

# PRE-FEASIBILITY REPORT

FOR THALAVAI (NORTH) SENTHAMANGALAM SAND QUARRY AS PER SAND  
MINING GUIDELINES, 2020

EXTENT: 4.80.0, HECTARES, S.F. NO.:158/1 (P)

VILLAGE: THALAVAI (NORTH) SENTHAMANGALAM, TALUK:  
SENDURAI, DISTRICT: ARIYALUR, STATE: TAMIL NADU



## PROJECT PROPONENT

**THE EXECUTIVE ENGINEER,**  
*Public works department,*  
*Water resources organization,*  
*Mining and monitoring division,*  
*Tiruchirappalli district.*

## EIA CONSULTANT

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*Suriyakumarsemban*  
11/02/2022

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11/02/2024

# **PREFEASIBILITY REPORT**

## **FOR THALAVAI (NORTH) SENTHAMANGALAM SAND QUARRY AS PER SAND MINING GUIDELINES, 2020**

**S.No 158/1 (P) in Vellaru River, Thalavai (North) Senthamangalam village, Sendurai Taluk, Ariyalur District, Tamil Nadu.**

### **1.EXECUTIVE SUMMARY**

This project is for quarrying Sand, Minor minerals over an area of 4.80.0 Hectares in SF. No. 158/1 (P), a part of Vellaru River in Thalavai (North) Senthamangalam Village, Sendurai Taluk, Ariyalur District, Tamil Nadu. The quantity to be removed \ excavated shall be **48000 m<sup>3</sup>** as permitted by the Dept. of Geology and Mining, Ariyalur for a lease period of One year vide precise area letter No. Rc No. **Rc No. 181/G&M/2017, dated 27.02.2020.** 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, Ariyalur vide letter Rc No. 181/G&M/2017, dated 02.06.2020. 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 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, Ariyalur to obtain permission for removal of sand and seeking Environmental clearance from SEIAA, Chennai for grant of fresh Quarry Lease.



Handwritten signature and date: 11/02/2020

**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. 181/G&M/2017, dated 27.02.2020 is enclosed in Approved Mining plan's Annexure.

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

The area is represented by Survey of India Topo sheet No. 58 M/3. The applied Lease area lies between latitude of 11°22'19.19265" N to 11°22'28.33703" N and Longitude of 79°14'13.49567"E to 79°14'20.48548"E as per DGPS survey.

P.no	Latitude (N)	Longitude (E)	Utm E	Utm N	Elevation
1	N11°22'19.19265"	E79°14'13.98887"	307644.367	1257695.524	43.11
2	N11°22'27.12405"	E79°14'13.49567"	307630.892	1257939.333	43.62
3	N11°22'28.33703"	E79°14'20.02819"	307829.183	1257975.404	44.76
4	N11°22'20.58361"	E79°14'20.48548"	307841.604	1257737.071	44.9

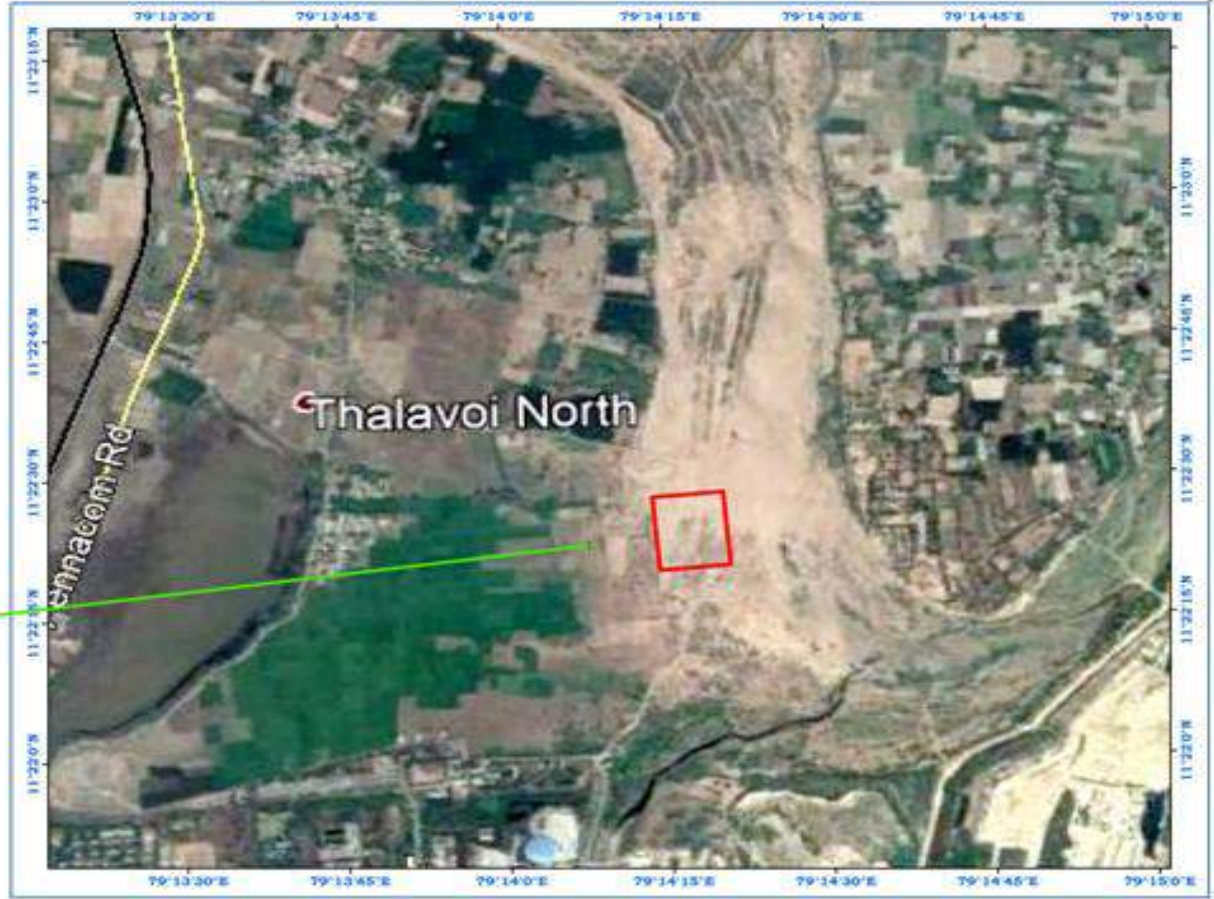
District & State	Taluk	Village	S.F.No	Area (Ha)
Ariyalur, TamilNadu	Sendurai	Thalavai (North) Senthamanga lam	158/1 (P)	<b>4.80.0Ha</b>

  
11/02/2020



**LOCATION & ACCESSIBILITY MAP**

Location of Quarry: Extent : 4.80.0 Ha, SF.No. 158/1(P), Senthamangalam Village, Sendurai Taluk, Ariyalur District.



**Geo coordinates**  
Latitude : 11°22'19.87"N to 11°22'28.17"N  
Longitude : 79°14'13.39"E to 79°14'20.59"E

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

**Legend:**  
 Mine Lease Boundary

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

**Type of Mining:** Open cast semi-mechanized mining, 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:** 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 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>Supervisory &amp; Skilled Persons</b>			
<b>S.No</b>	<b>Designation</b>	<b>Nos</b>	
1	PWD Assistant Engineer	1	
2	Technical Assistant	1	
3	Poclain Operator	2	
4	Poclain Assistant	2	
<b>Total</b>		<b>6</b>	
<b>Unskilled</b>			
<b>S.No</b>	<b>Designation</b>	<b>Nos</b>	
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	
<b>Total</b>		<b>36</b>	
<b>Grand Total</b>		<b>42</b>	

### 3. PROJECT DESCRIPTION

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

This project is located in Thalavai (North) Senthamangalam village, Sendurai taluk, Ariyalur 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 4.80.0 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 Survey of India Topo sheet No. 58 M/3. The applied lease area lies between Latitude of N11°22'19.19265" to N11°22'28.33703" and Longitude of E79°14'13.49567" to E79°14'20.48548".

P.no	Latitude (N)	Longitude (E)	Utm E	Utm N	Elevation
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The area is accessible from Ariyalur to reach Sendurai by 20Km via Ariyallur-Sendurai Road then 22Km to reach Thalavai (North) via Sendurai – Pennadam Road. Further 1.5Km 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,

**Table No.3. Details of infrastructures and communication**

S.No.	Description	Place	Distance (Kms)
1	Railway	Eachangadu Railway Station	2.11
3	Post office	Sengamedu	3
4	Airport	Tiruchirapalli	88
5	Police station	Thalavai	1.7
6	Fire service	Sendurai	23
7	Primary Health centre	Pennadam	4



8	DSP Office	Thittagudi	14
9	School	Eachangadu	2.11
10	Villages		
i)	NorthWest	Silupanur (Thalavai North)	0.97
ii)	South	Alathiyur	1.5
iii)	SouthEast	Adhanakurichi	1.8
iv)	West	Thalavai North	0.748

### 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 semi-mechanized 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 48000m<sup>3</sup> by semi-mechanized Open cast, loading by hydraulic excavator and manual. Transport by bullock cart, tractors and tippers.

### 3.5 Project description with Process Details

#### Mining Process Details

1. Fixing boundaries of lease area covering an extent of 4.80.0Hectares 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.



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

- 2) Loading of sand by hydraulic excavator and manual into Bullock Carts, Tipper and tractors 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 excavator loading and transport by Bullock Carts, Tipper and tractor by semi mechanized mining.

**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.

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.

<b>Year</b>	<b>Production in m<sup>3</sup></b>
One year	48000

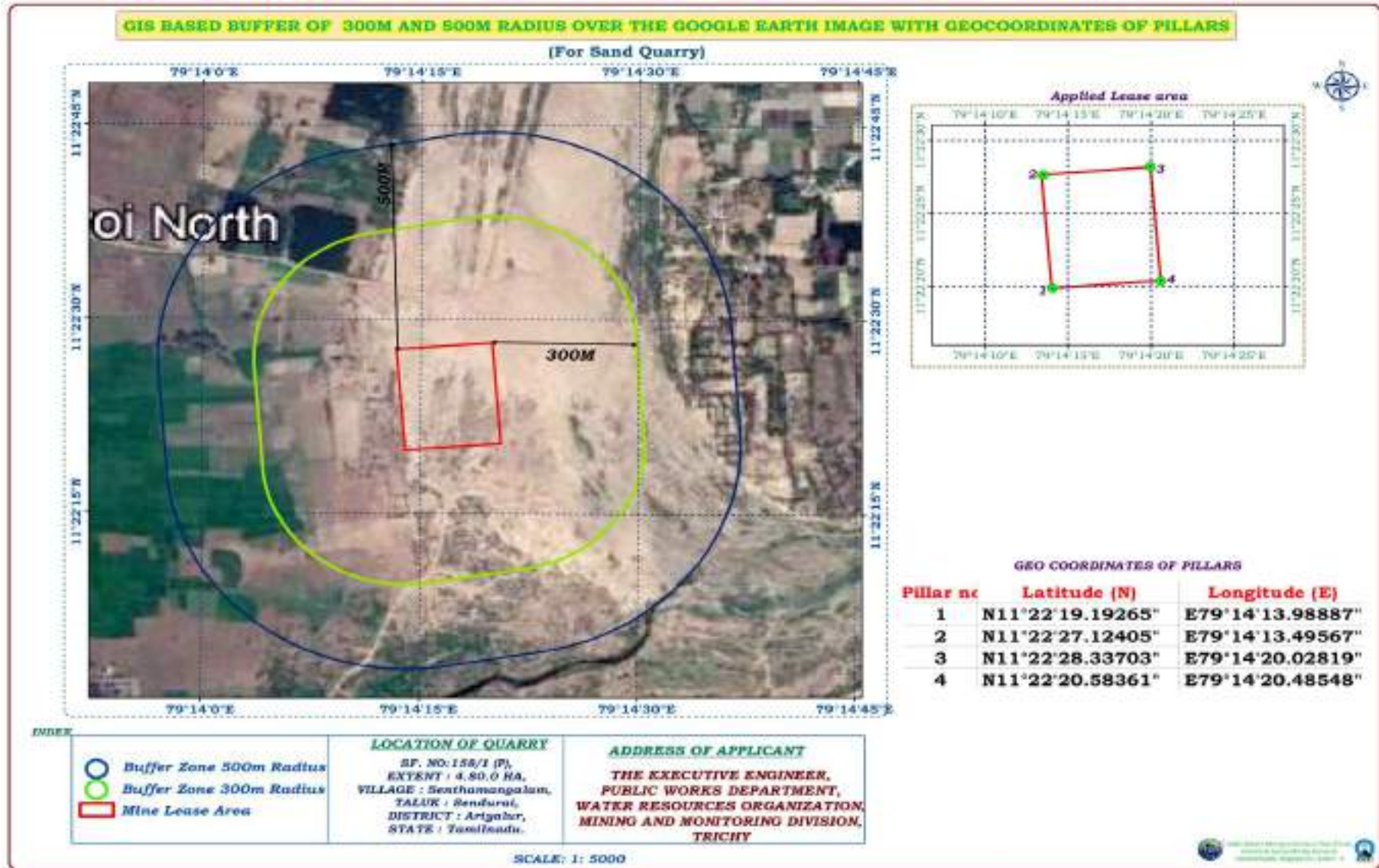


Fig.3: Google earth Image showing 300m/500m radius from the sand quarry lease boundary

**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 anywhere inside the lease area the area of lease.

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

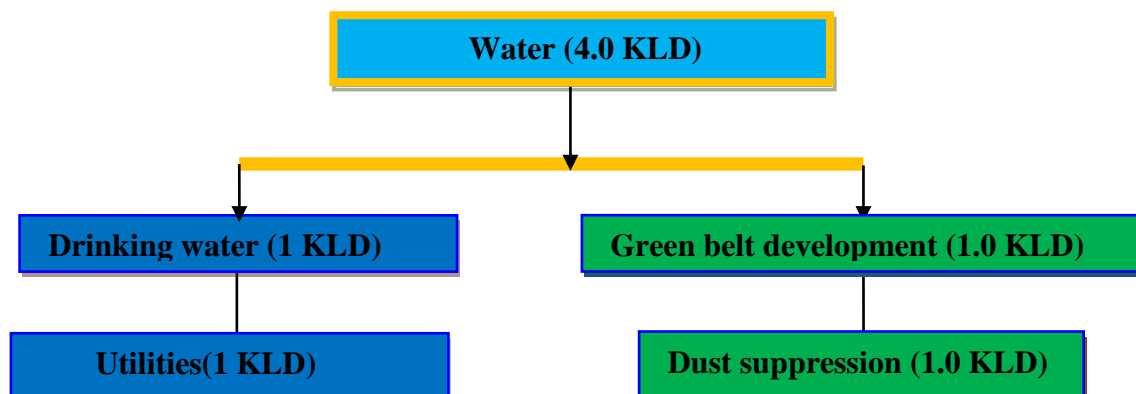
Removal of sand is made for the purpose of clearing the obstacles of the river for free flowing of water. The sand will be replenished being a natural resource and therefore recycling is not possible for this project.

**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 2.0KLD. Minimum quantity of **4.0KLD** 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 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.4: Water Balance Chart**

### **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 Ariyalur to reach Sendurai by 20Km via Ariyallur-Sendurai Road then 22Km to reach Thalavai (North) via Sendurai –Pennadam Road. Further 1.5Km 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.**

The land covers under the mining lease area as under.

<b>District &amp; State</b>	<b>Tehsil</b>	<b>village</b>	<b>Area in Hect.</b>	<b>Type of land</b>
Ariyalur District, Tamilnadu	Sendurai	Thalavai (North) Senthamangalam	4.80.0	Vellaru river

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

The area applied for mining lease is a River Bed, with elevation vary from 41.20m (Minimum) to 45.40m (Maximum) above MSL. It is represented in the Geological Survey of India 58M/3. The applied Lease area lies between latitude of 11°22'19.19265" N to 11°22'28.33703" N and Longitude of 79°14'13.49567"E to 79°14'20.48548"E using DGPS survey

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. Vangaram R.F found about 9km SW direction from proposed project site. 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 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.

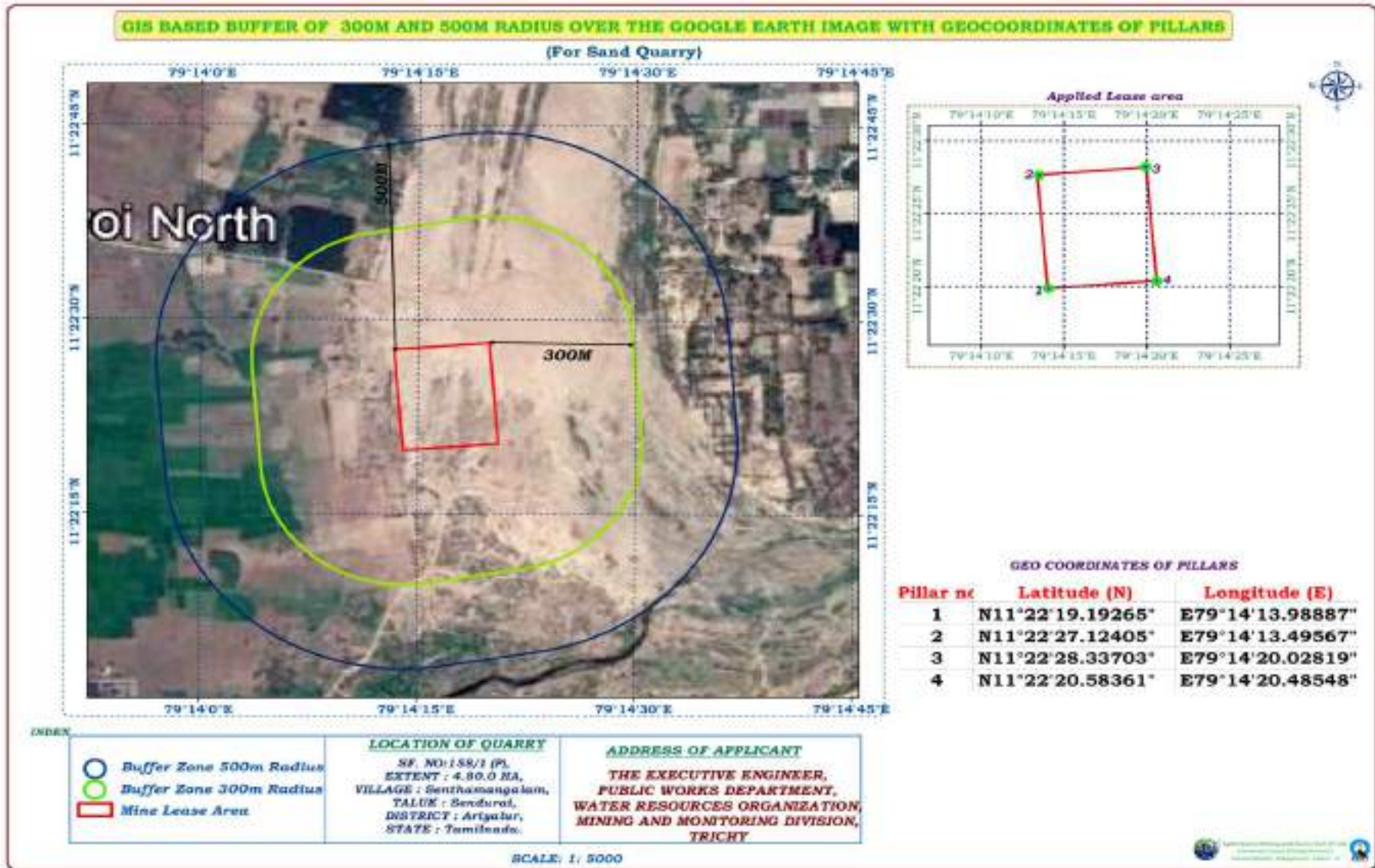


Fig.5: Satellite image showing lease boundary of Sand quarry in Vellaru River

### 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	4.80.00
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	4.80.00	0.00
<b>Total</b>		<b>4.80.00</b>	<b>4.80.00</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.

##### 4.5.2. 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.

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 39.0dB.

#### 4.5.6. Vibration Levels

There is no drilling and blasting.

**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:** No solid waste removal

**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.

Sl. No	Parameters	Units	Sample 1 (surface water) result	Sample 2 (ground water) result	<i>As per is 10500:2012</i>	
					Requirement (acceptable limit)	Permissible limit in the absence of alternate source
1	pH value at 25°C	-	7.84	8.34	6.5 – 8.5	6.5 – 8.5
2	Turbidity	NTU	-	-	1	5
3	Electrical conductivity at 25°C	Micromhos/cm	428	1025	-	-
4	Total Suspended Solids	mg/l	0.014	0.048	-	-
5	Total Dissolved Solids	mg/l	448	1558	500	2000
6	Total Hardness as CaCO <sub>3</sub>	mg/l	106.82	398.94	200	600
7	Chlorides as Cl	mg/l	34.49	871.59	250	1000
8	Sulfates as SO <sub>4</sub>	mg/l	-	-	200	400
9	Total Iron as Fe	mg/l	-	-	0.3	0.3
10	Silica (Reactive) as SiO <sub>2</sub>	mg/l	-	-	-	-

Sl. No	PARAMETERS	UNITS	SAMPLE 1 (SURFACE WATER) RESULT	SAMPLE 2 (GROUND WATER) RESULT	Requirement as per IS 10500: 2012 Second revision (Acceptable Limit)
1	Total Coliforms	MPN / 100ml	Absent	8/ml	Shall not be detectable in any 100 ml
2	E.coli	MPN / 100ml	Absent	1/ml	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.

#### Air Quality test report




S. No	Parameters ( $\mu\text{g}/\text{M}^3$ )	Measured Value	NAAQS
1	Particulate Matter (PM <sub>2.5</sub> )	26	60
2	Respirable Particulate Matter (PM <sub>10</sub> )	47	100
3	Sulphur Dioxide (SO <sub>2</sub> )	9	80
4	Nitrogen Dioxide (NO <sub>2</sub> )	7	80
5	Ozone (O <sub>3</sub> )	28	180
6	Lead (Pb)	BDL (DL=0.1)	1
7	Carbon Monoxide (CO) 1 hour	BDL (DL=1.1)	4
8	Ammonia (NH <sub>3</sub> )	15	400
9	Arsenic (As)	BDL (DL=1.0)	6
10	Nickel (Ni)	BDL (DL=0.1)	20
11	Benzene (C <sub>6</sub> H <sub>6</sub> )	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

#### 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.	Mamaram tree	Mangifera indica.	25	

4.	Thennai maram	Coconut Tree	Innumerable	
5.	Pappali Tree	genus Carica	Innumerable	

**Table No.11C List of Shrubs of the lease area**

**c) HERBS:**

**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:**

**List of Mammals of the lease area**

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

**b) Avian Fauna:**

**List of Avian Fauna of the lease area**

S.No.	Tamil & English Name	Zoological Name
1.	Kalugu (Black kite)	Milvis migrans

2.	Myna ( <i>Black drogue</i> )	Dicrurus macrocercus
3.	Kakka ( <i>House crow</i> )	Corvus splendens
4.	Chittukuruvi ( <i>Indian Robin</i> )	Saxicoloides fulicatus
5.	Parunthu( <b>Brahminy Kite</b> )	Haliastur indus

**c) Butterfly/Insects:**

**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

**4.13. OTHER PERMANENT STRUCTURES**

**4.13.1 Habitations / Village:**

Population of Thalavai (North) Senthamangalam village W- (2691), Village in Sendurai taluk and Ariyalur district. Other Village like Alathiyur S-(3606) Adhanakurichi -(3772), Thalavai North N-(2691).

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

**4.13.3 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.

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

**4.13.5 Road (NH, SH others):**

The NH-532 road is situated at 17kms away from site connecting Salem-Vridhachalam and S.H-141 situated 3Km Connecting Tittagudi-Virudhachalam. A Village road is available nearby the site for transport of materials.

**4.13.6 Places of worship:** Nil

4.13.7 Reserved forest / Forest / Social forest / wild life sanctuary etc: Vangaram R.F found about 9 Km SW directions from proposed project site.

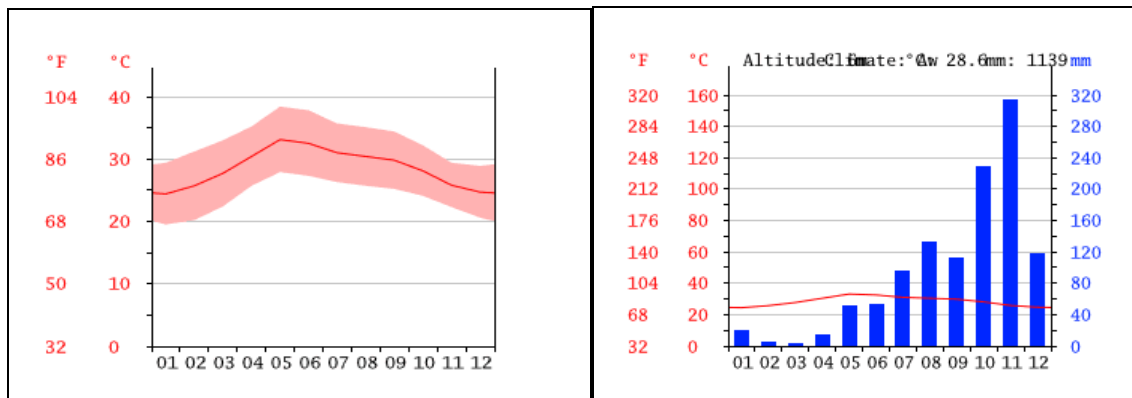
**4.7 Climatic Conditions**

**a) Temperature**

**Climatic Conditions**

The district receives the rainfall under the influence of both southwest and northeast monsoon. There is a gradual decrease in precipitation from northeast to southwest over the district. The normal rainfall for the period (1901-70) ranges from 843.5 to 1123.3 mm. It is lowest in the Vembavur area and highest in the

Jayankondan areas. Ariyalur district enjoys a typical semi arid climate with hot summers and moderately cool winters. The hottest season is from March to May. During the period the maximum temperature often exceeds 40°C. The winter season is spread over two months viz. January and February and the nights are cool and pleasant. The district generally has a high humidity. The district experiences strong winds during the southwest monsoon season. The wind speed during June to August is more than 25 km/hr. Thereafter there is a gradual decrease in speed reaching the lowest value 7.7 km/hr.



**Ariyalur Climate Graph // Weather by Month**

**ARIYALUR WEATHER BY MONTH // WEATHER AVERAGES**

	January	February	March	April	May	June	July	August	September	October	November	December
Avg. Temperature (°C)	24.4	25.7	27.7	30.4	31.1	32.5	31	30.6	29.3	25.1	25.5	24.7
Min. Temperature (°C)	18.5	20.2	22.4	25.7	27.9	27.5	25.3	25.7	25.2	24.1	22.3	20.5
Max. Temperature (°C)	29.9	31.2	33	35.2	35.4	37.5	35.7	35.1	34.4	32.2	29.4	28.8
Avg. Temperature (°F)	75.9	78.3	81.9	86.7	88.8	90.5	87.8	87.1	85.5	77.2	77.9	76.5
Min. Temperature (°F)	65.1	68.4	72.3	78.3	82.2	81.1	77.3	78.3	77.4	75.4	72.1	68.1
Max. Temperature (°F)	84.9	88.2	91.4	95.4	101.1	100.5	96.3	95.2	93.9	90.0	84.9	84.0
Precipitation / Rainfall (mm)	10	4	2	12	51	62	95	132	112	229	312	117

The variation in the precipitation between the driest and wettest months is 311 mm | 12 inch. The average temperatures vary during the year by 8.7 °C | 47.7 °F

**Ariyalur Average Temperature**

The climate of Ariyalur district is sub-tropical. The average maximum and minimum temperatures for district have been 40°C and 22°C respectively. The annual maximum and minimum temperature normal (1970-2000) of Ariyalur district are 33.7°C and 24.2°C respectively.

## 5. PLANNING BRIEF

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

The proposed working is by Open cast semi-mechanized, loading by hydraulic excavator and manual. Transport by bullock cart, tractors and tippers combination 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

Thalavai north is a Village in Sendurai Taluk, Ariyalur district and Tamil Nadu State. Thalavai north Village Total population is 2426 and number of houses are 648. Female Population is 51%. Village literacy rate is 47% and the Female Literacy rate is 33%.(2001)

Thalavoi north is a Village in Sendurai Taluka, Ariyalur district and Tamil Nadu State. Thalavoi north Village Total population is 2691 and number of houses are 685. Female Population is 51%. Village literacy rate is 50% and the Female Literacy rate is 41%. (2011)

Sex composition is the most important demographic characteristics that affect the incidence of birth and death. Sex ratio is used to describe the number of females per 1000 of males. The average sex ratio in Sendurai taluk, Thalavai north village was 1065 during 2001 and decreased to 1056 in the year of 2011.

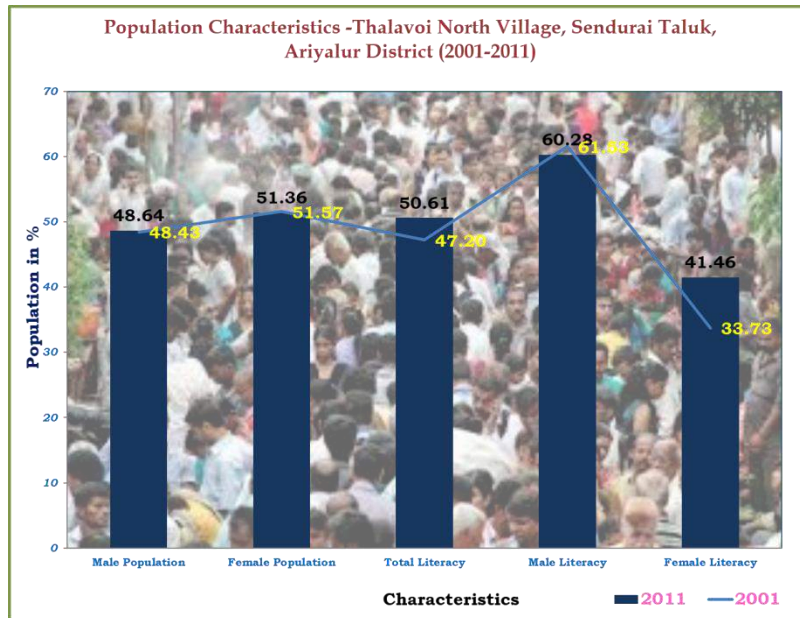
### Population Characteristics - Thalavoi north Village, Sendurai Taluk, Ariyalur District (2001-2011)

Sno	Characteristics	2001	%	2011	%
1	Total Household	648		685	
2	Total Population	2426		2691	
3	Male Population	1175	48.43	1309	48.64
4	Female Population	1251	51.57	1382	51.36
5	Total Literacy	1145	47.20	1362	50.61



6	Male Literacy	723	61.53	789	60.28
7	Female Literacy	422	33.73	573	41.46
8	Sex Ratio		1065		1056

Source: As Per census 2001, 2011, Ariyalur District



### Occupational Characteristics- Thalavoi north 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 Thalavoi north village had 1405 workers accounting for 57 percent of the total population of the Village. During 2011 there were about 1403 (52 %) according to the census. There were about 707 men (60%) during 2001 which is an increase to 785 persons (59%) according to census 2011. There were about 698 (55%) female according to 2001 which is decreased to 618 (44 %) female during 2011 marking a increase of 80 women over the previous census.

**Main Workers** are those workers who had worked for the major part of the reference period i.e. 6 months or more. In Thalavoi north village had a total main workers accounted of 530 (21 %) persons during 2001 census which is an increase to 991 (36 %) persons during 2011.

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. Sendurai taluk in Thalavoi north village had agricultural labourers 604 (43 % of the total workers) agricultural labourers during census 2011.

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 Thalavoi north 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.

**Workers in the tertiary** part of the economy provide services rather than goods. Sales, repair services, banking, and insurance are all part of the tertiary industry. In Thalavai north village had tertiary workers accounted for about 6 percent of the workers during 2001 census it is decreased to 5 % according to census 2011. There were about male tertiary workers of 62 (9% of the male workers which is decrease to 50 (6% of the male workers) according to census 2011.

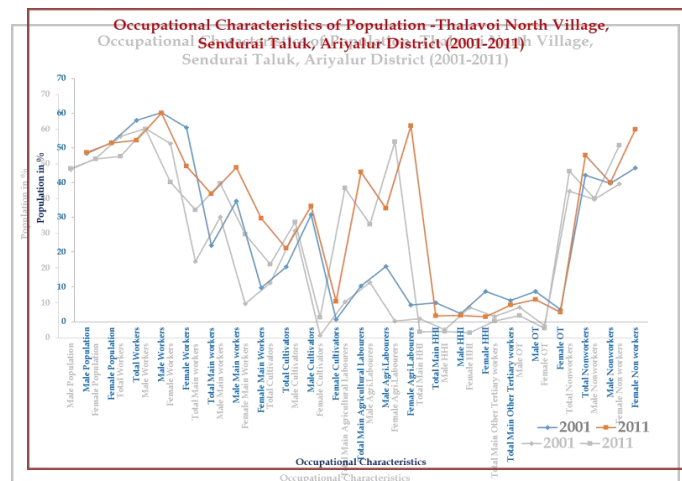
**Non-workers** as defined in Census of India are persons who did not at all work during the reference period. In Thalavai north village had non workers population accounted of 1288 (47% of the total population) according to census 2011. Which is decreased from previous census 2001 had population 1021 (42 %). Because of more number of people are educated most of people living the village had agricultural labours and cultivating area more, and then newly mining & cement industries also lot of money earn our daily life.

#### **Occupational Characteristics of Population -Thalavoi north Village,Sendurai Taluk, Ariyalur District (2001-2011)**

Sno	Characteristics	2001	%	2011	%
1	Total Population	2426		2691	
2	Male Population	1175	48.43	1309	48.64
3	Female Population	1251	51.57	1382	51.36
4	Total Workers	1405	57.91	1403	52.14
5	Male Workers	707	60.17	785	59.97
6	Female Workers	698	55.80	618	44.72
7	Total Main workers	530	21.85	991	36.83
8	Male Main workers	408	34.72	581	44.39
9	Female Main Workers	122	9.75	410	29.67
10	Total Cultivators	222	15.80	297	21.17
10	Male Cultivators	218	30.83	261	33.25
11	Female Cultivators	4	0.57	36	5.83
12	Total Main Agricultural Labourers	145	10.32	604	43.05
13	Male Agri.Labourers	112	15.84	256	32.61
14	Female Agri.Labourers	33	4.73	348	56.31

15	Total Main HHI	77	5.48	23	1.64
16	Male HHI	16	2.26	14	1.78
17	Female HHI	61	8.74	9	1.46
18	Total Main Other Tertiary workers	86	6.12	67	4.78
19	Male OT	62	8.77	50	6.37
20	Female OT	24	3.44	17	2.75
21	Total Nonworkers	1021	42.09	1288	47.86
22	Male Nonworkers	468	39.83	524	40.03
23	Female Non workers	553	44.20	764	55.28

Source: As Per census 2001, 2011, Ariyalur District



### 5.3. 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 Thalavai (North) Senthamangalam . 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 Thalavai (North) Senthamangalam and Sendurai in addition facilities in Ariyalur. Rest room to meet the demand of shelter and Office room for project management will be made with portable container in the project area. They 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 NH-532 road is situated at 17kms away from site connecting Salem-Vridhachalam and S.H-141 situated 3Km Connecting Tittagudi-Virudhachalam.

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- road is situated at 17kms away from site and connecting Ariyalur-Virudhachalam. 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 The 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 a forestation program with 150 trees per annum along the bank of the river.

Suggested plant species for Greenbelt development around the project:

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	15-20m tall spreading

		moonji	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:**

The area is accessible from The NH-532 road is situated at 17kms away from site connecting Salem-Vridhachalam and S.H-141 situated 3Km Connecting Tittagudi-Virudhachalam A Village road is available nearby the site on the Western side for transport of material. 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 The NH-532 road is situated at 17kms away from site connecting Salem-Vridhachalam and S.H-141 situated 3Km Connecting Tittagudi-Virudhachalam

#### **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 1 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 required for loading by hydraulic excavator and manual. Transport by bullock cart, tractors and tippers. However being a short term 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
<b>Total</b>		<b>Rs 25.0 lakhs</b>

### **EMP Cost**

i) Environmental Monitoring	=	Rs. 2,00,000
ii)Sanitary arrangements	=	Rs 75,000
iii)Safety kits	=	Rs 75,000
iv)Internal road & Maintenance	=	Rs 1,50,000
v)Afforestation cost	=	Rs. 1,00,000
<b>Total</b>	=	<b>Rs 6.0 lakhs</b>

## **9. Analysis of Proposal**

**(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.

### **Project Proponent**



### **The Executive Engineer**

Public Works Department,  
Water Resources Organization,  
Mining and Monitoring Division,  
Tiruchirappalli District

### **(Mr.S.SuriyakuMar)**

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