

# ***Executive Summary***

*of*

***Proposed Manufacturing unit of Manganese Oxide,  
Manganese Dioxide, Ferro Alloy Unit (By Thermite  
Process) &  
Manganese/ Iron Ore Beneficiation from ROM***

***Proponent***

***M/s. SHREE SHYAMJEE METALLICS***

***At Survey No. 165 & 169 Village Tekadi, Tehsil Parseoni, District – Nagpur,  
Maharashtra***

*By*

***Pollution & Ecology Control Services  
NAGPUR***

# **EXECUTIVE SUMMARY**

## **INTRODUCTION**

Environment Impact Assessment (EIA) is a process, used to identify the environmental, social and economic impacts of a project prior to decision-making. It is a decision-making tool, which guides the decision makers in taking appropriate decisions for projects. It aims predicting environmental impacts at an early stage of project planning and design, find ways and means to reduce adverse impacts, shape projects to suit the local environment and present the predictions and options to decision makers. By using EIA, both environmental and economic benefits can be achieved. EIA systematically examines both beneficial and adverse consequences of the project and ensures that these impacts are taken into account during the project design. By considering environmental effects and mitigation early in the project planning cycle, there are many benefits, such as protection of the environment, optimum utilization of resources and saving overall time and cost of the project. Properly conducted EIA also lessens conflicts by promoting community participation, informs decision-makers, and helps lay the base for environmentally sound projects.

Pollution & Ecology Control Services (PECS), Nagpur presents this Environmental Impact Assessment Report on behalf of Shree Shyamjee Metallics to install a new manufacturing unit for Manganese Dioxide, Manganese Oxide, Ferro Alloy Unit (By Thermite Process) and Manganese / Iron Ore Beneficiation from ROM at Village Tekadi, Tehsil Parseoni, District – Nagpur, Maharashtra.

## **DESCRIPTION OF PROCESS**

### **Manufacturing Process of Manganese Dioxide**

After receipt of material it is tested for its quality. 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 zigging is done to separate and wash impurities.
- **Magnetization:** Different sizes of MnO<sub>2</sub> ore are feed to magnet where unwanted impurities get removed.

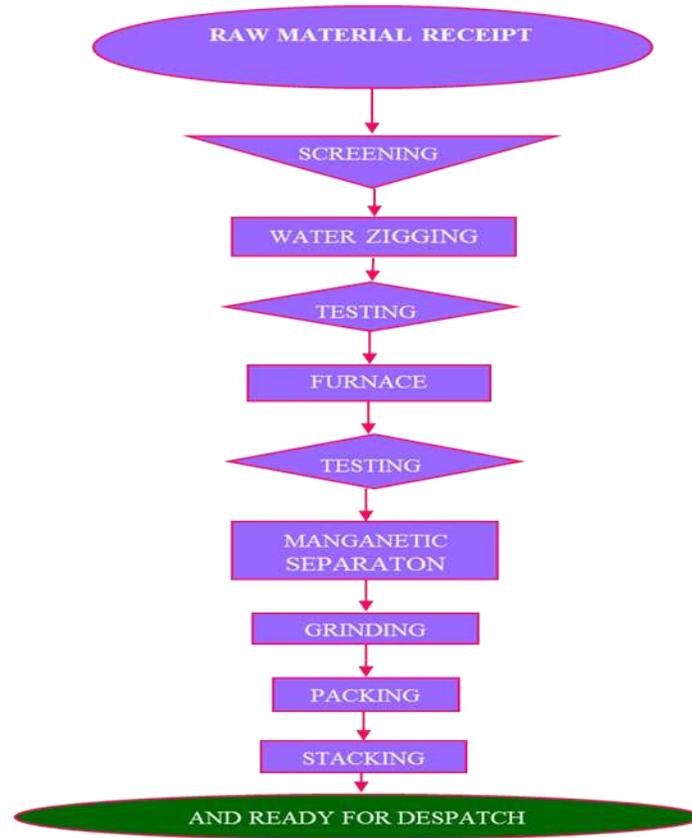


**Process Flow Chart of MnO<sub>2</sub>**

### **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 zigged in automatic water zigging.
- The material is then heated in coal fired furnace. From where it is transferred for drying and magnetic separation.
- 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**

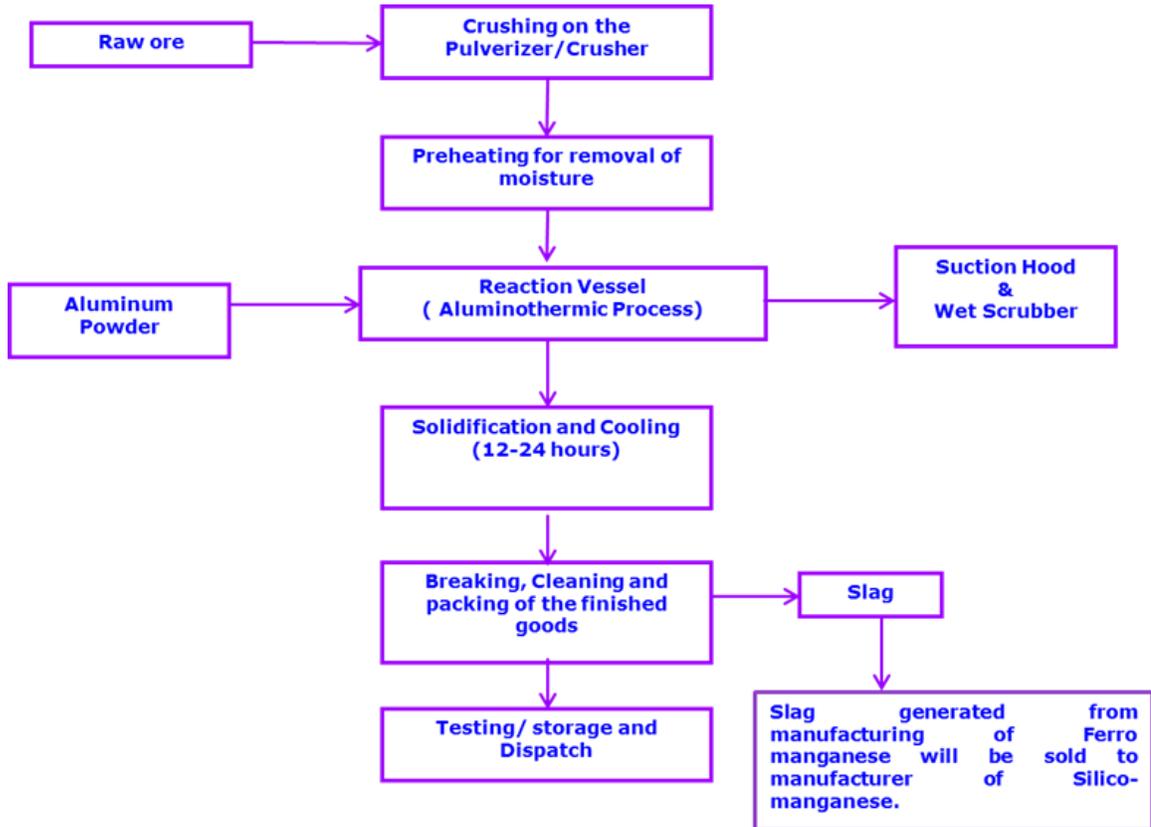
#### **Ferro Alloys / and Other Noble Ferro Alloys Thermite Process**

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**

#### **DESCRIPTION OF ENVIRONMENT**

The baseline environmental quality for the period of February, March, April and May 2018 was assessed in an area of 10 km radius around the proposed project site.

#### **Air Environment**

The predominant wind directions were North and North West.

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

PM<sub>10</sub> : 40.1 to 61.8 µg/m<sup>3</sup>.  
PM<sub>2.5</sub> : 20.7 to 40.4 µg/m<sup>3</sup>  
SO<sub>2</sub> : 8.3 to 27.9 µg/m<sup>3</sup>  
NO<sub>x</sub> : 11.9 to 29.9 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 14 samples including six 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.

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
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\*\* 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

Three 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.

- a) Texture of soil samples from agriculture lands are silt clay loam. Samples from barren lands are sandy loam and silt-loam and soil samples from waste land are silt-loam in Texture Classification.
- b) Colour of soil samples from agriculture and waste land are grey and soil samples from barren land are yellow in colour.
- c) The bulk density of soil samples from agriculture land are in the range of 1.75 to 1.79 g/cc and sample from Barren land are in the range of 1.83 to 1.98 g/cc and sample from Waste land are in the range of 1.69 to 1.72 g/cc.
- d) Soil samples from agriculture land have pH values between 8.14 to 8.52 and sample from barren land have 7.46 to 7.76 ranges of pH values and Soil samples from waste land have pH values between 8.37 to 8.61 The pH values are indicating nature of soil samples is alkaline.
- e) Soil samples from agriculture land have conductivities between 0.148 to 0.153 mmhos/cm however; conductivity of soil sample from barren land ranges between 0.075 to 0.092 mmhos/cm and conductivity of soil sample from waste land ranges between 0.097 to 0.102 mmhos/cm..
- f) Soil samples from agriculture land have Organic Matter between 0.99 to 1.07 % and sample from barren land have between 0.64 to 0.76 % Organic Matter and sample from waste land have between 0.68 to 0.84 % Organic Matter. These values represent good fertility of soils.
- g) Soil samples from agriculture land have concentration of Available Nitrogen values ranged between 400 to 443 kg/ha and samples from barren land range

between 253 to 314 kg/ha Available Nitrogen value and samples from waste land range between 274 to 335 kg/ha Available Nitrogen value

- h) Soil sample from agriculture land have concentration of Available Phosphorous values ranged between 52.3 to 64.1 kg/ha and soil samples from barren land have concentration values ranges from 38.7 to 47.8 kg/ha and and soil samples from waste land have concentration values ranges from 44.2 to 52.8 kg/ha.
- i) Soil sample from agriculture land have concentration of Available Potassium values range between 390.1 to 459.9 kg/ha, whereas sample from barren lands concentration of Available Potassium as its values range between 263.5 to 279.3 kg/ha and sample from waste lands concentration of Available Potassium as its values range between 307.3 to 347.2 kg/ha.

## **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 minimize the concentration of pollutants.

### **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. 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, NOX and Carbon monoxide, etc.
- Fugitive dust generated during vehicular movement

### **Mitigation Measures**

- M/s. Shree Shyaamjee Metallics 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.
- Regular monitoring of air polluting concentrations, *etc.*
- Installation of Wet Scrubbers followed by Stack.

### **Impacts Due to the Transportation of 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 maintenance 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<sup>3</sup> by providing efficient dust suppression and extraction system like 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.
- 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**

The total water requirement for the proposed activities is 40 KLD. During plant operation 3 m<sup>3</sup>/ day of waste water will be generated from the zigging process of MnO and 4 m<sup>3</sup>/ day of waste water will be generated from cooling and scrubbing process. The wastewater generated in this process and in cooling process & scrubber will be treated in the settling tank. This wastewater will be reused in the process of zigging and for gardening.

The sewage generated from the toilets and bathroom in the will be 5 m<sup>3</sup>/day in the proposed facilities which will be treated in Packaged Type STP.

Most of the water used in Beneficiation will be ultimately be evaporated either in the atmosphere or at the raw mix driers. Water spilled from the processes and tank blow downs will be collected and used for spraying in the yards as well as for plantation.

### **Impact on Noise Environment**

During operation, the major noise generating sources are grinding mill, 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.

- ❖ 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.

### **Solid Waste Generation**

Following are the solid waste generation due to operation of proposed units:

- a. Ash from MnO Bhatti (Furnace)
- b. Slag from Ferro Alloys

The solid waste generation in the proposed plant is as follow

**Solid Waste Generation & Mitigation Measures**

<b>Waste</b>	<b>Quantity</b>	<b>Mitigation Measures</b>
Slag	7237 TPA	Slag generated from manufacturing of Ferro manganese will be sold to manufacturer of Silico-manganese.

**SOCIO-ECONOMIC ENVIRONMENT**

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

- Increase in employment opportunities and Reduction in migrants to outside for employment.
- The plant will give direct employment to 40 people and indirect employment to 40-50 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.Shyaamjee Metallica has proposed to give preference to local people for recruitment in skilled and semi skilled category.

**ENVIRONMENT MONITORING PROGRAMME**

The environmental monitoring is important to assess performance of pollution control equipment installed in the project of M/s. Shyaamjee Metallica. The proposed project is for manufacturing of manganese oxide and manufacturing of ferro alloys and

beneficiation. The sampling and analysis of environmental attributes including monitoring locations will be as per the guidelines of the Central Pollution Control Board.

Environmental monitoring will be conducted on regular basis by M/s. Shyaamjee Metallics to assess the pollution level in the proposed plant. 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;

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

- Air quality
- Water and wastewater quality;
- Noise levels;
- Soil quality;

## **ENVIRONMENT MANAGEMENT PLAN**

### **Air Environment**

The sources of air pollution are raw material handling system, materials transportation, raw materials feeding to the operating equipments. 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 Furnace.

#### **Action Plan to Control of fumes**

- Wet Scrubbers followed by a 30 mt height stack will be installed to induction furnace.
- 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<sub>10</sub> 100µg/m<sup>3</sup>, PM<sub>2.5</sub> 60µg/m<sup>3</sup> SO<sub>2</sub> 80µg/m<sup>3</sup>, NO<sub>x</sub> 80µg/m<sup>3</sup> and CO 04µg/m<sup>3</sup>) 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
- Plantation will be strengthen further to control fugitive emissions & gaseous pollutants to keep clean and healthy environment.

#### **Water Environment**

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**Noise Environment:**

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- The insulation provided for prevention of loss of heat and personnel safety will also act as noise reducers.

**Land Environment**

Apart from the aforesaid pollution control measures the management has decided to develop green belt covering more than 33% of total area reserved for industrial use. During plantation landscaping pattern will be considered.

**Management Plan of Solid waste**

- Slag generated from manufacturing of Ferro manganese will be sold to manufacturer of Silico-manganese.
- 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.

- Slag generated from manufacturing of Ferro manganese will be sold to manufacturer of Silico-manganese.
- Fly ash generated will be reused in manufacturing of bricks.

### **Socio Economic Environment**

M/s Shyaamjee Metallics would aid in the overall social and economic development of the region. The plant will give direct and indirect employment to about 40-50 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 Shyaamjee Metallics will provide all necessary provisions under Factory Act. In addition a Safety officer will be appointed as per Factory Act. All personal protect equipments like Safety shoes, helmet & uniform will be issued to each employee based on the nature of job involved.