EXECUTIVE SUMMARY OF EIA REPORT

Proposed Expansion of Manganese Ore Beneficiation Plant at Plot No. B-6, MIDC Area Parshivni, Tal. Parshivni, Dist. Nagpur, Maharashtra 441106.

ACTIVITY: 2 (b) CATEGORY: B1

By

M/S. RAZA METALS MANGANESE PROCESSING & TRADING.

EIA Consultant –
Ecomen Laboratories Pvt. Ltd., Lucknow
NABET Accreditation No. – NABET/EIA/2023/RA 0203
valid up to 22/03/2025

Environmental Monitoring Laboratory -
ULTRA-TECH Environmental Consultancy and Laboratory
(NABL Accredited vide NABL Lab Code – 5227)

Baseline Period – Pre-Monsoon: 1st March 2023 to 31st May 2023

Contents

EXECUTIVE SUMMARY

1. Introduction

M/s. Raza Metals Manganese Processing and Trading is a leading manufacturer and supplier of Manganese. The industry is located at Plot No. B-6, MIDC Area Parshivni, Tal. Parshivni, Dist. Nagpur, Maharashtra 441106. Raza Metals Manganese Processing & Trading, has proposed expansion in terms of an upgradation of its existing mineral beneficiation unit by manufacturing 350 MT/M of MnO_2 (Manganese Di-Oxide) in addition to its existing production of 150 MT/M of MnO_2 and 1000 MT/M of MnO (Manganese Oxide). Hence, the total production capacity will be 1500 MT/M. The proposed expansion will be carried out within the existing premises of industry. The existing manpower of 10 Nos. along with additional 10 Nos. of workers is sufficient for the proposed expansion.

1.1 Location of the project

The project site is located at Plot No. B-6, MIDC Area Parshivni, Tal. Parshivni, Dist. Nagpur, Maharashtra 441106. Site can be approached by Ghogra Mahadev Road and it is located at 27 km away from Nagpur City. The nearest Highway is NH-753 which is 1.5 km in South. The nearest Railway Station is Nagpur Moti Bagh Railway Station at 25.5 km in the South-west direction & nearest Domestic Airport is Nagpur airport at about 35 km in South-West direction. Project site is located at a distance of 1.18 km SW from Parshivni Town. The proximity to the road is an advantage, since the company's raw materials and finished products will be transported easily by road.

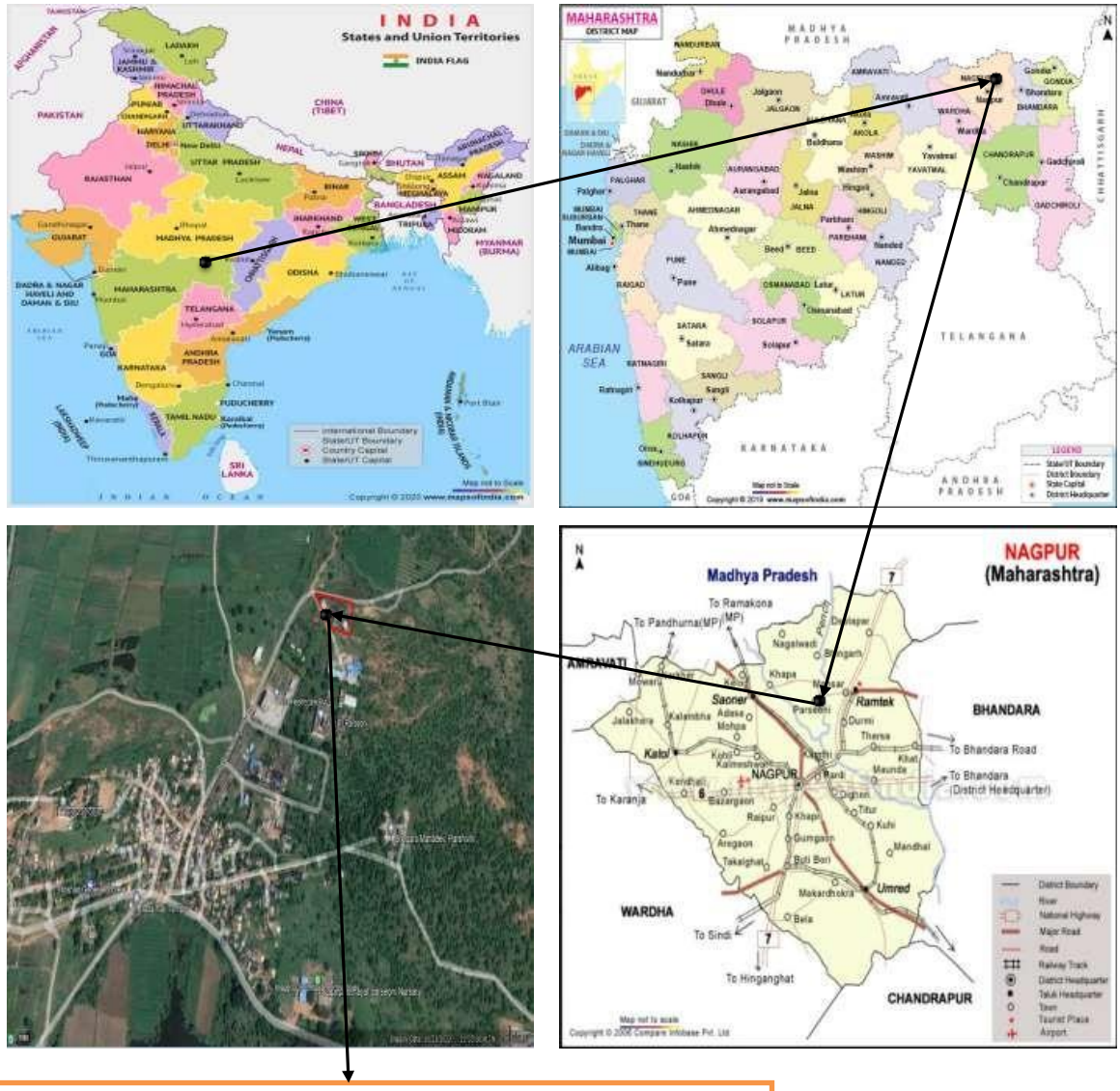

Figure 1: Index Map of Project Site

Points	Lattitude	Longitude
A	21°23'1.92"N	79° 9'32.30"E
B	21°23'2.51"N	79° 9'28.69"E
C	21°23'0.19"N	79° 9'30.17"E
D	21°22'59.80"N	79° 9'32.05"E

Figure 2: Google Image of Project Site with Coordinates

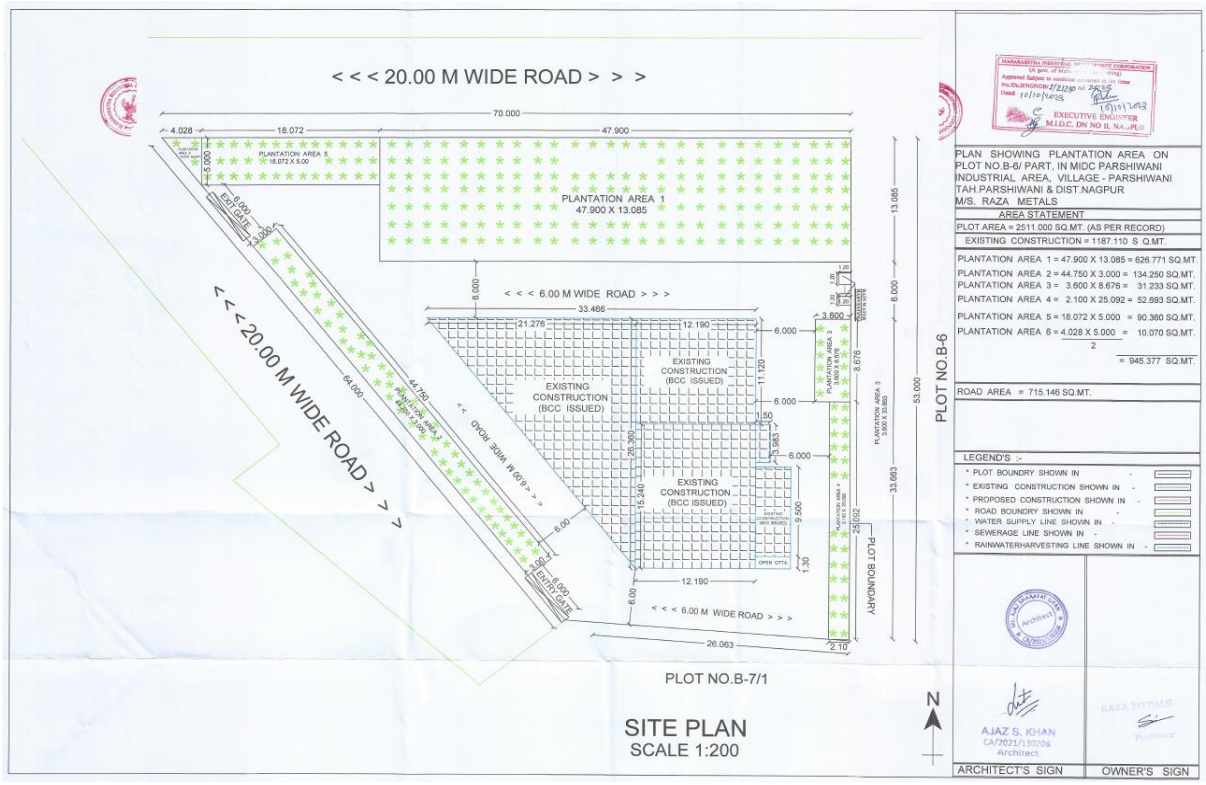

Figure 3: Master Layout Plan

Table 1: Area Statement

Sr. No.	Particulars	Area in Sq.m.
1	Total Plot area	2511.00
2	Existing Green Belt Area	160.00
3	Proposed Green Belt Area	675.035
4	Total Green Belt Area (33%)	835.035
5	Raw Material Storage Area	48.00
6	Road Area	182.66
7	Parking Area	41.48
8	Existing BUA	1187.11
9	Proposed Construction Area	92.887

2. Project Description with Process Details

Table 2: Project Description in Brief

<table>
<tr><th>Sr. No.</th><th>Particulars</th><th colspan="2">Details</th></tr>
<tr><td>1</td><td>Ownership of land</td><td colspan="2">M/s. Raza Metals Manganese Processing and Trading.</td></tr>
<tr><td>2</td><td>Type/Category</td><td colspan="2">2 (b)- Mineral Beneficiation, Category-B1</td></tr>
<tr><td>3</td><td>Production details</td><td colspan="2">
<table>
<tr><th>Sr No</th><th>Particulars</th><th>Existing Capacity (MT/M)</th><th>Proposed Capacity (MT/M)</th><th>Total (MT/M)</th></tr>
<tr><td>1</td><td>MnO_2</td><td>150</td><td>350</td><td>500</td></tr>
<tr><td>2</td><td>MnO</td><td>0</td><td>1000</td><td>1000</td></tr>
<tr><td colspan="4">Total</td><td>1500</td></tr>
</table>
</td></tr>
<tr><td>4</td><td>Water Consumption</td><td colspan="2">Construction Phase –
Water Requirement – 5 KLD

Operation Phase –
Existing – 2 KLD
Proposed – 6.05 KLD
Total – 8.05 KLD
(Fresh 8.05 + Recycle 4.4 KLD = 12.45 KLD)</td></tr>
<tr><td rowspan="2">5</td><td rowspan="2">Wastewater generation</td><td>Sewage</td><td>Construction Phase – 0.45 KLD
Operation Phase
Existing- 1 KLD
Proposed- 0.4 KLD
Total – 1.4 KLD</td></tr>
<tr><td>Effluent</td><td>Operation Phase
Existing- 1 KLD
Proposed- 2 KLD
Total- 3 KLD</td></tr>
</table>

6	Wastewater Treatment Facility	Sewage	Construction Phase- Package STP of capacity 2 KLD. Operation Phase- After proposed expansion total 1.4 KLD of sewage will be treated in package STP of 2 KLD.
		Effluent	The wastewater generated from the Jigging process i.e., 3 KLD will be treated in settling tank and slag will be recycle in roasting furnace and balance water will use for quenching process.
8	Roasting furnace	**Existing –** 0 **Proposed -** 2 Nos. of Coal/ wood fired Roasting furnace of capacity 15 TPD and 20 TPD respectively.	
9	Stack Details	**Stack Attached to**	**Stack Height**
		Furnace	30 m
		DG set	8 m
10	Fuel	**Existing** - HSD – 50 lit/hr **Proposed** - Coal/Wood: 500 MT per month / 850 MT per month	
11	Air Emissions	During the operation of the furnace, emissions of particulate matter (PM), sulfur dioxide (SO2), and nitrogen oxides (NOx) are anticipated from the stack. The furnace will utilize either coal or wood as its fuel source, and emissions will be mitigated through a stack height of 30 meters equipped with a wet scrubber. In the construction phase, fugitive emissions, particularly dust, are expected. These emissions will be managed through dust suppression methods and water sprinkling. Additionally, the diesel generator (DG) set is foreseen to emit PM and SO2 while serving as a standby source of electricity for the site.	
12	Power Requirement	Construction Phase- 70 kVA Operation Phase-Demand Load- 30 KW Connected Load- 50 KW	
13	DG set	100 kVA	
14	Manpower	During Construction Phase – approx. 7-10 nos. Operation Phase – **Existing-** 10 nos. of workers **Proposed** – Total 10 nos. of additional manpower required for proposed expansion.	
15	Project Cost	**Existing-** 52 lakhs **Proposed-** 1.06 Crore **Total-** 1.58 Crore	
16	EMP Cost	**Proposed:** Capital Cost – Rs. 19.50 lakhs Recurring Cost – Rs 3.75 Lakh per Annum	

17	CER Cost	Rs. 1.58 Lakhs.

2.1 Process Description

The detailed process description of is given below –

In the proposed manganese ore beneficiation project two processes are mainly carried out viz.

1. Jigging

2. Roasting

Low grade manganese ore of pyrolusite type containing 72-80% will be brought to the site with tarpaulin covered truck. Two operations are very important in the total process and are the essential steps for production of 'MnO2' & 'MnO' viz, jigging for removal of impurities (in the form of quartz) and roasting i.e., reduction for production of manganese oxide. If 'Fe' is more in the form of free iron i.e, Fe3O4 (balance in the form of non-magnetic Fe2O3/FeO) the same may be removed by giving a pass on magnetic separator prior to roasting.

The magnetic material is accumulated to a bulk quantity and is periodically passed second time over magnetic separator, where the non-magnetic fraction is separated out of this material and is mixed with raw material, which is used in roasting, and the magnetic fraction is salvaged suitably and sold to iron /steel manufacturers.

To perform these operations effectively, disintegration of lumpy ore from 6 mm to maximum 10 mm size is necessary. However, this operation is not necessary in case of M/s Raza Metals Manganese Production & Trading as 4/5 mm screened material is readily available- which can be jigged and roasted directly.

The Jigging is the simple washing process of ore by mechanical means. It will be carried out after crushing & screening. In the jigging process most of the impurities will be removed such as silica compound, aluminium compound etc. Then tailings from jigging operation containing more quartz are accumulated and periodically re-jigged to produce ore free from silica.

The roasting is carried out for production of manganese oxide (MnO) by providing heat to the jigged material (MnO2) in the vertical furnace. In order to maintain highly reducing atmosphere in the furnace, wood/coal will be charged from bottom window of vertical furnace & blower is started which will ignite the batch & resulting CO2 gases will be led to scrubber. The objective of this process is to reduce MnO2 to MnO by heating in the furnace at temperature of 400-500^{o}C. Though wood/coal application rate is 15 to 20% of the ore charged but normally 25/30% wood/coal will be charged in the furnace. The un- burnt wood/coal which

is 10/15%, is taken out of the furnace and is re-used for next batch. Hence, after establishing the production cycle, the wood/coal application rate comes to approximately 20% of the Mn-ore charged in the furnace. The reaction will start slowly in 20-30 min. & the entire batch of manganese ore gets roasted after 3 hours.

$$2\ MnO_2 \xrightarrow[400\ -500^0C]{Air\ \Delta} 2\ MnO + O_2$$

After roasting is done, the cover of furnace is taken off and the entire roasted mass is quenched on-site with water. After bringing the temperature down to normal handling temperature the material from the furnace is removed and spread on drying platform. After drying, material is sent for pulverizing and is further packed with proper air-tight sealing in double line woven-sacks and kept- ready for loading in the truck covered with tarpaulin.

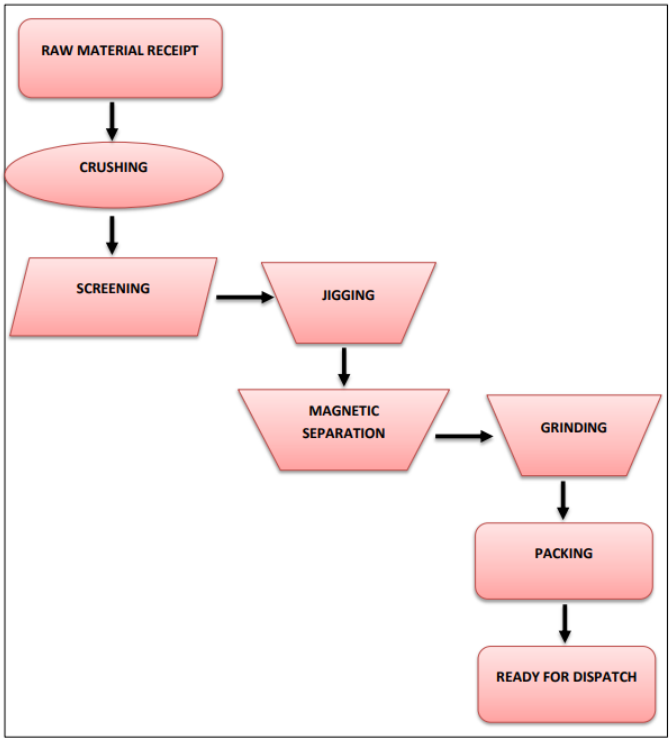

Figure 4: Manufacturing Process of MnO2

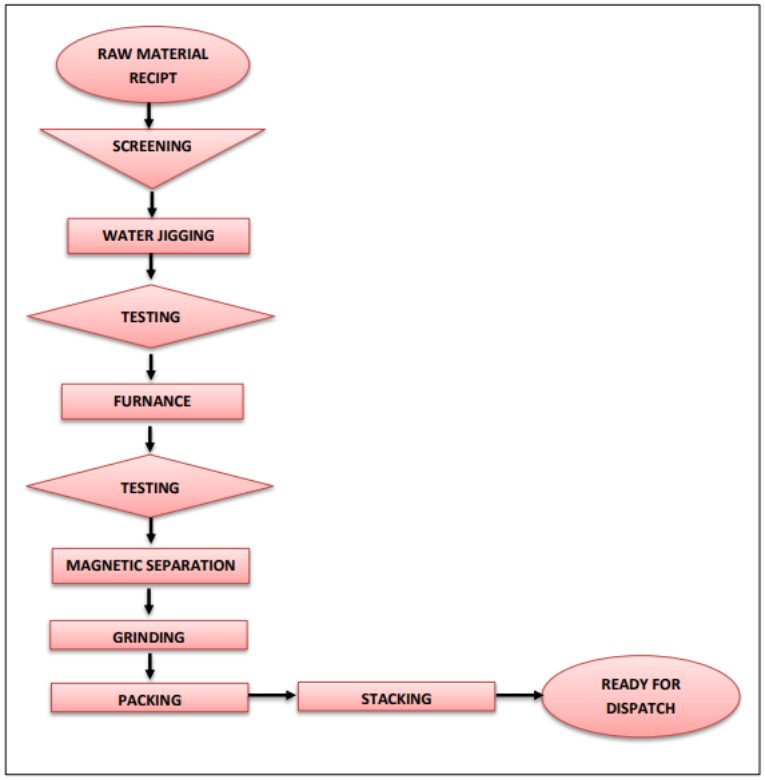

Figure 5: Manufacturing Process of MnO

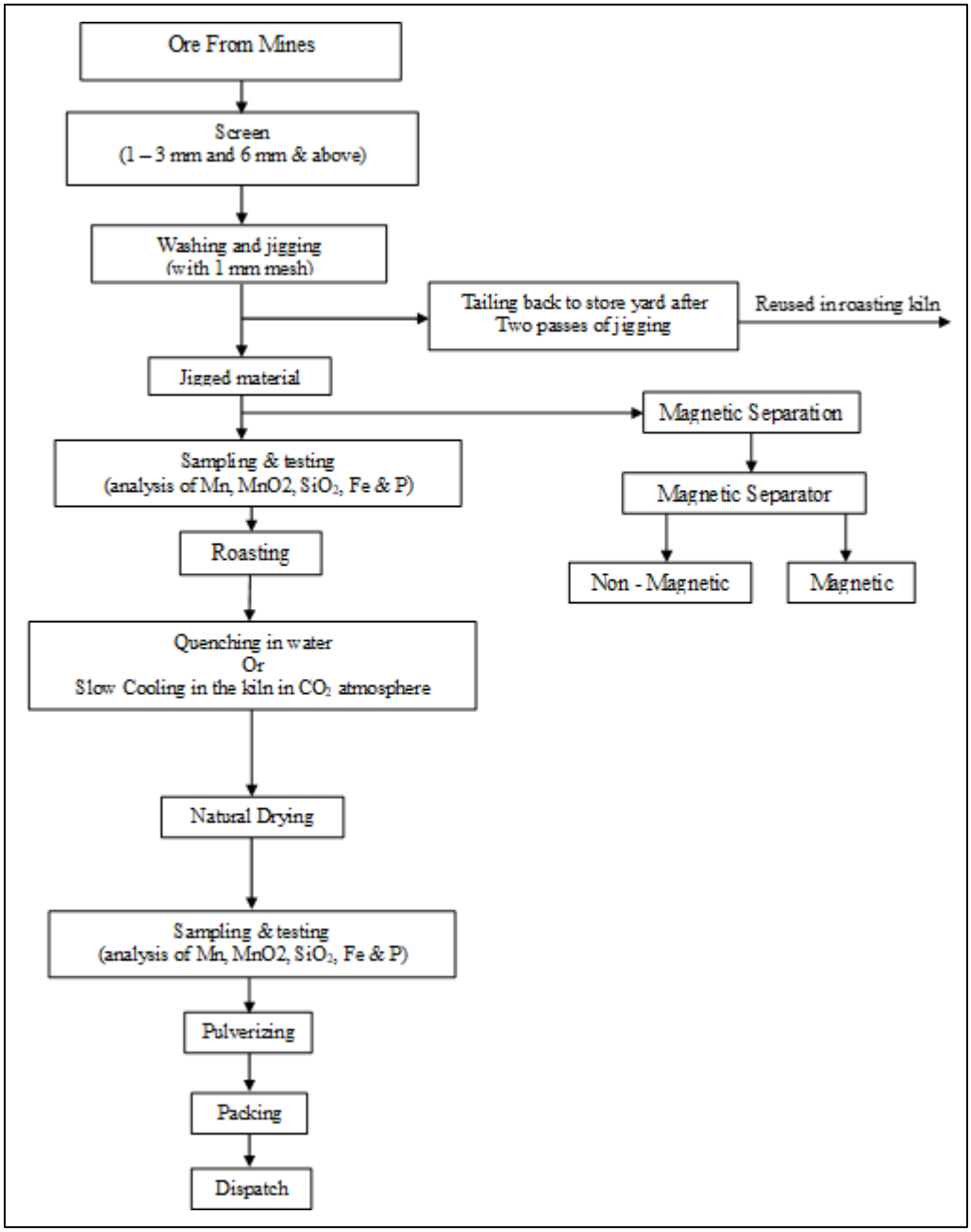

Figure 6: Process of Reduction of MNO_2 to MNO in Roasting furnace

3. Description of Environment

Field monitoring was done for primary data collection of various environment components such as air quality, water quality, soil quality, noise. Also, secondary data such as micrometeorology, flora and fauna, socio-economic, hydro-geological study, traffic study etc. from authenticated sources was used as a guideline and reference material. The entire data has been collected through actual physical surveys and observations, literature surveys, interaction

with locals, government agencies, and departments. The baseline study begins with site visits and reconnaissance survey in the study area.

The guiding factors for the present baseline study are the requirements prescribed by the guidelines given in the EIA Manual of the MoEFCC and methodologies mentioned in Technical EIA Guidelines Manual for Mineral Beneficiation projects by Administrative Staff College of India, Bellavista, Khairatabad, Hyderabad.

The studies were conducted during winter season for the period of 1st March 2023 to 31th May 2023.

Frequency of environment monitoring and its result is given in **Table 3.**

Table 3: Frequency of primary data collection and its results

Environmental Attributes	**Frequency of monitoring**	**Parameters**	**Observed Results**
Meteorology	Microprocessor based Weather Monitoring Station Continuous hourly recording	Wind speed,	3.4 m/s
		Wind direction	North West followed by West
		Max. Temp.	45.9 °C
		Mini. Temp.	7.0 °C
		Relative Humidity	50 - 64 %
		Precipitation	1151.2
Ambient Air Quality	8 Locations 24 hourly samples Twice a week for 3 months (in µg/m^3)	PM10	51µg/m^3 - 64 µg/m^3
		PM2.5	20 µg/m^3 - 35 µg/m^3
		SO_2	6µg/m^3 – 16 µg/m^3
		NO_x	14µg/m^3 - 27µg/m^3
Water Quality (Ground and Surface)	Once in season at 10 locations (Physical, chemical and biological parameters)	Colour	All parameters are within limit except TDS, Total Hardness & Total Alkalinity as $CaCO_3$. E-Coli is absent in all samples.
		pH	
		TDS	
		COD	
		E-Coli	
Soil Quality	Once in season at 8 locations	Soil type and texture, Physico-chemical properties, NPK	Soil type is Very Deep Moderately Loamy to Moderately Deep Loamy and Moderately Loamy to slightly Deep Loamy soil.
Noise Quality	Once in season at 8 Locations (Noise levels in dB(A))	Average Day	51.6 dB(A) - 65.8 dB(A)
		Average Night	41.8 dB(A) - 54.8 dB(A)
Land use Pattern	One time visit of the study area for ground truthing	Identification and classification of land use	Most of the land is Agricultural land followed by Barren land

Geology and hydrogeology	Primary observation during visit and sec. data	Geology and hydrogeology of the study area	Granite Gneisses, Schist meta sediments of Saucer group belonging to Dharwar Super Group and Archaen Age. Metamorphic and igneous rocks, alluvium occurs in small areas.
Ecology	General in 10 km radial study area and data collected around the project site through field visits.	Flora	Azadirachta indica, Casuarina equisetifolia, Muntingia calabura, Mangifera indica, Musa paradisiaca, etc.
		Fauna	Canis lupus familiaris and Funambulus palmarum, Calotes versicolor, etc.
Socioeconomic Data	Primary and sec data in 10 km radial study area and data collected around the project site through field visits	Socio-economic characteristics of the affected area	Sanitation facilities are unsatisfactory, Power supply facility is available in almost villages and town, drinking water sources is mostly from corporation water supply, medical facilities in terms of primary health center and primary health sub centers in the rural areas are good.

4. Anticipated Environmental Impacts

Significant Impacts from the project activities and its mitigation measures are summarized in **Table 4** below –

Table 4: Summary of Impacts and Mitigation Measures

Sr. No	Environmental Component	Project Activity	Impacts Identified	Impact Assessment after Mitigation
1.	Air Quality	Construction activities	Local increase in SPM	Insignificant
		Transportation	Vehicular and fugitive emissions	Insignificant
2.	Noise	Construction activities	Temporary local increase in noise	Insignificant
		Operation activities	Continuous noise but confined to within the Plant Area	Insignificant

Sr. No	Environmental Component	Project Activity	Impacts Identified	Impact Assessment after Mitigation
		Transportation	Increase in noise levels due to vehicular traffic	Insignificant
3.	Water Resources	Construction activities	The water will be used during the construction activities.	Insignificant
		Operation activities	No impacts as no waste water will be discharged outside the plant	Insignificant
4.	Water Pollution	Construction activities	Small volume of wastewater from the construction and sanitation	Insignificant
		Operation activities	Waste water generated in the plant	Insignificant as there will be zero discharge of waste water.
5.	Ecology	Construction activities	There will not be major disturbance	Insignificant
		Operation activities	There will not be major disturbance to flora fauna	Insignificant
6.	Soil Characteristics	Construction activities	Since no excavation, the proposed expansion area is within the existing industry.	Insignificant
		Operation activities	No changes are envisaged in this phase	Insignificant
7.	Socio-economics	Construction activities	Creation of additional jobs/ businesses	Significant
		Operation activities	No additional employment generation	Insignificant
8.	Occupational Health	Construction activities	Dusty conditions during summer with vehicular movement	Insignificant
		Operation activities	Process specific activities, heat and emission protective control measures followed	Insignificant
9.	Vibrations	Construction activities	Heavy equipment usage will be temporary	Insignificant
		Operation activities	Continuous usage of machinery	Insignificant
10.	Solid/ Hazardous waste	Construction activities	General construction waste will be disposed of in designated sites	Insignificant
		Operation activities	Ash from burning of coal/wood in boilers	Insignificant

5. Analysis of Alternatives

No alternatives have been considered, as the project is an expansion of the existing industry located at Plot No. B-6, MIDC Area Parshivni, Tal. Parshivni, Dist. Nagpur, Maharashtra 441106. Since it is an expansion project, all required infrastructure such as industrial land, roads, electricity, etc. are already developed. The industry has proposed to produce 350 MT/M of MnO_2 in addition to the existing production of 150 MT/M of MnO_2 and 1000 MT/M of MnO. Thus, total production capacity is 1500 MT/M. The site selected also has the following merits –

- Project site is already developed and the existing area is sufficient for the proposed expansion.
- Land use of the site is already earmarked as industrial use.
- Required infrastructure like road, transport, water, electricity, etc. are already available in the area.
- No resettlement & rehabilitation is involved.
- Site is easily accessible to local markets.
- For finished good product market area is available within 75-100 km radius

Table 5: Matrix of Alternative Site Analysis

Sr. No.	Site Selection Criteria	Existing Site
1.	Non-Agricultural Land	✓
2.	No R & R Issue	✓
3.	Topography (Flat)	✓
4.	Site Connectivity (Approach Road)	✓
5.	No Notified Wildlife Sanctuary, National Park, Ecologically Sensitive Area, Biosphere Reserve, etc. within 5 km radius	✓
6.	No Notified Critically Polluted Area as per CPCB within 5 km radius	✓
7.	No Archaeological Monuments within 5 km radius	✓
8.	Availability of Electricity (MSEDCL)	✓
9.	Availability of Raw Material	✓
10.	Availability of labour force (Construction purpose)	✓
11.	Availability of Local Market for finished products	✓

6. Environmental Monitoring

The consistent monitoring of various environmental parameters holds significant importance for evaluating both the current state of the environment and the potential impacts of the proposed project. A comprehensive monitoring program is essential to ensure the efficacy of suggested mitigation measures. This environmental monitoring initiative aims to assess changes in environmental conditions, oversee the successful implementation of mitigation measures, and promptly address any deterioration in environmental quality.

The planned expansion will occur within the existing plot area, leveraging pre-existing infrastructure such as roads, electricity, and water facilities. To adhere to regulatory standards, the monitoring program, both during and after the project, will be meticulously designed to align with the guidelines set forth by the Central Pollution Control Board and the Maharashtra Pollution Control Board.

Table 6: Environmental Monitoring During Construction Stage

Sr. No.	Potential Impact	Action to be Followed	Parameters for Monitoring	Frequency of Monitoring
1.	Air	All equipment to be operated within prescribed standards	Random checks of equipment logs/manuals	Weekly
		Ambient air quality within the premises of the proposed unit to be monitored.	The ambient air quality will conform to the standards for PM_{10}, $PM_{2.5}$, SO_2, NO_X	As per CPCB/SPCB requirement or on monthly basis whichever is earlier
2.	Noise	List of all noise generating machinery onsite along with age to be prepared. Equipment to be maintained in good working order.	Equipment logs, noise readings.	Weekly during construction activities
		Night working is to be minimized.	Working hour records.	Daily records
		Generation of vehicular noise	Maintenance of record of vehicles.	Daily records
		Noise to be monitored in ambient air within the plant premises.	Spot noise recording.	As per CPCB/ SPCB requirement or on monthly basis whichever is earlier

3.	Wastewater Discharge	No untreated domestic waste water discharge is to be made to groundwater or soil.	No discharge hoses shall be in the vicinity of the watercourse.	Monthly during construction activities.
4.	Soil Erosion	Protect topsoil stockpile where possible at the edge of the site.	Effective cover in place.	The period during construction activities
5.	Drainage and Management	Ensure drainage system and specific design measures are working effectively. The design to incorporate existing drainage patterns and avoid disturbing the same.	Visual inspection of drainage and record thereof.	Weekly during construction activities
6.	Waste Management	Implement a waste management plan that identifies and characterizes every waste arising associated with proposed activities and which identifies the procedure for collection, handling, and disposal of each waste arising.	A comprehensive Waste Management plan should be in places and available for inspection on site. Compliance with MSW Rules,1998 and Hazardous Wastes (Management and Handling Rule) 2003.	Fortnightly check during construction activities
7.	Non-routine events and accidental releases	Plan to be drawn up, considering likely emergencies and steps required to prevent/limit consequences	Mock drills and records of the same.	Monthly during construction activities.
8.	Health	Employees and migrant labour health check-up.	All relevant parameters including HIV.	Six monthly check-ups.
9.	Environmental Management Cell/Unit	The Environmental Management Cell/Unit is to ensure implementation and monitoring of environmental safeguards.	Responsibilities and roles will be decided before the commencement of work.	During construction phase.
10.	Loss of flora and fauna	Re-vegetation as per Forest guidelines	No. of plants, species.	During site clearance Phase.

The following routine monitoring program as detailed in Table 7 shall be implemented at the site. Besides this monitoring, the compliances to all environmental clearance conditions and regular permits from SPCB/MoEFCC shall be monitored and reported periodically.

Table 7: Environmental Monitoring Schedule during Operation Phase

Sr. No.	Particulate	Parameters	Number of locations	Frequency
1.	Ambient air quality	PM_{10}, $PM_{2.5}$, SO_2, NOx, CO, and HC	Ambient air quality at minimum 2 locations. 1 location within the plant premises, 1 location in downwind direction.	Monthly
2.	Stack gas	PM, SO_2, and NOx	1 No. of stack	Monthly
3.	Surface water and ground water	pH, Salinity, Conductivity, TDS, Turbidity, DO, BOD, Phosphate, Nitrates, Sulphates, Chlorides, Total Coliforms (TC) and *E.Coli*	1 Ground water location at plant site	Half yearly
4.	Solid waste	Wet Waste, Dry Waste	Process dust generated sludge.	Monthly
5.	Noise	Equivalent noise level - dB (A) at min. Noise Levels measurement at high noise generating places as well as sensitive receptors in the vicinity	2 locations At plant site and nearest habitat	Monthly
6.	Green belt	Number of plantation (units), number of survived plants/ trees, number of poor plants/ trees.	In and around the plant site.	Monthly
7.	Soil	Texture, pH, electrical conductivity, cation exchange capacity, alkali metals, Sodium Absorption Ratio (SAR), permeability, porosity.	1-2 near Solid/ hazardous waste storage. At least 2 locations from Greenbelt and area where manure of biological waste is applied.	Quarterly
8.	Occupational health	Health and fitness check-up of employees getting exposed to various hazards and all other staff	All worker	Yearly/ twice a year

Sr. No.	Particulate	Parameters	Number of locations	Frequency
9.	Drainage and Waste Water Management	Design to incorporate Existing drainage pattern and avoid disturbing the same.	Ensure drainage system and specific design measures are working effectively.	Periodic during operation phase
10.	Emergency preparedness, such as fire fighting	Mock drill records, on site emergency plan, evacuation plan	Fire protection and safety measures to take care of fire and explosion hazards, to be assessed and steps taken for their prevention.	Monthly during operation phase

7. Additional Studies

Risk analysis follows an extensive hazard analysis. It involves the identification and assessment of risks to proposed project M/s. Raza Metals Manganese Processing & Trading in terms of upgradation of a Mineral Beneficiation project to produce two main Products i.e. MnO_2 and MnO. This is purely independent project and not interlinked with any project in any manner. Mineral Ore will be sourced from MOIL. This requires a thorough knowledge of failure probability, credible accident scenario, vulnerability of population etc. In this project, the operations will be planned and designed in such way to eliminate or reduce any hazards that may arise during the operations of the plant. The efforts will be made to achieve the desired standard of safety by implementing rules and regulation. Improvement will be done in working condition. The material and monetary resources shall be provided for the smooth and efficient execution of the safety plans. Continual efforts will be made to improve the living conditions and health of all the employees. The working floors will be furnished with required equipment/materials that ensures free from recognized occupational hazards likely to cause injury or illness.

Additional studies have been included in chapter VII are as below,

- Risk Assessment in which risks arising from
  - ✓ Charging of roasting furnace.

Following additional studies have been carried out to mitigate the risk -

- Disaster Management Plan
- Occupational Health and Safety Management System.
- On-site and Off-Site Emergency Plan

8. Project Benefits

As the proposed expansion will be done within the existing plot area; all industrial infrastructure such as water supply and electricity are already present. In addition to that, industry has planned to develop 835.035 sq.m. of area as Green Belt. Apart from this, as per the ministry's O.M No 22-65/2017-IA. II (M) dated 1st May, 2018, 1 % of the total project investment i.e. Rs. 1.58 Lakhs will be earmarked for Corporate Environmental Responsibility (CER) Activities. Details of budget is presented in **Table 8.**

Table 8: Details of CER Activity

Sr. No.	CER Activity	Details	Cost (In Rupees)
1.	Providing RO Water Filters	1 No. of RO Water Filters at Gram Panchayat Hospital, Parshivni 1 No. of RO Water Filters at Z. P. School, Kalapatha	50,000/-
2.	Waste management projects	Providing 4 nos. (Dry & Wet) of dustbins to Jai Shree Hanuman Devasthan, Ghundhari, 10 Nos. (Dry & Wet) to Gramin Hospital, Parshivni, 10 Nos. (Dry & Wet) to Palora Primary Health Sub Center, 10 Nos. (Dry & Wet) to ZP School Babulwada	68,000/-
3.	Rainwater Harvesting-Well Recharge Systems	Directing rainwater into dugwells to recharge groundwater- Dugwells at Bansingi, Parshivni villages	40,000/-
	TOTAL		**Rs. 1.58,000/-**

M/s. Raza Metals Manganese Processing & Trading is aware of the obligations towards the society and to fulfil the social obligations during Construction phase, semi-skilled and unskilled labourers from the nearby villagers will be employed as far as possible. The development of the industry will also try to generate maximum indirect employment in the vicinity of the project by appointing local transport services during the operation phase. After the successful operation of the proposed project, the unit will also make provision of the fund every year towards CSR activities in nearby villages. The various CSR activities identified and planned at present are described below:

- Education and Skill development

- Health Camps
- Infrastructure development in nearby government and Zilla Parishad school
- Blood and Organ Donation Camps
- Other social welfare activities as per Felt Need Study.

9. Environmental Management Plan

The EMP is,

- Prepared in accordance with rules and requirements of the MoEFCC and the State Pollution Control Board.
- Prepared to ensure that the component of facility is operated in accordance with the design.
- A process that confirms proper orientation through supervision and monitoring.
- A system that addresses public complaints during construction and operation phase.
- A plan that ensures remedial measures are implemented immediately.

The key benefits of the EMP are that, it provides the organization with means of managing its environmental performance thereby allowing it to contribute to improved environment quality. The other benefits include cost control and improved relation to stakeholders.

EMP includes four major element –

- Commitment and Policy: of proposed project will strive to provide and implement the Environmental Management Plan that incorporates all issues related to air, land and water.
- Planning: This includes identification of environmental impacts, legal requirements and setting environmental objectives.
- Implementation: This comprises of resources available to the developers, accountability of contractors, training of operational staff associated with environmental control facilities and documentation of measures to be taken
- Measurement and Evaluation: This includes monitoring, corrective actions, and record keeping.

9.1 Environment Management Plan during Construction Phase

The construction activities of the proposed unit will increase dust concentrations and fugitive emission. The following control measures are recommended to mitigate the probable adverse impacts.

9.1.1 Site Preparation

The development of the site for the erection of plant structures and related activities demands meticulous management planning by the proponent. Effective measures are imperative to control dust nuisances arising from levelling and transportation activities, thereby minimizing impacts on various environmental components. To address this, a systematic approach involves the regular sprinkling of water in vulnerable areas of the construction site to mitigate dust spread or emissions into the atmosphere. It is noteworthy that the identified impacts are of a temporary nature and confined within the plant boundary.

To further mitigate environmental impacts, a green belt area will be established to alleviate air and noise pollution effects. The topsoil, extracted during the setup of the new unit, will be utilized in the development of this green belt. Moreover, to ensure the well-being of individuals involved in construction activities, first aid facilities will be made readily available. This holistic approach reflects a commitment to responsible construction practices and environmental stewardship.

9.1.2 Noise

While the intensity of construction activities is anticipated to be moderate, it is imperative to manage specific noise sources such as welding, transportation, tractors, and concrete or asphalt mixing in a controlled manner. Ensuring that neither the plant nor the construction workers are exposed to excessive noise levels is a paramount concern. Stringent measures will be in place to prohibit the idling of machines during construction activities, and night-time construction activities and vehicular movement will be strictly restricted.

To safeguard the well-being of workers exposed to high noise levels, personal protective equipment such as earmuffs, earplugs, and masks will be provided. This proactive approach underscores a commitment to maintaining a conducive and safe working environment during the construction phase, demonstrating a comprehensive consideration for both operational and occupational aspects.

9.1.3 Construction Equipment and Waste

Throughout the entire construction phase, a stringent maintenance regimen will be implemented for both transport vehicles and transport routes to minimize smoke and dust emissions from vehicle exhausts and unpaved roads. This proactive measure aims to mitigate environmental impacts associated with construction-related transportation.

To address the generation of composite solid wastes, including metal scrap, a systematic and safe disposal mechanism will be implemented. This includes the proper sorting, handling, and disposal of solid wastes to prevent adverse environmental effects.

While the usage of hazardous waste materials will be limited, those materials will be stored safely and disposed of in accordance with established safety and environmental guidelines. This approach ensures that even minimal quantities of hazardous materials are managed responsibly, aligning with best practices for environmental protection and safety.

9.2 Environment Management Plan for Operation Phase

Factory proposes comprehensive environment management plan to combat pollution arising from the project activities. Detailed EMP is described below for various environmental parameters.

Sr. No	Aspects	Source & Impacts	Mitigation Measures	Monitoring/ Action	Responsibility	Frequency of Audit/ Monitoring/ External Reporting	Cost (Rs. In Lakh)
1.	Air Emission	Source: Emission from Roasting Furnace Emergency operation of DG Sets Emission from vehicular movement Dust emission from dusty road Impact: Increase in NOx, Sox, PM concentration Impact: Impact on ground water	• 30 m common stack will be attached with furnace (2 nos.) for better dilution and dispersion of pollutants. • Wet scrubber will be attached preceding to the stack to arrest particulate matter. • DG stacks of 8 m or as per MPCB directions/ norms. • Provision of air filters to DG sets. • All vehicles and their exhausts will be well maintained and will be regularly monitored for emission generated from the vehicle exhaust. • Control of the airborne fugitive emissions from the ore handling area will be achieved through regular water sprinkling in this area. • Only PUC holder trucks will be allowed at site.	Review of status of implementation of suggested mitigation measures Monitoring provision for flue gases emitting from process & Utilities. Six monthly/as per Consent condition requirement for monitoring of stack emissions through MoEF recognized external laboratory	EHS Manager	EHS Manager to review Emission results of monitoring Results of manual samples collected from process emissions stack by external laboratory Ensure compliance of conditions of Consent to Operate issued under Air Act; Annual renewals of CTO;	10

Sr. No	Aspects	Source & Impacts	Mitigation Measures	Monitoring/ Action	Responsibility	Frequency of Audit/ Monitoring/ External Reporting	Cost (Rs. In Lakh)
			• All internal road within plant area will be asphalted & whenever dusty situation will be found on road, water sprinkling will be done. • Green belt will be developed around the plant area. • Regular Air quality monitoring will be done.				
2.	Wastewater generation	Source: Discharge of untreated sewage & effluent Impact: Ground water pollution and increase in soil alkalinity	• In the proposed expansion, 0.4 KLD additional sewage generation along with existing 1 KLD sewage will be treated in package STP of 2 KLD. • The generated waste water of 3 KLD from jigging will be reused for quenching process. • Efforts should be taken towards treated wastewater quality to achieve land irrigation parameters prescribed in SCHEDULE –VI, The Environment (Protection) Rules, 1986.	Review of status of implementation of suggested mitigation measures	EHS officer & Facility Manager	Facility Manager to Daily review of ETP log books Review of results of essential parameters and results of monthly collected treated water samples by external laboratory Ensure compliance of conditions of Consent to Operate issued under Water Act Annual renewals of CTO;	--

Sr. No	Aspects	Source & Impacts	Mitigation Measures	Monitoring/ Action	Responsibility	Frequency of Audit/ Monitoring/ External Reporting	Cost (Rs. In Lakh)
			• Maintaining good housekeeping in all the units so that wastewater generation is minimized;			Six monthly monitoring of treated effluent.	
3.	Solid Waste generation.	Source: Coal/ Wood Ash – 500 MT/M/ 150 MT/M & Tailing -400 MT/M Domestic waste will be generated from the project activity Impact: Ground water pollution Soil contamination Sanitation and Hygiene problem plant processes	• Ash will be given to Bricks manufacturer for which agreement will be done. • Tailings will be reused in roasting furnace. • Garbage collection bins will be provided at requisite locations for collection of dry waste & wet waste. • Domestic solid waste will be given to Authorized waste management Authority.	Review of status of implementation of suggested mitigation measures Monthly review of non-hazardous and hazardous waste generated from the project Review conditions of storage location and records related to hazardous wastes as per the conditions of authorization Maintain records on disposal of hazardous wastes.	Facility Manager	Review of status of implementation of suggested mitigation measures Monthly review of non-hazardous and hazardous waste generated from the project	1
4.		Source:					--

Sr. No	Aspects	Source & Impacts	Mitigation Measures	Monitoring/ Action	Responsibility	Frequency of Audit/ Monitoring/ External Reporting	Cost (Rs. In Lakh)
	Ambient Noise	Increase in noise from DG set, Mechanical Separator, Jigging Process etc. Movement of vehicles inside the project site Impact: It will affect occupational Health & Safety	• Provision of silencers at high noise generating utility equipment and erecting suitable enclosures to minimise the impact of high noise generating sources. • DG sets will be provided with Acoustic Enclosures to minimise noise. • Ear plugs to be provided to the personnel working in high noise area. • Unwanted honking of horns to be restricted through signage.	Review of status of implementation of suggested mitigation measures Quarterly review by EHS Manager Ambient noise monitoring along the plant periphery to be done through external laboratory on six monthly basis.	EHS Manager	Quarterly monitoring of ambient noise	
5.	Socio – Economic	Source: Employment Impact: There will be positive impact	Preference to be given to the local candidate as per educational qualification during recruitment	Review status of implementation of planned CSR activities	HR Head	Quarterly as per requirement	--
6.	House Keeping	Source: Operational activity Impact: Aesthetics blockage of	• System to upkeep housekeeping and general cleanliness by providing adequate manpower. • Maintain clean curb cuts to avoid soil and vegetation	Review of status of implementation of suggested mitigation measures	Facility Manager	Fortnightly review of by Facility Manager	1

Sr. No	Aspects	Source & Impacts	Mitigation Measures	Monitoring/ Action	Responsibility	Frequency of Audit/ Monitoring/ External Reporting	Cost (Rs. In Lakh)
		storm water drain & Rain Water harvesting pit	build up, Green belt and landscape maintenance. • Inspections of drains and area surrounding cooling tower to check any water logging situation.				
7.	Energy	Utilization of non-renewal resources Heat gain in the building	Provision of renewable energy to be used for street lighting. LED have been used for internal lighting which helps save energy.	Review of status of implementation of suggested mitigation measures	Facility Manager	Six monthly review by Facility Manager	5
8.	EHS including associated risks of flammables	Source: Fire, Explosion, accident Impact: Health hazards, Damage to property	• The industry will adopt high standards, controls, mitigation measures to control risks associated with fire. • Following risk mitigation measures are adopted: • Proper system for collection and disposal of domestic and non-hazardous waste; • Earthing has been done in Hazardous Waste Storage area. • All the required safety measures (working guideline, use of personal protective equipment like gloves,	Review of status of implementation of suggested mitigation measures	EHS Manager	Six monthly review by EHS Manager	1

Sr. No	Aspects	Source & Impacts	Mitigation Measures	Monitoring/ Action	Responsibility	Frequency of Audit/ Monitoring/ External Reporting	Cost (Rs. In Lakh)
			helmets, earmuffs, etc.) for any repair and maintenance work within the proposed facility have been provided; • For safety of people occupying the building, regulations concerning fire safety are followed. Some of the requirements are: ✓ Installation of fire extinguishers all over the building, ✓ Emergency Response Plan will be periodically updated. ✓ The Site Operations Manager shall carry out exercises of part of the Emergency Response Plan at a regular interval as deemed necessary. ✓ The lesson learnt from these exercises shall be documented and used during the updating of the Emergency Response Plan.				

Sr. No	Aspects	Source & Impacts	Mitigation Measures	Monitoring/ Action	Responsibility	Frequency of Audit/ Monitoring/ External Reporting	Cost (Rs. In Lakh)
			✓ Provision of water hydrants in operative conditions. ✓ Emergency exit. ✓ Proper labelling of exit and place of the protective system installation. ✓ Conducting mock drills. ✓ Trained personnel to use the fire control systems. ✓ Display of emergency evacuation maps at the working place. ✓ Regular training and awareness programs to be conducted for people as per training modules formulated by the management for efficient control and management of environmental, safety and health related issues.				
9.	Disaster Management	Source: Risk of damage due to fire, natural	• During operation phase, potential risks include accidental fire, electrical	Review of status of implementation of suggested mitigation measures	EHS Manager Security In charge	Six monthly reviews by EHS Manager and Security In charge	--

Sr. No	Aspects	Source & Impacts	Mitigation Measures	Monitoring/ Action	Responsibility	Frequency of Audit/ Monitoring/ External Reporting	Cost (Rs. In Lakh)
		disaster and other emergency situations Impact: Loss of life, damage to property, financial loss to company	shock, fall hazards by working at height, physical injury, mechanical failure, vehicular hazards etc. • These risks will be minimised by periodical operation and maintenance of equipment and periodical supervision by operation team. Ensure adequate Fire Fighting system established onsite prior to commissioning of the Project as per the Fire Fighting Plan covering following aspects: • Fire Prevention Measure and Systems Signage • Fire Detection & alarm System • Fire Fighting System and devices • Annually, update Emergency Response Plan and ensure organization available for its implementation.				

Sr. No	Aspects	Source & Impacts	Mitigation Measures	Monitoring/ Action	Responsibility	Frequency of Audit/ Monitoring/ External Reporting	Cost (Rs. In Lakh)
10.	Project Related Traffic	Potential Congestion on the approach roads	The unit has provided a total area of 41.48 sqm. for parking space. The vehicles bringing utility raw materials are regulated and managed by the project in such a way that the impact during peak hours of traffic remains minimum. Internal roads are provided with adequate signage to maintain smooth flow of different type of Project related traffic.	Review of status of implementation of suggested mitigation measures	Facility Manager	Monthly review by the staff related to function.	--

9.3 Implementation of EMP

Environmental Health and Safety (EHS) Department of M/s. Raza Metals Manganese Processing & Trading will take the overall responsibility for co-ordination of the actions required for environmental management and mitigation and for monitoring the progress of the proposed management plans and actions to be implemented for the project. An Environment Management System (EMS) would be set-up which identifies legal requirement, analyses aspect-impact, sets objective, targets and programs, prepares action plans, roles & responsibilities, monitors the progress of these plans and incorporates corrective action required if any.

The implementation mainly comprises of resources available to the project proponent, accountability of contractors, training of operational staff associated with environmental control facilities and documentation of measures to be taken. It is proposed to create Environment Management Cell under EHS Manager for effective implementation of EMP. The Cell will have following functions:

- To implement the environmental management plan,
- To assure regulatory compliance with all relevant rules and regulations,
- To ensure regular operation and maintenance of pollution control devices,
- To minimize environmental impacts of operations as by strict adherence to the EMP,
- To initiate environmental monitoring as per approved schedule.
- Review and interpretation of monitored results and corrective measures in case monitored results are above the specified limit.
- Maintain environmental related records; and
- Coordination with regulatory agencies, external consultants, monitoring laboratories.

The schematic organizational set up of Environment Management Cell for operation phase is given in **Figure 7.**

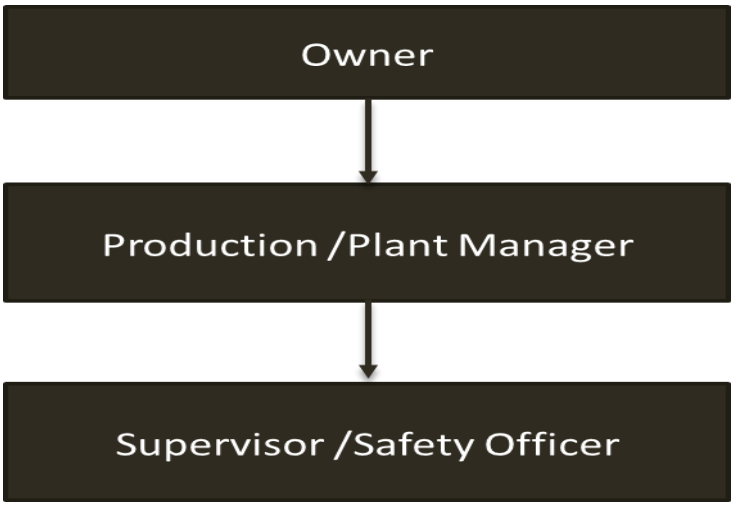

Figure 7: Environment Monitoring Cell

9.4 EMP Review and Amendments

The EMP acts as an environmental management tool that needs to be reviewed periodically to address changes in the organization, process, or regulatory requirements. Following a review, EHS Manager will be responsible for making the amendments in the EMP and seeking approval from the senior management. The amended EMP will be communicated to all related staff. EHS Manager will ensure that the training needs are identified and conducted.

Training needs will be identified based on the specific requirements of EMP and the capacity of site and project personnel to undertake the required EMP management actions and monitoring activities. Also, general environmental awareness will be created among the project's team to encourage the implementation of environmentally sound practices and compliance requirements of the project activities. This will help in minimizing adverse environmental impacts, compliance with the applicable regulations and standards, and achieving performance beyond compliance.

10. Environment Management Cost

The gross capital investment of the unit without depreciation till date including Cost of building, land, plant and machinery is ₹ 52 Lakhs. For proposed expansion, additional ₹ 1.02 Crore will be required for setting up of 2 Nos. of roasting furnace, 30 m stack, Wet Scrubber and other required infrastructure. Thus, the total cost after proposed expansion will be approx. ₹ 1.58 Crore. Environment management cost during construction phase will be around Rs.

40,000 per month and during operation phase will be around Rs. 19.5 Lakhs and recurring cost will be Rs. 3.75 Lakhs. The details of EMP cost are given in **Table. 10 and Table 11.**

Table 10: Environmental Management Cost during Construction Phase

Sr. No.	Component	Description	Cost (In Rupees) Per month
1.	Air Pollution control	Dust Suppression by sprinkling water	₹. 10,000
2.	Environmental Monitoring and Management	Ambient air monitoring, work place monitoring, Noise, Soil, etc. from MoEF approved lab on 6 monthly basis. (Rs. 60,000 each twice in year)	₹. 10,000
3.	Occupational Health and Safety	Medical check of staff from certified doctor	₹. 10,000
4.	Solid & Hazardous Waste Management	Disposal of Municipal Solid Waste and Industrial Construction Waste	₹. 5,000
5.	PPE'S	Personal Protective Equipment's	₹. 5,000
Total			**₹. 40,000**

Table 11: Environmental Management Cost during Operation Phase

Sr. No.	Component	Description	Capital cost Rs. In lakhs	Operational & Maintenance cost (Rs. In Lakhs/yr.)
1	Air Pollution control	Stack for Roasting furnace, wet scrubber system	10	0.5
2	Noise pollution control	Noise Level Monitoring	--	0.5
3	Environmental Monitoring and Management	Ambient air monitoring, stack emission monitoring, work place monitoring from MoEF approved lab on monthly basis.	--	1
4	Occupational Health and Others	Medical check of staff from certified doctor and providing health cover, Personal Protective Equipment's	1	0.25
5	Green Belt	Green belt development & maintenance	1.5	0.25

Sr. No.	Component	Description	Capital cost Rs. In lakhs	Operational & Maintenance cost (Rs. In Lakhs/yr.)
6	Solid & Hazardous Waste Management	Solid waste disposal	1	0.5
7	PPE's	Personal Protective Equipment's	1	0.25
8	Provision of renewable energy	Provision of renewable energy to be used for street lighting.	5	0.5
Total			**19.5**	**3.75**

Conclusion

In anticipation of the potential impacts associated with the proposed expansion project, M/s. Raza Metals has diligently devised comprehensive remedial measures and formulated an Environmental Management Plan for their effective implementation. The project is poised to generate both direct and indirect employment opportunities, contributing to an increase in physical resources.

As part of its corporate responsibility, Raza Metals is committed to undertaking various activities under the Companies Act, including Waste management projects, Providing RO Water Filters, and Rainwater Harvesting-Well Recharge Systems. These initiatives are designed to yield positive effects extending from the project site to the surrounding area, fostering a thriving environment.

In conclusion, the strict adherence to the established mitigation measures during both the construction and operational phases is expected to result in negligible environmental impact..