

“EXECUTIVE SUMMARY”

IN

ENGLISH

FOR

Periyaganalur Limestone Mine

Periyaganalur Village, Ariyalur Taluk, Ariyalur District,

Tamil Nadu State

Area- 9.94.5 Hectare

Purpose - Environment Clearance

Proposed production - 6, 07,362 Tons of ROM

PROJECT COST - 100Lakhs

CATEGORY- 'B'

STUDY PERIOD - 1st MARCH TO 31st MAY, 2018

APPLICANT

M/s Tamil Nadu Minerals Limited

(An undertaking of Govt. of Tamil Nadu)

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Prepared BY



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***EXECUTIVE SUMMARY IN
ENGLISH***

1. INTRODUCTION

This report is prepared to evaluate the environmental impacts of the project namely Periyagalur Limestone Mine over an area of 9.94.5ha situated at Periyagalur village, Ariyalur Taluk , Ariyalur District, Tamil Nadu in line with the requirements of EIA notification SO 1533(E) dated 14.9.2006 and amendments made thereof.

1.1 PROJECT IDENTIFICATION

This is a mining project of Limestone situated in Periyagalur village, Ariyalur Taluk, Ariyalur District, Tamil Nadu over an area of 9.94.5 ha (Non forest government land).

The Government of Tamil Nadu has granted limestone mining lease over an extent of 9.94.5 ha in Periyagalur Village, Ariyalur Taluk and District, Tamil Nadu dated: 05.12.1981 for the period of 20 years. The lease deed was executed on 30.06.1986 and the lease expired by 29.06.2006.

TAMIN has already applied for renewal of mining lease vide TAMIN office letter No. 7196/ML1/2005, dated 31.05.2005 for 10 years. The mining operation was continued deemed to have been extended under Rule 24 A of Mineral Concession Rules, 1960. Now the lease period of this mine is taken up to 31.03.2020 as per the Rule 8A (6) of latest Mines and Minerals Development and Regulation Act, 2015 as the mine is non-captive.

The Mining Plan for this Periyagalur limestone mine over an extent of 9.94.5ha was approved by the Controller of Mines (SZ), Indian Bureau of Mines, Bangalore vide TN/ALR/MP/LST-1900-SZ/2031, dated 03.12.2013.

Subsequently the Scheme of Mining to the years 2016-2017 to 2019-2020 was submitted 120 days before the expiry of Mining Scheme period for this area vide this office Lr. No.7176/ML1/2005, dated: 16.03.2016 and the same was approved by the Regional Controller of Mines, Indian Bureau of Mines, Chennai vide TN/ALR/MS/LST-1339-MDS, dated 21.03.2016

1.2 IDENTIFICATION OF PROJECT PROPONENT

Applicant	Nominated owner
TAMIL NADU MINERALS LIMITED (An Undertaking of Government of Tamil Nadu) 31, Kamarajar Salai, P.B.No.2961,Chepauk, Chennai- 600005, Tamil Nadu State Phone No.+91 44 28410382, 28511972 Fax Number +91 44 28524960 E-mail : tamin@tamingranites.com	E. GANESAN Deputy Manager (Mining Lease) Tamil Nadu Minerals Limited 31, Kamarajar Salai, P.B.No.2961, Chepauk, Chennai- 600005, Tamil Nadu

1.2.1. PROJECT DESCRIPTION

Table 1.1 - PROJECT PROFILE & SALIENT ASPECTS

S.No.	PARTICULARS	DETAILS																																				
1.	Name of the Project	Periyagalur Limestone Mine																																				
2.	Project Proponent	M/s Tamil Nadu Minerals Limited																																				
3.	Location of the project	Periyagalur Village, Ariyalur Taluk, , Ariyalur District, Tamil Nadu																																				
4.	Latitude & Longitude	11°7'3.76"N to 11°7'21.11"N 79°7'54.34"E to 79° 8'11.61"E																																				
5.	Mine site topography	Above 70 m (Max.) from MSL.																																				
6.	ML area	9.94.5 Non forest Government land.																																				
7.	Nearest Railway Station	The nearest rail head is Ariyalur which is at a distance of 6.0 Km NW direction from mine site.																																				
8.	Nearest Airport	Tiruchirapalli (TRZ) : 60.66 Km SW																																				
9.	Nearest major water bodies	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">S. No.</th> <th style="text-align: center;">Location</th> <th style="text-align: center;">Distance from Project site (In Km)</th> <th style="text-align: center;">Direction from Project site</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1.</td> <td>MARUDAIYAR RIVER</td> <td style="text-align: center;">5.41</td> <td style="text-align: center;">SW</td> </tr> <tr> <td style="text-align: center;">2.</td> <td>KALLAR RIVER</td> <td style="text-align: center;">2.27</td> <td style="text-align: center;">W</td> </tr> <tr> <td style="text-align: center;">3.</td> <td>VANCHIYAM ODAI</td> <td style="text-align: center;">7.10</td> <td style="text-align: center;">W</td> </tr> <tr> <td style="text-align: center;">4.</td> <td>METTAL ODAI</td> <td style="text-align: center;">8.12</td> <td style="text-align: center;">SW</td> </tr> <tr> <td style="text-align: center;">5.</td> <td>CHEMPAN ODAI</td> <td style="text-align: center;">7.14</td> <td style="text-align: center;">SW</td> </tr> <tr> <td style="text-align: center;">6.</td> <td>OTTAN ODAI</td> <td style="text-align: center;">8.73</td> <td style="text-align: center;">S</td> </tr> <tr> <td style="text-align: center;">7.</td> <td>UPPU ODAI</td> <td style="text-align: center;">4.57</td> <td style="text-align: center;">SE</td> </tr> <tr> <td style="text-align: center;">8.</td> <td>VILANGUDI ODAI</td> <td style="text-align: center;">5.16</td> <td style="text-align: center;">NEE</td> </tr> </tbody> </table>	S. No.	Location	Distance from Project site (In Km)	Direction from Project site	1.	MARUDAIYAR RIVER	5.41	SW	2.	KALLAR RIVER	2.27	W	3.	VANCHIYAM ODAI	7.10	W	4.	METTAL ODAI	8.12	SW	5.	CHEMPAN ODAI	7.14	SW	6.	OTTAN ODAI	8.73	S	7.	UPPU ODAI	4.57	SE	8.	VILANGUDI ODAI	5.16	NEE
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10.	Reserved / Protected Forests	Vannankurichchi R.F -7.8Km, NE direction Vilangudi R.F - 6.82 Km, ESE direction Nr. Ambapur R.F - 8.23 Km, ENE direction																																				

11.	Nearest Town	Ariyalur
12.	Nearest villages	Periyanalur : 1.65Km, ESE direction Kattupiringiyam : 0.52Km SE direction Hasthinapura : 1.00 Km WNW direction
13.	Other Industries (in Aerial distance)	Nil

FIGURE 1: KEY PLAN OF THE LEASE AREA

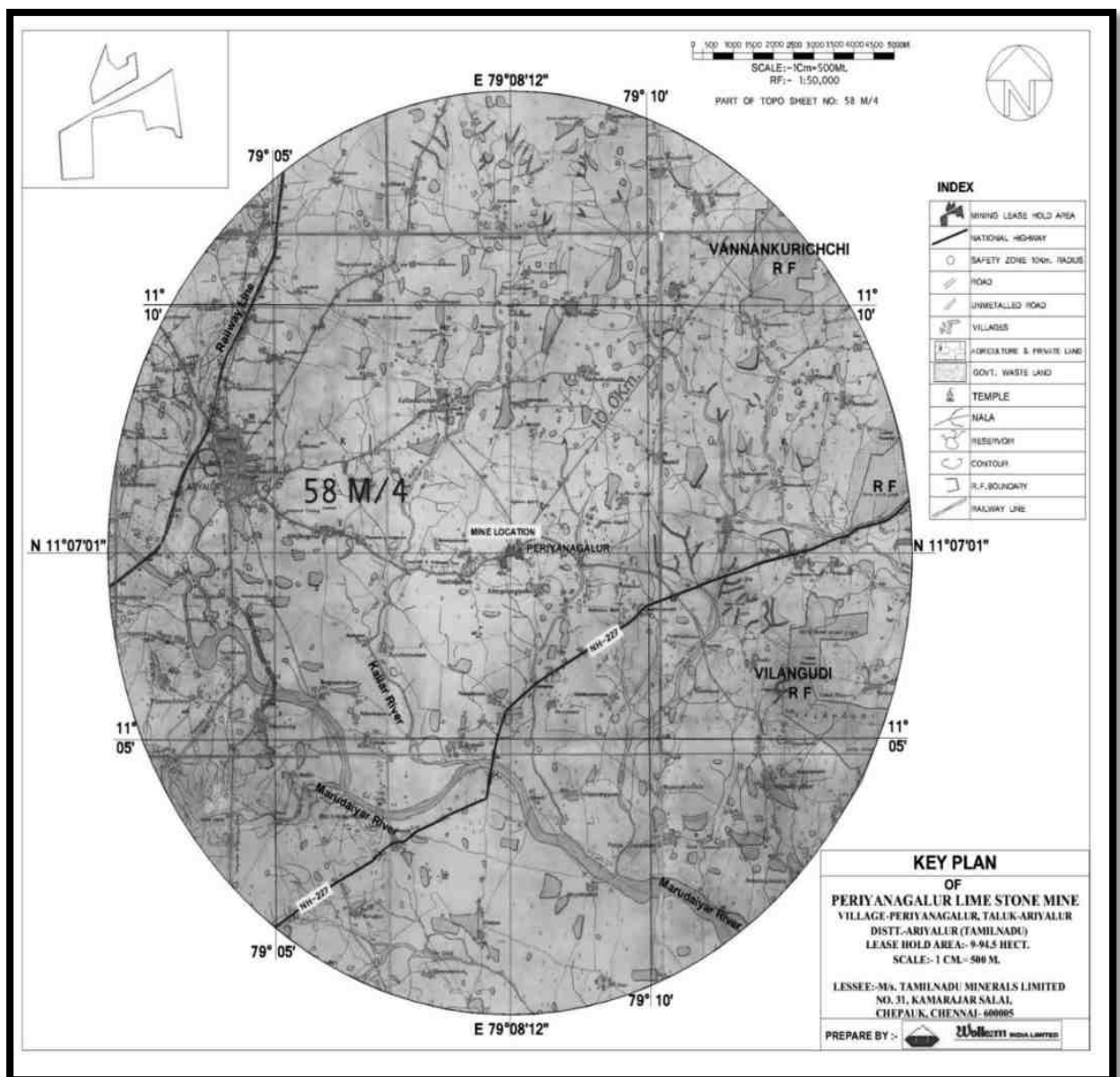
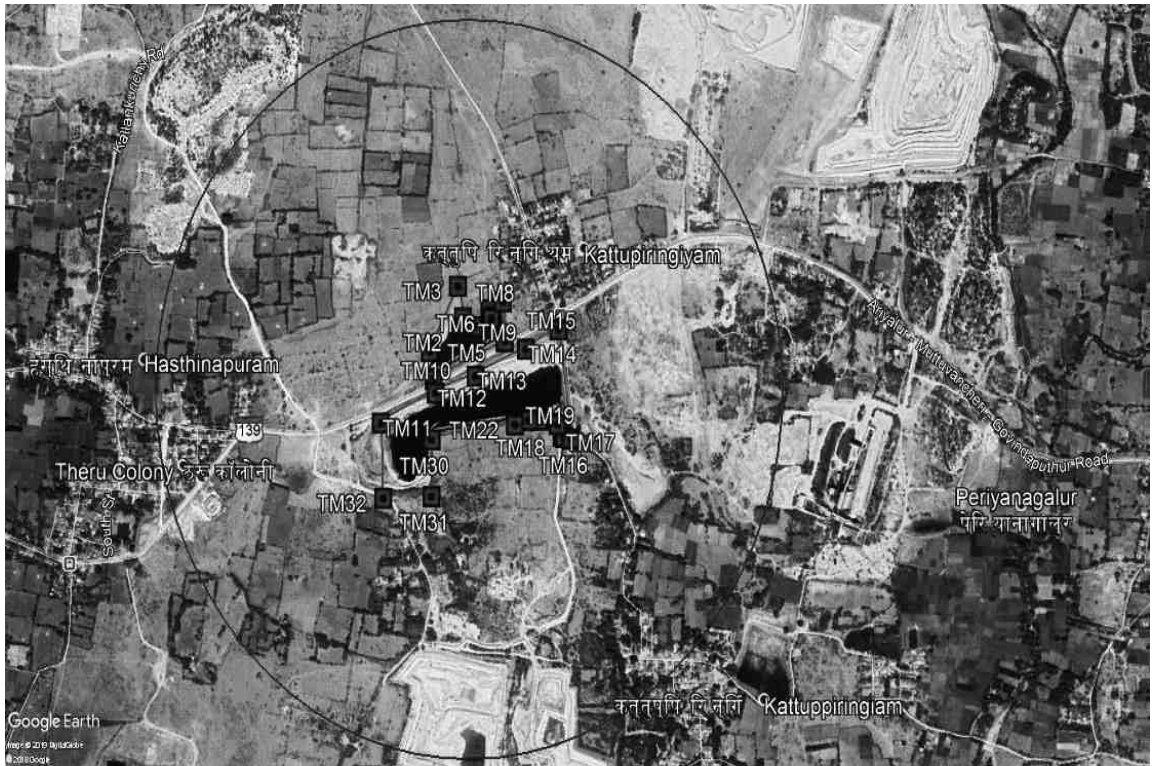
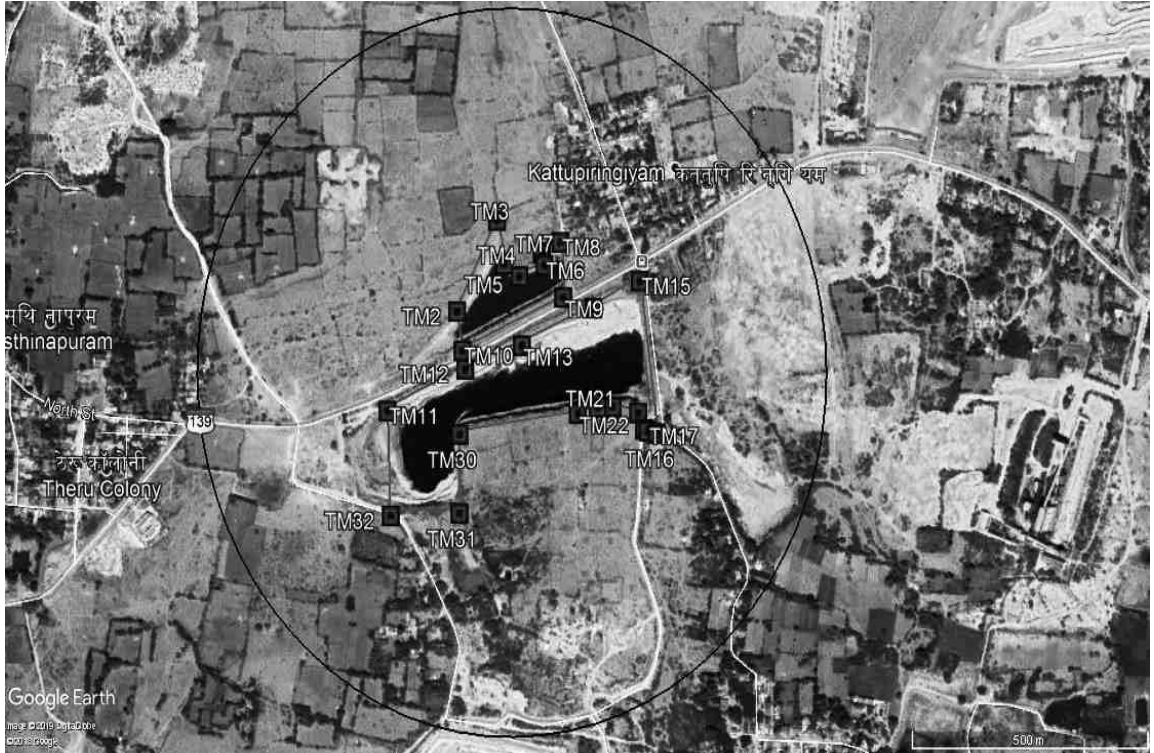


FIGURE 2: GOOGLE IMAGE SHOWING GENERAL LOCATION OF THE LEASE AREA (300M & 500M RADIUS)



1.2.2 DESCRIPTION OF APPLIED LEASE AND MINING PROCESS:

Proposed working: The mine working will be opencast mechanized, excavator shall be deployed for removal and loading of mineral and dumpers will be deployed for transportation of mineral.

Manpower: As per the Scheme of Mining, about 35 man powers will be required for mining operation.

Machinery to be deployed: Detail of the mining machinery to be deployed is given in the table below:

S.No	Purpose	Name of the machinery	Nos
1.	Drilling	Mega Rock Breaker	2
2.	Loading	Excavator	2
3.	Transport	Tippers and Dumpers	2

Water :

Total water requirement in the mine will be about 1.5 KLD for drinking, spraying and plantation. Total water required for the mine will be met from vendors.

TABLE 1.2 WATER REQUIREMENT		
No.	Particulars	Quantity in KLD
1	Drinking and Domestic use	0.5
2	Dust Suppression	0.6
3	Green Belt	0.4
Total		1.5

1.2.3 Need of the project: This sedimentary type of limestone mineral mining project falls in the area of Ariyalur District, Tamil Nadu where scanty agricultural activities are been carried out and the new industries are springing up in the district and more specifically the area applied for mining lease is devoid of any major industries and agricultural activities. The earning source in the targeted area is limited, most of the people in and around the area depend upon the seasonal agriculture and much of the people migrate to nearby towns where good number of industries and factories are growing up.

This project will provide 35 direct/indirect employment .

Mineral Industries of the state of Tamil Nadu provides employment opportunities for the people of the state as well as in the specific project area. The Mining is one among the major core sector industries which plays a vital process of country's economic development and foreign exchange.

1.3. DESCRIPTION OF THE ENVIRONMENT

The baseline environmental monitoring was carried out during pre-monsoon season of year March 2018 to May 2018. 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	<p>Local Geology-</p> <p>The topography of the land is more or less flat with little undulations carved south flowing seasonal nallahs. The northern adjoining lands to the area occupy high ground and almost barren as they are occupied by relatively hard shell limestone. The soil cover in the lands is about 0.5m thick on average.</p> <p>The drainage is represented by small seasonal rivulets, which join the irrigation tanks located nearby. The lands surrounding the mining area is brought under dry seasonal cultivation. Kattupirangium and Hasthinapuram hamlets are located at about 3km radius from the area.</p> <p>Land use:</p> <p>Land use patter of core zone</p>

Description	Present Area (Ha)	Area to be required at the present Scheme period(Ha)	Area at the end of life of quarry (Ha)
Area Under Quarrying	8.46.0	--	8.46.0
Storage of Top soil afforested area included	1.16.0 (Non-afforested 1.01.5Ha & Afforested 0.14.5Ha)	Afforestation proposed over the existing top soil 0.16.0Ha	1.16.0 (Non-afforested 0.85.5Ha and Afforested 0.30.5Ha).
Roads	0.01.0	--	0.01.0
Infrastructure	0.02.0	--	0.02.0
Un-utilized	0.29.5	0.29.5	0.29.5
Total	9.94.5	0.29.5	9.94.5

Soil quality: The major part of the district is covered by clay loam both black and red. Loamy soil, Black soil, alluvial soil, Sandy loam and Sandy clay are the soil types found in the district.

The texture is usually loamy, the colour varying from red at the surface to yellow at the lower horizon. The soils are of medium depth with good drainage, free from accumulation of salt and calcium carbonate, ranging from 6.5 to 8.0 and contain low amounts of organic matter, nitrogen and phosphorus but with generally adequate amounts of potash and lime.

Red loam soil is found to be prevalent in Sendurai, T. Palur, Andimadam, Jeyankondam blocks of Ariyalur District. Block soil is found in Thirumanur and Ariyalur blocks of the district.

Water environment	<p>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 March'18 to May '18. There is no perennial source of surface water body in the core zone, however Two rivers flows in study area. (Refer in drainage map of the study area).</p> <p>Analysis of different Samples of ground water shows that all parameter are well within prescribed limit.</p>
Air and Noise environment	Ambient air quality has been determined by measuring the concentration

	<p>of parameters like PM₁₀, PM_{2.5}, SO₂ and NO₂ in the air and results are within the NAAQS standards.</p> <p>The noise monitoring shows that Leq day and night time noise levels in applied lease area are within the CPCB standards.</p>
Biological environment	<p>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.</p> <p>No Threat & endangered species found in the core & buffer zone. No endemic plant species found in the study area.</p>
Socio economic environment	<p>The primary socio economic data was collected through field survey and structured interviews in sample villages in study area as well as the observations by the survey team. A judgmental and purposive sampling method was used for choosing respondents of various sections of the society i.e. panchayat representatives, adult males and females, teachers, medical practitioners, businessmen, agriculture labourers, youth etc. Judgmental and purposive sampling method includes the right cases from the total population that helps to fulfil the purpose of research needs.</p>

1.4 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environment Component	Anticipated Impacts	Mitigation measures
Land Environment	<p>Change in topography and drainage of applied lease area.</p> <p>Change in Land use of the applied lease area.</p>	<ul style="list-style-type: none"> Plantation will be done on waste dump & remaining land. About 0.30.5 Ha of the total lease area will be covered under plantation by the end of life of mine. The Mine Pit will be used for rain water storage.
Water Environment	<p>There is no proposal for abstraction of groundwater for the proposed Limestone Mine. Also there is no any source of ground water in the applied lease area.</p> <p>There is no abstraction of surface water. The opencast</p>	<ul style="list-style-type: none"> Garland drains will be constructed on all side of quarries. All the garland drains will be routed through settling pits to remove suspended solids from flowing into storm water. The water collected in the pit, after settling of the suspensions, will be used for plantation. Plantation shall further help to reduce

	mining operation usually causes surface water pollution. The sources of pollution generally are run-off from waste dump and mining area.	surface water pollution. <ul style="list-style-type: none"> • Mining will be done above water table.
Air Environment	The sources of air pollution are dust generated due to excavation, loading and unloading of material and movement of dumpers on haul roads.	<ul style="list-style-type: none"> • The sprinkling of water will be undertaken as and when required on roads as well as stockpile.. • Plantation around the applied lease. • Training to driver for unloading the material from safe height to prevent dust generation. • The dumper will be covered while moving the material and care will be taken so that loading will be done without spillage of material during the movement. • Traffic management to ensuring that there are no traffic jams on mine route by deputing manpower and by planning dumper movement. • Proper management of waste dump yard. • Effective mine closure plan or post mining land use. • Ambient Air Quality Monitoring will be conducted on regular basis to assess the quality of ambient air as per the proposed monitoring plan.
Noise and Vibration Environment	The nearest population is in Periyagalur village at about 1.65 Km from the mining site. Continuous noise levels beyond the prescribed standards can however have impact on fauna. These can also have an impact on workers.	<ul style="list-style-type: none"> • Plantation along mining lease boundary. The greenbelt minimizes propagation of noise. • Proper maintenance of vehicles will be done. • Mine operations will be limited to day time. • Power Horns will not be allowed in dumper. Drivers will be further instructed not to use music systems at high volumes. • The excavator use will be for limited hours with breaks at regular intervals. The excavator will be regularly serviced. • In order to reduce the effect of noise pollution, ear plugs / earmuffs will be

		<p>provided to workers</p> <ul style="list-style-type: none"> • Ambient and Source Noise level Monitoring will be conducted on regular basis to assess the quality of ambient air w.r.t noise as per the proposed monitoring plan to have a watchful eye on noise levels and to assess the effectiveness of mitigation measures.
Biological Environment	<p>The dust is the only major pollutant which will be generated from different activities of mining. The effect of particulate matter on vegetation is in the form of incrustation, plugging of stomata, and loss of chlorophyll and reduction of photosynthesis process.</p>	<ul style="list-style-type: none"> • Mining activities will be restricted to night time so that fauna will not disturb at night. • Material will be covered 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. • Hedge of sturdy woody shrubs along the applied lease will be created. • 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. • The noise causing activities as operation of excavator shall be stopped at regular intervals so that the continuity is broken • Educational and awareness programmes for mine workers will be arranged.
Socio Economic Environment	<p>Positive impacts:</p> <ul style="list-style-type: none"> • Direct Employment Potential in various categories as skilled/semi-skilled/unskilled work force for carrying out mining activities besides indirect employment in transport Sector. 	<ul style="list-style-type: none"> • Adequate measures will be adopted to control dust generation like water sprinkling on unpaved road, working sites and wheel & dumper wash facility at mine site. • Construction and maintenance of approach roads. • Material will be covered during

	<ul style="list-style-type: none"> • Increase in business opportunity with contract works. • Improvement in the economic growth in the region. • Improvement in the general living standards and knowledge sharing. • CSR activity. <p>Negative impacts:</p> <ul style="list-style-type: none"> • Dust generation from mining activity can have negative impact on the health of the workers and people in the nearby area. • Approach roads can be damaged by the movement of dumpers. • Nearby agricultural field can also be affected by the dust generation. 	<p>transportation.</p> <ul style="list-style-type: none"> • Paving of unpaved roads.
<p>Occupational Health & Safety</p>	<p>Exposure to dust can result in Respiratory problems.</p> <p>Physical hazards: Injuries during Project operation are typically related to slips and falls; contact with falling / moving objects; and lifting / over-exertion.</p> <p>Injuries may occur due to contact with, or capture in, moving machinery (e.g. dumpers).</p>	<p>The working in the applied lease area will be done with all safety measures under the supervision of qualified staff. The workers will be provided dust mask, safety boot, helmet and other safety equipment. A well-equipped first aid box will be maintained at site.</p> <p>For mitigating the aspect the following measures will be implemented:</p> <ul style="list-style-type: none"> • 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 maintained. • Medical facilities to the workers. • Any early symptom of diseases, if observed, such workers will be taken off in the dusty atmosphere and suitable employed elsewhere. • Personal Protective Equipment's will be provided to the workers. • Vocational Training will be provided to the workers.

		<ul style="list-style-type: none"> • Safety of the employee during mining will be taken care as per Mine Regulations.
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1.5 PROJECTS BENEFITS:-

This sedimentary type of limestone mineral mining project falls in the area of Ariyalur District, Tamil Nadu where scanty agricultural activities are been carried out and the new industries are springing up in the district and more specifically the area applied for mining lease is devoid of any major industries and agricultural activities. The earning source in the targeted area is limited, most of the people in and around the area depend upon the seasonal agriculture and much of the people migrate to nearby towns where good number of industries and factories are growing up.

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SOCIAL IMPACT ASSESSMENT, R&R ACTION PLAN

There will be the positive impact on the villagers of the nearby villages in the form of employment. There is no human settlement in the lease area. Thus there is no impact on the human settlement and thus no R & R plan is required.

Conceptual reclamation and rehabilitation of the worked out area

It is considered that no back filling of the pits after recovery of the deposit as the mine-pit(s) will serve as source of water for this area at the end of mining and the mine area is properly fenced in order to avoid tress pass. The stored water can be used for domestic and irrigation purposes. The water stored in pits will serve as a good habitat for birds and fishes and can be developed into a fishing pond or bird sanctuary. In the mine site invariably thick water columns present during summer in the month of April to June. The stored water will be a good water source for the nearby villagers. The mine area is free from housing and other infrastructures and hence rehabilitation does not arise.

The recovered topsoil was kept on the border(s) of mine-pit(s) as protective bund, which will be utilized for phased afforestation programme. Mining of limestone

deposit will result in the formation of water reservoir, which can be useful for growing vegetation and also cater the needs of Villagers for domestic and irrigation purposes.

1.6 ENVIRONMENT MANAGEMENT PLAN

The main objective of environmental management plan is implementation of all environment pollution controlling system effectively to maintain the ecological balance of the area and also to promote the sustainable development during the operational and post operational phase in the area.

1.6.1 ENVIRONMENT MONITORING PROGRAM

The monitoring schedule along with monitoring parameters, monitoring frequencies and duration is given in the below table.

Table 1.3 MONITORING SCHEDULE FOR ENVIRONMENTAL PARAMETERS

Particulars	Monitoring Frequencies	Duration of Station	Important Monitoring Parameters
Surface water/ Ground water Sampling	Twice in a year	-	EC, PH, TDS, TSS, Iron, Hardness, Alkalinity, Chlorides, Calcium, magnesium, Nitrates, Sulphate, manganese & Fluorides.
Ambient air quality monitoring	Twice in a year.	24/8 hr.	PM _{2.5} PM ₁₀ , SO ₂ and NO ₂ .
Noise Monitoring	Twice in a year.	8/1 hr.	Level in dB (A). Day/Night
Soil Sampling	Twice in a year	-	PH, Conductivity, organic matter permeability, water holding capacity, Alkalinity & texture.

The monitoring will be taken up by the supervisory officers of the mine. Mine manager will be in charge of the environment cell and will be responsible for the effective functioning of the monitoring programme.

1.6.2 FUNCTIONS OF THE MONITORING CELL

1. To carry out the environment monitoring for environmental parameters given in the above table by an outside agency or through monitoring cell that will be formed by the mines management. The monitoring

programme will be focused to ensure the environmental status of the core and buffer zone will be preserved in good status as per rules.

2. To observe the effectiveness of mitigation measures.
3. Regular visit of the working site to examine the slope stability, mine faces and waste dump.
4. Regular checking of garland drain for any blockage due to silting or accumulation of the loose materials.
5. To ensure the green belt development in a time bound manner and also regular monitoring of planted species for survival rate.
6. Regular water monitoring for the parameters prescribed in the consent conditions of SPCB.
7. Monitoring of ambient air quality at the desired monitoring location covering both upwind and downwind directions and also to make sure that control measures are effectively implemented.
8. Health check-up of the workers will be conducted regularly for Occupational health and safety and also concentration of respirable dust in the workplace will be regularly measured as laid down by DGMS.
9. The information regarding the health status of the workers will be maintained.
10. Conducting safety week programmes to create safety awareness amongst the workers and other staff. This will educate the workers to work safely in mine lease with different equipment along with all PPE's.
11. To make sure that CSR activities are taken up in the proposed villages.
12. Coordinating the environment related activities within the project as well as with outside agencies.
13. To comply with all the EC conditions effectively.

1.6.3 ENVIRONMENTAL MANAGEMENT CELL

The small Environmental Management Cell will also co-ordinate all the related activities such as collection of statistics of health of workers and population of the region, afforestation and green belt development.

The action plan for green belt development is given in the following table:

TABLE 1.4: STAGE WISE PLANTATION						
Year	Remaining lease area		Mine out benches		Total	
	Area (Hect.)	Trees	Area (Hect.)	Trees	Area (Ha.)	Trees
Existing	0.14.5	150	-	-	-	-
I st	0.200	200	-	-	-	-
II nd	0.200	200	-	-	-	-
III rd	0.200	200	-	-	-	-
IV th	0.200	200	-	-	-	-
V th	0.200	200	-	-	-	-
At the end of 5 th year	1.16	1150	-	-	-	-
Onward at End of life of mine	--	--	-	-	-	-
Total	1.16	1150	7.52	7500	8.68	8000

1.6.4 BUDGETARY PROVISION FOR ENVIRONMENTAL MANAGEMENT

The below table give overall investment on the environmental safeguards and recurring expenditure for successful monitoring and implementation of control measures.

(Investment and Recurring cost)

TABLE 1.5: COST OF ENVIRONMENTAL PROTECTION MEASURES		
Particulars	Capital cost (In Rs.)	Annual recurring cost (in Rs.)
	Proposed	Proposed
Pollution control (Water tanker, garland drain, fencing.)	5,00,000/-	1,00,000/-
Pollution monitoring	2,50,000/-	50,000/-
Plantation on barren area	3,00,000/-	50,000/-
Occupation health & Safety	1,00,000/-	25,000/-
Miscellaneous	1,00,000/-	25,000/-
Total	12,50,000/-	2,50,000/-

COST OF CSR ACTIVITIES

TABLE - 1.6 PROPOSED CSR ACTIVITY		
S.No.	Particular	Cost in Lakhs/-
1.	Construction & development activities in school or village, washroom for girls , road repairing, drinking water facility as per requirement	1.0/-
2.	Organize Medical camps, free distribution of medicines in nearby villages	1.0/-
Total		2.0/-

1.7 CONCLUSIONS

Thus, it can be concluded on a positive note that after the implementation of the mitigation measures and Environmental Management Plan, activities of mine during the mining phase would have negligible impact on environment.
