

Executive Summary

For

**Expansion of Existing crushing and Grinding unit of
Manganese Ore with addition of Manufacturing of
24000 TPA of Manganese Oxide by Roasting
furnace**

At

*Khasra No. 291, 292 Aamdi Faata, Taluka Parseoni, District
Nagpur, Maharashtra*

Project Proponent

EVERGREEN MANGANESE & MINERALS

INDUSTRIES PRIVATE LIMITED

Environmental Consultant

Pollution and Ecology Control Services

Near Dhantoli Police Station, Dhantoli, Nagpur

Accreditation no.: NABET/EIA/2225/RA 0291 valid till 16th October 2025

EXECUTIVE SUMMARY

INTRODUCTION

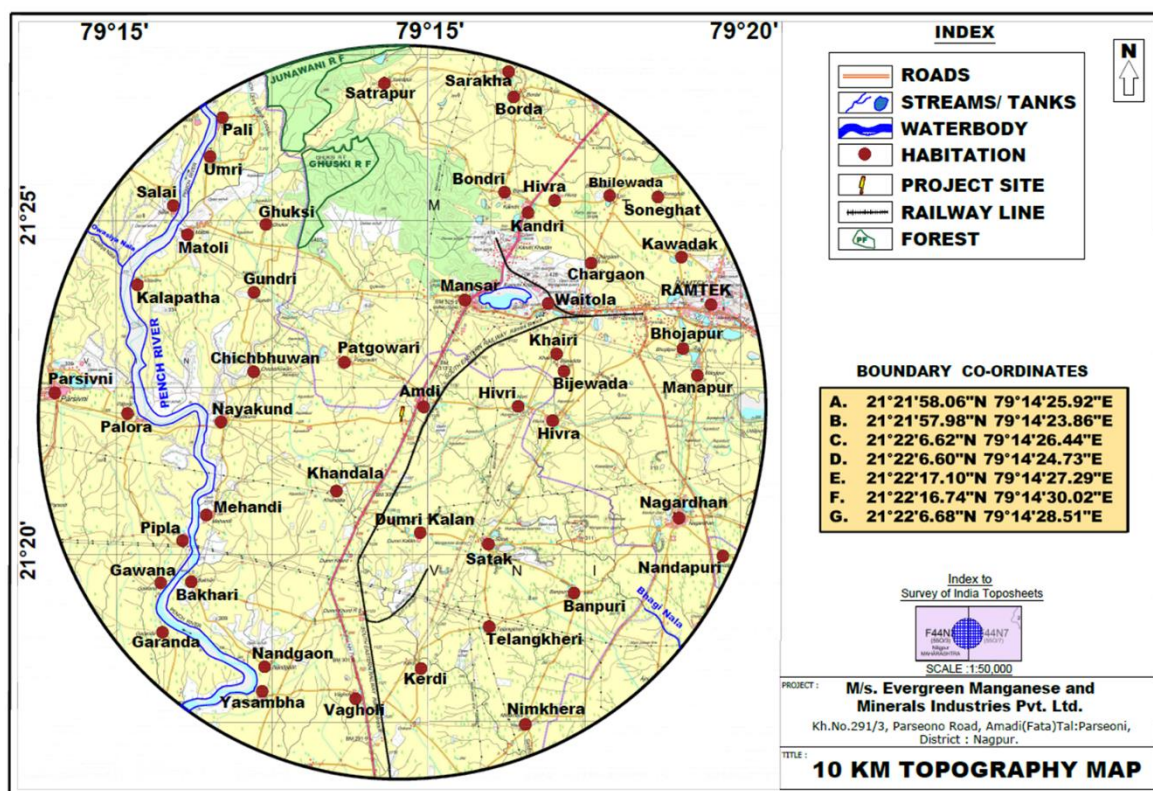
Manganese compounds are among the essential inputs required for many sectors. Growth in global as well as domestic steel industry directly drives their demand. Since Indian industry is under massive expansion, there is a tremendous potential for investment in such kind of production.

Manganese compounds are used as raw material in various industrial and agricultural sectors. MnO is a component of fertilizers and food additives. Manganese Oxide is derived from the manganese, a brittle metal element. It is widely distributed in the earth crust and is the most important manganese compound.

The increasing demand of Manganese compounds which is used as raw material in various industrial and agricultural sector prompted M/s. Evergreen Manganese and Minerals Industries Private Ltd. to establish the manufacturing unit of Manganese Oxide.

IMPLEMENTATION OF THE PROJECT

The proposed project attracts the provisions of EIA Notification, 2006 and falling under Category “A” of Schedule, 3 (a) Metallurgical Industries (Ferrous and Non-ferrous). The project proponent made online application on 19th September 2024 along with Form-1, Pre-feasibility report and other documents for obtaining Terms of Reference (TORs) from concerned Regulatory Authority for undertaking detailed EIA study. The proposal was granted Standard ToR vide letter No. IA-J-11011/315/2024-IA-II(IND-I) dated 12th October 2024 for EIA study for the proposed Expansion of Existing crushing and Grinding unit of Manganese Ore with addition of Manufacturing of 24000 TPA of Manganese Oxide by Roasting furnace at Khasra No. 291, 292 Aamdi Faata, Taluka Parseoni, District Nagpur, Maharashtra.



Source: Survey of India (SOI) Toposheet

Topographical map (10Km radius)

PROJECT DETAILS

Project at a Glance

Sr. No.	Description	Details
1	Nature of the project	Expansion of Existing crushing and Grinding unit of Manganese Ore with addition of Manufacturing of 24000 TPA of Manganese Oxide by Roasting furnace
2	Plant Location	Khasra No. 291, 292 Aamdi Faata, Taluka Parseoni, District Nagpur, Maharashtra
3	Configuration	Existing unit: Manganese Di-oxide : 750 TPM (Jigging and pulverizing) (CTO is obtained) Proposed: Manganese Oxide: 24000 TPA
5	Water requirement for the proposed project	7 KLD Ground Water (Below 10 KL permission from CGWA is exempted)
6	Power requirement & Source	The power requirement for the proposed project will be 500 KW. Source: State Electricity Board
7	Land for proposed plant	Total Land Area as per 7/12: 4.81 ha Land for Existing unit: 1.13 ha Land for proposed unit: 2.02 ha

		Additional land at kh no 292 for Green belt: 1.66 ha Type of Land: Industrial
8	Total manpower after commissioning of the unit.	60 nos.
9	Environmental Aspects	<p>Air Pollution Control: There will be two major source of air pollution in the plant, fugitive emissions from various material handling and transportation and flue gases generated from roasting furnace / bhatti. Flue gases generated will be cleaned in the Scrubbers and discharged through stack, so that the dust concentration will be well within the prescribed standard.</p> <p>Water Pollution Control: The wastewater generated from the Zigging process will be treated in the settling tank and reused in the process. The domestic wastewater generated will be treated in Packaged Type STP.</p> <p>Solid Waste: 640 TPA of Hard Coke Ash & 190 TPA of Firewood Ash will be generated which will be sold to brick manufacturers.</p>
9	Estimated Cost of the project	Rs. 5 Crores

PROCESS DESCRIPTION

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 size which are jigged in automatic water jigging.
- The material is then heated in Hard Coke fired furnace (Bhatti). From where it is transferred for drying and magnetic separation.
- Then the material is dried (through wood Fire) 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 100 kg HDPE Bags and kept ready for dispatch.

Manganese ore can be roughly divided into manganese oxide ore and manganese carbonate ore according to the properties of manganese ore. The beneficiation methods of these two manganese ores have similarities and differences, so the manganese mining and processing equipment is also different.

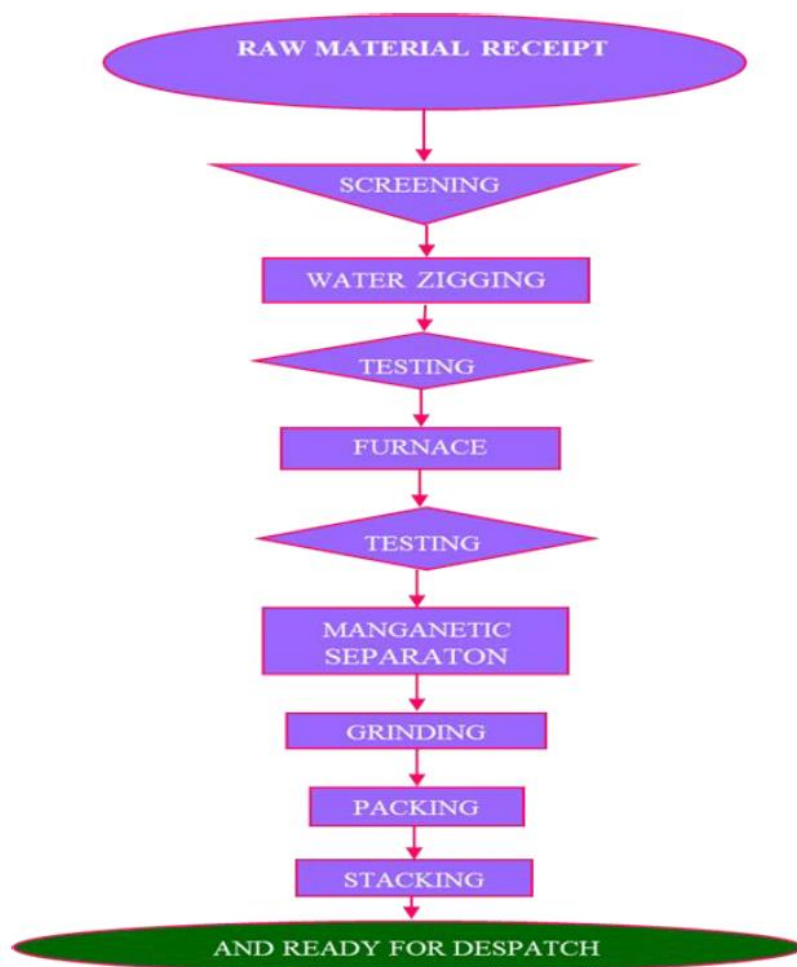
Gravity separation: The process of sorting according to the density difference between the mold ores, putting the mixture of ore particles into the vertically ascending and descending variable-speed medium flow, and then separating them. The manganese ore dressing equipment jig has the characteristics of simple structure, low investment, high separation efficiency, high recovery rate and low operating cost. Under suitable conditions, it can remove about 80% of the waste rock in siderite. The specific gravity difference between manganese minerals and waste rocks in manganese oxide. Ore is large, and good beneficiation indicators and economic indicators can be obtained by using gravity beneficiation method.

Magnetic separation: Manganese ore is a weakly magnetic mineral, so the strong magnetic separation method can be used for effective separation of manganese ore. The magnetic field strength of the strong magnetic separation equipment must be higher than 14000 gauss. The difference is sorted to obtain manganese concentrate. Manganese ore magnetic separation is mainly suitable for manganese oxide ore and manganese carbonate ore beneficiation, generally referred to as an auxiliary beneficiation process, but dry strong magnetic separation can also be used to treat manganese ore in areas without water or water shortage.

Magnetic-Flotation: The main beneficiation methods of manganese carbonate ore are strong magnetic separation and flotation. The flotation process is a general flotation process, and the equipment used includes crushers, ball mills, classifiers, mixing drums, flotation machines, etc. Mainly used for beneficiation of manganese carbonate ores or associated polymetallic manganese ores.

Manufacturing Process

The proposed project is for Screening, Grinding and sorting of manganese ore.



Process Flow Diagram of MnO Production

DESCRIPTION OF ENVIRONMENT

Air Environment

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

PM₁₀ : 37.0 to 65.2 $\mu\text{g}/\text{m}^3$.

PM_{2.5} : 14.7 to 33.9 $\mu\text{g}/\text{m}^3$

SO₂ : 9.3 to 22.5 $\mu\text{g}/\text{m}^3$

NO_x : 11.3 to 27.0 $\mu\text{g}/\text{m}^3$

Industrial Area, Residential, Rural Area (CPCB Norms)	PM ₁₀	PM _{2.5}	SO ₂	NO _x
	100 $\mu\text{g}/\text{m}^3$	60 $\mu\text{g}/\text{m}^3$	80 $\mu\text{g}/\text{m}^3$	80 $\mu\text{g}/\text{m}^3$

The ambient concentrations of PM₁₀, PM_{2.5}, SO₂ and NO_x were found to be within the National Ambient Air Quality Standards (NAAQ).

Water Environment

A total of 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 presence of coliform in surface water, which may be due to the human activities

Noise Environment

It has found that in the proposed expansion plant, noise levels are in the range of 36.5 (night time) to 55.1 dB (A) (day time) 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.

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 characteristics of the soil sample were compared with different depths for respective parameters.

The observations of soil characteristics are discussed parameter wise below;

- a) Texture of all soil samples are clay loam and sandy clay loam in Texture Classification.
- b) Colour of soil samples is light grey & brown in color.
- c) The bulk density of soil samples is in the range of 2.3 to 3.3 gm/cc.
- d) Soil samples have pH values in the range of 7.2 to 7.6. The pH values are indicating nature of soil samples as neutral.
- e) Soil samples have conductivities between 0.046 to 0.076 mmhos/cm.

- f) Soil samples have Organic Matter between 0.52 to 1.8 %. These values represent average fertility of soils.
- g) Soil samples have concentration of Available Nitrogen values ranged between 238 to 332 kg/ha.
- h) Soil sample have concentration of Available Phosphorous values ranged between 33 to 55 kg/ha.
- i) Soil sample have concentration of Available Potassium values range between 131 to 194 kg/ha.

ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Air Environment

There will be two major source of air pollution in the plant, fugitive emissions from various material handling and transportation and flue gases generated from roasting furnace / bhatti. Flue gases generated will be cleaned in the Scrubbers and discharged through stack, so that the dust concentration will be well within the prescribed standard.

- M/s. Evergreen Manganese and Minerals Industries Private Limited shall provide dust suction system which will control fugitive emission due to material and raw material handling.
- Bag Filters for dedusting will be provided.
- Dust suppression system will be provided in the form of water sprinklers.
- Regular monitoring of air quality parameters
- A Stack of 30 mt ht will be attached to MnO Furnace with Bag filters to minimize the concentration of pollutants which is mainly PM₁₀, PM_{2.5}.
- Green belt shall be provided around the plant area.
- Water spraying will be practiced frequently

Details of Air Emissions and its Control System

S.No.	Source of Air Emissions	Type of Pollutant Generated	Control System
1.	Process Emission	PM _{2.5} , PM ₁₀ , SO ₂ , NO ₂	Scrubbers, Stack of 30 mt height, Water Sprinkling System

Noise Pollution & control measures

Noises from fans, centrifugal pumps, electrical motors etc. will be kept in control so that the ambient noise level shall not exceed 75dBA during daytime and 70dBA during

nighttime. Noise pollution control measures will be provided in respective departments by way of providing silencers, provision of ear plugs or ear muffs and proper selection of less noise prone machinery and by development of green belt.

The employees shall be trained in the mitigation measures and personal protection measures to be taken to prevent noise related health impacts.

Impact on Water

The total water requirement for the proposed activities is 5 KLD. The wastewater generated from the Zigging process will be treated in settling tank and reused in the process. The domestic wastewater generated will be treated in Packaged Type STP.

Sewage Treatment Plant

Sewage generated due to domestic activities during operation phase will be treated in Packaged Type STP. 2.0 m³/day of domestic sewage will be generated in the proposed plant of 5 m³/day capacity.

Effluent Management Plant

Effluent 0.5 m³/day generated during the manufacturing process is basically the process water coming out due to washing of ore which is taken through pipeline to the settling tank where the sludge, i.e sedimented residue part is removed periodically, dried and mixed with the raw materials and residual water is recycled in the manufacturing process.

Solid Waste Generation

Table: Solid Waste Generation & Mitigation Measures

Waste	Quantity	Mitigation Measures
Hard Coke Ash	640 TPA	Will be sold to brick manufacturers
Firewood Ash	190 TPA	Will be sold to brick manufacturers

ENVIRONMENTAL MONITORING PROGRAMME

The environmental monitoring will be important to assess performance of pollution control equipment in the proposed project of M/s. Evergreen Manganese and Minerals Industries Pvt Ltd. The proposed project is for a manufacturing of Manganese oxide. The sampling and analysis of environmental attributes including monitoring locations will be as per the conditions of the Consent issued by Maharashtra Pollution Control

Board and Environmental Clearance issued by Ministry of Environment, Forest & Climate Change, New Delhi.

Environmental monitoring will be conducted on regular basis by M/s. Evergreen Manganese and Minerals Industries Private Limited through MoEF&CC Recognized Laboratory 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.

ADDITIONAL STUDIES

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

PROJECT BENEFITS

CORPORATE ENVIRONMENT RESPONSIBILITY (CER)

Developmental activities should be based on community priority and with significant local contributions. Important areas identified by Social Impact Assessment and during Public hearings have been considered under CER activities. This approach will strengthen the groups, empower the members and local people will be benefited.

CER Budget

- CER Budget will be finalized after the conduction of Public Hearing based on issues raised in Public Hearing.
- The amount will be spent in various activities as per the issues raised in public hearing
- After successful completion of CER activities more villages will be selected for CSR.
- CSR activity shall be regular feature till the life span of project.

ENVIRONMENTAL MANAGEMENT PLAN

The environmental management plan will be followed during construction and operation phases. The project allocated a budget of Rs. 50 Lakhs for the implementation of capital works under EMP apart from the annual recurring budget that will be allocated annually for operation and maintenance of environmental infrastructure. An

environment management cell is existing in the existing project, which will be further enhanced as per the requirements of the proposed project .

GREEN BELT DEVELOPMENT

Green belt will be developed within the Plant premises covering a total area of about 1.79 ha (existing + proposed) (33%) of total Plant area. The plantation work for green belt development will be carried out as per CPCB guidelines, local species would be preferred.

A green belt or tree plantation around the proposed plant shall help to arrest the effects of particulate matter in the area besides playing a major role in environmental conservation efforts. Green belt development and plantation programme for the proposed project shall also be a part of the proposed plan. An Area of 1.66 ha will be developed as green belt in phases. An area of 0.11 ha is already developed as greenbelt, about 4150 no. of trees will be planted. Main species of the trees are Ashoka, Pipal, Neem, Gulmohar, Badam etc.