EXECUTIVE SUMMARY

1.0 INTRODUCTION

The factory of M/s. Nagpur Pyrolusite Pvt. Ltd. was established on 15th January 1994, which is to be registered with District Industries Center as SSI Unit No. 1435/111409673/021296/SSI. The Office of M/s Nagpur Pyrolusite is placed at 85, Yashvant Stadium, Dhantoli, Nagpur-440012. The main object to be pursued by the factory is to manufacture and process Manganese Ore.

This is a group of industrial house, enriched by tradition and commitment to quality for over two and a half decades, the company has continuously progressed and their operating procedure are continuously reviewed and improved to meet the customer's requirement. The company had a humble beginning. The solid foundation of high ethical standards, an unflinching commitment to customer satisfaction and a strong infrastructural set-up resulted in unprecedented growth and a global reputation for consistent quality and time-bound deliveries. With a Heritage of about 25 years, Nagpur Pyrolusite Pvt. Limited has carved out a niche for itself in Manufacturing, Exporting, Marketing and Distribution of Manganese Dioxide.

1.1 SITE DESCRIPTION

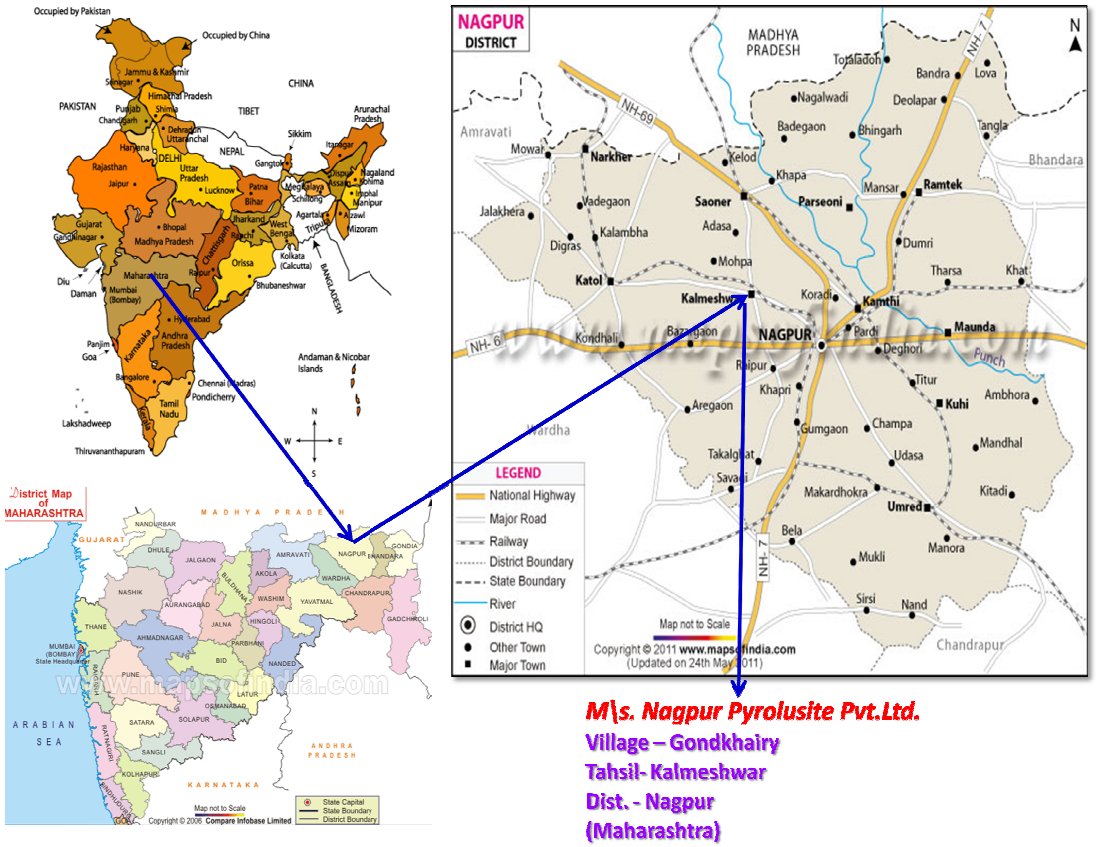
The plant of M/s. Nagpur Pyrolusite Pvt. Ltd. was established to manufacture and process Manganese Ore and Manganese Dioxide. The factory is located 21 kms away from Nagpur city, at Plot No. 472/2, Mouza Gondkhairy, Amravati Road, Tah: Kalmeshwar, Dist: Nagpur.

Table no.1: Environmental setting of the site

SR. NO	FEATURES	PARTICULARS
1	Location	At Village - Gondkhairy Tahsil - Kalmeshwar Dist. - Nagpur State - Maharashtra.
2	Nearest major road	SH-265

3	Co-ordinates	Latitude - 21°8'46.38"N Longitude - 78°53'26.53"E
4	Nearest railway station	Kalmeshwar Railway Station - 9 Kms
5	Nearest village	Khapri -1.5 Kms Pethkaldongri -2 Kms
6	Nearest major city	Nagpur - 21Kms
7	Nearest water body	Vena Talav - 1.5 Kms
8	Defense Installation	Ambazari Ordnance Factory: 8.5Km : E
9	Sensitive locations	Archaeological structures, Historical places, Sanctuaries and Biosphere are not present within 10 km
10	Nearest forest	Bazargao Reserved Forest - (5 kms) - W Madhogarh Reserved Forest - (9 kms) - W

Location Map of the Proposed Project Site



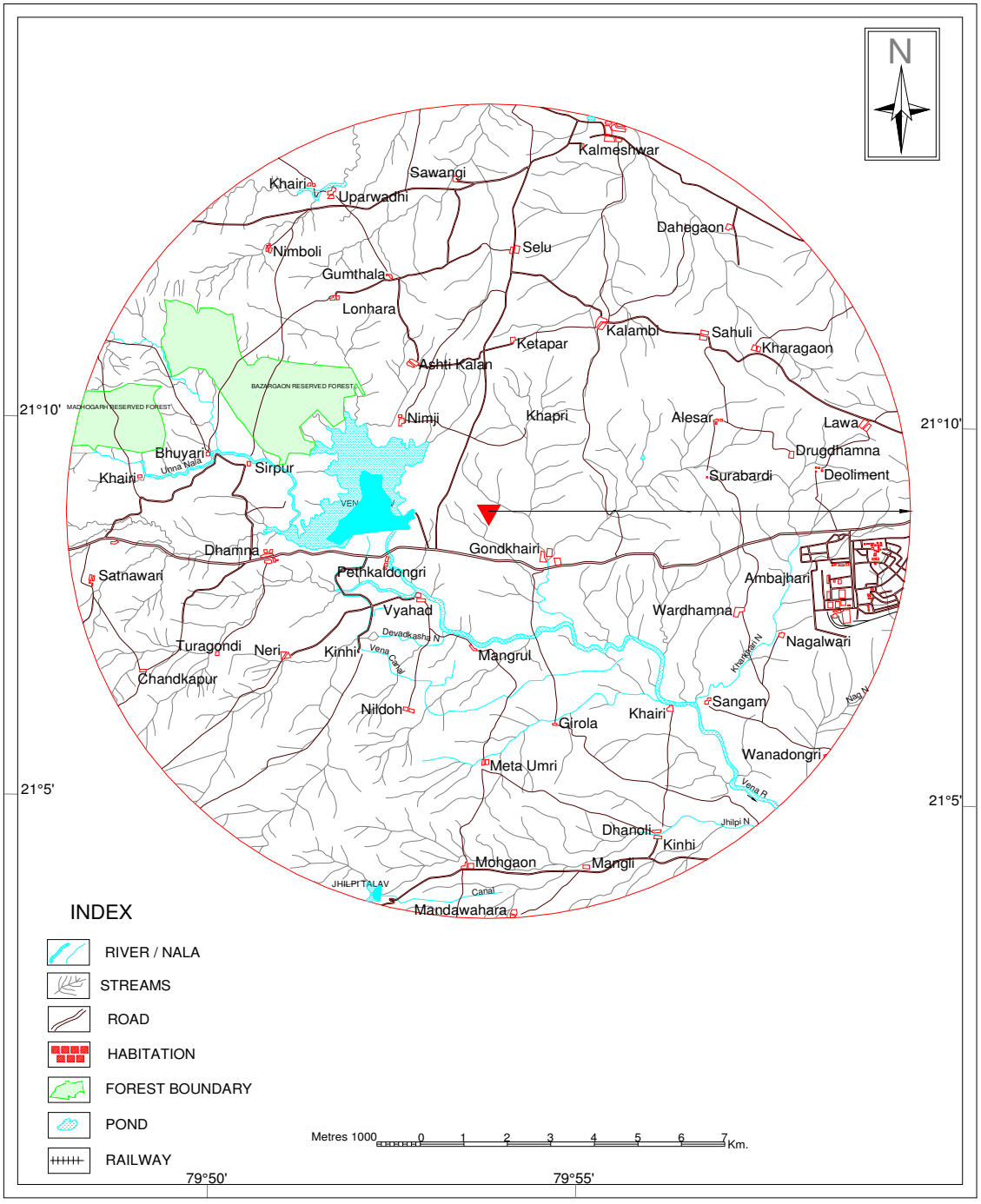
1.2 SITE SELECTION CRITERIA

- Existing Plant in operation.
- Availability of 100 acres of vacant plot with ample scope to accommodate all future expansions plans.
- No Rehabilitation/Resettlement required.
- No National Park, Biosphere Reserve and Wildlife Sanctuary including Notified Eco Sensitive Areas within 10 km radius.
- No archaeological monument, interstate boundary and defense installation.
- No notified critically polluted area.
- No nallah/water body, public roads, forests within the project site.
- Availability of Raw Material.
- Availability of Water (20 m^3/Day ; source :Ground Water).
- Assured Power Supply.
- Market available for finished products.
- Availability of man power.
- Availability of industrial infrastructure.

1.3 SITE LOCATION

The factory is on the Nagpur-Bombay Highway No. 6 just 21 kms from Nagpur. It is easily accessible throughout the year from Nagpur and Amravati by road. Though the factory site is in the rural area between Kalmeshwar MIDC and Hingna MIDC. The railway siding is only 9 Km. away from the factory side and nearest Airport is Dr. Babasaheb Ambedkar Airport, Nagpur is 25 kms away. Study area map has given as follows.

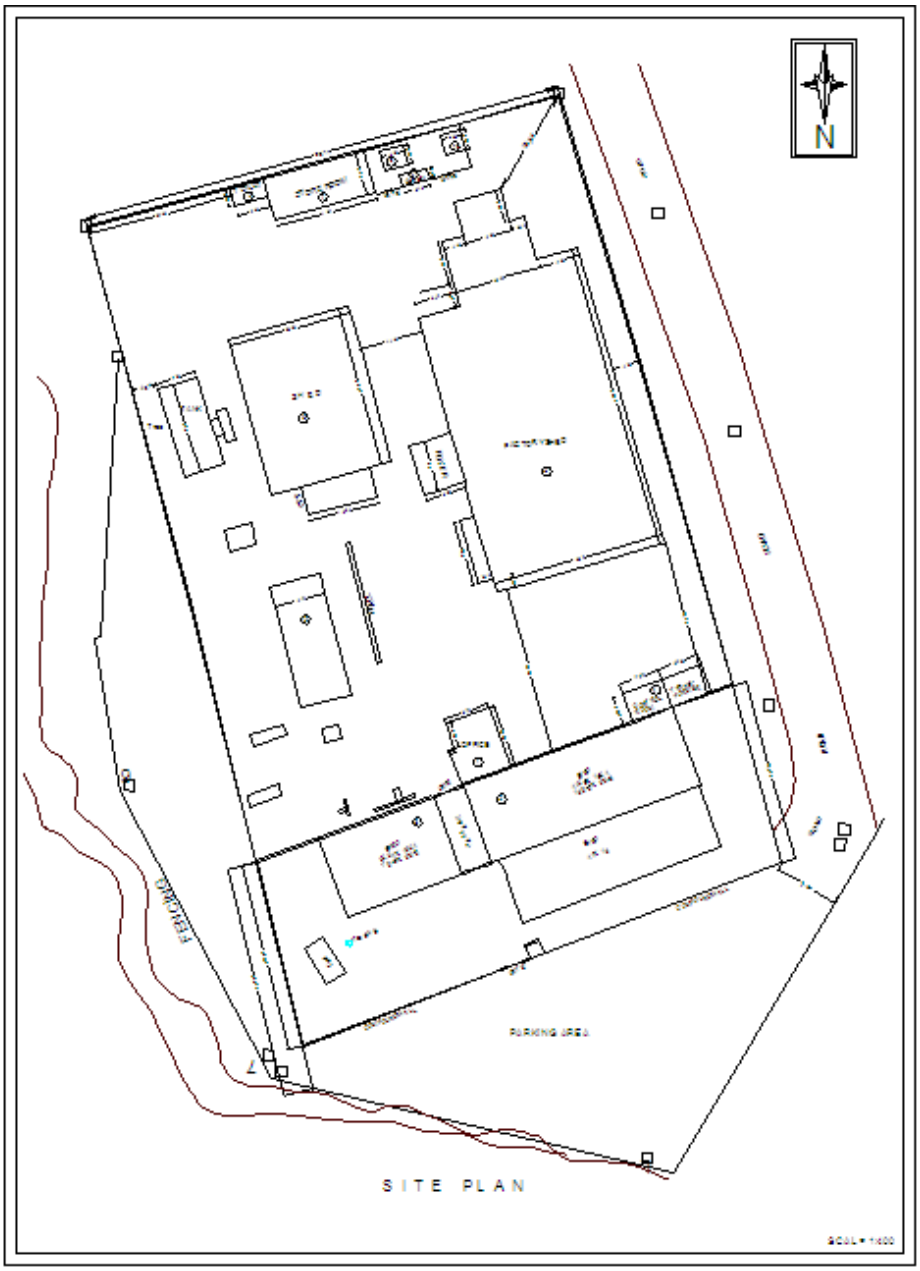
Fig no.1.1: STUDY AREA MAP



1.4 PLANT LAYOUT PLAN

The site layout plan is given below in figure no. 1.2.

fig. no.1.2 PLANT LAYOUT MAP



2.0 PRODUCTION DETAILS

The production details of the proposed expansion and new unit are given below

Table no. 2.1 Production Scenario

Sr. No.	Name	Existing	Proposed	Total
1.	Manganese oxide	840 MTPA	6000 MTPA	6840 MTPA
2.	Manganese dioxide	---	6000MTPA	6000 MTPA
	By thermite process (10 Nos. of MS crucibles of 500kg each)			
3.	Ferro Titanium **OR**	---	**500 MTPA**	**500 MTPA**
4.	Low/medium carbon ferro manganese **OR**	---	**4000 MTPA**	**4000 MTPA**
5.	Ferro molybdenum **OR**	---	**200 MTPA**	**200 MTPA**
6.	Ferro vanadium **OR**	---	**200 MTPA**	**200 MTPA**
7.	Low/medium Carbon silico manganese **OR**	---	**400 MTPA**	**400 MTPA**
	By installing Induction Furnance (2 Nos. of 500kg each)			
8.	Ferro aluminium **OR**	---	**6000 MTPA**	**6000 MTPA**
9.	Ferro silicon zirconium **OR**	---	**500 MTPA**	**500 MTPA**
10.	Ferro silicon magnesium **OR**	---	**500 MTPA**	**500 MTPA**
11.	Lead/ Aluminum shots	---	**100 MTPA**	**100 MTPA**
12.	Aluminium master alloy	---	**200 MTPA**	**200 MTPA**
	By installing Crusher/ Raymond Mill			
13.	All Ferro alloys and metal powder	---	**1000 MTPA**	**1000 MTPA**

The products are produced from highly acclaimed raw materials sourced from different corners of the domestic market. Located at a strategic location in the country, they procure the raw material from the nearby mines and also procure raw material from international markets.

2.1 Raw Material Details

The raw material requirement for the proposed expansion and new unit is given in **Table 2.2, 2.3 and 2.4.**

Table 2.2: Raw Material Requirement

Sr. No.	Raw Material	Quantity MT/Year
1.	Manganese Ore	9000 MT / year
2.	S. Coal / Charcoal	3000 MT / year

Table 2.3: Quantitative Details Of Raw Materials Required (Thermite Process)

Sr. No.	Raw material	Quantity required (TPA)				
		Low/medium carbon Si - Mn	Low/medium carbon Fe - Mn	Fe - V	Fe - Mb	Fe - Ti
1.	Manganese Ore	-	2500 MT	-	-	-
2.	Ilmenite Sand	-	-	-	-	300 MT
3.	Silico Manganese	400 MT	1000 MT	-	-	-
4.	Aluminum Powder	20 MT	100 MT	40 MT	40 MT	140 MT
5.	Aluminum Scrap	10 MT	400 MT	20 MT	10 MT	-
6.	Steel / Iron Scrap	-	-	-	5 MT	10 MT
7.	Manganese ore	-	-	-	-	-
8.	Molybdenum Concentrate	-	-	-	125 MT	-
9.	Flourspur,	-	-	2 MT	2 MT	5 MT

10.	Rutile / Zirconium,	-	-	-	-	50 MT
11.	Titanium Scrap,	-	-	-	-	40 MT
12.	Limestone Powder,	10 MT	400 MT	5 MT	5 MT	40 MT
13.	Titanium Dioxide,	-	-	-	-	5 MT

Sr. No.	Raw material	Quantity required (TPA)			
		Fe - Al	Fe – Si -Zr	Fe – Si - Mg	Al shots
1.	Rutile / Zirconium,	-	20 MT	-	-
2.	Ferro Silicon	-	275 MT	210 MT	-
3.	Aluminum Scrap	2100 MT	-	-	105 MT
4.	Coal / Charcoal	-	-	-	-
5.	Steel / Iron Scrap	4000 MT	125 MT	75 MT	-
6.	Magnesium Metal	-	-	25 MT	-

Table 2.4: Quantitative Details Of Raw Materials Required (Induction Furnace)

2.2 Basic requirement of project

2.2.1 Water Requirement

Water will be sourced from ground water and the total water requirement will be 20 KLD.

2.2.2 Power Requirement

The power required will be supplied by State Electricity Board. The power requirement for the proposed project will be 1200KV.

2.2.3 Land Requirement

M/s. NPPL is in possession of 100 Acres of land. Only 10 acres of land out of 100 acres will be utilized for expansion and installation of new units

2.2.4 Man Power:

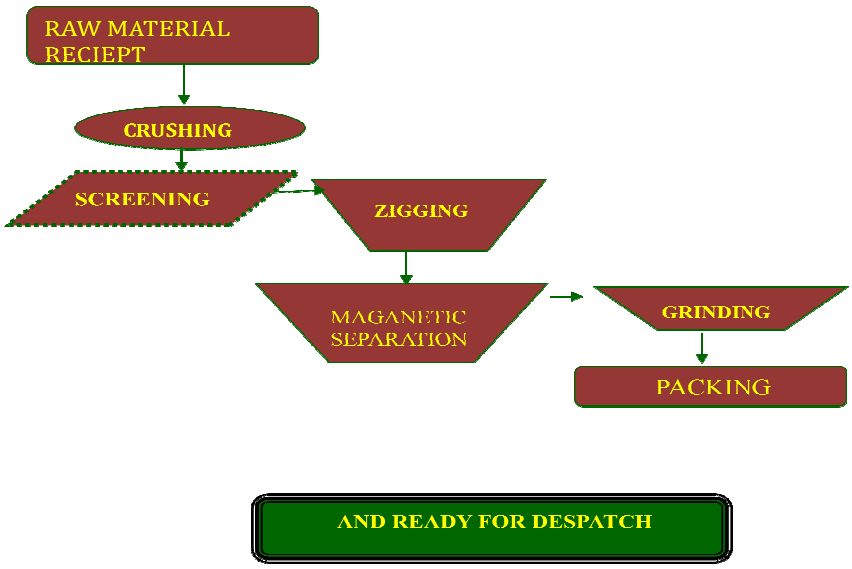
The proposed expansion project creates direct employment to 125 people and indirect employment to 400 people.

2.3 PROCESS DETAILS

2.3.1 Manufacturing Process of Manganese Dioxide

After receipt of material it is tested for its impurities. After getting full information's about its impurities following processes are followed to remove impurities and improve the purity of Manganese Ore.

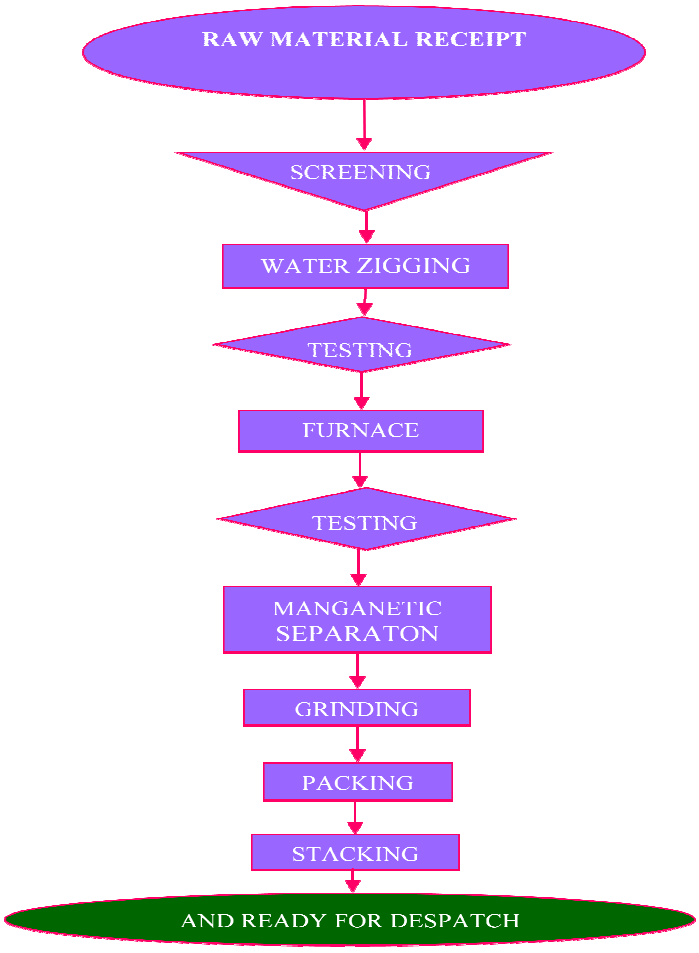
- **Screening**: The material is screened so that uniform sizes are obtained for further process.
- **Zigging**: Water jigging is done to separate and wash impurities.
- **Magnetization**: Different sizes of MnO_2 ore are feed to magnet where unwanted impurities get removed.



Process Flow Chart of MnO_2

2.3.2 Manufacturing Process of Manganese Oxide

- After Raw Material receipt at the site it is tested for the contents of various elements and then the material is screened. After screening you get different sizes, which are jigged in automatic water jigging.
- Then the material is dried and after Magnetic Separation it is feed to grinding Machine, where it is powdered in the required mesh size.
- After grinding it is semi automatically packed in 25 kg/50 kg/ or 1000 kg HDPE Bags and kept ready for dispatch.



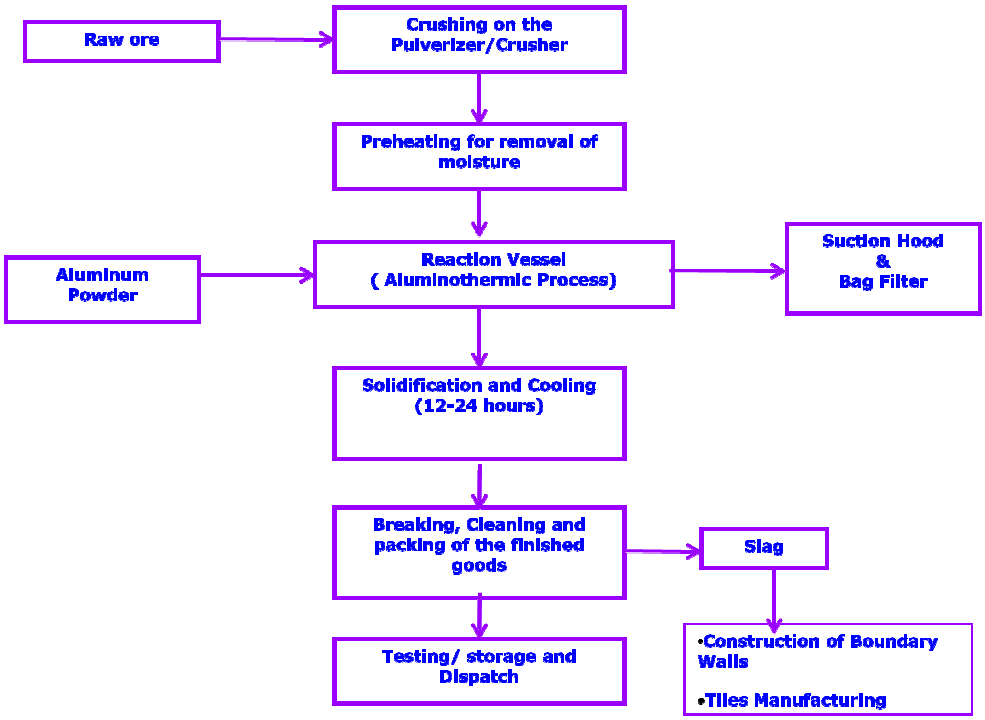
Process Flow Chart of MnO Production

2.3.3 Ferro Alloys / and Other Noble Ferro Alloys Thermite Process

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

Following activities are carried on:

- ✓ Powdering of different Alloys / Minerals.
- ✓ Mixing in blender in the required proposition
- ✓ 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.
- ✓ Metal and Sludge are separated by manual processes.
- ✓ Metal is crushed and for some customer it is powdered in Pulveriser.
- ✓ The Metal is crushed and packed in bags and kept ready for dispatches.

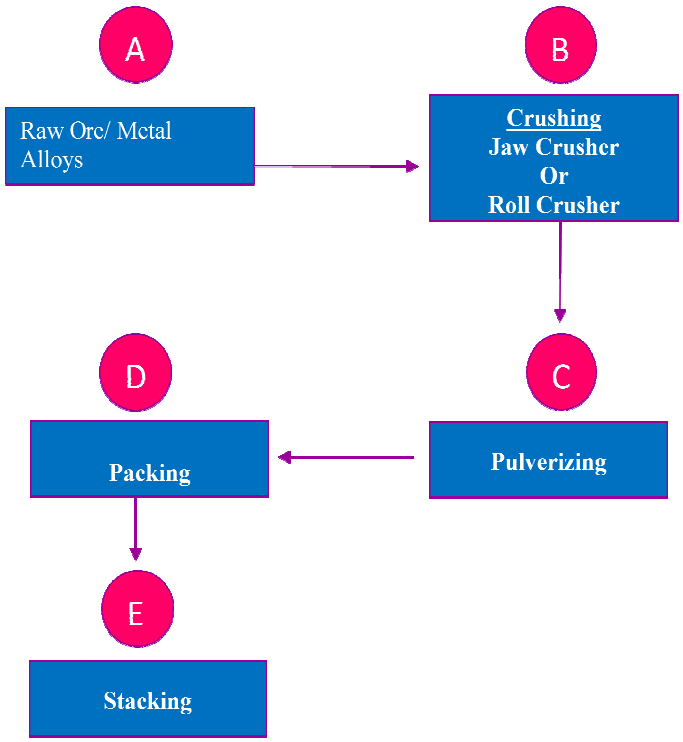


Thermite Process

2.3.4 Manufacturing Process for Metal / Alloys Powder

All Metal Alloys are crushed in Jaw Crusher or Roll Crusher in the required Sizes.

This Crushed material is then fed to Pulverizer or Raymond Mill for Powdering. Then the material is packed in 25 KG/ 50 KG / or Jumbo Bags as required by the Customer.

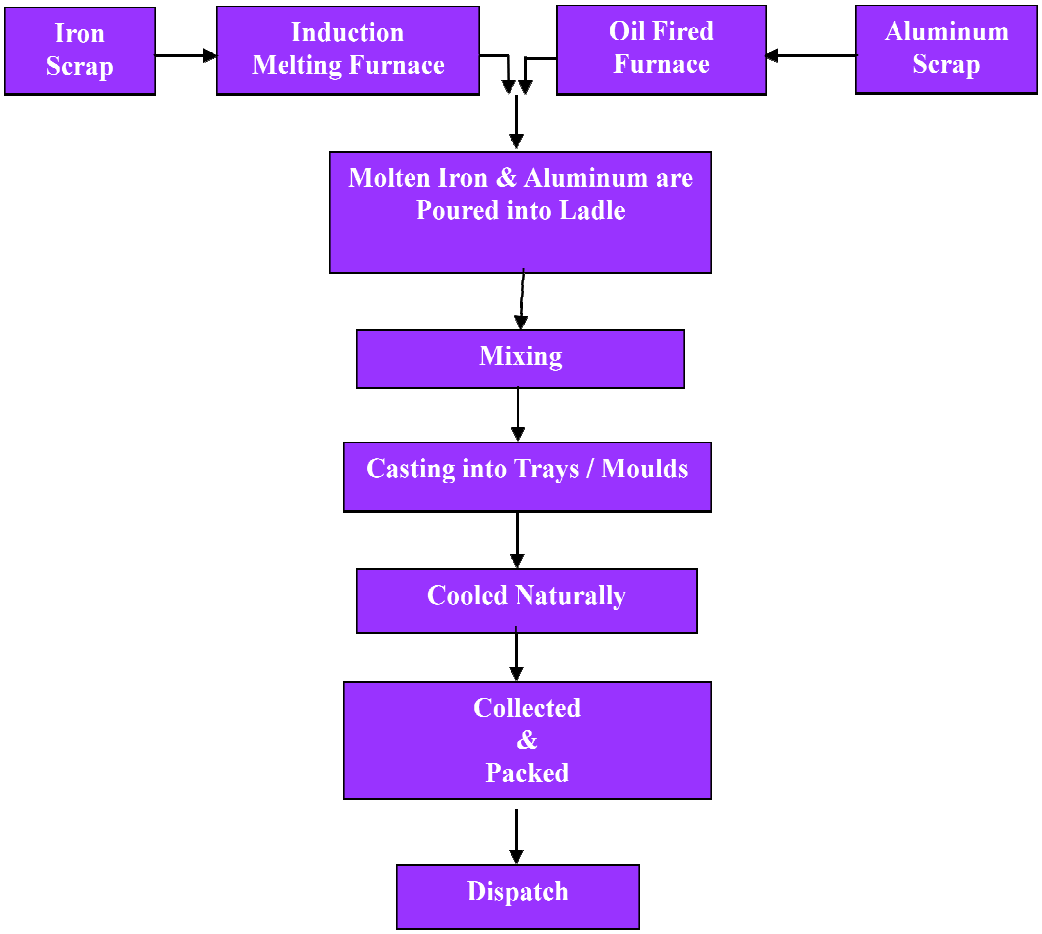


Manufacturing Process for Metal / Alloys Powder

2.3.5 Induction Furnace Manufacturing Process

1. **Melting Iron / Steel Scrap** : - Initially Iron Scrap is placed into the Induction Melting Furnace (Electrically Operated) and allowed to melt.
2. **Melting Aluminum / Scrap** : - The Aluminum / scrap is melted simultaneously in the oil fired furnace.
3. **Mixing** : Molten aluminum scrap is poured into the Ladle, which is then carried to the induction furnace, whereby molten Iron is also poured into the same ladle.

4. **Casting** : - The resulting mixture is then poured onto stationary patterns / moulds/ tray or casting machine and allowed to cool.
5. **Packing** : - The cooled Piglets are then taken into packing ready for dispatch.



Flow Chart of Process

2.3.6 Process of Castings

- **Green Sand Molding**

Green sand is by far the most diversified molding method used in current metal casting operations. The green sand process utilizes a mold made of compressed or compacted moist sand packed around a wood or metal pattern. The term "green" denotes the

presence of moisture in the molding sand, and indicates that the mold is not baked or dried.

- **Process**

The mold material consists of silica sand mixed with a suitable bonding agent (usually clay) and moisture. To produce the mold a flask, usually a metal frame, (although wood may be used for some processes and types of castings), is placed over the pattern to produce a cavity representing one half of the casting. Compaction is achieved by either jolting or squeezing the mold. The other half of the mold is produced in like manner and the two flasks are positioned together to form the complete mold.

3.0 DESCRIPTION OF THE ENVIRONMENT (BASELINE DATA)

3.1 AIR ENVIRONMENT

Ambient air quality (AAQ) samples were collected on basis of 24-hour sampling and twice a week at each site. The ambient air quality samples were collected for continuous 13-weeks beginning from 7th Jan 2014 to 7th Apr.-2014 assessed in an area of 10 km radius around the proposed project site.

During the study period, the predominant wind directions were from North (20.9%), from NNE(13.6%) and from ENE(13.5%)

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

PM_{10}	:	32.2 µg/m^3 -59.4 µg/m^3
$PM_{2.5}$	:	16.1 µg/m^3 -33.4 µg/m^3
SO_2	:	6.2 µg/m^3-24.5µg/m^3
NO_x	:	8.0 µg/m^3-28.2 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).

3.2 Impact on Demography and Socio-Economics

The impacts of the proposed project, during its operation, on demography and socio-economic condition can be identified as follows.

- Negative impacts can be depletion of natural resources like water and land. The impact on the air quality will be marginal.
- Increase in employment opportunities and Reduction in migrants to outside for employment.
- During operation phase 400 technical and nontechnical people will be employed.
- Increase in consumer prices of indigenous produce and services, land prices, house rent rates and Labour prices.
- Improvement in socio-economic environment of the study area.
- Improvement in transport, communication, health and educational services.
- Increase in employment due to increased business, trade commerce and service sector.
- The overall impact on the socio economic environment will be beneficial.

M/s Nagpur Pyrolusite Private Ltd. would aid in the overall social and economic development of the region. 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.

3.3 CORPORATE SOCIAL RESPONSIBILITY

M/s. Nagpur Pyrolusite Private Limited will put the efforts towards socio-economic activities for the betterment of the society and will contribute for the following activities

- Repair of School buildings
- Sponsoring of health checkup camps, sports & other cultural activities in surrounding villages
- Income augmenting schemes for women
- Fodder Farming schemes.

The total cost of project is Rs. 3 Crore and M/s. Nagpur Pyrolusite Private Limited will spend

Sr No	**Environmental Aspect**	**Capital Expenditure (in lacs)**	**Recurring Expenditure (in lacs)**
1	Air pollution control device	Rs. 7.0	Rs. 1.0
2	Rain water Harvesting	Rs. 1.0	Rs. 0.05
3	Green Belt	Rs. 2.0	Rs. 0.05
4	Solid Waste management	Rs. 1.0	Rs. 0.20
5	Wastewater management	Rs. 2.0	Rs. 0.20
6	Per year expenditure for environmental awareness training	Rs. 1.0	-
7	Environmental Study and devices	Rs. 1.0	Rs. 0.05
	Total	**Rs. 15 Lacs**	**Rs. 1.55 Lacs**

5% of project cost towards EMP.

4.0 ANTICIPATED ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

Impact on Air Quality

The impacts on air quality due to source of the air pollution 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 activities the possible environmental impact on air quality has been envisaged due to the following sources.

In this case the source emission is envisaged from furnace during roasting of manganese ore with coal.

Stack of 30 mt ht is proposed with wet scrubbers to minimse the concentration of pollutants which is mainly PM & SO_2.

In addition to above a minor source emission is envisaged during thermite process and melting of M.S. scrap & aluminium in induction furnace of 500 kg capacity.

Raw Material Handling / Transport System

The possible pollutants are fugitive dust emissions from raw materials handling areas viz. loading / unloading, fuel stockyard, crushing units etc. Raw materials will be fed to hopper with the help of pay-loader / tipper. The major sources of pollution from proposed units can be classified under the following heads:

- Pollutants in the waste gases namely, suspended particulate matter (SPM), sulphur dioxide, NO_X and Carbon monoxide, etc.
- Fugitive dust generated during vehicular movement

Mitigation Measures

- M/s. Nagpur Pyrolusite Private Ltd. shall provide dust suction system which will control fugitive emission due to material and raw material handling.

- Dust suppression system will be provided in the form of water sprinklers.
- All vibrating screens and weigh feeders below the hopper; day bins etc are totally covered to prevent leakages of dust.
- All bins are packed and covered so that there is no chance of dust leakage.
- All discharge and feed points wherever the possibility of dust generation, is provided with dust suppression system.
- All material transfer points are connected with dust suppression water nozzles to avoid air pollution.
- Regular monitoring of air polluting concentrations, *etc*.
- Wetting of roadways to reduce traffic dust and reentrained particles
- Provision for masks when dust level exceeds, *etc.*
- Installation of Wet Scrubbers followed by Stack.

Impacts Due to the Transportation of Raw Material

The major impact due to transportation of the raw material. The emissions due to transportation of vehicles in the study area were determined from fuel-based emission factors and number of vehicles plying on roads in the area. Loading and transportation of raw materials are the significant sources of emissions.

The majority of trucks (95%) plying in the study area are manufactured in India as per the standard norms hence it is assumed that emission from these trucks will be similar and is mandatory for the vehicle manufactures to follow emission norms under the Motor Vehicle Act. The emissions through transportation are assessed based on Emission factors for on-road vehicles (CPCB Publication 1998).

Mitigation Measures

- The vehicles transporting raw materials will be covered by tarpaulin in order to prevent dust emission during the transport.
- The vehicles used in transportation will comply norms as per the motor vehicle act.
- The repair and maintains of vehicle will be taken care by transporter

- Vehicles with PUC will be only allowed to operate

Air pollution mitigation measures

- Particulate matter will be controlled below 50 mg/Nm^3 by providing efficient dust suppression and extraction system like bag filters / wet scrubbers followed by 30 mt stack. Water spray system shall be installed in the material handling system transfer points
- Green belt shall be provided around the plant area. Plantation along the internal roads in the plant premises will also be undertaken. Already we have planted about 5000 trees of oranges, mangos in 100 Acres of land.
- All the internal roads shall be concreted / asphalted to reduce the fugitive dust due to vehicular movement
- Water spraying will be practiced frequently
- The emissions from the stacks shall be regularly monitors for exit concentration of Sulphur dioxide, Nitrogen oxides and PM. Sampling ports shall be provided in the stacks according to CPCB guidelines.

Impact on Water Environment

The total water requirement for the proposed activities is 20 KLD. During plant operation 2 m^3/ day of waste water will be generated from the zigging process of MnO and MnO2. The wastewater generated in this process and in cooling process will be treated in the settling tank and will be reused in the zigging process.

The sewage generated from the toilets and bathroom in the will be 3 m^3/day in the proposed expansion facilities which will be disposed through septic tank.

Impact on Noise Environment

During operation, the major noise generating sources are grinding mill, auto loading sections, blenders 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 within the Proposed plant the impact of noise levels on surrounding will be insignificant.

Mitigation Measures

The noise levels stipulated by Central Pollution Control Board at any point of time will not exceed the standards. The equipment will have inbuilt noise control devices. The measured noise level produced by any equipment will not exceed 85 dB (A) at a distance of 1.0 m from its boundary in any direction under any load condition. The noise produced in valves and piping associated with handling compressible and incompressible fluids will be attenuated to 75 dB(A) at a distance of 1 m from the source by the use of low noise trims, baffle plate silencers/ line silencers, acoustic lagging (insulation), thick-walled pipe work as and where necessary. The general mitigation for the attenuation of the noise are given below:

- By providing padding at various locations to avoid sharp noise due to vibration.
- Encasement of noise generating equipment where otherwise noise cannot be controlled
- Providing noise proof cabins to operators where remote control for operating noise generating equipment is feasible.
- In all the design/installation precautions are taken as specified by the manufacturers with respect to noise control will be strictly adhered to;
- High noise generating sources will be insulated adequately by providing suitable enclosures;
- Use of lagging with attenuation properties on plant components / installation of sound attenuation panels around the equipment
- 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. 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.

Solid Waste

The solid waste generation in the proposed plant is given in following Table

Solid Waste Generation & Mitigation Measures

Waste	Quantity	Mitigation Measures
Slag	100 Mt/month	Slag generated from manufacturing of Ferro manganese will be sold to manufacturer of Silico-manganese.
Ash	100 Mt/month	Reused and recycled in manufacturing of bricks.

SOCIO-ECONOMIC ENVIRONMENT

The impacts of the proposed project, during its operation, on demography and socio-economic condition can be identified as follows.

- Negative impacts can be depletion of natural resources like water and land. The impact on the air quality will be marginal.
- Increase in employment opportunities and Reduction in migrants to outside for employment.
- The plant will give direct employment to 125 people and indirect employment to 400 people of local area.
- Increase in consumer prices of indigenous produce and services, land prices, house rent rates and Labour prices.
- Improvement in socio-economic environment of the study area.
- Improvement in transport, communication, health and educational services.

- Increase in employment due to increased business, trade commerce and service sector.
- The overall impact on the socio economic environment will be beneficial.

  The management of M/s. Nagpur Pyrolusite Private Ltd. has proposed to give preference to local people for recruitment in semi skilled and semi skilled category.

5.0 ENVIRONMENT MONITORING PROGRAMME

The environmental monitoring is important to assess performance of pollution control equipment installed in the expansion project of M/s. Nagpur Pyrolusite Private Limited. The proposed project is for Expansion of manufacturing of manganese oxide and installation of new unit to manufacture various ferro alloys. The sampling and analysis of environmental attributes including monitoring locations will be as per the guidelines of the Central Pollution Control Board / State Pollution Control Board.

Environmental monitoring will be conducted on regular basis by M/s. Nagpur Pyrolusite Private Limited to assess the pollution level in the proposed plant as well in the surrounding area. Therefore, regular monitoring program of the environmental parameters is essential to take into account the environmental pollutant of the study area.

The objective of monitoring is:

- To verify the result of the impact assessment study in particular with regards to new developments;
- To follow the trend of parameters which have been identified as pollutants;
- To check or assess the efficiency of the controlling measures;
- To ensure that new parameters, other than those identified in the impact assessment study, do not become critical due to the commissioning of proposed facilities;
- To check assumptions made with regard to the development and to detect deviations in order to initiate necessary measures;

- To establish a database for future Impact Assessment Studies for new projects.

The attributes, which needs regular monitoring, are specified below:

- Air quality
- Water and wastewater quality;
- Noise levels;
- Soil quality;
- Ecological preservation and afforestation; and
- Socio Economic aspects and community development

6.0 ENVIRONMENT MANAGEMENT PLAN

Overview of Pollution Control Management

Furnace for MnO and MnO_2.

SOURCE	POLLUTANTS	CONTROL MEASURES
A. Air pollution	PM_{10},$PM_{2.5}$,So_X and NO_2	Wet Scrubbers followed by stack of 30 mt height.
B. Solid waste	Slag generated	Slag generated from manufacturing of Ferro manganese will be sold to manufacturer of Silico-manganese.
C furnace	Fly Ash	Reused and recycled in cement industry and manufacturing of bricks.

Induction Furnace

SOURCE	POLLUTANTS	CONTROL MEASURES
A. Air pollution from induction furnace due to melting of hot metal	PM_{10},$PM_{2.5}$	Wet Scrubbers followed by stack of 30 mt height.
B. Solid waste from Induction Furnace (Cumulative)	Slag generated from induction furnace	Slag generated will be used for filling nearby village road constructions after receiving the necessary approval from the authorities.

Air Environment

The sources of air pollution are raw material handling system, materials transportation, raw materials feeding to the operating equipments. The automatic process equipments will be employed for the raw material feeding system. Stacks of adequate height of 30 m is proposed for proper dispersion of flue gases from induction furnaces. The following Environmental Management Plan will be implemented to control air emissions from Induction Furnace.

Action Plan to Control of fumes

- 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 ducting will be employed.
- Wet Scrubbers followed by a 30 mt height stack will be installed to induction furnace & gasifier.
- Fugitive emission from material unloading operations, material transfer points will be controlled fully with total enclosure.
- 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} 100µg/m^3, $PM_{2.5}$ 60µg/m^3 SO_2 80µg/m^3, NO_x 80µg/m^3 and CO 04µg/m^3) prescribed by CPCB.
- The monitoring frequency of air quality shall be as per the consent issued by State Pollution Control Board and reports shall be submitted as part of compliance. The records will be maintained.
- Regular Stack Monitoring will be done. All the emissions from the plant will be controlled to meet the relevant standard set by CPCB/State Pollution Control Board
- Details regarding volumetric flow, temperature and emission rate of pollutants from different stacks shall be collected and compiled regularly
- Effective steps shall be taken to control fugitive emission inside the plant. All internal roads will be Tar Roads. Efficient arrangements will be provided to control

fugitive dust emission during handling/transportation of Raw materials / finished product etc

- The emission from induction furnace area will be extracted and treated in a fume extraction system.
- Fumes will be evacuated directly from induction furnaces through hoods with swirling mechanism and ducting.
- Avenue plantation will be strengthen further to control fugitive emissions & gaseous pollutants to keep clean and healthy environment.

Water Environment

- During plant operation 2 m^3/ day of waste water will be generated from the zigging process of MnO and MnO_2. The wastewater generated in this process will be treated in the settling tank and will be reused in the zigging process.
- Close circuit system will be provided in cooling process; here the water is evaporated in the process of cooling. The wastewater generated from the cooling process will be recycled and reused in cooling process.
- The necessary design parameters and material of construction for cooling system including cooling towers will be selected in such a way that they are able to utilize water from the clarifier. Provision for oil/grease separators will be made to skim oil / grease, if any in the waste water. After skimming of the oil water will be stored in guard pond.
- Domestic waste will be disposed through Septic Tanks along with soak pits.

Noise Environment:

- The industry will take care while procuring major noise generating machines/equipment to ensure that the manufactures have taken adequate measures to minimize generation of noise.
- The areas where noise levels are high will be partitioned off, noise levels will be minimized at the source, and noise reflection and transmission will be minimized.

- The workers working in the high noise areas will be provided with ear muffs/ear plugs.
- Acoustic laggings and silencers will be provided in equipment wherever necessary. Ventilation fans shall be installed in enclosed premises.
- Supply ducts and grills on the ventilation and air conditioning system will be suitably sized for minimum noise level.
- The silencers and mufflers of the individual machines shall be regularly checked
- The noise level shall not exceed the limit 75 dB (A) during the day time 70 dB (A) night time within the plant premises.
- Provision of insulating caps and lids at the exit of noise source and providing polystyrene, etc. as noise insulation material will be adopted. All the openings will be covered and partitions will be acoustically sealed.
- Avenue plantation around the plant area will reduce the noise level further. Training of personnel is recommended to generate awareness about damaging effects of high noise levels.

Management Plan of Solid waste

- Process needs refractory lining and is being changed every month.
- Solid waste of slag generation (Cumulative) will be about 100 Mt/month. The Fly ash generated will be 100 Mt/month.
- Solid waste is non hazardous and non-toxic in nature.
- Slag generated will be used for filling nearby village road constructions after receiving the necessary approval from the authorities.
- Fly ash generated will be reused and recycled in cement industry and manufacturing of bricks
- Solid waste will be use for land filling, in own premises, for which M/s. Nagpur Pyrolusite Private Ltd.. have already acquired adjacent plot from MIDC.
- Temporary Landfill will be designed for slag and dust as per the guidelines of MoEF New Delhi for unused slag.

Socio Economic Environment

M/s Nagpur Pyrolusite Private Ltd. would aid in the overall social and economic development of the region. The plant will give direct employment to about 125 people and indirect employment to 400 people of local area. 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.

Occupational Safety & Health Management

M/s Nagpur Pyrolusite Private Ltd. will provide all necessary provisions under Factory Act. In addition a Safety committee will be formed and manned by equal participants from Management and Workers. All personal protect equipments like Safety shoes, helmet & uniform will be issued to each employee based on the nature of job involved. In case a person inhales fumes, he should be removed to fresh air and given oxygen through a mask for 30 minutes and if required cardiopulmonary resuscitation should be performed.