

EXECUTIVE SUMMARY (ENGLISH)

FOR

EXPANSION IN PRODUCTION OF PATHARI SAND MINE; M.L AREA: 40.41 HA.

FOR MINERAL- BAJRI (RIVER SAND)

EXISTING PRODUCTION – 50,000 Cu.M/Annum &

**AFTER EXPANSION PRODUCTION – 1,00,000 Cu.M. /Annum
(EXPANSION PROJECT)**

LOCATION NEAR VILLAGE PATHARI, TEHSIL TUMSAR, DISTRICT BHANDARA, MAHARASHTRA

EXISTING COST - Rs. 1.0 Lakh; AFTER EXPANSION - Rs. 15.0 Lakh

STUDY PERIOD: - 1st MARCH 2023 TO 31st MAY 2023 (SUMMER SEASON)

TOR vide File No. SIA/MH/MIN/432657/2023 dated 12th June 2023

FOR

ENVIRONMENTAL CLEARANCE

("B1" under category 1(a) of EIA Notification dated 14.09.2006 & its subsequent amendments dated 14.08.2018)



MOIL LIMITED
Formerly Maganese Ore(India) Limited
A Government of India Enterprise

MOIL LIMITED

(A Government of India Enterprise)

Authorized Signatory: Mr. M. M. Abdullah

MOIL Bhavan, 1-A, Katol Road, Nagpur-440013, Maharashtra

Tel. No.: 0712-2592272; E-mail: - moilind_ngp@sancharnet.in



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**Wolkem India Limited
(Consultancy Division)
E- 101-102, Mewar Industrial Area, Madri,
Udaipur – 313003 (Rajasthan)
Phone No. 0294-2494600/2,
E-mail – info.wcs@wolkem.com**

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EXECUTIVE SUMMARY

1.1 INTRODUCTION

The present draft EIA EMP report has been prepared for Environmental Impact Assessment of proposed expansion of Pathari Mine of M/s MOIL Limited (A Government of India Enterprise), for production capacity from 50,000 Cu.M/ Annum to 1,00,000 Cu.M/ Annum using the opencast mining methods of excavation in mining lease area of 40.41 Ha. It is an existing mining project. Environmental clearance letter by SEIAA, Maharashtra was granted for production capacities of 50,000 Cu.M/ Annum vide meeting number 182, dated 06th December 2019 (SEIAA-Statement -0000003692), vide EC number 0000002213, dated 20th December 2019.

1.1.1 Project Identification

Pathari Sand mine of M/s MOIL Ltd. is for the capacity expansion from 50,000 Cu.M./Annum to 1,00,000 Cu.M./Annum.

- **Reason for Expansion in E.C:** To obtain Environmental clearance for enhanced production capacity from 50,000 Cu.M./Annum to 1,00,000 Cu.M./Annum to be used in sand stowing at Pathari mine of M/s MOIL Ltd.

1.1.2 Identification of Project Proponent

Table 1.1: 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.m	Mr. M. M. Abdullah Nominated Owner & Director (Production & Planning) MOIL Limited, MOIL Bhawan, 1-A, Katol Road Nagpur- 440013 (MS) E-mail: envsafety@moil.nic.in

1.1.3 Location of Project

Table 1.2: Location Based Details

Name of the project		Pathari Sand Mine
Promoter		MOIL Limited
Location	Village	Pathari
	Tehsil	Tumsar
	District	Bhandara
	State	Maharashtra
Toposheet no.		55 O/14
Coordinates		Latitude 21°35'18.37"N to 21°35'47.42"N Longitude 79°45'6.25"E to 79°46'35.45"E

1.1.4 NEED OF THE PROJECT

MOIL Limited is using the sand excavated from Pathari mine, to be used for stowing purposes at Chikla underground mine. The occurrence of sand in the proposed area is proved by the way of exposures and its production has important role in filling the underground mine of Lessees. The sediment in the form of riverbed material (RBM) is deposited every year during monsoon season at many locations of the Bawanthadi River. Removal of the sand from the proposed location is unlikely to damage the riparian system if the excavation and transport is carried out in systematic manner proposed in the approved Mining Plan. This project operation will provide direct and indirect employment to 34 local people.

Furthermore, M/s MOIL Lit. provides Manganese, which is the prime raw material required for any steel industry. India ranks 7th position in Steel production. The consumption of steel per capita is comparatively less with respect to developed countries. Presently, India is producing approximately 55 MT steel per annum which has been envisaged in Steel Policy of Govt. of India to achieve 100 MT by 2015. Aiming the above goal, Government of India is encouraging steel sector. The reserves of manganese are found in limited areas. At present the company is the largest producer of manganese ore in the country with a share of about 45% but still import large quantities of high-grade manganese ore. This indicates enough gaps between demand & supply which provides opportunities for MOIL to increase its production.

1.2 PROJECT DESCRIPTION

Description of applied lease and mining process:

Local geology - Locally, the lowermost formation i.e., Tirodi gneiss overlaid by soil and alluvium are the formations available in and around the area under reference.

Tirodi gneiss i.e. the biotite gneiss, biotite muscovite gneiss are exposed on the banks of the river Bawanthadi and at few place in the river bed striking along ENE-WEW swinging over to NE-SW towards western part of S.H. towards east, the gneiss closed near Miragpur (in M.P.) and the strike direction also swing along NW-SE, the dip of the gneiss varies from 35° to 60°. Towards west of the S.H. 54, the dip further flattens to 20°. Along the riverbed, at some places this gneiss is fairly exposed or otherwise it is covered by soil.

The alluvium (sand) just lies over the gneiss. The other locally developed formation such as Sitasaongi schist and Munsar schists are absent in the area. The quality of sand is not useful for other applications except stowing.

Table 1.3: Available Reserves and Life of Mine

a)	Total Reserves (as in 2022)	4,50,000 Cu.M.
b)	Proposed average rate of production	1,00,000 Cu.M./Annum
c)	Anticipated life of Mine	5 years

Note: Since the mineral is replenishable, no life can be estimated. However, as per guidelines, Life is calculated 5 years.

1.3 DESCRIPTION OF THE ENVIRONMENT

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

BASELINE ENVIRONMENT STATUS

1.3.1 Meteorological Condition

The meteorological data generated at site during study period (1st March 2023 to 31st May 2023) is summarized below:

Month	Wind Speed (m/s)		Temperature (°C)		Relative Humidity (%)		Rain Fall (mm)	Predominant Wind Direction from
	Min	Max	Min	Max	Min	Max	Total	
Mar 2023	0.1	7.6	17.2	38.9	10	94	57.2	NW to SE
Apr 2023	0.1	7.6	20.0	42.2	14	95	11.9	
May 2023	0.1	9.4	20.0	43.9	10	96	48.2	

1.3.2 Ambient Air Quality

PM₁₀ level in the study area - The minimum and maximum concentration for PM₁₀ was recorded 38.19 µg/m³ and 65.67 µg/m³ respectively. The maximum concentration was recorded at Project Site(A1) and minimum concentration was recorded at Nakadongri Village(A4).

PM_{2.5} level in the study area - The minimum and maximum concentration for PM_{2.5} was recorded 20.49 µg/m³ and 35.9 µg/m³ respectively. The maximum concentration was recorded at project area and minimum concentration was recorded at Nakadongri Village(A4).

SO₂ level in the study area - The minimum and maximum concentration for SO₂ was recorded 6.06 µg/m³ and 11.65 µg/m³ respectively. The maximum concentration was recorded at Project Site(A1) and minimum concentration was recorded at Dhutera Village(A3).

NO₂ level in the study area - The minimum and maximum concentration for NO₂ was recorded 7.09 µg/m³ and 15.23 µg/m³ respectively. The maximum concentration was recorded at project area and minimum concentration was recorded at Nakadongri Village(A4).

CO level in the study area - The minimum and maximum concentration for CO was recorded 0.28 mg/m³ and 0.83 mg/m³ respectively.

Conclusion: 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.

1.3.3 Ambient Noise Level

A preliminary survey was undertaken at 6 locations during study period to identify the baseline noise level in the study area.

Conclusion: During study period maximum ambient noise level were observed: 61.4 at mine area during daytime & minimum 49.7 during night-time. In the Buffer zone maximum ambient noise level were observed: 57.2 at Nakadongri during daytime and minimum at 38.8 at Dhutera during nighttime.

1.3.4 Water Quality

Conclusion

- It is observed that pH of the ground water samples are in range of 7.15 to 7.65, which is between the acceptable pH limit for drinking water.
- Total dissolve solids (TDS) of the Ground Water samples are in range of 386 to 590 mg/L.
- Total hardness observed in different ground water samples are in range of 234 to 376 mg/l which are above the range of permissible limit.
- Fluoride Concentration is in range of 0.5 to 0.7 mg/l. which is under permissible limit.
- Bio-chemical oxygen Demand - All surface water samples have BOD values ranging 1.3 to 1.5 which indicate 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 8.1 to 10.8 which indicates 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.

1.3.5 Soil Characteristics

- The soil in which neither sand & silt nor clay predominates is called "loam".
- The bulk density of the soils was found in the range of 1.38 gm/cm³ at Dhutera (S3) to 1.52 gm/cm³ at 500 m (S2).
- Soil pH measure of acidity and alkalinity and reflects the status of base saturation. The soil pH ranges from 7.14 Hardoli (S5) to 7.58 ,500 m (S2).
- The Organic matter content of soil varied 0.57% Dhutera (S3) to 0.83 % at Anjanihari village(S6).
- Available nitrogen content in the surface soils ranges between 91.4 kg/ha at Nakadongri (S4) to 500 m DW (S2) 104 kg/ha.
- Total phosphorus content ranges between 22.35 Kg/ha Dhutera Village (S3) to 26.56 Kg/ha at 500 m DW (S2).
- Total potassium content in these soils ranges between 98.00 kg/ha at Hardoli (S5) to 118.4 Kg/ha at Nakadongri village (S4).

Conclusion: The study revealed that the soils of six villages of Bhandara block are neutral and alkaline in nature. The nitrogen content was found low in the study area. The availability of phosphorus and potassium was found below normal. The availability of micronutrients like copper, manganese, zinc, iron and boron were low in the study area. The rice-wheat and sugarcane growing farmers of the study area neglects towards the application of micronutrients which has resulted in poor fertility status of the area. The use of biofertilizers

like Trichoderma, Azotobacter, Rhizobium, Pseudomonas etc. along with organic manures like farmyard manure, compost can boost up the soil nutrient status.

Table 1.4: Land Use Pattern of The Core Area

S. No.	Type of land use (in ha)	Area at the beginning of the Project	Area proposed under activity	At conceptual Period	Remark
1	Mining	10.0	10.0	0.0	NA
2	Mineral storage	1.39	1.39	0.0	Adjoining mining lease at Khasra no. 121, 122, 123, 124 of Pathari village
3	Roads	1.0	1.0	0.0	Temporary kachcha road
4	Infrastructure (Workshop, administrative building etc.)	0.0	0.0	0.0	As the sand mining area falls in riverbed, hence no permanent structure and plantation is proposed within lease area.
5	OB/waste dump	0.0	0.0	0.0	
6	Total area put to use	10.0	10.0	0.0	
7	Undisturbed area	30.41	30.41	0.0	
	Grand Total	40.41	40.41	0.0	

Note: Plantation is proposed at riverbanks/ open area available in village like gram panchayat, schools, primary health centres or any available land.

Table 1.5: Land Use Pattern of Study Area (10 Kms.)

S. No.	Classes Name	Area (In Hect.)	% Area
1	Study Area	40.4100	0.108
2	Built-Up	322.3428	0.864
3	Agriculture Land	15969.4240	42.805
4	River, Water Bodies & Nalla	731.6397	1.961
5	Open Scrub / Stony Waste	2504.5847	6.713
6	Forest & Open Jungle	17393.0318	46.621
7	NH, SH & Road	323.0810	0.866
8	Railway Line	22.4860	0.060
	Total Area	37307.0000	100.00

1.3.6 Biological Environment

There are no National parks, Sanctuaries, Biosphere Reserves, Wildlife corridors, Tiger/Elephant reserves (existing as well as proposed), within core zone of the area. We have collected secondary data for seasonality data of whole year and analysis of primary data. It discussed with forest experts, field staff and locals persons. FGD's has been done for verification of secondary data along with concerned officials of Forest Department.

1.3.7 Demography and Socio- Economics

The study area comprises 39 villages with population of about 59362 (Male- 29708 & female – 29654) and number of households are 16346. (According to the Census 2011).

1.4 ANTICIPATED ENVIRONMENTAL IMPACT & MITIGATION MEASURES

1.4.1 Impact on Air Quality- Mining activity which includes excavation, loading & unloading of material may increase the concentration of particulate matter in the air. However, this will be controlled by water sprinkling.

1.4.2 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.

1.4.3 Impact on Water Environment- The mine lease area falls within the riverbed. No mining will be done, deeper to occurrence of groundwater. Hence, during the course of mining, no Nallah/stream & water bodies have been diverted.

1.4.4 Impact on land Environment- Land area indicating the area likely to be degraded due to quarrying, dumping, roads, workshop, processing plant, tailing pond/dam, township etc. The total land required for mining in this lease area is 10.0 ha. out of the total lease area of 40.41 ha. This area will be utilized for dumping, infrastructure, plantation during the first five years of the modified mining plan period after commencement of mine.

Plantation programme will be done as per approved mining plan and rainwater collected and used for plantation/agriculture purpose during life of the mine.

1.4.5 Impact on Biological Environment- There is no National parks, Sanctuaries, Biosphere Reserves, Wildlife corridors, Tiger/Elephant reserves (existing as well as proposed), within core zone of the area.

1.5. ANALYSIS OF ALTERNATIVES

1.5.1 Site Alternatives - It is an existing mining project of riverbed sand mining. The mine must be located where the mineral exists in enough quantity to be economically extracted.

1.5.2 Technology alternatives - The proposed mining operations for expansion activity will be performed adopting existing opencast mining method. Keeping in view of geological parameters, mineable reserves, method of mining will be adopted, and transportation of mineral shall be done through road by dumper.

1.6 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.

1.7 ADDITIONAL STUDIES

1.7.1 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 and likelihood of harmful effects.

1.7.2 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:

- Rapid control and containment of Hazardous situation.
- Minimizing the Risk and impact of event/accident.
- Effective prevention of damage to property.

1.7.3 Occupational health and safety- The main areas of concern for ensuring adequate occupational health and safety are: -

All working places will have safe means of access, safe working platform and exit. Persons working in hazardous dust prone area will be provided with dust mask.

Personal protective equipments like respirators, ear plug, noise muff, helmet etc. will be provided to the workers.

Proper unit design and engineering controls in order to protect workers, including by control of process and fugitive emissions.

Adequate arrangement of drinking water will be done.

Education & training will be provided to the workforce about facilities, protective equipment, risk associated, potential health effects, etc.

Display board will be provided showing the hazards associated and recommended precautionary measures.

1.7.4 Social impact assessment, R&R Action Plan - There is no hutment in the lease area. No human being displaced from the area so no person will be affected contrary local people will get job opportunity.

1.8 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	Emanation of dust during working will be minimized by adoption of dust suppression system (like water spraying) at working faces. Transport of material will be done by covered trucks/ dumpers to minimize the dust generation. The transfer points will be provided with sufficient water sprinkling system. Dust mask will be	Project authorities, through Regular monitoring of the roads, plantation sites, random checking of

	provided as safety measures to the workers, engaged at dust generation points like loading/unloading points, material handling etc.	equipment.
Noise & Vibration	<ul style="list-style-type: none"> There will be no drilling and blasting as the mineral is loose bind. Additional soundproof enclosures of fixed and mobile plant/ machinery. Regular checking of machineries. 	Project authorities through Regular monitoring.
Water environment	<ul style="list-style-type: none"> No wastewater generation due to mining operations. Development of ground water 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"> Mining activities will be restricted to daytime 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 roads to control fugitive emissions. 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. 	Project authorities through regular monitoring.
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 will be provided to the workers. Vocational Training will be provided to workers. Safety of the employee during mining will be taken 	<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>

	care as per Mine Regulations.	
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 1.6: Cost Estimates of EMP (Investment and Recurring Cost in Lakhs)

S. No.		Capital Cost (In Lakhs)		Annual Recurring Cost (In Lakhs)	
		Existing	Proposed	Existing	Proposed
1	Pollution Control Measures including: Conservation of Natural Resources through Garland Drain, Water sprinkler, Septic tank, Rainwater Harvesting Structure etc.)	0.50	2.0	0.0	0.50
2	Pollution Monitoring (Air, Water, Soil and Noise Monitoring on quarterly and half yearly basis)	1.0	2.0	0.0	0.50
3	Occupational Health & Safety	0.25	1.0	0.0	0.50
4	Green Belt Development	0.25	1.0	0.0	0.50
5	Awareness, training programme, celebration of safety & environment week, Hydrogeological study, Fencing and RH study.	0.0	1.0	0.0	0.25
Total		2.0	7.0	0.0	2.25
6. Activities under CER* will be part of EMP, in light of MoEF&CC's OM dated 30.09.2020 and conducted public hearing, yet to be scheduled.					

Table- 1.7 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 etc.	Once in five years.	-

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