EXECUTIVE SUMMARY

For

PROPOSED MANUFACTURING OF FERRO ALLOYS BY THERMITE PROCESS

Project Proponent

B.B. Minerals and Metals

At

Plot No. SZ-4 & SZ-5, Butibori Industrial Area, Tehsil Hingna District Nagpur, State Maharashtra.

Environmental Consultant
Pollution and Ecology Control Services
Near Dhantoli Police Station, Dhantoli, Nagpur
Accreditation no.: NABET/EIA/2023/SA 0165 valid upto 16th October 2022

EXECUTIVE SUMMARY

1.0 INTRODUCTION

B.B. Minerals and Metals has proposed manufacturing of Ferro Alloys (Ferro Chrome: 3600 TPA OR Ferro Molybdenum: 1200 TPA OR Ferro Manganese Medium Carbon: 3600 TPA OR Ferro Manganese Low Carbon: 3600 TPA OR Ferro Titanium: 1200 TPA OR Ferro Vanadium: 1200 TPA)by Thermite Process at Plot No. SZ-4 & SZ-5, Butibori Industrial Area, Tehsil Hingna District Nagpur, State Maharashtra. The proposed project is a Greenfield project which falls under Category "A" in schedule 3(a) Metallurgical Industries (Ferrous and Non-ferrous) as per EIA Notification 2006.

The purpose of the report is to identify the impact, whether negative or positive and to suggest the mitigation plan to minimize the negative impacts on air, water, noise and soil.

PROJECT DETAILS

Project at a Glance

Project name	Proposed manufacturing of Ferro Alloys by Thermite Process
Project location	Plot No. SZ-4 & SZ-5, Butibori Industrial Area, Tehsil Hingna District Nagpur, State Maharashtra
Total Area	3996 sq mt (0.3996 ha)
Production Capacity	Ferro Chrome: 3600 TPA OR Ferro Molybdenum: 1200 TPA OR Ferro Manganese Medium Carbon: 3600 TPA OR Ferro Manganese Low Carbon: 3600 TPA OR Ferro Titanium: 1200 TPA OR Ferro Vanadium: 1200 TPA
Water Demand	Requirement: 6 KLD Source: MIDC
Power Requirement	Requirement: 200 KW Source: MSEDCL
Man Power	50 to 60 nos.
Nearest railway station	Butibori Railway Station : 6.5 Km (ESE)
Nearest airport	Dr. Babasaheb Ambedkar International Airport: 18.8 Km (NNE)
Project cost	19 Crores.

2.0 PROCESS DESCRIPTION

Manufacturing of Ferro Alloys through Termite Process is very easy and simple.

Following activities are carried on:

(a) Powdering of different Alloys / Minerals.

(b) Mixing in blender in the required proposition

(c) Then a small fire is created (By aluminum powder) in the reaction vessel, where this blended material is added slowly. The powder starts melting inside the vessel and the Metallic contents are automatically separated which settles down and the sludge floats.

(d) Metal and Sludge are separated by manual processes.

(e) Metal is crushed and for some customer it is powdered in Pulveriser.

(f) The Metal is crushed and packed in bags and kept ready for dispatches.

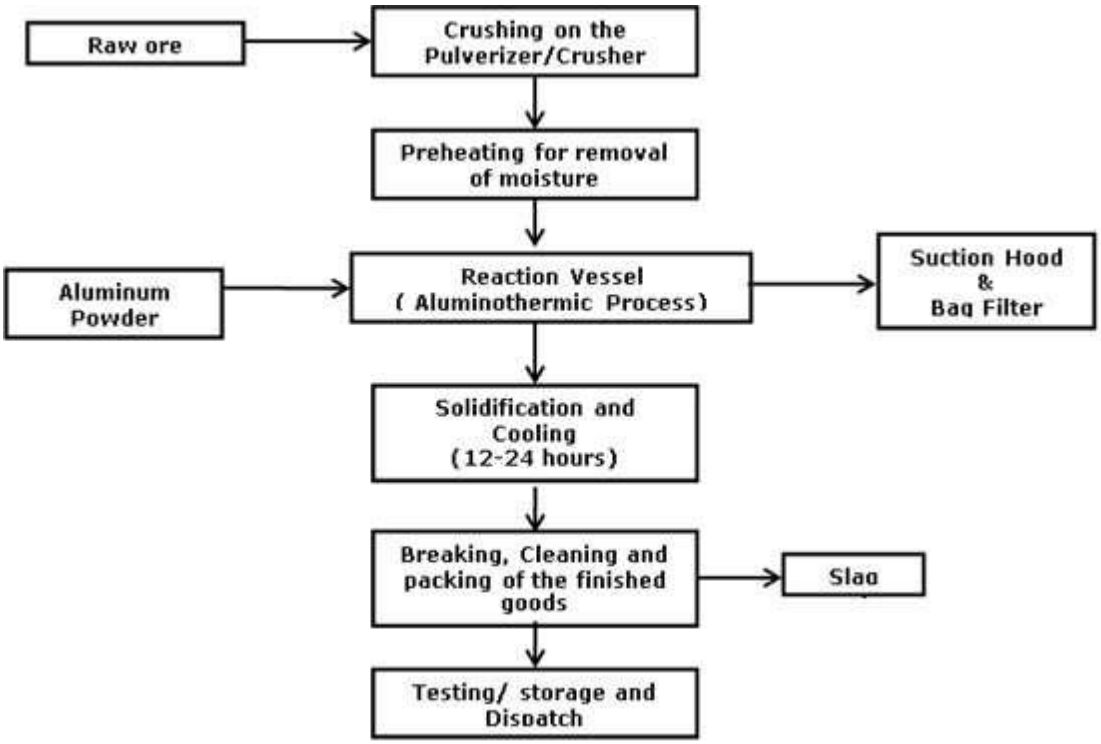
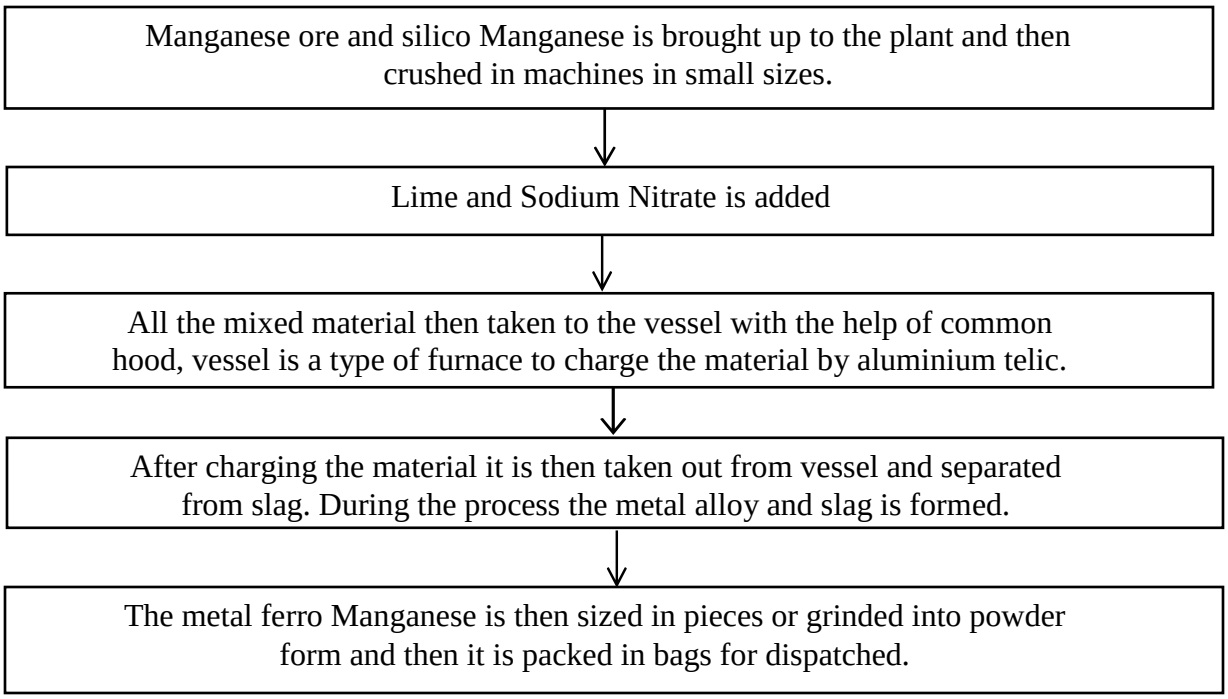


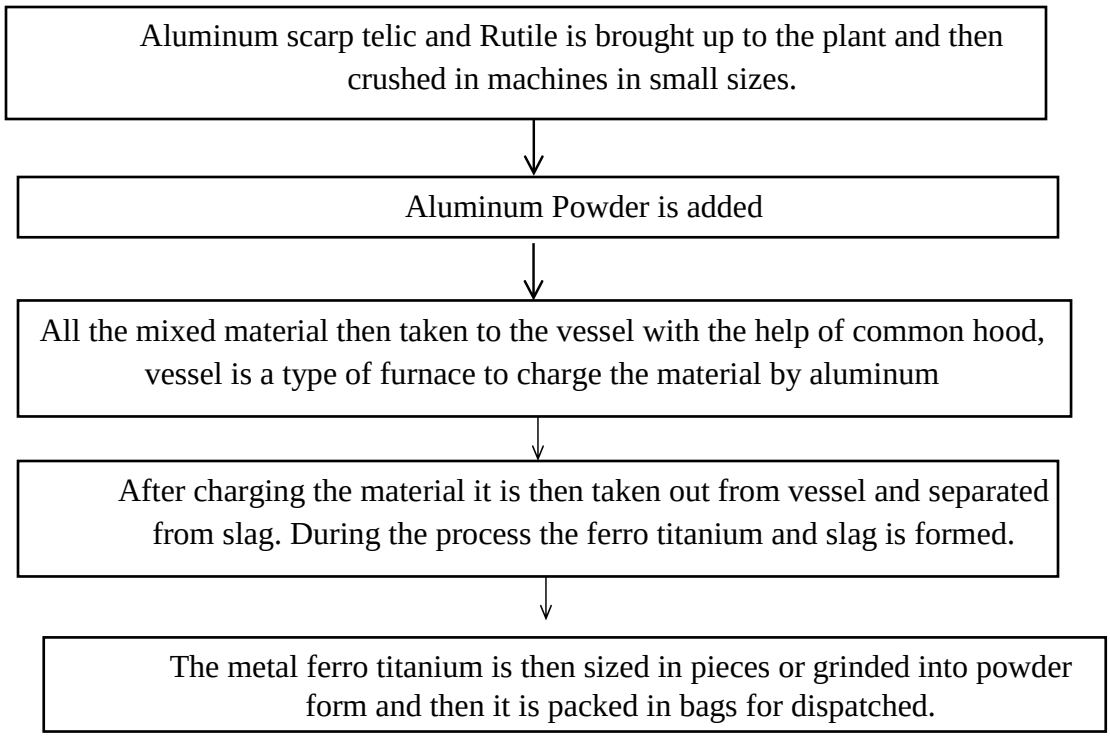
Figure: Process Flow Diagram for Ferro Alloys

Given below is the flow chart for the manufacturing of Ferro Alloys such as Low, Medium Carbon Ferro Manganese, Ferro Titanium, Ferro Molybdenum, Ferro Vanadium.

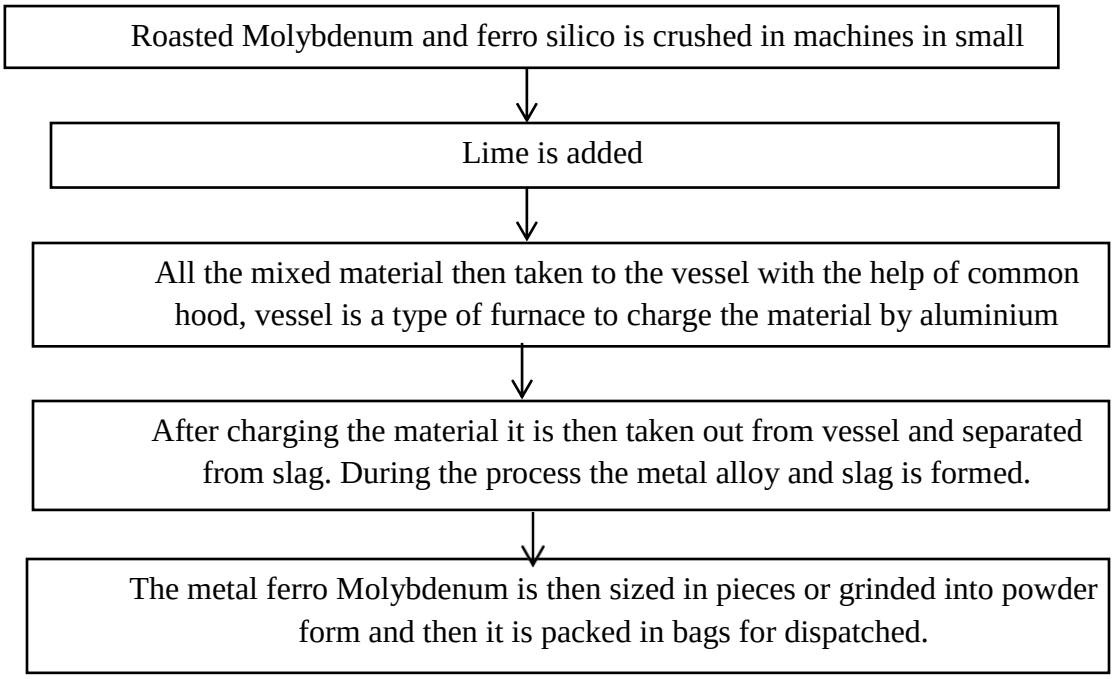
FLOW CHART FOR MEDIUM/LOW CARBON FERRO MANGANESE



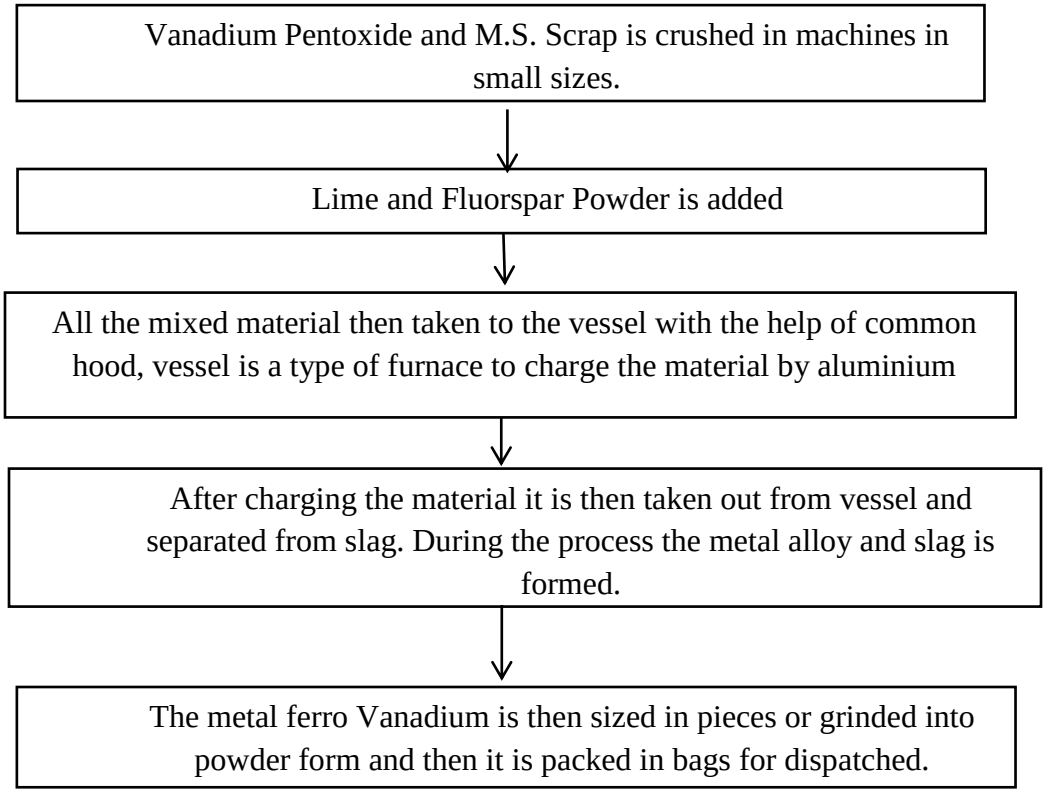
FLOW CHART FOR FERRO TITANIUM



FLOW CHART FOR FERRO MOLLYBDENUM



FLOW CHART FOR FERRO VANADIUM



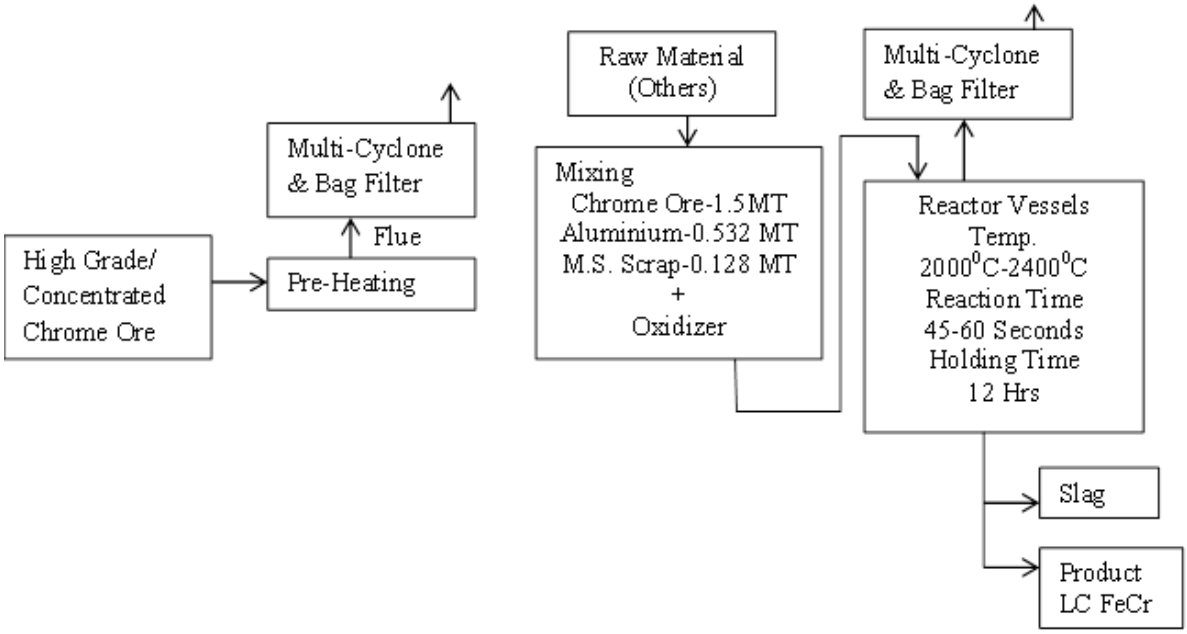
Ferro Chrome:

- High grade Chrome Ore/Concentrate will be sourced. The ore will be stored within a covered shed such that it does not come in contact with water/moisture.
- The high grade/conc. Chrome ore is taken for preheating in Electrically heated dryer. Chrome Ore is heated upto 400 C. There is no dust extraction during heating process.
- Smelting is done with upper ignition (top-priming). The entire mixture of charge materials is poured in refractory lined reaction Vessel. Then a Hood is placed on the top of vessel for proper collection of flue gases generated at the time of smelting. Upon filling the vessel with charge materials, 2 or 3 craters are formed for ignition mixture. Upon ignition of the mixture, it ignites quickly, and the process of smelting occurs at a high speed.
- The smelting of 500 kg of mixture takes up 5-10 minutes. With a normal run of heat, flue gases escape through the Hood. With a cold run of heat (weak uneven evolution of gases), 15-20 kg of thermite mixture with Excess reducer is given to the charge.
- At the end of smelting, when no more gases rise from the melt, hood is being removed and Reaction Vessel is also removed for natural cooling for 6-8 hrs. After cooling charged material which forms a button shape comprising slag on the top and Ferro Chrome at the bottom is removed from reaction vessel.
- Slag and Metal is separated and metal is sized as per customer's requirement for dispatch. Slag is sent for recovery of Prills of Ferro Chrome.
- After recovery of Prills, remaining slag is crushed and reused in reaction vessel for relining or sale to outside parties.

The reaction is as follows:

$$Cr_2O_3 + 2Al = Al_2O_3 + 2Cr$$

$$Fe_2O_3 + 2Al = 2Fe + Al_2O_3$$



3.0 DESCRIPTION OF ENVIRONMENT

Air Environment

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

PM_{10} : 35.6 to 65.4 µg/m^3.

$PM_{2.5}$: 19.7 to 39.0 µg/m^3

SO_2 : 7.6 to 26.9 µg/m^3

NO_x : 10.1 to 27.6 µg/m^3

Industrial Area Residential, Rural Area (CPCB Norms)	PM_{10}	$PM_{2.5}$	SO_2	NOx
	100 µg/m^3	60 µg/m^3	80 µg/m^3	80 µg/m^3

The concentrations of PM_{10}, $PM_{2.5}$, SO_2 and NO_x 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

It has been found that in the proposed plant, noise levels are in the range of 37.8 to 62.2 dB (A) at all eight stations. Maximum levels of noise have recorded in day hours which are natural as our most of activities have done in day hours.

Noise levels measured at all eight stations are well within limit of either 65.0 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.

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

**** Silence zone is defined as area up to 100 meters around premises of hospitals, educational institutions and courts. Use of vehicle horns, loud speakers and bursting of crackers are banned in these zones

Land Environment

Eight 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 clay loam, sandy loam and sandy clay loam in Texture Classification.

b) Colour of soil samples is gray and brown in colour.

c) The bulk density of soil samples are in the range of 2.1 to 2.9 gm/cc.

d) Soil samples from have pH values between 7.2 to 7.8.

e) Soil samples have conductivities between 0.048 to 0.065 mmhos/cm.

f) Soil samples have Organic Matter between 0.46 to 1.2 %.

g) Soil samples have concentration of Available Nitrogen values ranged between 225 to 319 kg/ha.

h) Soil sample have concentration of Available Phosphorous values ranged between 17 to 39 kg/ha.

i) Soil sample have concentration of Available Potassium values range between 115 to 178 kg/ha.

j) Characteristic of Agricultural land soil is a little deficient in Nitrogen nutrients concentration and have low organic matter.

4.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Air Environment

The present baseline concentrations were monitored in the EIA study. The additional emissions are mainly from furnace during operation of thermite process.

The proposed project activity will result in air emissions from the following areas.

a) Raw material Handling and storage area

b) Vessels (Ferro Alloys)

c) Transportation

I. Stack Emission

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.

In this case the source emission is envisaged from various sources, 1 Stack of height 35 m will be installed for proper dispersion of gaseous pollutants.

Mitigation Measures

- Bag filter of Capacity 45000 m^3/Hr will be installed.
- All internal roads will be tarred.
- Stack will be 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_{10} 100 $\mu g/m^3$, $PM_{2.5}$ 60 $\mu g/m^3$ SO_2 80$\mu g/m^3$ and NOx 80 $\mu g/m^3$ prescribed by CPCB.
- Water sprinklers will be installed to control dust emission.

Action plan to control Fugitive emissions

- The vehicles transporting raw materials will be covered with tarpaulin in order to prevent dust emission during the transport.
- It would be ensured that all the vehicles in the working zone are properly maintained to keep emissions within the permissible limits.
- Proper traffic management will be undertaken.
- Adequate greenbelt will be developed in the plant area. Greenbelt acts as a surface for settling of dust particles and thus reduces the concentration of particulate matter in air.
- Water Sprinkling will be done to reduce fugitive emission in the plant and maintain the ambient air quality within CPCB standard.

Impact on Noise Levels and Mitigation Measures

During operation, the major noise generating sources are crushing mill, 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 75 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 will not exceed the standards stipulated by Central Pollution Control Board at any point of time.

- 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
- All rotating items will be well lubricated and provided with enclosures as far as possible to reduce noise transmission. Extensive vibration monitoring system will be provided to check and reduce vibrations. Vibration isolators will be provided to reduce vibration and noise wherever possible;
- The insulation provided for prevention of loss of heat and personnel safety will also act as noise reducers.

Impact on Water and Mitigation Measures

The company follows “the zero wastewater discharge concept” and the entire wastewater is recycled to the plant for various uses. The domestic wastewater will be treated in Packaged Type STP. As no wastewater will be discharged outside the plant premises, there will be no impact on the water quality of any surface water bodies of the area.

Solid Waste Generation

The solid waste generation and utilization is given below as Table below**.**

Table : Solid waste generation and utilization

Solid Waste generation	Quantity (TPA)	Utilization
Ferro Manganese Slag	100	Used for relining.
Ferro Titanium Slag	90	Used for relining.
Ferro Molybdenum Slag	100	Used for relining.
Ferro Chrome Slag	100	Used for relining.
Ferro Vanadium Slag	80	Used for relining.

Impact on Socio-Economic Environment Socio Economic Environment

B.B. Minerals and Metals is providing direct employment 50 - 60 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

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

Ambient Air Quality Monitoring

Ambient air quality monitoring at 4 locations in and around the plant will be carried out by NABL accredited lab on regular basis and reports will be submitted to MPCB regularly.

Water Quality Monitoring

Ground & surface water samples will be collected and analyzed by NABL accredited lab, ground water from different locations on quarterly basis and analyzed by NABL accredited lab. Reports will be submitted to MPCB, CPCB and MoEF.

Monitoring of Rain Water Harvesting

Piezometer with Telemetry shall be provided within 100 m of water extraction structure on Rain Water Harvesting Project.

Noise Environment

Noise levels will be 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_2, NOx will be carried out periodically. Dust concentration and gaseous emission levels from all the fugitive sources will be within prescribed limit and it will be regularly monitored.

Necessary control measures will be adopted to keep the secondary fugitive emission within limits.

6.0 ADDITIONAL STUDIES

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

7.0 PROJECT BENEFITS

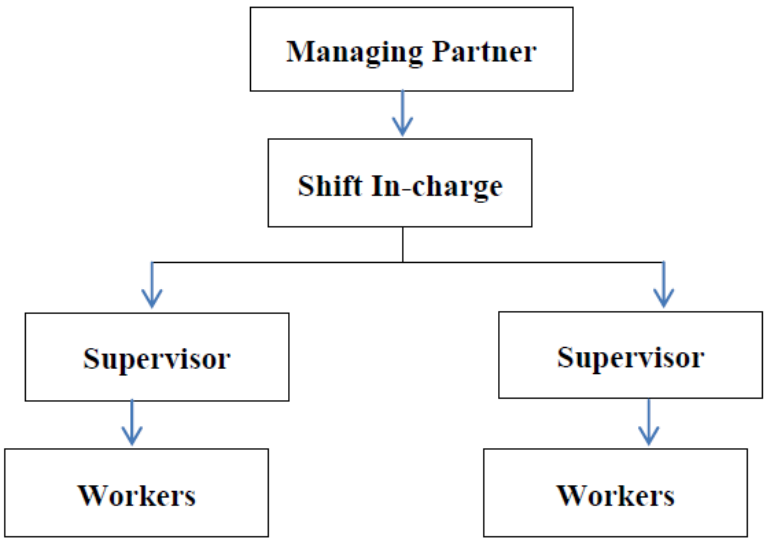
- This project will contribute towards development activities as per its share.
- Rain water harvesting will be done for groundwater recharging that will maintain and improve the ground water table.
- Plantation will be carried out under CER fund in nearby area.

As per the Office Memorandum No. 22-65/2017-IA.III dated 20th October 2020 based on the need of the local people, Local Gram Panchayat and District authorities, CER will be spent.

8.0 ENVIRONMENTAL MANAGEMENT PLAN

Environmental issues particularly in the operations will be looked after by the Managing Partner and shift incharge. The reporting mechanism in case any deviation in the implementation of environmental conditions as below:

Environmental Management Cell



Project Cost: The total cost of the project is Rs. 19 Crores. Total Rs. 153 lakhs as a capital investment and Rs. 41 lakhs/annum as recurring cost has been earmarked for implementation of Environmental Management Plan for proposed project.

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.