EIA Study for Proposed MS Billets/ TMT Bars/Ingots plant 750 MTD At Gut No.30, Daregaon, Adjacent to MIDC, Jalna, Maharashtra

Submitted By
M/s. Bhagyalaxmi Metals Pvt. Ltd
At Gut No.30, Daregaon,
Adjacent to MIDC,
Jalna, Maharashtra

Prepared By
Mantras Green Resources Ltd.,
Hall No.1, First Floor, NICE Sankul,
Plot No. A-9, Opp.- Nashik Merchant
Co-op Bank Ltd.,ITI Signal, MIDC Satpur,
Nasik-422007

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1. INTRODUCTION

The company is registered under The Companies Act, 1956 and Government of Maharashtra has sanctioned the mega project and going to set up a steel manufacturing project. Now the proposed project by M/s. Bhagyalaxmi Rolling Mills Pvt. Ltd. is now taken over by the sister company M/s. Bhagyalaxmi Metals Pvt. Ltd.

Bhagyalaxmi Group was formed in year 2004. Shri Satish Agrawal, Shri Sunil Goyal, Shri Vishal Agrawal, Shri Nitin Kabra and Shri Praveen Goyal promoted the group. All the five promoters have background in different manufacturing activities like steel, cement, automobile, pharmaceuticals. They formed a group and started business under consideration.

The group formed the first company in year 2004 in the name of M/s Bhagyalaxmi Steel Alloy Private Limited. This company manufactured MS Billets which are used in Iron and steel industry to manufacture flat bars, round bars, angles, channels, beams, etc. The commercial production of the unit was started in July 2005.

The unit was set up at plot no G8 Additional MIDC Phase II at Jalna. The installed capacity of the plant was 750 MTD of M. S. billets. Amongst the ten steel plants in Jalna this was the first plant to manufacture billets in place of Ingots. At present all the Ingot plants are converted to Billet plants. Thus a new trend in the industry was set by Bhagyalaxmi.

The group started next business by forming a partnership venture in the year 2006. This firm was named as Shaswati Infrastructure. The firm is involved in the business of automatic cutting and bending of Steel Bars. The machine and technology used at this unit was imported from Korea. After TISCO this unit was first cutting and bending unit in India. Now there are about 50 similar types of units in India which provide ready to use shapes as per customer designs and requirement.

Another new business was started by forming Private Limited Company named of Bhagyalaxmi Rolling Mill Pvt. Ltd. This business activity was forward integration of existing MS Billets manufacturing plant at G-8. The company was formed in year 2004. However actual activities in this company were started in year 2007. The commercial production of this unit was started on 8th February 2008 with an installed capacity of 90000 MTPA TMT/QST bars. This unit was approved as Mega Project by the State Government of Maharashtra under its scheme known as Package Scheme of Incentive 2007. Thus this plant is entitled for subsidy from state Government to the limit of Capital Investment up to Rs. 10300.00 lacks.

The fourth business of the company is in the form of M/s Bhagyalaxmi Metals Pvt. Ltd at Chandrapur. This company was formed in 2004. However activities in this company have been started in 2010. This company had purchased MIDC land of 3 lacs sq. mtrs. It has plans to start an integrated plant of Sponge Iron and power. Now this proposal is transferred to new location at Jalna and is still at proposal level..

In January 2011 M/s Bhagyalaxmi Rolling Mill Pvt. Ltd. purchased all the assets of M/s Bhagyalaxmi Steel Alloy Pvt. Ltd. This decision was taken as to reduce the legal complications, cost reduction and manpower management. And then presently the project name is changed from

M/s Bhagyalaxmi Rolling Mill Pvt. Ltd. to M/s. Bhagyalaxmi Metals Pvt. Ltd. but all the project details are the same as they were previously. Thus presently both the units manufacturing Billets and TMT bars are under one roof of M/s. Bhagyalaxmi Metals Pvt. Ltd.

1.1 Location:

Registered office of Bhagyalaxmi Rolling Mills Pvt. Ltd is located at: 603, Laxmi Villa, Opp. Kala Hanuman Temple, MG Road, Kandiwali (W) Mumbai-400067.

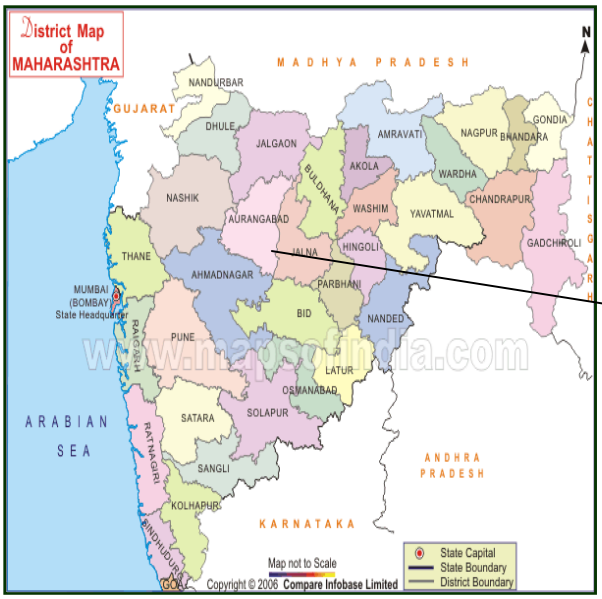

Fig 1. Map of Maharashtra

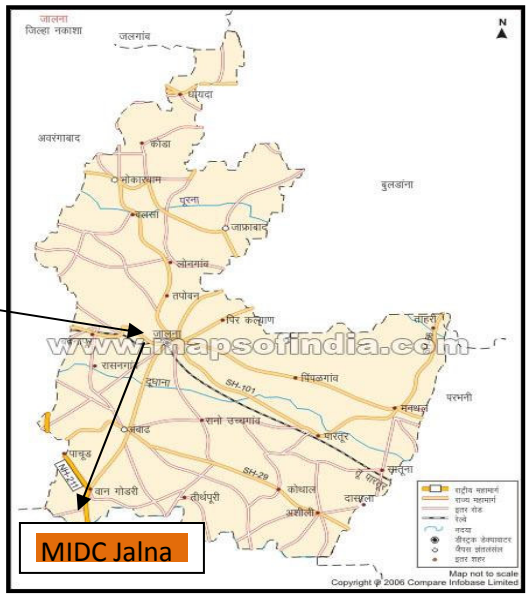

Fig 2. Map of Jalna District

Proposed project will come up at existing location in **Gut No. 30, Village Daregaon, Adjacent to Addl MIDC Phase II, Jalna in the state of Maharashtra.**

Latitude	**19°56'31.59" to 19°56'46.81" N**
Longitude	**75°50'09.34 to 75°50'14.58"E.**
Nearest village	**Daregaon**
Nearest State highway	**Mumbai Aurangabad Nagpur highway**
Nearest railway station	**Jalna in SCR 6 km from site**
Nearest airport	**Aurangabad 60 km from site**
Nearest river	**Kundalika at 5.5 km from site**
Nearest Talao	**Moti Talao 2 Km from site**
Nearest town	**Jalna**
Forests, archeological sites, defense installations	**Nil within 10 km of area**

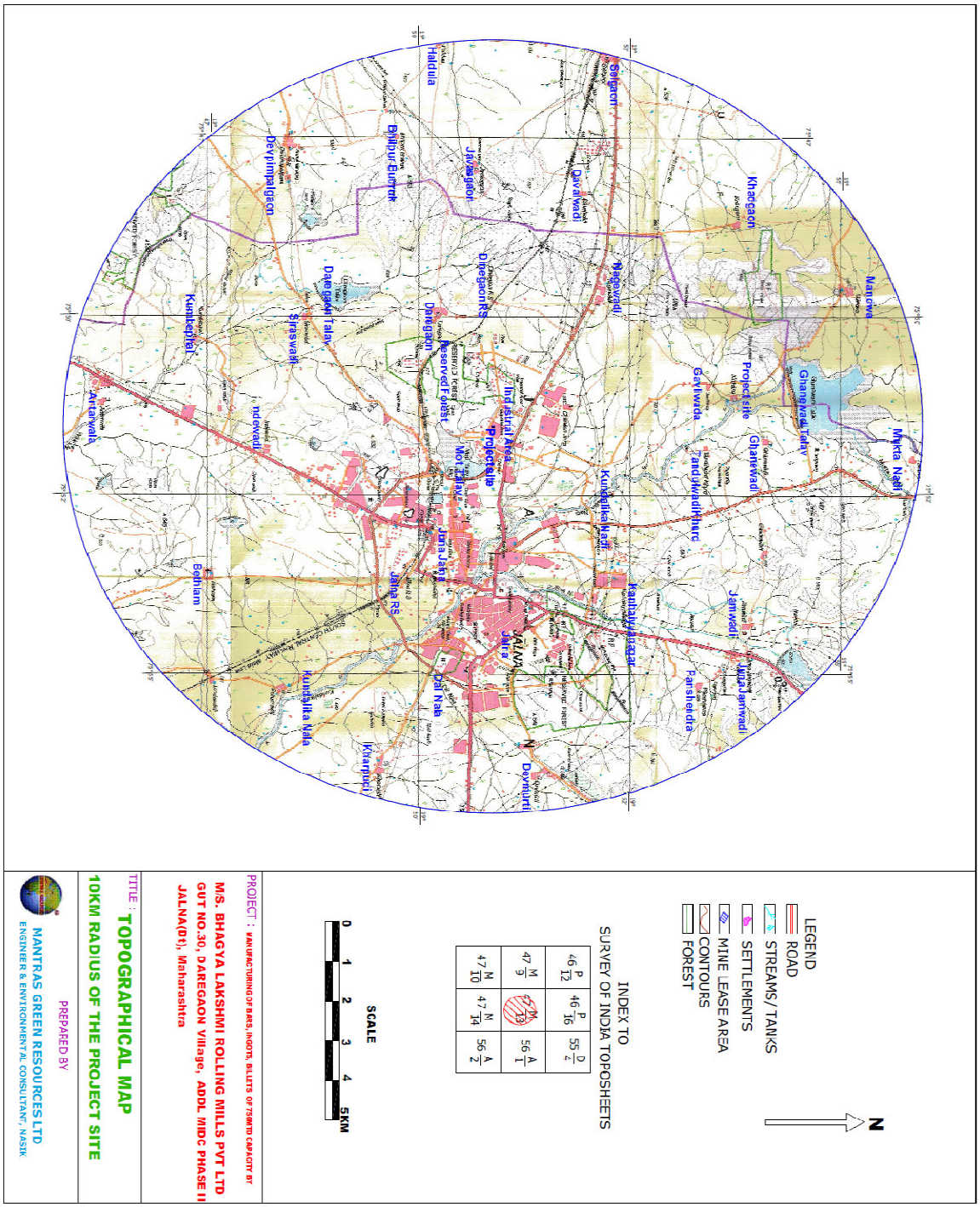

Fig 3. Topographical Map of Project Site

Fig 4. Google Image of Project Site

1.2 Site selection

This site has been selected based on following criteria:

It is an existing site where rolling mill is already installed. Present rolling mill uses billets manufactured at G8 to produce TMT bars. Billets are cooled and transported to this site for onward processing.

Installation of furnaces at this site will not require transportation of billets from G-8 to Gut No. 30.

Installation of furnaces at this site will not require reheating of billets.

The existing reheating furnace and producer gas plant will not be required.

2. Type of Project

Under EIA Notification, S.O. 1533 dated 14th September, 2006 and it's subsequent amendments under Environmental (Protection) Act (EPA) 1986, prior environmental clearance is mandatory for the establishment of secondary steel project. Secondary steel projects are categorized under item no 8 of schedule of activities and require environment clearance from SEAC/SEIAA as they fall in category "B" under the schedule.

These activities are listed at Sr. No. 8 of Schedule of EIA Notification, 2006 under Category 'B' and have to be appraised at SEAC Mumbai. Since the project is not located in the MIDC but outside it at Gut no 30 in village Daregaon, it will require a detailed environmental impact assessment report supported by public approval before the project is cleared for implementation.

Hence the project is classified in activity 8 under B-1 category.

Present EIA report is prepared to assess impacts due to proposed installation of two numbers 30 MT/heat capacity of induction furnaces and installation of continuous concasting unit to produce 750 MT/day of TMT bars, on the environment and obtain approval from public and SEAC for the proposal.

TMT Bars

The manufacturing facility for TMT bars is situated at Gut No.30 Daregaon, Jalna with capacity 25,000 MTM. TMT bars of following sizes are produced at the unit.

TMT bars of the company are sold under the Brand Name of '**POLAAD'** which is registered under Trade Mark Act 1999. The product is also registered for ISI trademark with Bureau of Indian Standards. ISI mark and POLAAD 500 QST is embossed at every one meter on each size. The grade manufactured is Fe 415, Fe 500, Fe 500 D, Fe550, Fe550 D

Raw material (Billets) to manufacture TMT bars is obtained in house from BMPL plant at Plot No. G-8 Additional MIDC Jalna. This plant is located adjacent to proposed unit at Gut No. 30 Village Daregaon, Jalna.

TMT Bars of different sizes

Segment	**Size**
TMT Bars	
	8 mm
	10 mm
	12 mm
	16 mm
	20 mm
	25 mm
	28 mm
	32 mm
TMT Bars – Cut and Bend	As per customer design

The proposed expansion will involve:

1. Addition of a two new induction furnaces of capacity of 30MT per heat
2. Installation of new Continuous Casting Machine of 2 stand 6/11 radius.
3. Provision of Scrap yard in order to store, segregate and process the scrap

4. Augmentation of the existing utilities and services to support the induction furnace and associated utilities.

2.1. Project Cost Estimate:

The cost estimate for the proposed backward integration to install two sets of 30 MT/heat furnace is given below:

Sr. No.	Account Head	Amount in Rs. Cr
1	Installation of 30 MT/heat furnaces and associated utilities	162.00
2	**Total Project Cost**	**162.00**

2.2. Need of Project:

At this location - gut no.30 at Daregaon, BMPL has only a rolling mill without a billet manufacturing unit. Billets are the raw material for manufacture of TMT bars which are made after passing red hot billets through rolling mills.

At present billets are being made at G-8 owned by PP. Billets manufactured here all cooled for transportation. These are shifted to gut no 30 owned by PP where rolling mills are installed. This involves transportation activity by road.

Further billets are to be made red hot before these can be rolled. For this a coal fired reheating furnace is used. It involves firing of coal to produce producer gas which is burnt in reheating furnace to heat billets. Products of combustion are emitted by a chimney to atmosphere. Reheating of billets increases cost of production of steel.

The installation of induction furnace at gut no 30 will:

Eliminate use of reheating of billets.

Eliminate billets transportation.

Reduce pollution.

Reduce cost of production of TMT bars.

3. Raw material:

Raw Material used for MS Billet plant is MS Scrap and Sponge Iron. Source of MS scrape are Industrial and House hold waste generated at Pune, Mumbai, Aurangabad, Satara, Sangli and Kolhapur. Apart from inland Scrap Bhagyalaxmi Imports Scrap from Dubai and European countries. Sponge Iron is produced at Billary in Karnataka and in State of Orissa and MP. Both Scrap and Sponge Iron are available in required quantity.

3.1 Power required:

Company has a source of power from Maharashtra State Electrical Distribution Company Ltd. The power supplied to the company from a special line called "expressed feeder" which provides undisturbed power connection. Company has two separate connections one for Billet Plant and other for Rolling Mill. The table given below will illustrate the power connection at present and power connection after expansion.

Table No. 1
Power Connection Load

Unit	Present Connected Load	After Expansion Connected Load
Billet Plant	Nil KW	20000 KW
Rolling Mill	4500 KW	4500 KW

3.2 Water:

The water is required in the project for cooling tower circulation, cooling of all mill stands and also for TMT bars production. Water is also required for effective dust suppression system, domestic use and gardening.

4. Magnitude of Operation:

The following points indicate all facets of proposed project to elaborate magnitude of project operation.

Table No. 2
Magnitude of Operation

Sr. No.	Facet of operation	Magnitude	Unit
A.	**Existing capacity (TMT bars)**	**25000**	**MTM**
C.	**Existing furnace**	**Nil**	
	Proposed furnace 1 + 1	**30**	**MT / Heat**
D	**Total area of plot**	**36400**	**M^2**
	Reserved area for project	**3450**	**M^2**
E.	**Present investment**	**41**	**Crore**
	Proposed addition in investment	**120**	**Crore**
F	**Existing manpower**	**260**	
	Proposed increase in manpower	**150**	
G	**Present power consumption**	**4500**	**KW**

	Proposed increase in power consumption	**20000**	**KW**
H	**Present water requirement**	**57**	**CMD**
	Proposed increase in water need	**155**	**CMD**
I	**Present raw material requirement**		
	Scrap	**300**	**MTD**
	Sponge iron	**490**	**MTD**

4.1 Technology and Process Description

Billets:

Billets in various sizes and length are required by the consumer. These are used for manufacturing of construction bars and equipment castings. Construction Bars of various sizes as per length required by the consumer. These are very widely used for construction of house, large Buildings, Bridges, Dams, Irrigation projects, Transmission Lines Tower etc.

Procurement and Segregation of Raw Material at Scrap Yard

Billets are manufactured by using steel scrap and Sponge Iron. Steel scrap is available in various forms like castings, punchings, forgings, turnings, and scrap for press bundles as collected by various scrap dealers across the country. Imported scrap is also easily available.

Scrap required is easily available from own state as well as neighbouring states of Gujarat, Andhra and Karnataka. Sponge iron is available from Ballary in Karnataka.

All the above scrap is segregated at scrap yard. In the scrap yard specific areas are demarcated for storing particular quality of scrap.

4.2 Billet Plant:

i. **Raw material Processing:-**The main raw material used is Sponge Iron/DRI. In addition to this, casting and some selected Industrial end cuts such as punching, etc. are used in predetermined proportions. These different raw materials are graded and stored in very large yard. The Selected raw material sample is first added into the lab furnace and melted. The sample's chemical composition is analyzed in the in-house spectrometer and C & S apparatus.

ii. **Melting Process:-**The core-less induction furnace used for melting is composed of a refractory container capable of holding the molten bath which is surrounded by water cooled helical coil connected to a source of alternating current. The furnace lining is made up of silicate and is capable to withstand the slag generated of mild steel/ any plain carbon steel that is acidic in nature.

    After melting, the furnace is tilted to remove the slag and other impurities that come to the surface of molten metal.

    Additional of Micro alloying Elements:- Micro alloying elements are added for refining the molten metal to achieve the desired level of composition. The molten metal is filled with

Aluminium, Ferro Silicon, and Ferro Maganese. If necessary, de-sulfurising and de-phosphorising is also done to remove all the gases present in the molten metal.

During melting and while addition of micro alloy elements, process samples are taken out and chemically analyzed till accurate and desired chemical compositon is achieved.

iii. **Ladle Purging Process:-** Purging is done to the molten metal tapped to the laddle to achieve homogeneous chemistry and temperature throughout the ladle.

In order to avoid thermal undesirable varying steel compositons, gas purging is done. Purging is conducted by generating both turbulence to retain thermal homogeneity. This process also helps in removing excessive non-metallic inclusions.

iv. **Contineous Casting Process:-** After Purging, the ladle is taken to Contineous Casting set up where it is placed on the "Tundish". The material then passes from ladle to tundish and then tundish to moulds.

Liquid steel is contineously poured into the mould to replenish the withdrawn steel at an equal rate. The withdrawal rate depends on the cross section, grade and quality of steel being produced and may vary between 12-300 per minute. Casting time is typically 0.9-1.2 hours per heat to avoid excessive ladle heat losses.

Upon exiting the mould, strand enters a roller containment section and secondary cooling chambers in which the solidifying strand is sprayed with water or mist for solidification. This area preserves cast shape integrity and product quality.

4.3 Rolling Mill:

i. Reheating Process: - Reheating is the process of heating the billets up to the re-crystallization temperature **(1150^0C)**. The re-crystallization temperature is very important because at this temperature the rolling process can be started effectively without destroying the bonding. The fuel used for reheating is producer gas. Producer gas is generated by gasification of solid fuels like coal or biomass in the gasifier. Reheating with the use of producer gas is very eco-friendly and ensures uniform temperature of Billet from one end to other. Billets are pushed into reheating furnace with the help of pusher and then heated to temperature of **1150^0C.**

Reheating will not be required once plant has own induction furnace.

ii.Rolling Process:- Once the billets achieve the desired rolling temperature, they are outside taken out of the furnace. These billets are passed through the first stand (known as roughing stand) with rolling conveyor. Here, the process of gradual size reduction of billets is started. After roughing mill, the size is further reduced in intermediate and finishing Mills. Gradual reduction ensures finer grain structure of the bars. The rolling continues till the required size is obtained. Roller bearings fitted on the Roll Neck prevent any unnecessary deformation of the bars. The loop scanner in the flow of the bar ensures tensionless rolling process so as to achieve perfect round shape of the bars. The surface characteristics are finalized in this section only.

iii.Quenching Process :- In order to impart strenghth to deformed Mild steel bars that have a natural strength of @ 250-300 N/mm^2 **'Controlled Quenching Process'** is performed. The bar after leaving the last rolling mill is fed to a quenching box at very high speed. In this box rapid controlled water quenching is done reducing the temperature of surface drastically from **950^0 C**

to **300^0 C.** Due to higher speed, only outer portion of the bar (case) gets quenched while the inner part (core) remains hot. The case due to rapid quenching gets converted in martensite form. The micro- structure is fine grained Ferrite-Pearlite structure at the Core and martensite case. Then the bar is cut with automatic flying shear and fed to the cooling bed.

iii.**Self Tempering & Normalizing Process:-** At cooling bed, the core that is still hot transfers heat outside to the case thereby tempering it. Due to this self tempering the martensitic case becomes Tempered Martensite which has more strenghth and very high corrosion resistance properties. Quenching as well as self tempering lead to typical micro-structure of QST bars, i.e.fine grained Ferrite-Pearlite structure at the Core (Soft) and Tempered Martensite Case (Hard).

Subsequently, Normalizing process starts where the bar cools down in atmospheric temperature and gradually attaining the same

iv.Quality Control and Inspection Process:- Samples form cooling bed are collected frequently at regular intervals and then treated for different paramaetrs as per IS 1786. The results are recorded and test certificate is provided to customer for every lot. The material is disposed to dispatch yard only after the approval from Quality Control Department

v.Cutting , Packing, Storage and Dispatch :- Once the bars are cooled, they are cut into desired lengths (standard cutting length being 40 fts) by means of cool shear. Different sized bars are then packed in intact sealed bundles with plastic strips. Subsequently, these bundles are stored in Finished Goods Yard according to their Grades, Sizes, Lot No. Or any other distinguishing factor. The material is now ready for dispatch.

vi. Analysis of chemical composition

Every heat sample is checked using spectrometer. It is possible to check presence of 18 elements. Accurate desired chemical composition is achieved by using spectrometer.

PROCESS FLOW CHART

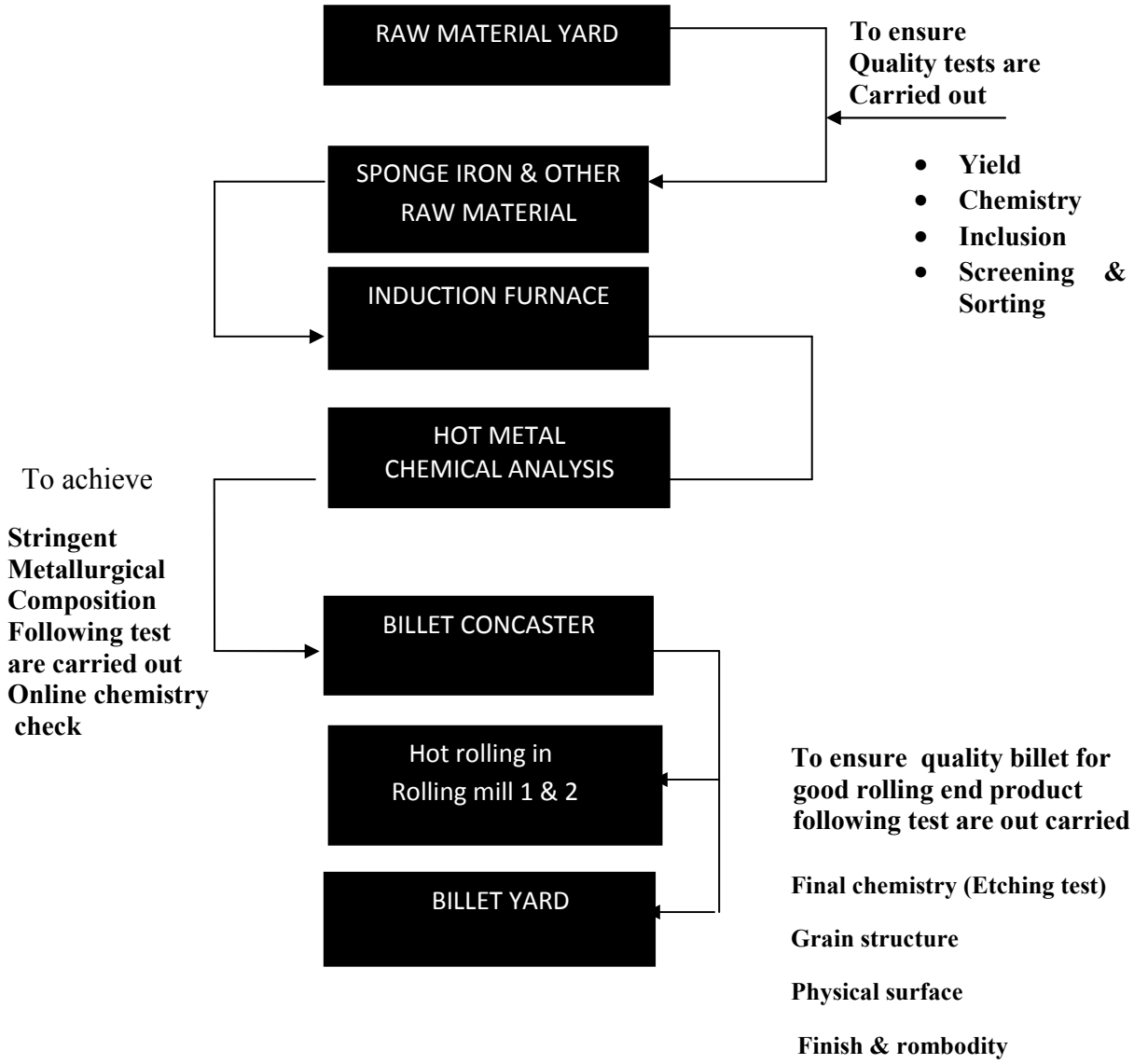

Fig 5. Process Flow Chart

5. Present Base Line Conditions

PM_{10} concentration was observed to be below the stipulated standards for residential, rural or mixed area (rural and residential) as well as in for industrial area ranged from 60– 88 µg/m³ during winter season (Standard Limits for PM_{10} is 100 µg/m^3).

$PM_{2.5}$ concentration was observed to be vary from 38 to 56 µg/m³ and observed below the stipulated standards limits ($PM_{2.5}$ = 60 µg/m³).

Concentrations of SO_2 and NOx were recorded as 4-10 µg/m³ and 12-49 µg/m^3 were below the stipulated standards of (80 µg/m^3) respectively.

Carbon monoxide varied from 1.17 to 3.39 mg/m^3 in the study area and was below the stipulated standard of (4.0 mg/ m^3) 24 hourly sampling.

Major contributors for PM_{10}, are due to transportation activity and hauling on semi-permanent road network.

6. Mitigation Measures :

Sr. No.	Facets of Environment	Impact Mitigations
1.	Air	Fume extraction system with ventury scrubber will be provided complete with extraction hood, underground duct and extraction fan. Chimney height 35 m. Producer gas plant for reheating will not be required. Reheating furnace operation will not be required.
2.	Fugitives	Intermittent water spraying done on scrap, dust, and coal. Internal road paved, leveled, no diversions, no sharp curves, speed limits will be fixed inside plant. Green belt development in approximately 33% area.
3.	Waste water	No trade effluent. For domestic waste STP provided. Overflow water used for watering green belt
4.	Solid waste	Slag generated 40 MTD. Used for brick making or land filling.
5.	Noise	Ear muffs or other protective devices will be provided to the staff working in high noise prone area. Smooth roads, speed limits imposed within plant movement Trees plantation within the plant as well as around the boundary of the facility to mitigate noise pollution.

7. Raw material Requirement :

Raw material used for manufacturing MS Billets is MS Scrap and sponge iron. Source of MS scrape are Industrial and House hold waste generated at Pune, Mumbai, Aurangabad, Satara, Sangli and Kolhapur. Apart from inland Scrap BMPL imports scrap from Dubai as well as European countries. Sponge Iron is produced at Billary in Karnatka and also in State of Orissa and MP. Both scrap and sponge irons are available in required quantites.

Raw material required:-

Scrap	:	300 MT/day
Sponge Iron	:	490 MT/day
Total	:	790 MT/day
Slag	:	40 TPD

8. Draft Environment Impact Assessment Report :

MGRL was assigned the project of preparing environment impact assessment report for the proposal in light of background of existing rolling mill at Gut no.30 village Daregaon. Environmental impact assessment studies were conducted in an area covering 10 km radial distance from the center of project area which was identified as likely impact zone admeasuring 314 km².

The EIA study was carried out for each individual environmental component during winter season, (November 2016, December 2016 & January 2017)

MGRL established the baseline, studied the process requirement, raw material requirement, products generated, safety measures adopted, mitigation measures recommended and predicted impacts and suggested mitigation measures. Environment management plan was prepared and budget estimated. Post project monitoring plan was finalized to check predicted impacts are within line of control norms.

A draft EIA report was prepared and submitted for public hearing. After public hearing, the draft EIA will be modified and final EIA will be prepared incorporating public suggestions.

Final EIA will be discussed with SEAC/SEIAA Government of Maharashtra and final environment clearance will be obtained.

9. Environmental Management Plan:

The proposal involves installation, commissioning and operation of induction furnaces in the existing rolling mill unit which has reserved space for above activity.

Scrap melting with sponge iron generates fumes containing iron and other material fine dust. It is emitted at high temperature.

Fume extraction hood will be installed on a swing pivot through which the extraction duct will pass. The duct line shall be laid underground and it will be water cooled. The cooled fume and gases shall pass through a ventury scrubber followed by cyclonic shaped entrainment separator.

Water will be sprayed in the ventury scrubber and dust will be entrapped. Mixer of water and dust will be separated in entrainment separator.

The wet dust shall fall in RCC tank below filled with different grades of sand. Water will be filtered and used again to reduce fresh water requirement. Make up water will be added if circulation rate drops. The collected dust shall be manually removed in trolleys and will be reused.

Scrubber will be followed by an I D Fan of adequate capacity to extract fume. The outlet gased will be discharged through a chimney in the atmosphere.

The emission norms of 150 mg. nm3 from stack shall be maintained.

The extracted dust shall be transported to local brick making unit.

Water requirement will be mostly for cooling. Fresh water requirement will be reduced by use of air cooled cooling tower.

Blow down from cooling towers will be used for quenching process of TMT bars.

There is no effluent generation in the process.

A separate STP will be provided to treat domestic sewage. Treated sewage shall be used for gardening.

An elaborate plan of rain water harvesting is done to ensure unit fresh water requirement is reduced to minimum.

10. Environmental Monitoring Plan:

To ensure mitigation measures are effectively working a post project environment plan has been worked out as below:

Table No. 3
Environmental Monitoring Plan

Parameters	Sampling Location	Frequency
Ambient Air Quality	1 sample in upwind direction and 2 samples at downwind direction (500 m and 1000 m)	Once in 6 months
PM_{10}, $PM_{2.5}$, SO_2, NOx	Sampling port of Stack (Flue gas and flow rate)	Once in 6 months
Ground Water	Not recommended	N.A.
Surface Water	1 location upstream and 500 m down stream of river Dudhana and 1 location at Moti Talao	Quarterly
Wastewater	Final Discharge point at project site	N.A.
Soil	At plant location and in villages. agricultural fields in downwind direction	Pre and Post Monsoon

11 . Budget Allocation for EMP :

The EMP cost is bifurcated in two different parts i.e. EMP budget when molasses as feedstock and other is when grain is used as feed stock.

Table No. 4
EMP Budget

Sr. No.	Particulars	Capital Cost	Annual Recurring Cost
		Rupees in lacks.	
1	Air pollution control system consisting of swinging extraction hood, water cooling system, ventury scrubber, entrainment separator, I D fan and chimney.	80.00	6.20
2	Sewage treatment plant	12.50	4.40
3	Slag collection and disposal		
4	Rain water harvesting	28.00	6.00
5	Environment monitoring		
6	Remuneration of environment cell staff	22.00	6.00
7	Occupational health and safety		
8	CSR activity	100.00	50.00
9	Green belt development	6.00	1.00
	Total	**248.50**	**73.60**

There will be a separate cell that will ensure regular inspection and maintenance of pollution control systems, statutory approval, waste treatment and disposal including stack emission etc.

12. Occupation Health and Safety:

During the construction and operation phases there are chances of major or minor accidents at the project site

All the workers will be provided with helmets, goggles and safety equipments, welder equipments for eye and face protection, ear plug, ear muffs, dust masks, safety belt, hand gloves, and safety shoes along with safety instructions in the form of manual and first-aid facilities will be made available.

During operation, workers working in hot zone will be provided with heat resistant aprons, gloves. Resting shed shall be provided to enable them take rest outside the hot zone.

There shall be regular medical check up of the workers.

Adequate safety precautions shall be exercised strictly for observing safety norms.

13. Conclusion:

The proposal of project proponent to install induction furnace at their own rolling mill plant is in the interest of environment.

Transportation of billets from plot G-8 to Gut No.30 Village Daregaon will be avoided.

The reheating operation of billets can be eliminated

The coal fired producer gas type reheating furnace operation will be avoided.

PP plans to install air cooled cooling towers to reduce cooling tower losses.

Water use will be minimum. There will be no effluent generation.

An excellent rain water harvesting system has been installed to reduce fresh water consumption.

A state of art dust extraction and collection system has been proposed to reduce air pollution and maintain stack emission norms.

Ambient air quality shall be maintained.

Adequate safety precautions, workers welfare and environment friendly operation has been ensured.

Hence the proposal deserves environmental clearance.