EXECUTIVE SUMMMARY

FOR

Kothulna Manganese and Quartz Mine

Village-Kothulna, Tehsil- Savner,

Dist-Nagpur, Maharashtra

(Area – 24.00 Ha)

Project Proponent

M/s. Shubhnam Minerals Enterprises

Artefact Tower, 3rd Floor, Plot No-54/3, Chatrapatti Square,

Wardha Road, Nagpur,

Maharashtra

EIA Consultant

POLLUTION & ECOLOGY CONTROL SERVICES

Near Dhantoli Police Station, Dhantoli, Nagpur-440012 (Maharashtra)

NABET No.: QCI/NBET/EIA/1720/RA0101

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INTRODUCTION

The report has been prepared for the Environmental Impact Assessment of the expansion in production capacity for Manganese in Kothulna Manganese Mine of M/s Shubhnam Minerals Enterprises from 1160 TPA to 25757 TPA & production of Quartz mineral 270000 TPA (Max) within the existing mine lease area of 24.00 ha located in Kothulna Village, Savner Tehsil, Nagpur District in accordance with the Notification of MoEF&CC S.O. 1533 dated 14.09.2006 under sub-rule (3) of Rule 5 of the Environment (Protection) Rules, 1986 which imposes certain restrictions and prohibitions on new projects or activities, or on the expansion or modernization of existing projects or activities based on their potential environmental impacts as indicated in the Schedule to the notification, being undertaken in any part of India, unless prior environmental clearance has been accorded.

The application for prior Environmental Clearance (Form-1) for the expansion project was considered by the State Expert Appraisal Committee-1, Maharashtra in its 177th meeting held during 05th Feb 2020 to 07th Feb 2020 for prescribing Terms of Reference (ToR) for preparation of the Environmental Impact Assessment (EIA) report. The Committee, after going through the Form-1, Pre-Feasibility report and presentation, has suggested specific Terms of Reference (ToR's) along with Standard ToR for preparation of the EIA report and Environmental Management Plan vide its 177th Minutes of Meeting.

Manganese ore is mostly used in steel plants, Ferro-Manganese plants and Manganese based chemicals & compounds for various applications. The high manganese steel is very hard and resistant to wear and tear and is used for making rock crushers, rail, road, armor plates and burglar proof safes. It is also used in dry batteries, animal feed and paint industries.

During preparation of the final EIA/EMP, it has been noticed the project is located at a distance of 6.85 km from Mansingdeo Wildlife Sanctuary. As such the General Conditions of the EIA Notification dt 14th September 2006 does not apply to this project. As far as Eco Sensitive Zone (ESZ) issue is concerned, the ESZ Draft

Notification was issued on 17th March 2016 and Final ESZ Notification was issued on 13th September 2017. The present project is outside the Final ESZ Notification.

A suitable environment management plan to ensure environment-friendly mining has also been drawn. This report prepared in accordance with the generic structure of an EIA document includes project description, base line environmental quality data of core zone (ML Area 24.00 Ha) and buffer zones of 10 km radius, anticipated impacts and their mitigation measures as well as an Environment Management Plan.

PROJECT DETAILS

The proposed manganese mining project is for mining of Manganese ore from 1160 TPA to 25757 TPA & production of Quartz mineral 270000 TPA within the existing Kothulna Manganese mine lease of 24.00 ha located in Kothulna Village, Savner Tehsil, Nagpur District, Maharashtra as per EIA Notification 2006, dated 14th September, 2006 and as amended from time to time. This mining project falls under Category "B". There is no interlinked project with this mine.

PROCESS DESCRIPTION

This is an existing Manganese ore Open Cast mechanized mine with a planned expansion of Manganese Ore (1160 TPA to 25757 TPA). The mining would be carried out by open cast method involving removal of top soil/Reject/overburden, drilling and blasting, loading and transportation by excavator-tipper combination, manual sorting, stacking and dispatch by covered trucks to the various consumer industries.

METHOD OF MINING

Present Method of Mining

The method of mining is fully mechanized opencast. The bench height will be 6 m and width of the benches is will not be less than 6m for manganese ore and in mineral quartz bench height and width is being kept 3m and 5m respectively.

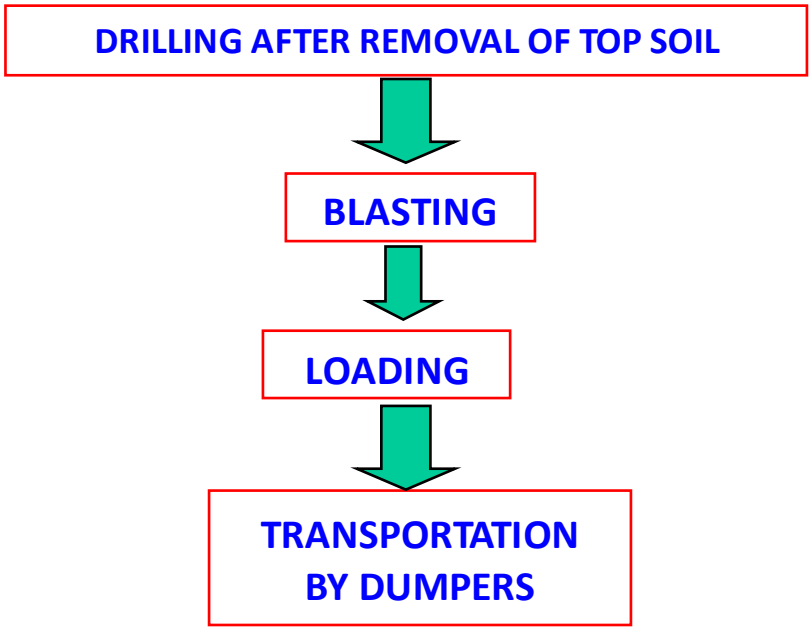
Quartz being a hard, it is blasted by drilling drill holes with jack hammer i.e. 32mm to a depth of 1.5 m with spacing 1.0 m and burden 0.75m both in mineral quartz and OB. The holes are charged with explosive slurry based gelatin 80% strength with 0.75kg in each hole in conjunction with electric detonators. Yield per hole is about 2.81 t.

Powder factor that is achieved is about 3.75t/kg of explosive. At a time 20 holes are fired.

Proposed Method of Mining

Quartz and Manganese will be mined by category 'A' mechanized mode. In this process of mining, the bench height in overburden will be maintained maximum to 6m and width of the bench will not be less than the height of the bench i.e. 6 m with the slope of each bench to 45^0 to the horizontal. For blasting in over burden, spacing will be 3m and burden 2.5m. Drilling will be carried by wagon drill 85mm dia. The maximum depth of hole will be 6m excluding sub grade drilling. Sub grade drilling will be kept to 10% of hole depth i.e. 0.60m to maintain bench flour avoiding toe formation. Total depth of blast hole will be 6.60m. The blast holes in overburden will be charged with slurry based cap sensitive solar gel of six cartridges weighing each 2.75 kg. One nonel detonator will be used. Overall slope of hanging and foot wall will be maintained 45^0. Manganese ore body is 3m wide, hence it will be drilled by jack hammer 32mm diameter to a depth of 1.5 m with spacing 1.0m and 0.75 m. The holes will be charged with explosive slurry based gelatin 80% strength with 0.5 kg in each hole in conjunction with electric detonators.

MINING METHODOLOGY PROCESS FLOW DIAGRAM



DESCRIPTION OF ENVIRONMENT

Air Environment

The baseline environmental quality for the October 2020 to December 2020 was assessed in an area of 10 km radius around the proposed project site. The predominant wind directions are South West, West and South. The ambient air quality monitored at 8 locations selected based on predominant wind direction, indicated the following ranges;

PM_{10}	-	33.3 to 60.6 µg/m^3.
$PM_{2.5}$	-	16.5 to 35.5 µg/m^3
SO_2	-	7.2 to 26.2 µg/m^3
NOx	-	8.2 to 29.4 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 (IS 10500 – 2012).

Noise Environment

Noise levels measured nine 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

The characteristics of the soil sample were compared with different depths for respective parameters in three stations. The soil analysis report indicates that the soil in the area are capable of supporting plant growth.

Biological Environment

Flora

Most common species found in the area are *Acacia Arabica, Azadirachta indica, Cassia fistula, Ficus benghalensis, Madhuca indica and Mangifera indica etc.*

Fauna

In the core area movement of lizards, were noticed. Local persons told about the movement of various reptiles. Information was provided by the Local people about the various types of snakes found in this core and buffer zone areas. As the river passes through green patches, some bird activity was seen. Also, lot of human activity was observed due to village situated very close.

Socio Economic Environment

The study area constitutes 49 inhabited villages. The population is distributed among 16084 households in the study area. The 49 inhabited villages have a population of 71266 comprising of 36599 males and 34667 females.

ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

S.N.	Plant	Aspect	Impact	Mitigation Measures
1.	Manganese and Quartz Mines	Air Pollution	Increase of dust (particulate matter) level in surrounding.	Regular water sprinkling will be done to control the dust emission and plantation will be done at the road side to control the emission.
		Solid Waste	Land Degradation	The lease area consists of four pits. During the ensuing scheme period 265113 M^3 OB / Waste will be generated and dumped separately. Mineral Rejects will be stored separately and will be used for maintenance of road within lease area.

ENVIRONMENTAL MONITORING PROGRAMME

Environmental monitoring at various locations around 10 km (study area) from the operation are carried out on periodic basis. A comprehensive network for monitoring has been prepared. Sampling locations have been identified by considering the source of pollution due to mining operations, drainage pattern and topography of the area. To evaluate the effectiveness of environmental management programme, regular

monitoring of the important environmental parameters will be taken up after approval of EIA.

ADDITIONAL STUDIES

The additional studies as per the ToR issued are Public Consultation, Social Impact Assessment, Risk Assessment, & Disaster Management Plan and Rain Water Harvesting Plan

PROJECT BENEFITS

The company has made budgetary provision for Corporate Social Responsibility of Rs 2.77 Lakhs per annum for aforesaid activities. The implementation of aforesaid activities will be carried out after consultation with Gram Panchayat and Block Development Officer.

As per O.M. dated 01/05/2018 issued by MoEFCC, New Delhi regarding Corporate Environment Responsibility (C.E.R.). The Proposed project cost is Rs. 277 Lakhs. Thus, as per CER OM 1% i.e. 1.1 lakhs will be spent towards Corporate Environment Responsibility.

ENVIRONMENTAL MANAGEMENT PLAN

Prevention and Control of Air Pollution

A. <u>Pollution due to Fugitive Emissions</u>

The main pollutant in air is Particulate Matter (PM), which is generated due to various mining activities. However, to reduce the impact of dust pollution the following steps has been taken during various mining activities.

- The ore produced will not be subjected to wet beneficiation, except for manual dressing and sizing of the ore.
- Haulage roads in the area will be kept wide, leveled, compacted and properly maintained with motor grader and water shall be sprayed regularly during the shift operation to prevent generation of fugitive dust due to movement of dumpers, and other vehicles.
- Proper care will be taken while transportation of manganese ore and Quartz. The trucks will be covered by tarpaulin properly.
- In order to reduce the spread of air pollution in the surroundings, green belt shall be developed around the mines office, on both the sides of mine approach road, all along the mine boundary, which arrest the air born dust.

- Periodic ambient air quality monitoring shall be done to assess the quality and for timely corrective actions.

WATER MANAGEMENT

Surface Water Management

- As no surface water body exists within the lease area, no adverse impacts are envisaged on the same.
- Garland drains shall be provided around the mine

Ground Water Management: There will be no intersection of the ground water table during any stage of mining operation. The pumped out water will be settled in settling tanks and the clarified water will be used for plantation and sprinkling on the roads for dust suppression

Waste Water Management: No waste water generation is envisaged during the mining process. The waste water generated from the mine office, will treated in portable STP.

Rain Water Harvesting: During monsoon period, the rains pouring down directly into the mining lease area shall be allowed to accumulate garland drain. The rain falling outside the pit shall be diverted by constructing garland drains.

The harvested water augments the ground water level of the area. The water accumulated in garland drain shall be allowed to settle down the solid suspension and clean water shall be used in plantation and also used for sprinkling on haul road for suppression of fugitive dust emission. The water collected in the pit will be pumped out for reuse.

Mine Pit Water

Water from the mine pit will be pumped out and settled in a settling tank. The settled water will be used for dust control and plantation. The quantity of mine pit water and its utilization is given in chapter 2.

Solid Waste:

Quartz

The recovery of ROM from in-situ is 100% as mineral quartz is not blocked into 7.5 m mining limit, safety barrier and ultimate pit slope. Therefore, in conceptual period too recovery of ROM would be 100%. The saleable quartz when sorted out from ROM at sorting yard, it would be around 95% as per the present norms. The mineral reject generation would be around 95% as per the present norms.

Disposal of waste

Quartz mineral is outcropped and there is no overburden. However inter burden and side burden calls for removal during the conceptual period which will be dumped near the existing dump and part of waste will be utilised for reclamation of mined out area of manganese mine.

Reclamation and Rehabilitation

Quartz mineral has been proved to be depth of 45m from surface. It is on elevated ground i.e. hill. It is mineable with known method of mining i.e. opencast. Due to excavation it will form 45m deep pit at the end of the third conceptual period of life if mine. The pit will be used for impounding rain water as water reservoir.

Manganese

The recovery of ROM from in-situ is 100% as mineral quartz is not blocked into 7.5 m mining limit, safety barrier and ultimate pit slope. Therefore, in conceptual period too recovery of ROM would be 100%. The saleable manganese ore when sorted out from ROM at sorting yard, it would be around 90% as per the present norms. The mineral reject generation would be around 10% containing less than 10% manganese.

Disposal of waste

Manganese mineralised area has been opened up in all the pits and there is no overburden. However inter burden and side burden calls for removal during the conceptual period which will be dumped near the existing dump and part of waste will be utilised for reclamation of mined out area of manganese mine.

Reclamation and Rehabilitation

Mn ore at deeper horizon may not be possible to mine due to non cost effective excavation. During the first conceptual period, part of waste generated will be used to reclaim the excavated area. Part of the pit may be converted to water reservoir.

Back filling, Reclamation and Rehabilitation (Up to end of lease)

There are four pits within mining lease area. These four pits at the end of ensuing review period will occupy an area of 3.03 ha. and waste dumps will too occupy 0.97 ha. Mn ore will be mined in already excavated area. Mined out land will be converted to water reservoir in conceptual period.

Adequate safety measures like barbed wire fencing with dry wall around the abandoned mine pit will be created. Green belt of local tree species around safety zone, waste dump area and mineral reject areas will be created.

NOISE & GROUND VIBRATION MANAGEMENT

Noise Vibration Abatement and Control

I. Controlled blasting with adequate charge per hole and use of delay detonators/NONEL shall be adopted to minimize noise generation.
II. Earmuffs shall be provided to all operators and employees working at mining site as a safety measure.
III. Plantation shall be carried out around mining area, along the sides of approach roads, around office complex and workshop area. This will act as an acoustic barrier and help in arresting noise at source so that public at large will not be affected.
IV. Proper maintenance, oiling and greasing of machines at regular intervals will reduce generation of noise. In the project under consideration mining will be carried out by mechanized opencast method and due care will be taken in operation of any machinery deployed.
V. Periodic monitoring of noise level in the vicinity of operating mining machines and in the surrounding areas of mine shall be carried out.

To keep ground vibration well within the prescribed limits of DGMS, following measures will be taken.

I. Drilling and blasting operations shall be carried out under the supervision of qualified person.
II. Blast holes shall be always initiated by delay detonators/NONEL initiation system.

III. Number of holes per delay, charge per blast and charge per delay shall be kept to minimum to keep the vibration, fly rock and noise to the minimum level.

GREEN BELT DEVELOPMENT

The proposed green belt in the lease area is to be developed by taking into consideration the availability of area as the efficacy of green belt in pollution control mainly depends on tree species, its width, distance from pollution sources, direction of the habitation from working place and tree height. The proposed green belt has been designed to control PM, gaseous pollutants, noise, surface run off and soil erosion etc. While considering the above aspects due care will be taken for selecting the suitable characteristics plant species such as fast growing, locally suitable plant species, resistant to specific pollutant and those which would maintain the regional ecological balance, soil and hydrological conditions.

Total green belt & plantation will be carried out on 3.37 ha area till the end of life of mine. Species proposed for greenbelt development are *Azadirachta indica (* Neem), *Acacia nilotica* (Babool), *Punica granatum* (Anar), *Terminalia arjuna* (Arjuna), *Ziziphus mauritiana* (Ber), *Mangifera indica* (Aam), *Musa acuminata* (Banana), *Dalbergia sissoo* (Shesham) *Ficus religiosa* (Pipal), *Ocimum sanctum* (Tulsi), *Syzygium cumini(Jamun),Tamarindus indica* (Imli) etc.