


# **PRE-FEASIBILITY REPORT**

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

	<p><b>Extent : 4.00.0Hectares</b></p> <p><b>S.F. No : 76 (P)</b></p> <p><b>Village : Perunavalur</b></p> <p><b>Taluk : Aranthangi</b></p> <p><b>District : Pudukkottai</b></p> <p><b>State : Tamil Nadu</b></p>
---	---

## **PROJECT PROPONENT**

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



## **EIA CONSULTANT**

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

**NABET Accredited EIA Consultant – “A” Category.**

**Certificate No: NABET/EIA/1821/RA 0103**

**No.3/216, K.S.V.Nagar, Narasothipatti, Salem-636004.**

**Phone (0427) 2440446, Cell: 9842729655**

**[www.abmenvirotec.com](http://www.abmenvirotec.com), [suriyakumarsemban@gmail.com](mailto:suriyakumarsemban@gmail.com)**

## TABLE OF CONTENTS

S.NO	DESCRIPTION	PAGE.NO
1.	EXECUTIVE SUMMARY	35
2.	INTRODUCTION OF THE PROJECT/BACKGROUND INFORMATION	35
3.	PROJECT DESCRIPTION	40
4.	SITE ANALYSIS	48
5.	PLANNING BRIEF	60
6.	PROPOSED INFRASTRUCTURE	65
7.	REHABILITATION & RESETTLEMENT PLAN (R&R Plan)	67
8.	PROJECT SCHEDULE & COST ESTIMATES	68
9.	ANALYSIS OF PROPOSAL AND FINAL RECOMMENDATIONS	69

# PRE-FEASIBILITY REPORT

FOR PERUNAVALAR SAND QUARRY

AS PER SAND MINING GUIDELINES, 2020

in S.No 158/1(P) in South Vellaru River, Perunavalur Village, Aranthangi Taluk,  
Pudukkottai District, Tamil Nadu.

## 1. EXECUTIVE SUMMARY

This project is for quarrying Sand, Minor minerals over an area of 4.00.0 Hectares in SF. No. 76 (P), a part of South Vellaru river in Perunavalur Village, Aranthangi Taluk, Pudukkottai District, Tamil Nadu. The quantity to be Quarried shall be 44,001 m<sup>3</sup> as permitted by the Dept. of Geology and Mining, Pudukkottai for a lease period of One year vide precise area letter No. Rc No. **479/2019(G&M) dated 18.03.2020**, 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 Deputy Director of Dept of Geology and Mining, Pudukkottai vide letter No. Rc No. 479/2019(G&M) Dated. 07.08.2020. 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 South Vellaru River.

## 2. INTRODUCTION OF THE PROJECT

As per the Environmental Impact Assessment (EIA) Notification dated 14<sup>th</sup> 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, Pudukkottai 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.

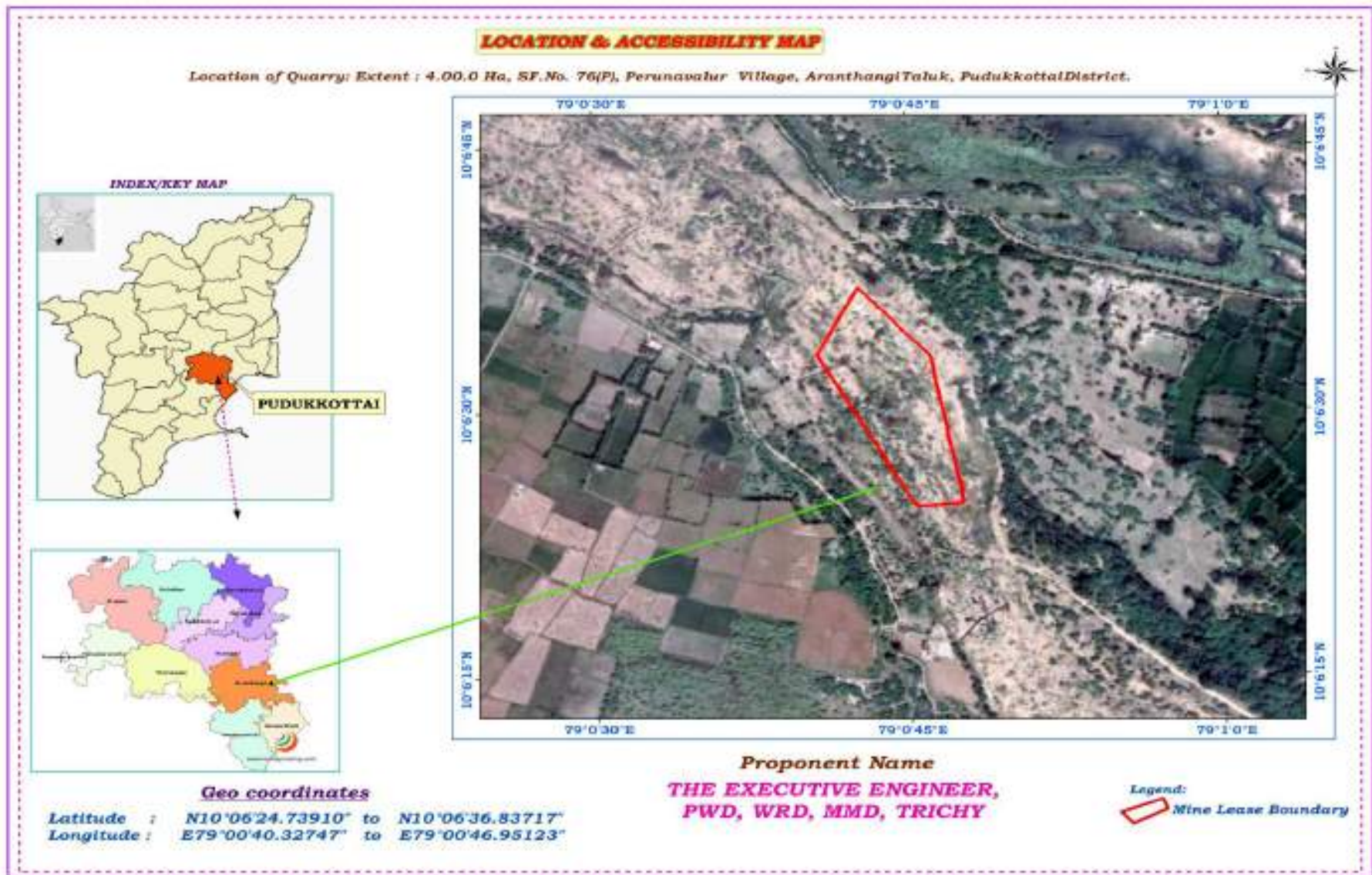
A copy of Mining lease letter issued by the District Collector (R.C.No. 479/2019(G&M) dated 18.03.2020 is enclosed in Approved Mining plan's Annexure.

**2.2 Brief description of nature of project:**

The area is represented by Geological Survey of India Topo sheet No. 58 N/3 and falls between Latitude of N10°06'24.73910" to N10°06'36.83717" and Longitude of E79°00'40.32747" to E79°00'46.95123"..

P.no	Latitude (N)	Longitude (E)	Utm E (m)	Utm N(m)	Elevation(m)
1	N10°06'24.75856"	E79°00'46.95123"	282268.632	1117891.983	31.212
2	N10°06'24.73910"	E79°00'44.73853"	282201.25	1117891.796	32.075
3	N10°06'32.73679"	E79°00'40.32747"	282068.429	1118138.381	33.439
4	N10°06'36.83717"	E79°00'42.37921"	282131.673	1118264.004	34.065
5	N10°06'33.17556"	E79°00'45.82548"	282235.927	1118150.844	33.217

District & State	Taluk	Village	S.F.No	Area (Ha)
Pudukkottai, TamilNadu	Aranthangi	Perunavalur	76 (P)	4.00.0Ha



**Fig.1.1 Location Map of the proposed sand quarry**

*[Signature]*  
 11/02/2022

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 South Vellaru River. The proposed area for quarry lease is river poramboke land, not a forest land.

**Type of Mining:** Manual opencast quarrying. The sand shall be excavated to a depth of 0.9m below the theoretical bed level. All shall be loaded directly into the Bullock carts.

**Period of Mining:** One year 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 South Vellaru 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.

<b>Skilled</b>		
<b>S.No</b>	<b>Designation</b>	<b>Nos</b>
1	PWD Assistant Engineer	1
2	Technical Assistant	1
Total		2

<b>Semi skilled &amp; Unskilled Labours</b>				
<b>S.No</b>	<b>Designation</b>	<b>Nos</b>	<b>Cumulative</b>	
3	Bullock Cart persons	12	<b>34</b>	
4	Permit Slip issuer	2		
5	Traffic Regulator	Entrance		-
		Exist		-
		Quarrying Site		2
6	Manual loader	12		
7	Office Helper	4		
8	Track Maintainer	-		
9	Watchman(Two Shift)	2		
<b>Grand Total</b>			<b>36</b>	

### 3. PROJECT DESCRIPTION

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

This project is located in Perunavalur village, Aranthangi taluk, Pudukkottai 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 4.00.0 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. 58 N/3 and falls between Latitude of N10°06'24.73910" to N10°06'36.83717" and Longitude of E79°00'40.32747" to E79°00'46.95123"..

**Table no. 3.1 Latitude and longitude**

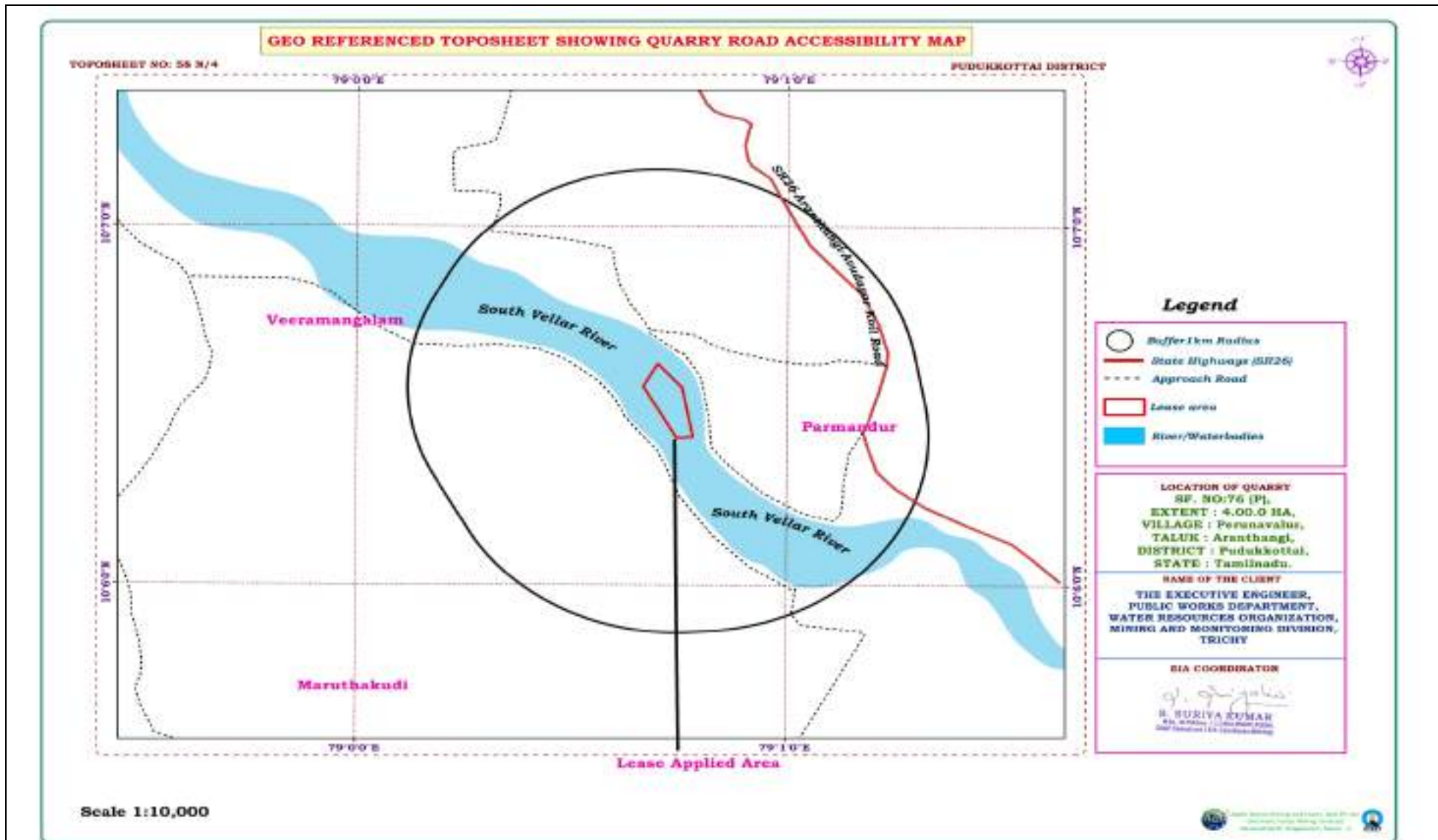
P.no	Latitude (N)	Longitude (E)	Utm E (m)	Utm N(m)	Elevation(m)
1	N10°06'24.75856"	E79°00'46.95123"	282268.632	1117891.983	31.212
2	N10°06'24.73910"	E79°00'44.73853"	282201.25	1117891.796	32.075
3	N10°06'32.73679"	E79°00'40.32747"	282068.429	1118138.381	33.439
4	N10°06'36.83717"	E79°00'42.37921"	282131.673	1118264.004	34.065
5	N10°06'33.17556"	E79°00'45.82548"	282235.927	1118150.844	33.217



The area is accessible from Pudukkottai to reach Aranthangi by 30km via SH 26 Road then 13Km to reach veeramangalam Road. Further 1.2Km 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,

**Table No.3.2. Details of infrastructures and communication**

<b>S.N o.</b>	<b>Description</b>	<b>Place</b>	<b>Distance (km)</b>	<b>Directio n</b>
1	Railway	Aranthangi Railway Station	7	N
3	Post office	Puduvakottai	5.5	NW
4	Airport	Tiruchirapalli	80	NW
5	Police station	Aranthangi	6.5	NW
6	Fire service	Avudaiyarkoil	5.2	SE
7	Primary Health centre	Aranthangi	6	NW
8	DSP Office	Pudukkottai	34	NW
9	School	Aranthangi	6.3	NW
10	Town	Aranthangi	6.3	NW
11	Villages			
i)	Veeramangalam		1.5	NW
ii)	Perunavalur		1.9	SW
iii)	Avudaiyarkoil(Rural)		3.7	SE
iv)	Kanakkanvayal		2.6	NE



**Fig.No.3.1.MINES ROAD ACCESSABILITY MAP**

*Handwritten signature and date: 11/02/2022*

### 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 44,001m<sup>3</sup> 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 4.00.0Hectares 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 into Bullock Carts.
- 3) Transport of sand to the Consumer Construction site.
- 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 remove the materials by Bullock Carts and loading directly into the Consumer Construction Site shall be connected by proper approach roads. The Layout of infrastructure such as workings and its sections are shown in the approved Mining Plan.

#### **Removal of over burden**

No overburden is proposed in the approved Mining plan.

## **Extent of Mining**

### a) Mining

As the Sand is loose gritty material and it does not require any drilling or blasting. Sand shall be loaded directly into the Bullock Carts to the Consumer Construction Site.

### b) Loading equipment

Loading of sand shall be done by Bullock carts into Manual Loading.

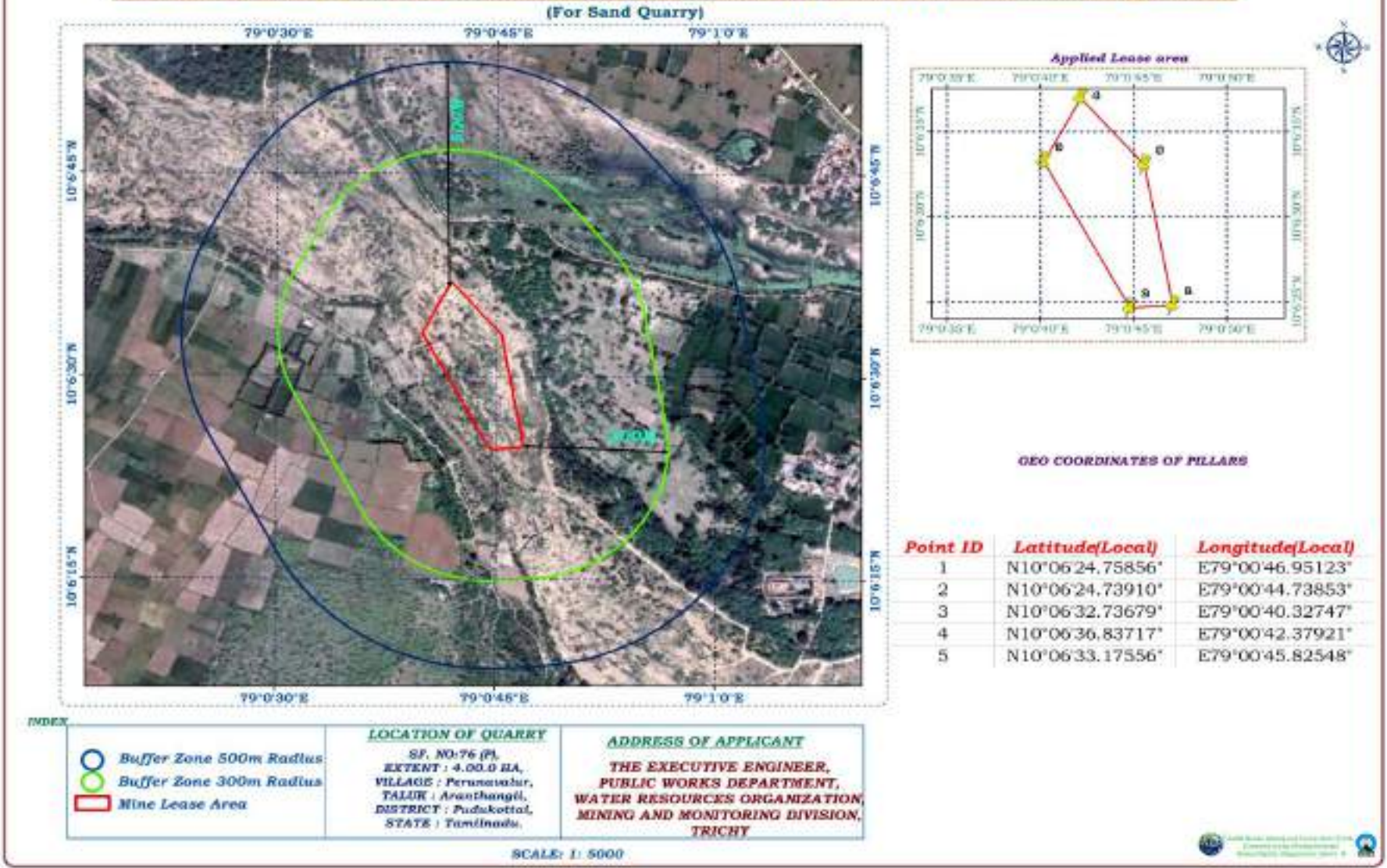
### c) Transportation

Haulage of minerals will be done by Bullock carts directly carry from mining site to the Consumer Construction Site.

**Table No.3.3 Production detail**

<b>Year</b>	<b>Production in m<sup>3</sup></b>
One year	44,001

**GIS BASED BUFFER OF 300M AND 500M RADIUS OVER THE GOOGLE EARTH IMAGE WITH GEOCOORDINATES OF PILLARS**



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

*[Handwritten signature]*  
11/02/2022

**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.**

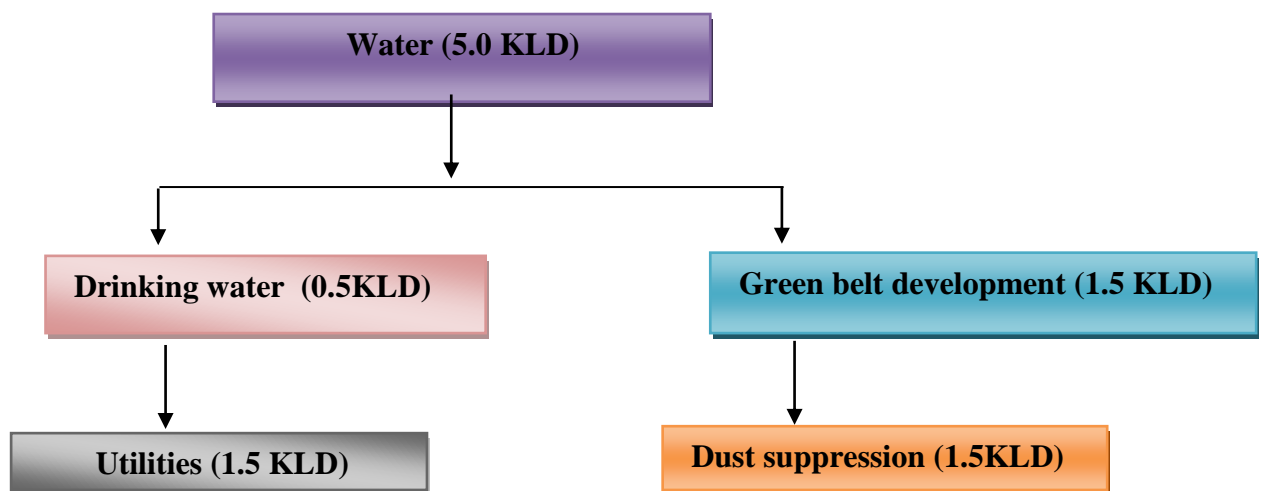
Removal of sand is made for the purpose of clearing the obstacles of the river for free flowing of water. The sand will be replenished being a natural resource and therefore recycling is not possible for this project.

**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 South Vellaru 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**

*Signature*  
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 Pudukkottai to reach Aranthangi by 30km via SH 26 Road then 13Km to reach veeramangalam Road. Further 1.2Km 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
Pudukkottai District, Tamilnadu	Aranthangi	Perunavalur	4.00.0	South Vellaru river

### 4.3. Topography (along with Map):

The area applied for mining lease is a River Bed, with elevation vary from 33.897m (Minimum) to 30.061m (Maximum) above MSL. It is represented in the Geological Survey of India 58N/3. The applied Lease area lies between Latitude of N10°06'24.73910" to N10°06'36.83717" and Longitude of E79°00'40.32747" to E79°00'46.95123".

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 RF, 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 South Vellaru 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	4.00.00
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	4.00.00	0.00
<b>Total</b>		<b>4.00.00</b>	<b>4.00.00</b>

#### **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.

**LOCATION & ACCESSIBILITY MAP**

Location of Quarry: Extent : 4.00.0 Ha, SF.No. 76(P), Perunavalur Village, Aranthangi Taluk, Pudukkottai District.



**Geo coordinates**  
Latitude : N10°06'24.73910" to N10°06'36.83717"  
Longitude : E79°00'40.32747" to E79°00'46.95123"

**Proponent Name**  
**THE EXECUTIVE ENGINEER,**  
**PWD, WRD, MMD, TRICHY**

**Legend:**  
 Mine Lease Boundary

**Fig.4.1: Satellite image showing lease boundary of Sand quarry in South Vellaru River**

#### 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 <sub>2</sub> , NO <sub>x</sub>
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"><li>• Water spraying over haul road using sprinklers.</li><li>• 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.</li></ul>
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 36.6dB.

#### 4.5.6. Vibration Levels

It is a manual mining. Hence, no vibration is anticipated.

**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. Manual quarrying method shall be adopted for sand excavation.

#### 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	Protocol	Units	Result	Limits
<b>GROUND WATER / BOREWELL and WELL WATER</b>					
1	Acidity as CaCO <sub>3</sub>	IS3025(Part22):1986	mg/l	<b>20</b>	2mg/l to 1000mg/l
2	Bicarbonate	IS3025(Part51):2001	mg/l	<b>499.7</b>	1mg/l to 5000mg/l
3	Calcium as Ca	IS3025(Part40):1991	mg/l	<b>5.24</b>	0.4mg/l to
4	Carbonate	IS3025(Part51):2001	mg/l	<b>0</b>	1mg/l to 5000mg/l
5	Chloride as Cl-	IS3025(Part32):1988	mg/l	<b>88.695</b>	1mg/l to 5000mg/l
6	Electrical	IS3025(Part14):1984	µS/cm	<b>604</b>	0.1µS/cm to
7	Magnesium as Mg	IS3025(Part46):1994	mg/l	<b>15.362</b>	0.4mg/l to
8	pH	IS3025(Part11):1983	-	<b>8.28</b>	8.05 ± 0.011
9	Total Alkalinity as	IS3025(Part23):1986	mg/l	<b>499.7</b>	1mg/l to 1000mg/l
10	Total Dissolved Solids	IS3025(Part16):1983	mg/l	<b>530</b>	500mg/l to

Handwritten signature and date stamp: 11/02/2022

11	Total Hardness as	IS3025(Part21):2009	mg/l	<b>194.02</b>	1mg/l to 5000mg/l
12	Total Suspended	IS3025(Part17):1984	mg/l	<b>0.006</b>	2mg/l to 5000mg/l
13	Turbidity	IS3025(Part10):1984	NTU	<b>0.007</b>	1 NTU to 100NTU

S. No	Parameters	Protocol	Unit	Result	Range
1.	<i>Escherichia coli</i>	IS 5887 (Part 1): 1976	Per 100ml	<b>9/100 Present</b>	Qualitative
2.	Total Coliforms	IS 5401 (Part 2): 2012	Per 100ml	<b>Absent</b>	Qualitative

#### 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**





Sl. No	PARAMETERS	PROTOCOL	UNIT	RESULT	NAAQS*
1	Particulate Matter (PM <sub>2.5</sub> )	SOP-EA-001	µg / m <sup>3</sup>	30	60
2	Respirable Particulate Matter ( PM <sub>10</sub> )	IS 5182 Part 23-2017	µg / m <sup>3</sup>	45	100
3	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 Part 2 - 2017	µg / m <sup>3</sup>	6	80
4	Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 Part 6-2017	µg / m <sup>3</sup>	12	80
5	Ozone (O <sub>3</sub> )	IS 5182 Part 9-2014	µg / m <sup>3</sup>	22	180
6	Lead (Pb)	IS 5182 Part 22-2017	µg / m <sup>3</sup>	BDL (DL=0.1)	1
7	Carbon Monoxide (CO) (1 Hour )	IS 5182 Part 10-2014	mg/m <sup>3</sup>	BDL (DL=1.17)	4
8	Ammonia (NH <sub>3</sub> )	SOP-EA-009	µg / m <sup>3</sup>	24	400
9	Arsenic (As)	SOP-EA-010	ng / m <sup>3</sup>	BDL (DL=1.0)	6

10	Nickel (Ni)	SOP-EA-011	ng / m <sup>3</sup>	BDL (DL=0.1)	20
11	Benzene (C <sub>6</sub> H <sub>6</sub> )	IS 5182 Part 11-2017	µg / m <sup>3</sup>	BDL (DL=0.1)	5
12	Benzo (a) Pyrene	IS 5182 Part 12-2014	ng / m <sup>3</sup>	BDL (DL=0.1)	1

#### 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 Maram	Acasia bushes	Innumerable	
2.	Panai/ Palmyra tree	Borassus fiabellifer	Innumerable	
3.	Echa Mamaram	Phoenix sylvestris	5	
4.	Thennai maram	Coconut Tree	Innumerable	



##### 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
2.	Erukku Chedi	Calotropis Gigantea	Innumerable	
3.	Kakkattan, Kotikkakkattan, Sirikki,	Ipomoea nil	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.	Kalugu ( <i>Black kite</i> )	<i>Milvis migrans</i>
2.	Myna ( <i>Black drogue</i> )	<i>Dicrurus macrocercus</i>
3.	Kakka ( <i>House crow</i> )	<i>Corvus splendens</i>
4.	Chittukuruvi ( <i>Indian Robin</i> )	<i>Saxicoloides fulicatus</i>
5.	Parunthu( <b>Brahminy Kite</b> )	<i>Haliastur indus</i>

**c) Butterfly/Insects:**

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

<b>S.No.</b>	<b>Tamil &amp; English Name</b>	<b>Zoological Name</b>
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**

<b>Name of Village</b>	<b>Distance from Mines in Km (Approx)</b>	<b>Direction</b>	<b>Population</b>
Veeramangalam	1.5	Northwest	1782
Perunavalur	1.9	Southwest	1969
Avudaiyarkoil(Rural)	3.7	Southeast	87250
Kanakkanvayal	2.6	Northeast	2691

**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 NH-210 road is situated at 27km away from site connecting Karaikudi -Pudukkottai and S.H-26 situated about 300m Connecting Nimisal -Aranthangi. MDR is connecting Avudaiyarkoil - kalakkam situated about 3.6km on southeast. A Village road is available nearby the site on the western side 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

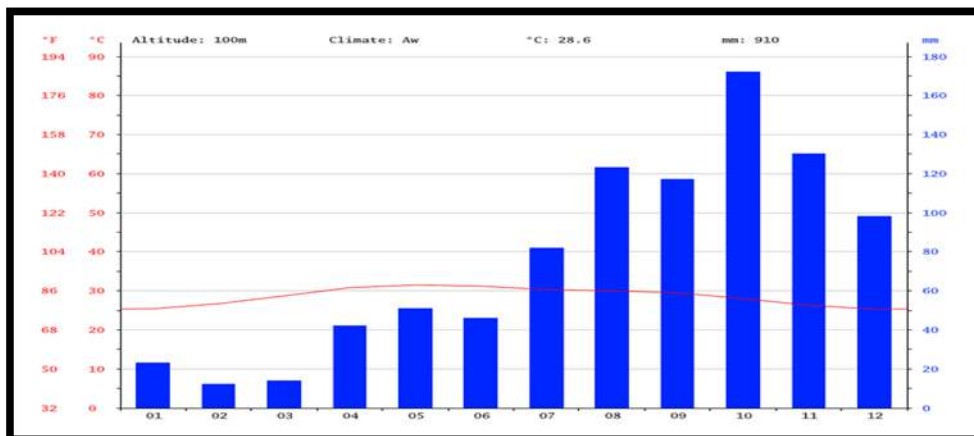
**4.7 Climatic Conditions**

**a) Temperature**



## Climatic Conditions

The Pudukkottai lies on 100m above sea level Pudukkottai has a tropical climate. The summers here have a good deal of rainfall, while the winters have very little. This location is classified as Aw by Köppen and Geiger. The average temperature in Pudukkottai is 28.6 °C | 83.6 °F. Precipitation here is about 910 mm | 35.8 inch per year.



**Fig No.4.2 Pudukkottai 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.

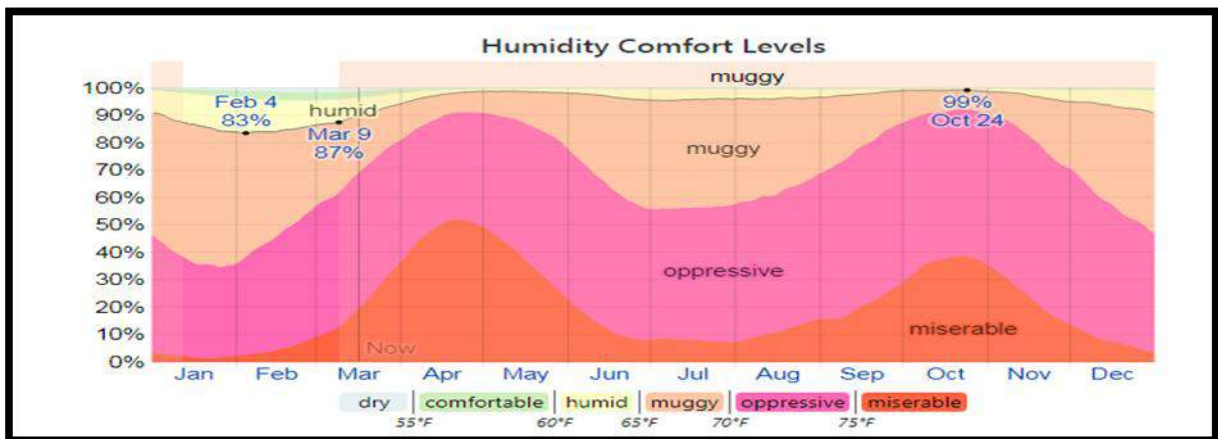
**Table No.4.10. PUDUKKOTTAI WEATHER BY MONTH // WEATHER AVERAGES**

Month	Avg. Temperature (°C)	Min. Temperature (°C)	Max. Temperature (°C)	Avg. Temperature (°F)	Min. Temperature (°F)	Max. Temperature (°F)	Precipitation / Rainfall (mm)
<b>January</b>	25.4	21.2	29.6	77.7	70.2	85.3	23
<b>February</b>	26.7	21.7	31.7	80.1	71.1	89.1	12
<b>March</b>	28.7	23.3	34.1	83.7	73.9	93.4	14
<b>April</b>	30.8	25.9	35.7	87.4	78.6	96.3	42
<b>May</b>	31.5	26.6	36.4	88.7	79.9	97.5	51
<b>June</b>	31.2	26.5	35.9	88.2	79.7	96.6	46
<b>July</b>	30.3	25.9	34.8	86.5	78.6	94.6	82
<b>August</b>	30	25.5	34.5	86	77.9	94.1	123
<b>September</b>	29.5	25.1	33.9	85.1	77.2	93	117
<b>October</b>	28	24.1	32	82.4	75.4	89.6	172
<b>November</b>	26.3	23	29.7	79.3	73.4	85.5	130
<b>December</b>	25.3	21.7	28.9	77.5	71.1	84	98

The difference in precipitation between the driest month and the wettest month is 160 mm | 6 inch. Throughout the year, temperatures vary by 6.2 °C | 43.2 °F.

## 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.

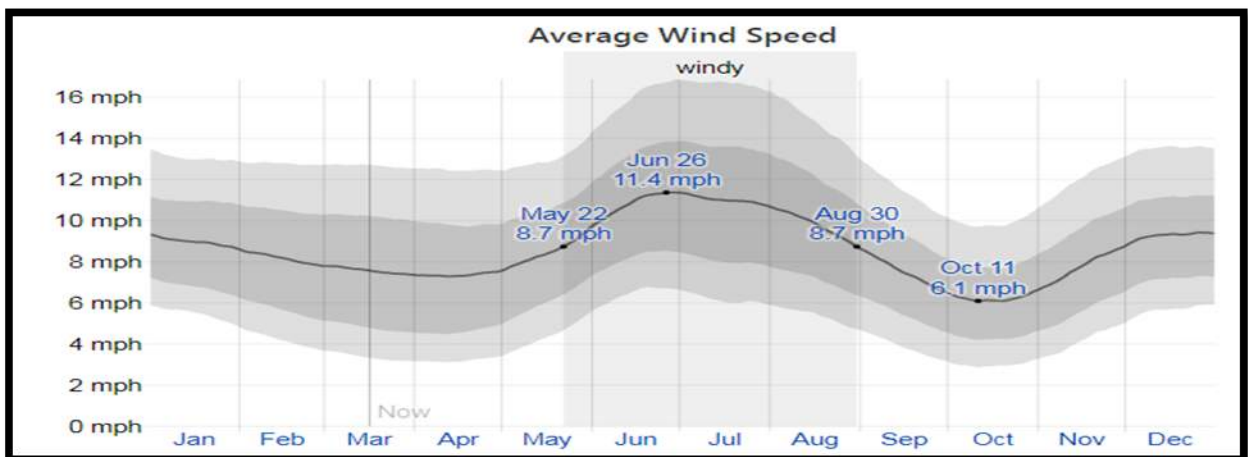


**Fig No.4.3 Humidity comfort level**

## Wind

The windier part of the year lasts for 3.3 months, from May 22 to August 30, with average wind speeds of more than 8.7 miles per hour. The windiest day of the year is June 26, with an average hourly wind speed of 11.4 miles per hour.

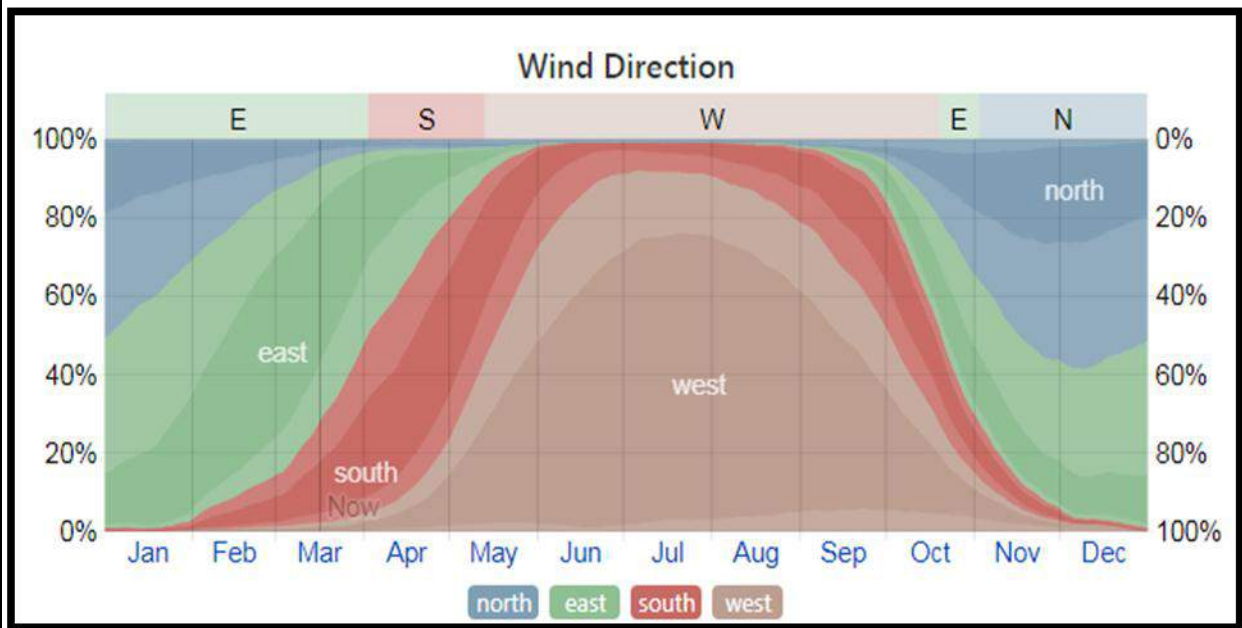
The calmer time of year lasts for 8.7 months, from August 30 to May 22. The calmest day of the year is October 11, with an average hourly wind speed of 6.1 miles per hour.



**Fig No.4.4 Average wind speed**

The wind is most often from the east for 3.0 months, from January 2 to April 2 and for 2.0 weeks,

From October 19 to November 2, with a peak percentage of 73% on March 3. The wind is most often from the west for 5.2 months, from May 13 to October 19, with a peak percentage of 92% on July 6. The wind is most often from the north for 2.0 months, from November 2 to January 2, with a peak percentage of 50% on January 1.



**Fig No.4.5. wind direction**

## 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 One year only. The proposed working is by opencast 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 Aranthangi, Perunavalur village had a total household 991 in 2001 which is decreased to 981 in according to census 2011. Village had a total person of 1969 in 2011 census previous census 1756 persons in 2001. There were about 994 men (50%) according to 2011 census and 882 men (50%) in 2001 census marking an increase of 112 men over the previous census. During 2001 there were about 874 women (49 %), which is increase to 975(50%) in 2011 census.

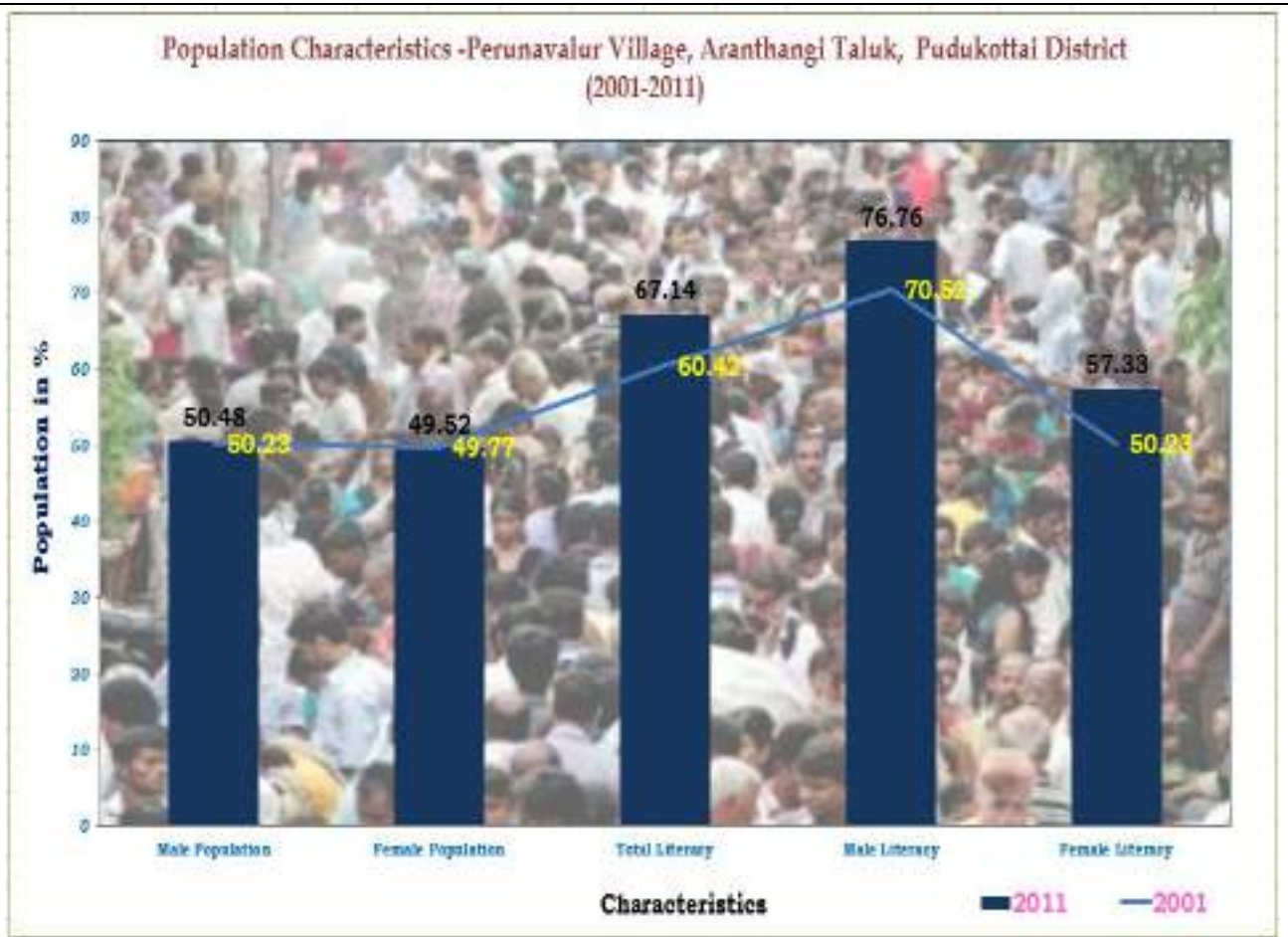
Sex Ratio (number of Females per 1000 Males) is an important population characteristic that highlights the social attention provided to women. Though the sex ratio has been a matter of concern for the all population, the same has been good in the case of Population. From Census 2001 to Census 2011 there has been an increase from 991 to 981 females per 1000 males

The lowest sex ratio may be either due to the migrants for educational purpose and employment other opportunities. Compare to female more than male population is high in this village. 2001 and 2011 census gradually increases the population.

**Table No.4.10 Population Characteristics-Perunavalur Village, Aranthangi, Pudukkottai District (2001-2011)**

Sno	Characteristics	2001	%	2011	%
1	Total Household	396		490	
2	Total Population	1756		1969	
3	Male Population	882	50.23	994	50.48
4	Female Population	874	49.77	975	49.52
5	Total Literacy	1061	60.42	1322	67.14
6	Male Literacy	622	70.52	763	76.76
7	Female Literacy	439	50.23	559	57.33
8	Sex Ratio		991		981

**Source: As per census 2001, 2011 Pudukkottai district**



**Fig No.4.6- Population Characteristics**

**c) Literacy Characteristics - Perunavalur Village**

Literacy has been a marked improvement in the proportion of literates in the last decade. Literates in 2001 constitute 60 per cent of the total population aged seven and above as compared to 67 percent in 2011. The effective literacy rate for Perunavalur village, works out to 70%. The corresponding figures for male and females are 67 % & 76 % respectively.

**d) Occupational Characteristics - Perunavalur Village**

The work participation rate for total workers is defined as the percentage of total workers to total population. In a similar way, it is defined for main and marginal workers.

In the year 2011, it is recorded that 54 percent of population is working population. Out of the total working population, male participation rate in the village is 63%. It may be observed that percentage of total working population in 2001 was 61percent, which has increased to 7 percent in the year 2001. The percentage male working population in 2001

*[Handwritten Signature]*  
11/02/2022

was 64 %, which has decreased to 63% in the year of 2011. But female working population increased from 63% as per census 2001.

The analysis clearly indicates that the share of total working population of male has found increased and female working population has increased but percentage of Female population still remain higher than male working population.

The analysis clearly indicates that primary and secondary sectors have decreasing trend of working population during last decades. Similarly the percentage of workers in the tertiary sector is higher than those of secondary and primary sector.

Some manufacturing units were shifted outside the city limits due to problems like transportation, pollution, effluent disposal etc. some workers have engaged in the occupations like, construction of buildings, roads, bridges etc. through this increase was not substantial to counter balance, the decrease that took place due to reasons mentioned above. The table no.3.19 Shows decrease secondary sector. It is only 0.36 to 1.1percent occurred in the span of 10 years in the village, and it has not affected the occupational structure as a whole of the village.

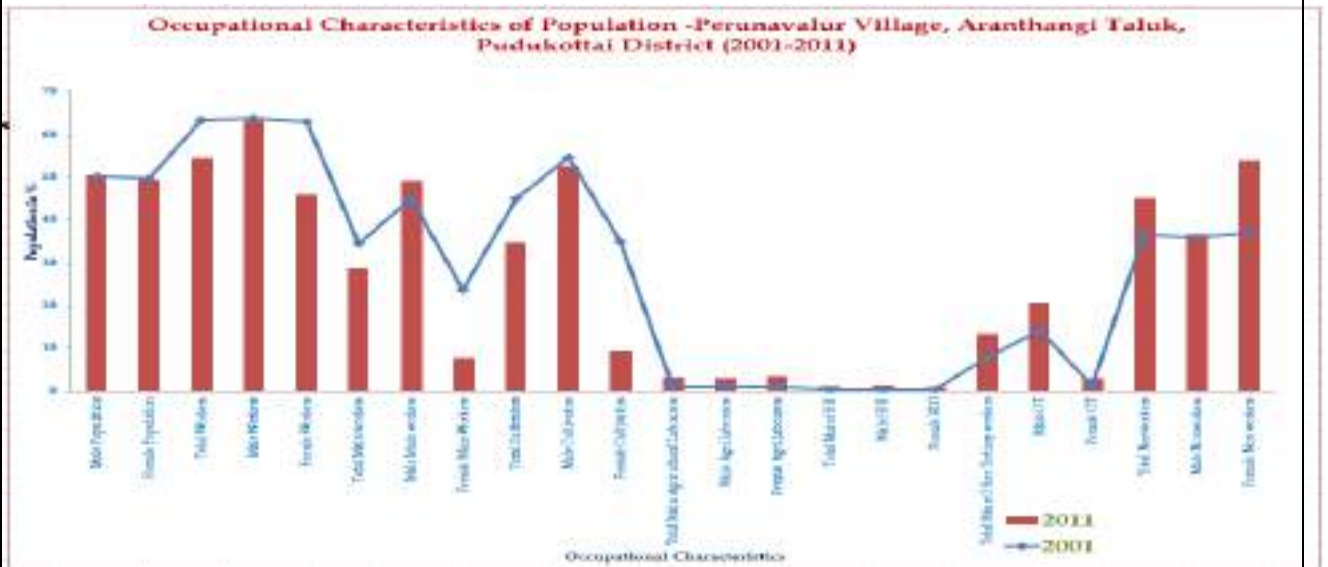
The percentage of workers in the tertiary sector is higher than those of secondary and primary sector. This is definitely percentage of workers in the tertiary sector is higher than those of secondary and primary sector. This is definitely showing an increasing trend. The percentage of the tertiary sector increased from 7.81 percent to 13 percent. It may be noted that employment opportunities in the categories like, trade and commerce, transport and communication and other services have increased enormously due to the opening of new means of communication and transportation offices and related activities during last decades.

**Table No.4.11. Occupational Characteristics of Population -Perunavalur Village, Aranthangi, Pudukkottai District (2001-2011)**

Sno	Characteristics	2001	%	2011	%
1	Total Population	1756		1969	
2	Male Population	882	50.23	994	50.48
3	Female Population	874	49.77	975	49.52
4	Total Workers	1114	63.44	1078	54.75
5	Male Workers	564	63.95	629	63.28
6	Female Workers	550	62.93	449	46.05
7	Total Main workers	604	34.40	565	28.69
8	Male Main workers	397	45.01	489	49.20

9	Female Main Workers	207	23.68	76	7.79
10	Total Cultivators	501	44.97	374	34.69
10	Male Cultivators	309	54.79	332	52.78
11	Female Cultivators	192	34.91	42	9.35
12	Total Main Agricultural Labourers	12	1.08	35	3.25
13	Male Agri.Labourers	6	1.06	19	3.02
14	Female Agri.Labourers	6	1.09	16	3.56
15	Total Main HHI	4	0.36	12	1.11
16	Male HHI	2	0.35	8	1.27
17	Female HHI	2	0.36	4	0.89
18	Total Main Other Tertiary workers	87	7.81	144	13.36
19	Male OT	80	14.18	130	20.67
20	Female OT	7	1.27	14	3.12
21	Total Non workers	642	36.56	891	45.25
22	Male Non workers	318	36.05	365	36.72
23	Female Non workers	324	37.07	526	53.95

**Source: As per census 2001, 2011, Pudukkottai district**



**Fig no.4.7 - Occupational Characteristics of Perunavalur Village**

**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 Perunavalur . 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 Aranthangi in addition facilities in Pudukkottai. Rest room to meet the

*[Handwritten signature]*  
11/02/2022

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**

MDR is connecting Avudaiyar koil - kalakkam situated about 3.6km on southeast. A Village road is available nearby the site on the western side 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 NH-210 road is situated at 27km away from site connecting Karaikudi -Pudukkottai and S.H-26 situated about 300m Connecting Nimisal -Aranthangi.. A Village road is available nearby the site on the Western side for transport of material.

#### **(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 South Vellaru 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 afforestation program with 150 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 NH-210 road is situated at 27km away from site connecting Karaikudi -Pudukkottai and S.H-26 situated about 300m Connecting Nimisal -Aranthangi. MDR is connecting Avudaiyarkoil - kalakkam situated about 3.6km on southeast. A Village road is available nearby the site on the western side 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.

Machineries not required for manual mining method; however being a short term project,

#### PROJECT COST & EMP BUDGET

##### a) Project cost

i) Land Cost	:	Nil
ii) Machinery to be used	:	Nil
iii) Construction of bank reiver	:	Rs 2,00,000
iv) Laboures Shed	:	Rs 1,00,000
v) Sanitary facility	:	Rs 1,10,000
vi) Other items	:	Rs 75,000
<b>Total</b>		<b>Rs 4.85 lakhs</b>

##### EMP Cost

i. Environmental Monitoring	=	Rs 1,00,000
ii. Sanitary arrangements	=	Rs 50,000
iii. Safety kits,	=	Rs 50,000
iv. Water supply for dust control	=	Rs 75,000
v. Afforestation etc.	=	Rs 1,00,000
<b>Total</b>		<b>= Rs 3.75lakhs</b>

## 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: 19.02.2022

Place : Salem

