

PRE-FEASIBILITY REPORT

**FOR KALLAPALLI SAND QUARRY
AS PER SAND MINING GUIDELINES, 2020**



PROJECT PROPONENT

The Executive Engineer,
Public Work Department,
Water Resources Organization,
Mining and Monitoring Division,
Tiruchirappalli District.



EIA CONSULTANT

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PRE-FEASIBILITY REPORT

FOR KALLAPALLI SAND QUARRY

AS PER SAND MINING GUIDELINES, 2020

in S.No 1(P) in Cauvery River, Kallapalli Village, Krishnarayapuram Taluk, Karur District, Tamil Nadu.

1. EXECUTIVE SUMMARY

This project is for quarrying Sand, Minor minerals over an area of 4.90.0 Hectares in SF. No. 1 (P), a part of Cauvery river in Kallapalli Village, Krishnarayapuram Taluk, Karur District, Tamil Nadu. The quantity to be Quarried shall be 72,709 m³ as permitted by the Dept. of Geology and Mining, Karur for a lease period of Two Years vide precise area letter No. Rc No. **833/Mineral/2020 dated 07.12.2020**, granted under Rule 12 of Tamil Nadu Minor Mineral Concession Rules, 1959 and amended up to date. Mining Plan is prepared under the provisions of Rule 41 of TNMMCR, 1959 and approved by Assistant Director of Dept of Geology and Mining, Karur vide letter No. Rc No. 833/Mineral/2020 Dated. 28.12.2020. The Geological Resources and Mineable reserves are estimated as per the requirement of Sand Mining Guidelines, 2020 with grid levels taken 10m x 10m interval and plans and sections has been prepared with 0.25m contour interval. The Environment Clearance is required under Rule 42 of TNMMCR, 1959 under category B2 for a fresh quarry lease for Sand from Cauvery River.

2. INTRODUCTION OF THE PROJECT

As per the Environmental Impact Assessment (EIA) Notification dated 14th September, 2006 and its subsequent amendments and supreme court order of February 27, 2012 the proposed quarry project fall under category B2 which required Environmental Clearance from the State Environmental Impact Assessment Authority (SEIAA), Chennai region.

The lease land\river basin was maintained by Executive Engineer, PWD/WRO Dept, MMD and they are removing such Sand, containing fine and coarse materials for clearing the obstacles of river flow. This project is more beneficial to the public for water supply around the flow direction of the river.

The Executive Engineer, PWD/WRO, MMD has applied to the District Collector, Karur to obtain permission for removal of sand and seeking Environmental clearance from SEIAA, Chennai for grant of fresh Quarry Lease.

2.1 Identification of project and project proponent. In case of Mining project, a copy of Mining lease/letter of intent should be given.

The Executive Engineer, PWD/WRO, Mining and monitoring Division is a Govt. project.

Owner name and address (address for correspondence):

The Executive Engineer,
PWD/ WRO, MMD,
Tiruchirappalli District.

A copy of Mining lease letter issued by the District Collector (R.C.No. 833/Mineral/2020 dated 07.12.2020 is enclosed in Approved Mining plan's Annexure.

2.2 Brief description of nature of project:

The area is represented by Geological Survey of India Topo sheet No. 58J/05 and falls between Latitude of N10°57'20.47107" to N10°57'26.87324" and Longitude of E78°20'37.13101" to E78°20'45.26179"..

P.no	Latitude (N)	Longitude (E)	Utm E (m)	Utm N(m)	Elev (m)
1	N10°57'20.47612"	E78°20'37.18378"	209671.033	1212359.555	87.399
2	N10°57'26.87120"	E78°20'37.13101"	209671.78	1212556.29	86.758
3	N10°57'26.87324"	E 78°20'45.22102"	209917.25	1212554.62	86.347
4	N10°57'20.47107"	E78°20'45.26179"	209916.446	1212357.237	86.784

District & State	Taluk	Village	S.F.No	Area (Ha)
Karur, TamilNadu	Krishnarayapura m	Kallapalli	1 (P)	4.90.0Ha

LOCATION AND ACCESSIBILITY MAP

Index Map



Geo Coordinates of Pillars

Latitude: N10°57'20.47107" to N10°57'26.87120"

Long : E78°20'37.13101" to E78°20'45.26179"

Project Proponent

The Executive Engineer



Fig.1.1 Location Map of the proposed sand quarry

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The name of mineral intends to quarry is sand containing fine and coarse materials. No toxic elements or hazardous materials are reported from this river bed. The applicant has received necessary clearance from all concerned authorities for removal of such Sand from the Cauvery River. The proposed area for quarry lease is river poramboke land, not a forest land.

Type of Mining: semi-mechanized Open cast, loading by hydraulic excavator and manual. Transport by bullock cart, tractors and tippers. Excavated sand from river site shall be transported to the stocking yard within 500m distance.

Period of Mining: Two Years from the date of execution of quarry lease.

2.3 Need for the project and its importance to the country and or region:

- i) The Cauvery River should be desilted often during off season of rainy period so as to remove obstacles of flowing of water in the river, failing which the rain water will be flooded into down line stream and cause damage of paddy fields and other agricultural lands.
- ii) Water demand and supply can be met during summer season and avoid water scarcity in this area.
- iii) The sand is a non-sticky material which is useful for construction and other civil purposes. Therefore this project is beneficial to the society as well as to the applicant to get some income out of this work.
- iv) No damage of land, no reclamation or back filling is required. Pollution out of this project is absolutely negligible.

2.4. Demand-Supply Gap

Demand of sand required for civil and other construction purposes is very high in this district.

2.5. Export Possibility

It is a low cost product and therefore the Lessee would like to sale out the sand in domestic market through bullock cart on royalty basis as per the order of state Govt.

2.6 Domestic Export / Markets

Lessee will like to sale out in domestic market as per requirement. No export is proposed.

2.7 Employment generation (direct and indirect) due to the project.

For the purpose of Mines safety under the provisions of MMR, 1961 under the Mines Act, 1952 the workers are employed more than 10, it is preferred to have a qualified Mining

Mate to keep all the production workers directly under his control and supervision.

A mines clerk shall also be appointed to keep the registers and record of the mine and make necessary entries for the persons employed in the mines.

Supervisory & Skilled Persons			
S.No	Designation	Nos	
1	PWD Assistant Engineer	1	
2	Technical Assistant	1	
3	Poclain Operator	2	
4	Poclain Assistant	2	
Total		6	
Unskilled			
S.No	Designation	Nos	
5	Permit Slip issuer	3	
6	Traffic Regulator	Entrance	2
		Exist	2
		Quarrying Site	3
7	Bullock Cart persons	12	
8	Bucket Watcher	3	
9.	Office Helper	1	
10	Track Maintainer	6	
	Watchman(Two Shift)	4	
Total		36	
Grand Total		42	

3. PROJECT DESCRIPTION

3.1 Type of project interlinked and interdependent projects, if any.

This project is located in Kallapalli village, Krishnarayapuram taluk, Karur District. It is mandatory to obtain environmental clearance for all mining project of minor minerals irrespective of mining area as per the order of the Honorable Supreme Court of India in I.A.No. 12-/13/2011 in S.L.P.No. 19628-19629 of 2009 etc., dated 27.02.2012, the Ministry of Environmental and Forest Office Memorandum dated 18.05.2012 clearance has to be obtained from the State Level Environmental Impact Assessment Authority, Tamil Nadu.

As per above order all projects less than 5 hectares falls in 'B2' Category of Schedule 1 (a). The extent of this lease area is 4.90.0 hectares, and falls in 'B2' Category of Schedule 1 (a).

3.2 Location (Map showing general location, specific location, and project boundary & project site layout) with coordinates.

The area is represented by Geological Survey of India Topo sheet No. 58J/05 and falls between Latitude of N10°57'20.47107" to N10°57'26.87324" and Longitude of E78°20'37.13101" to E78°20'45.26179" ..

Table no. 3.1 Latitude and longitude

P.no	Latitude (N)	Longitude (E)	Utm E (m)	Utm N(m)	Elevation(m)
1	N10°57'20.47612"	E78°20'37.18378"	209671.033	1212359.555	87.399
2	N10°57'26.87120"	E78°20'37.13101"	209671.78	1212556.29	86.758
3	N10°57'26.87324"	E 78°20'45.22102"	209917.25	1212554.62	86.347
4	N10°57'20.47107"	E78°20'45.26179"	209916.446	1212357.237	86.784

The area is accessible from Karur to reach Lalapettai by 28km via Karur Trichy NH 67 Road then 1.2Km to reach Kallapalli Further 0.5Km to reach the site. A Village road is available nearby the site. The PWD make temporary road which connects the village road for transportation of Materials. The PWD make temporary road which connects the village road for transportation of Materials,

Table No.3.2. Details of infrastructures and communication

S.No.	Description	Place	Distance (km)	Direction
1	Railway	Lalapettai	0.65	SW
3	Post office	Lalapettai	0.96	SW
4	Airport	Tiruchirapalli	45	SE
5	Police station	Mokanur	0.86	SW
6	Fire service	Musiri	10.5	NE
7	Primary Health centre	Mettuthirrukkampuliyur	9.2	W
8	DSP Office	Kulithalai	8.3	SE
9	School	Lalapettai	0.91	SW
10	Town	Kulithalai	8	SE
11	Villages			
i)	Kallapalli		0.5	SE
ii)	Lalapettai		0.96	SW
iii)	Thirunarayanapuram		1.5	NW
iv)	Mahandramangalm		1.5	N

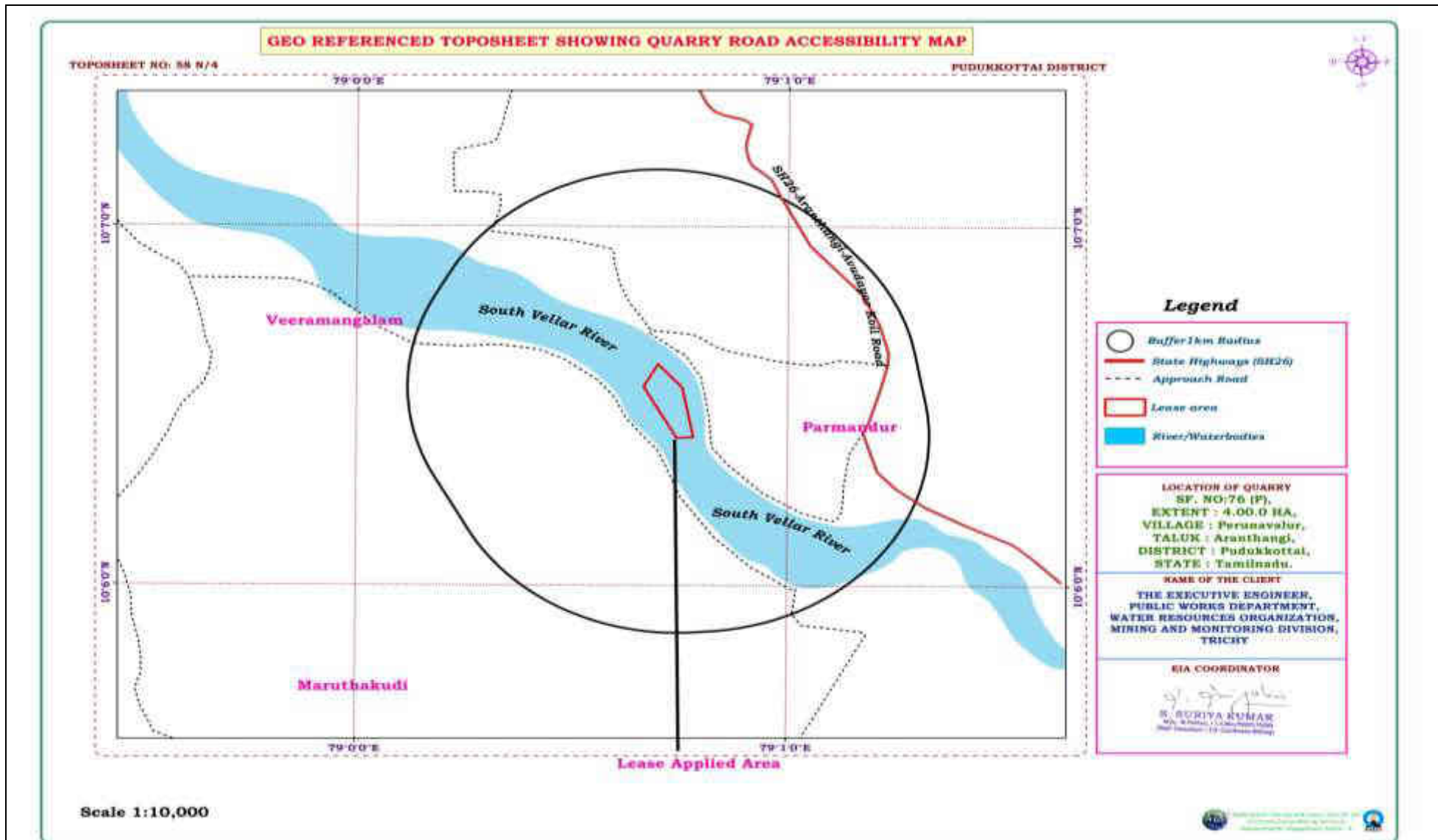


Fig.No.3.1.MINES ROAD ACCESSABILITY MAP

S. Suriya Kumar
 11/02/2024

3.3 Details of alternate sites considered and the basis of selecting the proposed site.

This is a mining project, which is site specific due to availability of sand. Hence the site cannot be shifted. The opencast mining is proposed in the area for excavation of minerals and overburden.

3.4 Size or Magnitude of operation

Targeted production of Sand removal will be 72,709m³ by open cast mining.

3.5 Project description with Process Details

Mining Process Details



Fig.3. 2 DGPS survey for Ground control Points (GCP) and Drone for Aerial surveying

- 1) Fixing boundaries of lease area covering an extent of 4.90.0Hectares using DGPS and Drone Technology as per the requirement of Sand Mining guidelines, 2020. Reduced levels (RL) were taken at 10mx 10m interval with cm accuracy. Contour lines were made at 0.25m interval.
- 2) Loading of sand by hydraulic excavator and manual into Bullock Carts, Tipper and tractor respectively.
- 3) Transport of sand from river site to the stocking yard and further to the Consumer Construction site based on the demand.
- 4) Mined out land shall be used for refilling of same type of sand by natural replenishing.

Proposed Method of Mining:

Being loose sand, it is proposed to load the materials by manual and hydraulic exactor and transport by Bullock Carts, Tipper and tractor by semi mechanized mine.

Removal of over burden

No overburden is proposed in the approved Mining plan.

Extent of Mining

a) Mining

Open cast, Mining would be carried out by opencast semi-mechanized method. Excavation of sand by using hydraulic excavator into the tipper and partly manual method using hand shovel and load into Bullock Cart, As the sand is loose granular material, it does not require any drilling.

b) Loading equipment

Loading of sand by manual as well as hydraulic excavator and manual.

c) Transportation

Transportation by means of Bullock Carts, Tipper and tractor combination. The bullock transport sand from river site directly to the consumer point whereas tippers may not able to transport to its rated capacity and therefore sand will be transported upto the stock yard, located within 500m from the river bank.

Table No.3.3 Production detail

Year	Over Burden/Shoal portion (m³)	ROM of sand (m³)	Saleable sand (m³)	Sub grade ore / mineral	Mineral Rejects	Ore to overburden ratio
1 st	11854	24500	36354	0	0	1:0
2 nd	11855	24500	36355	0	0	1:0
Total	23,709	49,000	72,709	0	0	1:0

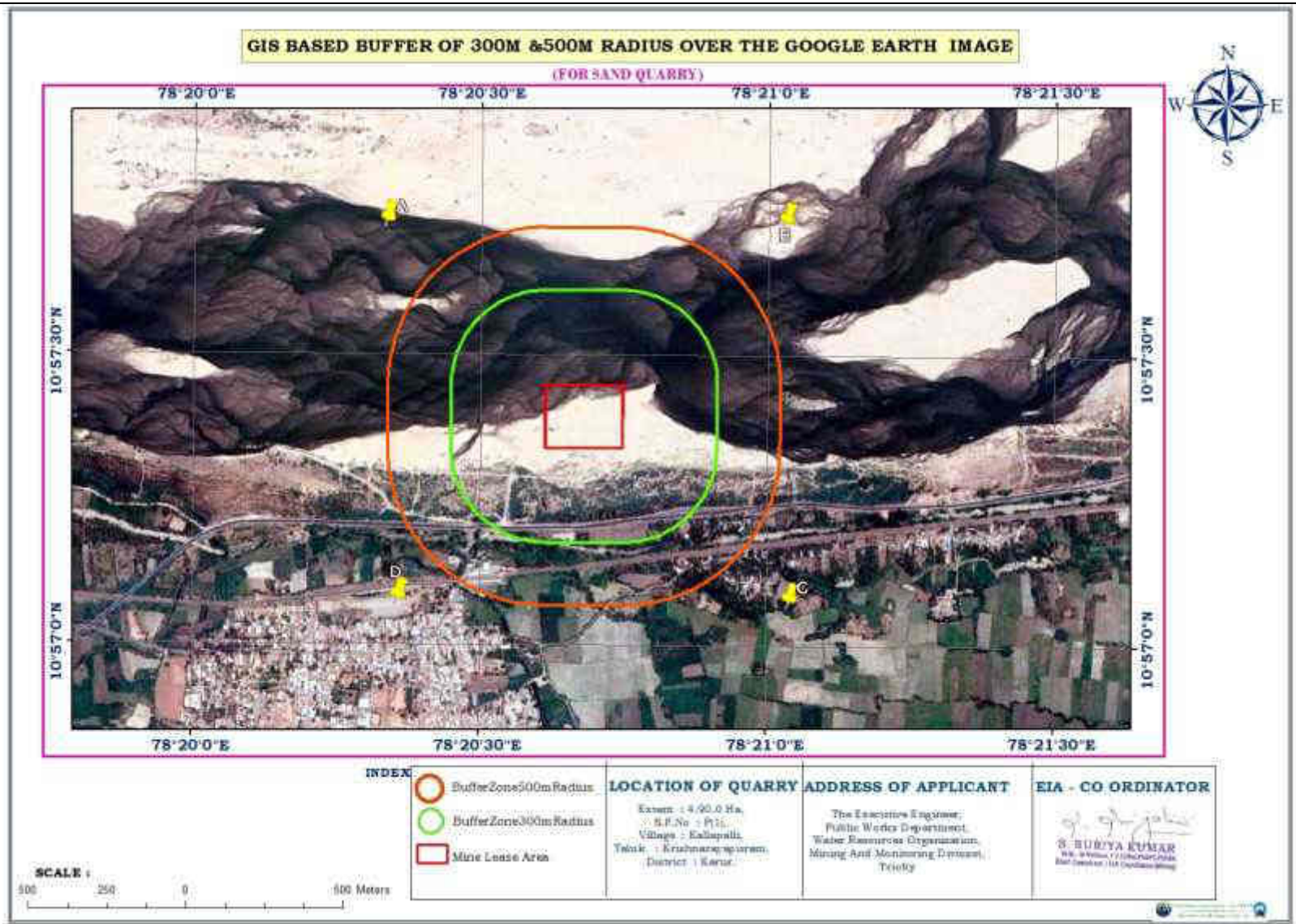


Fig.3.3: Google earth Image showing 300m/500m radius from the sand quarry lease boundary

S. Hurya Kumar
11/02/2024

3.6 Raw Material required along with estimated quantity, likely source, Marketing area of final product/s, Mode of transport of raw Material and finished products.

This is a mining project for mining of sand, therefore no need of raw material except water for drinking and utilities. The Product is natural river sand; it will be transported to the Stock point directly. No stocking is permitted any where inside the lease area the area of lease.

3.7. Resource optimization/recycling and reuse envisaged in the project.

Removal of sand is made for the purpose of clearing the obstacles of the river for free flowing of water. The sand will be replenished being a natural resource and therefore recycling is not possible for this project.

3.8. Availability of water its source, energy/power requirement and source.

Whole some drinking water shall be provided as per the Mines Rules, 1955. Quantity for Drinking and utilities is 2.0KLD. Dust suppression and Green belt of water is 3.0KLD. Minimum quantity of **5.0KLD** has to be maintained as per the Rule. Drinking water is obtained by Mineral water industries by water canes. Dust suppression and green belt is obtained from the open wells of proponent site. Water will be drawn from the adjacent open well in The Cauvery river itself. No separate arrangements shall be made to bring water from external sources or by pumping. No electricity or fuel is required for this project.

3.9. Water balance chart:

Water balance chart on per day basis is given as under:

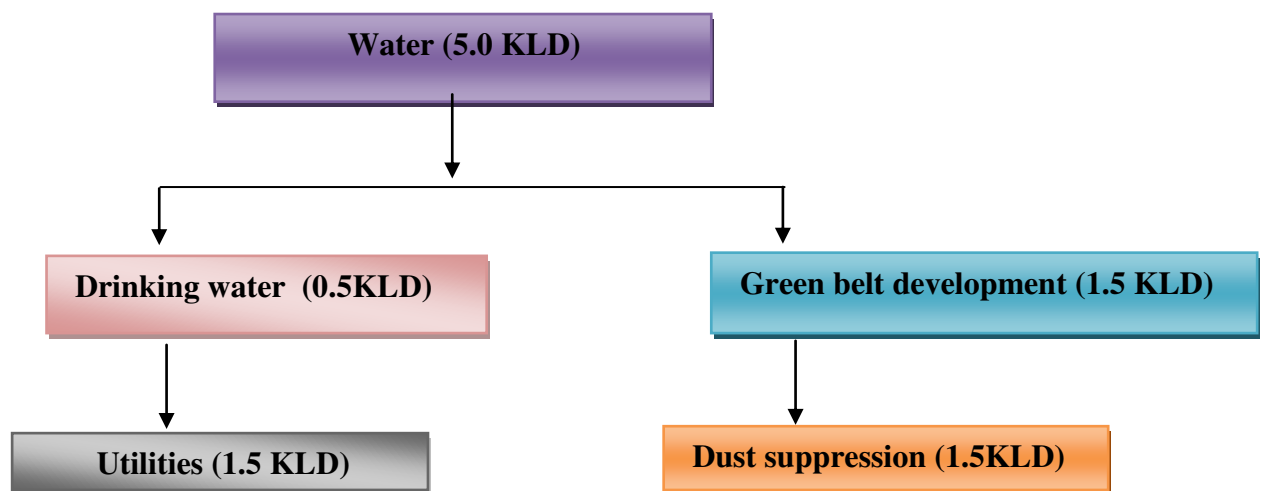


Fig. 3.4 Water Balance Chart

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11/02/2022

3.9 Quantity of waste to be generated (liquid and solid) and scheme for their Management/disposal.

There is no waste material to be removed from this river basin.

3.10 Schematic representations of the feasibility drawing which give information of EIA purpose.

As per the order of the Honorable Supreme Court of India in I.A.No. 12-/13/2011 in S.L.P.No. 19628-19629 of 2009 etc., dated:27.02.2012, the Ministry of Environmental and Forest Office Memorandum dated:18.05.2012 clearance has to be obtained for Minor Minerals from the State Level Environmental Impact Assessment Authority, Tamil Nadu. Form I and Pre-Feasibility report is required to get Environmental Clearance for the project from SEAC. EIA Report identifies all of the issues and technical requirements of a proposed operation, with particular attention to potential Environmental, Health and Safety, Social and Economic Impacts.

The purpose of EIA is to ensure the protection and conservation of the environment and natural resources including human health aspects against uncontrolled development. The long-term objective is to ensure a sustainable economic development that meets present needs without compromising future generation ability to meet their own needs. EIA is an important tool in the integrated environmental management approach.

The aim of Environmental Impact Assessment (EIA) is to enable the approving authority, the public, local and central government and the developer to properly consider the potential environmental consequences of a proposal, and to make recommendations to reduce the environmental consequences if necessary. It is important to provide sufficient information for the approving authority to make a decision on whether to approve a proposal and if so, under what conditions. The EIA provides the basis for sound ongoing environmental management.

4. SITE ANALYSIS

4.1 Location and Connectivity:

The area is accessible from Karur to reach Lalapettai by 28km via Karur Trichy NH 67 Road then 1.2Km to reach Kallapalli Further 0.5Km to reach the site. A Village road is available nearby the site. The PWD make temporary road which connects the village road for transportation of Materials.

4.2. Land form, land use and land ownership.

Table No.4.1 Land ownership details

District & State	Tehsil	village	Area in Hect.	Type of land
Karur District, Tamilnadu	Krishnarayapuram	Kallapalli	4.90.0	Cauvery river

4.3. Topography (along with Map):

The area applied for mining lease is a River Bed, with elevation vary from 86.53m (minimum) - 88.09m (Maximum) above MSL. It is represented in the Geological Survey of India 58J/05. The applied Lease area lies between Latitude N10°57'20.47107" to N10°57'26.87324" and Longitude of E78°20'37.13101" to E78°20'45.26179".

This is a river bed with huge amount of sand deposit. The area receives only scanty rainfall mostly during the northeast monsoon period of October to December. There is no wild life sanctuary, national monument etc nearer to the area around 10kms.

4.4 Existing land use pattern (agriculture, non-agriculture, forest, water bodies (including area under CRZ), shortest distances from the periphery of the project to periphery of the forest, national park, wild life sanctuary, eco sensitive areas, water bodies(distance from the HFL of the river), CRZ. In case of notified industrial area, a copy of the gazette notification should be given.

The lands applied for removal of sand is a part of Cauvery River which carries rain and flood water to the sea during rainy season. It should be deepened or the silted area should be removed periodically for free flow of water without any obstacles.

Table No.4.2 LAND USE PATTERN

S. No.	Description	Area of Land Use (In Hec.)	
		As at Present	At the end of Two years
1.	Mining	0.0	4.90.00
2.	Waste Dump	0.0	0.00.0
3.	Infrastructure	0.0	0.00.0
4.	Safety zone & Plantation	Nil	0.00.0
5.	Mine Roads	0.00	0.00
6.	Undisturbed area	4.90.00	0.00
Total		4.90.00	4.90.00

4.5. BASELINE ENVIRONMENT

4.5.1. Land environment

In the proposed Mining activity there will not be much impact on the land environment due to the following reasons.

- There is no removal of vegetation such as plants, bushes in the reach area
- No effluent generation as any further processing of mineral is proposed. Hence no ground water contamination due to the proposed mining activity.

However, the quarrying activity will result in disturbance of the land use pattern of the quarry lease area. The land degradation is unavoidable during mining activities like excavation, overburden dumping, etc. Land requirement for the project has been assessed considering functional needs.

GOOGLE EARTH IMAGE SHOWING COORDINATES OF PILLARS



Pillar No	Latitude(Local)	Longitude(Local)
1	<i>N10°57'20.47612"</i>	<i>E78°20'37.18378"</i>
2	<i>N10°57'26.87120"</i>	<i>E78°20'37.13101"</i>
3	<i>N10°57'26.87324"</i>	<i>E78°20'45.22102"</i>
4	<i>N10°57'20.47107"</i>	<i>E78°20'45.26179"</i>


 **Applied Lease Boundary**

Fig.4.1: Satellite image showing lease boundary of Sand quarry in Cauvery River

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4.5.2. Sources of Air Pollution

Table No.4.3 Sources of Air Pollution

S.No	Activities in Mines	Air Pollutants
1.	Drilling	Nil
2.	Blasting	Nil
3.	Loading & Unloading	SPM
4.	Haul Road	SPM
5.	Transportation	PM, SO ₂ , NO _x
6.	Waste / Top soil handling	Nil

4.5.3 Air Pollution Control Measures

Some of the air pollution control measures are mentioned below. The APC system requirement should be assessed based on the mining activity and location aspects.

Table No.4.4 Air Pollution Control Measures

Potential sources of air pollution	Magnitude of air pollution	Control Measures
Drilling	High Dust Generation Risk of occupational hazard	No drilling
Blasting	Air emission	No blasting
Loading of material on dumper	Air emission	Closed Air conditioned cabin for loading operator and provide mask and ear muffles in addition to helmet for persons working nearby.
Transportation	High dust potential	<ul style="list-style-type: none"> • Water spraying over haul road using sprinklers. • Development of Green belt with the native species of trees having leaves and dense growth to control spreading of dust to villages and minimize noise level from vehicles operation.
Storage	High dust emission	No storage applicable for this project

4.5.4. Mine Drainage

The natural flow of water will not be affected any way and drainage will improve by proper gradient.

4.5.5. Noise Levels

Noise level has to be studied prior to mining and after opening the quarry for production. Ambient noise level on threshold is 36.2dB.

4.5.6. Vibration Levels

The vibration from HEMM is negligible.

4.5.7. Measures for Ground Vibrations Due to Blasting: Not applicable

4.5.8. Solid waste Management:

Solid Waste Generated: No solid waste removal

Disposal of waste

Overburden waste Management: No overburden shall be removed or dumped elsewhere.

Top soil Management: No top soil removal

Other wastes: The removed bushes on the site clearings are conveyed and dumped along the bank of the river.

4.5.9 Power requirement & supply/source. No power requirement .

4.5.10 Water quality

- The quality of ground water is fairly good. There is no liquid waste discharge from quarrying activity, which is likely to pollute water.
- Drinking water will be utilized from the Mineral water Industries.

Table No.4.5 Water quality test report

S.no	Parameters	Unit	Results (Bore water)	As per IS 10500: 2012	
				Requirement (Acceptable limit)	Permissible limit in the absence of alternate source
1	pH value at 25°C	-	7.86	6.5 – 8.5	6.5 – 8.5
2	Turbidity	NTU	BDL	1	5
3	Electrical conductivity at 25°C	Microm hos/cm	1316	-	-

4	Total Suspended Solids	mg/l	2	-	-
5	Total Dissolved Solids	mg/l	656	500	2000
6	Total Hardness as CaCO ₃	mg/l	546	200	600
7	Chlorides as Cl	mg/l	381.58	250	1000
8	Sulphates as SO ₄	mg/l	49.974	200	400
9	Total Iron as Fe	mg/l	-	0.3	0.3
10	Silica (Reactive) as SiO ₂	mg/l	-	-	-

MICROBIOLOGICAL EXAMINATION

S.NO	Parameters (MPN / 100 MI)	Results Bore water	Requirement as per IS 10500: 2012 Second revision (Acceptable Limit)
1	Total Coliforms	180	Shall not be detectable in any 100 ml
2	E.Coli	Absent	Shall not be detectable in any 100 ml

4.5.11 Air Quality

Drilling and blasting operations are source of fugitive dust emission but its effect is more or less localized. The major part of the dust generated during such operations usually gets settle down and thus the effect of such operation will be localized phenomenon. The generation of dust is controlled and suppressed at source by sprinkling of water on haul roads, loading points at regular intervals.

Table No.4.6 Air Quality test report

S.No	Parameters (µg/m ³)	Measured Value	NAAQS
1	Particulate Matter (PM _{2.5})	29	60
2	Respirable Particulate Matter (PM ₁₀)	39	100
3	Sulphur Dioxide (SO ₂)	9	80
4	Nitrogen Dioxide (NO ₂)	12	80
5	Ozone (O ₃)	16	180
6	Lead (Pb)	BDL (DL = 0.1)	1
7	Carbon Monoxide (CO) 1 hour	BDL (DL = 1.15)	4
8	Ammonia (NH ₃)	19	400
9	Arsenic (As)	BDL (DL = 1.0)	6
10	Nickel (Ni)	BDL (DL = 0.1)	20







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11	Benzene (C ₆ H ₆)	BDL (DL = 0.1)	5
12	Benzo (a) Pyrene	BDL (DL = 0.1)	1
BDL = Below Detectable Limit, DL = Detection Limit NAAQS = National Ambient Air Quality Standards			

4.5.12 Flora and Fauna

a) Flora


Table No.4.7. A. List of Flora of the lease area

S. No.	Tamil /English Name	Botanical Name	Number of Trees	Photograph
1.	Vivasaaya mullu Maram	<i>Acasia bushes</i>	Innumerable	
2.	Pungai Maram (Avenue tree)	<i>Ponga Miagiabro</i>	Innumerable	
3.	Poovarasa maram	<i>Thespesia Populnea</i>	Innumerable	
4.	Veppamaram/ Margosa tree	<i>Azadirachta Indica</i>	Innumerable	
5	Puliyamaram/ Tamrind	<i>Tamaridus indicus</i>	13	
6.	Thennai maram	<i>Coconut Tree</i>	Innumerable	

7.	Thilaimaram/ Nilgiri tree	Eucalyptus globules	Innumerable	
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b) Climbers:

Table No.4.7.B List of Climbers of the lease area


S.No.	Tamil/English Name	Botanical Name	Number of Trees	Photograph
1.	Oonangodi	Fragor Monstrum	Innumerable	

c) HERBS:

Table No.4.7.C. List of Herbs of the lease area

S.No.	Tamil Name	Botanical Name	Number of Plants	Photograph
1.	Erukku Chedi	<i>Calotropis Gigantea</i>	Innumerable	
2.	Parangi	<i>Cucurbita digitata</i>	Innumerable	

c) Shrubs:

S.No.	Tamil/English Name	Botanical Name	Number of Trees	Photograph
1.	korai pul	<i>Cyperus rotundus</i>	Innumerable	

2. Fauna:

The fauna species may be found around the project site is given below,

a) Mammals:

Table No.4.8.A. List of Mammals of the lease area

S.No.	Tamil & English Name	Zoological Name
1.	Keeri(<i>Common Mongoose</i>)	<i>Herpestes edwardsii</i>
2.	Anil (<i>Three Striped Squirrel</i>)	<i>Funambulus palmarum</i>
3.	Thavalai (Frog)	Cane toad

b) Avian Fauna:

Table No.4.8.B. List of Avian Fauna of the lease area

S.No.	Tamil & English Name	Zoological Name
1.	<i>Kalugu (Black kite)</i>	<i>Milvis migrans</i>
2.	<i>Myna (Black drogue)</i>	<i>Dicrurus macrocercus</i>
3.	<i>Kakka (House crow)</i>	<i>Corvus splendens</i>
4.	<i>Chittukuruvi (Indian Robin)</i>	<i>Saxicoloides fulicatus</i>
5.	<i>Parunthu (Brahminy Kite)</i>	<i>Haliastur indus</i>
6.	<i>Chinna Neer Kagam(Little Cormorant)</i>	<i>Microcarboniger</i>
7.	<i>Karungkarichan (Black Drongo)</i>	<i>Dicrurus macrocercus</i>
8.	<i>VellaNarai (white stork)</i>	<i>Ciconia ciconia</i>

c) Butterfly/Insects:

Table No.4.8.C List of Butterfly/Insects of the lease area

S.No.	Tamil & English Name	Zoological Name
1.	Theil (<i>Scorpion</i>)	Scorpiones
2.	Vannthupoochi (<i>Millipedes</i>)	Diplopoda

4.6. OTHER PERMANENT STRUCTURES

4.6.1 Habitations / Village:

Table No.4.9. Habitation details

Direction	Name of Village	Distance from Mines in Km (Approx)	Population
Northwest	Thirunarayanapuram	1.5	578
South	Kallapalli	0.42	6043
South	Pillapalayam	1.8	4671
Southeast	Karupathur	0.95	5968

4.6.2 Power Lines (HT / LT): There is no HT or LT lines is found nearby the site

4.6.3 Water Bodies: The site is a part of river basin.

There is no other major river or water body, nallah and ponds are situated around 500m radius.

4.6.4 Archaeological / historical Monuments: There are no archaeological monuments around 500m radius.

4.6.5 Road (NH, SH others):

The area is accessible from Karur to reach Lalapettai by 28km via Karur Trichy NH 67 Road then 1.2Km to reach Kallapalli Further 0.5Km to reach the site. A Village road is available nearby the site. The PWD make temporary road which connects the village road for transportation of Materials.

4.6.6 Places of worship: Nil

4.6.7 Reserved forest / Forest / Social forest / wild life sanctuary etc: None in 10km radius

4.7 Climatic Conditions

a) Temperature

Climatic Conditions

The Karur lies on 127m above sea level. The prevailing climate in Karur is known as a local steppe climate. During the year, there is little rainfall in Karur. ... The average temperature in Karur is 28.7 °C | 83.7 °F. The annual rainfall is 595 mm | 23.4 inch..

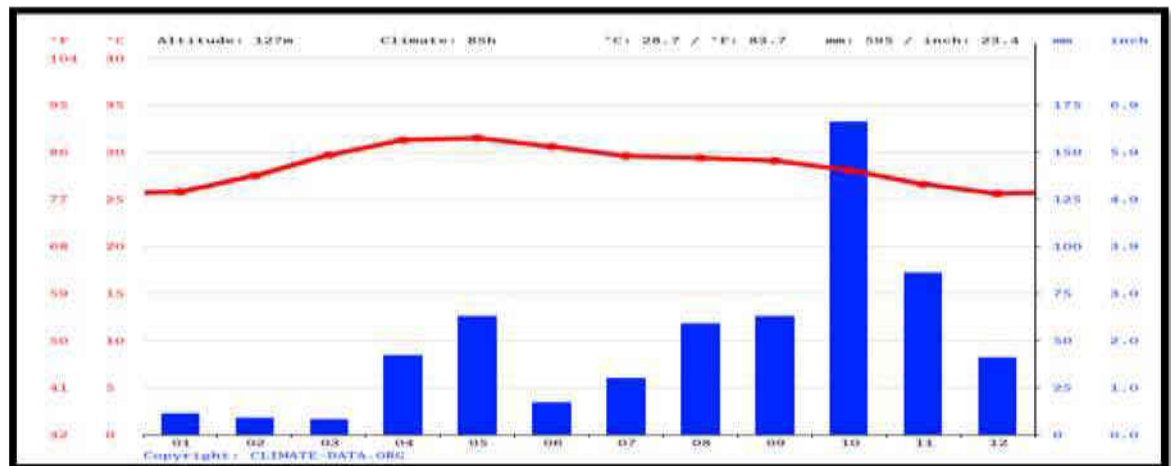


Fig No.4.2 Karur Climate Graph // Weather by Month

The driest month is February, with 12 mm | 0.5 inch of rainfall. Most of the precipitation here falls in October, averaging 172 mm | 6.8 inch.

Humidity

We base the humidity comfort level on the dew point, as it determines whether perspiration will evaporate from the skin, thereby cooling the body. Lower dew points feel drier and higher dew points feel more humid. Unlike temperature, which typically varies significantly between night and day, dew point tends to change more slowly, so while the temperature may drop at night, a muggy day is typically followed by a muggy night.

The chance that a given day will be muggy in Karur is rapidly decreasing during December, falling from 82% to 66% over the course of the month.

For reference, on October 4, the muggiest day of the year, there are muggy conditions 98% of the time, while on February 1, the least muggy day of the year, there are muggy conditions 50% of the time

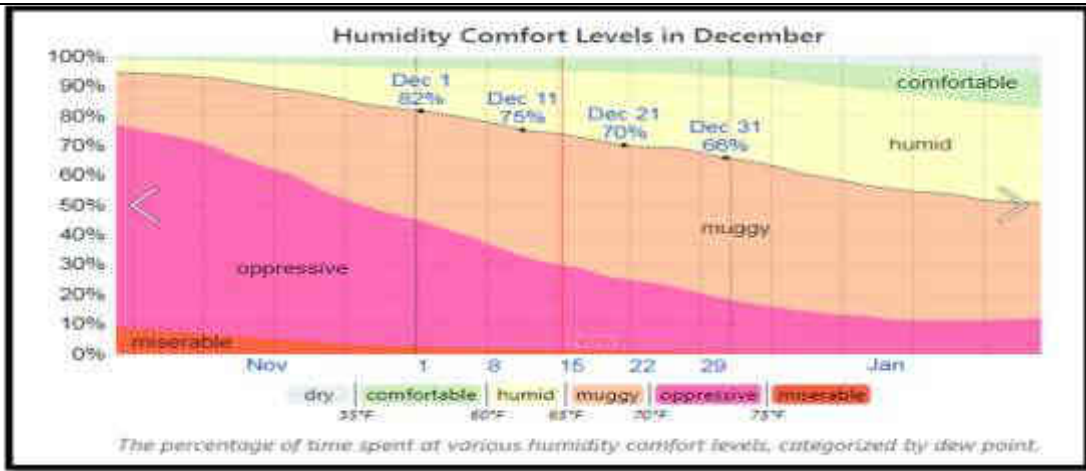


Fig No.4.3 Humidity comfort level

Wind

This section discusses the wide-area hourly average wind vector (speed and direction) at 10 meters above the ground. The wind experienced at any given location is highly dependent on local topography and other factors, and instantaneous wind speed and direction vary more widely than hourly averages. The average hourly wind speed in Karur is essentially constant during December, remaining within 0.2 miles per hour of 7.0 miles per hour throughout. For reference, on July 1, the windiest day of the year, the daily average wind speed is 13.1 miles per hour, while on October 22, the calmest day of the year, the daily average wind speed is 5.5 miles per hour. The hourly average wind direction in Karur throughout December is predominantly from the east, with a peak proportion of 70% on December 31., The highest daily average wind speed during December is 7.2 miles per hour on December 26.

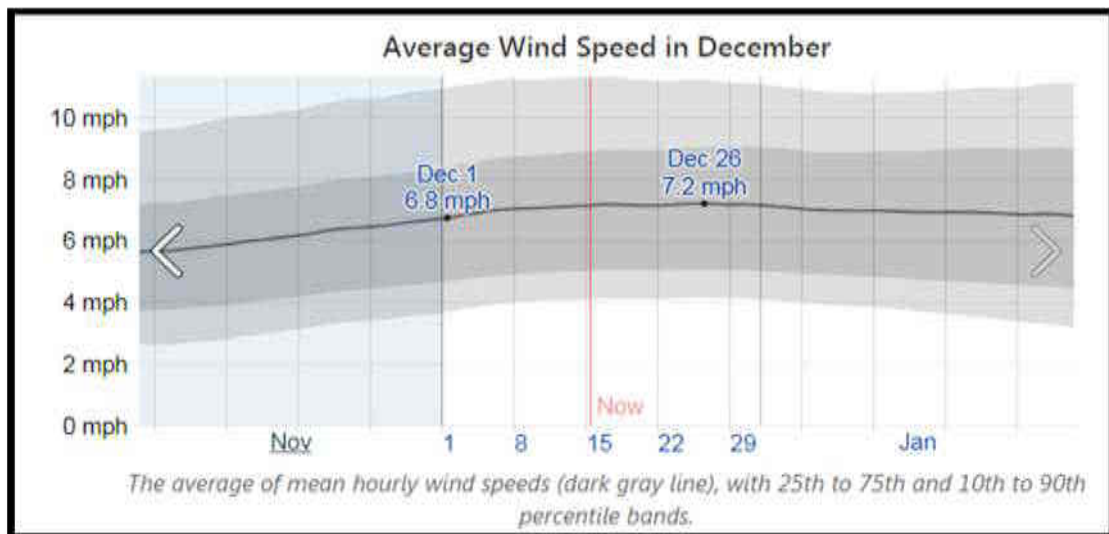


Fig No.4.4 Average wind speed

5. PLANNING BRIEF

5.1 Planning concept (type of industries, facilities, transportation etc) town and country planning/development authority classification.

It is opencast mining project. The mine is proposed to work for a period of Two Yearsonly. The proposed working is by open cast, semi mechanized mining with manual mining method and which will also continue in future. The mining will be carried out by removing and transporting the sand found in the project area.

Mining will be done by open cast method to a depth of 1.0m after scrapping a thin layer of sludge materials containing bushes. Being a shallow mining with single bench no much planning required for slope stability issues. However the proponent shall maintain 45° slope as per safety practices.

5.2 Population Projection

In Krishnarayapuram taluk, Kallapalli Village had a total household 1446 in 2001 increased to 1576 in according to census 2011. Village had a total person of 6043 in 2011 census previous census 6119 persons in 2001. There were about 3069 men (51 %) according to 2011 census and 3053 men (50%) in 2001 census marking decrease of 16 men over the previous census. During 2001 there were about 3066women (59%), which is decrease to 2974 (49%) in 2011 census.

Kallapalli Village had a literate accounted for 4181 persons (68%) in 2001 and increased to 4394 persons (72%) in 2011. There were about 77percent males in 2001 and 80 percent in 2011. There were about 1809 (59%) females increased to 1932 (64%) classes as literates in 2011.

Sex composition is the most important demographic characteristics that affect the incidence of birth and death. The average sex ratio in Krishnarayapuram taluk, Kallapalli Village was 1004 during 2001 census decrease to 969 the year of 2011. The lowest sex ratio may be either due to infant fertility of female is medium and they will get literate people to get it employment opportunities to earn income do other business.

Table No.4.10 Population Characteristics-

Sno	Characteristics	2001	%	2011	%
1	Total Household	1446		1576	
2	Total Population	6119		6043	
3	Male Population	3053	49.89	3069	50.79
4	Female Population	3066	50.11	2974	49.21
5	Total Literacy	4181	68.33	4394	72.71
6	Male Literacy	2372	77.69	2462	80.22
7	Female Literacy	1809	59.00	1932	64.96
8	Sex Ratio		1004		969

Source: As per census 2001, 2011 Karur district

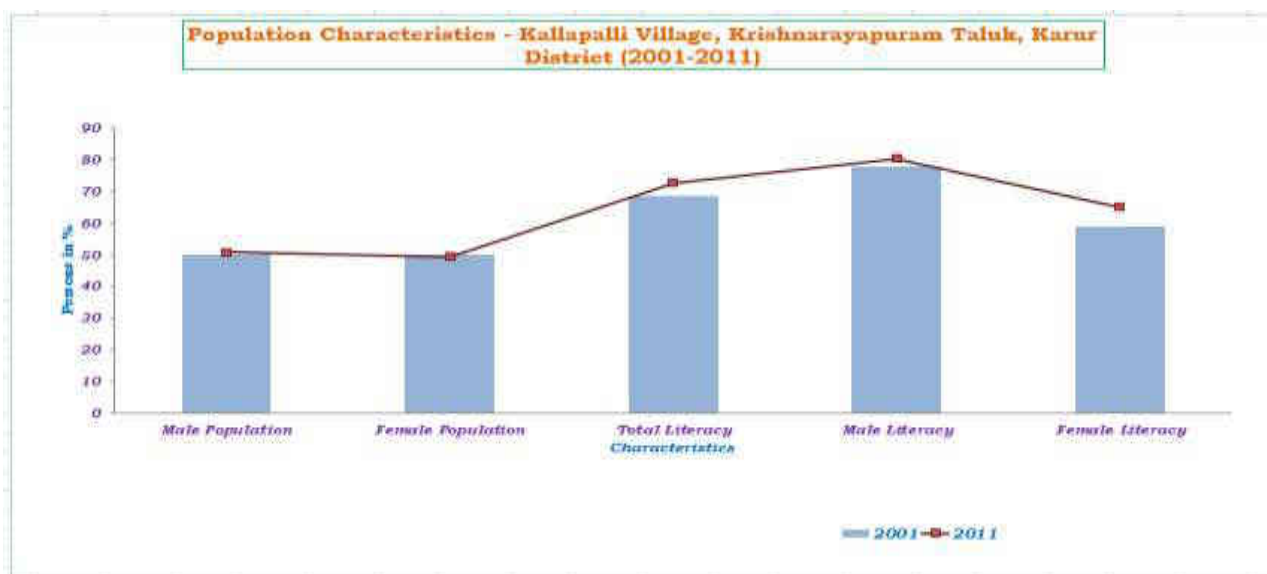


Fig No.4.6- Population Characteristics

b) Occupational Characteristics - Kallapalli Village

The term workers denote the population engaged in primary, secondary and tertiary activities classified in the census reports of Indian government. During the year 2001 Kallapalli Village had 2602 workers accounting for 42percent of the total population of the Village. During 2011 there were about 2712 (45%) according to the census. There were about 1821 men (60%) during 2001 which is decreased to 1767 persons (57%) according to census 2011. There were about 781 (25%) female according to 2001 which is an increased to about 945 (32%) female during 2011 marking increased to 164 women over the previous census 2001.

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In Kallapalli Village had a total main workers accounted of 2462 (40%) persons during 2001 census which is an increase to 2665 (44 %) persons during 2011. There were about 674 (22%) women in 2001 and 917 women according to the census 2011 marking an increases of 243 women over the previous census 2001.

The distribution of agricultural laborers in the study area for the two census periods has revealed that the study area has experienced a decline in the proportion of workers classed as agricultural laborers between 2001 and 2011. Krishnarayapuram taluk in Kallapalli Village had agricultural labourers 1637 (60 % of the total workers) agricultural labourers during census 2011. There were about 929 (52% of male workers) men in 2011 which is decrease to 876 (48% of male workers) according to census years 2001.

This group includes the employment of workers in manufacturing activities. Agro based industries, located in the study area engages a sizeable amount of workers. The distribution of secondary workers in the study area is calculated as percent to the total workers. The proportion of secondary workers to total workers has experienced decreasing trend in the Kallapalli Village area between 2001 and 2011. Secondary workers during 2001 and 2011 it could be stated that this may be due to the opening of a number of manufacturing units in the study area.

The tertiary workers include the labour force engaged in service sector such as education, medical, judicial, finance, administration, recreation, trade and commerce and transport. In Kallapalli Village had tertiary workers accounted for about 30 percent of the workers during 2001 census decreased to 23% according to census 2011.

The study area has experienced a change in the occupational structure in the form of a decline in the proportion of cultivators, agricultural laborers and an increase in the proportion of Non workers has 55% of total population as per census 2011.

Table No.4.11. Occupational Characteristics of Population

Sno	Characteristics	2001	%	2011	%
1	Total Population	6119		6043	
2	Male Population	3053	49.89	3069	50.79
3	Female Population	3066	50.11	2974	49.21
4	Total Workers	2602	42.52	2712	44.88
5	Male Workers	1821	59.65	1767	57.58
6	Female Workers	781	25.47	945	31.78

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7	Total Main workers	2462	40.24	2665	44.10
8	Male Main workers	1788	58.57	1748	56.96
9	Female Main Workers	674	21.98	917	30.83
10	Total Cultivators	288	11.07	334	12.32
10	Male Cultivators	247	13.56	293	16.58
11	Female Cultivators	41	5.25	41	4.34
12	Total Main Agricultural Labourers	1357	52.15	1637	60.36
13	Male Agri.Labourers	876	48.11	929	52.57
14	Female Agri.Labourers	481	61.59	708	74.92
15	Total Main HHI	37	1.42	74	2.73
16	Male HHI	29	1.59	48	2.72
17	Female HHI	8	1.02	26	2.75
18	Total Main Other Tertiary workers	780	29.98	620	22.86
19	Male OT	636	34.93	478	27.05
20	Female OT	144	18.44	142	15.03
21	Total Non workers	3517	57.48	3331	55.12
22	Male Non workers	1232	40.35	1302	42.42
23	Female Non workers	2285	74.53	2029	68.22

Source: As per census 2001, 2011, Karur district

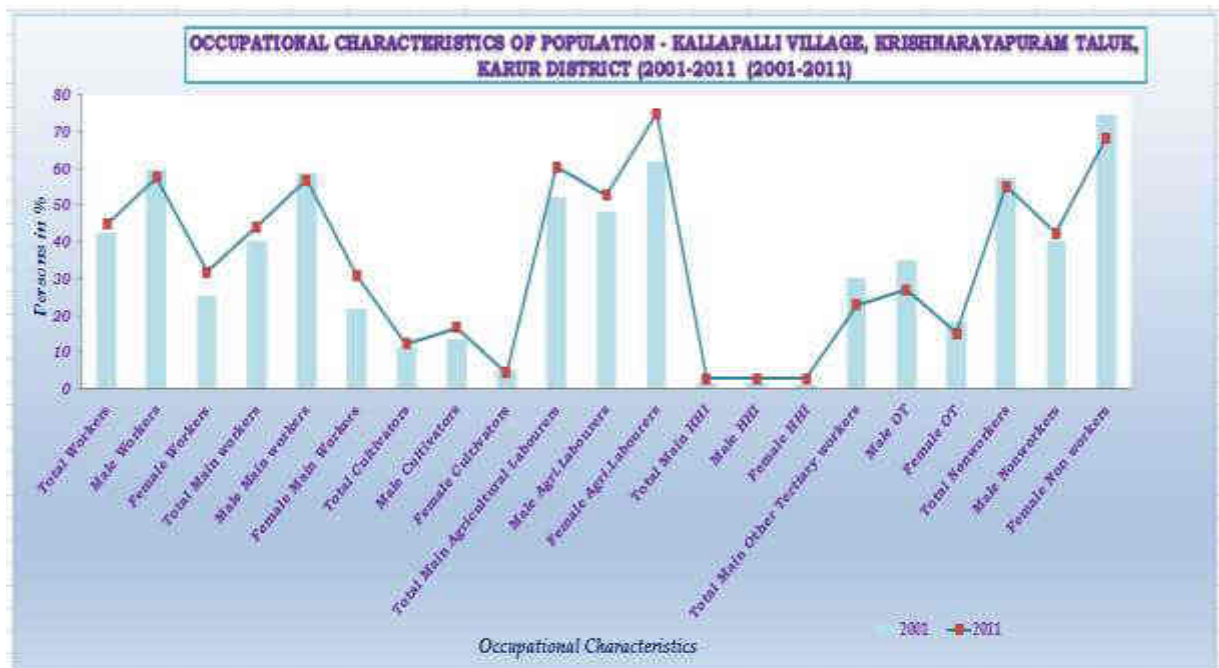


Fig no.4.7 - Occupational Characteristics of Kallapalli Village

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Assessment of infrastructure demand (physical & social):

Physical Infrastructure

The road facility is already available which shall be used and maintained. The labour requirement is taken from the nearest villages like Kallapalli . Other requisite infrastructure as transport of mine labours is available by way of jeep and two-wheeler. Medical facility is available for first aid at project site. Government Dispensary is available nearest to ML area in Krishnarayapuram in addition facilities in Karur. Rest room to meet the demand of shelter and Office room for project management will be made with portable container in the project area.

The will convey the excavated sand outside the quarry site to the end users.

The following measures may be taken for temporary soil erosion of bank:

Initiate stabilization measures as soon as practicable by dumping top soil over bank of the river for stability and afforestation purposes. General safety precaution shall be taken as per mining practices.

Access Roads

The area is accessible from Karur to reach Lalapettai by 28km via Karur Trichy NH 67 Road then 1.2Km to reach Kallapalli Further 0.5Km to reach the site. A Village road is available nearby the site. The PWD make temporary road which connects the village road for transportation of Materials.

Usage of public road for transport shall be done as per approved practices and any damage it will be intimated to the Panchayat or concerned authorities for immediate remedies.

Social Infrastructure

The area is accessible from Karur to reach Lalapettai by 28km via Karur Trichy NH 67 Road then 1.2Km to reach Kallapalli Further 0.5Km to reach the site. A Village road is available nearby the site. The PWD make temporary road which connects the village road for transportation of Materials.

(iv) Amenities/facilities:

As the workers are from nearby villages, the shelter room with toilet facilities & the first aid room will be built in a portable container since the project area itself a river bed and therefore all sanitary provisions shall be made outside of Cauvery river or in a portable container with disposal system. An office-cum-store shall be constructed. The water is

required for drinking purpose as well as Drinking water is available by the water tankers from nearby area. Power is available at proximity. First aid box with all necessary materials will be kept all time in the office building for use as and when required.

6. PROPOSED INFRASTRUCTURE

6.1 Industrial area (processing area):

No processing unit is required; the sand material can be directly consumed. An office-cum-store will be constructed at mine site. A shelter room with toilet facilities & the first aid facilities will be built in a portable container.

6.2 Residential area (non processing area):

Not applicable, local personnel will be employed and there is no residential area proposed.

6.3 Greenbelt:

There would not be any adverse impact in the existing environment arising from the mining activities. To protect the environment, the Applicant Company would do adequate a forestation program with 100 trees per annum along the bank of the river.

Suggested plant species for Greenbelt development around the project:

Table No.4.12. Suggested plant species

S.No	Botanical Name	Tamil Name	Characteristics
1.	Azadirachta indica	Vepa or Neem	Semi ever-green, 5-8m height and spreading type
2.	Thespesia populnea	Poovarasam	Quick growing evergreen tree of 18m
3.	Samanea saman	Thoongu moonji	15-20m tall spreading tree
4.	Pongamia pinnata	Pongam	15-20m evergreen tree
5.	Albizzia lebbak	Vagai	15-20m tall tree
6.	Prosopis juliflora	Neer Karuvai	A bushy thorny tree

6.4 Social infrastructure:

Positive community relationship proposed will be adopted by following methods:

- Care will be taken to ensure Mining Industrial Traffic not degrading public roads or jeopardize public safety
- Consulting with local people in a sincere manner
- Protecting drinking water and all water sources
- Minimize visual impacts to the landscape
- Minimize disruption of local footpaths and public areas
- Mine Supervisor and Workers will be aware and at all times meet the following requirements:
 - Usage of Personal Protective equipments
 - Necessary signage at mine access point
 - First Aid Kits
 - Gates, Fences, Signs (Or) Other barriers to ensure the mine site is secured against unauthorized and / or accidental entry
 - Ensure the mine site is not used for any other purpose other than mining

6.5 Connectivity:

The area is accessible from Karur to reach Lalapettai by 28km via Karur Trichy NH 67 Road then 1.2Km to reach Kallapalli Further 0.5Km to reach the site. A Village road is available nearby the site. The PWD make temporary road which connects the village road for transportation of Materials

6.6 Drinking water Management (source & supply of water):

The requirement of water will be of drinking water need for the labours, which will be around 5 KLD. Drinking water is obtained by Mineral water industries by water canes. Dust suppression and green belt is obtained from the open wells of proponent site.

6.7 Sewerage system:

There is no Sewerage System available in the Mining proposed area. No sewage will be generated from this project.

6.8 Industrial waste Management:

No wastes are anticipated

7. REHABILITATION AND RESETTLEMENT (R&R) PLAN

(i) **Policy to be adopted (central/state) in respect of the project affected persons including home owners, land owners, and landless labours.**

a) PAP

There is no hutment in the lease area. No human being will be displaced from the project area so no person will be affected contrary local people will get job opportunities and better facilities. There is no rehabilitation & resettlement of people is required.

Mine Closure

Once the process of economical extraction of a mine is complete there is need for scientific mine closure which will not only restore ecology and regenerate bio mass but also take into account the socio-economic aspects of such closure. When mining activities carries out, mining communities get established and closure of the mine means not only loss of jobs but also disruption of community life. At the mine closure, it will be orderly and systematic and so planned as to help the workers and the dependent community to rehabilitate them without undue hardship. But in this case the excavation is made to deepen the water tank for storage and avoid flooding of storm water into villages and paddy fields. Therefore Mine closure plan should have proper leveling of the area before closing is advisable for this project.

8. PROJECT SCHEDULE AND COST ESTIMATION

(i) Likely date of start of construction and likely date of Completion

The proposed mining operation will commence from the date of execution of quarry lease.

(ii) Estimated project cost along with analysis in terms of Economic viability of the project.

Being a short term project, the hired Machineries are used for excavation

PROJECT COST & EMP BUDGET

a) Project cost

i) Land Cost	:	Nil
ii) Machinery to be used	:	Rs. 20,00,000
iii) Construction of bank reiver	:	Rs 2,00,000
iv) Laboures Shed	:	Rs 1,00,000
v) Sanitary facility	:	Rs 1,00,000
vi) Other items	:	Rs 1,00,000
Total		Rs 25.0 lakhs

EMP Cost

i) Environmental Monitoring	=	Rs. 2,00,000
ii) Sanitary arrangements	=	Rs 50,000
iii) Safety kits	=	Rs 50,000
iv) Internal road & Maintenance	=	Rs 200,000
v) Afforestation cost	=	Rs. 100,000
Total	=	Rs 6.0 lakhs

9. ANALYSIS OF PROPOSAL AND FINAL RECOMMENDATIONS

(i) **Financial and social benefits with special Emphasis on the benefit to the local people including tribal population, if any in the area.**

Social Benefits:

Mining in the project area will provide employment to nearby villagers. This employment will help in raising the standard of living on the people in the area. The mining activity in this belt will benefit the locals both directly and indirectly. The direct beneficiaries will be those who get employed in the mines as skilled and un-skilled workers. The indirect beneficiaries will be those who open small business to sell goods required by the residents whose "Per Capita income will be enhanced by the

Mining activity, and thereby their purchasing power. In the long run a lot of social goods are expected in the comparatively backward area when the inhabitants will be able to send their children to school, the change, though slow, is bound to be perceptible.

Financial Benefits:

It is clear from the objectives of the project that it will have significant positive impacts since it will:

- Provide filling material to the society.
- Give a boost to economic development in the region.
- Make a significant contribution to the construction and infrastructure sector of India.
- The Management will ensure good production and in turn there will be good revenue to the Government of Tamil Nadu and Government of India through taxes. The industry is an asset to the nation.

This project is planned keeping in view the above mentioned advantages.

The quarrying operations will be carried out scientifically and systematically with an integrated mining plan and mine design may not disturb the environment and ecology of the area.

Signature of Project Proponent

Signature of EIA- Coordinator

Along with signature



The Executive Engineer

S.Suriyakumar

Project Proponent

M.Sc., M.Phil, F.C.C. (Min)

Public Works Department,

PGDBA, DIPC

Water Resources Organization,

EIA Co-ordinator (Mining)

Mining and Monitoring Division,

Tiruchirappalli District

Date: 11.02.2022

Place : Salem



ENVIRONMENTMANAGEMENT PLAN

FOR SAND QUARRY

AREA DETAILS

Extent: 4.90.0Hectares

S.F.No: 1 (P)

Kallapalli Village,

Krishnarayapuram Taluk,

Karur District.

PROJECT PROPONENT

THE EXECUTIVE ENGINEER

*Public Works Department,
Water Resource Department,
Mining and Monitoring Division,
Trichy, TamilNadu.*

CONSULTANT



AADHI BOOMI MINING AND ENVIRO TECH (P) LTD.,

(NABET Accredited EIA Consultant "A" Category)

Accreditation No. NABET/EIA/1821/RA-0103

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ENVIRONMENT MANAGEMENT PLAN

1. INTRODUCTION

The Environmental Management Plan (EMP) has been formulated and integrated with the mine planning to mitigate the adverse impacts which are likely to be caused due to the quarrying operation.

2. QUARRYING PROCESS

Open cast, Mining would be carried out by opencast semi-mechanized method. Excavation of sand by using hydraulic excavator into the tipper and partly manual method using hand shovel and load into Bullock Cart, As the sand is loose granular material, it does not require any drilling.

2.1 PRODUCTION DETAILS

Total production of sand is 72,709 m³ including shoal portion. The average production is about 36354.5 m³ per annum 242 m³ /per day or 341 cart load for period of Two years.

3. MANPOWER REQUIREMENT

The manpower requirement for the proposed project will be around 36. This includes manpower for excavation, maintenance as well as loading of minerals.

4. BASELINE ENVIRONMENT

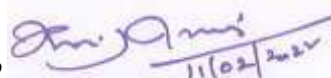
The EMP has been developed considering its implementation and monitoring of environmental protection measures during quarrying operations. Baseline study was carried out during 10.12.2020.

ENVIRONMENT MANAGEMENT PLAN

There would not be any adverse impact in the existing environment arising from this mining activity. To protect the environment, the proponent would do adequate afforestation program and spend CER @ 2% of the project cost and CSR at a rate of 2.5% of the profit through local Panchayat for the welfare.

TABLE NO: 2: ENVIRONMENT MANAGEMENT PLAN

S.No	Parameters	Mitigation Measures
1	Water Environment	<ul style="list-style-type: none">▪ Mining activity will be above the ground water level and hence ground water table will not be affected.▪ Drinking water utilized from Mineral water industries▪ Total Water requirement will be 5.0 KLD
2	Air Environment	<ul style="list-style-type: none">▪ Water sprinklers along the sides of haul road shall be fixed to control fly of dust while transporting


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		<p>minerals and waste</p> <ul style="list-style-type: none"> ▪ Avenue trees along roads around ML boundary shall be planted as per the norms of MoEF&CC to control fly of dust, noise etc. ▪ Labours engaged in such dust prone areas should be provided with safety devices like ear muff, mask, goggles as per the MMR, 1961 amendments and circulars of DGMS.
3	Noise Environment	<ul style="list-style-type: none"> ▪ This eco-friendly quarrying operation does not involve any blasting and drilling methods. Hydraulic excavator is less than 80db. ▪ Hence noise will be minimal and this is only due to the movement of Excavator and trucks. ▪ Plantation will help in arresting noise at source ▪ Periodical monitoring of noise and vibration to ensure safety environment for workers.
4	Soil Environment	<ul style="list-style-type: none"> ▪ Humus top soil shall be preserved for reuse in afforestation and agriculture.
5	Land Environment	<ul style="list-style-type: none"> ▪ By permitting quarrying of sand from this uneven bed can be remove substracals and it will help the free flow of water. ▪ Greenbelt will be developed around the mine lease boundary
6	Ecology and Biodiversity	<ul style="list-style-type: none"> ▪ No rare species of flora and fauna identified except regional common species.
7	Waste Management	<ul style="list-style-type: none"> ▪ There is no wastage is encountered during the quarrying operation the entire quarry is utilized.
8	Occupational Health and Safety	<ul style="list-style-type: none"> ▪ Workers involved in quarrying work shall be provided protective equipments such as Thick Gloves, Goggles, ear plugs, safety boot wears, etc... ▪ First Aid station as per provision under Rule (44) – schedule III of the Mines Rules 1955 to be provided. ▪ Qualified First Aid personnel should be appointed /nominated to attend emergency first aid treatment. ▪ Periodic medical examination has to be made for occupational health once in six months in addition to attending medical treatment of occupational injuries under Rule 45 (A).
9	CSR Activities	<ul style="list-style-type: none"> ▪ The proponent is proposed to spend CSR @ 2.5% of

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		profit as per the Companies Act, 2013 and CSR Rules, 2014 through local Panchayat for maintenance of road, street light, school sanitation etc., The CER will be @ 2% of the project cost.
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4.1. Land environment

The quarrying activity will result in disturbance of the land use pattern of the quarry lease area. The land degradation is unavoidable during mining activities like excavation, etc. 3.60.0Ha will be utilized for quarrying activities at the end of the lease period. It is a shallow quarrying to a depth of 1.0m and there is no benches shall be formed. The excavated area shall be replenished during the next rainy season naturally.

- There is no removal of vegetation such as plants, bushes in the quarry area
- No effluent generation as any further processing of mineral is proposed. Hence no ground water contamination due to the proposed quarrying activity.
- Opencast, semi mechanized and manual mining is adapted to Excavate sand.

i. Mitigation measures

Land requirement for the project has been assessed considering functional needs. For this Green belt development is proposed all around quarry lease area. The mined out area is small, the removal of sand will help for free flow of water.

4.2 Water quality

Quarrying does not have any significant impact on the water quality, as the neither quarrying nor intercept with the ground water level neither there is any surface water body near the site.



Image No.1 water sample collection

Table 1: Physical and Chemical properties

S.no	Parameters	Unit	Results (Bore water)	As per IS 10500: 2012	
				Requirement (Acceptable limit)	Permissible limit in the absence of alternate source
1	pH value at 25°C	-	7.86	6.5 – 8.5	6.5 – 8.5
2	Turbidity	NTU	BDL	1	5
3	Electrical conductivity at 25°C	Microm hos/cm	1316	-	-
4	Total Suspended Solids	mg/l	2	-	-
5	Total Dissolved Solids	mg/l	656	500	2000
6	Total Hardness as CaCO ₃	mg/l	546	200	600
7	Chlorides as Cl	mg/l	381.58	250	1000
8	Sulphates as SO ₄	mg/l	49.974	200	400
9	Total Iron as Fe	mg/l	-	0.3	0.3
10	Silica (Reactive) as SiO ₂	mg/l	-	-	-

MICROBIOLOGICAL EXAMINATION

S.NO	Parameters (MPN / 100 MI)	Results Bore water	Requirement as per IS 10500: 2012 Second revision (Acceptable Limit)
1	Total Coliforms	180	Shall not be detectable in any 100 ml
2	E.Coli	Absent	Shall not be detectable in any 100 ml

i. Mitigation measures

- The quality of ground water is fairly good. There is no liquid waste discharge from quarrying activity, which is likely to pollute water.
- Drinking water will be utilized from the Mineral water Industries.
- Total water requirement will be 5.0 KLD.

4.3 Noise and vibration

Major noise generating sources may be considered as excavation, loading and vehicle movement during transportation of minerals. With the starting of quarrying operations, it is imperative that noise levels shall increase. In order to assess the impact baseline ambient noise level, noise monitoring has been carried out at different points using Sound level meter.

Image No.2 Noise level monitoring



Table 2: Ambient Noise levels

S. No	Location	Latitude	Longitude	Noise levels dB (A)	TNPCB Standards
1	Core zone	10°57'23.06"N	78°20'41.30"E	36.2	Day Time Industrial – 75 dB (A) Residential – 55 dB (A)
2	Lease boundary (Pillar No.1)	N10°57'20.48"	E78°20'37.18"	37.6	
3	Lease boundary (Pillar No.2)	N10°57'26.87"	E78°20'37.13"	39.9	
4	Lease boundary (Pillar No.3)	N10°57'26.87"	E 78°20'45.22"	40.1	
5	Lease boundary (Pillar No.4)	N10°57'20.47"	E78°20'45.26"	38.4	

The noise level found to be within the limits as per TNPCB Standards.

i. Mitigation Measures

- Greenbelt will be developed around the mine lease as well as safety zones which will help in arresting noise at source
- Safety devices provided to workers, where noise is more than 80dB (A)


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- Limiting time exposure of workers to excessive noise
- Proper and regular maintenance of vehicles & machinery.
- Periodic inspection of all equipment and risk prone areas
- Regular lubrication & replacement of worn out parts etc.,

4.4 Air Quality

Drilling and blasting operations are source of fugitive dust emission but its effect is more or less localized. Ambient Air monitoring has been carried out in the core zone. The major part of the dust generated during such operations usually gets settle down and thus the effect of such operation will be localized phenomenon.



Table 3: Ambient Air monitoring station

Table 3: Ambient Air Monitoring result

S.No	Parameters ($\mu\text{g}/\text{m}^3$)	Measured Value	NAAQS
1	Particulate Matter ($\text{PM}_{2.5}$)	29	60
2	Respirable Particulate Matter (PM_{10})	39	100
3	Sulphur Dioxide (SO_2)	9	80
4	Nitrogen Dioxide (NO_2)	12	80
5	Ozone (O_3)	16	180
6	Lead (Pb)	BDL (DL = 0.1)	1
7	Carbon Monoxide (CO) 1 hour	BDL (DL = 1.15)	4
8	Ammonia (NH_3)	19	400
9	Arsenic (As)	BDL (DL = 1.0)	6
10	Nickel (Ni)	BDL (DL = 0.1)	20
11	Benzene (C_6H_6)	BDL (DL = 0.1)	5
12	Benzo (a) Pyrene	BDL (DL = 0.1)	1
BDL = Below Detectable Limit, DL = Detection Limit NAAQS = National Ambient Air Quality Standards			

The above results comply with NAAQS. The generation of dust is controlled and suppressed at source by sprinkling of water on haul roads, loading points at regular intervals as shown below.

i. Mitigation Measures

- Water sprinklers along the sides of haul road shall be fixed to control fly of dust while transporting minerals.
- Avenue trees along roads around ML boundary shall be planted as per the norms of MoEF&CC to control fly of dust, noise etc...
- Labours engaged in such dust prone areas should be provided with safety devices like ear muff, mask, and goggles as per the MMR, 1961 amendments and circulars of DGMS.

4.5 Soil Environment

Soil sample has been collected in the quarry lease area for analysis its physical and chemical characteristics.



Image No.3 Soil sample collection

Table 3 Soil Test Report

Physical Parameters	Results
pH value (10% Solution)	7.52
EC@ 25°C (Micromhos/cm) (10% solution)	92
Moisture	1.14%
Bulk Density	1.32 g/cc
Texture	Sand =90.45% : Silt = 6.76 %: Clay = 2.70% "Sand"
Chemical Parameters	Results
Calcium(%)	0.686
Magnesium (%)	BDL

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Chlorides (%)	0.0006
Organic Matter	0.0251%
Water Holding Capacity	40%

i. Observations & Mitigation measures

- The pH of the soil found to be 7.52 indicating neutral in nature.
- Bulk Density of the soil found to be 1.14 g/cc
- The Water Holding Capacity of the soil is found to be 40%.

5. SOLID WASTE MANAGEMENT

No wastes are anticipated.

6. GREEN BELT

Local trees like Neem will be planted along the lease boundary and avenues as well as over Non-active dumps at a rate of 100 trees per annum with interval 5min between. The rate of survival expected to be 80% in this area.

7. COST OF EMP IMPLEMENTATION

EMP Cost

a) Environmental Monitoring	=	Rs. 2,00,000
b) Sanitary arrangements	=	Rs 50,000
c) Safety kits	=	Rs 50,000
d) Internal road & Maintenance	=	Rs 200,000
e) Afforestation cost	=	Rs. 100,000
Total	=	Rs 6.0 lakhs

The quarrying activity shall be undertaken in accordance with the environmental conditions as prescribed in the EC.

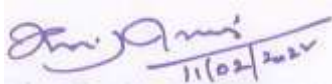
8. PROJECT BENEFITS

The quarrying activities in this area will benefit to the local people both directly and indirectly. The direct beneficiaries will be those who get employed in the mines as skilled and un-skilled workers. 30 persons will be employed in this quarry. The extent of impact will however be confined to lease area only. This operation doesn't need relocation of any habitats.

The proponent is proposed to spend CSR @ 2.5% of profit as per the Companies Act, 2013 and CSR Rules, 2014 and 2% of the Project Cost will be spend as corporate Environmental Responsibility (CER) through local Panchayat for maintenance of road, street light, school sanitation etc.

Green belt will be developed around the quarry lease boundary. At the end of life of mine, excavated pit will be backfilled and reclaimed and rehabilitated by plantation with native species so as to restore the natural eco-system which could have positive impact on the environment.

**Signature of Project Proponent
Along with name and address**



Project Proponent,
THE EXECUTIVE ENGINEER
Public Works Department,
Water Resource Department,
Mining and Monitoring Division,
Tiruchirappalli, TamilNadu.

Date: 11.02.2022

Place : Salem

Signature of the EIA Coordinator



S.Suriyakumar
M.Sc., M.Phil, F.C.C. (Min)
PGDBA, DIPC
EIA Co-ordinator (Mining)

