

ROUGHSTONE AND GRAVEL QUARRY OF M/s. UDHAYAM MINES AND MINERALS PVT. LTD. OVER AN AREA OF 4.04.5 Ha IN PERIYAVENMANI VILLAGE, MADHURANTHAKAM TALUK, CHENGALPATTU DISTRICT, TAMILNADU

1.2 EXISTING ENVIRONMENTAL SCENARIO:

The studies and data collection have been carried out systematically and meticulously as per relevant IS codes, CPCB and MoEF&CC guidelines and as per approved ToR during **Summer Season (March to May 2024)**. For the purpose of this study, the area has been divided into two zones, namely, core and buffer zones. The lease area is considered to be the core zone while the buffer zone encompasses a 10km radius from the periphery of the core zone. Based on 2011 census data, in the 10km radius there are 64 Rural villages from Two Taluks namely Maduranthakam& cheyyurTaluk, in (Kancheepuram)Chengalpattu District

Table 2: Social, Economic And Demographic Profile of the Study Area

Details	Population	Percentage
A. Gender-wise distribution		
Male Population	43679	50.02
Female Population	43652	49.98
Total	87331	100
B. Caste-wise population distribution		
Scheduled Caste	47611	54.52
Scheduled Tribes	946	1.08
Other	38774	44.40
Total	87331	100
C. Literate and Illiterate population		
Literate Males	11725	13.43
Literate Females	17450	19.98
Total Literate Population	29175	33.41
Others Males	31954	36.59
Others Females	26202	30.00
Others Population	58156	66.59
Total	87331	100
D. Occupational structure		
Main workers	27098	31.00
Marginal workers	17877	20.50
Total Workers	44975	51.50
Total Non-workers	42356	48.50
Total	87331	100

Further developments in this area with respect to these various facilities has occurred over the years.

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1.3 EXISTING ENVIRONMENTAL QUALITY:

Table 3: Baseline Data

A. AMBIENT AIR QUALITY		Monitoring Location – 5 locations	
Parameter	Result (µg/m³)		*LIMIT (µg/m³)
Location	Core Zone	Buffer Zone	
Particulate Matter (Size <10 µm)	57.2 – 60.4	46.5 – 71.6	100
Particulate Matter (Size <2.5 µm)	26.9 – 28.4	20.5 – 34.4	60
Sulphur Dioxide (as SO ₂)	7.2 – 9.5	5.2 – 9.5	80
Nitrogen Dioxide (as NO ₂)	8.4 – 13	6.4 – 11.9	80
Conclusion: The existing Ambient Air Quality levels for PM10, PM2.5, SO ₂ and NO ₂ , are within the NAAQ standards prescribed CPCB limits of 100 µg/m ³ , 60 µg/m ³ , 80 µg/m ³ & 80 µg/m ³ . The CO values in all the locations were found to be below detectable limit.			
B. WATER QUALITY		Monitoring Location – 4 locations	
Parameter	Result	*LIMIT (µg/m³)	
pH at 25 °C	7.26 – 7.59	6.5-8.5	
Total Dissolved Solids, mg/L	78 – 912	2000	
Chloride as Cl ⁻ , mg/L	120 – 310	1000	
Total Hardness (as CaCO ₃), mg/L	230 – 392	600	
Total Alkalinity (as CaCO ₃), mg/L	196– 390	600	
Sulphates as SO ₄ ²⁻ , mg/L	104 – 270	400	
Iron as Fe, mg/L	0.03 – 0.06	0.3	
Nitrate as NO ₃ , mg/L	1.64 – 3.21	45	
Fluoride as F, mg/L	0.24 – 0.41	1.5	
Conclusion: The water quality of ground water is found to be within the prescribed Permissible limits of IS: 10500 Norms in the absence of an alternative source as per Drinking Water Specifications.			
C. NOISE LEVELS		Monitoring Location – 5 locations	
Parameter	RESULT dB(A)		*LIMIT (µg/m³)
	Day Equivalent	Night Equivalent	
Core Zone	45.8	39.2	90
Buffer Zone	43.6 – 50.2	39.6 – 40.4	Day Equivalent - 55dB(A), Night Equivalent - 45dB(A)
*Permissible noise for industrial workers as laid down by CPCB (at 8 hrs Exposure Time). While comparing with the MoEF&CC Norms, the monitored ambient noise levels are generally within the limit values.			
D. SOIL QUALITY		Monitoring Location – 4 locations	
Parameter	Core Zone	Buffer Zone	
pH	6.32 – 6.57	7.26 – 7.51	
Electrical Conductivity (µmho/cm)	83.60 – 90.43	49.87 – 110.60	
Organic matter (%)	0.62 – 0.77	0.21 – 1.32	
Total Nitrogen (mg/kg)	220 – 234	192 – 290	
Phosphorus (mg/kg)	0.56 – 0.62	0.49 – 0.99	
Sodium (mg/kg)	840 – 860	825 – 1045	
Potassium (mg/kg)	390 – 410	339 – 2160	
Soil is of clay loam type.			

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E. LAND ENVIRONMENT:

Land use pattern study carried out through remote sensing satellite data around the 10km buffer zone shows that 23.04 % of the buffer area is classified under the Agriculture/ Plantation followed by 32.07 % of fallow land, 35.94 % constitutes land with out scrub and the balance 8.95 % falls under other land use categories.

F. BIOLOGICAL ENVIRONMENT:

Flora: The lease area falls within dyke like rocky formation following a general strike of NW- SE for a length of 3 to 3.5 km and a width of 500m to 800m. The entire area is covered with scattered trees , rocky exposures, grasses and shrubs. Because of the rocky exposures with very little soil cover, the area is not suitable for agriculture / commercial crops and as such off late used for quarrying purpose. Buffer Zone comprise of agricultural land, rocky waste land, barren land and mined out pits.

Fauna: There is no Wild Life Sanctuary or National Park within the study area of 10 km. Domesticated animals are commonly found. From the study it observed that the area in general consists of species of least concern only.

G. HYDROLOGICAL STUDY:

As per village map there is an odai on the south eastern side of the lease area of Udhayam Mines and Minerals Private Limited. Physically it is not present in the field no such course is visible. A safety distance of 10m has been left for this seasonal drainage channel. Due to scanty rainfall the eri and the drainage channel remains dry for most of the year. Earthen bund will be formed within the lease area on the south eastern and eastern side. No major impact is envisaged on the nearby water bodies due to project operations. Due to rocky dyke like formation for a major stretch of land in and around the lease area, the ground water potential is very poor. Water level after good monsoon gives better yield whereas it lowers down substantially during summer season. Besides, the mining area consists of hard compact rock, no major water seepage within the mine is expected. The working nearby mines validates the same.

1.4 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

The identified impacts due to this mine during mining and associated activities have been studied in relation to various environmental components like Air, water, noise, vibration, land, transport etc.

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1.4.1 AIR ENVIRONMENT:

The principal sources of air pollution in general due to mining and allied activities will be Excavation, Drilling, Movement of HEMM such as Excavators, tippers etc., Loading and unloading operation and transportation. In case of this mine, the following measures will be adopted to control impact on the air quality due to mining operations in the lease area:

- Regular wetting of transport road using mobile water tanker.
- Wet drilling / Covering of drill holes with wet clothes
- Use of controlled blasting techniques with Nonel to keep the dust generation within the prescribed limits.
- Proper maintenance of roads.
- Avoiding overloading of tippers
- Transportation of material by tarpaulin covered trucks
- Proper maintenance of HEMM to minimize gaseous emission
- Setting up of tyre washing facility in the lease area exit.
- Vehicular emission tests with digital smoke meter.
- Provision of green netting around the lease periphery on all sides.
- Development of green belt/ plantation in various areas within the mine lease area etc.

By adoption of all these measures, no adverse impact on air quality is envisaged due to this proposed opencast mining operation.

The impact on air quality due to the proposed cumulative project operations is project estimated using AERMOD dispersion models show that the resultant added concentrations with baseline figures even at worst scenario, the values of ambient air quality with respect to PM₁₀ are in the range of 56.7 µg/m³ to 72.6 µg/m³ and with respect to PM_{2.5} are in the range 25.5 µg/m³ to 35.4 µg/m³ which are within the statutory limits in each case.

For preservation of environment in this mine strict enforcement of management schemes will be undertaken for taking corrective actions, as needed. By adopting the effective implementation of all the mitigative measures, no adverse impact on Air quality due to the mining operation in this lease area is expected.

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1.4.2 WATER ENVIRONMENT:

The total water requirement for this project will be 8.0 KLD. The water will be sourced initially from outside agencies. Later the rainwater collected in the mine pit sump will be used for this purpose.

The domestic effluent to be generated from the project will be collected in septic tank with soak pits arrangements. This being a mining project there will not be any process effluent. Towards surface runoff management, garland drain of 1050m length will be constructed around the quarry and will be connected to a settling pond with silt traps. The supernatant clear water from the settling pond will be flow to the downstream users.

As already mentioned, the lease area is part of a huge dyke like compact rock formation with less intergranular porosity and fractures leading to less permeability and transmissivity values and as such the ground water level in this area is deep from surface. As such hence no major water seepage within the mines is expected from the periphery.

Good rainwater harvesting measures for augmenting the ground water level in the region will be implemented.

1.4.3 NOISE ENVIRONMENT:

During mining operation there will be noise generation due to working of excavators, movement of vehicles, etc. However, it will be felt near the active working area only and at away from its source it will get reduced. There will also be attenuation due to vegetation, tin sheet/ green netting to be erected by the proponent all around the lease and as such there will not be any adverse noise propagation outside the lease boundary Due to natural attenuation effects, by proper green belt development, design / maintenance of machines, etc., the impact on noise levels will be negligible and are expected to be well within the prescribed limits.

1.4.4 VIBRATION:

In the proposed mine workings, blasting & vibration effects will be controlled by adopting following measures.

- Carrying out controlled blasting using Nonel delay detonator.
- Optimum design for burden and spacing.
- The peak particle velocity (PPV) of ground vibration will be kept very low through optimally controlled blasting techniques, after necessary field trials.

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- Reducing explosive charge per delay to minimum.
- Using rock breaker wherever possible
- Proper care and supervision during blasting by a competent and experienced person to be carried out.
- Besides, different blasting time for both the projects is suggested and the timing is to be mentioned in the display board in the mines entrance.

By adoption of above measures, it will be ensured that ground vibrational levels due to blasting will be maintained within the prescribed DGMS conditions of 10 mm/s for the domestic houses/structures.

1.4.5 IMPACT ON LAND ENVIRONMENT:

The lease area is a patta land in the name of Udhayam Mines and Minerals. Out of the lease area of 4.045 Ha, in the post mining stage, 3.100Ha of mined out area will be left as water body and 0.945 Ha will be greenbelt area.

Effective post closure monitoring will be done to ensure that there will be no adverse impact due to mining operations.

1.4.6 BIOLOGICAL ENVIRONMENT:

No major clearance of major vegetation is involved. Since the lease area forms part of a vast tract of dyke like rocky formation , no agricultural activities are possible and practiced in the lease and its nearby areas. Agricultural activities are carried out far away lands irrigated by tanks and wells during monsoon rainfall. By adoption of systematic mining adhering to all the environmental mitigation measures as explained earlier, no adverse impact on the far away agricultural or surrounding environs envisaged.

There are no migratory corridors, migratory avian-fauna, rare endemic and endangered species. Therefore, there shall be no impacts due to mining activity on them. Even though there are no adverse impact on bio diversity and flora/fauna status due to project operations, positive impacts will arise due to well-planned reclamation measures for restoration of land status in the area ultimately to productive land category with well-planned green belt development activities. About 2800 trees will be planted in and around the lease area in a phased manner.

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1.4.7 SOCIO ECONOMIC ENVIRONMENT:

The entire lease area is private patta land. There are no habitations or hutments in the core zone area and no rehabilitation or resettlement problems will arise here. The mining operations in the proposed mine will provide the following socio-economic benefits:

- Direct Employment for about 12 persons.
- Besides through allied opportunities in logistics, trading, repairing works etc. good employment potential will arise in this area, which will provide raising income levels and standards of living in the area through various service-related activities connected with the project operations.
- Benefit to State and central exchequer by way of royalty, taxes.
- Improvement in infrastructural facilities, providing education aids etc. in nearby schools
- Betterment of drinking water facilities.

From above details, it is clear that the project operations will have highly beneficial positive impact in the area. Towards the socio-economic development of the surrounding area, the proponent has earmarked an amount of Rs.5 Lakhs. The activities identified will be implemented in a phased manner in the nearby Government school. In consultation with the locals based on the need & priority it will be implemented.

1.4.8 IMPACT ON LOCAL LOGISTICAL SYSTEM DUE TO PROJECT:

The material mined out from this lease area will be directly transported to the crusher units for producing stone aggregates of different sizes or construction of roads, bridges, buildings and other buyers etc. During the project operations, there will be 3 trips/hr. The transport route will be properly maintained to absorb this traffic due to this project. The following mitigative measures are suggested for mitigation of adverse impacts on the logistical aspect of the project:

- ❖ Water sprinkling on material in the transport vehicles before transporting, so that no dust nuisance during transport will arise.
- ❖ Plantation in consultation with the concerned department.
- ❖ Proper maintenance of transport roads and transport vehicles.
- ❖ Avoiding overloading of material

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- ❖ Covering of loaded vehicles with tarpaulins sheet
- ❖ Keeping traffic regulators at vulnerable locations.
- ❖ Distribution of transport vehicles for avoiding choking of roads
- ❖ Limiting of speed
- ❖ Installation of barriers at vulnerable locations
- ❖ Provision of tyre washing facility at the mine outlet

1.4.9 WASTE MANAGEMENT:

There is no process effluent generation from this mine. Hence no liquid waste is generated. Single use plastics/ use and throwaway plastics will be banned in the site as directed by the Tamil Nadu Government vide GO(Ms)No.84 regarding ban on use of plastic products. The employees will be encouraged to use compostable material or reusable material.

1.5 ENVIRONMENTAL MONITORING PROGRAME:

Regular, systematic and sustained programme schedules for implementation and monitoring of various control measures are devised with clear cut guidelines of various concerned plans for keeping a continuous surveillance on the various environmental quality parameters in the area. The Mines Manager in the mine project site will be directly responsible for various environmental activities in the mine and will undertake effective monitoring and implementation of various environmental control measures promptly and effectively and to oversee various environmental management schemes for air quality control, water quality status, noise level control, plantation programme, social development schemes, etc in the mine. Towards implementation of environmental control measures, Rs. 27.30 Lakhs is allocated under capital cost and Rs.17.85 Lakhs per annum will be spent under recurring cost.

1.6 ADDITIONAL STUDIES:

Although the individual lease area of this project is less than 5 Ha, the other existing and proposed quarries within the 500m radius along with this subject project works out to >5 Ha. The baseline monitoring carried out for this project reflects the cumulative impact of the existing quarries. The cumulative impact assessment of both the proposed quarries in the cluster given in the EIA/ EMP report also reflects no adverse impact on the surrounding environ on the post project basis.

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1.7 CONCLUSION:

By systematic and scientific mining adhering to all the statutory norms and enforcing and strictly implementing the above said mitigation measures mentioned in this report, no adverse impact is envisaged. The proposed mining project will benefit this region in the fields of potential employment opportunities, improved income for local people, improved social welfare facilities in respect of education, medical healthcare systems, etc. in its own way and also revenue to Government through royalty, taxes etc. Besides, it will meet the raw material requirement of the construction industry also.

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