

Executive Summary

1.1 INTRODUCTION

The present draft EIA/EMP report has been prepared for Environmental Impact Assessment of proposed Munsar Manganese Mine of MOIL Ltd of M/s MOIL Limited (A Government of India Enterprise), for production capacity from 89992 TPA to 2,80,000 TPA using the mining methods of lease area of 193.27 Ha. It is an existing mining project.

1.2 PROJECT IDENTIFICATION

Munsar Manganese mines are located in the North-Eastern part of Nagpur District, Maharashtra State and is approx. 42 Km away from Nagpur. The mine is approachable from Nagpur by N.H. No. 7/44 & 753. The nearest Railway station is Ramtek, which is 0.38 Km away from the mine in West. Maximum temperature is about 45°C and minimum temperature is about 12°C with an average rainfall of about 1287.63mm.

The production of manganese ore was commenced in the year 1898 under prospecting license by then British company, the CPMO, and the first shipment was done in the year 1900 under Mining Lease.

The mining activities commenced about a century. Initially the South limb was worked to the depth of 70 m by opencast method. After achieving economic limit, the activities were shifted to underground method of mining. Flat back cut and fill method of mining is being now largely followed at this mine. In early phase of mining timber was used as support system and rock generated elsewhere in the development was used as fill material. With change in technology, in present days the stopes are filled with sand. Pre-mining support as cable bolts and rock bolts are largely being adopted. However South limb extension is exception, where both pre-mining and post-mining supports are being adopted, due to in-competency of strata.

Munsar mines is access through shaft & Inclined. In light of exploration conducted by MOIL, proving the deposit to deeper levels, it is necessary for Mansar mine to provide the access to deeper levels by extending existing shaft or sinking of new shaft at suitable location.

Efforts are being made to maintain the equilibrium of the ambience by planting suitable species over the hill slopes & dump slopes. Mine has contributed its share towards environment by planting various species within lease hold area and outside the lease area. It is also pertinent to note that a school is constructed at village Mansar under CSR activities, to provide higher education to the locals. This contribution is a land mark for the Mine in its progressive path.

MOIL is applying for the capacity expansion of the mine from 89992 TPA to 2,80,000 TPA from underground. This will help to conserve the valuable mineral which is locked at various positions. Hence the modifications in the mining plan over an area of 193.27 Ha. of Mine is submitted to the Regional Controller of Mines, IBM, Nagpur Region, Nagpur for approval under rule 17 (3) of MCR, 2016.

The present proposal is submitted for amalgamation of Munsar & Parsoda Manganese Mine of MOIL Ltd. At present both mines have separate approvals and now due to operation ease and statutory approvals fulfilment in a more suitable way, the mine leases are being merged. The existing capacity of both mines is 89,992 TPA of Manganese Ore and after expansion it is planned at 2,80,000 TPA of Manganese Ore.

1.3 Name and Address of the Applicant

Applicant	Nominated owner:-
M/s MOIL Limited. (A Government of India Enterprise) 1A- MOIL Bhawan, Katol Road, Nagpur-440 013 Telephone: 0712-2590775 Fax: 0712-2592073 E-mail: moilind_ngp@sancharnet.in Website: www.moil.nic.in	Mr. Mirza Mohammad Abdulla Designation: Director (Production & Planning) MOIL Limited, MOIL Bhawan, 1-A, Katol Road Nagpur- 440013 (MS) Tel.No : 0712-2592272; Mob.:- 7768830444 E-mail:- mma@moil.nic.in ; envsafety@moil.nic.in

Table No. A Location Based Details

Name of the project	Munsar Manganese Mine (Expansion in production capacity)
Project Proponent	Moil Limited
Location	Village Mansar, Chargaon, Khairi, Parsoda, Kandri
	Tehsil Ramtek
	District Nagpur
	State Maharashtra
Khasra details	24, 27, 26, 26, 26, 30, 30, 28, 74, 89, Road, 61, 73, 72, 71, 69, 68, 62, 67, 67, 82, 78, 75, 77, 76, 104, 105, 95, 95, 97, 97, 97, 96, 94, 92, 298, 23, 25, 26, 82, 82, 89, 90, 91, 92, 92, 92, 88, 87, 92, 92, 93, 86, 83, 94, 96, 55, 58, 56, 60, 59, 61, 66, 67, 67, p.o.11, 18, 20, 21, 22, 23, p.o.24, 68/1a, 68/1b, 68/2, 68/3, 69/1&69/2, 70, 71, 72, 73/1, 74, 75, 76, 77, 78, 79, 80, 81/1a&81/1b, 81/2, 81/3, 81/4, 81/5(134, 135.p.o), 81/6, 81/7, 81/8, 83/1, 83/2, 84, p.o.92&132, 93/1&93/2.
Total Area	193.27 Ha.
Water Requirement	MOIL has been obtained CGWA NOC No. CGWA/NOC/MIN/REN/2/2023/8073 dated 03/08/2023 for ground water abstraction from CGWA for 159 KLD, which is valid up to 16/10/2024.
Power Requirement	23,69,720 KWH and this will be met through 11 KV supply is received from MSEPC L Munsar through Gang operated AB switch.
Manpower Requirement	Existing - 264; Expansion - 62 workers = Total 324
Estimated Project cost	Existing- Rs. 176.6 Cr; Expansion Project Cost:- Rs. 14.12 Crores = Total Cost - Rs. 190.72 C.A. Certificate
Nearest Railway Station	Ramtek Railway Station (0.38 Km) in W direction.
Nearest Highway	NH- 7/44 -0.31 Km E direction NH- 753-0.01 Km Center NH- 247-11.92 ESE SH-253-0.46 KM E Direction SH251-14.39 KM NNE SH- 267-14.83 Km WSW direction
Nearest Airport	Dr. Babasaheb Ambedkar International Airport, Nagpur (41.03 Km) SW direction
School facilities	School facilities are available at Sai International school Ramtek ,0.88 K.M W Direction.
Hospital	Hospital facilities are provided at mine for mine employees. The hospital is supervised by full-time medical officer and staff. The hospital is equipped with three nos. ambulance. Hospital services are available for 24 Hours. Number of beds available in female ward - 03 Number of beds available in male ward -03

1.4 NEED OF THE PROJECT

Manganese is one of the major mineral deposits occurring in the Indian sub-continent. It has played a great role in the development of civilization and industrialization. The occurrence of Manganese ore in the proposed area is proved by the way of exploration and its production has an important role in the steel industries.

The ore will be sold to Ferro/ Silico Industries. MOIL has its own specifications, which are derived as per buyer's demands & available quality. MOIL sales its ore to various Ferro/Silico producers as per demand. It is to be mentioned here that MOIL has set up its own lab, for chemical analysis the analytical results of the lab are expectable to all concerns

MOIL Limited, the leading producer of high-grade Manganese ore and manufacturer of Electrolytic Manganese Dioxide and Manganese alloys in India, markets various grades and blends of ores to suits individual requirements of consumers, particularly for Steel, Ferro Manganese, Dry Battery, and Chemical Industries.

1.5 PROJECT DESCRIPTION

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1.6 Available Reserves and Life of Mine

Total Reserves (in situ)	44, 78,425 Tones
Total Resources including Blocked Resource	1,35,66,822.50 Tones
Proposed average rate of production	2, 80,000 Tones (U/G)
Anticipated life of Mine	48.45 Years. Say 48 years

As per the life of Mine is for 48 years but the lease is up to 2032. The mine will continue as per approval of lease extension.

1.7 DESCRIPTION OF THE ENVIRONMENT

The baseline environmental monitoring was carried out during pre-monsoon season of year 1st March 2023 to 31st May 2023. The various environmental components which are thoroughly studied during the study period include:

- ❖ Land Environment
- ❖ Water Environment (surface and ground water)
- ❖ Air Environment
- ❖ Noise Environment
- ❖ Biological Environment
- ❖ Socio- Economic Environment

Component	Baseline Status						
Land environment	Sl. No.	Type of land use	Area at the beginning of the proposal period	Area proposed under the activity	Actual Area utilized in the proposal period	Deviation	Reasons for deviation
	1	Mining	10.95	15.45	11.03	-4.42	Area updated as per current drone Survey
	2	Mineral storage	4.28	4.53	3.97	-0.56	Area updated as per current drone Survey
	3	Mineral Beneficiation plant	0.00	0.30	1.00	0.70	Area updated as per current drone Survey
	4	Township	6.94	6.99	9.30	2.31	Area updated as per current drone Survey
	5	Tailing Pond	0.00	0.00	0.00	0	Nil
	6	Railways	0.00	0.00	0.00	0	Nil
	7	Roads	2.22	2.32	3.58	1.26	Area updated as per current drone Survey.
	8	Infrastructure (Workshop, administrative building etc.)	4.81	5.10	7.28	2.18	Area updated as per current drone Survey.
	9	OB/waste dump	22.90	26.15	34.16	8.01	Area updated as per current drone Survey.
	10	Top soil preservation	0.25	0.50	0.00	-0.50	Area updated as per current drone Survey.
	11	Others	2.67	3.27	10.23	6.96	Area updated as per
	12	Total area put to use	55.01	64.60	80.55	15.95	Area updated as per current drone Survey.
	13	Excavated area	0.00	2.44	0.00	-2.44	Area updated as per current drone Survey.

	reclaimed					
14	Waste dump area reclaimed	0.00	0.00	0.00	0	Nil
15	Undisturbed Area	138.26	131.11	112.72	-18.39	Area updated as per current drone Survey.
	Total	193.27	193.27	193.27	0	

Water environment

The assessment of present status of water quality within the study area was conducted by collecting water from ground & surface water sources during the period of 1st March 2023 to 31st May 2023.

Nine ground water samples and Four surface water sample were collected. The quality of ground water and surface water studied by collecting water samples from representative, dug wells, tube wells and by from different surface water sources. These samples were taken as grab sample and were analysed for various parameters and compared with standards IS: 10500.

- It is observed that pH of the ground water samples are in range of 7.14 to 7.72, which is between the acceptable pH limit for drinking water.
- It is observed that pH of the ground water samples are in range of 7.18 to 7.61, which is between the acceptable pH limit for drinking water.
- Total dissolve solides (TDS) of the Ground Water samples are in range of 246 to 286.
- Total hardness observed in different ground water samples are in range of 116 TO 142 & 376 mg/l which are above the range of permissible limit.
- Fluoride Concentration is in range of 0.2 to 0.3 mg/l. which is under permissible limit.
- Biochemical oxygen Demand - All surface water samples have BOD values ranging 1.8 to 2.2 which indicte very low organic pollution load. All samples have BOD values are within prescribed limit (<30.0 mg/l as in IS 10500 :2012)
- Chemical oxygen demand (COD) - All surface water samples have COD values ranging from 8.4 to 16.8 which indictes low level of organic pollution load in term of COD.

Results & Discussion- From the above data it is observed that all parameters are within permissible limit of drinking water standard.

- **Water Level:** A systematic hydrogeological survey has been carried out in and around lease area. On the basis of the depth to water level of the study area, the Pre-monsoon depth to water level ranges between 9mbgl to 11mbgl. Pre monsoon and the Post Monsoon depth to water level ranges between 6mbgl to 8mbgl.

Air and Noise environment

PM₁₀ level in the study area - The maximum and minimum concentration for PM₁₀ was recorded in 98% is 52.15 µg/m³ and 67.89 µg/m³ respectively. The maximum concentration was recorded at Munsar Village and minimum concentration was recorded at Parsoda Mine.

PM_{2.5} level in the study area - The maximum and minimum concentration for PM_{2.5} was recorded 27.55 µg/m³ and 37.13 µg/m³ respectively. The maximum concentration was recorded at Ramtek and minimum concentration was recorded at Parsoda Mine.

SO₂ level in the study area - The maximum and minimum concentration for SO₂ was recorded 6.41 µg/m³ and 14.49 µg/m³ respectively. The maximum concentration was recorded at Khumari and minimum concentration was recorded at Parsoda Mine.

	<p><u>NO₂ level in the study area</u> - The maximum and minimum concentration for NO₂ was recorded 7.79 µg/m³ and 18.24 µg/m³ respectively. The maximum concentration was recorded at Ramtek and minimum concentration was recorded at Parsoda mine</p> <p><u>Conclusion:</u> From the baseline monitoring result, it is observed that monitored parameters (PM₁₀, PM_{2.5}, and SO₂ & NO₂, CO) are within permissible limits of NAAQS, 2009.</p>
Biological environment	The biological study of the area has been conducted in order to understand the ecological status of the existing flora and fauna to generate baseline information and evaluate the probable impacts on the biological environment.
Socio economic environment	Total population of the study area (for 10 km. radius buffer zone) comprising 51 villages as per 2011 census is 64046 out of which 32721 are male and 31325 are female.

1.8 ANTICIPATED ENVIRONMENTAL IMPACT & MITIGATION MEASURES

- ❖ **Impact on Air Quality-** Mining activity which includes excavation, loading & unloading drilling blasting of material may increase the concentration of particulate matter in the air. However, this will be controlled by water sprinkling.
- ❖ **Impact on Noise Quality-** Generation of noise due to operation of mining machinery and increased frequency of vehicular traffic in the area. However, these impacts are short term, intermittent and temporary in nature & will be controlled by idling running of vehicles & plantation along lease boundary.
- ❖ **Impact on Water Environment-** There is No perennial river and little seasonal nallah flow in the lease area. Hence, during the course of mining, no Nallah/stream & water bodies have been diverted.
- ❖ **Impact on land Environment-** In the existing condition mining operations are underground and expansion of underground mining will be proposed. Here is no removal of topsoil at present. However, expansion stage, there will be increased vehicular traffic for loading, unloading, storing, handling and transportation of mined ore & overburden.
- ❖ **Impact on topography and drainage pattern after expansion phase-** The top soil stockpiles will be low height not exceeding 2m and will be grassed to retain fertility. The excavated loose soil will be utilized for plantation work in the M.L area, if available. Thus, the impact on topography and drainage pattern after expansion will be negligible. No major and minor changes in soil quality and quantity may be occurred during life of the mine.
- ❖ **Impact on Biological Environment-**
 1. A lot of PM_{2.5} & PM₁₀ gets suspended in the air and affect the surrounding vegetation and agriculture land. PM_{2.5} & PM₁₀ effects can be chemical and physical in nature of the 2 K.M radius. The effect of PM_{2.5} & PM₁₀ on vegetation is in the form of incrustation, plugging of stomata, loss of chlorophyll and reduction of photosynthesis process. Disturbance in plant metabolism due to deposition of dust particles on foliar surfaces leads to reduction in plant growth.
 2. Mechanical and physical disturbance associated with proposed underground mining. it is created by drilling, blasting, digging of soil and rock, transportation of materials, mineral processing can create Air pollution in the Ambient environment and major pollutants are PM_{2.5} & PM₁₀.
 3. The Particulate matters are the major and minor pollutants which are generated by transportation of vehicles activities in the M.L area and 2 to 3 K.M radius.
 4. There will be minor impacts on ecological and biodiversity of the area beyond what is already present due to traffic on the State Highway.

5. There will be positive impact due to the green belt development activities, which are existing and proposed by MOIL on areas surrounding surface infrastructure for underground mine.
 6. Due to excavation for mining, the existing vegetation (Trees, Shrubs, Herbs /climbers, Grasses and medicinal plants) over the area will disappear, in phases as per progress of the mined out area. Similarly, due to influx of labour force, there may be a sudden spurt in demand of small timber and fire wood thereby shifting the additional biotic pressure on the surrounding forests causing further destruction of forests within the impact area. This will lead to depletion of quantity and quality of flora.
- ❖ **Impact on Fauna:-** The activities such as blasting including drilling holes, operation of machinery, movement of dumpers can have minor impacts in terms of disturbance due to noise & vibration, interference in movement etc fauna of the area. Due blasting migratory birds and wild animals are slightly affected. Fauna of the area is affected due to ground vibration, and it may be moved to nearby villages and other areas.

1.9 ANALYSIS OF ALTERNATIVES

- ❖ **Site Alternatives** - It is a existing mining area for mining of manganese ore. The mine must be located where the mineral exists in enough quantity to be economically extracted.
- ❖ **Technology alternatives** - The proposed mining operations for expansion activity will be performed adopting existing Underground Mining. Keeping in view of geological parameters, mineable reserves & overburden, underground method of mining is being adopted and transportation of mineral shall be done through road by dumpers.

1.10 ENVIRONMENT MONITORING PROGRAM

Environmental monitoring programme will be taken up after the grant of EC and half yearly compliance report in respect of the terms and condition stipulated in the EC letter will be submitted to the regulatory authorities.

Environment monitoring will be carried out at the site as per the CPCB guideline. Environmental Monitoring Programme will be conducted for various environmental components as per conditions stipulated in Environmental Clearance Letter issued by SEIAA Maharashtra & Consents to Operate issued by SPCB. Six monthly compliance reports will be submitted to SEIAA Maharashtra & SPCB.

1.11 ADDITIONAL STUDIES

- ❖ **Risk Studies:** Hazard identification and risk analysis involves identification of undesirable events that leads to hazard, the analysis of hazard mechanism by which this undesirable event could occur & usually estimation of extent, magnitude & likelihood of harmful effects.
- ❖ **Disaster Studies** - The objectives of Disaster Management Plan (DMP) is to describe the lessee's emergency preparedness organization, the resource availability and response actions applicable to deal with various types of emergencies that could occur at the mines with organization structure being deployed in shortest time possible during the emergency.

Thus, the overall objectives of the emergency plan are summarized as:

1. Rapid control and containment of materials situation.
 2. Minimizing the Risk and impact of event/accident.
 3. Effective prevention of damage to property.
- ❖ **Occupational health and safety** - The main areas of concern for ensuring adequate occupational health and safety are: -
1. All working places will have safe means of access, safe working platform and exit. Persons working in dust prone area will be provided with dust mask.
 2. Personal protective equipments like respirators, ear plug, noise muff, helmet etc. will be provided to the workers.

3. Proper unit design and engineering controls in order to protect workers, including by control of process and fugitive emissions.
4. Adequate arrangement of drinking water will be done.
5. Education & training will be provided to the workforce about facilities, protective equipment, risk associated, potential health effects, etc.
6. Display board will be provided showing the hazards associated and recommended precautionary measures.

❖ **Social impact assessment, R&R Action Plan** - There is no hutment in the lease area. No R & R Plan required.

1.12 ENVIRONMENT MANAGEMENT PLAN

The Environmental Management Plan has been developed with a view to bring down the levels of impacts as discussed in the last chapter within limits. In each of the areas of impact, measures have to be taken to reduce potentially significant adverse impacts and where these are beneficial in nature, such impacts are to be enhanced/augmented so that the overall adverse impacts are reduced to as low level as possible. Measures to be taken for each of the impact areas are detailed in the following paras:

Environmental Issue	Management measures	Implementation
Air environment	The mine site has mechanical ventilator. Emanation of dust during working will be minimized by adoption of dust suppression system (like water spraying) at working faces before and after blasting and during loading. Wet drilling will be adopted in drill machines. Transport of material will be done by covered conveyor belt of km length to minimize the dust generation. The transfer points will be provided with sufficient water sprinkling system. Dust mask will be provide as safety measures to the workers, engaged at dust generation points like drills, loading/unloading points, material handling etc.	Project authorities, through Regular monitoring of the roads, plantation sites, random checking of equipment.
Noise & Vibration	<ul style="list-style-type: none"> • Controlled blasting is a technique for the purpose to reduce the amount of over break and to control the ground vibration. • Additional soundproof enclosures of fixed and mobile plant and mine ventilation fans. • Altering the blast drilling pattern and delay layout. • Regular checking of machineries. 	Project authorities through Regular monitoring.
Water environment	<ul style="list-style-type: none"> • Septic tank followed by soak pit is already provided for the treatment of domestic wastewater. • Garland drain around dumps and sumps will be constructed to channelize rainwater on surface. • Development of groundwater recharges system around ML area. • Implementation of recharge measures proposed in the hydrological and hydrogeological study. • Optimal use of water. • Monitoring of ground water level and quality in and around the mine area. 	Project authorities through regular monitoring.
Biological Environment	<ul style="list-style-type: none"> • As the mining method is underground so not much impact will be anticipated on surrounding flora & 	Project authorities through regular monitoring.

	<p>fauna.</p> <ul style="list-style-type: none"> • Mining activities will be restricted to day-time so that fauna will not disturb at night. • Tar road will be used for transportation to minimise fugitive emissions. • Material will be covered with tarpaulin during transportation. • Plantation will be taken up in consultation with Forest department and species local to the area shall be planted as per findings during baseline environment which help maintain the regional ecological balance, soil and hydrological conditions. • Water sprinkling will be done on haul roads to control fugitive emissions. • The removal or picking of any protected/unprotected plant will not be permitted. • Proper traffic management including ban on use of pressure horns; restriction on use of music in vehicles at high volume as well as regular maintenance of vehicles shall be insisted to minimize disturbance from vehicular movement. • Educational and awareness programmes for mine workers will be arranged. 	
Occupational health & safety & public health & safety.	<ul style="list-style-type: none"> • Safety officer look after the safety aspects. • Dedicated safety & environmental committees in mine review the safety and environmental aspects. • Regular water sprinkling on haul roads. • Dust mask will be provided to the workers. • Periodical medical examinations will be carried out for the workers as per norms. • Medical records will be keep maintained. • Medical facilities to the workers. • Personal Protective Equipment's to the workers. • Vocational Training will be provided to workers. • Safety of the employee during mining will be taken care as per Mine regulations. 	<p>Vocational Training will be provided to the workers.</p> <p>A well-equipped first aid facility will be made available round the clock in ML area. By Project authority.</p>
Socio economic environment	<ul style="list-style-type: none"> • Employment will be given to local people. • Regular medical camps will be organized. • Funds will be provided for development activities in nearby villages. 	Regular monitoring by project authorities.

Table No. B Cost Estimates of EMP (Investment and Recurring Cost in Lakhs)

S. No.	Description	Capital Cost (In Lakhs)		Annual Recurring Cost (In Lakhs)	
		Existing	Proposed	Existing	Proposed
1	Pollution Control Measures including: <ul style="list-style-type: none"> ▪ Installation of Online AQM System. ▪ Conservation of Natural Resources through Garland Drain, Water sprinkler, Septic tank, Rainwater Harvesting Structure etc.) ▪ Protective works for waste dump management including construction of retaining wall/ water drains, terraces & maintenance of check dams etc. 	90.0	5.0	30.0	4.0
2	Pollution Monitoring (Air, Water, Soil and Noise Monitoring on quarterly and half yearly basis)	40	5.0	15.0	1.0
3	Occupational Health & Safety	20.0	2.0	10.0	0.5

4	Green Belt Development	40.0	1.0	25.0	1.0
a	Mine	30.0	1.2	10.0	0.2
b	Township	10.0	1.0	5.0	0.5
5	Reclamation/ Rehabilitation of mined out area	11.0	2.0	Nil	1.0
6	Others (specify)	20.0	1.0	10.0	0.5
a	Awareness, training programme, celebration of safety & environment week, Hydrogeological study, Fencing and RH study.	20.0	2.0	Nil	Nil
b	Fauna management	As per WLCP, if applicable			
c	Protective Equipment's	11.0	5.0	5.0	2.0
Sub-Total		352	28.2	110	10.7

Activities under CER* will be part of EMP, in light of MoEF&CC' s OM dated 30.09.2020. Details are as given below:

Activity		I st Year	II nd Year	III rd Year	Total
a	Employment to locals in the mining	As per Govt. Rules/ minimum wages based on the skills			
b	Rural Development (laying roads, construction of drains, community halls, other infrastructure for development of surrounding villages – Munsar, Chargaon, Khairi, Parsoda, Kandri villages)	2	2	2	6
c	Promoting Education (providing infrastructure like construction of additional classrooms, furniture, smart class facilities, Boys and girls toilets, support to special children education /therapy etc. in nearby village – Govt. School at Munsar, Chargaon, Khairi, Parsoda, Kandri villages)	2	2	2	6
d	Health Care (Performing free Cataract surgeries, Infrastructure support to area Govt. Hospitals like providing bed and equipment for treatment etc. – Govt. Primary Health Centers at Munsar, Chargaon, Khairi, Parsoda, Kandri villages)	2	2	2	6
e	Skill Development and Livelihood (conducting skill development/ vocational training programmes for unemployed youth /women of surrounding villages - Munsar, Chargaon, Khairi, Parsoda, Kandri villages)	2	2	2	6
f	Sanitation & Drinking Water supply (supply of drinking water, construction/ installation community toilets, support for solid waste management in the communities etc. at Munsar, Chargaon, Khairi, Parsoda, Kandri villages)	2	2	2	6
Sub-Total		10	10	10	30

Note: *Activities proposed under CER will be undertaken in 3 years time only.

1.13 Monitoring Schedule for Environmental Parameters

Particulars	Monitoring Frequencies	Duration of Station	Important Monitoring Parameters
Surface water/ Ground water Sampling	Quarterly all seasons	-	EC, PH, TDS, TSS, Iron, Hardness, Alkalinity, Chlorides, Calcium, magnesium, Nitrates, Sulphate, manganese & Fluorides
Ambient air quality monitoring	Quarterly all seasons other than monsoon	24/8 hr	PM _{2.5} PM ₁₀ , SO ₂ and NO ₂ .
Noise Monitoring	Quarterly all seasons other than monsoon	8/1 hr	Level in dB (A). Day/Night
Soil Sampling	Half Yearly	-	PH, Conductivity, organic matter permeability, water holding capacity, Alkalinity & texture
Inventory of flora	Once in 3 years in project monitoring area.	-	Tree plantation and survival % etc
Growth of faunal species in the area	Once in year	-	Number and biodiversity
Socio-economic condition of local population, physical survey.	Once in five years.		
