

# Executive Summary

of

Proposed Installation of Induction Furnace, Rolling Mill & Submerged Arc Furnace for production of Ingots, Billets 5,00,000 TPA, TMT & Long product : 5,00,000 TPA and Ferro alloys 25,000 TPA respectively  
(In addition to Existing 3,24,000 TPA Sponge Iron Plant, 0.216MTPA Coal Washery & 25 MW Power Plant)

Project by  
M/s Lloyds Metals and Energy Limited.  
At Plot A-1 and A-2, MIDC Area, Ghugus, Chandrapur,  
Maharashtra.

Environmental Consultant  
Pollution and Ecology Control Services  
Accreditation no.: QCI/NABET/ENV/ACO/20/1530

## EXECUTIVE SUMMARY

### 1.0 INTRODUCTION

The proposed project attract the provisions of EIA Notification, 2006 and falling under Category A of Schedule, 3 (a) Metallurgical Industries (Ferrous and Non-ferrous). The proponent made online application on 24<sup>th</sup> June 2019 along with Form-1, Pre-feasibility report and other documents for proposing Terms of Reference (TOR) for undertaking detailed EIA study. The proposal was appraised in the 13<sup>th</sup> Meeting of Re-constituted EAC (Industry-1) held on 27<sup>th</sup> to 29<sup>th</sup> November, 2019 and the committee recommended the ToR for undertaking EIA study for proposed project of Installation of Induction Furnace, Rolling Mill & Submerged Arc Furnace for production of Ingots, Billets 5,00,000 TPA, TMT & Long product 5,00,000 TPA and Ferro alloys 25,000 TPA respectively at Plot No. A-1 and A-2, MIDC Area, Ghugus, Chandrapur, Maharashtra. Accordingly, the Ministry prescribed ToR vide letter No. J-11011/243/2019-IA.II(I) dated 10.02.2020 for the proposed project.

#### Project at a Glance

Sr. No.	Description	Details		
1	Nature of the project	Installation of Induction Furnace, Rolling Mill & Submerged Arc Furnace for production of Ingots, Billets 5,00,000 TPA, TMT & Long product : 5,00,000 TPA and Ferro alloys 25,000 TPA		
2	Proposed Products	Sr. No	Product	Quantity
		1	M.S. Billets/Ingots (6X30T)	500000 TPA
		2	TMT & Long Products	500000 TPA
		3	Ferro Alloys (2X9MVA)	25000 TPA
3	Raw Material Requirement	M.S. Scrap : 144000 TPA Sponge Iron : 396000 TPA (resourced from our DRI plants at Ghugus and Konsari Dist Gadchiroli) Molten Billets for Hot charged : 500000 TPA Manganese Ore: 52500 TPA Coke : 15000 TPA Electrode Paste : 750 TPA Quartz : 2000 TPA Dolomite : 750 TPA Ferro Manganese Slag: 15000 TPA		

4	Water requirement	The total water requirement will be 260 KLD Source : Wardha River. The application letter for renewal of agreement signed with Irrigation Department, Chandrapur for supply of water attached as <b>Annexure II</b> .
5	Power requirement & Source	The power required for the proposed project will be 35 MW which will be sourced from own power plant & MSEDCL.
6	Land for proposed plant	Total Land in Possession: 93.52 ha (A-1 is 4.00 Ha & A-2 is 89.52 Ha).
7	Total manpower after commissioning of the unit.	The proposed project creates employment for 750 people.
8	Estimated Cost of the project	Total cost of the project Rs. 760 Cr.

<b>2.</b>	<b>Location Details</b>	
i.	Plot no.	At Plot A-1 and A-2, MIDC Area, Ghugus, Chandrapur, Maharashtra
ii	Village	MIDC Area, Ghugus
iii	Tehsil	Chandrapur
iv	District	Chandrapur
v	State	Maharashtra
vi	Co-ordinates	Boundary Co-ordinates: A: 19°56'29.54"N 79° 6'58.36"E B : 19°56'29.52"N 79° 7'3.04"E C: 19°55'29.26"N 79° 6'56.26"E D: 19°55'29.54"N 79° 7'2.05"E E: 19°55'37.71"N 79° 7'18.27"E F: 19°56'0.20"N 79° 7'25.25"E
vii	Toposheet No.	56 M/1, 55 P/4
viii	Elevation above MSL	189 m
ix	Nearest Highway	SH:6, 1.0Km(N)
x	Nearest Airport	Nagpur Air Port, 127Km(N)
xi	Nearest Railway Station	Ghugus Railway station - 2.0 Km
xii	Nearest Village	Ghugus, 0.5 Km (N)
xiii	Forest	Pardi Reserved Forest (6.0 Km (SW)) Distance from Existing Boundary of Tadoba Wildlife Sanctuary : 25.5 km Distance from Proposed Boundary of Tadoba Wildlife Sanctuary as per Notification dated 13 <sup>th</sup> July 2018 : 17.5 km
xiv	Nearest major water body	Wardha River (2.5 Km (SW)) NirgudaNala (3.0 Km (SSW)) Penganga River (5.0 Km (SE)) Sarai Nala (6.5 Km (NE))

xv	Major Industries within 10 km area	A.C.C. Cement (In operation) (3 million tonne per annum) Gupta Energy Power Ltd. (2 X 60 MW) (Not in operation), Western coalfield Ltd (WCL mines)
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## 2.0 PROJECT DESCRIPTION

The proposed project is for manufacturing of M.S. Billets, TMT Bars and Ferro Alloys. The existing projects for sponge iron manufacturing plant was accorded environmental clearance vide lr.no. Env (NOC)2005/747/CR.97/D.I dated 28<sup>th</sup> December 2005. The existing projects for coal washery environmental clearance was accorded vide lr.no. J-11015/272/2007-IA.II (M) dated 9<sup>th</sup> April 2008. The existing projects for waste Heat Recovery based captive power plant of 25 MW capacities environmental clearance was accorded vide lr.no. J-13012/123/07-IA-II dated 12<sup>th</sup> October 2009.

### Production Scenario

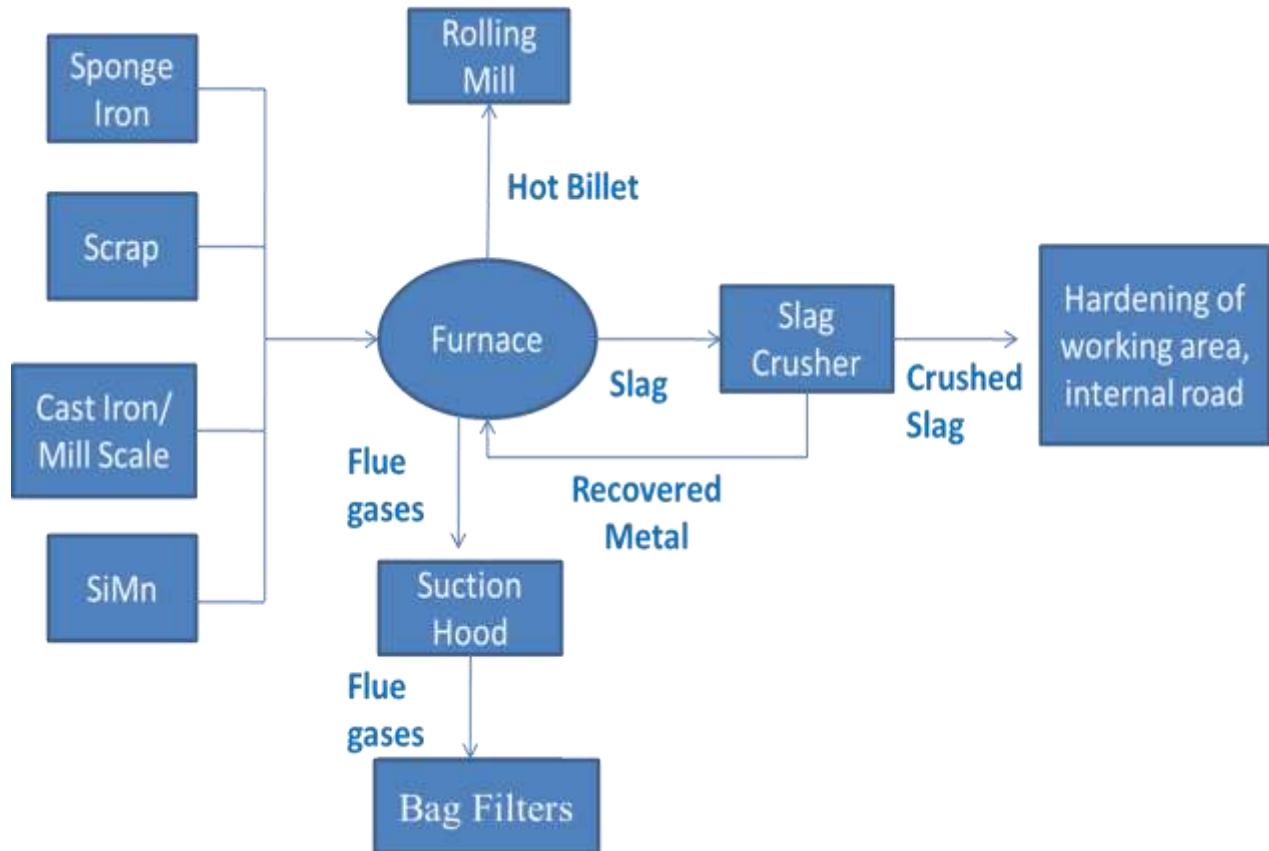
Name of unit	Existing Unit	Proposed Unit	Capacity of each Unit	Total Production
Sponge Iron	Sponge Iron	-	4 X100 TPD and 1x500 TPD	3,24,000 TPA
Coal Washery	Coal Washery	-	0.216 MTPA	0.216 MTPA
Electricity Generation	WHRB + AFBC	-	25 MW	25 MW
Ingots/ Billets	-	Induction Furnace	6 X 30 T	5,00,000 TPA
Hot rolled long product / TMT	-	Rolling Mills (2 Nos)	-	5,00,000 TPA
Ferro Alloys (Silico Manganese, Ferro Silicon, Ferro Manganese)	-	Submerged Arc Furnace	2X 9MVA	25,000 TPA

## PROCESS DESCRIPTION

### Manufacturing Process of M.S. BILLETS & TMT BARS

The induction furnace is used to melt many different sorts of metals, from common steel to more exotic alloys or precious metals. The greatest advantage of the induction furnace is its low capital cost, its easier installation, simpler operation, no noise generation and there is very little heat loss due to radiation from the furnace. The raw material (Sponge Iron, MS scrap, Ferro Manganese and Ferro Silicon) is charged into the induction furnace. As soon as the furnace is charged, the switches admitting power current to the induction coil are closed.

After the furnace is switched on, current starts flowing at a high rate and a comparatively low voltage through the induction coil of the furnace, producing an induced magnetic field inside the central space of the coils where the crucible is located. As the magnetic fluxes cut through the scraps and complete the circuit, they generate an induced current in the scrap which is known as eddy current, this eddy current flows through the highly resistive path of the scrap mix, generates tremendous amounts of heat and melting of scrap starts. Soon a pool of molten metal forms in the bottom causing the charge to sink. The induced current which is generated in the charge mixed and heated more homogeneously. As soon as the charge has melted clearly, any objectionable slag is skimmed off, and the necessary alloying elements are added. When these additives have melted completely, the power input may be increased to bring the temperature of metal up to the point most desirable for pouring. The current is then turned off and the furnace is tilted for pouring into a crucible. As soon as pouring has ceased the crucible is cleaned completely from any slag or metal droplets adhering to the wall of the crucible and the furnace is now ready for charging again. The temperature of the furnace will be 1650<sup>0</sup>C. When the total scrap as per the capacity of the crucible is molten, the sample is taken from liquid steel and tested for the composition of steel and the carbon contents. Therefore some additives of ferro-alloys like Silico-manganese, silicon, aluminum shots and are added to the liquid steel to maintain the composition and quality. The billets in the molten stage are transferred to rolling line for the production of TMT Bars bypassing the reheating furnace. The cooled TMT Bars are then inspected and dispatched. The process flow chart is presented in the **Figure**.



**Process flow Chart for Hot Billet Rolling**

#### **Advantages of Hot Billet Rolling Process**

- ❖ Energy saving is the main benefit as it consists in avoiding the normal cooling of the billet down to room temperature and the reheating for initiating the rolling. Thus the process is of less energy and more environmentally friendly.
- ❖ Billets in molten condition will be directly fed to Hot Billet Rolling machine thus saving of fuel & electricity.
- ❖ No additional increment in GLC for PM & SO<sub>2</sub>.
- ❖ No need of storing fuel required in Gasifier for conventional Re-heating Furnace in rolling mill
- ❖ No generation of Fly Ash.

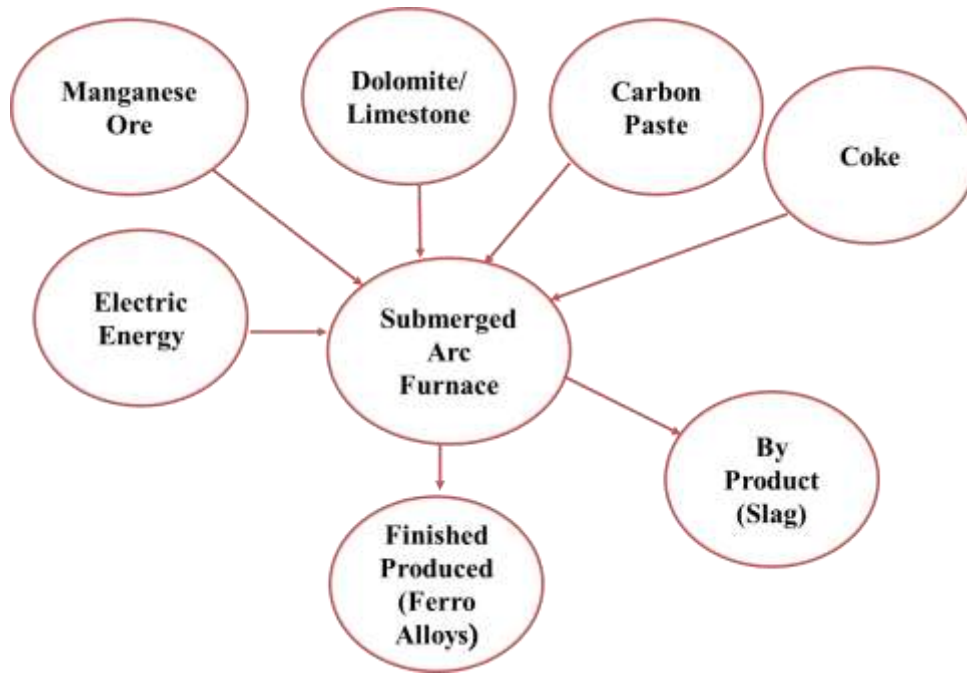
- ❖ No space will be required for storage of Billets and fly ash.
- ❖ Easy handling of Process.
- ❖ Low operational cost of rolled steel depending on unit costs
- ❖ Reduced civil works and infrastructure costs
- ❖ Reduced energy consumption
- ❖ Less man power required.

### **FERRO ALLOY PLANT**

Standard High Carbon Ferro/Silico Manganese is smelted at about 1700 - 1800<sup>0</sup>C. A conventional Submerged Arc Electric Furnace achieves this. The three carbon electrodes, partially submerged in the charge, are supported on hydraulic cylinders for upward and downward movements to maintain the desired electrical conditions in the furnace. The body of the furnace is cylindrical in shape, and is lined with firebricks, silicon carbide bricks and carbon tamping paste. Two tap-holes are provided at 120<sup>0</sup>. Apart for draining out both the molten alloy and the slag.

During the repair works of one of the tap holes the other will function as standby. The raw materials are thoroughly mixed in the proper proportion before being charged into the furnace. Manual poking rods or stoker car are used for stoking the charge on the furnace top. As the charge enters the smelting zone, the metal alloy formed by chemical reactions of the oxides and the reluctant, being heavy gradually settles at the bottom. The slag produced by the unreduced metal oxides and the flux, being relatively lighter, floats on the metal alloys surface. At regular intervals the furnace is tapped. The tap hole is opened by Oxygen lancing pipe and after tapping is completed, it is closed by clay plug.

The liquid Silicon manganese and the slag flow the C.I. Pan. The slag being lighter overflows from the C.I. pan and is taken into the sand mould. The alloy cake from C.I. pan is removed and broken manually with hammer to required lump size. The slag produced in the process is generally free from metal thus after cooling the slag is shifted to slag dump.



### **Manufacturing Process of Ferro Alloys**

#### **Capital Cost**

The existing project cost is Rs. 701 Crores. The estimated cost of the proposed project will be Rs. 760 Crores.

#### **Budget for Implementation of Environmental Management Plan**

The capital cost for environmental protection measures for proposed project will be as Rs. 710 Lakhs. The annual recurring cost towards the environmental protection measures for proposed project will be Rs. 65.0 Lakhs.

#### **Site Selected for the Project**

Lloyds Metals and Energy Limited have proposed Installation of Induction Furnace, Rolling Mill & Submerged Arc Furnace for production of Ingots, Billets 5,00,000 TPA, TMT & Long product 5,00,000 TPA and Ferro alloys 25,000 TPA in existing Steel plant premises.

### **3.0 DESCRIPTION OF THE ENVIRONMENT**

#### **Air Environment**

The ambient air quality monitored at 8 locations selected based on predominant wind direction, indicated the following ranges;



PM<sub>10</sub> : 40.9 to 79.4 µg/m<sup>3</sup>.  
PM<sub>2.5</sub> : 24.0 to 43.2 µg/m<sup>3</sup>  
SO<sub>2</sub> : 10.7 to 35.6 µg/m<sup>3</sup>  
NO<sub>x</sub> : 17.5 to 46.3 µg/m<sup>3</sup>

Industrial Area	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>
Residential, Rural Area (CPCB Norms)	100 µg/m <sup>3</sup>	60 µg/m <sup>3</sup>	80 µg/m <sup>3</sup>	80 µg/m <sup>3</sup>

The concentrations of PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub> and NO<sub>x</sub> were found within the National Ambient Air Quality Standards (NAAQ).

### **Water Environment**

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

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

### **Noise Environment**

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

### **Land Environment**

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

The observations of soil characteristics are discussed parameter wise below;

- a) Texture of all soil samples are silty-loam, Sandy and sandy Loamy in Texture Classification.
- b) Colour of soil samples from agriculture and waste land is black & grey, brown in color.
- c) The bulk density of soil samples are in the range of 0.69 to 1.99 gm/cc.
- d) Soil samples have pH values in the range of 6.93 to 7.39. The pH values are indicating nature of soil samples as neutral.
- e) Soil samples have conductivities between 0.058 to 1.266 mmhos/cm.
- f) Soil samples have Organic Matter between 0.37 to 1.27 %. These values represent average fertility of soils.
- g) Soil samples have concentration of Available Nitrogen values ranged between 148.58 to 515.09 kg/ha.
- h) Soil sample have concentration of Available Phosphorous values ranged between 180.18 to 1263.26 kg/ha.
- i) Soil sample have concentration of Available Potassium values range between 22.58 to 81.45 kg/ha.

#### **4.0 Anticipated Impacts & Mitigation Measures**

##### **Impact on Air Quality**

The major pollutants of air in a proposed plant are the particulate matters from the various stacks and fugitive emissions due to material handling. SO<sub>2</sub> also add to the pollutant level due to Boiler. Company is presently taking all measures to effectively control the air emissions and periodic monitoring of the stack emissions & ambient air quality is being done to monitor the pollutant concentrations. Same will be continued after the proposed expansion. During operation phase, air emissions both gaseous and fugitive will be on account of process emissions from stacks of Sponge Iron Plant, induction furnace, captive power plant as well as transportation of men and material. The impacts on air quality due to source of the air pollutant in the proposed facilities have been identified

### **Sources of Emissions**

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

### **Raw Material Handling / Transport System**

The possible pollutants are fugitive dust emissions from raw materials handling areas viz. loading / unloading, etc. Raw materials will be fed to hopper with the help of pay-loader / tipper.

### **Mitigation Measures**

- The primary fume pick up from Induction Furnace will be by a canopy hood placed over the furnace and to convey the same single walled MS duct will be employed. Fumes will be evacuated directly from induction furnaces through hoods with swirling mechanism and ducting.
- The emission from induction furnace area will be extracted and treated in a fume extraction system.
- Fourth hole extraction system along with bag filter will be installed in submerged arc furnace
- Fugitive emission will be collected using suitable fume extraction system, connected to bag filter.
- Bag filters of Capacity 50000 m<sup>3</sup>/Hr will be installed in steel melting shop and Arc furnaces.
- All internal roads are concreted.
- The flue gases generated from Sponge Iron project are re-used to generate electricity.
- At all the points, Dust Collectors/ dust suppression systems/ESP will be installed.
- Water sprinkling will be done regularly to control the fugitive emissions.
- The waste gases will be fed in the Waste Heat Recovery Boiler wherein Electro Static Precipitator is installed and AFBC boiler is also installed with ESP.

- The fly ash is being utilized in cement plants (MOU with ultratech cement).
- All internal roads are tarred.
- All belt conveyors are covered.
- All the stacks are equipped with continuous emission monitoring system along with remote calibration facility for gaseous parameters.
- Fugitive as well ambient air quality monitoring shall be carried out on regular basis to ensure the compliance with National Ambient Air Quality Standards (NAAQS). The ambient air quality within the factory premises shall not exceed the standards (PM<sub>10</sub> 100 µg/m<sup>3</sup>, PM<sub>2.5</sub> 60 µg/m<sup>3</sup> SO<sub>2</sub> 80µg/m<sup>3</sup>, NO<sub>x</sub> 80 µg/m<sup>3</sup> and CO 04 µg/m<sup>3</sup>) prescribed by CPCB.
- 100 nos. of water sprinklers are installed in the existing plant.
- During induction melting of steel scrap, lot of sparks gets generated. For the purpose of arresting sparks & flame, it is necessary to have an arrestor which arrests sparks. The device provided will be a centrifugal cyclone, which removes sparks and also collects coarser particles. The collected dust in the cyclone hopper can be drained periodically into a drum when the system is shut or a continuous motorized rotary air lock valve can be provided.
- ESPs are attached to stack in Sponge Iron Plant and AFBC plant in the existing plant

### **Noise Levels**

During operation, the major noise generating sources are auto loading section, electric motors etc. These sources will be located far off from each other. Under any circumstances the noise level from each of these sources will not exceed 85 dB (A).

Noise levels generated in the project site will be confined to the noise generating plant units hence the impact of noise levels on surroundings will be insignificant

### **Mitigation Measures**

The noise levels stipulated by Central Pollution Control Board at any point of time will not exceed the standards.

- By providing padding at various locations to avoid sharp noise due to vibration.

- Other than the regular maintenance of the various equipment, ear plugs/muffs are recommended for the personnel working close to the noise generating units;
- All the openings like covers, partitions will be designed properly
- Inlet and outlet mufflers will be provided which are easy to design and construct.
- All rotating items will be well lubricated and provided with enclosures as far as possible to reduce noise transmission.
- The insulation provided for prevention of loss of heat and personnel safety will also act as noise reducers.

### **Impact on Water**

Total water requirement for the proposed project will be about 260 KLD. Water requirement for the project will be sourced from Wardha River. LMEL is committed to ZERO Discharge of waste water. 30 KLD Industrial waste water will be treated in Neutralization Pit and settling tank. 11 KLD of Domestic waste water will be taken to adequately designed 15 KLD STP. The treated water will be recycled for utilization in Green Belt Development.

### **Impact on Terrestrial ecology**

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

- Particulate matter emissions and fugitive emissions due to transportation activity & material handling may degrade the soil quality of surrounding environment that may affect the biodiversity of surrounding environment.
- Fugitive emissions (dust) may impact the terrestrial flora. The settlement of dust on the laminar surface of plants can impede the efficiency of photosynthesis and thereby, affect the productivity of plants. In some of the plant, it may also smother the leaf surface blocking stomata, resulting in reduced transpiration.

The present running plant has no significant impact on surrounding ecology and biodiversity as following mitigation measures have been / will be adopted:

- Greenbelt development and plantation in and around the plant site.
- Using paved roads for transportation to minimize fugitive emissions.

- Transporting material in truck covered with tarpaulin and storing it under covered facilities.
- Transport vehicles and machinery will be properly maintained and periodically checked for pollution level to reduce noise and gaseous emission in the surrounding environment.

**Solid Waste Generation**

The solid waste generation in the existing and proposed expansion activities are given in following table

**Solid Waste Management**

Solid Waste	Quantity	Mitigation Measures
<b>Existing</b>		
Char	48000 TPA	Sale to local entrepreneurs for making a coal briquettes
Bottom Ash	9855 TPA	-
Accretion	3650 TPA	-
Fly ash	39785 TPA	Low Land Filling and Brick Manufacturing
Dust from ESP	7300 TPA	Brick Manufacturing
Washery reject	91250 TPA	Sold to Third Party
<b>Proposed</b>		
Slag	25000 TPA	A slag crusher will be installed to crush slag. Iron particles will be separated by using Magnetic Separator. These iron particles will be reused in Induction Furnace. Initially Slag will be used for levelling of Plot. It will be used for hardening of working area & construction of internal roads. In future possibilities will be explored to use slag for construction of internal village roads.
Tail cutting	15,000 TPA	100% reuse in Induction Furnace
Ferro/Silico Manganese Slag	15,000 TPA	100% Ferro manganese slag will be used in Plant for production of Silico manganese.

**Impact on Socio-Economic Environment**

LMEL is providing direct employment 750 workers. The local persons have been given preference in employment as per the qualification and technical competencies. In order to mitigate the adverse impacts likely to arise in the proposed project activities and also to minimize the apprehensions to the local people, it is necessary to formulate an affective EMP

for smooth initiation and functioning of the project. The suggestions are given below:

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

The overall impact on the socio economic environment will be significant.

## **5.0 Environmental Monitoring Programme**

Lloyds Metals and Energy Limited is carrying out the Environmental Monitoring on regular basis. The methodologies adopted for environmental monitoring are in accordance with the CPCB guidelines.

The environmental monitoring points is done considering the environmental impacts likely to occur due to the operation of existing and proposed project as the main scope of monitoring program is to track, timely and regularly, the change in environmental conditions and to take timely action and adopt mitigation measures for protection of environment.

### **Ambient Air Quality Monitoring**

Ambient air quality monitoring at 3 locations in and around the plant are being carried out by NABL accredited lab (Mahabal Enviro Engineers Pvt. Ltd. (MEEPL) on regular basis and reports are being submitted to MPCB regularly.

### **Water Quality Monitoring**

Ground water quality & Waste water quality samples are being collected and analyzed by NABL accredited lab, ground water from different locations on quarterly basis and analyzed by NABL accredited lab. Reports are being submitted to MPCB, CPCB and MoEF.

### **Noise Environment**

Noise levels are being monitored at various locations of the plant premises for day and night

time as per the CPCB guidelines.

### **Fugitive emission**

Monitoring of Ground level dust concentration/Fugitive emission along with gaseous pollutants viz SO<sub>2</sub>, NO<sub>x</sub> are being carried out periodically. Dust concentration and gaseous emission levels from all the fugitive sources are well within prescribed limit and it is being regularly monitored.

Necessary control measures are being adopted to keep the secondary fugitive emission within limits.

Further, same practice of monitoring of environmental parameters will be continued as per the State Pollution Control Board norms after establishment of proposed project

## **6.0 Additional Studies**

The additional studies as per the ToR issued by MoEF&CC are Public Consultation, Social Impact Assessment, Risk Assessment, & Disaster Management Plan.

## **7.0 Project Benefits**

Rs.14,532,376.38 have been spent towards various CSR activities in last 5 years. The summary of CSR amount spend in last five years for various activities such as sports, education, medical facilities and water facilities are given below:

<b>CSR BUDGET SPEND SUMMARY</b>	
<b>Year</b>	<b>Amount</b>
2014 - 2015	609079.00
2015 - 2016	462870.00
2016 - 2017	274483.00
2017 - 2018	2151848.84
2018 - 2019	2433526.54
2019 - 2020	5384863.00
2020 - 2021	3215706.00
<b>Total</b>	<b>14,532,376.38</b>

## **8.0 Environmental Management Plan**

### **Environmental Management Cell**

A separate environmental management cell is established to implement the management plan.



The group is headed by a Vice President-Comm/HR. The group will ensure the suitability, adequacy and effectiveness of the Environment Management Program. The functions of Environmental Management Cell are:

- Obtaining consent order from State Pollution Control Board.
- Environmental monitoring.
- Analysis of environmental data, preparations and submission of report to statutory authorities, & Corporate Office.
- To co-ordinate with statutory bodies, functional groups of the plant units & head office.
- Interactions with plant official for modification programme if any to improve pollution control devices / systems.
- Environmental Appraisal (Internal) and Environmental Audit.

**The following mitigation measures will be undertaken for the proposed project**

#### **AIR POLLUTION**

The major pollutants of air in a proposed plant are the particulate matters from the various stacks and fugitive emissions due to material handling. The automatic process equipments will be employed for the raw material feeding system. Stacks of adequate height along with bag filters for induction furnace, fourth hole extraction system along with bag filter for submerged arc furnace is proposed for proper dispersion of flue gases. Plantation along the internal roads in the plant premises will be strengthen and all the internal roads shall be concreted / asphalted to reduce the fugitive dust due to vehicular movement..

#### **WATER POLLUTION**

The Wastewater generated from the industrial process will be treated in the settling tank within the premises and the treated water will be re-used back to the process. The domestic wastewater will be treated in Packaged Type STP of 15KLD capacity and treated water will be used for greenbelt development. Hence, the zero wastewater discharge is proposed for the proposed project.

## NOISE POLLUTION

Regular maintenance of the various equipment, ear plugs/muffs will be provided for the personnel working close to the noise generating units. Further all the openings like covers, partitions will be designed properly to abate noise pollution.

## SOLID WASTE DISPOSAL AND MANAGEMENT

The main solid waste generated from the proposed project will be slag, tail cutting and Ferro/Silico Manganese Slag. A slag crusher will be installed to crush slag. Iron particles will be separated by using Magnetic Separator. These iron particles will be reused in Induction Furnace and Slag will be used for levelling of Plot. Further it will be used for hardening of working area & construction of internal roads. In future possibilities will be explored to use slag for construction of internal village roads. Tail cutting will be reuse completely in Induction Furnace.

## GREEN BELT DEVELOPMENT

The plantation helps to capture the fugitive emissions and attenuate the noise apart from improving the aesthetics quality of the region. Avenue plantation within the plant and green belt development will be done. Total area of the project area is 93.52 ha. Out of the total area, green belt development is done in 30.86 ha (33%) and further will be undertaken in area of 16.84 ha (18%) of plant area of A-1 & A-2 and number of Trees planted till date is 2,32,650. The total area of green belt will be 47.7 ha (51% of the total land)

### Year-wise Plantation Details

Sr. No.	Year	Trees planted	Survival
1.	2015	3000	2872
2.	2016	3000	2725
3.	2017	3000	2950
4.	2018	3000	3002
5.	2019	3000	2795
6.	2020	3000	2895
	<b>Total</b>	<b>18000</b>	<b>17239</b>

The plant is in operation since 1994-95 and till 2014 2,14,650 nos. of trees are survived.

After commissioning of the proposed project the LMEL is going to follow all the measures as per EMP in the plant premises that will results in the further improvement in the environmental quality and all the parameters will be maintained within the prescribed limits.

## **9.0 Conclusion**

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

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

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