 19.0
Baseline Emission Factor Calculation		
Calculation method:	Weighted average	Combined margin
Data vintage for projection of emission reductions:	2020-21 (most recent available at time of PDD validation)	For OM: 2018-19, 2019-20, 2020-21 (most recent 3 years available at time of PDD validation) For BM: 2020-21
Data vintage for verification of emission reductions:	Actual year of generation, i.e., 2022-23, 2023-24 etc. (emission factor fixed *ex post*)	Same as for projection (emission factor fixed *ex ante*)
Accounting of imports:	Not mandatory, but done	Mandatory
Weights for combined margin:	Not applicable	Operating margin: 75% Build margin: 25% (default for intermittent sources)
Emission Reduction Calculations		
Values in t CO_2/MWh:	0.79 Weighted average	0.953 Operating margin 0.865 Build margin 0.931 Combined margin
Projected emission reductions:	13,766 t CO_2 per year	290,938 t CO_2 per year
Actual emission reductions:	Monitored net generation x monitored weighted average	Monitored net generation x fixed combined margin

7 Updating Procedure

The CO_2 Database will be updated annually by CEA and made available on its website: www.cea.nic.in. Previous versions will be archived by CEA and the main changes relative to previous database versions will be documented.

8 Further Information

For any further information, contact by email:

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Appendix A – Systems in India's Grids

Abbreviation	Full name
ABAN	ABAN Power Company
ADHPL	AD Hydro Power Limited
APCPL	Aravali Power Company Limited
APGCL	Assam Power Generation Corporation Limited
APGENCO	Andhra Pradesh Power Generation Co Limited
APPDCL	Andhra Pradesh Power Development Corporation Ltd.
ASEB	Assam State Electricity Board
BBMB	Bhakra Beas Management Board
BECL	Bhavnagar Energy Co. Ltd.
BSEB	Bihar State Electricity Board
BALCO	Bharat Aluminum Co. India Pvt. Ltd.
CESC	Calcutta Electric Supply Company Limited
CSEB	Chattisgarh State Electricity Board
CSPGCL	Chattisgarh State Power Generation Co Ltd
D.B. Power Ltd	Diligent Power Limited
DANS EPL	DANS Energy Pvt. Ltd.
DPL	Durgapur projects Limited
DVC	Damodar Valley Corporation
DVC Tata JV	Damodar Valley Corporation-Tata Joint Venture
GAMA	Gama Infraprop
GIPCL	Gujarat Industries Power Company Ltd
GMDCL	Gujarat Mineral Development Corporation Limited
GMR Chattisgarh	GMR Chattisgarh
GMR Energy	GMR Energy
GMR K Ltd	GMR Kamlanga Energy Ltd.
GPEC	Gujarat Paguthan Energy Corporation Pvt. Limited
GSECL	Gujarat State Electricity Corporation Limited
GSEGL	Gujarat State Energy Generation Limited
GTE Corp	GTE Corporation

Abbreviation	Full name
GVK Ind.	GVK Power & Infrastructure Limited
GVK	GVK Group
HEGL	HEG Limited
HNPCL	Hinduja National Power Corp. Ltd.
HPGCL	Haryana Power Generation Corporation Limited
HPPCL	Himachal Pradesh Power Corporation Ltd.
HPSEB	Himachal Pradesh State Electricity Board
HIRANMAYE	Hiranmaye Energy Ltd.
IEPL	Ideal Energy Pvt. Ltd.
IL&FS TN PC Ltd.	IL&FS Tamil Nadu Power Co. Ltd.
INDSIL	Indsil Electrosmelt Ltd
IPPGCL	Indraprastha Power Generation Co Ltd
JINDAL	JSW Energy Limited
JIPL	Jas Infrastructure and Power Ltd.
JKEB	Jammu & Kashmir Electricity Board
JKPDC	Jammu & Kashmir Power Development Corp. Ltd.
JPHPL	Jai Prakash Hydro Power Limited
JPL	Jhabua Power Ltd.
JSEB	Jharkhand State Electricity Board
JSW Energy	JSW Energy Limited
JV NTPC & BSEB	Joint Venture NTPC & Bihar State Electricity Board
KPCL	Karnataka Power Corporation Limited
KSEB	Kerala State Electricity Board
KSK Ventures	KSK Energy Ventures Ltd.
LPG CO	Lalitpur Power Generation Co. Ltd.
LVS Power	LVS Power Limited
M B Power (M P)	M B Power Madhya Pradesh
Madurai P	Madurai Power Corporation Limited
MAHAGENCO	Maharashtra State Power Generation Company Limited
MAPS	Madras Atomic Power Station

Abbreviation	Full name
MEECL	Meghalaya Energy Generation Corporation Ltd.
MEGEB	Meghalaya State Electricity Board
MPDC	Manipur Power Development Corporation
MEECL	Meghalaya Energy Corporation Ltd.
MPDC	Manipur Power Development Corporation
MPGPCL	Madhya Pradesh Power Generating Co. Ltd.
NAPS	Narora Atomic Power Station
NCTPP	National Capital Thermal Power Plant
NDPL	North Delhi Power Ltd.
NEEPCO	North Eastern Electric Power Corporation Ltd
NHDC	Narmada Hydro Electric Development Corporation
NHPC	National Hydro Electric Corporation
NLC	Neyvelli Lignite Corporation Ltd
NPC	Nuclear Power Corporation of India Ltd.
NTPC	NTPC Ltd
NTPC/NTECL	NTPC Tamilnadu Energy Company Limited
OHPC	Orissa Hydro Power Corporation
OPGC	Orissa Power Generation Corporation
PPCL	Puducherry Power Corporation Limited
PPGCL	Prayagraj Generation Co. Ltd.
PPNPG	PPN Power Generating Company Pvt. Limited
PSEB	Punjab State Electricity Board
RAPS	Rajasthan Atomic Power Station
RATANAGIRI	Ratnagiri Gas & power Pvt Ltd
REL	Reliance Energy Ltd
RKM PPL	RKM Powergen Pvt. Ltd.
RPG	RP Goenka Group
RRVUNL	Rajasthan Rajya Vidyut Utpadan Nigam
Samalpatti	Samalpatti Power Company Limited
SHIRPUR	Shirpur Power Pvt. Ltd.

Abbreviation	Full name
SCPL Ltd.	Spectrum Power Limited
SJVNL	Sutluj Jal Vidyut Nigam Ltd
SKS Power	SKS Power Generation
SKPL	Sneha Kinetic Power Projects Pvt. Ltd.
SPECT. IND	Spectrum Power Generation Limited
SP&ML	Subhash Projects and Marketing Co. Ltd.
SSVNL	Sardar Sorovar Vidyut Nigam Limited
STPS	Super Thermal Power Station
Tata MAH	Tata Power Company Limited
Tata PCL	Tata Power Company Limited
THDC	Tehri Hydroelectric Development Corporation
TNEB	Tamilnadu Electricity Board
Torr. Power	Torrent Power Limited
TSECL	Tripura State Electricity Corporation Limited
TSGENCO	Telangana Power Generation Corp. Ltd.
TVNL	Tenughat Vidyut Nigam Limited
UJVNL	Uttarakhand Jal Vidyut Nigam Limited
UPCL	Uttarakhand Power Corporation Limited
UPHPC	Uttar Pradesh Hydro Power Corporation Limited
UPRVUNL	Uttar Pradesh Rajya Vidyut Utpadan Nigam
VVNL	Visvesarya Vidyut Nigam Ltd
WBPDC	West Bengal Power Development Corporation Ltd
WBSEB	West Bengal State Electricity Board

Appendix B – Assumptions for CO_2 Emission Calculations

Fuel Emission Factors (EF) (Source: for Indian Coal/Lignite - Initial National Communication; for Imported Coal Gas/Oil/Diesel/Naphtha - IPCC 2006; for Corex - own assumption)

	Unit	Coal	Imported Coal	Lignite	Gas	Oil	Diesel	Naphtha	Corex
EF based on NCV	gCO_2 /MJ	95.8	89.5	106.2	54.3	75.5	72.6	69.3	0.0
Delta GCV NCV	%	3.6%	5.0%	3.6%	10%	5%	5%	5%	n/a
EF based on GCV	gCO_2 /MJ	92.5	85.2	102.5	49.4	71.9	69.1	66.0	0.0
Oxidation Factor	-	0.98	1.00	0.98	1.00	1.00	1.00	1.00	n/a
Fuel Emission Factor	gCO_2 /MJ	90.6	85.2	100.5	49.4	71.9	69.1	66.0	0.0

n/a = not applicable (i.e. no assumptions were needed)

Assumptions at Station Level (only where data was not provided by station)

	Unit	Coal	Lignite	Gas-CC	Gas-OC	Oil	Diesel-Eng	Diesel-OC	Naphtha	Hydro	Nuclear
Auxiliary Power Consumption	%	8.0	10.0	3.0	1.0	3.5	3.5	1.0	3.5	0.5	10.5
Gross Heat Rate	kcal /kWh (gross)	2,500	2,713	2,013	3150	2,117	1,975	3,213	2,117	n/a	n/a
Net Heat Rate	kcal /kWh (net)	2,717	3,014	2,075	3,182	2,193	2,047	3,330	2,193	n/a	n/a
Specific Oil Consumption	ml /kWh (gross)	2.0	3.0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
GCV	kcal /kg (or m3)	3,755	n/a	8,800	n/a	10,100	10,500	10,500	11,300	n/a	n/a
Density	t /1,000 lt	n/a	n/a	n/a	n/a	0.95	0.83	0.83	0.70	n/a	n/a
Specific CO_2 emissions	tCO_2 /MWh	1.04	1.28	0.43	0.66	0.66	0.59	0.96	0.61	n/a	n/a

n/a = not applicable (i.e. no assumptions were needed)

Assumptions at Unit Level (by capacity; only for units in the BM, where data was not provided by station)

Coal	Unit	67.5 MW	120 MW	200-250 MW	300 MW	500 MW Type 1	500 MW Type 2	600 MW	660 MW Type 1	660 MW Type 2	800 MW
Gross Heat Rate	kcal /kWh	2,750	2,500	2,500	2,350	2,425	2,380	2,380	2,178	2,126	2126
Auxiliary Power Consumption	%	12.0	9.0	9.0	9.0	7.5	6.5	6.5	6.5	6.5	5.25
Net Heat Rate	kcal /kWh	3,125	2,747	2,747	2,582	2,622	2,545	2,545	2,329	2,274	2,244
Specific Oil Consumption	ml /kWh	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.5
Specific CO_2 Emissions	tCO_2 /MWh	1.19	1.05	1.05	0.99	1.00	0.97	0.97	0.89	0.87	0.85

Lignite	Unit	75 MW	125 MW	210/250 MW	500 MW
Gross Heat Rate	kcal /kWh	2,750	2,560	2,713	2713
Auxiliary Power Consumption	%	12.0	12.0	10.0	8.5
Net Heat Rate	kcal /kWh	3,125	2,909	3,014	2965
Specific Oil Consumption	ml /kWh	3.0	3.0	3.0	3.0
Specific CO_2 Emissions	tCO_2 /MWh	1.32	1.23	1.28	1.25

Gas	Unit	0-49.9 MW	50-99.9 MW	>100 MW
Gross Heat Rate	kcal /kWh	1,950	1,910	1,970
Auxiliary Power Consumption	%	3.0	3.0	3.0
Net Heat Rate	kcal /kWh	2,010	1,969	2,031
Specific CO_2 Emissions	tCO_2 /MWh	0.42	0.41	0.42

Diesel	Unit	0.1-1 MW	1-3 MW	3-10 MW	>10 MW
Gross Heat Rate	kcal /kWh	2,350	2,250	2,100	1,975
Auxiliary Power Consumption	%	3.5	3.5	3.5	3.5
Net Heat Rate	kcal /kWh	2,435	2,332	2,176	2,047
Specific CO_2 Emissions	tCO_2 /MWh	0.70	0.67	0.63	0.59

Naphtha	Unit	All sizes
Increment to Gas Heat Rate	%	2%
Gross Heat Rate	kcal /kWh	2,117
Auxiliary Power Consumption	%	3.5
Net Heat Rate	kcal /kWh	2,193
Specific CO_2 Emissions	tCO_2 /MWh	0.61

Combined Margin	Unit	
Weight OM	%	50%
Weight BM	%	50%

Conversion Factors	Unit	
Energy	kJ /kcal	4.1868
	MJ /kWh	3.6

Oil		
Specific Emission	gCO_2 /ml	2.89

Appendix C – Grid Emission Factors

Note: Values are rounded off at two decimals here. See Database (Excel File, Worksheet "Results") for additional decimals.

Table A: Values for FY 2016-17 to 2020-21, excluding cross-border electricity transfers.

Emission Factors (tCO_2/MWh) (excl. Imports)	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**2020-21**
Weighted Average Emission Rate	0.83	0.82	0.82	0.80	0.79
Simple Operating Margin (1)	0.97	0.96	0.96	0.96	0.95
Build Margin	0.87	0.87	0.88	0.87	0.87
Combined Margin (1)	0.92	0.91	0.92	0.92	0.91

(1) Operating margin is based on the data for the same year. This corresponds to the *ex post option* given in "Tool to Calculate the Emission Factor for an Electricity System", Ver. 7.0 (p.16)

Table B: Values for FY 2016-17 to 2020-21, including cross-border electricity transfers.

Emission Factors (tCO_2/MWh) (incl. Imports)	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**2020-21**
Weighted Average Emission Rate (2)	0.82	0.82	0.82	0.79	0.79
Simple Operating Margin (1) (2)	0.96	0.95	0.96	0.96	0.94
Build Margin (not adjusted for imports)	0.87	0.87	0.88	0.87	0.87
Combined Margin (1) (2)	0.92	0.91	0.92	0.91	0.90

(1) Operating margin is based on the data for the same year. This corresponds to the *ex post option* given in "Tool to Calculate the Emission Factor for an Electricity System", Ver. 7.0 (p.16)

(2) For Adjustments of imports from other countries, an emission factor of zero is used. See "Tool to Calculate the Emission Factor for an Electricity System", Ver. 7.0 (p.10 & 11), options a+b

Appendix D – Summary of Methodology ACM0002 / Version 20.0

Download ACM0002 at: http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html

ACM0002 is a consolidated CDM methodology for grid-connected power generation from renewable energy sources. It covers grid-connected renewable power generation project activities that involve retrofitting, rehabilitation (or refurbishment), replacement or capacity addition of an existing power plant or construction and operation of a Greenfield power plant... Examples of eligible project types include hydro power plants with or without reservoir; wind energy; geothermal energy; solar energy; and wave and tidal energy.

The methodology requires the calculation of the baseline emission factor following the combined margin (CM) approach. The combined margin consists of a weighted average of:

- Operating margin (OM);
- Build margin (BM).

The relative weights used to determine the combined margin are by default the same, i.e. 50%. Alternative weights can be used for intermittent power sources.

There are four options to calculate the operating margin, depending on local conditions:

- *Simple operating margin*. This is the preferred approach for India.
- The other three approaches are: (i) *simple adjusted operating margin*; (ii) *dispatch data analysis operating margin*; and (iii) *average operating margin*.

The build margin is the generation-weighted average emission factor of the most recent power plants, consisting of the larger of (i) the five power plants that have been built most recently; or (ii) the capacity additions that represent 20% of the system generation that have been built most recently. In India, the latter approach generally yields the larger sample and hence must be followed. CDM projects must be excluded from the build margin, as long as the build margin does not contain generation units older than 10 years.

The operating margin must be adjusted for electricity transfers (imports) from connected electricity systems (other states/regions, other countries) to the project electricity system. Generally, no such adjustments are required for the build margin.

The actual emission reductions achieved by a CDM project are calculated based on the monitored electricity production in each year, and the combined margin (baseline emission factor). The combined margin is initially calculated from the most recent data available at the time of PDD submission. It can then either remain fixed for the duration of the project's crediting period *(ex-ante approach)*, or be updated annually *(ex-post approach)*. The two approaches have different requirements in terms of data vintage.

Appendix E – Abbreviations

Abbreviation	Full Name
ACM0002	Approved Consolidated Methodology by CDM Executive Board for grid connected large scale renewable project
ACM0013	Approved Consolidated Methodology by CDM Executive Board for new grid connected fossil fuel fired power plants using a less GHG intensive technology.
AMS-I.D	Approved Methodology for small scale grid connected renewable projects
BM	Build margin
CDM	Clean Development Mechanism
CEA	Central Electricity Authority
CER	Certified Emission Reduction
CM	Combined margin
CO_2	Carbon Dioxide
FY	Fiscal year
GCV	Gross Calorific Value
GHG	Greenhouse Gases
GWh	Gigawatt hour
IEA	International Energy Agency
IPCC	Intergovernmental Panel on Climate Change
IPP	Independent Power Producer
MW	Megawatt
NEWNE	Integrated Northern, Eastern, Western and North Eastern Grid
OM	Operating margin
PDD	Project Design Document
RLDC	Regional Load Dispatch Centre
RPC	Regional Power Committee
SR	Southern Grid
UNFCCC	United Nations Framework Convention on Climate Change

GIRIDHAN METAL PRIVATE LIMITED

JAMURIA INDUSTRIAL ESTATE,
P. O. NANDI, P. S. JAMURIA,
PASCHIM BARDHMAN-713344(W.B.)

Expansion of Integrated Steel Plant by expanding Sponge Iron from 1,20,000 TPA to 3,18,000 TPA, MS Billets from 1,05,000 TPA to 3,72,300 TPA, Rolling Mill from1,00,000 TPA to 3,00,000 TPA, Submerged Arc Furnace (SAF) from 15,000 TPA to 30,000 TPA & Captive Power Plant from 16 MW to 42 MW including Waste Heat Recovery Boiler (WHRB).

A DOCUMENT ON

HAZARDS IDENTIFICATION AND RISK ASSESSMENT

HAZARD IDENTIFICATION, RISK ASSESSMENT & DETERMINING CONTROL

Name of Job :	Department :	Prepared By :	Checked By :-	Approved By :
DEMOLITION WORK	CONSTRUCTION			

HAZARD IDENTIFICATION				RISK ASSESSMENT			Recommended Action/Additional Control
Job Activity	**Hazard**	**Hazard Character**	**Current Risk Control**	**Probability**	**Severity**	**Risk**	
Setting up working platform (Scaffold)	Scaffold rod collapsed and hit a person at site.	Major injury/illness (Long absenteeism, M.C > 14 days).	Use safety net; Proper planning of work.	2	4	**8**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Heat stress/stroke due to hot working environment.	Near miss/ unsafe act/ unsafe condition.	Workers to take a short break where applicable.	3	1	**3**	Additional control shall be proposed when necessary.
	Electrocution due to faulty wiring touching metal.	Fatality or permanent disability or irreversible illness	Do not allow electrical wiring through scaffold structures.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
Setting up working platform (Ladder)	Slippery, ladder fall.	Fatality or permanent disability or irreversible illness	Buddy system properly secured.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Ladder broke.	Fatality or permanent disability or irreversible illness	Check the ladder properly before use.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Heat stress/stroke due to hot working environment.	Near miss/ unsafe act/ unsafe condition.	Workers to take a short break where applicable.	3	1	**3**	Additional control shall be proposed when necessary.
	Overstretching.	Near miss/ unsafe act/ unsafe condition.	Workers to take a short break.	3	1	**3**	Additional control shall be proposed when necessary.
	Space constrain.	Near miss/ unsafe act/ unsafe condition.	Training and proper planning of work.	4	1	**4**	Additional control shall be proposed when necessary.
Setting up working platform (Temporary Staging)	Temporary staging broke due to overloading of debris which is not removed.	Minor damage (No or less disruption, repair cost > RM1,000 and < RM10,000).	Training and proper planning of work.	2	2	**4**	Additional control shall be proposed when necessary.
Working environment	Falling from height	Fatality or permanent disability or irreversible illness	Workers wear safety harness; Provide safe working procedure.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Electrocuted due to faulty electrical equipment/dismantling wiring.	Fatality or permanent disability or irreversible illness	Wear proper PPE; Provide safe working/proper handling procedure.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Use of solvents or any other chemical.	First aid cases/medical treatment (M.C between 1 to 3 days)	Proper protective clothing; Training.	3	2	**6**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Lighting.	First aid cases/medical treatment (M.C between 1 to 3 days)	To provide adequate lighting.	2	2	**4**	Additional control shall be proposed when necessary.
	Falling and drowned.	Fatality or permanent disability or irreversible illness	Fall protection provided; To wear life jacket.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.

HAZARD IDENTIFICATION, RISK ASSESSMENT & DETERMINING CONTROL

Name of Job :	Department :	Prepared By :	Checked By :-	Approved By :
DEMOLITION WORK (Cont'd)	CONSTRUCTION			

HAZARD IDENTIFICATION				RISK ASSESSMENT			Recommended Action/Additional Control
Job Activity	Hazard	Hazard Character	Current Risk Control	Probability	Severity	Risk	
Working at height	Fall during erection	Severe injury /fatality	Work Permit Procedure, Use of PPEs like Full body harness, fall arrestor and helmet.	4	2	8	BOCW Act 1996 and state rules
	Failure of ladder structure	Failure of ladder structure	Weekly safety inspection	4	2	8	BOCW Act 1996 and state rules
	Tripping or slipping from ladders or stairs	Severe injury /fatality	Work Permit Procedure, Use of PPEs like Full body harness, fall arrestor and helmet.	4	2	8	BOCW Act 1996 and state rules
Welding work	Incompetence of employees	Incompetence employees can result in an injury	BOCW Act 1996 and state rules	3	3	9	Only trained welders must b used, Work Permit System Procedure for Welding and Cutting Safety.
	Use of damaged welding holder & cable	Electrocution, shock resulting in injury	Electricity Rules 1956	3	3	9	Only trained welders must be used, Work Permit System Procedure for Welding and Cutting Safety.
	Explosion of cylinder due to mishandling	Burn injury/fatality/	Gas Cylinders Rules 2004	2	2	4	Procedure for Welding and Cutting Safety
	Working in inadequate lighting conditions	eye problem/ headache / other like slip/trip/fall	Light posts have been provided.	2	2	4	Light posts have been provided.
	Use of improper PPE's	Inadequate or wrong PPE could cause injuries	BOCW Act 1996 and state rules	2	2	4	Procedure for selection of PPEs, Procedure for Inspection of PPEs and Safety Devices.
Grinding work at Fabrication Area	Use of improper PPE's	Inadequate or wrong PPE could cause injuries	BOCW Act 1996 and state rules	2	2	4	Procedure for selection of PPEs Procedure for Inspection of PPEs and Safety Devices
	Operation of grinding wheel without wheel guard	Physical injury/fatality	BOCW Act 1996 and state rules	3	4	12	Guards to be ensured on the wheel, Abrasive Wheel Safety Procedure(
	No separate switches for common extension board	Physical injury/fatality	Electricity Rules 1956	2	2	4	Electrical Safety Procedure. Procedure for Electrical Safety Inspection
	Operation of grinding wheel without wheel guard	Physical injury/fatality	Electricity Rules 1956	2	2	4	Guards to be ensured on the wheel, Abrasive Wheel Safety Procedure
	Use of damaged power cables & bare wire connections	Electrical shock, physical injury	Electricity Rules 1956	2	2	4	Electrical Safety Procedure. 28). Procedure for Electrical Safety Inspection

HAZARD IDENTIFICATION, RISK ASSESSMENT & DETERMINING CONTROL

Gas cutting work	Back fire in gas cutting torch and gas cylinder	Burn injury/fatality	BOCW Act 1996 and state rules	4	4	16	Flash back arrestors are available at cylinder side as well as gas cutting torch, Procedure for Welding and Cutting Safety
	Flash back in gas cutting torch	burn injury	BOCW Act 1996 and state rules	3	3	9	Flash back arrestors are available at cylinder side as well as gas cutting torch, Procedure for Welding and Cutting Safety
	Damage of gas cylinder valve due to roll and fall	Fire/major injury/explosion/fatality	Gas cylinder rules 2004	3	2	6	Procedure for Welding and Cutting Safety
	Improper storage of gas cylinders	Physical injury due to fall of cylinders/explosion/property damage	Gas cylinder rules 2004	3	3	9	Procedure for Welding and Cutting Safety
	Fire/explosion due to heat exposure	Major burn injury/fatality	Gas cylinder rules 2005	2	2	4	Procedure for Welding and Cutting Safety
	Use of inadequate/improper PPE's	Inadequate or wrong PPE could cause injuries	BOCW Act 1996 and state rules	2	3	6	Procedure for selection of PPEs , Procedure for Inspection of PPEs and Safety Devices
Working environment	Heat stress/stroke due to hot working environment.	Near miss/ unsafe act/ unsafe condition.	Use proper ventilation system; Workers to take a short break.	3	1	**3**	Additional control shall be proposed when necessary.
	Body injuries due to struck by object / material debris.	Fatality or permanent disability or irreversible illness	Wear proper PPE.	2	5	**10**	Briefing By SHO on safety awareness Additional control shal be made i necessary.
	Physical stress/repetitive work.	Near miss/ unsafe act/ unsafe condition.	Workers to take a short break where applicable.	3	1	**3**	Additional control shall be proposed when necessary.
Working with manual handling	Physical stress due to vibration.	Near miss/ unsafe act/ unsafe condition.	Workers to take a short break where applicable.	3	1	**3**	Additional control shall be proposed when necessary.
	Punching.	First aid cases/medical treatment (M.C between 1 to 3 days)	Training on proper handling; Wear proper PPE.	2	2	**4**	Additional control shall be proposed when necessary.
	Repetitive work.	Near miss/ unsafe act/ unsafe condition.	Working in interval time limit.	3	1	**3**	Additional control shall be proposed when necessary.
	Rotating, Shearing.	Minor injury/illness (M.C between 5 to 14 days)	Machine guarding; Training on proper handling.	2	3	**6**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Body injuries/cut caused by sharp object.	Major injury/illness (Long absenteeism, M.C > 14 days);	Worker wear proper PPE.	2	4	**8**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Heat due to oxy cutting activities.	Near miss/ unsafe act/ unsafe condition.	Wear proper and safe attire.	3	1	**3**	Additional control shall be proposed when necessary.
	Electrocuted due to faulty tools wiring.	Fatality or permanent disability or irreversible illness	To check tool equipment free from defect; Wear proper PPE.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Body injuries due to heat/radiation.	Near miss/ unsafe act/ unsafe condition.	Workers wear proper PPE.	2	1	**2**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.

HAZARD IDENTIFICATION, RISK ASSESSMENT & DETERMINING CONTROL

	Inhalation of fume or chemical vapor.	Near miss/ unsafe act/ unsafe condition.	Worker wear proper PPE.	2	1	**2**	Additional control shall be proposed when necessary.
Working with machinery	Hit by moving object.	Fatality or permanent disability or irreversible illness	Provide signalman and barricade working area.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Damage to equipment/machinery due to mishandling.	Minor damage (No or less disruption, repair cost > RM1,000 and < RM10,000).	Trained operator and close supervision; Provide safe working procedure.	2	2	**4**	Additional control shall be proposed when necessary.

HAZARD IDENTIFICATION, RISK ASSESSMENT & DETERMINING CONTROL

Name of Job :	Department :	Prepared By : GMPL TEAM	Checked By :- GMPLTEAM	Approved By : GMPL TEAM
CONCRETEING WORK	CONSTRUCTION			

HAZARD IDENTIFICATION				RISK ASSESSMENT			Recommended Action/Additional Control
Job Activity	**Hazard**	**Hazard Character**	**Current Risk Control**	**Probability**	**Severity**	**Risk**	
Mobilization of machinery	Traffic Collision	Major injury/illness (Long absenteeism, M.C > 14 days)	Provide experience driver with legal driving licence.	2	4	**8**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Machinery collapse due to unstable ground	Major injury/illness (Long absenteeism, M.C > 14 days)	Use steel plate/solid material as a temporary platform.	2	4	**8**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Space constrain.	Near miss/ unsafe act/ unsafe condition	Engineer to plan site layout.	3	1	**3**	Additional control shall be proposed when necessary.
Machinery movement within work area	Traffic collision.	Major injury/illness (Long absenteeism, M.C > 14 days)	Provide trafficman.	2	4	**8**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Space constrain.	Near miss/ unsafe act/ unsafe condition	Engineer to plan site layout.	3	1	**3**	Additional control shall be proposed when necessary.
Unloading of ready mix concrete	Hit by moving object.	Fatality or permanent disability or irreversible illness	Workers wearing proper PPE; Closed supervision.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Hit by falling object.	Fatality or permanent disability or irreversible illness	Operator to check bucket condition; Closed supervision.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Hit by falling object due to broken cable crane.	Fatality or permanent disability or irreversible illness	Crane with PMA certificate; Signal man properly monitor.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Heat stroke from prolonged exposure to sunlight and dehydration.	Near miss/ unsafe act/ unsafe condition	Worker wear hard hat and safety glove; Worker encouraged to take short break; Break if more than 2 hours.	3	1	**3**	Additional control shall be proposed when necessary.
	Crane boom failure due to overloading or mishandling.	Fatality or permanent disability or irreversible illness	Crane with PMA certificate; Signal man properly monitor.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
In-situ concrete mixing (Manually)	Physical injuries caused by sharp object or hand tools.	Minorinjury/illness (M.C between 5 to 14 days)	Workers wear gloves and safety shoes.	2	3	**6**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Manual handling due to improper lifting techniques.	Minorinjury/illness (M.C between 5 to 14 days)	Use proper hand tool, Proper handling techniques.	2	3	**6**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Working with cement and mineral dust.	Near miss/ unsafe act/ unsafe condition	Workers wear proper PPE.	3	1	**3**	Additional control shall be proposed when necessary.
	Dermatitis/skin irritation.	Near miss/ unsafe act/ unsafe condition	Workers wear gloves and safety shoes.	3	1	**3**	Additional control shall be proposed when necessary.

HAZARD IDENTIFICATION, RISK ASSESSMENT & DETERMINING CONTROL

Name of Job :	Department :	Prepared By :	Checked By :-	Approved By :
EXCAVATION WORK	CONSTRUCTION			

HAZARD IDENTIFICATION				RISK ASSESSMENT			Recommended Action/Additional Control
Job Activity	**Hazard**	**Hazard Character**	**Current Risk Control**	**Probability**	**Severity**	**Risk**	
Mobilization/ Unloading of excavator	Physical injuries caused by weight, sharp edges, hit by moving object.	Fatality or permanent disability or irreversible illness	Workers wear proper PPE; Signal man to monitor; Close supervision.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Insects bites or allergy to plants.	Near miss/ unsafe act/ unsafe condition	To ensure that worker wear heavy duty gloves during work.	3	1	**3**	Additional control shall be proposed when necessary.
	Trip or fall during mount or dismount of machinery.	Minor injury/illness (M.C between 5 to 14 days)	Worker wear proper PPE; Closed supervision.	2	3	**6**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Sudden injuries caused by excessive or cumulative lifting and/or work-rest cycle.	Near miss/ unsafe act/ unsafe condition	To ensure that worker do not work more than 2 hours at each time.	3	1	**3**	Additional control shall be proposed when necessary.
	Struck by overturning machinery due to unstable ground/traffic collision or machinery mishandling.	Fatality or permanent disability or irreversible illness	Instruction and site condition being briefed; Use solid platform; Signal man provided for traffic; Monitoring and provide signage.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
Excavator and case prepare base for site office container, diesel tank and store	Heat stroke caused by prolong exposure to sunlight and lack of water.	Near miss/ unsafe act/ unsafe condition	Workers wear hat and take a short break where applicable.	3	1	**3**	Additional control shall be proposed when necessary.
	Physical injuries caused by startup/mobilization such as belts, chain or weight of bucket wheel or hydraulic breaker during changeover between different types of accessories.	Minor injury/illness (M.C between 5 to 14 days)	To ensure that only competent person/operator performed mobilization for respective machinery.	2	3	**6**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Fire caused by heats engine or cigarette during refuel.	Localized damage (Repair cost > RM10,000 and < RM50,000)	To ensure that operator or worker not smoking during refueling and engine cool down of 15 minutes before refuel.	2	3	**6**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.

HAZARD IDENTIFICATION, RISK ASSESSMENT & DETERMINING CONTROL

Name of Job :	Department :	Prepared By :	Checked By :-	Approved By :
EXCAVATION WORK (Cont'd)	CONSTRUCTION			

HAZARD IDENTIFICATION				RISK ASSESSMENT			Recommended Action/Additional Control
Job Activity	Hazard	Hazard Character	Current Risk Control	Probability	Severity	Risk	
Excavate drainage/trenches/channel/site	Struck by collapse slope/falling object/material.	Fatality or permanent disability or irreversible illness	Close supervision; Working in buddy system; Barrier at excavate site area.	4	5	**20**	Briefing By SHO on safety awareness. Provide extra slope protection.
	Electrocution due to punching underground or overhead electric cable.	Minor damage (No or less disruption, repair cost > RM1,000 and < RM10,000)	Worker or operator being briefed of site condition and hidden danger; Wear proper PPE; Closed supervision.	3	2	**6**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Monotony of work and work rest cycle for excavator operator; cumulative trauma of bending over in drainage trenches/channels during side shoring for workers.	Near miss/ unsafe act/ unsafe condition	To ensure that operator or worker not work continuously more than 4 hours and encourage short breaks where applicable.	2	1	**2**	Additional control shall be proposed when necessary.
	Punching by moving bucket due to improper manual handling.	Fatality or permanent disability or irreversible illness	Provide safe working practice; Warning signage; Close supervision.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Trip/fall/drop into trenches/drain/site during work or inspection.	Minor injury/illness (M.C between 5 to 14 days)	Set up barrier or warning markers; Close supervision.	2	3	**6**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.

HAZARD IDENTIFICATION, RISK ASSESSMENT & DETERMINING CONTROL

Name of Job :	Department :	Prepared By :	Checked By :-	Approved By :
ROAD WORK	CONSTRUCTION			

HAZARD IDENTIFICATION				RISK ASSESSMENT			Recommended Action/Additional Control
Job Activity	**Hazard**	**Hazard Character**	**Current Risk Control**	**Probability**	**Severity**	**Risk**	
Unloading material	Physical injuries caused by weight, sharp edges, hit by falling object.	Fatality or permanent disability or irreversible illness	Workers wear gloves and hard hat; Provide safe working procedure; Close supervision.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Snakes & insects bites & allergies from plant might be occurred during the activities	First aid cases/medical treatment (M.C between 1 to 3 days)	All workers at the site are required to wear long safety boots.	2	2	**4**	Additional control shall be proposed when necessary.
	During verification of peg points, trip / fall might happen.	First aid cases/medical treatment (M.C between 1 to 3 days)	All workers at the site are required to wear long safety boots.	2	2	**4**	Additional control shall be proposed when necessary.
	Punching.	Major injury/illness (Long absenteeism, M.C > 14 days)	Stay away from the working area.	2	4	**8**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Physical injuries caused by swinging object and property damage.	Minor damage (No or less disruption, repair cost > RM1,000 and < RM10,000)	Provide safe working procedure on proper lifting and material handling; Provide warning signage.	2	2	**4**	Additional control shall be proposed when necessary.
	Crane collapse due to unstable ground.	Fatality or permanent disability or irreversible illness	To check outrigger and ground condition; Close supervision.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Damage to road surface due to crane sitting.	Minor damage (No or less disruption, repair cost > RM1,000 and < RM10,000)	Proper use of outrigger pad; Use of supporting platform.	3	2	**6**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Electrocution due to over head or underground live cable.	Minor injury/illness (M.C between 5 to 14 days)	Wear proper gloves; Provide warning signage; Close supervision.	2	3	**6**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Boom failure due to overloading or mishandling.	Fatality or permanent disability or irreversible illness	To check on load chart and proper lifting method.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Material falling onto public vehicle/road.	Localized damage (Repair cost > RM10,000 and < RM50,000)	Provide warning signage; Put barrier on working area; Close supervision.	2	3	**6**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Hit by falling object due to improper stacking.	Fatality or permanent disability or irreversible illness	Requirements on proper stacking techniques; Close supervision.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.

HAZARD IDENTIFICATION, RISK ASSESSMENT & DETERMINING CONTROL

Name of Job :	Department :	Prepared By :	Checked By :-	Approved By :
ROAD WORK (Cont'd)	CONSTRUCTION			

HAZARD IDENTIFICATION				RISK ASSESSMENT			Recommended Action/Additional Control
Job Activity	Hazard	Hazard Character	Current Risk Control	Probability	Severity	Risk	
Working environment and with material	Body injuries while handling machinery/hopper.	Major injury/illness (Long absenteeism, M.C > 14 days).	Provide safe working procedure; Training on machinery handling; Close supervision.	2	4	**8**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Health hazard due to tar and bitumen exposure.	Near miss/ unsafe act/ unsafe condition	Wear proper PPE; Close supervision.	3	1	**3**	Additional control shall be proposed when necessary.
	Heat stroke and dehydration due to prolonged exposure to sunlight or heating material.	Near miss/ unsafe act/ unsafe condition	Worker wear proper PPE; Worker to take a short break where applicable.	3	1	**3**	Additional control shall be proposed when necessary.
	Heat injury to body due to inappropriate insulation hand tools or inappropriate hands tools.	First aid cases/medical treatment (M.C between 1 to 3 days)	To use proper insulated hand tool; Wear proper PEP.	2	2	**4**	Additional control shall be proposed when necessary.
	Burnt injury due to mishandling flammable liquid or other combustible materials.	Fatality or permanent disability or irreversible illness	Wear proper PPE; Provide warning signage/MSDS; Close supervision.	1	5	**5**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Struck or hit by moving object (Hand tool or machinery).	Fatality or permanent disability or irreversible illness	To check outrigger and ground condition; Close supervision.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Physical injuries caused by traffic collision with public vehicle.	Minor injury/illness (M.C between 5 to 14 days)	Road site barrier/warning signage; Signal man proper monitoring; Close supervision.	2	3	**6**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Fall hazard due to cable snap or mishandling during lifting works.	Minor injury/illness (M.C between 5 to 14 days)	To check wire rope and proper handling during lifting work.	2	3	**6**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Fall into loading tray.	Minor injury/illness (M.C between 5 to 14 days)	Training for workers; Close supervision.	2	3	**6**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Fall into paver grader with rotating equipment.	Near miss/ unsafe act/ unsafe condition	Training for workers; Close supervision.	1	5	**5**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.

HAZARD IDENTIFICATION, RISK ASSESSMENT & DETERMINING CONTROL

Name of Job :	Department :	Prepared By :	Checked By :-	Approved By :
ROAD WORK (Cont'd)	CONSTRUCTION			

HAZARD IDENTIFICATION				RISK ASSESSMENT			Recommended Action/Additional Control
Job Activity	Hazard	Hazard Character	Current Risk Control	Probability	Severity	Risk	
Working environment and with material.	Material falling onto public vehicle/live lane/roads.	Minor damage (No or less disruption, repair cost > RM1,000 and < RM10,000)	Close supervision; Proper cover and close the road while unloading material.	2	2	**4**	Additional control shall be proposed when necessary.
	Communication interrupted by noisy condition.	Near miss/ unsafe act/ unsafe condition	Training to workers use proper hand signal where applicable.	3	1	**3**	Additional control shall be proposed when necessary.
	Traffic collision with public vehicle.	Minor damage (No or less disruption, repair cost > RM1,000 and < RM10,000)	To wear high visibility vest and clothing; Close supervision.	2	2	**4**	Additional control shall be proposed when necessary.
	Material lifting interrupted by windy condition.	Near miss/ unsafe act/ unsafe condition	Training to workers proper lifting techniques and to provide sling man.	2	1	**2**	Additional control shall be proposed when necessary.
	Sudden injuries on hand due to vibration using jackhammer.	First aid cases/medical treatment (M.C between 1 to 3 days)	Provide safe working procedure; Training on hand tool handling.	3	2	**6**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.

HAZARD IDENTIFICATION, RISK ASSESSMENT & DETERMINING CONTROL

Name of Job :	Department :	Prepared By :	Checked By :-	Approved By :
ROOF WORK	CONSTRUCTION			

HAZARD IDENTIFICATION				RISK ASSESSMENT			Recommended Action/Additional Control
Job Activity	**Hazard**	**Hazard Character**	**Current Risk Control**	**Probability**	**Severity**	**Risk**	
Mobilization/ Unloading of roof.	Physical injuries caused by weight/sharp edges.	Major injury/illness (Long absenteeism, M.C > 14 days)	Workers wear gloves and hard hat; Provide safe working procedure.	2	4	**8**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Physical injuries due to hit by falling material/object.	Fatality or permanent disability or irreversible illness	Workers wear proper PPE; Close supervision.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Manual handling.	First aid cases/medical treatment (M.C between 1 to 3 days)	Training and regular toolbox talk; Close supervision.	2	2	**4**	Additional control shall be proposed when necessary.
	Hit by moving/falling object during transfer of material.	Fatality or permanent disability or irreversible illness	Provide signal man; Close supervision.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Damage of material due to mishandling and fall from height during lifting work.	Minor damage (No or less disruption, repair cost > RM1,000 and < RM10,000)	Provide safe working/material handling procedure; Close supervision.	2	2	**4**	Additional control shall be proposed when necessary.
Material storage at roof top.	Heat stress/stroke due to hot working environment	Near miss/ unsafe act/ unsafe condition	Use proper ventilation system; Take a short break and drink water.	3	1	**3**	Additional control shall be proposed when necessary.
	Falling/flying object material due to windy condition.	Fatality or permanent disability or irreversible illness	Material to be securely stack and away from edges.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
Walkways and working platform.	Slip and fall from height.	Fatality or permanent disability or irreversible illness	Provide safe working procedure; Wear safety harness and provides lifeline.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Space constraint.	Near miss/ unsafe act/ unsafe condition	Training and proper planning of work.	3	1	**3**	Additional control shall be proposed when necessary.
Installation of roof material	Slip & fall from height	Fatality or permanent disability or irreversible illness	Provide safe working procedure; Wear safety harness & provide lifelines.	3	5	**15**	Permit to work, qualification/competency, briefing by SHO on safety awareness
	Material damage due to falling/hit by falling object	Minor damage (No or less disruption, repair cost > RM1,000 and < RM10,000)	Provide safe material handling & toe board at edge of roof; Cordon working area; Warning signage.	2	2	**4**	Additional control shall be proposed when necessary

HAZARD IDENTIFICATION, RISK ASSESSMENT & DETERMINING CONTROL

Name of Job :	Department :	Prepared By :	Checked By :-	Approved By :
SCAFFOLDING WORK	CONSTRUCTION			

HAZARD IDENTIFICATION				RISK ASSESSMENT			Recommended Action/Additional Control
Job Activity	Hazard	Hazard Character	Current Risk Control	Probability	Severity	Risk	
Mobilization/ Unloading	Physical injuries caused by weight, sharp edges, hit by moving object.	Fatality or permanent disability or irreversible illness	Workers wearing proper PPE; Provide warning signage; Safe handling/working procedure.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Heat stress/stroke due to hot working environment.	Near miss/ unsafe act/ unsafe condition	Workers wearing hard hat; To take a short break and drink water.	3	1	**3**	Additional control shall be proposed when necessary.
	Physical injuries due to slip/trip fall during carry scaffold for storage.	First aid cases/medical treatment (M.C between 1 to 3 days)	Workers wearing proper PPE; Provide safe material handling/working procedure; Close supervision.	2	2	**4**	Additional control shall be proposed when necessary.
	Space constraint.	Near miss/ unsafe act/ unsafe condition	Training and proper planning of work; Safe work procedure.	3	1	**3**	Additional control shall be proposed when necessary.
	Physical injuries caused by fall of material during lifting process.	First aid cases/medical treatment (M.C between 1 to 3 days)	Workers wearing proper PPE; Close supervision; Provide safe material handling/working procedure.	2	2	**4**	Additional control shall be proposed when necessary.
	Sudden injuries caused by excessive lifting.	First aid cases/medical treatment (M.C between 1 to 3 days)	Workers wearing proper PPE; Provide warning signage; Safe handling/working procedure.	2	2	**4**	Additional control shall be proposed when necessary.
	Hand injuries when stacking the scaffold from lorry.	First aid cases/medical treatment (M.C between 1 to 3 days)	Workers wearing proper PPE; Provide safe working procedure.	2	2	**4**	Additional control shall be proposed when necessary.

HAZARD IDENTIFICATION, RISK ASSESSMENT & DETERMINING CONTROL

Name of Job :	Department :	Prepared By :	Checked By :-	Approved By :
SCAFFOLDING WORK (Cont'd)	CONSTRUCTION			

HAZARD IDENTIFICATION				RISK ASSESSMENT			Recommended Action/Additional Control
Job Activity	Hazard	Hazard Character	Current Risk Control	Probability	Severity	Risk	
Installation of scaffold	Hit by moving object.	Fatality or permanent disability or irreversible illness	Wear proper PPE, Provide safe working procedure.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Platform collapse due to unstable ground.	Extensive damage > RM250,000	Provide safe working procedure, safe handling/working procedure, supervisor to check platform ground	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Hit by falling object.	Fatality or permanent disability or irreversible illness	Wearing hard hat, close supervision by competent scaffold supervisor.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Slip & trip while set up of installation at platform.	First aid cases/medical treatment (M.C between 1 to 3 days),	Wear proper PPE, platform to be clear & dry, close supervision.	2	2	**4**	Additional control shall be proposed when necessary
	Fall from height.	Fatality or permanent disability or irreversible illness	Provide safe working procedure, wear safety harness & provide lifelines	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
Erection of scaffold	Slip and trip during erection.	First aid cases/medical treatment (M.C between 1 to 3 days),	Using safe working platform; Passageway clear from obstruction; Workers wear proper PPE.	3	2	**6**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Material falling.	Minor injury/illness (M.C between 5 to 14 days)	Close supervision by competent scaffold supervisor; Provide warning signage at working area; Workers wear proper PPE.	2	3	**6**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Falling from height.	Fatality or permanent disability or irreversible illness	Close supervision; Using safe working platform; Worker wearing safety harness.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.

HAZARD IDENTIFICATION, RISK ASSESSMENT & DETERMINING CONTROL

Name of Job :	Department :	Prepared By :	Checked By :-	Approved By :
DRAINAGE, SEWERAGE & PIPING WORK	CONSTRUCTION			

HAZARD IDENTIFICATION				RISK ASSESSMENT			Recommended Action/Additional Control
Job Activity	Hazard	Hazard Character	Current Risk Control	Probability	Severity	Risk	
Check and verify peg points as per survey drawings with reference to construct drawings	When checking peg points, possible injuries from snakes/insects bites and allergies from plants.	First aid cases/medical treatment (M.C between 1 to 3 days)	Worker to work in buddy system and compulsory use of safety shoes or proper PPE.	2	2	**4**	Additional control shall be proposed when necessary
	Trip/fall during verification of peg point.	First aid cases/medical treatment (M.C between 1 to 3 days)	Worker to work in buddy system and use of belay lines for transversing slopes if applicable; Workers to rotate carrying equipment and position.	2	2	**4**	Additional control shall be proposed when necessary
	Cumulative trauma from carrying peg variation equipment such as dumpy level, theodolite and stands inclusive of measurement staff.	First aid cases/medical treatment (M.C between 1 to 3 days)	Workers to rotate carrying equipment and position.	1	2	**2**	Additional control shall be proposed when necessary
Mobilize excavator or case	Trip/fall during mount/dismount of machinery, noise and vibration of machinery gives physical discomforts.	First aid cases/medical treatment (M.C between 1 to 3 days)	To ensure that operator to perform pre start check and clean up of slippery surfaces before mount/dismount.	2	2	**4**	Additional control shall be proposed when necessary
	Fire caused by heated engine or cigarette during refueling.	Minor damage (No or less disruption, repair cost > RM1,000 and < RM10,000)	Enforce no smoking area and cool down engine before refueling.	2	2	**4**	Additional control shall be proposed when necessary
	Drop of machinery parts and hit the body of worker, noise and vibration of machinery might cause injury.	First aid cases/medical treatment (M.C between 1 to 3 days)	Workers to wear proper PPE; Provide safe working procedure; Close supervision.	2	2	**4**	Additional control shall be proposed when necessary

HAZARD IDENTIFICATION, RISK ASSESSMENT & DETERMINING CONTROL

Name of Job :	Department :	Prepared By :	Checked By :-	Approved By :
DRAINAGE, SEWERAGE & PIPING WORK (Cont'd)	CONSTRUCTION			

HAZARD IDENTIFICATION				RISK ASSESSMENT			Recommended Action/Additional Control
Job Activity	Hazard	Hazard Character	Current Risk Control	Probability	Severity	Risk	
Unloading pipes from trailers	The crane's chain slipped or broken during the lifting operation and piles fall off and hit the body of worker causing body parts dislocated/fracture.	Major injury/illness (Long absenteeism, M.C > 14 days)	Workers to wear proper PPE; Provide signalman; Crane to have a valid PMA certificate; Provide safe work procedure.	1	4	**4**	Additional control shall be proposed when necessary
	Hand injuries might be occurred when the workers help to unload the pipes.	First aid cases/medical treatment (M.C between 1 to 3 days)	Workers to wear proper PPE; Provide safe work procedure.	2	2	**4**	Additional control shall be proposed when necessary
	Sudden body injuries due to excessive load weight.	First aid cases/medical treatment (M.C between 1 to 3 days)	Provide training/safety awareness; Close supervision.	2	2	**4**	Additional control shall be proposed when necessary
	Physical injuries caused by weight, sharp edges.	Minor injury/illness (M.C between 5 to 14 days)	Workers wear proper PPE.	2	3	**6**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Hit by moving object.	Fatality or permanent disability or irreversible illness	Provide warning signage; Close supervision.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
Stacking of pipes	Improper stacking of pipes might cause others to fall off and cause body injuries.	First aid cases/medical treatment (M.C between 1 to 3 days)	Workers wear proper PPE.	2	2	**4**	Additional control shall be proposed when necessary
	Hand injuries due to stacking the pipes on form ground with timber blocks and wedges.	First aid cases/medical treatment (M.C between 1 to 3 days)	Workers wear proper PPE.	2	2	**4**	Additional control shall be proposed when necessary
	Snakes and insects bites and allergies from plant might be occurred during the activities.	Near miss/ unsafe act/ unsafe condition	Workers wear proper PPE.	2	1	**2**	Additional control shall be proposed when necessary

Name of Job :	Department :	Prepared By :	Checked By :-	Approved By :
DRAINAGE, SEWERAGE & PIPING WORK (Cont'd)	CONSTRUCTION			

HAZARD IDENTIFICATION				RISK ASSESSMENT			Recommended Action/Additional Control
Job Activity	Hazard	Hazard Character	Current Risk Control	Probability	Severity	Risk	
Excavate drainage/ channels and preparing foundation	Trip/fall during mount/dismount of machinery, noise and vibration of machinery gives physical discomforts.	First aid cases/medical treatment (M.C between 1 to 3 days),	To ensure that operator to perform pre start checks and clean up of slippery surfaces before mount/dismount.	2	2	**4**	Additional control shall be proposed when necessary
	Monotony of work and work cycle for excavator operator; cumulative trauma of bending over in drainage trenches/channel during side shoring.	First aid cases/medical treatment (M.C between 1 to 3 days),	To ensure worker take a short break where applicable.	2	2	**4**	Additional control shall be proposed when necessary
	Buried alive by collapse ground or material.	Fatality or permanent disability or irreversible illness	Adequate slope protection; Safe excavation technique; Close supervision.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Trip/fall/drop into trenches during work or inspection.	First aid cases/medical treatment (M.C between 1 to 3 days),	Trenches have barricade or warning signage; Close supervision.	2	2	**4**	Additional control shall be proposed when necessary
	Struck by collapse machinery.	Fatality or permanent disability or irreversible illness	Provide solid platform/use steel plate; Close supervision.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Heat stroke from prolonged exposure to sunlight and dehydration.	Near miss/ unsafe act/ unsafe condition	Workers wear hard hat; Workers encourage to take a short where applicable.	3	1	**3**	Additional control shall be proposed when necessary
Placing of culverts/lay bedding concrete/pipes or related materials	Snakes and insects bites and allergies from plant might be occurred during the activities.	Near miss/ unsafe act/ unsafe condition	Workers wear proper PPE	2	1	**2**	Additional control shall be proposed when necessary
	Powered equipment and machinery such as hopper or manual compactor may cause possible injuries.	First aid cases/medical treatment (M.C between 1 to 3 days),	Workers wear proper PPE	2	2	**4**	Additional control shall be proposed when necessary

Name of Job :	Department :	Prepared By :	Checked By :-	Approved By :
DRAINAGE, SEWERAGE & PIPING WORK (Cont'd)	CONSTRUCTION			

HAZARD IDENTIFICATION				RISK ASSESSMENT			Recommended Action/Additional Control
Job Activity	Hazard	Hazard Character	Current Risk Control	Probability	Severity	Risk	
Placing of culverts/lay bedding concrete/pipes or related materials (Cont'd)	Physical injuries caused by weight, sharp edges.	Minor injury/illness (M.C between 5 to 14 days)	Workers wear proper PPE.	2	3	**6**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Hit by moving object.	Fatality or permanent disability or irreversible illness	Provide warning signage; Close supervision.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Fire caused by heated engine or cigarette during refueling.	Minor damage (No or less disruption, repair cost > RM1,000 and < RM10,000)	Enforce no smoking area and cool down engine before refueling.	2	2	**4**	Additional control shall be proposed when necessary
	Buried alive by collapse ground or material.	Fatality or permanent disability or irreversible illness	Adequate slope protection; Safe excavation technique; Close supervision.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Physical injuries caused by heavy items slipping from hands/lifting equipment and falling onto worker.	Minor injury/illness (M.C between 5 to 14 days)	Workers wear proper PPE; Signalman to be provided to stop other from working under the crane.	2	3	**6**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Sudden body injuries due to excessive lifting.	First aid cases/medical treatment (M.C between 1 to 3 days),	Allowed to carry only where one's can; Required assistant when needed; Use crane or lifting machinery.	2	2	**4**	Additional control shall be proposed when necessary
	Electrocuted by faulty wiring.	Fatality or permanent disability or irreversible illness	Workers wear proper PPE; Close supervision.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Struck by collapse machinery due to unstable ground.	Fatality or permanent disability or irreversible illness	Use of solid supporting platform; Close supervision.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Radiation.	Major injury/illness (Long absenteeism, M.C > 14 days)	Worker wearing proper eye protection.	1	4	**4**	Additional control shall be proposed when necessary
	Heat stroke from prolonged exposure to sunlight and dehydration.	Near miss/ unsafe act/ unsafe condition	Workers wear hard hat; Workers encourage to take a short where applicable.	3	1	**3**	Additional control shall be proposed when necessary
	Trip/fall/drop into trenches during work or inspection.	First aid cases/medical treatment (M.C between 1 to 3 days),	Trenches have barricade or warning signage; Close supervision.	2	2	**4**	Additional control shall be proposed when necessary
	Dermatitis due to prolonged direct contact with cement.	First aid cases/medical treatment (M.C between 1 to 3 days),	Workers wear proper PPE.	2	2	**4**	Additional control shall be proposed when necessary

HAZARD IDENTIFICATION, RISK ASSESSMENT & DETERMINING CONTROL

Name of Job :	Department :	Prepared By :	Checked By :-	Approved By :
DRAINAGE, SEWERAGE & PIPING WORK (Cont'd)	CONSTRUCTION			

HAZARD IDENTIFICATION				RISK ASSESSMENT			Recommended Action/Additional Control
Job Activity	**Hazard**	**Hazard Character**	**Current Risk Control**	**Probability**	**Severity**	**Risk**	
Install applicable components according to specifications	Physical injuries caused by weight, sharp edges when transferring material and equipment.	Minor injury/illness (M.C between 5 to 14 days)	Workers wear proper PPE; Workers to work in buddy system.	2	3	**6**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Snakes and insects bites and allergies from plant might be occurred during the activities.	Near miss/ unsafe act/ unsafe condition	Workers wear proper PPE.	2	1	**2**	Additional control shall be proposed when necessary
	Possible injuries from fall and or equipment/ components falling onto workers when work at night.	Minor injury/illness (M.C between 5 to 14 days)	Workers wear proper PPE; Provide proper lighting.	2	3	**6**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Heat stroke from prolonged exposure to sunlight and dehydration.	Near miss/ unsafe act/ unsafe condition	Workers wear hard hat; Workers encourage to take a short where applicable.	3	1	**3**	Additional control shall be proposed when necessary
	Physical injuries caused by heavy items slipping from hands/lifting equipment and falling on to worker.	First aid cases/medical treatment (M.C between 1 to 3 days),	Workers wear proper PPE; Signalman to be provided to stop other from working under the crane.	2	2	**4**	Additional control shall be proposed when necessary
Conduct applicable acceptance test or benchmark acceptance procedure	Heat stroke from prolonged exposure to sunlight and dehydration.	Near miss/ unsafe act/ unsafe condition	Workers wear hard hat; Workers encourage to take a short where applicable.	3	1	**3**	Additional control shall be proposed when necessary
	Physical injuries caused by weight, sharp edges when transferring test equipment.	First aid cases/medical treatment (M.C between 1 to 3 days),	Workers wear proper PPE; Workers to work in buddy system.	2	2	**4**	Additional control shall be proposed when necessary
	Possible injuries from fall and or hit by falling equipment.	Minor injury/illness (M.C between 5 to 14 days)	Ensure trenches have boundaries and warning markers.	2	3	**6**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.

HAZARD IDENTIFICATION, RISK ASSESSMENT & DETERMINING CONTROL

Name of Job :	Department :	Prepared By :	Checked By :-	Approved By :
DRAINAGE, SEWERAGE & PIPING WORK (Cont'd)	CONSTRUCTION			

HAZARD IDENTIFICATION				RISK ASSESSMENT			Recommended Action/Additional Control
Job Activity	Hazard	Hazard Character	Current Risk Control	Probability	Severity	Risk	
Backfill for applicable closed drainage system to desired level	Excessive vibration of compactor/hopper and heat radiation from closed proximity of equipment.	Near miss/ unsafe act/ unsafe condition	To ensure workers not working more than 4 hours continuously and encourage to take a short break.	3	1	**3**	Additional control shall be proposed when necessary
	Monotony of work and work rest cycle for excavator operator; cumulative.	Near miss/ unsafe act/ unsafe condition	To ensure workers not working more than 4 hours continuously and encourage to take a short break.	3	1	**3**	Additional control shall be proposed when necessary
	Heat stroke from prolonged exposure to sunlight and dehydration.	Near miss/ unsafe act/ unsafe condition	Workers wear hard hat; Workers encourage to take a short where applicable.	3	1	**3**	Additional control shall be proposed when necessary
	Trip/fall/drop into trenches during work or inspection.	First aid cases/medical treatment (M.C between 1 to 3 days),	Trenches have barricade or warning signage; Close supervision.	2	2	**4**	Additional control shall be proposed when necessary
Post-work safety	Fire caused by heated engine or cigarette during refueling.	Minor damage (No or less disruption, repair cost > RM1,000 and < RM10,000)	Enforce no smoking area and cool down engine before refueling.	2	2	**4**	Additional control shall be proposed when necessary
	Fall from height due to unprotected opening.	Fatality or permanent disability or irreversible illness	Provide warning system; Provide barrier.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Inhalation/exposure to toxic gases.	Fatality or permanent disability or irreversible illness	Working in buddy system; Close supervision; Check for toxic gases.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Confine space and insufficient oxygen.	Fatality or permanent disability or irreversible illness	Provide proper ventilation; Working in buddy system; Exhaust fan system.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.

HAZARD IDENTIFICATION, RISK ASSESSMENT & DETERMINING CONTROL

Name of Job :	Department :	Prepared By :	Checked By :-	Approved By :
CONFINED WORK SPACE	CONSTRUCTION			

HAZARD IDENTIFICATION				RISK ASSESSMENT			Recommended Action/Additional Control
Job Activity	Hazard	Hazard Character	Current Risk Control	Probability	Severity	Risk	
Entering confined space	Physical injuries due to slip and fall into manhole.	Major injury/illness (Long absenteeism, M.C > 14 days).	Workers wear proper PPE; Use safety harnesses if required; Closedsupervision.	2	4	**8**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Toxication due to inhalation of toxic gases.	Fatality or permanent disability or irreversible illness	Competent gas tester checks the air;Provide proper ventilation; Closed supervision.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Electrocuted due to faulty wiring or electric leakage.	Fatality or permanent disability or irreversible illness	Workers wear proper PPE; Closed supervision.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Body cut/pierce by sharp object.	Major injury/illness (Long absenteeism, M.C > 14 days).	Workers wear proper PPE; Closed supervision.	2	4	**8**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
Mobilize material or equipment into confined space	Hand injuries might be occurred when the workers to unload material/ equipment.	First aid cases/medical treatment (M.C between 1 to 3 days),	Workers to wear proper PPE; Provide safe work procedure.	2	2	**4**	Additional control shall be proposed when necessary
	Hit by moving object.	First aid cases/medical treatment (M.C between 1 to 3 days),	Provide warning signage; Closed supervision.	2	2	**4**	Additional control shall be proposed when necessary
	Sudden body injuries due to excessive load weight.	First aid cases/medical treatment (M.C between 1 to 3 days),	Provide training/safety awareness; Closed supervision.	2	2	**4**	Additional control shall be proposed when necessary
Working in confined space	Physical injuries or death caused by hazardous atmosphere: asphyxiate, toxic gases, explosion.	Fatality or permanent disability or irreversible illness	Workers to wear proper PPE; Provide proper ventilation system; Work in buddy system; Closed supervision.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Sudden injuries due to prolonged bending over .	First aid cases/medical treatment (M.C between 1 to 3 days),	Workers wear proper PPE; Workers to take break where applicable.	2	2	**4**	Additional control shall be proposed when necessary

HAZARD IDENTIFICATION, RISK ASSESSMENT & DETERMINING CONTROL

Name of Job :	Department :	Prepared By :	Checked By :-	Approved By :
CONFINED WORK SPACE (Cont'd)	CONSTRUCTION			

HAZARD IDENTIFICATION				RISK ASSESSMENT			Recommended Action/Additional Control
Job Activity	Hazard	Hazard Character	Current Risk Control	Probability	Severity	Risk	
Working in confined space (Cont'd)	Heat stroke due to excessive heat and dehydration.	Near miss/ unsafe act/ unsafe condition	Workers to take a short break where applicable and drink more water; Provide proper ventilation system; Closed supervision.	3	1	**3**	Additional control shall be proposed when necessary
	Buried alive due to slope collapse/earth/solid material/fluid.	Fatality or permanent disability or irreversible illness	Workers to wear proper PPE; Provide lifeline communication system and work in buddy system; Closed supervision; Provide adequate slope protection.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Death due to inhalation of carbon monoxide.	Fatality or permanent disability or irreversible illness	Any machinery to be place outside; Provide proper ventilation system; Closed supervision.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
Inspection/ finished up and exit from confined space	Trip/fall/drop into manhole during inspection.	Fatality or permanent disability or irreversible illness	Provide warning signage; Closed supervision.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Buried by collapse ground or material.	Fatality or permanent disability or irreversible illness	Adequate slope protection; Safe excavation technique; Closed supervision.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Electrocuted by faulty wiring.	Fatality or permanent disability or irreversible illness	Workers wear proper PPE; Closed supervision.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Space constraint.	First aid cases/medical treatment (M.C between 1 to 3 days),	Training and proper planning of work; Provide safe working procedure.	2	2	**4**	Additional control shall be proposed when necessary
	Hit by moving object.	First aid cases/medical treatment (M.C between 1 to 3 days),	Workers wearing proper PPE; Provide safe working procedure.	2	2	**4**	Additional control shall be proposed when necessary

HAZARD IDENTIFICATION, RISK ASSESSMENT & DETERMINING CONTROL

Name of Job :	Department :	Prepared By :	Checked By :-	Approved By :
WELDING WORK	CONSTRUCTION			

HAZARD IDENTIFICATION				RISK ASSESSMENT			Recommended Action/Additional Control
Job Activity	Hazard	Hazard Character	Current Risk Control	Probability	Severity	Risk	
Mobilization/ unloading of welding equipment	Physical injuries caused by weight, sharp edges.	First aid cases/medical treatment (M.C between 1 to 3 days),	Workers wear proper PPE.	2	2	**4**	Additional control shall be proposed when necessary
	Physical injuries caused by falling cylinder.	First aid cases/medical treatment (M.C between 1 to 3 days),	Workers wear safety shoes; Provide safe handling procedure.	2	2	**4**	Additional control shall be proposed when necessary
	Environment pollution caused leaking gases.	First aid cases/medical treatment (M.C between 1 to 3 days),	Provide safe storage procedure; Provide maintenance schedule; Closed supervision.	2	2	**4**	Additional control shall be proposed when necessary
	Sudden injuries caused by excessive lifting and mishandling.	First aid cases/medical treatment (M.C between 1 to 3 days),	Provide safe handling/lifting procedure; Closed supervision.	2	2	**4**	Additional control shall be proposed when necessary
Welding process	Eyes injury caused by excessive flash light.	First aid cases/medical treatment (M.C between 1 to 3 days),	Workers wearing face shield/goggle; Provide only competent welder.	2	2	**4**	Additional control shall be proposed when necessary
	Gas inhalation/welding fume.	First aid cases/medical treatment (M.C between 1 to 3 days),	Wearing face mask and face shield; Provide safe working procedure; Provide proper ventilation/exhaust fan.	2	2	**4**	Additional control shall be proposed when necessary
	Explosion due to leaking cylinder/valve/hose.	Fatality or permanent disability or irreversible illness	Worker wear proper PPE; Provide safe working procedure; Provide warning signage; Proper maintenance schedule; Closed supervision.	1	5	**5**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Body injuries due to burnt/hot surface.	Major injury/illness (Long absenteeism, M.C > 14 days).	Worker wear proper PPE; Provide safe working procedure.	2	4	**8**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.

HAZARD IDENTIFICATION, RISK ASSESSMENT & DETERMINING CONTROL

Name of Job :	Department :	Prepared By :	Checked By :-	Approved By :
WELDING WORK (Cont'd)	CONSTRUCTION			

HAZARD IDENTIFICATION				RISK ASSESSMENT			Recommended Action/Additional Control
Job Activity	Hazard	Hazard Character	Current Risk Control	Probability	Severity	Risk	
Welding process (Cont'd)	Fire caused by improper welding procedure.	Minor damage (No or less disruption, repair cost > RM1,000 and < RM10,000)	Worker wears proper PPE; Provide safe working procedure; Provide fire extinguisher; Closed supervision.	2	2	**4**	Additional control shall be proposed when necessary
	Physical injuries caused by sharp objects.	First aid cases/medical treatment (M.C between 1 to 3 days),	Worker wear proper PPE; safe material handling.	2	2	**4**	Additional control shall be proposed when necessary
	Falling from height due to unstable platform.	Fatality or permanent disability or irreversible illness	Worker wearing safety harness; Provide safe working procedure; Provide safe working platform.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
Inspect and storage of wielding set	Manual handling.	First aid cases/medical treatment (M.C between 1 to 3 days),	Training and regular toolbox talk; Closed supervision.	2	2	**4**	Additional control shall be proposed when necessary
	Material damage due to falling/mishandling during storage.	Minor damage (No or less disruption, repair cost > RM1,000 and < RM10,000)	Provide safe handling procedure; Provide a specific storage room.	2	2	**4**	Additional control shall be proposed when necessary
	Hand injury due to hot surface/platform.	First aid cases/medical treatment (M.C between 1 to 3 days),	Worker wear proper PPE; To ensure/wait till hot surface is cold.	2	2	**4**	Additional control shall be proposed when necessary
	Hit by moving object during transfer of equipment.	First aid cases/medical treatment (M.C between 1 to 3 days),	Provide safe working procedure; Closed supervision.	2	2	**4**	Additional control shall be proposed when necessary

HAZARD IDENTIFICATION, RISK ASSESSMENT & DETERMINING CONTROL

Name of Job :	Department :	Prepared By :	Checked By :-	Approved By :
MASONRY WORK	CONSTRUCTION			

HAZARD IDENTIFICATION				RISK ASSESSMENT			Recommended Action/Additional Control
Job Activity	Hazard	Hazard Character	Current Risk Control	Probability	Severity	Risk	
Transporting of material	Traffic collision.	Minor damage (No or less disruption, repair cost > RM1,000 and < RM10,000)	Competent and certified driver; Closed supervision.	2	2	**4**	Additional control shall be proposed when necessary
	Machinery breakdown.	Minor damage (No or less disruption, repair cost > RM1,000 and < RM10,000)	Regular maintenance and servicing.	2	2	**4**	Additional control shall be proposed when necessary
	Material overloading, falling and hit workers.	Minor injury/illness (M.C between 5 to 14 days)	Workers wear proper PPE; Closed supervision.	2	3	**6**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
Unloading of material	Physical injuries due to hit by moving objects.	Fatality or permanent disability or irreversible illness	Workers wear proper PPE; Provide safe working procedure.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Physical injuries due to hit by falling objects.	Fatality or permanent disability or irreversible illness	Workers wear proper PPE; Provide safe working procedure.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Crane collapse due to unstable ground/platform or mishandling.	Fatality or permanent disability or irreversible illness	Provide a proper PMA certificate; Fully use outrigger platform.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Trip and fall due to poor housekeeping.	Major injury/illness (Long absenteeism, M.C > 14 days).	Provide good/save access and maintain good hours keeping.	2	4	**8**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Manual handling due to improper lifting techniques.	Minor injury/illness (M.C between 5 to 14 days)	Use proper hand tools; Workers wear proper PPE.	2	3	**6**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Physical injuries due to cut/pierce by sharp edge object.	Minor injury/illness (M.C between 5 to 14 days)	Workers wear proper PPE; Provide safe working procedure.	2	3	**6**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.

HAZARD IDENTIFICATION, RISK ASSESSMENT & DETERMINING CONTROL

Name of Job :	Department :	Prepared By :	Checked By :-	Approved By :
MASONRY WORK (Cont'd)	CONSTRUCTION			

HAZARD IDENTIFICATION				RISK ASSESSMENT			Recommended Action/Additional Control
Job Activity	Hazard	Hazard Character	Current Risk Control	Probability	Severity	Risk	
Storage of material	Hit by falling object due to improper stacking.	First aid cases/medical treatment (M.C between 1 to 3 days),	Requirements proper stacking techniques.	2	2	**4**	Additional control shall be proposed when necessary
	Fall hazard due to mishandling during stacking.	First aid cases/medical treatment (M.C between 1 to 3 days),	To check safe condition of platform; Wear a proper PPE; Close supervision.	2	2	**4**	Additional control shall be proposed when necessary
	Sudden body injuries due to excessive lifting is carried out.	First aid cases/medical treatment (M.C between 1 to 3 days),	Allowed to carry only where one's can; Required assistant when needed; Use crane or lifting machinery.	2	2	**4**	Additional control shall be proposed when necessary
	Manual handling.	Near miss/ unsafe act/ unsafe condition	Training and regular toolbox talk; Closed supervision.	3	1	**3**	Additional control shall be proposed when necessary
Working environment	Material fall onto public vehicle/live lane/road.	Minor damage (No or less disruption, repair cost > RM1,000 and < RM10,000)	To properly cover the material/stacked it away from the edge.	3	2	**6**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Heat stroke from prolonged exposure to sunlight and dehydration.	Near miss/ unsafe act/ unsafe condition	Workers wear hard hat; Workers encourage to take a short break where applicable.	3	1	**3**	Additional control shall be proposed when necessary
	Trip and fall due to poor housekeeping.	First aid cases/medical treatment (M.C between 1 to 3 days),	Provide good/save access and maintain good house keeping.	2	2	**4**	Additional control shall be proposed when necessary
	Dusty work environment.	First aid cases/medical treatment (M.C between 1 to 3 days),	Workers to wear proper PPE (i.e Face mask); Conduct housekeeping regularly.	3	2	**6**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Falling from height.	Fatality or permanent disability or irreversible illness	To provide barrier at open space edge; Workers to wear safety harness; Closed supervision.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Body injuries/cut caused by sharp object.	Minor injury/illness (M.C between 5 to 14 days)	Worker wears proper PPE.	2	3	**6**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.

HAZARD IDENTIFICATION, RISK ASSESSMENT & DETERMINING CONTROL

Name of Job :	Department :	Prepared By :	Checked By :-	Approved By :
MASONRY WORK (Cont'd)	CONSTRUCTION			

HAZARD IDENTIFICATION				RISK ASSESSMENT			Recommended Action/Additional Control
Job Activity	Hazard	Hazard Character	Current Risk Control	Probability	Severity	Risk	
Working with material	Hit by falling object due to mishandling/slip/fall.	Fatality or permanent disability or irreversible illness	Provide safe working procedure; Closed supervision.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Dermatitis due to exposure to cement/mineral dust.	First aid cases/medical treatment (M.C between 1 to 3 days),	Worker wear gloves/face mask; Conduct housekeeping regularly.	3	2	**6**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Damage to equipment/material due to mishandling.	Minor damage (No or less disruption, repair cost > RM1,000 and < RM10,000)	Train worker for properly handling; Provide safe working procedure.	2	2	**4**	Additional control shall be proposed when necessary
	Fall from height due to unstable/collapse platform.	Fatality or permanent disability or irreversible illness	Provide safe working platform; To provide barrier at open space edge; Workers to wear safety harness; Closed supervision.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Physical stress/repetitive work.	Near miss/ unsafe act/ unsafe condition	Worker to take a short break where applicable.	3	1	**3**	Additional control shall be proposed when necessary
	Environment pollution due to concrete and mineral dust.	Near miss/ unsafe act/ unsafe condition	Worker wear gloves/face mask; Conduct housekeeping regularly; Provide water spray system.	3	1	**3**	Additional control shall be proposed when necessary

HAZARD IDENTIFICATION, RISK ASSESSMENT & DETERMINING CONTROL

Name of Job :	Department :	Prepared By :	Checked By :-	Approved By :
LIFTING WORK	CONSTRUCTION			

HAZARD IDENTIFICATION				RISK ASSESSMENT			Recommended Action/Additional Control
Job Activity	**Hazard**	**Hazard Character**	**Current Risk Control**	**Probability**	**Severity**	**Risk**	
Transporting of lifting machinery	Traffic collision.	Minor damage (No or less disruption, repair cost > RM1,000 and < RM10,000)	Provide experience driver with legal driving licensee; Provide traffic man.	2	2	**4**	Additional control shall be proposed when necessary
	Machinery breakdown.	Minor damage (No or less disruption, repair cost > RM1,000 and < RM10,000)	Regular maintenance and servicing.	3	2	**6**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Equipment/machinery falling onto public vehicle/road.	Minor damage (No or less disruption, repair cost > RM1,000 and < RM10,000)	To securely tighten up equipment/machinery before transporting; Provide warning signage.	2	2	**4**	Additional control shall be proposed when necessary
	Body injuries while handling or secure equipment/ machinery for transporting.	First aid cases/medical treatment (M.C between 1 to 3 days),	Provide safe working procedure; Training on machinery handling; Close supervision.	2	2	**4**	Additional control shall be proposed when necessary
Mobilization/ unloading machinery/ material	Physical injuries caused by fall/hit by moving object during lifting process.	Fatality or permanent disability or irreversible illness	Worker wear gloves and hard hat; Signalman monitored lifting process; Close supervision.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Crane cable slipped or break during the lifting process.	Fatality or permanent disability or irreversible illness	Provide a proper PMA certificate; Signalman monitored lifting process; Close supervision.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Damage to road surface due to crane sitting.	Minor damage (No or less disruption, repair cost > RM1,000 and < RM10,000)	Proper use of outrigger pad; Use of support platform.	3	2	**6**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Struck by moving object due to unstable ground or mishandling.	Fatality or permanent disability or irreversible illness	Provide safe working procedure; Signalman monitored lifting process; Provide barrier and signage, Closed supervision.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.

HAZARD IDENTIFICATION, RISK ASSESSMENT & DETERMINING CONTROL

Name of Job :	Department :	Prepared By :	Checked By :-	Approved By :
LIFTING WORK (Cont'd)	CONSTRUCTION			

HAZARD IDENTIFICATION				RISK ASSESSMENT			Recommended Action/Additional Control
Job Activity	Hazard	Hazard Character	Current Risk Control	Probability	Severity	Risk	
Working environment	Heat stroke from prolonged exposure to sunlight and dehydration.	Near miss/ unsafe act/ unsafe condition	Workers wear hard hat; Workers encourage taking a short break where applicable.	3	1	**3**	Additional control shall be proposed when necessary
	Sudden body injuries due to excessive lifting.	Near miss/ unsafe act/ unsafe condition	Allowed to carry only where one's can; Required assistant when needed; Use crane or lifting machinery.	3	1	**3**	Additional control shall be proposed when necessary
	Physical injuries caused by trip and fall during lifting and carrying material.	Minor injury/illness (M.C between 5 to 14 days)	Safe working procedure; Closed supervision.	2	3	**6**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Space constraint.	Near miss/ unsafe act/ unsafe condition	Training and proper planning of work; Safe working procedure.	3	1	**3**	Additional control shall be proposed when necessary
Working with lifting/hoisting machinery.	Crane boom failure/collapse due to overloading.	Fatality or permanent disability or irreversible illness	Provide a proper PMA certificate; Signalman monitored lifting process; Close supervision; Provide barrier and signage.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Crane topple due to overweight/unstable ground.	Fatality or permanent disability or irreversible illness	Crane park at solid platform and outrigger support is fully used; Close supervision.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Manual handling.	First aid cases/medical treatment (M.C between 1 to 3 days),	Training and regular toolbox talk; Closed supervision.	2	2	**4**	Additional control shall be proposed when necessary
	Material damage due to falling/mishandling during storage.	Minor damage (No or less disruption, repair cost > RM1,000 and < RM10,000)	Provide safe handling procedure; Provide specific storage room.	2	3	**6**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.

HAZARD IDENTIFICATION, RISK ASSESSMENT & DETERMINING CONTROL

Name of Job :	Department :	Prepared By :	Checked By :-	Approved By :
HANDTOOL WORK	CONSTRUCTION			

HAZARD IDENTIFICATION				RISK ASSESSMENT			Recommended Action/Additional Control
Job Activity	Hazard	Hazard Character	Current Risk Control	Probability	Severity	Risk	
Working environment	Space constraint.	First aid cases/medical treatment (M.C between 1 to 3 days),	Training and proper planning of work; Safe working procedure.	2	2	**4**	Additional control shall be proposed when necessary
	Physical injuries caused by swinging object and property damage.	First aid cases/medical treatment (M.C between 1 to 3 days), Minor damage (No or less disruption, repair cost > RM1,000 and < RM10,000).	Provide safe working procedure; Provide warning signage; Work in safe condition and space; Closed supervision.	2	2	**4**	Additional control shall be proposed when necessary
Working with hand tool	Physical injuries caused by weight/sharp object.	First aid cases/medical treatment (M.C between 1 to 3 days),	Workers wear gloves; Provide safe working procedure.	2	2	**4**	Additional control shall be proposed when necessary
	Electrocution due to faulty wiring.	Fatality or permanent disability or irreversible illness	Worker wear proper PPE, make sure all equipment free from defect.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.
	Injuries or damage due to excessive vibration (Jackhammer/hopper).	First aid cases/medical treatment (M.C between 1 to 3 days),	Provide training how to use hand tool; Provide safe workingprocedure; Closed supervision.	2	2	**4**	Additional control shall be proposed when necessary
	Eyes injury caused by flying object/debris of hand tools.	First aid cases/medical treatment (M.C between 1 to 3 days),	Provide safe working procedure; Workers wearing face shield / goggle; Provide only competent worker.	2	2	**4**	Additional control shall be proposed when necessary
	Physical stress/repetitive work.	Near miss/ unsafe act/ unsafe condition	Worker to take a short break where applicable.	3	1	**3**	Additional control shall be proposed when necessary
	Injuries or damage due to mishandling or use of tools.	First aid cases/medical treatment (M.C between 1 to 3 days),	Conduct training; Provide safe working procedure; Closed supervision.	2	2	**4**	Additional control shall be proposed when necessary
	Electrical hand toolbreakdown	Near miss/ unsafe act/ unsafe condition	Regular maintenance and servicing; Provide safe working procedure.	3	1	**3**	Additional control shall be proposed when necessary

HAZARD IDENTIFICATION, RISK ASSESSMENT & DETERMINING CONTROL

Name of Job :	Department :	Prepared By :	Checked By :-	Approved By :
HANDTOOL WORK (Cont'd)	CONSTRUCTION			

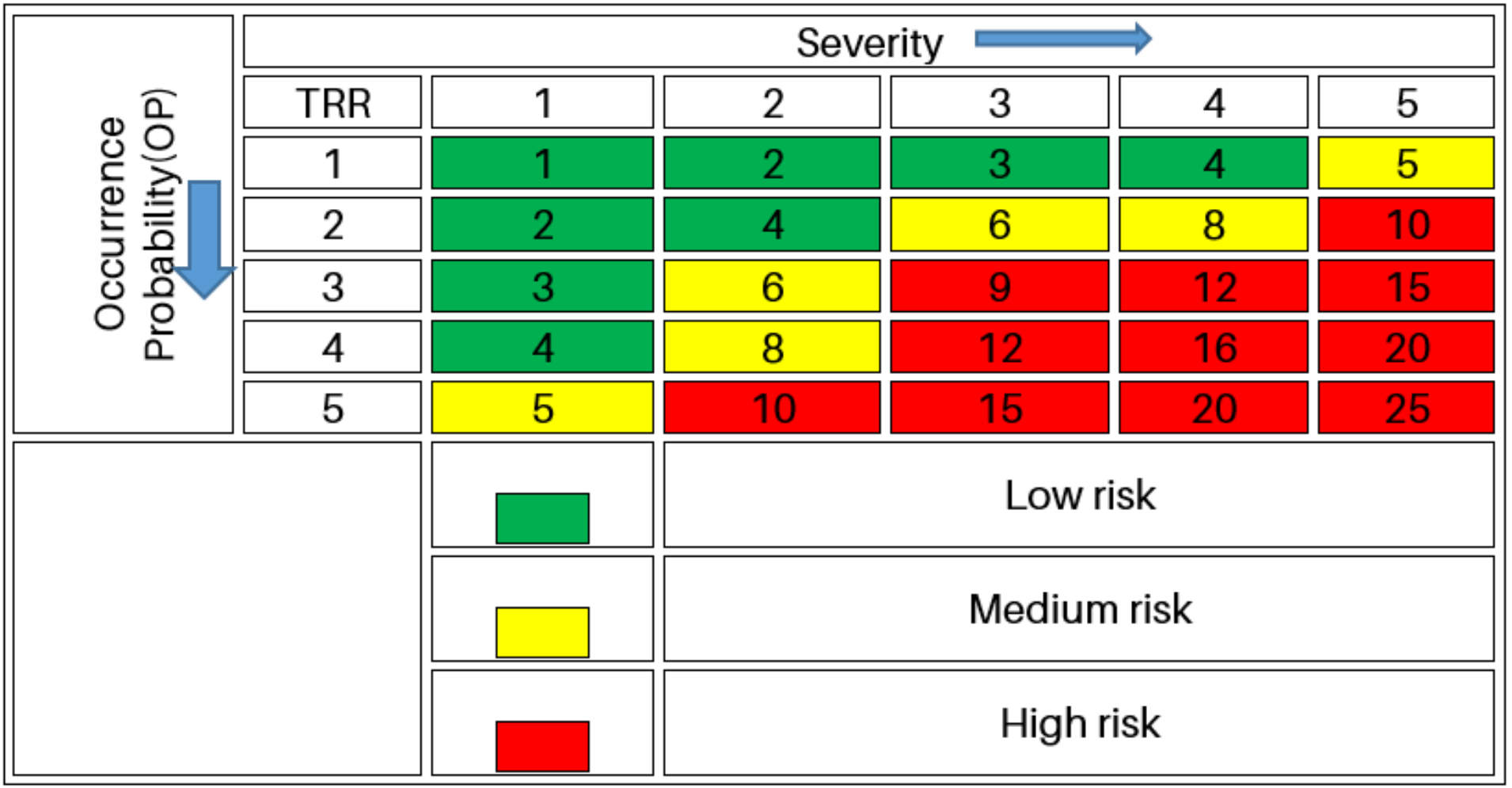
HAZARD IDENTIFICATION				RISK ASSESSMENT			Recommended Action/Additional Control
Job Activity	Hazard	Hazard Character	Current Risk Control	Probability	Severity	Risk	
Storage of hand tool	Physical injuries caused by weight/sharp objects.	First aid cases/medical treatment (M.C between 1 to 3 days),	Workers wear gloves; Provide safe working procedure.	2	2	**4**	Additional control shall be proposed when necessary
	Possible injuries from fall and or hit by falling hand tool.	First aid cases/medical treatment (M.C between 1 to 3 days),	Worker wear Proper PPE (i.e. Safety shoes).	2	2	**4**	Additional control shall be proposed when necessary
Working/office environment	Sudden injuries caused by excessive lifting and mishandling of files, table, boxes and files cabinet.	First aid cases/medical treatment (M.C between 1 to 3 days),	Provide safe handling/lifting procedure; Close supervision.	2	2	**4**	Additional control shall be proposed when necessary
	When dealing with people with unsound/unstable mind and being attack, verbally or physically abuse.	First aid cases/medical treatment (M.C between 1 to 3 days),	Inculculate team spirit in the office; Create a friendly office environment; Provide two way communication; Closed supervision.	2	2	**4**	Additional control shall be proposed when necessary
	Physical injuries and property damage caused by fire at company's floor or other floors.	First aid cases/medical treatment (M.C between 1 to 3 days), Minor damage (No or less disruption, repair cost > RM1,000 and < RM10,000).	Provide overload tripping device at main breaker and main switch; Provide fire extinguisher; Conduct ERP and fire drill training; Closed supervision.	2	2	**4**	Additional control shall be proposed when necessary
	Fall sick/fever/flu due to unstable room temperature.	First aid cases/medical treatment (M.C between 1 to 3 days),	Provide sweater; Air conditioning temperature to be set comfortably.	2	2	**4**	Additional control shall be proposed when necessary
	Vomiting and diarrhea due to food or water poisoning in the office.	First aid cases/medical treatment (M.C between 1 to 3 days),	Provide boiling water to all employees or visitor; To ensure cleanliness of pantry.	2	2	**4**	Additional control shall be proposed when necessary

HAZARD IDENTIFICATION, RISK ASSESSMENT & DETERMINING CONTROL

Name of Job :	Department :	Prepared By :	Checked By :-	Approved By :
HANDTOOL WORK (Cont'd)	CONSTRUCTION			

HAZARD IDENTIFICATION				RISK ASSESSMENT			Recommended Action/Additional Control
Job Activity	Hazard	Hazard Character	Current Risk Control	Probability	Severity	Risk	
Working/office environment (Cont'd)	Body injuries due to sitting for a very long period.	Near miss/ unsafe act/ unsafe condition	To ensure worker take a short break where applicable.	3	1	**3**	Additional control shall be proposed when necessary
	Allergic reactions or infections due to air contamination caused by rotten waste, fungi, bacteria and cigarette smoke.	Near miss/ unsafe act/ unsafe condition	Instruct building management to clean the air filter regularly; Impose NO SMOKING in the office.	2	1	**2**	Additional control shall be proposed when necessary
	Eyes injuries due to working in front of/looking at the computer for a very long period.	Near miss/ unsafe act/ unsafe condition	To ensure worker take a short break where applicable.	2	1	**2**	Additional control shall be proposed when necessary
	Electrocution due to short circuit or power leakage.	Fatality or permanent disability or irreversible illness	Provide overload tripping device at main breaker and main switch; Use SIRIM proven electrical appliances; Use only highly insulated electrical appliances.	2	5	**10**	Briefing By SHO on safety awareness. Additional control shall be made if necessary.

HAZARD IDENTIFICATION, RISK ASSESSMENT & DETERMINING CONTROL



LIMHOMEDIN
LIFELINE MULTISPECIALITY HOSPITAL
Where Healing Matters

OPD Prescription

Doctor/Unit	Dr. MUSTAK AHAMED	Reg. No	240000782
Doctor Degree	MBBS, MEM	Patient Name	Mr. RAMPROBESH NUNIYA
Department/Unit	Emergency Medicine	Age/Sex	44 Yrs/Male
Sponsor	GIRIDHAN METAL PVT.LTD (UNIT OF SUPER SMELTERS PVT LTD)	Patient Mob.	7699460048
Pay Mode		Issue Date	Dec 10 2024 11:49AM

BP:	Height:	Weight: 56kg	BMI:	Pulse: 84/m	Temperature:	Respiration: 99%

100/70 mmHg

History and complaints:

All investigations are within normal limits

Examination:

Investigations:

Medications:

Advice:
(Lifestyle / Rehab / Diet)

Follow up:

Date: _____

Contact: _____

Name & Signature of the Consultant with Stamp

LIMHOMEDIN
LIFELINE MULTISPECIALITY HOSPITAL
Where Healing Matters

Name	RAMPROBESH NUNIYA	Age/Sex	44Y - Male
Date	10/12/2024	Patient Id	PAT000582
Referring Doctor	SELF	Hospital	LIFE LINE (ASANSOL)

X-RAY CHEST PA VIEW

Bilateral apices are normal.
No obvious lung parenchymal lesion.
Bilateral hila appear normal.
Cardio-thoracic ratio within normal limits.
Both the costophrenic angles are clear.
Domes of diaphragm appear normal.
The visualized thoracic cage appears normal.

Impression:- Normal study.

DR. SUSMITA JANA GIRI
MBBS, MD, reg. 50857
CONSULTANT RADIOLOGIST

Scan QR to download report

DISCLAIMER-It is an online interpretation of medical imaging based on clinical data. All modern machines/procedures have their own limitation. If there is any clinical discrepancy this investigation may be repeated or reassessed by other tests. Patient's identification in online reporting is not established, So in no way can this report be utilized for any medico legal purpose.

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LIMHOMEDIN
LIFELINE MULTISPECIALITY HOSPITAL
Where Healing Matters

Reference No.	*: OID 1515*	*Date of Analysis*	*: 10/12/2024*
Patient Name	*: RAMPROBESH NUNIYA*	*Date of Collection*	*: 10/12/2024*
Age/Sex	*: 44 YEAR / Male*	*Date of Report*	*: 10/12/2024*
Referred by	*: Dr. M.AHMED*		

HEMATOLOGICAL EXAMINATION (COMPLETE BLOOD PICTURE)

SAMPLE – EDTA WHOLE BLOOD

INVESTIGATION	RESULT	REFERENCE VALUE
HEMOGLOBIN	16.0	Male: 13.5 - 17.5 gm/dl Female: 12.0 - 16.0 gm/dl
TOTAL LEUCOCYTE COUNT(TLC)	7,500	4,000 - 11,000 / cmm
DIFFERENTIAL COUNT		
NEUTROPHIL	72%	40 - 70 %
LYMPHOCYTE	23 %	20 - 40%
MONOCYTES	04 %	04 - 11 %
EOSINOPHILS	01 %	00 - 08 %
BASOPHILS	00 %	00 - 03 %
PLATELET COUNT	1,95,000	1,50,000 – 4,50,000/cumm
RBC COUNT	4.98	3.8-4.8 Cells/cumm
PCV	45.3	36.0-46.0 %
MCV	90.8	83.0-100 FL
MCH	32.1	27.0-32.0 Pg
MCHC	35.3	31.5-34.5 g/dl
RDW-CV	11.8	11.0-14.0 %
Erythrocyte Sedimentation Rate (ESR)		
1st hour reading	10.0 mm	Male - 00 - 17 mm/h Female 02 - 25 mm/h

DR. FARHAT FATIMA
MBBS, MD(PATHOLOGY)
Consultant pathologist

LIMHOMEDIN
LIFELINE MULTISPECIALITY HOSPITAL
Where Healing Matters

Reference No.	*: OID 1515*	*Date of Analysis*	*: 10/12/2024*
Patient Name	*: RAMPROBESH NUNIYA*	*Date of Collection*	*: 10/12/2024*
Age/Sex	*: 44 YEAR / Male*	*Date of Report*	*: 10/12/2024*
Referred by	*: Dr. M.AHMED*		

INVESTIGATION	RESULT	UNIT	REFERENCE VALUE
CREATININE	1.04	mg/ dl	0.70 - 1.2 mg/dl

TEST	RESULT
RANDOM BLOOD SUGAR (RBS)	92.0 mg/dl

DR. FARHAT FATIMA
MBBS, MD(PATHOLOGY)
Consultant pathologist

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LIFELINE MULTISPECIALITY HOSPITAL
Where Healing Matters

Reference No.	*: OID 1515*	*Date of Analysis*	*: 10/12/2024*
Patient Name	*: RAMPROBESH NUNIYA*	*Date of Collection*	*: 10/12/2024*
Age/Sex	*: 44 YEAR / Male*	*Date of Report*	*: 10/12/2024*
Referred by	*: Dr. M.AHMED*		

URINE EXAMINATION

Physical Examination

Volume	:	20 ML
Colour	:	STRAW
Appearance	:	CLEAR
Sediment	:	ABSENT
Sp.Gravity	:	1.020

Chemical Examination

Reaction	:	ACIDIC
Glucose	:	NIL
Protein	:	NIL
Ph	:	6.5

Microscopical Examination

Leucocytes (Pus cells)	:	2-3 / HPF
Erythrocytes (RBC)	:	1-2 /HPF
Epithelial cells	:	0-1 / HPF
Cast	:	NOT FOUND
Crystal	:	NOT FOUND
Others	:	NOT FOUND

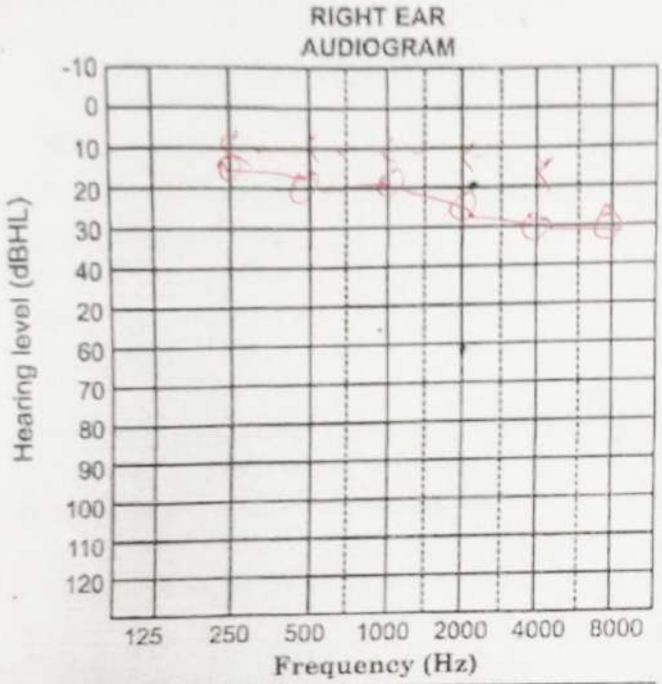
DR. FARHAT FATIMA
MBBS, MD(PATHOLOGY)
Consultant pathologist

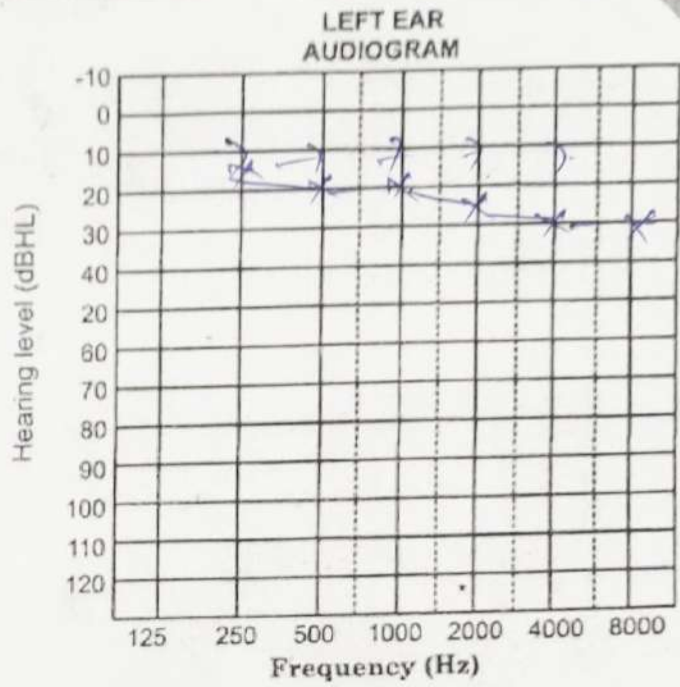
LIMHOMEDIN
LIFELINE MULTISPECIALITY HOSPITAL

PURE TONE AUDIOMETRY

Date: 18/12/24

NAME: MR. RAMPRABESH NUNIYA   AGE: 44   SEX: MALE





Right Ear	PTA	Left Ear
21.6 dBHL	I	21.6 dBHL
	II	

Rt Ear	SYMBOLS	Lt Ear
○	AC Unmasked	X
<	BC Unmasked	>
△	AC masked	□
[	BC masked	]
↙	No Response	↘

Audiometric responses : Fairly Consistent

(+)	RINNE TEST	(+)
←	WEBER TEST	→
←	250 Hz	→
←	500 Hz	→
←	1kHz	→
←	2kHz	→
←	4kHz	→

Provisional Diagnosis : B/L - Hearing sensitivity within normal limits

Consult ...

PK 18/12/24
PRAVIN KUMAR
AUDIOLOGIST
Reg. No- B43731

ASANSOL

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ID: 1

RAMPROBESH NUNIYA

Male 44Years

Req. No.

10-12-2024 01:43:19 PM

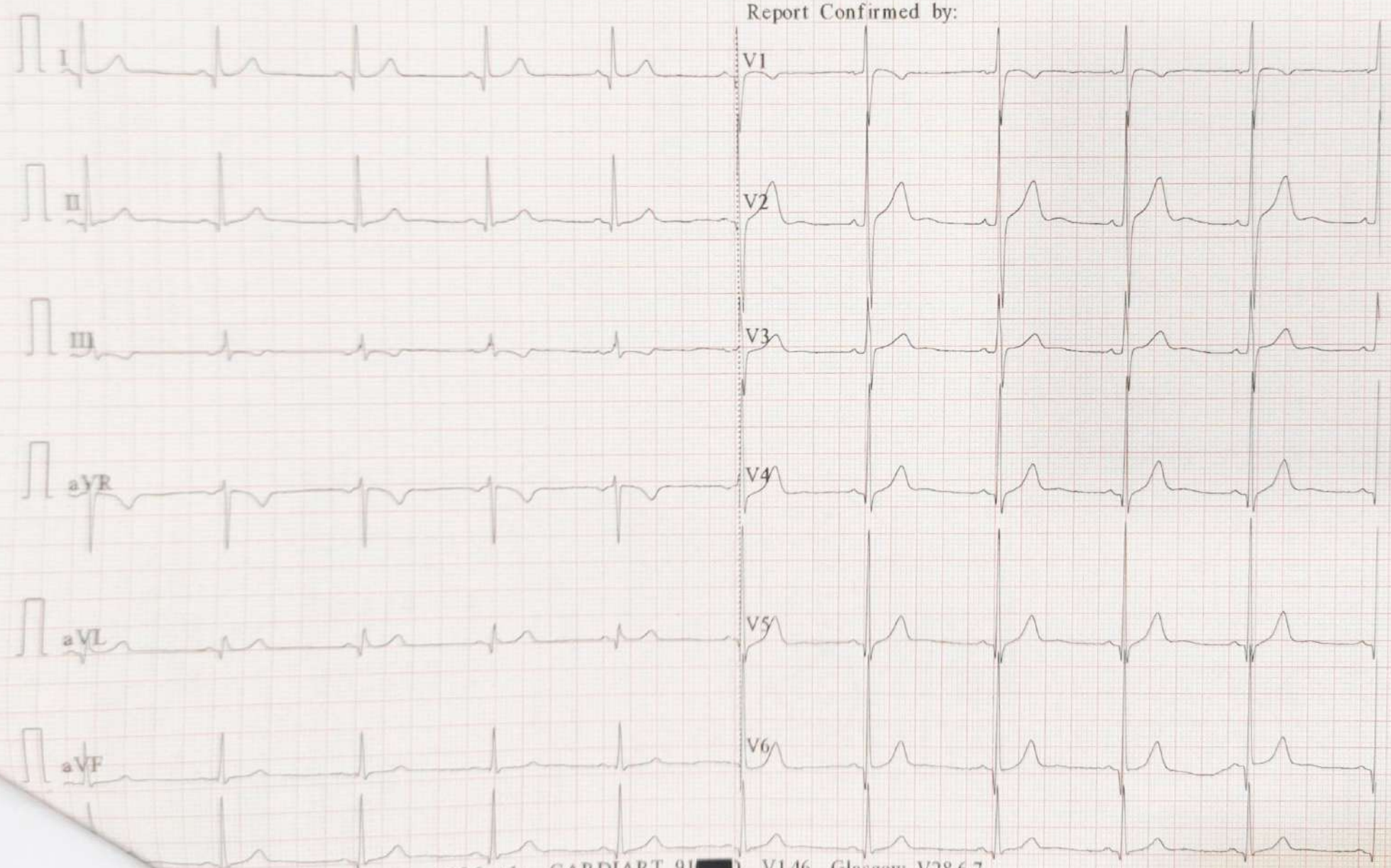
HR	: 61	bpm
P	: 90	ms
PR	: 116	ms
QRS	: 96	ms
QT/QTcBz	: 402/405	ms
P/QRS/T	: 13/45/19	°
RV5/SV1	: 2.244/1.019	mV

Diagnosis Information:

Sinus rhythm

Normal ECG

Report Confirmed by:



50 25mm/s 10mm/mV 2*5.0s+1r CARDIART 91[redacted] V1.46 Glasgow V28.6.7

CARDIART

EasyOne Air © ndd 2017
V1.15.0 | V1.15.0
Record No. 525
S/N 1160692

Samprobesh, Nuniya

ID	02
Age	44 Years | 02.05.1984
Height | Weight	144.0 cm | 51.0 kg | BMI: 24.6
Ethnic | Gender	Asian | Male
Smoker	
Asthma status	
COPD status	

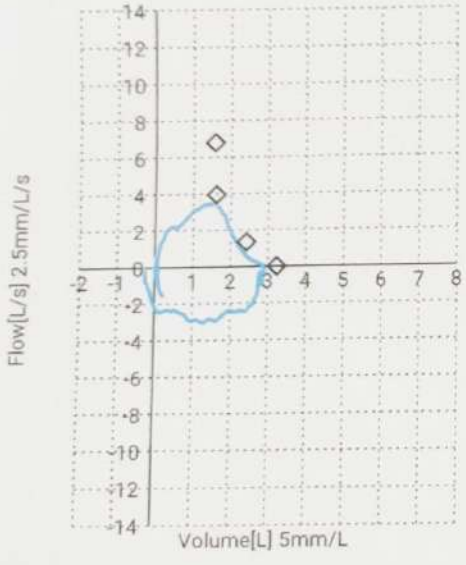
FVL Your FEV1/Predicted: 88.2%

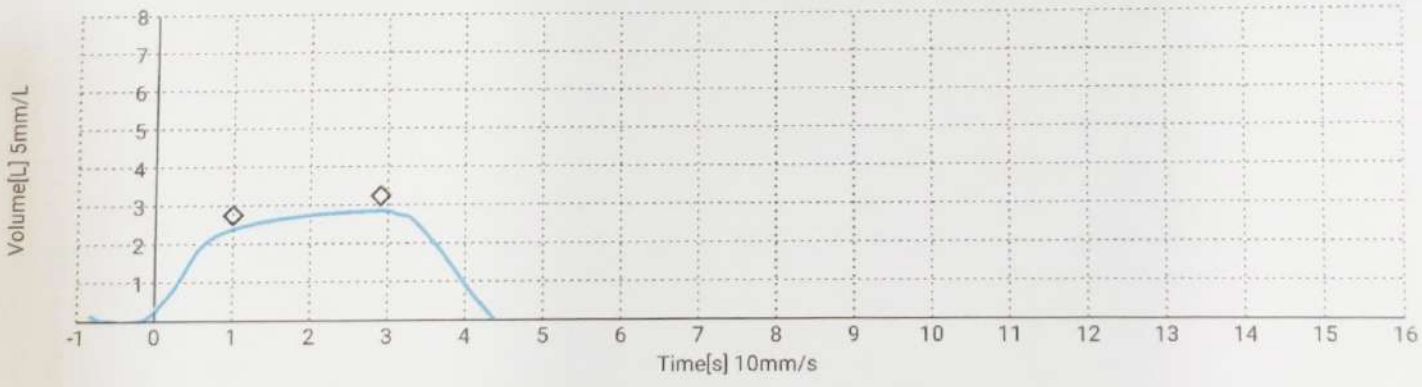
Interpretation	GOLD/Hardie 2008
Predicted ref.	Knudson 1983
Value selection	Best trial
Tech ID	admin
Automatic QC	On
BTPS In | Ex	1.05 | 1.02

Test1 18.01.2007 12:50 AM

Parameter	Pred	LLN	Trial1#	%Pred
FVC[L]	3.23	2.58	2.88	88.9
FEV1[L]	2.75	2.24	2.43	88.2
FEV1/FVC[%]	88.7	75.4	84.4	95.2
FEF2575[L/s]	3.21	1.89	2.76	86.1
PEF[L/s]	6.82	–	3.60	52.7
FET[s]			2.91	
FIVC[L]	3.23	2.58	3.17	98.1
FIF50[L/s]	–	–	2.96	–
PIF[L/s]	–	–	2.96	–

FEV1 Var = –mL –%, FVC Var = –mL –%
Session quality F
Poor quality, no interpretation possible





Comment

Signature

LIMHOMEDIN
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Where Healing Matters

Name – Ramprobesh Nuniya, Age – 44/M

eye

c/o → Regular Check up.

Vn
- RE: 6/6
- LE: 6/6

Refn

RE → Plano → 6/6

LE → Plano → 6/6

Add → BE × +1.00 Dsph → N6 at 33 cm.

Jkhan

ASANSOL

LIMHOMEDIN
LIFELINE MULTISPECIALITY HOSPITAL
Where Healing Matters

OPD Prescription

Doctor/Unit	**Dr. MUSTAK AHAMED**	**Reg. No**	240000790
Doctor Degree	MBBS, MEM	**Patient Name**	**Mr. SHANTANU SANTRA**
Department/Unit	Emergency Medicine	**Age/Sex**	29 Yrs/Male
Sponsor	GIRIDHAN METAL PVT.LTD (UNIT OF SUPER SMELTERS PVT LTD)	**Patient Mob.**	9093607050
Pay Mode		**Issue Date**	Dec 10 2024 12:15PM

BP:	Height:	Weight:	BMI:	Pulse:	Temperature:	Respiration:

History and complaints: All reports appear within normal limits;
The pt. appears clinically fit.

Examination:

Investigations:

Medications:

Advice:
(Lifestyle / Rehab / Diet)

Follow up:

Date: _____

Contact: _____

Name & Signature of the Consultant with Stamp

LIMHOMEDIN
LIFELINE MULTISPECIALITY HOSPITAL
Where Healing Matters

Name	SHANTUNU SANTRA	Age/Sex	29Y - Male
Date	10/12/2024	Patient Id	PAT000595
Referring Doctor	SELF	Hospital	LIFE LINE (ASANSOL)

X-RAY CHEST PA VIEW

Bilateral apices are normal.
No obvious lung parenchymal lesion.
Bilateral hila appear normal.
Cardio-thoracic ratio within normal limits.
Both the costophrenic angles are clear.
Domes of diaphragm appear normal.
The visualized thoracic cage appears normal.

Impression:- Normal study.

DR. SUSMITA JANA GIRI
MBBS, MD, reg. 50857
CONSULTANT RADIOLOGIST

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LIFELINE MULTISPECIALITY HOSPITAL
Where Healing Matters

Reference No.	*: OID 1526*	*Date of Analysis*	*: 10/12/2024*
Patient Name	*: SHANTANU SANTRA*	*Date of Collection*	*: 10/12/2024*
Age/Sex	*: 29 YEAR / Male*	*Date of Report*	*: 10/12/2024*
Referred by	*: Dr. M.AHMED*		

HEMATOLOGICAL EXAMINATION (COMPLETE BLOOD PICTURE)

SAMPLE – EDTA WHOLE BLOOD

INVESTIGATION	RESULT	REFERENCE VALUE
HEMOGLOBIN	13.6	Male: 13.5 - 17.5 gm/dl Female: 12.0 - 16.0 gm/dl
TOTAL LEUCOCYTE COUNT(TLC)	5,600	4,000 - 11,000 / cmm
DIFFERENTIAL COUNT		
NEUTROPHIL	55%	40 - 70 %
LYMPHOCYTE	37 %	20 - 40%
MONOCYTES	07 %	04 - 11 %
EOSINOPHILS	01 %	00 - 08 %
BASOPHILS	00 %	00 - 03 %
PLATELET COUNT	2,90,000	1,50,000 – 4,50,000/cumm
RBC COUNT	5.91	3.8-4.8 Cells/cumm
PCV	41.0	36.0-46.0 %
MCV	69.3	83.0-100 FL
MCH	23.1	27.0-32.0 Pg
MCHC	33.3	31.5-34.5 g/dl
RDW-CV	14.1	11.0-14.0 %
Erythrocyte Sedimentation Rate (ESR)		
1st hour reading	22.0 mm	Male - 00 - 17 mm/h Female 02 - 35 mm/h

DR. FARHAT FATIMA
MBBS, MD(PATHOLOGY)
Consultant pathologist

LIMHOMEDIN
LIFELINE MULTISPECIALITY HOSPITAL
Where Healing Matters

Reference No.	*: OID 1526*	*Date of Analysis*	*: 10/12/2024*
Patient Name	*: SHANTANU SANTRA*	*Date of Collection*	*: 10/12/2024*
Age/Sex	*: 29 YEAR / Male*	*Date of Report*	*: 10/12/2024*
Referred by	*: Dr. M.AHMED*		

INVESTIGATION	RESULT	UNIT	REFERENCE VALUE
CREATININE	1.20	mg/ dl	0.70 - 1.2 mg/dl

TEST	RESULT
RANDOM BLOOD SUGAR (RBS)	81.0 mg/dl

DR. FARHAT FATIMA
MBBS, MD(PATHOLOGY)
Consultant pathologist

LIMHOMEDIN
LIFELINE MULTISPECIALITY HOSPITAL
Where Healing Matters

Reference No.	*: OID 1526*	*Date of Analysis*	*: 10/12/2024*
Patient Name	*: SHANTANU SANTRA*	*Date of Collection*	*: 10/12/2024*
Age/Sex	*: 29 YEAR / Male*	*Date of Report*	*: 10/12/2024*
Referred by	*: Dr. M.AHMED*		

URINE EXAMINATION

Physical Examination

Volume	:	20 ML
Colour	:	PALE YELLOW
Appearance	:	CLEAR
Sediment	:	ABSENT
Sp.Gravity	:	1.020

Chemical Examination

Reaction	:	ACIDIC
Glucose	:	NIL
Protein	:	NIL
Ph	:	6.5

Microscopical Examination

Leucocytes (Pus cells)	:	1-2 / HPF
Erythrocytes (RBC)	:	0-1 /HPF
Epithelial cells	:	1-2P / HPF
Cast	:	NOT FOUND
Crystal	:	NOT FOUND
Others	:	NOT FOUND

DR. FARHAT FATIMA
MBBS, MD(PATHOLOGY)
Consultant pathologist

ID: 0
Santanu Santra
Male 29Years
Req. No. :

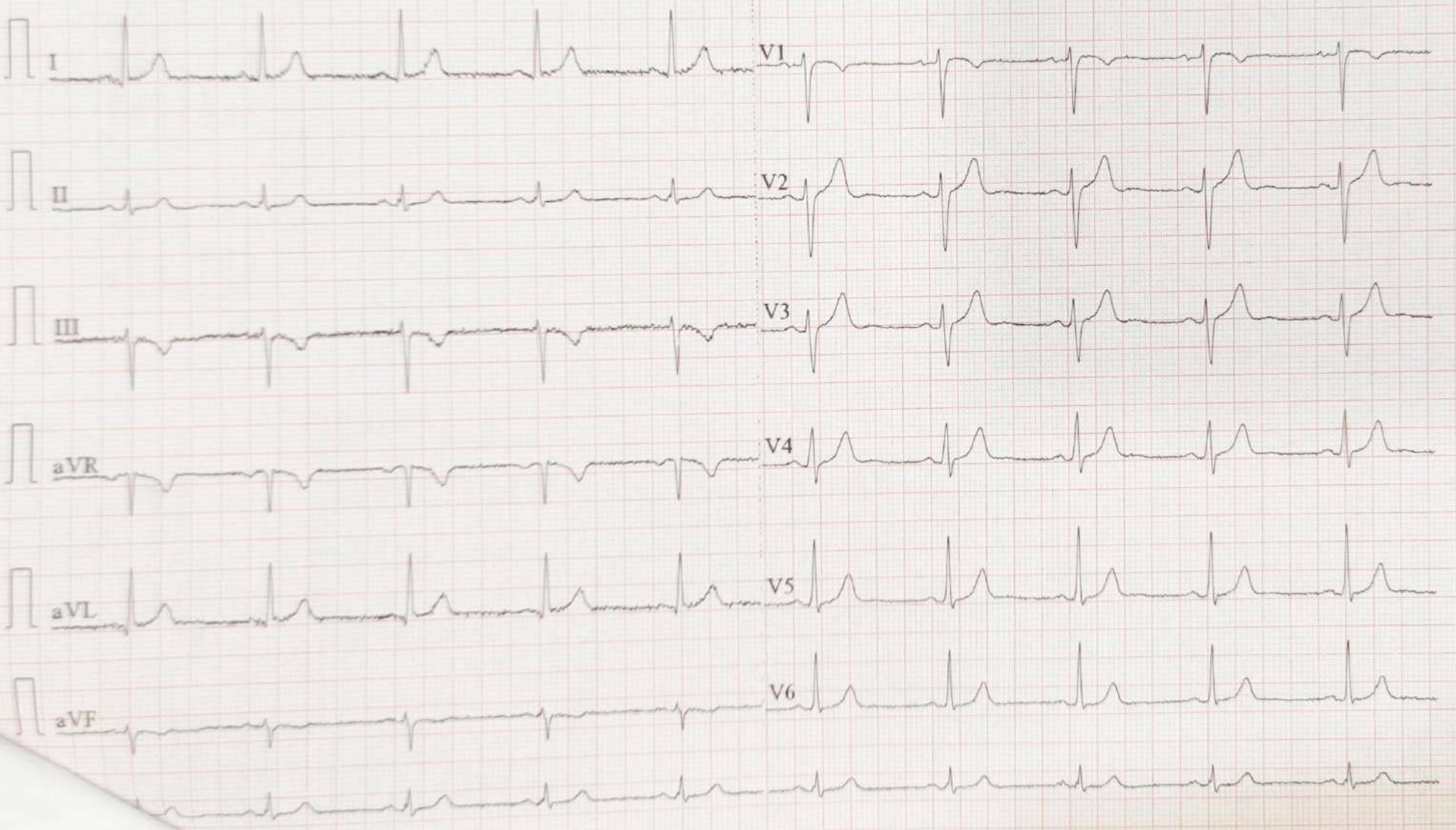
BPL-12

10-12-2024 01:29:02 PM

HR	: 61	bpm
P	: 110	ms
PR	: 150	ms
QRS	: 90	ms
QT/QTcBz	: 380/383	ms
P/QRS/T	: 23/-15/-5	°
RV5/SV1	: 1.212/0.994	mV

Diagnosis Information:
Sinus rhythm
Inferior T wave abnormality may be age and gender related : consider normal variant
Borderline ECG

Report Confirmed by:



m/s 10mm/mV 2*5.0s+1r CARDIART 910 [redacted] V1.46 Glasgow V28.6.7

CARDIART

EasyOne Air © ndd 2017
V1.15.0 | V1.15.0
Record No. 542
S/N 1160692

...antanu, Santra

ID	17
Age	29 Years | 07.03.1995
Height | Weight	145.0 cm | 78.0 kg | BMI: 37.1
Ethnic | Gender	Asian | Male
Smoker	
Asthma status	
COPD status	

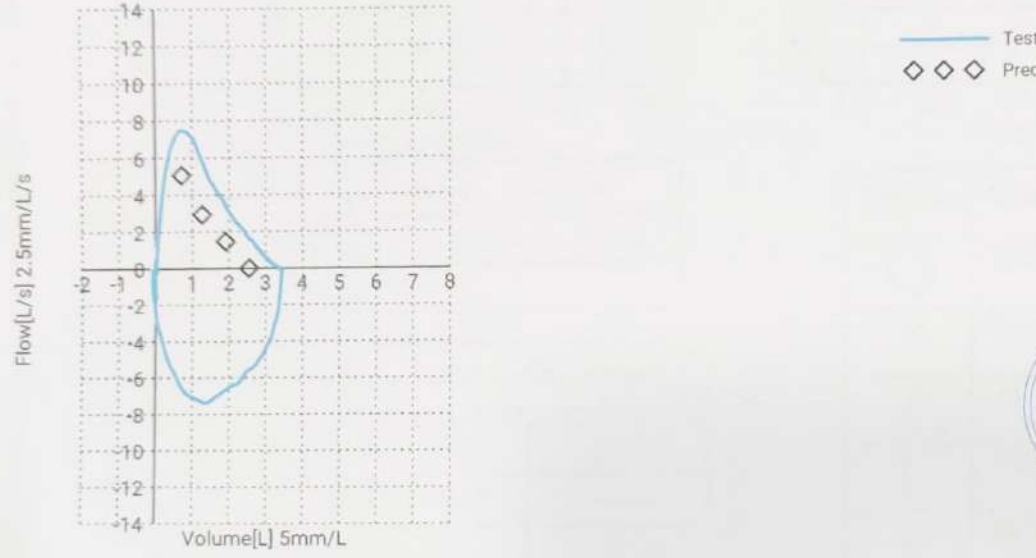
FVL Your FEV1/Predicted: 134.1%

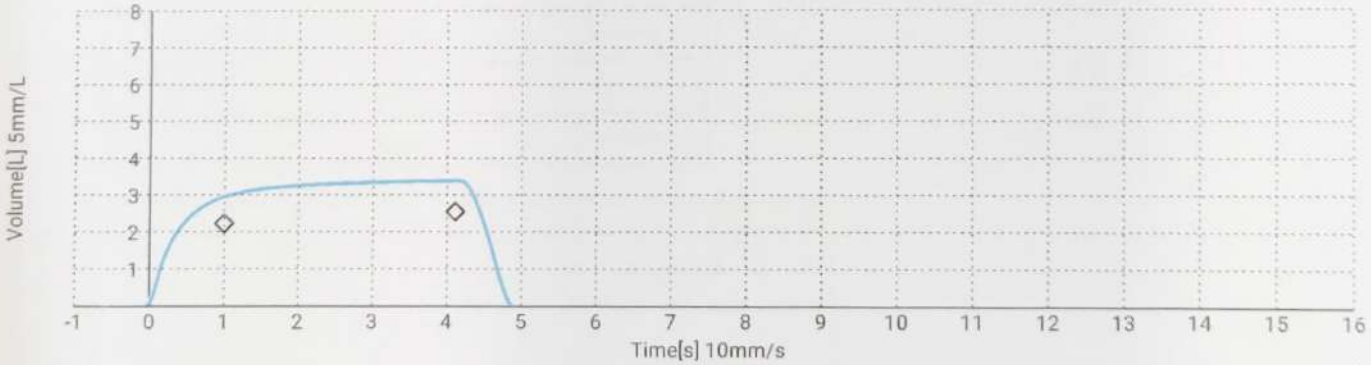
Interpretation	GOLD/Hardie 2008
Predicted ref.	Knudson 1983
Value selection	Best trial
Tech ID	admin
Automatic QC	On
BTPS In | Ex	1.06 | 1.02

Test1 18.01.2007 02:17 AM

Parameter	Pred	LLN	Trial1	%Pred
FVC[L]	2.55	1.91	3.42	133.9
FEV1[L]	2.23	1.74	2.99	134.1
FEV1/FVC[%]	88.6	75.3	87.5	98.8
FEF2575[L/s]	2.58	1.13	3.53	136.8
PEF[L/s]	5.08	–	7.56	149.0
FET[s]			4.11	
FIVC[L]	2.55	1.91	3.52	137.8
FIF50[L/s]	–	–	6.93	--
PIF[L/s]	–	–	7.30	--

FEV1 Var = –mL –%, FVC Var = –mL –%
Session quality D(2)
Poor quality, no interpretation possible





Comment

Signature

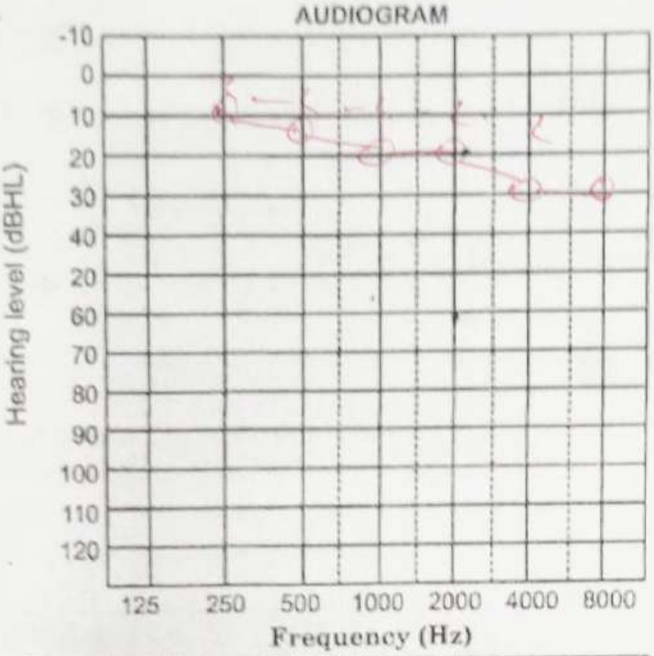
LIMHOMEDIN
LIFELINE MULTISPECIALITY HOSPITAL

PURE TONE AUDIOMETRY

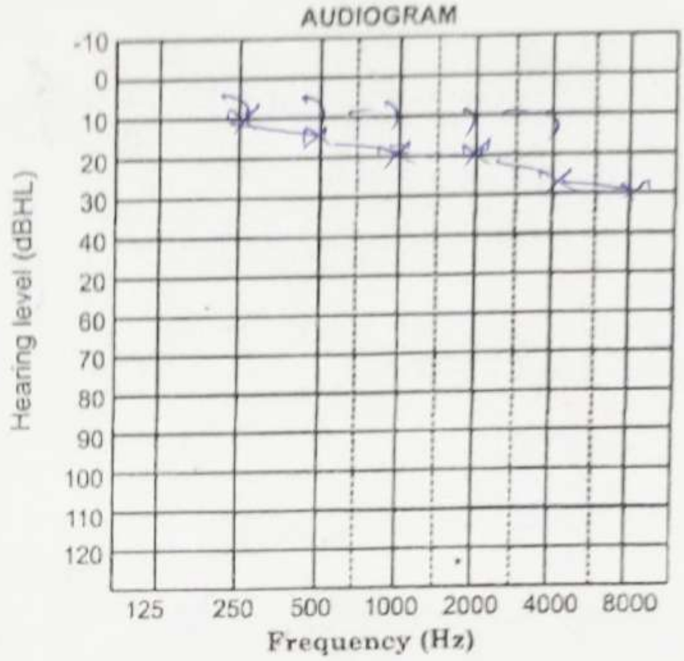
Date: 15/12/24

NAME: MR. SHANTANU SANTRA AGE: 29 SEX: MALE

RIGHT EAR AUDIOGRAM



LEFT EAR AUDIOGRAM



Right Ear	PTA	Left Ear
18.3 : dBHL	I	18.3 : dBHL
	II	

(Rt) Ear	SYMBOLS	(Lt) Ear
○	AC Unmasked	X
<	BC Unmasked	>
△	AC masked	□
[	BC masked	]
↙	No Response	↘

Audiometric responses : Fairly Consistent

(+)	RINNE TEST	(+)
←	WEBER TEST	→
←	250 Hz	→
←	500 Hz	→
←	1kHz	→
←	2kHz	→
←	4kHz	→

Provisional Diagnosis : B/L - Hearing Sensitivity within normal limits

counsel, f/u

PR... 15/12/24
ASST. AUDIOLOGIST
Reg No-B43731

ASANSOL

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Where Healing Matters

Name – Shantanu Santra, Age – 29/M

c/c

c/o → Regular check up

V/h
- RE: 6/6
- LE: 6/6

Refn

RE → Plano → 6/6
LE → Plano → 6/6

Add → BE × Plano → N6 at 33 cm.

Jkhan

ASANSOL

LIMHOMEDIN
LIFELINE MULTISPECIALITY HOSPITAL
Where Healing Matters

OPD Prescription

Doctor/Unit	Dr. MUSTAK AHAMED	Reg. No	240000802
Doctor Degree	MBBS, MEM	Patient Name	Mr. DIPAK KUMAR SHAW
Department/Unit	Emergency Medicine	Age/Sex	27 Yrs/Male
Sponsor	GIRIDHAN METAL PVT.LTD (UNIT OF SUPER SMELTERS PVT LTD)	Patient Mob.	9102756915
Pay Mode		Issue Date	Dec 10 2024 12:54PM

BP:	Height:	Weight: 61kg	BMI:	Pulse: 85b/m	Temperature:	Respiration: 100%

110/60 mmHg

History and complaints: ESR - 1st hr reading appears elevated [ESR - 35].
Eosinophills - 23%;

Examination:

Investigations: - 'c' - Reactive protein;

Medications: - T. Montelukast + fexofamidine - 1tab × OD × 7days.
- T. Pan (40) - 1tab × BD.

Advice:
(Lifestyle / Rehab / Diet)

Follow up:
Date: _____
Contact: _____

Name & Signature of the Consultant with Stamp

LIMHOMEDIN
LIFELINE MULTISPECIALITY HOSPITAL
Where Healing Matters

Reference No.	*: OID 1532*	*Date of Analysis : 10/12/2024*
Patient Name	*: DIPAK KUMAR SHAW*	*Date of Collection: 10/12/2024*
Age/Sex	*: 27 YEAR / Male*	*Date of Report : 10/12/2024*
Referred by	*: Dr. M.AHMED*	

URINE EXAMINATION

Physical Examination		
Volume	:	20 ML
Colour	:	WATERY
Appearance	:	CLEAR
Sediment	:	ABSENT
Sp.Gravity	:	1.005
Chemical Examination		
Reaction	:	ACIDIC
Glucose	:	NIL
Protein	:	NIL
Ph	:	6.0
Microscopical Examination		
Leucocytes (Pus cells)	:	2-3 / HPF
Erythrocytes (RBC)	:	0-1 /HPF
Epithelial cells	:	1-2 / HPF
Cast	:	NOT FOUND
Crystal	:	NOT FOUND
Others	:	NOT FOUND

DR. FARHAT FATIMA
MBBS, MD(PATHOLOGY)
Consultant pathologist

LIMHOMEDIN
LIFELINE MULTISPECIALITY HOSPITAL
Where Healing Matters

Reference No.	*: OID 1532*	*Date of Analysis*	*: 10/12/2024*
Patient Name	*: DIPAK KUMAR SHAW*	*Date of Collection*	*: 10/12/2024*
Age/Sex	*: 27 YEAR / Male*	*Date of Report*	*: 10/12/2024*
Referred by	*: Dr. M.AHMED*		

HEMATOLOGICAL EXAMINATION (COMPLETE BLOOD PICTURE)

SAMPLE – EDTA WHOLE BLOOD

INVESTIGATION	RESULT	REFERENCE VALUE
HEMOGLOBIN	15.4	Male: 13.5 - 17.5 gm/dl Female: 12.0 - 16.0 gm/dl
TOTAL LEUCOCYTE COUNT(TLC)	11,000	4,000 - 11,000 / cmm
DIFFERENTIAL COUNT		
NEUTROPHIL	40%	40 - 70 %
LYMPHOCYTE	32 %	20 - 40%
MONOCYTES	05 %	04 - 11 %
EOSINOPHILS	23 %	00 - 08 %
BASOPHILS	00 %	00 - 03 %
PLATELET COUNT	1,60,000	1,50,000 – 4,50,000/cumm
RBC COUNT	5.51	3.8-4.8 Cells/cumm
PCV	43.3	36.0-46.0 %
MCV	78.7	83.0-100 FL
MCH	27.9	27.0-32.0 Pg
MCHC	35.5	31.5-34.5 g/dl
RDW-CV	12.5	11.0-14.0 %
Erythrocyte Sedimentation Rate (ESR)		
1st hour reading	35.0 mm	Male - 00 - 17 mm/h Female 02 - 25 mm/h

DR. FARHAT FATIMA
MBBS, MD(PATHOLOGY)
Consultant pathologist

LIMHOMEDIN
LIFELINE MULTISPECIALITY HOSPITAL
Where Healing Matters

Name	DIPAK KUMAR SHAW	Age/Sex	27Y - Male
Date	10/12/2024	Patient Id	PAT000596
Referring Doctor	SELF	Hospital	LIFE LINE (ASANSOL)

X-RAY CHEST PA VIEW

Both hila are prominent.

Tiny foci left lung.

Cardiac shadow is normal.

Both costo – phrenic angles are clear.

Domes of diaphragm are smooth and regular in out line.

Impression:.. Both hila are prominent.

- Please correlate clinically.

Dr.Barasiya Jay Amrutlal
MBBS,MD (Radio Diagnosis)
G-60853

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DISCLAIMER-It is an online interpretation of medical imaging based on clinical data. All modern machines/procedures have their own limitation. If there is any clinical discrepancy this investigation may be repeated or reassessed by other tests. Patient's identification in online reporting is not established, So in no way can this report be utilized for any medico legal purpose.

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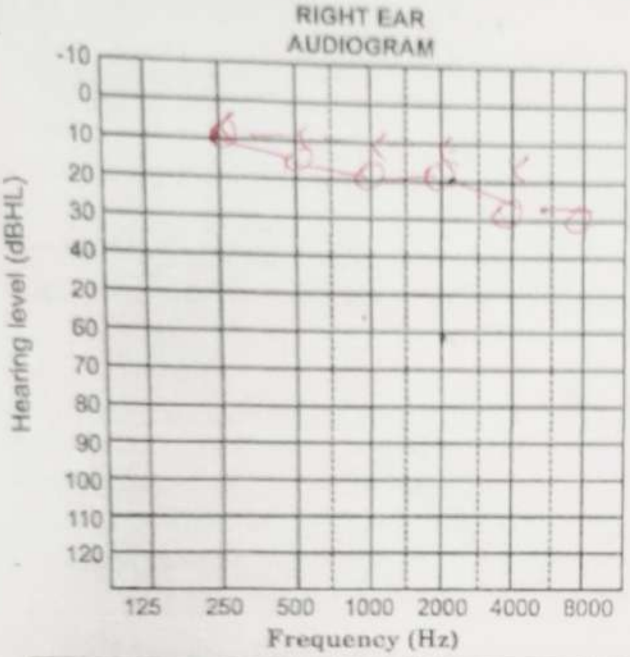
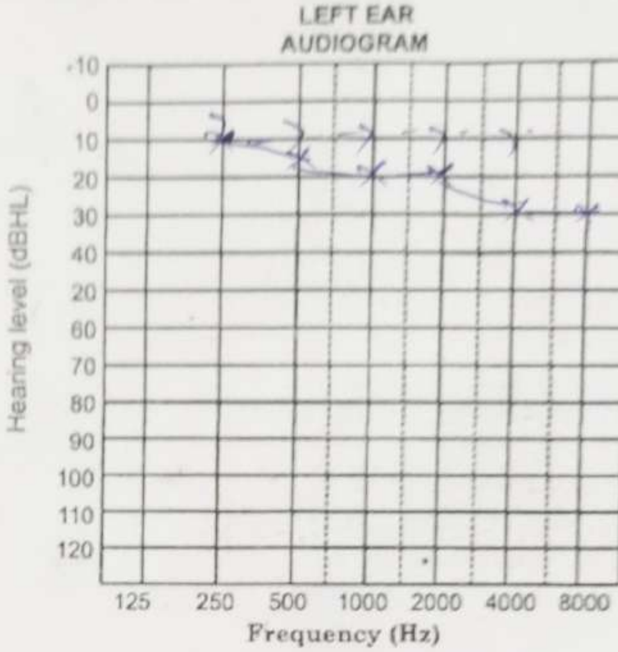
PURE TONE AUDIOMETRY

Date: 19/12/24

NAME: MR. DIPAK KUMAR SHAW **AGE:** 27 **SEX:** MALE





Right Ear	PTA	Left Ear
18.3: dBHL	I	18.3 dBHL
	II	

Rt Ear	SYMBOLS	Lt Ear
○	AC Unmasked	X
<	BC Unmasked	>
△	AC masked	□
[	BC masked	]
↙	No Response	↘

Audiometric responses : Fairly Consistent

(+)	RINNE TEST	(+)
←	WEBER TEST	→
←	250 Hz	→
←	500 Hz	→
←	1kHz	→
←	2kHz	→
←	4kHz	→

Provisional Diagnosis : B/L - Hearing Sensitivity within normal limits

Counselling.
Follow-up

P.K
KUMAR
ASST. AUDIOLOGIST
Reg. No: [illegible]

ASANSOL

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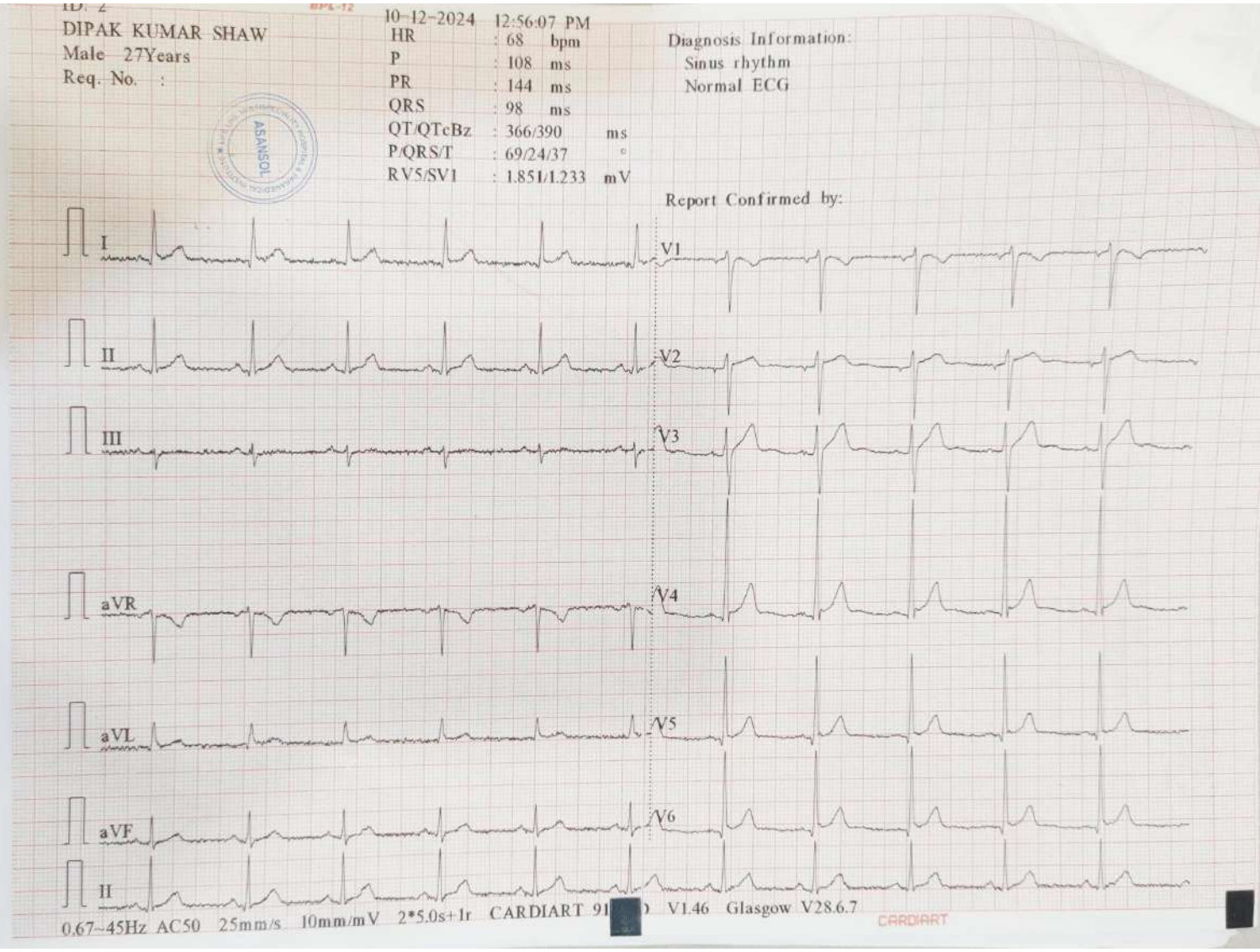

ID: 2
DIPAK KUMAR SHAW
Male 27Years
Req. No. :
10-12-2024 12:56:07 PM
HR : 68 bpm
P : 108 ms
PR : 144 ms
QRS : 98 ms
QT/QTcBz : 366/390 ms
P/QRS/T : 69/24/37 °
RV5/SV1 : 1.851/1.233 mV
Diagnosis Information:
Sinus rhythm
Normal ECG
Report Confirmed by:
I
II
III
aVR
aVL
aVF
II
V1
V2
V3
V4
V5
V6
0.67~45Hz AC50 25mm/s 10mm/mV 2*5.0s+1r CARDIART 91 V1.46 Glasgow V28.6.7
CARDIART

EasyOne Air © ndd 2017
V1.15.0 | V1.15.0
Record No. 534
S/N 1160692

...eak, Kumar Shaw

ID	11
Age	21 Years | 05.03.1997
Height | Weight	135.0 cm | 60.0 kg | BMI: 32.9
Ethnic | Gender	Asian | Male
Smoker	
Asthma status	
COPD status	

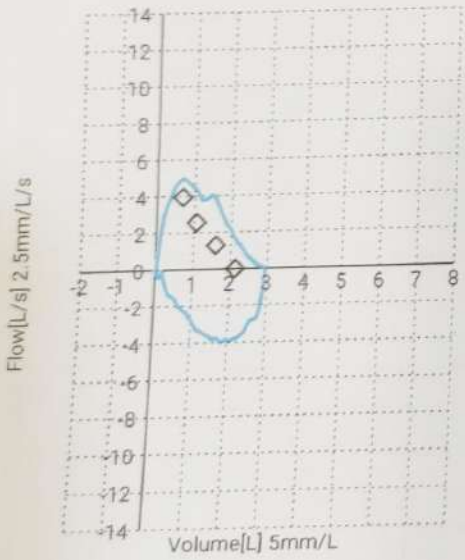
FVL Your FEV1/Predicted: 135.3%

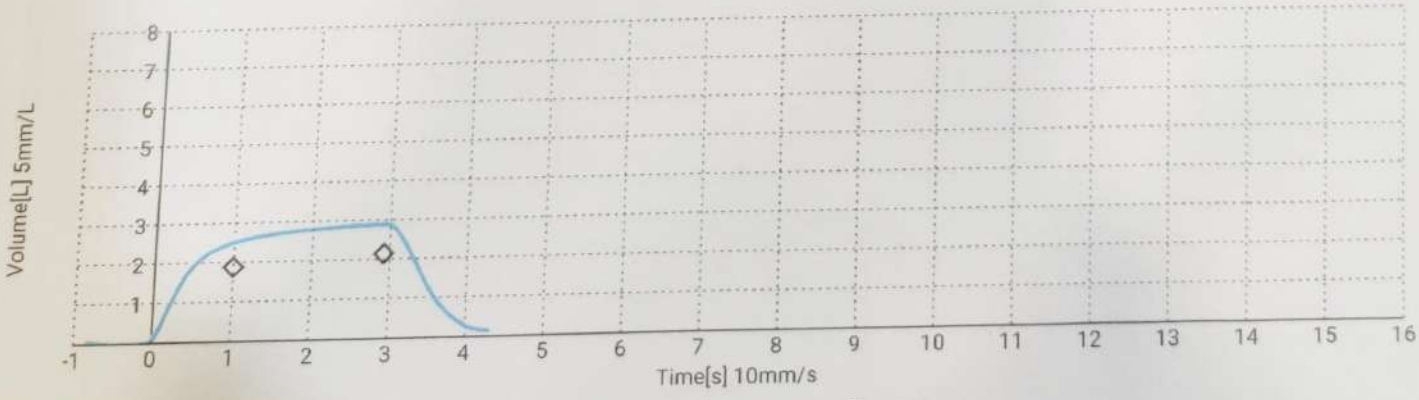
Interpretation	GOLD/Hardie 2008
Predicted ref.	Knudson 1983
Value selection	Best trial
Tech ID	admin
Automatic QC	On
BTPS In | Ex	1.06 | 1.02

Test1 18.01.2007 01:44 AM

Parameter	Pred	LLN	Trial1	%Pred
FVC[L]	2.15	1.61	2.92	136.3
FEV1[L]	1.88	1.47	2.55	135.3
FEV1/FVC[%]	89.4	76.0	87.1	97.5
FEF2575[L/s]	2.24	0.98	3.14	140.2
PEF[L/s]	3.96	–	5.04	127.2
FET[s]			2.92	
FIVC[L]	2.15	1.61	2.76	128.5
FIF50[L/s]	–	–	3.70	--
PIF[L/s]	–	–	3.92	--

FEV1 Var = --mL --%, FVC Var = --mL --%
Session quality D(2)
Poor quality, no interpretation possible





Comment

Signature

Name → Dipak Kumar Shaw, Age – 27/M

oye

c/o → Burning Sensation

V_n RE: 6/6
LE: 6/6

Ref_n
RE → Plano → 6/6
LE → Plano → 6/6

Add → BE Plano → N6 at 33 cm

Adv.
e/d → Refresh Tear · × BE × QDS × 1 month.

J Khan

ASANSOL

LIMHOMEDIN
LIFELINE MULTISPECIALITY HOSPITAL
Where Healing Matters

Reference No.	*: OID 1532*	*Date of Analysis*	*: 10/12/2024*
Patient Name	*: DIPAK KUMAR SHAW*	*Date of Collection*	*: 10/12/2024*
Age/Sex	*: 27 YEAR / Male*	*Date of Report*	*: 10/12/2024*
Referred by	*: Dr. M.AHMED*		

INVESTIGATION	RESULT	UNIT	REFERENCE VALUE
CREATININE	0.92	mg/ dl	0.70 - 1.2 mg/dl

TEST	RESULT
RANDOM BLOOD SUGAR (RBS)	94.0 mg/dl

DR. FARHAT FATIMA
MBBS, MD(PATHOLOGY)
Consultant pathologist

LIMHOMEDIN
LIFELINE MULTISPECIALITY HOSPITAL
Where Healing Matters

OPD Prescription

Doctor/Unit	Dr. MUSTAK AHAMED	Reg. No	240000788
Doctor Degree	MBBS, MEM	Patient Name	Mr. AMIT KARMAKAR
Department/Unit	Emergency Medicine	Age/Sex	33 Yrs/Male
Sponsor	GIRIDHAN METAL PVT.LTD (UNIT OF SUPER SMELTERS PVT LTD)	Patient Mob.	6295911852
Pay Mode		Issue Date	Dec 10 2024 12:11PM

BP:	Height:	Weight:	BMI:	Pulse:	Temperature:	Respiration:

History and complaints: All reports appear within normal limit.
The patient appears clinically fit.

Examination:

Investigations:

Medications:

Advice:
(Lifestyle / Rehab / Diet)

Follow up:

Date: _____

Contact: _____

Name & Signature of the Consultant with Stamp

LIMHOMEDIN
LIFELINE MULTISPECIALITY HOSPITAL
Where Healing Matters

Name	AMIT KARMAKAR	Age/Sex	33Y - Male
Date	10/12/2024	Patient Id	PAT000594
Referring Doctor	SELF	Hospital	LIFE LINE (ASANSOL)

X-RAY CHEST PA VIEW

Bilateral apices are normal.
No obvious lung parenchymal lesion.
Bilateral hila appear normal.
Cardio-thoracic ratio within normal limits.
Both the costophrenic angles are clear.
Domes of diaphragm appear normal.
The visualized thoracic cage appears normal.

Impression:- Normal study.

DR. SUSMITA JANA GIRI
MBBS, MD, reg. 50857
CONSULTANT RADIOLOGIST

Scan QR to download report

DISCLAIMER-It is an online interpretation of medical imaging based on clinical data. All modern machines/procedures have their own limitation. If there is any clinical discrepancy this investigation may be repeated or reassessed by other tests. Patient's identification in online reporting is not established, So in no way can this report be utilized for any medico legal purpose.

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034 1350 1350 Connect@limhomedin.co.in thelifelinehospital.co.in

LIMHOMEDIN
LIFELINE MULTISPECIALITY HOSPITAL
Where Healing Matters

Reference No. : OID 1517	*Date of Analysis : 10/12/2024*
Patient Name : AMIT KARMAKAR	*Date of Collection: 10/12/2024*
Age/Sex : 33 YEAR / Male	*Date of Report : 10/12/2024*
Referred by : Dr. M.AHMED	

HEMATOLOGICAL EXAMINATION (COMPLETE BLOOD PICTURE)

SAMPLE – EDTA WHOLE BLOOD

INVESTIGATION	RESULT	REFERENCE VALUE
HEMOGLOBIN	14.4	Male: 13.5 - 17.5 gm/dl Female: 12.0 - 16.0 gm/dl
TOTAL LEUCOCYTE COUNT(TLC)	9,400	4,000 - 11,000 / cmm
DIFFERENTIAL COUNT		
NEUTROPHIL	68%	40 - 70 %
LYMPHOCYTE	20 %	20 - 40%
MONOCYTES	03 %	04 - 11 %
EOSINOPHILS	09 %	00 - 08 %
BASOPHILS	00 %	00 - 03 %
PLATELET COUNT	2,05,000	1,50,000 – 4,50,000/cumm
RBC COUNT	6.18	3.8-4.8 Cells/cumm
PCV	42.3	36.0-46.0 %
MCV	68.5	83.0-100 FL
MCH	23.3	27.0-32.0 Pg
MCHC	34.0	31.5-34.5 g/dl
RDW-CV	12.6	11.0-14.0 %

Erythrocyte Sedimentation Rate (ESR)

1st hour reading	16.0 mm	Male - 00 - 17 mm/h Female 02 - 25 mm/h

DR. FARHAT FATIMA
MBBS, MD(PATHOLOGY)
Consultant pathologist

LIMHOMEDIN
LIFELINE MULTISPECIALITY HOSPITAL
Where Healing Matters

Reference No.	*: OID 1517*	*Date of Analysis*	*: 10/12/2024*
Patient Name	*: AMIT KARMAKAR*	*Date of Collection*	*: 10/12/2024*
Age/Sex	*: 33 YEAR / Male*	*Date of Report*	*: 10/12/2024*
Referred by	*: Dr. M.AHMED*		

URINE EXAMINATION

Physical Examination		
Volume	:	20 ML
Colour	:	WATERY
Appearance	:	CLEAR
Sediment	:	ABSENT
Sp.Gravity	:	1.010
Chemical Examination		
Reaction	:	ACIDIC
Glucose	:	NIL
Protein	:	NIL
Ph	:	6.0
Microscopical Examination		
Leucocytes (Pus cells)	:	1-2 / HPF
Erythrocytes (RBC)	:	0-1 /HPF
Epithelial cells	:	2-3 / HPF
Cast	:	NOT FOUND
Crystal	:	NOT FOUND
Others	:	NOT FOUND

DR. FARHAT FATIMA
MBBS, MD(PATHOLOGY)
Consultant pathologist

LIMHOMEDIN
LIFELINE MULTISPECIALITY HOSPITAL
Where Healing Matters

Reference No.	*: OID 1517*	*Date of Analysis*	*: 10/12/2024*
Patient Name	*: AMIT KARMAKAR*	*Date of Collection*	*: 10/12/2024*
Age/Sex	*: 33 YEAR / Male*	*Date of Report*	*: 10/12/2024*
Referred by	*: Dr. M.AHMED*		

INVESTIGATION	RESULT	UNIT	REFERENCE VALUE
CREATININE	1.12	mg/ dl	0.70 - 1.2 mg/dl

TEST	RESULT
RANDOM BLOOD SUGAR (RBS)	89.0 mg/dl

DR. FARHAT FATIMA
MBBS, MD(PATHOLOGY)
Consultant pathologist

ID: 0

Amit Karmaker

Male 33Years

Req. No. :

BPL-12

10-12-2024 01:24:23 PM

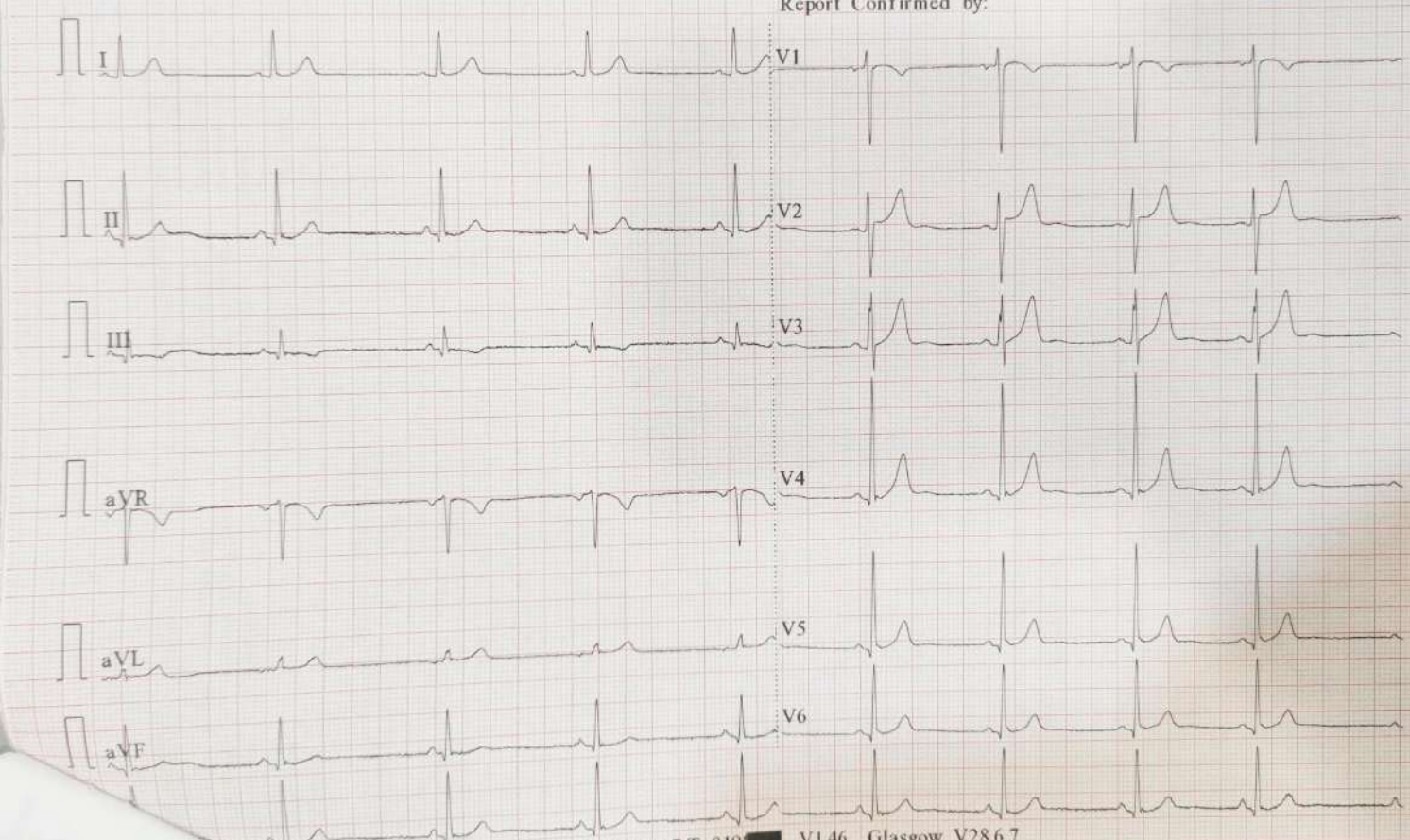
HR	: 55	bpm
P	: 88	ms
PR	: 124	ms
QRS	: 88	ms
QT/QTcBz	: 380/364	ms
P/QRS/T	: 63/44/18	°
RV5/SV1	: 1.850/1.552	mV

Diagnosis Information:

Sinus bradycardia

Normal ECG except for rate

Report Confirmed by:



25mm/s 10mm/mV 2*5.0s+Ir CARDIART 910[redacted] V1.46 Glasgow V28.6.7

CARDIART

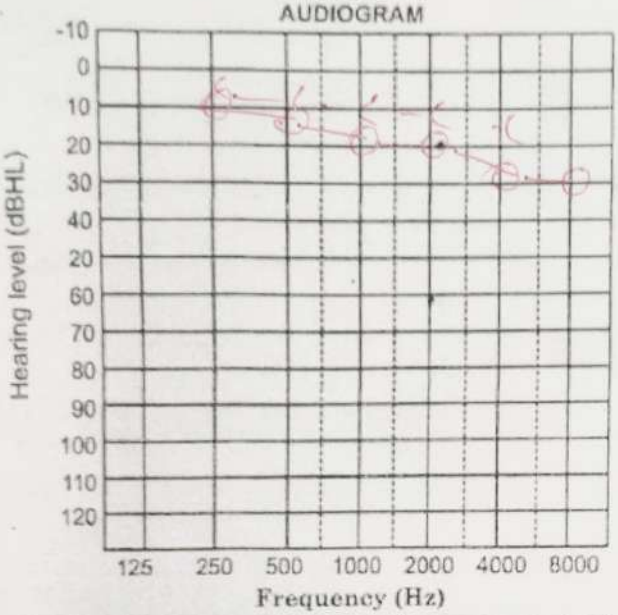
LIMHOMEDIN
LIFELINE MULTISPECIALITY HOSPITAL

PURE TONE AUDIOMETRY

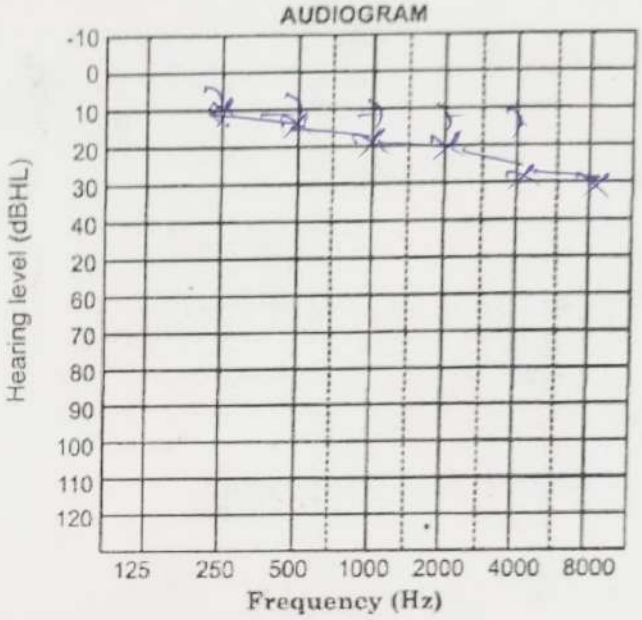
Date 10/12/24

NAME : AMIT KARMAKAR AGE : MALE SEX : 33

RIGHT EAR AUDIOGRAM



LEFT EAR AUDIOGRAM



Right Ear	PTA	Left Ear
18.3 : dBHL	I	18.3 : dBHL
	II	

(Rt) Ear	SYMBOLS	(Lt) Ear
○	AC Unmasked	X
<	BC Unmasked	>
△	AC masked	□
[	BC masked	]
↙	No Response	↘

Audiometric responses : Fairly Consistent

(+)	RINNE TEST	(+)
←	WEBER TEST	→
←	250 Hz	→
←	500 Hz	→
←	1kHz	→
←	2kHz	→
←	4kHz	→

Provisional Diagnosis : B/L - Hearing sensitivity within normal limits

- Counselled.
- Follow up

17/12/24
PRAVIN KUMAR
ASST. AUDIOLOGIST
RCI REG. 243731

ASANSOL

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034 1350 1350 Connect@limhomedin.co.in thelifelinehospital.co.in

LIFELINE MULTISPECIALITY HOSPITAL
Where Healing Matters

Name – Amit Karmakar, Age – 33/M

eye

c/o → Itching × BE.

Vn
- RE: 6/6
- LE: 6/6

Refn

RE → Plano → 6/6
LE → Plano → 6/6
Add → BE × plano → N/6 at 33 cm.

Adv.

e/d → Refresh Tear × BE × QDS × 7 days.

Ikhan

ASANSOL

LIMHOMEDIN
LIFELINE MULTISPECIALITY HOSPITAL
Where Healing Matters

OPD Prescription

Doctor/Unit	Dr. MUSTAK AHAMED	Reg. No	240000786
Doctor Degree	MBBS, MEM	Patient Name	Mr. RAM LOHAR
Department/Unit	Emergency Medicine	Age/Sex	32 Yrs/Male
Sponsor	GIRIDHAN METAL PVT.LTD (UNIT OF SUPER SMELTERS PVT LTD)	Patient Mob.	9144957284
Pay Mode		Issue Date	Dec 10 2024 12:04PM

BP:	Height:	Weight:	BMI:	Pulse:	Temperature:	Respiration:

History and complaints:

→ All investigations are WNL

Examination:

Investigations:

Medications:

Advice
(Lifestyle / Rehab / Diet)

Follow up:

Date: _____

Contact: _____

Name & Signature of the Consultant with Stamp

LIMHOMEDIN
LIFELINE MULTISPECIALITY HOSPITAL
Where Healing Matters

Reference No.	*: OID 1519*	*Date of Analysis*	*: 10/12/2024*
Patient Name	*: RAM LOHAR*	*Date of Collection*	*: 10/12/2024*
Age/Sex	*: 32 YEAR / Male*	*Date of Report*	*: 10/12/2024*
Referred by	*: Dr. M.AHMED*		

URINE EXAMINATION

Physical Examination		
Volume	:	20 ML
Colour	:	STRAW
Appearance	:	CLEAR
Sediment	:	ABSENT
Sp.Gravity	:	1.020
Chemical Examination		
Reaction	:	ACIDIC
Glucose	:	NIL
Protein	:	NIL
Ph	:	6.5
Microscopical Examination		
Leucocytes (Pus cells)	:	1-2 / HPF
Erythrocytes (RBC)	:	1-2 /HPF
Epithelial cells	:	0-1 / HPF
Cast	:	NOT FOUND
Crystal	:	NOT FOUND
Others	:	NOT FOUND

DR. FARHAT FATIMA
MBBS, MD(PATHOLOGY)
Consultant pathologist

LIMHOMEDIN
LIFELINE MULTISPECIALITY HOSPITAL
Where Healing Matters

Name	RAM LOHAR	Age/Sex	32Y - Male
Date	10/12/2024	Patient Id	PAT000585
Referring Doctor	SELF	Hospital	LIFE LINE (ASANSOL)

X-RAY CHEST PA VIEW

Bilateral apices are normal.
No obvious lung parenchymal lesion.
Bilateral hila appear normal.
Cardio-thoracic ratio within normal limits.
Both the costophrenic angles are clear.
Domes of diaphragm appear normal.
The visualized thoracic cage appears normal.

Impression:- Normal study.

Susmita Jana Giri

DR. SUSMITA JANA GIRI
MBBS, MD, reg. 50857
CONSULTANT RADIOLOGIST

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DISCLAIMER-It is an online interpretation of medical imaging based on clinical data. All modern machines/procedures have their own limitation. If there is any clinical discrepancy this investigation may be repeated or reassessed by other tests. Patient's identification in online reporting is not established, So in no way can this report be utilized for any medico legal purpose.

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034 1350 1350 Connect@limhomedin.co.in thelifelinehospital.co.in

LIMHOMEDIN
LIFELINE MULTISPECIALITY HOSPITAL
Where Healing Matters

Reference No. : *OID 1519*
Patient Name : *RAM LOHAR*
Age/Sex : *32 YEAR / Male*
Referred by : *Dr. M.AHMED*

Date of Analysis : 10/12/2024
Date of Collection: 10/12/2024
Date of Report : 10/12/2024

HEMATOLOGICAL EXAMINATION (COMPLETE BLOOD PICTURE)

SAMPLE – EDTA WHOLE BLOOD

INVESTIGATION	RESULT	REFERENCE VALUE
HEMOGLOBIN	12.3	Male: 13.5 - 17.5 gm/dl Female: 12.0 - 16.0 gm/dl
TOTAL LEUCOCYTE COUNT(TLC)	6,100	4,000 - 11,000 / cmm
DIFFERENTIAL COUNT		
NEUTROPHIL	47%	40 - 70 %
LYMPHOCYTE	40 %	20 - 40%
MONOCYTES	05 %	04 - 11 %
EOSINOPHILS	08 %	00 - 08 %
BASOPHILS	00 %	00 - 03 %
PLATELET COUNT	2,10,000	1,50,000 – 4,50,000/cumm
RBC COUNT	4.53	3.8-4.8 Cells/cumm
PCV	37.8	36.0-46.0 %
MCV	83.5	83.0-100 FL
MCH	27.0	27.0-32.0 Pg
MCHC	32.4	31.5-34.5 g/dl
RDW-CV	12.0	11.0-14.0 %

Erythrocyte Sedimentation Rate (ESR)

1st hour reading	22.0 mm	Male - 00 - 17 mm/h Female 02 - 25 mm/h

DR. FARHAT FATIMA
MBBS, MD(PATHOLOGY)
Consultant pathologist

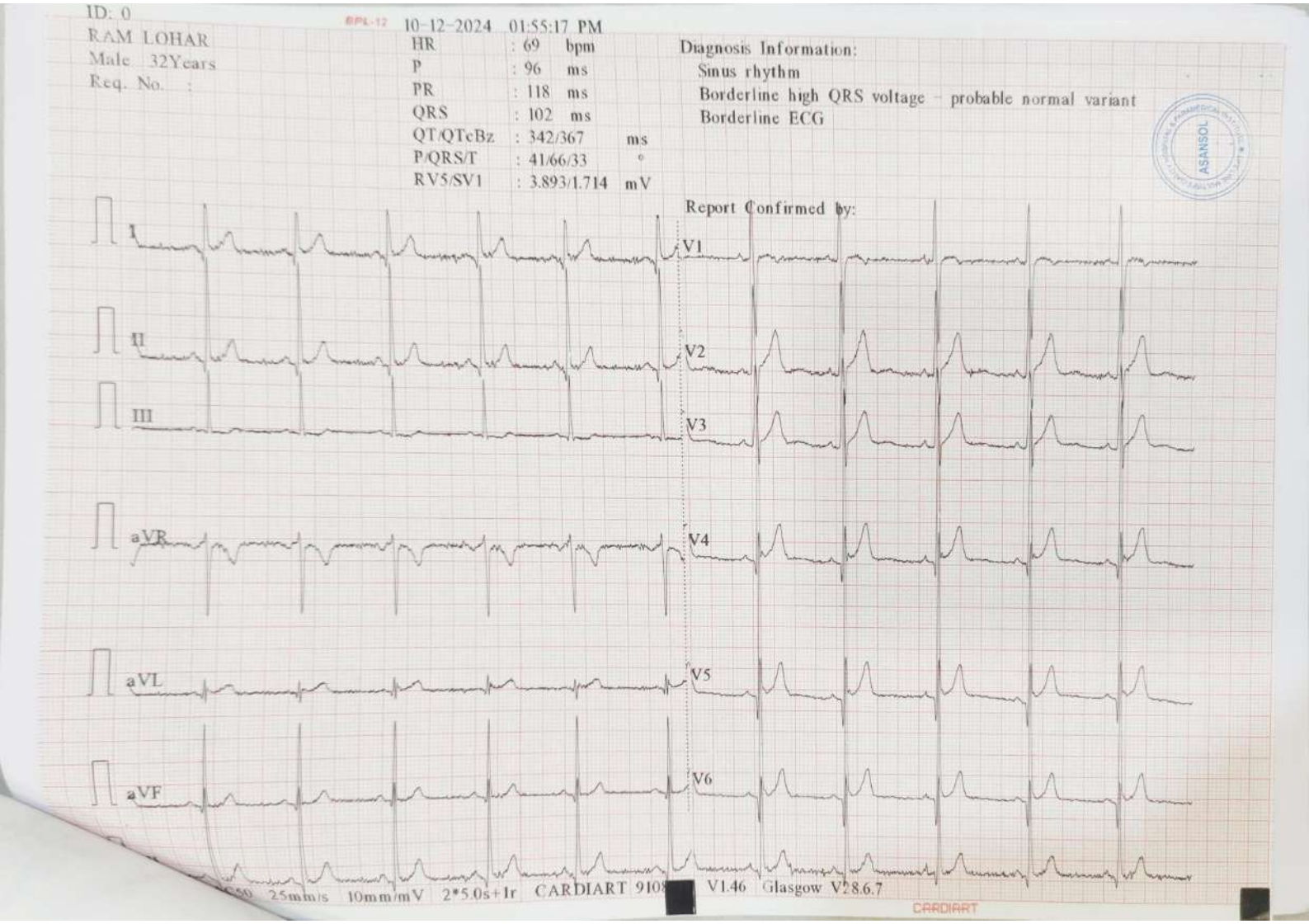
LIMHOMEDIN
LIFELINE MULTISPECIALITY HOSPITAL
Where Healing Matters

Reference No.	*: OID 1519*	*Date of Analysis*	*: 10/12/2024*
Patient Name	*: RAM LOHAR*	*Date of Collection*	*: 10/12/2024*
Age/Sex	*: 32 YEAR / Male*	*Date of Report*	*: 10/12/2024*
Referred by	*: Dr. M.AHMED*		

INVESTIGATION	RESULT	UNIT	REFERENCE VALUE
CREATININE	1.02	mg/ dl	0.70 - 1.2 mg/dl

TEST	RESULT
RANDOM BLOOD SUGAR (RBS)	84.0 mg/dl

DR. FARHAT FATIMA
MBBS, MD(PATHOLOGY)
Consultant pathologist


ID: 0
RAM LOHAR
Male 32Years
Req. No. :
10-12-2024 01:55:17 PM
HR : 69 bpm
P : 96 ms
PR : 118 ms
QRS : 102 ms
QT/QTcBz : 342/367 ms
P/QRS/T : 41/66/33 °
RV5/SV1 : 3.893/1.714 mV
Diagnosis Information:
Sinus rhythm
Borderline high QRS voltage - probable normal variant
Borderline ECG
Report Confirmed by:
I
II
III
aVR
aVL
aVF
V1
V2
V3
V4
V5
V6
25mm/s 10mm/mV 2*5.0s+Ir CARDIART 910[redacted] V1.46 Glasgow V2.8.6.7
CARDIART

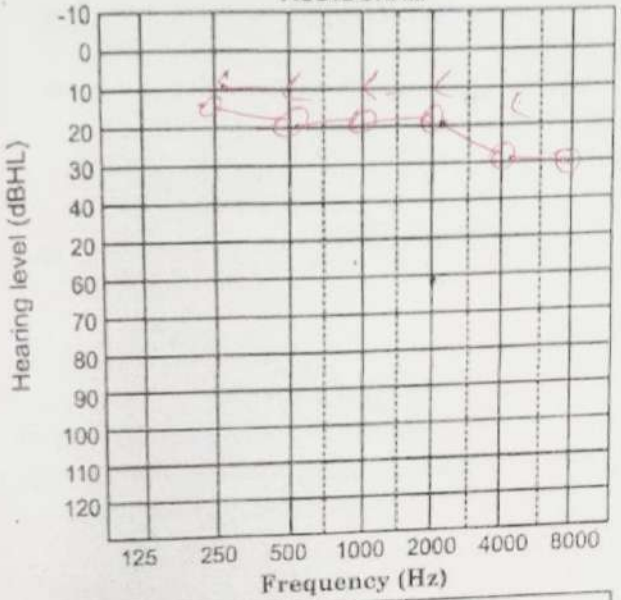
LIMHOMEDIN
LIFELINE MULTISPECIALITY HOSPITAL

PURE TONE AUDIOMETRY

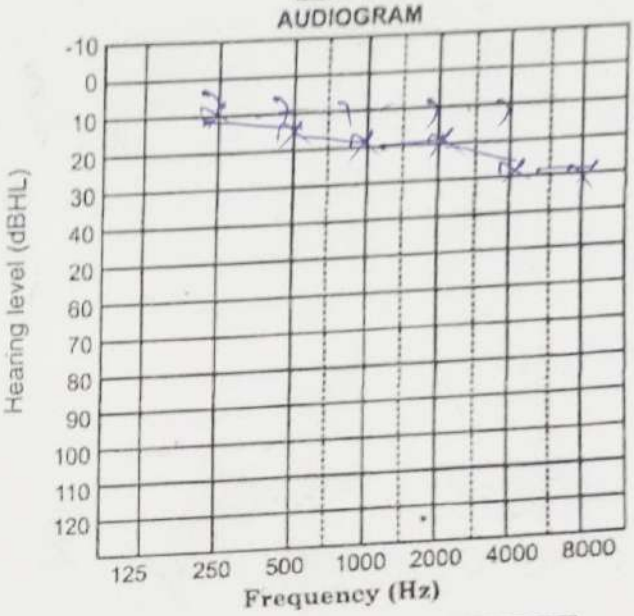
Date... 15/12/24

NAME : MR. Ram LOHAR AGE : 32 SEX : MALE

RIGHT EAR AUDIOGRAM



LEFT EAR AUDIOGRAM



Right Ear	PTA	Left Ear
20 : dBHL	I	18.3 dBHL
	II	

(Rt) Ear	SYMBOLS	(Lt) Ear
○	AC Unmasked	X
<	BC Unmasked	>
△	AC masked	□
[	BC masked	]
↙	No Response	↘

Audiometric responses : Fairly Consistent

(+)	RINNE TEST	(+)
←	WEBER TEST	→
←	250 Hz	→
←	500 Hz	→
←	1kHz	→
←	2kHz	→
←	4kHz	→

PRAVIN KUMAR
ASSTT. AUDIOLOGIST
Regd. No- P43731

ASANSOL

Provisional Diagnosis : B/L - Hearing Sensitivity within normal limits

Counselled.
Advised

EasyOne Air © ndd 2017
V1.15.0 | V1.15.0
Record No. 528
S/N 1160692

m, Lohar

ID 05

Age	32 Years | 25.04.1992
Height | Weight	144.0 cm | 46.0 kg | BMI: 22.2
Ethnic | Gender	Asian | Male
Smoker	
Asthma status	
COPD status	

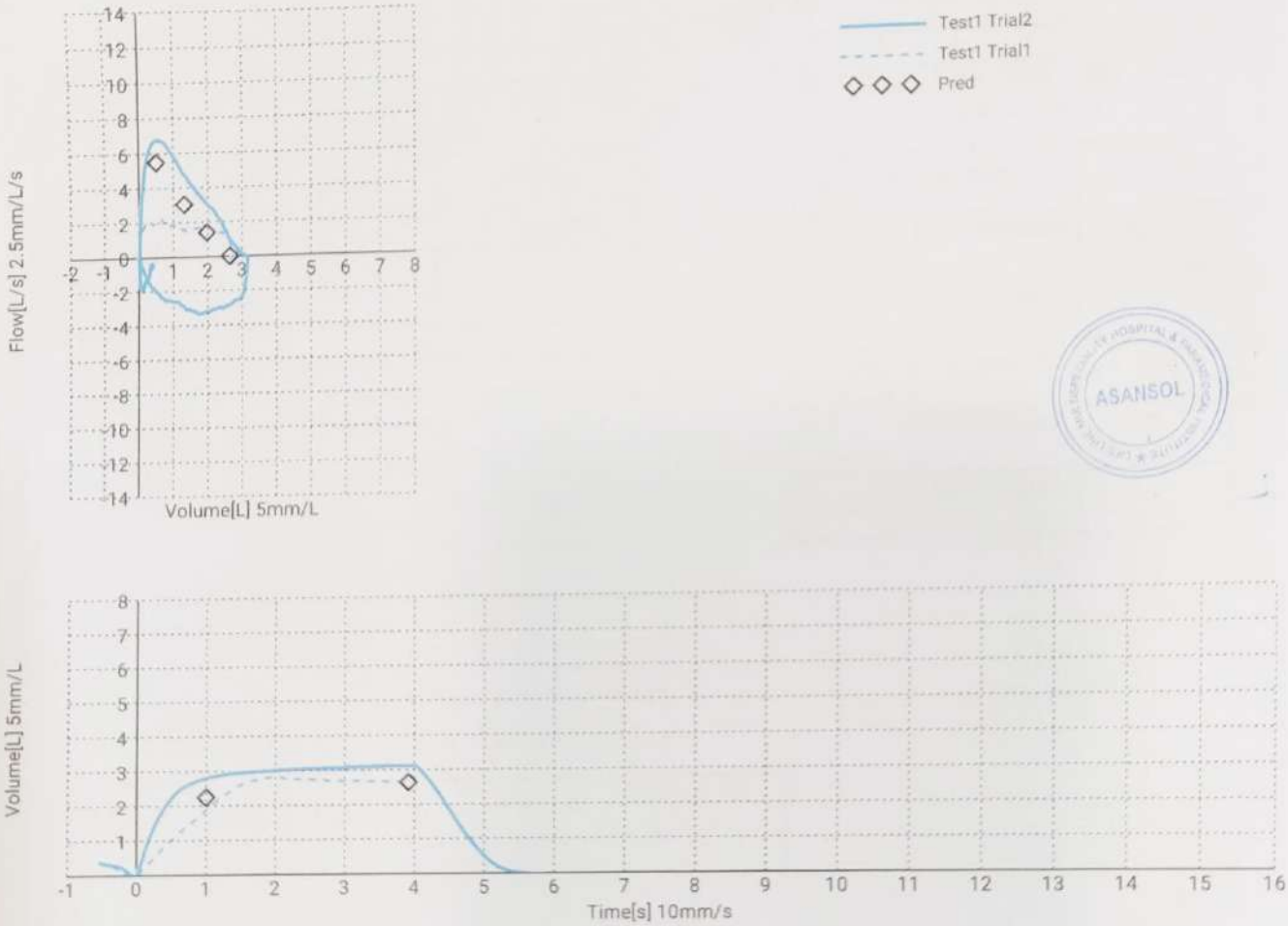
FVL Your FEV1/Predicted: 126.3%

Interpretation	GOLD/Hardie 2008
Predicted ref.	Knudson 1983
Value selection	Best trial
Tech ID	admin
Automatic QC	On
BTPS In | Ex	1.05 | 1.02

Test1 18.01.2007 01:02 AM

Parameter	Pred	LLN	Trial2	Trial1#	%Pred
FVC[L]	2.64	2.11	3.14	2.84	118.9
FEV1[L]	2.25	1.82	2.84	1.93	126.3
FEV1/FVC[%]	88.7	75.4	90.2	▼67.8	101.7
FEF2575[L/s]	2.61	1.53	3.79	1.76	145.0
PEF[L/s]	5.50	–	6.84	▼2.36	124.5
FET[s]			3.92	2.00	
FIVC[L]	2.64	2.11	3.17	▼0.16	119.8
FIF50[L/s]	–	–	3.09	0.16	–
PIF[L/s]	–	–	3.27	0.42	–

FEV1 Var = –mL –%, FVC Var = –mL –%
Session quality D(2)
Poor quality, no interpretation possible



ASANSOL

Comment

Signature

Name – Ram Lohar, Age – 32/M

eye

c/o → Regular Check up

V/n
- RE : 6/6
- LE : 6/6

Refn

RE → Plano → 6/6
LE → Plano → 6/6
Add → BE × plano → N6 at 33 cm.

JKhan

ASANSOL

GIRIDHAN METAL PRIVATE LIMITED

Registered Office : "PREMLATA" 39, Shakespeare Sarani, 3rd Floor, Kolkata - 700 017, West Bengal, India
Telefax : +91 33 2289 2734 / 35 / 36, E-mail : giridhanmetal@gmail.com CIN : U27320WB2019PTC234675

GIRIDHAN METAL PRIVATE LIMITED

CORPORATE ENVIRONMENTAL POLICY

For protection of environment and sustainable development, Giridhan Metal Private Limited is committed to abide by environmental norms and various conditions stipulated by the Govt of India during approval of projects at the central as well as at the state levels. In addition to this, Giridhan Metal Private Limited acknowledge the importance of the concept of inter-dependence of all sections of society. In particular, it focuses revolves around the community residing in the immediate vicinity of its steel manufacturing plant where it seeks to actively assist in improving the quality of life.

In line with its abiding concern for preservation of the ecological balance and safeguarding the health and environment of the community, Giridhan Metal Private Limited will always actively demonstrate its firm resolves to protect the environment and its deeply committed to its reputation and respect built over the years in industry and society for its professional of management based on philosophy of the best in business ethics. Giridhan Metal Private Limited has global commitments and also the guidelines on norms and directives of different State and Central Government of India, Giridhan Metal Private Limited has formulated the following Corporate Environmental Policy & Responsibility for effective implementation across the organization in its projects and integrated steel plant. The policy shall:

a) Be appropriate to the nature and scale of the organization's activities, products and services and adopted at the Board level. It shall be documented, implemented, maintained and communicated to all persons working for the organization and on its behalf.

b) Define a specific organisational structure for guidance & implementation.

c) Ensure the required commitment from top management for the allocation of sufficient financial, human, organizational infrastructure and technology resources for its implementation.

d) Shall be integrated with all stages of the project/activity cycle of the organization.

e) Ensure environmental performance of all projects/activities over and above the applicable statutory requirements to which organization have to comply.

f) Shall be aligned with policies and management systems of the organization including the Environmental Management System (EMS) or other environmental performance initiatives.

g) Shall provide for incentives for its employees for achieving corporate environmental targets that go beyond statutory compliance and disincentives for failure to achieve this.

h) Provide for monitoring and review of corporate environmental performance along with the reporting of non-compliance.

i) Monitoring of implantation and review shall be at the level of the Board and the guidance of the Board shall be communicated to all concerned in writing for compliance. Together these shall comprise the corporate Environmental Performance Report, and shall be included in the Organisation's Annual Report.

GIRIDHAN METAL PRIVATE LIMITED JAMURIA

In addition to the above, Giridhan Metal Private Limited will strive to adhere to the following elements of its Corporate Environmental Policy:

1) Operate the manufacturing and other facilities in compliance with all applicable laws and regulations related to environment and health & safety of employees and surrounding communities.
2) Continually improve the environmental performance of organisational process and products through waste minimization and pollution abatement.
3) Minimize consumption of natural resources through the reduction, reuse or recycling of materials, as much as possible.
4) Encourage efficient use of energy, water and utilities
5) Purchase products and services as far as possible, that do the least damage to the environment on a life cycle basis.
6) Promote environmental awareness among the employees and encourage them to work in environmentally responsible manner.
7) Communicate the environmental commitment and performance of the organization to its clients, customers and the public.
8) Develop and maintain appropriate emergency and response programs where required by legislation or where significant health, safety or environmental hazards exist.

Develop and maintain greenery in and around its mines, plants and other project units.

Implementation of the Corporate Policy

Resources, Roles and Responsibility:

Giridhan Metal Private Limited shall have an organization structure to oversee the effective implementation of corporate Environment Policy. This structure shall define key responsibilities within the various levels of the organization for policy implementation and shall include involvement at all the levels throughout the organization. An Organization structure in this regard is shown below:

The management shall ensure availability of resources essential to implement the corporate environment policy across its all operational and project units. Resources shall include human resources, organizational infrastructure, technology and financial resources. Roles and responsibilities shall be defined and documented to facilitate the effective implementation of the environment policy.

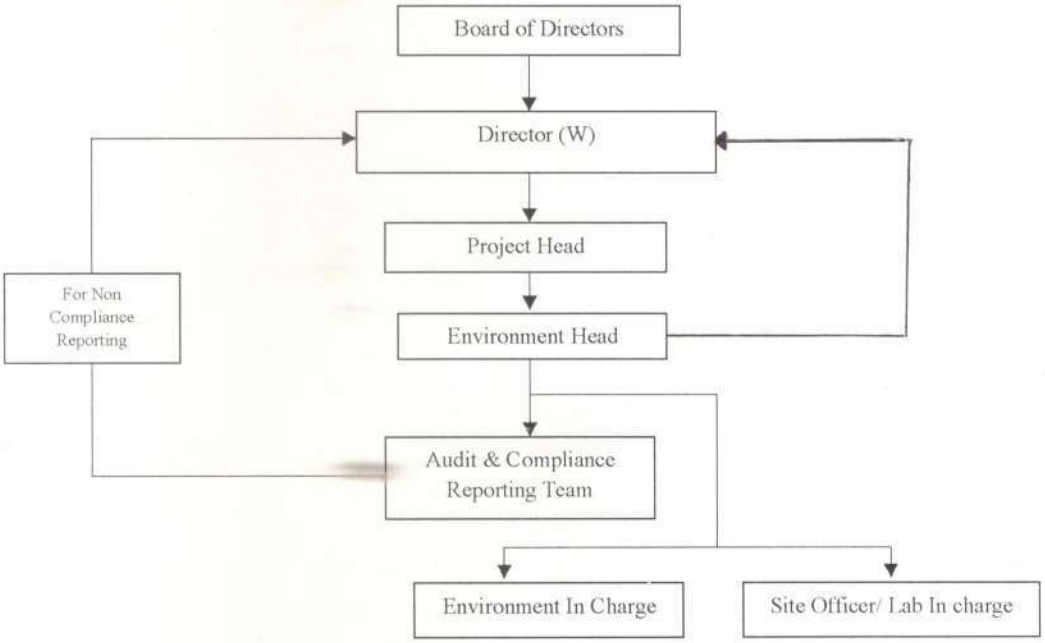
As part of the existing Board structure, Audit & Compliance reporting team shall also oversee the environmental status inclusive of the conditions prescribed under various environmental consents and clearances, as and when obtained from various State and Central Govt authorities, as well as the corporate norms, standards and targets that exceed the legal compliance requirements.

The below organizational structure Management Cell is responsible for any non-compliance/ infringement/ deviation/ violation of the environmental or forest norms under the supervision of Board of Directors.

GIRIDHAN METAL PRIVATE LIMITED JAMURIA

GIRIDHAN METAL PRIVATE LIMITED

Registered Office : "PREMLATA" 39, Shakespeare Sarani, 3rd Floor, Kolkata - 700 017, West Bengal, India
Telefax : +91 33 2289 2734 / 35 / 36, E-mail : giridhanmetal@gmail.com. CIN : U27320WB2019PTC234675



Documentation:

The policy shall be made available on the Giridhan Metal Private Limited's website and also be available in hard copy. The planning, implementation and monitoring of the organizational environmental performance shall be documented. All achieved milestones will be supported by documentary evidence in the form of photographs, monitoring records and /or reports, wherever applicable.

Transparency in the implementation of Environmental policy

Monitoring will be conducted periodically as per relevant norms framed by SPCB or MoEFCC or any other statutory authorities. It shall serve to drive accountability and transparency and provides for learning to implement in future initiatives. Giridhan Metal Private Limited shall implement a monitoring mechanism by its defined organizational structure with clear roles & responsibilities for every operational and project units by creating a register specifying all the regulatory compliances and clearance conditions that have been imposed by the Ministry or other public authorities. Giridhan Metal Private Limited shall also prepare Annual Environmental performance report and include it in its Annual Report.

The policy has been passed by the Board of Directors of Giridhan Metal Private Limited in compliance with the circular issued by Ministry of Environment, Forest and Climate Change. All issues related to Environment specifically non compliances be placed before the Board and the Head of the Plant should submit a report on the same before the ensuing meeting along with all the corrective measures taken thereon.

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Annexure – 1

GIRIDHAN METAL PRIVATE LIMITED

Environment Policy

Protection of environment is of prime concern and an important business objective at Giridhan Metal Private Limited. With a leading role in providing services in Manufacturing industry value chain in India, Giridhan Metal Private Limited is conscious of its responsibility towards creating, maintaining and ensuring a safe and clean environment for sustainable development. In particular Giridhan Metal Private Limited is committed to;

1) Operate the manufacturing and other facilities in compliance with all applicable laws and regulations related to environment and health & safety of employees and surrounding communities.
2) Continually improve the environmental performance of organisational process and products through waste minimization and pollution abatement.
3) Minimize consumption of natural resources through the reduction, reuse or recycling of materials, as much as possible.
4) Encourage efficient use of energy, water and utilities
5) Purchase products and services as far as possible, that do the least damage to the environment on a life cycle basis.
6) Promote environmental awareness among the employees and encourage them to work in environmentally responsible manner.
7) Communicate the environmental commitment and performance of the organization to its clients, customers and the public.
8) Develop and maintain appropriate emergency and response programs where required by legislation or where significant health, safety or environmental hazards exist.
9) Develop and maintain greenery in and around its mines, plants and other project units.

Date 04 MAR 2020

Sanjay Agarwal
Director

GIRIDHAN METAL PRIVATE LIMITED
JAMURIA

আনন্দবাজার পত্রিকা

আনন্দ প্লাস

কলকাতা শুক্রবার ১৯ জুলাই ২০২৪

ফের জুটিতে জাহ্নবী-ঈশান

ছ'বছর বাদে আবার একসঙ্গে কাজ করতে চলেছেন জাহ্নবী কপূর ও ঈশান খট্টর। ২০১৮ সালে করণ জোহরের প্রযোজনায় 'ধড়ক'-এ প্রথম বার জুটি বেঁধেছিলেন দু'জনে। আবারও ধর্মা প্রোডাকশনসের ব্যানারে জুটি বাঁধতে চলেছেন তাঁরা। ছবির পরিচালনায় রয়েছেন জাতীয় পুরস্কারপ্রাপ্ত পরিচালক নীরজ ঘেওয়ান। 'মসান' ছবির জন্য নীরজ পুরস্কৃত হয়েছিলেন। সেই ছবির পরে 'সেক্রেড গেমস'-এর দ্বিতীয় সিজ়ন, 'অজীব দস্তানস'-এর একটি গল্পের পরিচালনায় ছিলেন তিনি। তবে 'মসান'-এর পরে বড় পর্দার জন্য কোনও ছবি পরিচালনা করেননি তিনি। এ বছরের অক্টোবর থেকে নতুন ছবির কাজ শুরু হবে। চিত্রনাট্য লেখার কাজ চলছে এখন। 'ধড়ক'-এর সময়েই ঈশান-জাহ্নবীর প্রেমের চর্চা শুরু হয়েছিল। পরবর্তী কালে অবশ্য সেই প্রেম ভেঙে যায়, অন্য সম্পর্কে জড়ান দু'জনেই।

সামনেই মুক্তির অপেক্ষায় রয়েছে জাহ্নবীর 'উলঝ'। আপাতত সেই ছবির প্রচারে ব্যস্ত তিনি। তবে আপাতত অসুস্থতার কারণে হাসপাতালে ভর্তি অভিনেত্রী। বনি কপূর জানিয়েছেন, খাবার থেকে বিষক্রিয়ায় শারীরিক অবস্থার অবনতি হওয়ায় বৃহস্পতিবার হাসপাতালে ভর্তি করানো হয়েছে তাঁকে। এক-দু'দিনের মধ্যেই হাসপাতাল থেকে ছেড়ে দেওয়া হবে জাহ্নবীকে।


ঈশান


জাহ্নবী

মেয়ে হওয়ার সুখবর

মা হলেন রিচা চড্ডা। বৃহস্পতিবার এক বিবৃতিতে বাবা হওয়ার কথা ঘোষণা করেছেন আলি ফজ়ল। মেয়ে হওয়ার সুখবর অনুরাগীদের সঙ্গে ভাগ করে নিয়েছেন রিচাও। মঙ্গলবার কন্যাসন্তানের জন্ম দিয়েছেন অভিনেত্রী। আপাতত সুস্থ আছেন মা ও সন্তান উভয়েই।

দিনকয়েক আগেই সমাজমাধ্যমে মেটারনিটি ফোটোশুটের ছবি পোস্ট করেছিলেন রিচা। লিখেছিলেন, "পৃথিবীতে একটা ছোট্ট প্রাণকে নিয়ে আসার চেয়ে ভাল আর কী-ই বা হতে পারে! এই সুন্দর সফরে সঙ্গী হওয়ার জন্য তোমাকে ধন্যবাদ, আলি।"

সন্তানের জন্য যে মাসখানেক কাজ থেকে বিরতি নেবেন, তা আগেই জানিয়েছিলেন আলি। তবে মাতৃত্বকালীন ছুটি কাটিয়ে শীঘ্রই কাজে ফিরতে আগ্রহী রিচা। অক্টোবর থেকেই শুরু হবে রিচা ও আলি প্রযোজিত রম-কম ঘরানার মিউজ়িক্যাল ছবি 'পিঙ্কি প্রমিস'-এর কাজ। অন্য দিকে, অভিনেত্রীর হাতে রয়েছে অমিতোষ নাগপালের পরিচালনায় এক কমেডি ছবির কাজও।


রিচা-আলি

রহস্যগল্পে বিক্রান্ত

রাহুল ঢোলাকিয়ার পরবর্তী ছবিতে রয়েছেন বিক্রান্ত মেসি। মধু মন্টেনার প্রযোজনায় তৈরি এই মনস্তাত্ত্বিক রহস্য ঘরানার ছবিতে মুখ্য চরিত্রে দেখা যাবে বিক্রান্তকে। চুক্তিপত্র সইসাবুদের কাজ চলছে। তবে রাহুলের ছবির কাজ শুরু হতে দেরি আছে। আপাতত বিক্রান্ত ব্যস্ত পরিচালক রাজকুমার হিরানির প্রথম সিরিজ়ের শুটিংয়ে। সাইবার ক্রাইম নিয়ে তৈরি এই সিরিজ়েও মুখ্য ভূমিকায় তিনি। সামনেই মুক্তির অপেক্ষায় রয়েছে তাপসী পান্নুর সঙ্গে বিক্রান্তের ছবি 'ফির আয়ি হসীন দিলরুবা'।


বিক্রান্ত


'শুভ বিবাহ'

লড়াই জারি

ধারাবাহিকের টিআরপি তালিকায় পুরনো কয়েকটি মেগার সঙ্গে সদ্য শুরু হওয়া কিছু সিরিয়ালের টক্কর জমে গিয়েছে। তালিকার প্রথম স্থানটি এ বার 'ফুলকি'র দখলে রয়েছে। গত বারের প্রথম স্থানাধিকারী 'নিম ফুলের মধু' এই সপ্তাহে পিছিয়ে দ্বিতীয় স্থানে চলে গিয়েছে।

তৃতীয় স্থান ধরে রাখল 'কোন গোপনে মন ভেসেছে'। খুব অল্প সময়ের মধ্যেই তালিকার চতুর্থ স্থানে উঠে এল 'শুভ বিবাহ'। ধারাবাহিকে বিয়ের দিন সুধার অতীতের কথা জানতে পারে তেজ। কিন্তু সে কথা না জানিয়ে পরিবারের সম্মান রক্ষার্থে সুধার সঙ্গে বিয়েতে রাজি হয় সে। সুধা-তেজের সম্পর্ক কোন দিকে মোড় নিতে চলেছে, তা জানা যাবে আগামী পর্বে। এই সপ্তাহে পঞ্চমে 'জগদ্ধাত্রী'। উপরে উঠে এসেছে 'রোশনাই'-ও, তার স্থান ষষ্ঠে। তবে বেশ পিছিয়ে পড়েছে 'কথা', তার স্থান সপ্তমে। একই স্থানে রয়েছে 'উড়ান'ও। ধারাবাহিকে কথা ও এভির জীবনে কি তৃতীয় ব্যক্তির প্রবেশ ঘটতে চলেছে? তা জানা যাবে 'কথা'র আগামী পর্বে। অষ্টমে যুগ্ম ভাবে জায়গা করে নিয়েছে 'অনুরাগের ছোঁয়া' ও 'হরগৌরী পাইস হোটেল'। অনেকটাই পিছিয়ে গিয়ে এ বারে নবমে 'গীতা এলএল.বি'। ধারাবাহিকে ষড়যন্ত্রের পর্দা ফাঁস করে এ বার শ্বশুর অগ্নিজিতের পাশে দাঁড়াল বৌমা গীতা। আগামী পর্ব থেকে শ্বশুরের সম্মান বাঁচাতে নতুন লড়াই শুরু করতে চলেছে গীতা। অনেক দিন পর ফের তালিকায় জায়গা পেল 'মিঠিঝোরা'। তার স্থান দশমে।

তথ্য: বার্ক (ব্রডকাস্ট অডিয়েন্স রিসার্চ কাউন্সিল)

বাড়ি কিনলেন আথিয়া-রাহুল

মুম্বইয়ের বান্দ্রায় বিলাসবহুল এক অ্যাপার্টমেন্ট কিনলেন সুনীল শেট্টি-কন্যা অভিনেত্রী আথিয়া শেট্টি ও ক্রিকেটার কেএল রাহুল। খরচ পড়েছে প্রায় ২০ কোটি টাকা। পালি হিল রোডের এই এলাকাতেই থাকেন শাহরুখ খান, সলমন খান, রণবীর কপূর, সেফ আলি খান, টাইগার শ্রফ-সহ একাধিক বলি তারকা। তবে বৃহণ্মুম্বই মিউনিসিপ্যাল কর্পোরেশনের তরফে এখনও পুরোপুরি ছাড়পত্র পায়নি এই আবাসনটি। তাই কবে থেকে আথিয়া-রাহুল সেখানে থাকতে শুরু করবেন, তা এখনও ধোঁয়াশায়। সম্প্রতি আথিয়ার পুরো পরিবারের সঙ্গে রাহুল উপস্থিত হয়েছিলেন অম্বানীদের বিয়ের অনুষ্ঠানে।


প্রিয়ঙ্কা

জন্মদিনে

অভিনেত্রী প্রিয়ঙ্কা চোপড়ার জন্মদিন ছিল বৃহস্পতিবার। সেই উপলক্ষে তাঁর একগুচ্ছ অদেখা ছবি সমাজমাধ্যমে পোস্ট করলেন নিক জোনাস। ক্যাপশনে স্ত্রীকে জন্মদিনের শুভেচ্ছা জানিয়ে নিক লেখেন, স্বামী হিসেবে তিনি ভাগ্যবান। প্রিয় 'মিমি দিদি'র জন্মদিনে ইনস্টা-স্টোরিতে নিজেদের ছোটবেলার একটি ছবি পোস্ট করেছেন পরিণীতি চোপড়াও। তবে মাঝে দুই বোনের সম্পর্কের অবনতি হয়েছে বলে শোনা গিয়েছিল। পরিণীতির বিয়েতেও আসেননি প্রিয়ঙ্কা। সমাজমাধ্যমে শুভেচ্ছাও জানাননি তাঁর বোনকে। তবে এখন দুই বোনের সম্পর্ক সহজ হয়েছে বলেই অনুমান নেটিজ়েনদের।

Olympic dream for Tsitsipas

Athens: Greece's Stefanos Tsitsipas said the Olympics holds a special significance for him due to its Greek origins, adding that he is hoping to realise his dream of winning an Olympic medal at this month's Paris Games.

Greece, the birthplace of the Olympic Games, have won three medals in tennis at the Olympics, all of which came in 1896 at the first modern Olympic Games held in Athens.

"Greece and the (Olympic) Games for sure fit like bread and butter together. It is something that has been a dream of mine since I started playing tennis," the world No. 12 Tsitsipas told *Stats Perform* in an interview published on Wednesday.

"Since I first picked up a tennis racquet, I always wanted to be an athlete who gets to participate in something like that.

"And of course, to be aiming for a medal is something extraordinary.

"So my dream keeps on evolving, keeps on existing, and my path towards that is slowly building up. For me the best prize would be to walk away from the Games with a medal."

The tennis tournament at the Olympics will take place from July 27-August 4 at Roland Garros, the venue for the French Open.

Tsitsipas has enjoyed some success on the clay courts of Roland Garros in the past, making it to the French Open final in 2021 and reaching the quarter-finals of the grand slam in the past two editions.

"Getting a good preparation before the games start in August is something that I'm really looking forward to," Tsitsipas said. "I've had great success there a few years ago at the same stadium playing the finals of the Roland Garros.

"So coming back there with that confidence at the back of my mind allows me to strive and work towards the same goal that I had a few years ago."

Tsitsipas will compete in the singles at the Olympics as well as the men's doubles alongside brother Petros.

Written with inputs from Reuters

For Stefanos Tsitsipas, Greece and the Olympics are like 'bread and butter'

IRON CURTAIN: People look through the fencing as the security perimeter for the opening ceremony is deployed along the banks of River Seine in Paris on Thursday. (Reuters)

Swimsuit wars continue

Paris: The iconic LZR Racer, the swimsuit that Michael Phelps wore while winning eight golds medals at the Beijing Olympics, is still revered around Speedo's design centre.

It serves as a reminder of just how much a suit can push a swimmer to greater heights.

"In so many ways, that was the golden era," said Coora Lavezzo, the head of innovation at Speedo's Aqualab in London. "We've got those suits upstairs, and even though I wasn't there at the time, I'm fascinated by them and just how we can get back to a smidge of that former glory."

Of course, the rules these days are much more of a hindrance to swimsuit designers, the result of a wild summer 15 years ago in which rubberized attire was all the rage, leading to 43 world records being set at the championships in Rome.

The international governing body, now known as World Aquatics, decided the polyurethane suits were making a mockery of the sport. So the organisation hastily imposed strict new rules requiring textile fabrics and limiting the amount of body coverage from the hip to just above the knees for men, while women's racing attire cannot extend past the shoulder or cover the neck.

Michael Phelps at Beijing Olympics

For coaches such as Bob Bowman, who worked with Phelps over his entire career and was on hand in Rome for a speed show that bordered on a farce, the rules are just fine the way they are.

"Everybody is on a level playing field," he said. "We're still breaking world records in these suits."

But major swimsuit designers such as Speedo, TYR and arena are pushing for the guidelines to be liberalised.

They pump millions of dollars into the sport, and would love nothing more than to be allowed to come up with revolutionary new designs that lead to vastly improved performances. But as things stand now, their hands are largely tied.

"I think a lot of our sport is just mental," US Olympian Hunter Armstrong said. "It's just about feeling good in the water."

The manufacturers are desperate to do more.

AP/PTI

Gender parity, almost

Geneva: The founder of the modern Olympics and former IOC president, Pierre de Coubertin, once said women competing in the Games would be "impractical, uninteresting, unaesthetic and improper."

Over a century later, the 2024 Paris Olympic Games are targeting gender parity in the same city where women made their Olympic debut in 1900.

The IOC set a goal of a 50-50 split among the more than 11,000 men and women, including backups. However, the latest numbers from the IOC suggest organisers might fall just short of that target.

Slightly more medal events for men than women. There is still a slight edge toward men among the 329 medal events in Paris. The IOC has said there are 157 men's events, 152 women's events and 20 mixed-gender events.

AP/PTI

Richardson has a point to prove

New York: Sha'Carri Richardson set the tone for her own comeback story a year ago when she won the 100m US title, and then the World Championship, and brashly proclaimed: "I'm not back, I'm better."

Now, with a trip to her first Olympics approaching, come new questions: Is she still better than a field of the fastest women on the planet? And can she handle the pressure that is unique to the Olympics?

The 24-year-old favorite in the Olympic 100m has been open and honest about her quest to become a more appreciative, mindful version of the person whose positive marijuana test at the 2021 US Olympic trials was her unfortunate introduction to a world that knew little about her.

But in the three years that have encompassed both her stunning fall and her inspiring comeback, she has given few details of what happened. She has dropped clues about the death of her biological mother and the bout with depression following that tragedy.

All of this mystery, turmoil and, ultimately, success have made Richardson larger than life and left her enthusiastic and growing fan base wanting more. Some on social media are keenly into what hairstyle and fingernails she will show off when she runs.

It has also made her more than a mere celebrity sprinter. She is a young, famous, Black woman whose suspension evoked arguments about race, drugs, anti-doping rules and an Olympic ecosphere that is still largely run (and reported on) by older, white men.

"It's not a goal of mine to be known," Richardson said. "But I definitely don't want to be known for one thing. No one does. It's important for me to be the best person I can be in all that matters to me, like family, community and the work that I do."

Sha'Carri Richardson with the gold medal after winning the women's 100m during the US Olympic team trials in Eugene, US, on June 22. (Reuters)

Richardson is not the Simone Biles of these Olympics, but once gymnastics is over and the spotlight heads to the track, there will be no more compelling character.

"The entire world was caught up in the magic of who Sha'Carri is," said Olympic gold medalist Sanya Richards-Ross, who covers track for NBC. "And we've had a wonderful opportunity to watch her deal with all of that, and to mature and grow."

AP/PTI

GIRIDHAN METAL PRIVATE LIMITED

O/C

Registered Office : "PREMLATA" 39, Shakespeare Sarani, 2nd Floor, Kolkata - 700 017, West Bengal, India
Telefax : +91 33 2289 2734 / 35 / 36, E-mail : giridhanmetal@gmail.com, CIN : U27320WB2019PTC234675

Date: 17.07.2024

To,
The Mayor
Asansol Municipal Corporation
G.R. Mitra Sarani, Asansol – 713301
Dist. Paschim Bardhaman, West Bengal

Ref: Environmental Clearance vide letter no. IA-J-11011/366/2010-IA.II(IND-I) dated 15/07/2024

Dear Sir,

We glade to inform you that, we have obtained Environmental Clearance for Expansion of Integrated Steel Plant: Sponge Iron from 3,18,000 TPA to 9,12,000 TPA, MS Billets from 3,72,300 TPA to 4,96,500 TPA, Rolling Mill from 3,00,000 TPA to 4,00,000 TPA, Submerged Arc Furnace (SAF) from 30,000 TPA (Fe-Mn/Si-Mn) to 82,300 TPA Ferro Manganese or 56,200 TPA Silico Manganese or 56,200 Ferro Chrome or 48,100 Silico Chrome or 43,100 TPA Ferro Silicon or 82,300 TPA Pig Iron with proposed Electric Arc Furnace (25,000 TPA), Captive Power Plant (42 MW to 102 MW) including Waste Heat Recovery Boiler (WHRB) (21 MW to 81 MW) by additional installation of 60 MW WHRB at Jamuria Industrial Estate, Village - Ikra & Damodarpur, Tehsil – Jamuria, District - Paschim Burdwan, West Bengal from Ministry of Environment, Forest and Climate Change, Government of India.

As per the direction contained in the aforesaid Environmental Clearance (EC), kindly acknowledge Environment Clearance letter IA-J-11011/366/2010-IA.II(IND-I) dated 15/07/2024

Thanking you,

Yours faithfully
For Giridhan Metal Private Limited

GIRIDHAN METAL PRIVATE LIMITED JAMURIA

Sanjay Agarwal
Director

ASANSOL MUNICIPAL CORPORATION
ASANSOL OFFICE
18 JUL 2024
Sig. of Recipient

Enclosure:
1. Environmental Clearance vide letter no. IA-J-11011/366/2010-IA.II(IND-I) dated 15/07/2024

O/C

GIRIDHAN METAL PRIVATE LIMITED

Registered Office : "PREMLATA" 39, Shakespeare Sarani, 2nd Floor, Kolkata - 700 017, West Bengal, India
Telefax : +91 33 2289 2734 / 35 / 36, E-mail : giridhanmetal@gmail com. CIN : U27320WB2019PTC234675

Date: 17.07.2024

To,
The Chief Executive Officer
Asansol Durgapur Development Authority
ADDA Administrative Building, Kanyapur,
P.O.: Ramkrishna Mission, Pin code: 713305
West Bengal, India

Ref: Environmental Clearance vide letter no. IA-J-11011/366/2010-IA.II(IND-I) dated 15/07/2024

Dear Sir,

We glade to inform you that, We have obtained Environmental Clearance for Expansion of Integrated Steel Plant: Sponge Iron from 3,18,000 TPA to 9,12,000 TPA, MS Billets from 3,72,300 TPA to 4,96,500 TPA, Rolling Mill from 3,00,000 TPA to 4,00,000 TPA, Submerged Arc Furnace (SAF) from 30,000 TPA (Fe-Mn/Si-Mn) to 82,300 TPA Ferro Manganese or 56,200 TPA Silico Manganese or 56,200 Ferro Chrome or 48,100 Silico Chrome or 43,100 TPA Ferro Silicon or 82,300 TPA Pig Iron with proposed Electric Arc Furnace (25,000 TPA), Captive Power Plant (42 MW to 102 MW) including Waste Heat Recovery Boiler (WHRB) (21 MW to 81 MW) by additional installation of 60 MW WHRB at Jamuria Industrial Estate, Village - Ikra & Damodarpur, Tehsil – Jamuria, District - Paschim Burdwan, West Bengal from Ministry of Environment, Forest and Climate Change, Government of India.

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Thanking you,

Yours faithfully
For Giridhan Metal Private Limited

GIRIDHAN METAL PRIVATE LIMITED JAMURIA

Sanjay Agarwal
Director

Enclosure:
1. Environmental Clearance vide letter no. IA-J-11011/366/2010-IA.II(IND-I) dated 15/07/2024

Received the documents/ Date
issued without verifying the contents.
ADDA, Asansol 18/07/24
Signature

O/C

GIRIDHAN METAL PRIVATE LIMITED

Registered Office : "PREMLATA" 39, Shakespeare Sarani, 2nd Floor, Kolkata - 700 017, West Bengal, India
Telefax : +91 33 2289 2734 / 35 / 36, E-mail : giridhanmetal@gmail.com. CIN : U27320WB2019PTC234675

Date: 17.07.2024

To,
The District Magistrate – Paschim Bardhaman
Office of the District Magistrate,
ADDA Administrative Building, Kanyapur,
P.O.: Ramkrishna Mission, Pin code: 713305
West Bengal, India

Ref: Environmental Clearance vide letter no. IA-J-11011/366/2010-IA.II(IND-I) dated 15/07/2024

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As per the direction contained in the aforesaid Environmental Clearance (EC), kindly acknowledge Environment Clearance letter IA-J-11011/366/2010-IA.II(IND-I) dated 15/07/2024

Thanking you,

Yours faithfully
For Giridhan Metal Private Limited

GIRIDHAN METAL PRIVATE LIMITED JAMURIA

Sanjay Agarwal
Director

OFFICE OF THE DISTRICT MAGISTRATE & COLLECTOR PASCHIM BARDHAMAN
RECEIVED
18 JUL 2024
CONTENTS NOT VERIFIED

Enclosure:
1. Environmental Clearance vide letter no. IA-J-11011/366/2010-IA.II(IND-I) dated 15.07.2024

O/C

GIRIDHAN METAL PRIVATE LIMITED

Registered Office : "PREMLATA" 39, Shakespeare Sarani, 2nd Floor, Kolkata - 700 017, West Bengal, India
Telefax : +91 33 2289 2734 / 35 / 36, E-mail : giridhanmetal@gmail.com, CIN : U27320WB2019PTC234675

Date: 17.07.2024

To,
The G.M./Officer in-Charge
District Industries Centre
City Centre, Durgapur – 713216
Beside ADDA Building
Dist. Paschim Bardhaman, West Bengal

Ref: Environmental Clearance vide letter no. IA-J-11011/366/2010-IA.II(IND-I) dated 15/07/2024

Dear Sir,

We glade to inform you that, We have obtained Environmental Clearance for Expansion of Integrated Steel Plant: Sponge Iron from 3,18,000 TPA to 9,12,000 TPA, MS Billets from 3,72,300 TPA to 4,96,500 TPA, Rolling Mill from 3,00,000 TPA to 4,00,000 TPA, Submerged Arc Furnace (SAF) from 30,000 TPA (Fe-Mn/Si-Mn) to 82,300 TPA Ferro Manganese or 56,200 TPA Silico Manganese or 56,200 Ferro Chrome or 48,100 Silico Chrome or 43,100 TPA Ferro Silicon or 82,300 TPA Pig Iron with proposed Electric Arc Furnace (25,000 TPA), Captive Power Plant (42 MW to 102 MW) including Waste Heat Recovery Boiler (WHRB) (21 MW to 81 MW) by additional installation of 60 MW WHRB at Jamuria Industrial Estate, Village - Ikra & Damodarpur, Tehsil – Jamuria, District - Paschim Burdwan, West Bengal from Ministry of Environment, Forest and Climate Change, Government of India.

As per the direction contained in the aforesaid Environmental Clearance (EC), kindly acknowledge Environment Clearance letter IA-J-11011/366/2010-IA.II(IND-I) dated 15/07/2024

Thanking you,

Yours faithfully
For Giridhan Metal Private Limited

GDOS 18-7-24
Received (Contents not Verified)
DIC-Paschim Bardhaman
Durgapur, Govt. of West Bengal

GIRIDHAN METAL PRIVATE LIMITED JAMURIA

Sanjay Agarwal
Director

Enclosure:
1. Environmental Clearance vide letter no. IA-J-11011/366/2010-IA.II(IND-I) dated 15/07/2024

O/C

GIRIDHAN METAL PRIVATE LIMITED

Registered Office : "PREMLATA" 39, Shakespeare Sarani, 2nd Floor, Kolkata - 700 017, West Bengal, India
Telefax : +91 33 2289 2734 / 35 / 36, E-mail : giridhanmetal@gmail com. CIN : U27320WB2019PTC234675

Date: 17.07.2024

To,
The Sabhadhipati
Asansol Zilla Parishad
Court More, Asansol - 713304
Dist. Paschim Bardhaman, West Bengal

Ref: Environmental Clearance vide letter no. IA-J-11011/366/2010-IA.II(IND-I) dated 15/07/2024

Dear Sir,

We glade to inform you that, We have obtained Environmental Clearance for Expansion of Integrated Steel Plant: Sponge Iron from 3,18,000 TPA to 9,12,000 TPA, MS Billets from 3,72,300 TPA to 4,96,500 TPA, Rolling Mill from 3,00,000 TPA to 4,00,000 TPA, Submerged Arc Furnace (SAF) from 30,000 TPA (Fe-Mn/Si-Mn) to 82,300 TPA Ferro Manganese or 56,200 TPA Silico Manganese or 56,200 Ferro Chrome or 48,100 Silico Chrome or 43,100 TPA Ferro Silicon or 82,300 TPA Pig Iron with proposed Electric Arc Furnace (25,000 TPA), Captive Power Plant (42 MW to 102 MW) including Waste Heat Recovery Boiler (WHRB) (21 MW to 81 MW) by additional installation of 60 MW WHRB at Jamuria Industrial Estate, Village - Ikra & Damodarpur, Tehsil – Jamuria, District - Paschim Burdwan, West Bengal from Ministry of Environment, Forest and Climate Change, Government of India.

As per the direction contained in the aforesaid Environmental Clearance (EC), kindly acknowledge Environment Clearance letter IA-J-11011/366/2010-IA.II(IND-I) dated 15/07/2024

Thanking you,

Yours faithfully
For Giridhan Metal Private Limited

GIRIDHAN METAL PRIVATE LIMITED JAMURIA

Sanjay Agarwal
Director

PASCHIM BARDHAMAN ZILLA PARISHAD
RECEIVED
Date 18/07/24
CONTENTS NOT VERIFIED

Enclosure:
1. Environmental Clearance vide letter no. IA-J-11011/366/2010-IA.II(IND-I) dated 15/07/2024

Works : Jamuria Industrial Estate, P.O. Nandi, P.S. Jamuria, Paschim Bardhaman - 713 344, West Bengal, India
Email : info@giridhanmetal.com, Phone : 033-71548592

LED Display Board

Your (Half Yearly Compliance Report) has been Submitted with following details	
Proposal No	IA/WB/IND1/459702/2024
Compliance ID	113221786
Compliance Number(For Tracking)	EC/M/COMPLIANCE/113221786/2025
Reporting Year	2025
Reporting Period	01 Jun(01 Oct - 31 Mar)
Submission Date	31-05-2025
RO/SRO Name	Shri Senthil Kumar Sampath
RO/SRO Email	agmu156@ifs.nic.in
State	WEST BENGAL
RO/SRO Office Address	Integrated Regional Offices, Kolkata
Note:- SMS and E-Mail has been sent to Shri Senthil Kumar Sampath, WEST BENGAL with Notification to Project Proponent.	

FORM-V

ENVIRONMENTAL STATEMENT FOR THE FINANCIAL YEAR 2024-25

GIRIDHAN METAL PRIVATE LIMITED, JAMURIA

PART-A

Name and address of the owner/ occupier of the industry operation or process	Mr Sanjay Agarwal (Director) Giridhan Metal Private Limited Jamuria Industrial Estate P.O.-Nandi; P.S. - Jamuria Paschim Bardhaman – 713344 (W.B.)
Industry category Primary-(STC Code) Secondary-(STC Code)	Integrated Steel Plant ---
Production capacity	3,18,000 TPA DRI (Increase Sponge Iron production 3,18,000 to 3,88,000 TPD through NIPL, CTO No- WBPCB/6657363/2025 dated: 28/03/2025), 3,72,300 TPA MS Billet, 3,00,000 TPA Steel Flat & Rolled Product, 30,000 TPA Fe-Mn/Si-Mn with 42 MW CPP
Year of Establishment	2020 (Production starts from Aug 2021with 350 TPD DRI & 16 MW CPP)
Date of Last Environmental /Audit Report submitted	---

PART B

WATER AND RAW MATERIAL CONSUMPTION

1) Water consumption m^3/day

Process
Cooling } 884 m3
Domestic

Name of products	Process water consumption per unit of product output	
	During the financial year 2023-24	During the financial year 2024-25
Sponge Iron (m^3/MT)	0.19	0.20
Si-Mn/Fe-Mn (m^3/MT)	0.29	0.28
Captive Power Plant ((m^3/MW)	0.21	0.32
MS Billet (m^3/MT)	0.11	0.24
Steel Flat & Rolled Product (m^3/MT)	0.27	0.46

2) Raw material consumption

Sl No	Name of Raw Material	Name of the Products	Consumption of raw material	
			2023-24 (MT/Yr)	2024-25 (MT/Yr)
1	Iron Ore/Pellet	Sponge Iron	4,64,753	4,88,867
2	Coal	Sponge Iron	3,10,531	3,07,708
3	Dolomite	Sponge Iron	6,240	6,571
4	Manganese Ore	Si-Mn/Fe-Mn	47,403	51,094
5	Dolomite	Si-Mn/Fe-Mn	508	202
6	Coal	Si-Mn/Fe-Mn	11,359	10,570

7	Coke (LAM + MET)	Si-Mn/Fe-Mn	10,556	11,692
8	Fe-Mn slag	Si-Mn/Fe-Mn	25,835	3,863
9	Iron Ore/Pellet	Si-Mn/Fe-Mn	802	-
10	Quartz	Si-Mn/Fe-Mn	8,633	6,616
	Manganese Ore Slag	Si-Mn/Fe-Mn		31,871
11	Coal	CFBC	38,594	35,625
12	Dolochar	CFBC	40,124	40,858
13	Sponge/Pellet	MS Billet	82,706	1,81,665
14	Pig Iron	MS Billet	15,018	26,130
15	Scrap	MS Billet	12,651	26,860
16	Iron Ore	MS Billet	23,577	37,654
17	Si-Mn	MS Billet	216	-
18	Slag Metal	MS Billet	2,229	7,025
19	Skull Scrap	MS Billet	324	1,376
20	Anthracite Coal	MS Billet	277	-
21	MS Billet	Steel Flat & Rolled Product	90,246	2,00,917

PART-C
POLLUTION DISCHARGED TO ENVIRONMENT/ UNIT OF OUTPUT
(PARAMETERS AS SPECIFIED IN THE CONSENT ISSUED)

Sl No	Pollutants	Prescribed Standard (mg/l)	Quantity of Pollutants discharged (mass/day)		Concentration of Pollutants discharged (mass/volume)		Percentage of variation from prescribed standard with reasons
a)	Water	Standard norms (mg/l)	Kg/day		mg/lit		
			FY: 2023-24	FY: 2024-25	FY: 2023-24	FY: 2024-25	No deviation. All values are within the standard norms. No effluent discharge from the plant
	pH	5.5-9.5	8.20	6.54	8.20	6.54	
	Total Suspended Solids (TSS)	100	0.36	0.13	23.83	8.50	
	BOD	30	0.19	0.13	12.72	8.93	
	COD	250	0.78	0.43	51.83	28.86	
	Oil & Grease	10	0.04	<1.4	2.73	<1.4	
b)	AIR PM emission from Stack of	Prescribed Standard (mg/Nm^3)	Kg/day		mg/Nm^3		No deviation. All values are within the standard norms as pollution control equipments are maintained properly
			FY: 2023-24	FY: 2024-25	FY: 2023-24	FY: 2024-25	
	DRI 350 & 600 TPD attached with common stack through WHRB	30	121.05	202.84	20	21	
	DRI product separation house (attached with common stack)	30	40.69	41.09	22.50	18	
	DRI 350 TPD Cooler Discharge	30	11.72	-	16	-	
	DRI 360 TPD Cooler Discharge	30	9.75	12.30	11	15.50	
	Ferro Division (2x9MVA)	30	34.11	33.21	15	19	
	CPP CFBC Boiler	30	48.48	40.03	22	24	
	SMS	30	57.11	108.68	6.50	14.33	

PART-D
HAZARDOUS WASTES

(AS SPECIFIED UNDER HAZARDOUS WASTES (MANAGEMENT, HANDLING AND TRANS BOUNDARY MOVEMENT RULES, 2008)

The industry got consent for operation very recently and the process for getting the authorization as per Hazardous & Other Wastes (Management and Transboundary Movement) Rules, 2016 is under process.

PART-E
SOLID WASTE

Sl. No.	Solid waste	Total Quantity Generated	
		FY: 2023-24	FY: 2024-25
E-1: Generation from process			
1	Dolochar from DRI	40,124	40,858
2	Silico Manganese Slag	24,356	20,751
2	SMS Slag	17,937	29,540
E-2: Generation from Pollution Control Equipments (Tonne/year)			
1	DE dust from DRI	15,284	15,652
2	Ash	35,196	32,488
E-3: Quantity Recycled/Reutilized within the unit (Tonne/year)			
1	Dolochar from DRI	40,124	40,858
2	Ash	5,279	4,873
3	DE dust from DRI	13,194	13,460
4	SMS Slag	2,554	4,136
E-4: Quantity Sold (Tonne/year)			
NIL			
E-5: Quantity Disposed			
1	Si-Mn Slag	24,356 (Land filling)	20,751 (Land filling)
2	SMS Slag	15,383 (After metal recovery used in land filling)	25,404 (After metal recovery used in land filling)
3	DE dust from DRI	2,090 (Land filling)	2,191 (Land filling)
4	Ash	29,917 (Land filling)	27,615 (Land filling)

PART-F
Characteristics of Hazardous as well as Solid wastes and their method of disposal

Hazardous/ Solid Wastes	Characteristics	Method of disposal
Used oil	Oily	Sale to authorized recycler

PART-G
Impact of the pollution abatement measures taken on conservation of natural resources and on the cost of production

1. Roof top rain water harvesting is being implemented at the beginning of the construction stage.
2. Dolochar generated from DRI process is being/will be reused in CFBC for generation of power
3. Waste heat of DRI plant is being used to generate power through waste heat recovery boiler.
4. Highly efficient pollution control equipments have been installed at all the operation units.
5. Raw material handling systems are equipped with efficient Dust suppression control measures.

6. Pollution dust generated from coal handling system is reused in power plant.
7. All pollution dust pneumatically conveying to a designated hopper to minimize fugitive dust.
8. Raw materials & products are conveying under fully covered condition.

PART H

Additional measures/ investment proposal for environmental protection abatement of pollution, prevention of pollution

Environment Budgets (Planned Vs Actual) for FY 2024-25

Sl. No.	Item	Expenditure (Lakh(s) INR) Year-2024-25
1	Recurring cost for environmental protection during FY 2023-24	160.42
2	Installation of Water Supply System from Effluent Treatment Plant (E.T.P.)	12.54
Total		**172.96**

PART I

Any other particulars for improving the quality of the environment.

1. More than 90% internal roads are concreted and around 80% of area where heavy vehicle movements are not envisaged are paved to minimize the fugitive dust.
2. Water sprinkler has been installed to minimize the fugitive dust.
3. Housekeeping audit is being done each month for all units.
4. 33% area has been covered under plantation throughout the entire plant.

ACTION PLAN TO THE ISSUES RAISED DURING PUBLIC HEARING

<table>
<tr><th>S. No.</th><th>Name of the Person</th><th>Public comments/objections/ suggestions in brief</th><th>Response of the project proponent</th><th>Action Plan along with budgetary allocation</th></tr>
<tr><td colspan="5">AIR POLLUTION</td></tr>
<tr><td>1.</td><td>Mr. Jhantu Mandal, Village- Punahati, Jamuria</td><td>He requested to take necessary measures for abatement of air pollution.</td><td>The project proponent ensured to install modernized air pollution control devices for e.g. Bag Filter, ESP, Pug Mill, Telescopic Chute etc. in each and every dust generation point. The project proponent also ensured that the entire road of the plant premises will be concreted or paved and the two number road sweeping machines will be engaged to clean the area and water sprinkling will be provided on inside and outside of plant premises.</td><td>In its existing plant, the industry has maintained appropriate measures to control air pollution. Efficient air pollution control devices like Electrostatic Precipitators for DRI Kiln & CFBC Boiler, Bag Filter for IF, SEAF & Product Handling Areas. WHRB has been installed to utilize heat getting generated from DRI that helps in emission reduction & energy conservation as well. Prescribed limits are being maintained diligently.
<table>
<tr><th>Stack</th><th>Limits (mg/Nm^3)</th></tr>
<tr><td>DRI Kiln</td><td>PM- 30</td></tr>
<tr><td>IF</td><td>PM- 30</td></tr>
<tr><td>LF</td><td>PM-30</td></tr>
<tr><td>SEAF</td><td>PM-30</td></tr>
<tr><td>CFBC</td><td>PM- 30
SO_2- 100
NOx- 100</td></tr>
</table>
Under proposed expansion, the industry shall maintain its air pollution control measures by installing efficient APCM (like ESPs & Bag Filters) for its proposed components. Dust conveying system will be installed in APC & sent to silo to control fugitive dust. Telescopic chute in product dispatch building, dry fog systems in raw material handling area, suction hoods, pug mill system etc. will be installed to control dust and fugitive emissions. Spark erecter, dust extraction system comprising of pulse jet bag filters will be installed to control particulate emissions from the rolling mills/induction furnace/ladle furnace and gas cleaning plant. To control dust & emission control from plant, approx. 40% of plant area i.e., 12.7 Hectares has been developed as green area. Additional 1.38 Ha. green area will be developed under proposed expansion.
COST ON AIR MANAGEMENT (EMP):
The company shall contribute Rs. 68 Crores (Capital) and Rs. 6.6</td></tr>
</table>

ACTION PLAN TO THE ISSUES RAISED DURING PUBLIC HEARING

				Crores per annum (Recurring) *Timeline*: 3 years post grant of EC **COST ON MONITORING**: Approx. 2.05 Crores (Capital) & Rs. 0.75 Crores/annum (Recurring) will be spent on environment monitoring. *Timeline*: Every year post grant of EC
EMPLOYMENT				
2.	Mr. Kali Das, Village - Damodarpur, Purbapar	He requested for employment of youth of nearby villages viz Damodarpur, Shekpur, Mandalpur etc.	The project proponent stated that regarding employment of local youth, first preference shall be given to the local youth based on their qualifications.	The existing manpower in the plant is 2003 persons (408 persons regular & 1595 persons contractual). Under proposed expansion, additional 727 no. of staff will be employed. Local employees will be given preference based on their educational qualifications and experience skills & capability. Total manpower after expansion will be 2730 persons (550 permanent and 2180 contractual). Local labours will be employed during construction phase. However, specialized training for operation and maintenance will have to be given to selected candidates well in advance before commissioning of the plant. In addition to this there shall be indirect requirement of manpower in transportation sector for transportation of raw material. The company shall provide industrial skill development training for local youth via Ramakrishna Mission in Damodarpur, Sekhpur, Akhalpur, Simultala. **COST ON CER (EDUCATION)-**Industrial skill development training for 15 students in Ramkrishna Mission: Rs. 1.35 Crores *Timeline*: 3 years post grant of EC
GROUNDWATER AVAILABILITY AND WATER MANAGEMENT				
3.	Mr. Kartick Majhi, Village - Damodarpur	He requested for one more portable drinking water tanker. He also requested not to draw ground water for plant operation.	The project proponent ensured that they will not draw any ground water during operation and the required water shall be drawn from River Damodar and	The industry shall not abstract groundwater for its project as it will be sourced from Surface Water (River Damodar) through Damodar Valley Corporation (DVC) and Asansol Municipal Corporation. The water is being/will be supplied from Damodar River near PHE Intake point, Damalia, Raniganj for the plant. The industry shall install cooled and purified drinking water tanks "Piau" (2 no.), submersible pumps (17 no.) and portable drinking water tank (1 no.) in Jadudanga, Sekhpur, Damodarpur, Bijpur, Mandalpur & Simultala for better availability of drinking water in

ACTION PLAN TO THE ISSUES RAISED DURING PUBLIC HEARING

			Asansol Municipal Corporation. Regarding portable drinking water at Damodarpur, PP shall ensure to provide more drinking water.	nearby villages. **COST ON CER (INFRASTRUCTURE DEVELOPMENT FOR DRINKING WATER):** Rs. 2.31 Crores *Timeline*: 3 years post grant of EC
4.	Mr Manik Hembram, Village-Shimultala	He asked what measures shall be taken for effluent water.	The project proponent ensured for zero liquid discharge; no plant waste water shall be discharged from plant premises. The project proponent is installing an effluent treatment plant for treatment of plant waste water and the treated water shall be re-used in plant premises.	The plant will be completely based on Zero Liquid discharge concept. Closed circuit cooling system is will be provided in the process & cooling of SMS & CPP plants. Hence there will not be any waste water generation from process and cooling. To cater to make-up water requirement of steam generator turbine cycle, water treatment plant is being proposed of capacity 1500 KLD. Sanitary sewage will be treated in STP of capacity 200 KLD. The treated effluent will be partly used for dust suppression, partly for ash conditioning and the remaining will be utilized on land for greenbelt development & maintenance. To conserve water, re-circulating water system is being/will be adopted. Fresh water will be required only as makeup to cover the losses in the process, evaporation, spillage system bleed off etc. There circulation system consists of pump house with sedimentation tank and cold well, hot and cold – water supply pumps, multi-cell induced draft cooling towers, duplex filters, necessary pipeline with valves fittings and instruments. **COST ON WATER MANAGEMENT (EMP):** Rs. 6.5 Crores (Capital Cost); Rs.0.1 Crores per annum (Recurring Cost)
CSR AND OTHER SOCIO-ECONOMIC DEVELOPMENTAL ACTIVITIES				
5.	Mrs. Rakhi Karmakar, Village -Mandalpur	She requested to continue the CSR activities along with infrastructure development of local schools.	The project proponent shall do necessary activities for upliftment of local schools and shall also provide school dress, school	The industry shall conduct renovation of Mandalpur Primary School & Nandi High School. Drinking water facility & modern toilet facility will also be installed in the schools. Moreover, the industry shall also install CCTV cameras along with computer and distribute student benches at Nandi High School. Community Hall for educational and social functions will also be established in Village Damodarpur.

ACTION PLAN TO THE ISSUES RAISED DURING PUBLIC HEARING

			bags, tables, chairs and other required arrangements in the school premises after discussion with the concerned authorities.	**COST ON CER (EDUCATION):** Rs. 1 Crores *Timeline*: 3 years post grant of EC
6.	Mr Prasanta Murmu, Village-Damodarpur	He requested for one more community toilet at their area and also requested for road repairing in their area.	Project proponent ensured to make more community toilets at Damodarpur and other nearby villages.	The company shall install several community toilets (3 closed toilets with 2 urinals) in Damodarpur, Akhalpur, Mandalpur, Ikra, Shekhpur Jadudanga, Bijpur & Benali. **COST ON CER (SANITATION):** Rs. 0.5 Crores *Timeline*: 3 years post grant of EC
7.	Mr Pintu Kr. Dutta, Village-Mandalpur	He requested for road light and road repairing in their areas.	-	The company shall repair of internal roads through paver blocks in Damodapur. Akhalpur, Sekhpur, Jadudanga, and Ikra. Highmast lights will be installed in several mores within Jamuria, Damodarpur, Ikra & Sarthakpur. Moroever, the company shall distribute 200 LED Lights for roads & solar streetlights (10 in each village) in Damodarpur, Sekhpur, Akhalpur, Simultala, Jamuria, Mandalpur. **COST ON CER (ROAD & CROSS DRAIN):** Rs. 2.31 Crores **COST ON CER (ELECTRIFICATION INCLUDING SOLAR LIGHTS)**: Rs. 0.9 Crores *Timeline*: 3 years post grant of EC
8.	Mr. Rajesh Sharma, Village-Jamuria	He requested to upliftment of age-old Vivekananda Library at Jamuria.	The project proponent ensured to provide all necessary assistance for upliftment of Vivekananda Library, Jamuria after discussion with the concerned authorities.	The company shall conduct upliftment of age of Vivekanand Library and donate books in Village Jamuria. **COST ON CER (UPLIFTMENT OF VIVEKANANDA LIBRARY**): Rs 0.5 Crores *Timeline*: 3 years post grant of EC

ACTION PLAN TO THE ISSUES RAISED DURING PUBLIC HEARING

9.	Mr Shandar, Chairman - Borough l	He requested them to continue the CSR activities and address the requests of villagers during public hearing.	-	The company shall provide Self Help Groups for conduction of trainings for Handicraft in Simultala, Damodarpur,Mandalpur**.** **COST ON CER (SUSTAINABILITY):** Rs. 0.41 Crores *Timeline*: 3 years post grant of EC
PLANTATION				
10.	Mr. Raju, Village-Jamuria Bazar	He welcomed the proposed expansion project and requested for more plantation in local areas outside the plant premises.	The project proponent ensured planation outside the plant premises. Project Proponent also invites the villagers to this program. The PP ensured to provide 5 saplings to each family of villages on occasion of Environment Day Celebration every year, for plantation.	The company will undertake community plantation of total 6850 no. of saplings in Damodarpur. Simultala, Sekhpur, Ikra, Mondalpur, Akhalpur & Jamuria. 2 no. of water tankers for watering of new saplings will also be provided. Environment Day Celebrations shall also be conducted every year. **COST ON CER (PLANTATION):** Rs. 1.67 Crores *Timeline*: 3 years post grant of EC
MEDICAL & HEALTHCARE				
11.	Mr. Prabhat Bannerjee, (Block President-INTTUC), Village-Jamuria	He appreciated for current CER activities and requested for medical facility for surrounding villagers through all facility based Mobile Medical Van.	Regarding the medical facility for surrounding villagers, the project proponent ensured to provide a mobile health facility van for villagers.	The company shall provide ambulance type mobile medical van for daily health checkup for surrounding villagers in Damodarpur, Sekhpur, Simultala, Jadudanga, Mandalpur & Ikra. Moreover, the company shall also provide medical equipments like X-Ray Machines, USG, ECG Kits, Blood Test Kits etc. in local health centres in Village Akhalpur. **COST ON CER (DEVELOPMENT OF HEALTH FACILITIES): Rs 1.90 Crores** *Timeline*: 3 years post grant of EC