PRE-FEASIBILITY REPORT

FOR SAND QUARRY

LOCATION DETAILS

Extent: 3.60.0 Hectares
S.F.No: 1(P)
Veeramangudi (Devangudi) Village,
Papanasam Taluk,
Thanjavur District.
Tamil Nadu

APPLICANT
THE EXECUTIVE ENGINEER,
Public Works Department, WRD,
Mining and Monitoring Division,
Thanjavur, Tamil Nadu

CONSULTANT

AADHI BOOMI MINING AND ENVIRO TECH (P) LTD.
NABET Accredited EIA Consultant – "A" Category.
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December , 2020

Executive Engineer, WRD,
Mining and Monitoring Division
Thanjavur.

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Executive Engineer, WRD,
Mining and Monitoring Division,
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PRE-FEASIBILITY REPORT

FOR QUARRYING SAND.

OVER AN EXTENT OF 3.60.0HA INSF.NO.1(P),IN VEERAMANGUDI (DEVANGUDI)VILLAGE, PAPANASAM TALUK, THANJAVUR DISTRICT, TAMIL NADU

1. EXECUTIVE SUMMARY

This is Sand quarrying project, Minor minerals, over an extent of 3.60.0 Hectares in SF. No. 1 (P), a part of Coleroon River in Veeramangudi (Devangudi) Village, Papanasam Taluk, Thanjavur District, Tamil Nadu. The quantity to be removed \ excavated shall be 61,364m3 as permitted by the Dept. of Geology and Mining, Thanjavur for a lease period of three years vide precise area letter Rc.No.655-1/Mines/2020, dated 15.11.2020**,** 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 "Enforcement & Monitoring Guidelines For Sand Mining-2020"approved by Deputy Director of Dept of Geology and Mining, Thanjavur vide letter No. Rc No. 655-1/Mines/2020 dated 17.12.2020. The Environment Clearance is required under Rule 42 of TNMMCR, 1959 under category B2 for a fresh quarry lease for Sand from Coleroon river.

2. INTRODUCTION OF THE PROJECT

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

The lease land\river basin was owned and 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, Thanjavur to obtain permission for removal of sand and seeking Environmental clearance from SEIAA, Chennai for grant of fresh Quarry Lease with

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the District Collector, Thanjavur

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,

Public Works Department, WRD,

Mining and Monitoring Division,

Thanjavur, Tamil Nadu

A copy of Mining lease letter issued from the District Collector (R.C.No. 655-1/Mines/2020 dated 15.11.2020) 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 Toposheet No.58N/1 and falls between Latitude of N10°56'21.29208" to N10°56'26.00101" and Longitude of E 79° 9'57.15101" to E79°10'07.37352"

Table No.2.1. Geo Coordinates of Applied area by DGPS Survey

P.No	Latitude (N)	Longitude (E)	Utm E(m)	Utm N(m)	Elevation
1	N10°56'21.29208"	E79°09'57.46117"	299569.684	1209870.957	33.03
2	N10°56'25.13103"	E 79° 9'57.15101"	299561.556	1209989.888	33.488
3	N10°56'26.00101"	E79°10'6.99012"	299860.012	1210014.321	33.012
4	N10°56'22.29435"	E79°10'07.37352"	299870.872	1209899.927	33.492

Table No.2.2. Location details

District	Taluk	Village	S.F.No	Area (Ha)
Thanjavur & TamilNadu	Papanasam	Veeramangudi (Devangudi)	1 (P)	3.60.0Ha

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

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Thanjavur.

the Coleroon river. The proposed area for quarry lease is river poramboke land, not a forest land.

Type of Mining: Mining would be carried out by opencast Manual method. Excavation of sand by manual method using hand shovel and load into Bullock Cart, As the sand is loose granular material, it does not require any drilling.

Period of Mining: Three years from the date of execution of quarry lease.

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

i) The Coleroon 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 downstream 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 on royalty basis as per the order of state Govt.

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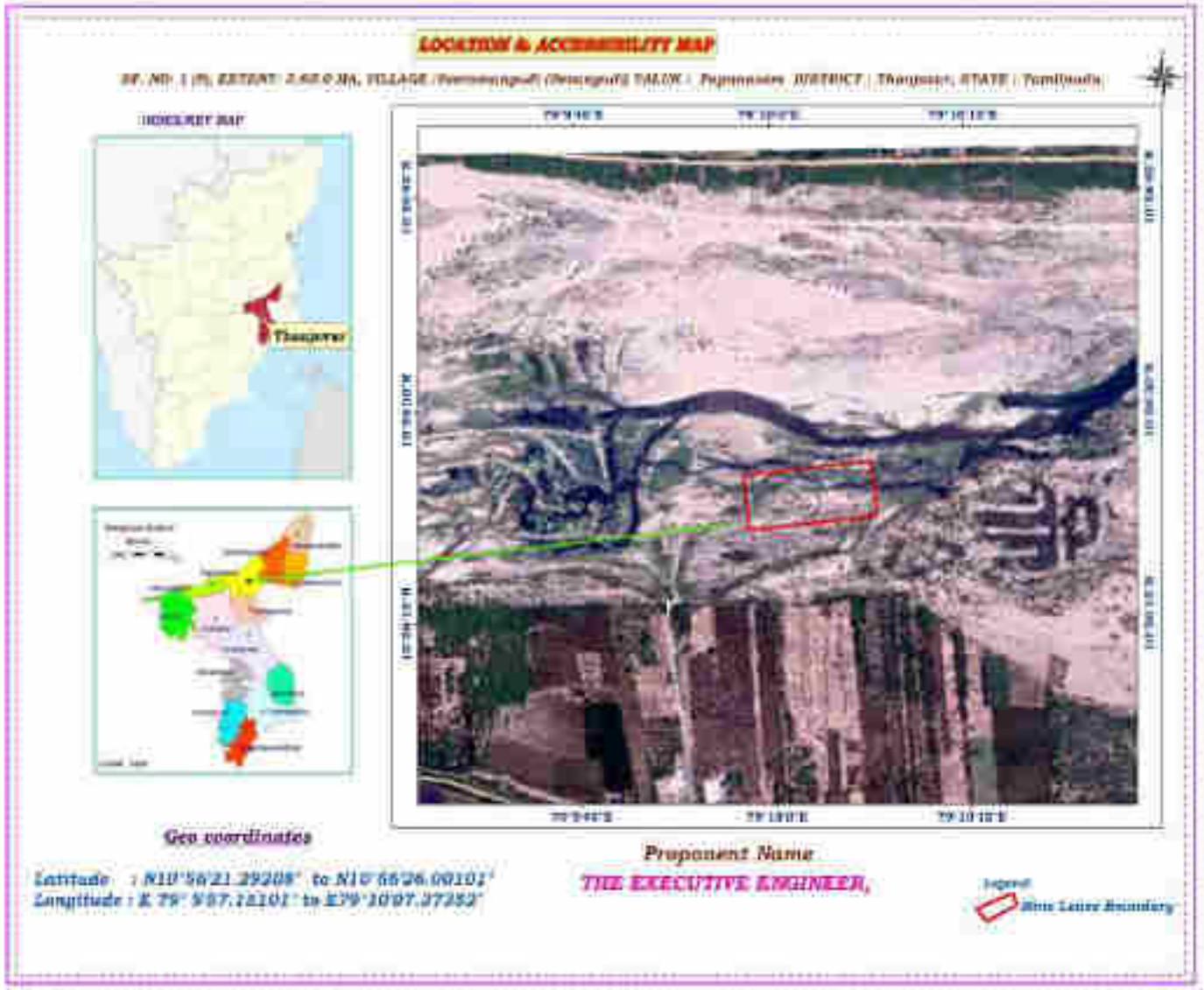

Fig.2.1 Location Map of the proposed sand quarry

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Mining and Monitoring Division,
Thanjavur.

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.

The managerial supervisory staff will be a PWD Assistant Engineer and other workers will be employed by experience. About 2 staff members and 34labours about 32 persons will be engaged for proposed mining project. The tentative man power required for the proposed mining project shall be as follows: -

Table No.2.3. Employment detail

Supervisory & Skilled Persons				
S.No	**Designation**		**Nos**	**Cumulative**
1	PWD Assistant Engineer		1	**2**
2	Technical Assistant		1	
Total			**2**	
Semi skilled & Unskilled Labours				
S.No	**Designation**		**Nos**	**Cumulative**
3	Bullock Cart persons		12	**34**
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	
Grand Total			**36**	

3. PROJECT DESCRIPTION

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

This project is located in Veeramangudi (Devangudi) Village, Papanasam taluk, Thanjavur 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 3.60.0 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 Toposheet No.58N/1 and falls between Latitude of N10°56'21.29208" to N10°56'26.00101" and Longitude of E 79° 9'57.15101" to E79°10'07.37352"

Table No.3.1. Geo Coordinates of Applied area by DGPS Survey

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4	N10°56'22.29435"	E79°10'07.37352"	299870.872	1209899.927	33.492

The area is accessible from Thanjavur to Thiruvaiyaru by 12.5Km via SH22Road. Then10Km travel to reach Pattugudi road viaSH22Road. Further 1.4Km travel to reach the Kollidamkallanai road. Another 2.7km travel to reach Devanagudi. From here, site is located 800m Northern side. A Village road is available nearby the site..

Details of infrastructures and communication are given in the table below

Table No.3.2. Details of infrastructures and communication

1	Railway	Ayyampet	6.3	SE
2.	Post office	Veeramangudi	1.6	SW
4	Airport	Thanjavur	23.5	SW
5	Police station	Valuthoor	6.4	SE
6	Fire service	Papanasam	11.3	E
7	Primary Healthcentre	Veeramangudi	1.5	SW
8	DSP Office	Papanasam	11	E
9	School	Veeramangudi	1.6	SW

10	Nearest Town	Papanasam	11	E
11	**Villages**			
	i)	Veeramangudi	1.5	SW
	ii)	Devanangudi	1	S
	iii)	Elakurichi	1	N
	iv)	Govindanattucheri	2.3	E

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 83,697m^3 for three years by open cast mining.

3.5 Project description with Process Details

Mining Process Details

1) Fixing boundaries of lease area covering an extent of 3.60.0Hectares

2) Loading of sand into Bull lock cart by manual loading.

3) Transport of sand to Needy customer 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 manual excavation and loading to the Bullcok cart and directly transported to the needy customer site. 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

Mining would be carried out by opencast Manual method. Excavation of sand by 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 shall be done by Excavator into Tippers

c) Transportation

Haulage of minerals will be done by Tipper directly carry from mining site to the stock yard.

Table No.3.3. Details of Production

Year	Over Burden/Shoal portion (m^3)	ROM of sand (m^3)	Saleable sand (m^3)	Sub grade ore / mineral	Mineral Rejects	Ore to overburden ratio
1st	15899	12000	27899	0	0	1:0
2nd	15899	12000	27899	0	0	1:0
3rd	15899	12000	27899	0	0	1:0
Total	**47697**	**36000**	**83697**	0	0	1:0

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 needy customer site 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 1.5KLD. Dust suppression and Green belt of water is 3.5KLD.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 adjacent open well in Coleroon 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.

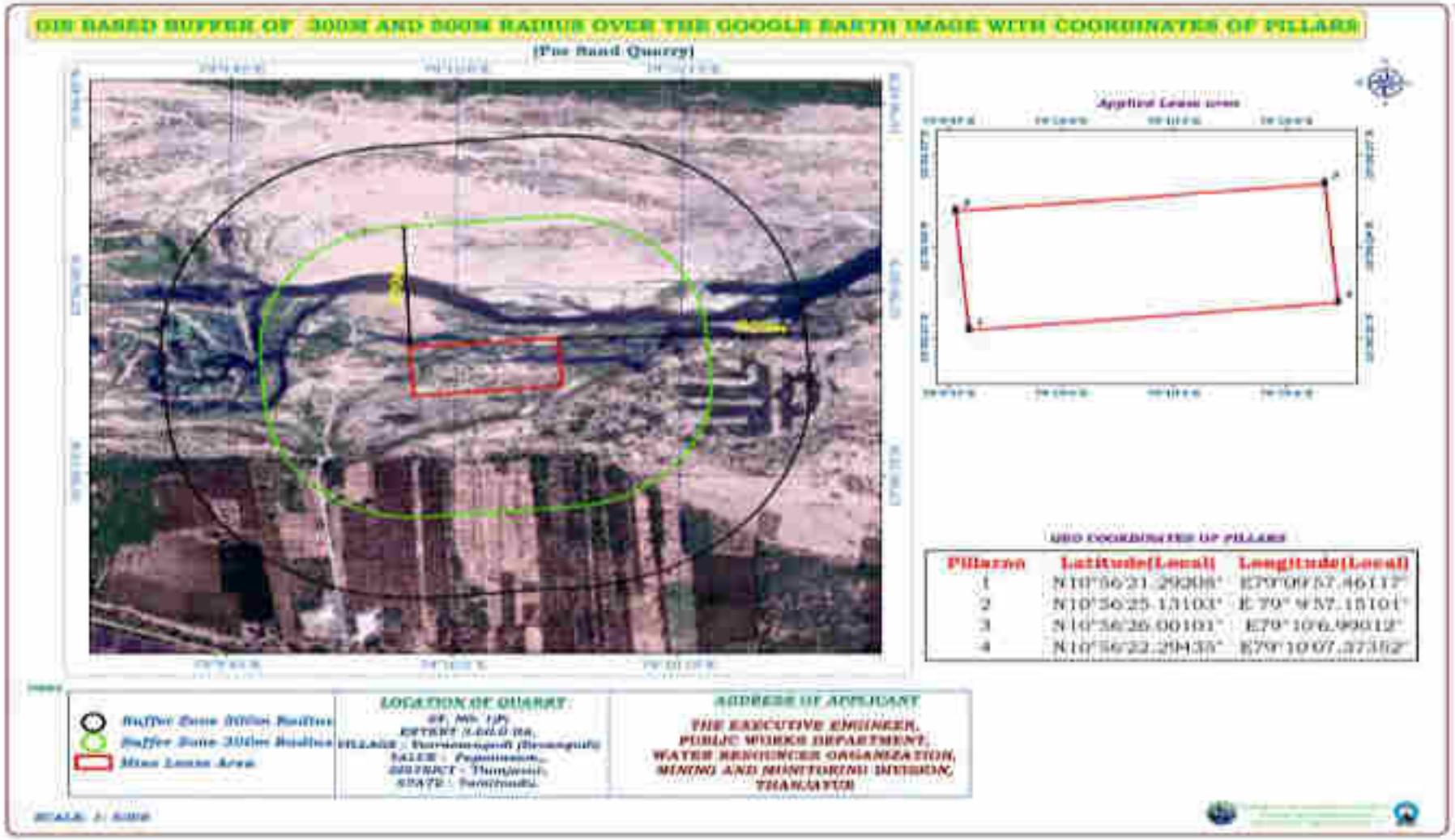

Fig.3.1: Google earth Image showing 300m/500m radius from the sand quarry lease boundary

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3.9. Water balance chart:

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

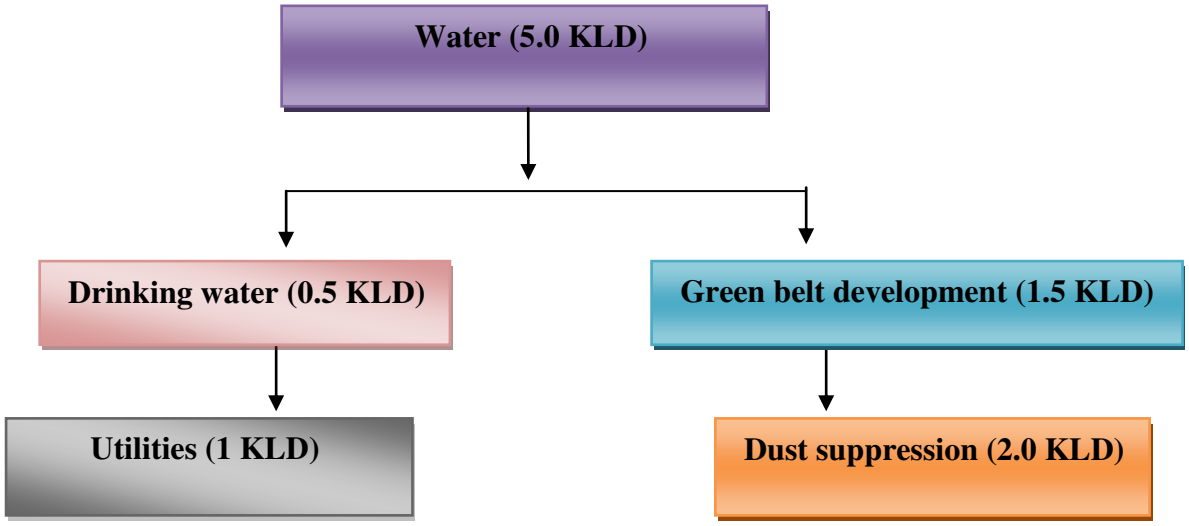

Fig. 3.2: Water Balance Chart

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's 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 Thanjavur to Thiruvaiyaru by 12.5Km via SH22Road. Then10Km travel to reach Pattugudi road viaSH22Road. Further 1.4Km travel to reach the Kollidamkallanai road. Another 2.7km travel to reach Devanagudi. From here, site is located 800m Northern side. A Village road is available nearby the siteThe 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 ownership details

District	Taluk	Village	S.F.No	Area (Ha)
Thanjavur & TamilNadu	Papanasam	Veeramangudi (Devangudi)	1 (P)	3.60.0Ha

4.3. Topography (along with Map):

The elevation of the area in Coleroon River is 34.951m (Mini) – 35.459m(Max) above MSL with a gentle slope due east. The area is represented in the Survey of India Topo sheet No. 58 N/1 and falls between Latitude of N10°56'21.29208" to N10°56'26.00101" and Longitude of E E 79° 9'57.15101" to E79°10'07.37352This 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 reserve forest, 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 Coleroon 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 Three years
1.	Mining	0.00.0	3.60.0
2.	Waste Dump	Nil	0.00.0
3	Safety zone & Plantation	Nil	Nil
4	Undisturbed area	3.60.0	0.00
Total		**3.60.0**	**3.60.0**

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

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, SO2, NOx
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	• Water spraying over haul road using sprinklers. • Development of Green belt with the native species of trees having leaves and dense growth to control spreading of dust to villages and minimize noise level from vehicles operation.
Storage	High dust emission	No storage applicable for this project

4.5.4.Mine Drainage

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

4.5.5.Noise Levels

Noise level has to be studied prior to mining and after opening the quarry for production. Ambient noise level on threshold is 40.7dB.

4.5.6.Vibration Levels

Muddy sludge shall be removed prior to removal of Sand and keep along the bank of the tank for growing trees.

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

4.5.8. Solid waste Management:

Solid Waste Generated: No solid waste removal

Disposal of waste

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

Top soil Management: No top soil removal

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

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

4.5.10 Water quality

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

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Thanjavur

Table No.4.5.Water sample analysis

Physical and Chemical Properties of Ground water sample

S.no	Parameters	Unit	Results (Bore water)	As per IS 10500: 2012	
				Requirement (Acceptable limit)	Permissible limit in the absence of alternate source
1	pH value at 25°C	-	7.16	6.5 – 8.5	6.5 – 8.5
2	Turbidity	NTU	2.2	1	5
3	Electrical conductivity at 25°C	Micromhos/cm	1690	-	-
4	Total Suspended Solids	mg/l	18	-	-
5	Total Dissolved Solids	mg/l	940	500	2000
6	Total Hardness as $CaCO_3$	mg/l	445	200	**600**
7	Chlorides as Cl	mg/l	200	250	1000
8	Sulphates as SO_4	mg/l	141	200	400
9	Total Iron as Fe	mg/l	1.39	0.3	0.3
10	Silica (Reactive) as SiO_2	mg/l	36	-	**-**

Micro biological examination

S.NO	Parameters (MPN / 100 Ml)	Results Bore water	Requirement as per IS 10500: 2012 Second revision (Acceptable Limit)
1	Total Coliforms	70	Shall not be detectable in any 100 ml
2	E.Coli	Absent	Shall not be detectable in any 100 ml

4.5.11 Air Quality

Drilling and blasting operations are source of fugitive dust emission but its effect is more or less localized. The major part of the dust generated during such operations usually gets settle down and thus the effect of such operation will be localized phenomenon. The

generation of dust is controlled and suppressed at source by sprinkling of water on haul roads, loading points at regular intervals.

Table No.4.6.Air Quality test report

Sl. No	PARAMETERS	PROTOCOL	UNIT	RESULT	NAAQS*
1	Particulate Matter ($PM_{2.5}$)	SOP-EA-001	µg / m^3	25	60
2	Respirable Particulate Matter (PM_{10})	IS 5182 Part 23-2017	µg / m^3	39	100
3	Sulphur Dioxide (SO_2)	IS 5182 Part 2 - 2017	µg / m^3	9	80
4	Nitrogen Dioxide (NO_2)	IS 5182 Part 6-2017	µg / m^3	10	80
5	Ozone (O_3)	IS 5182 Part 9-2014	µg / m^3	17	180
6	Lead (Pb)	IS 5182 Part 22-2017	µg / m^3	BDL (DL=0.1)	1
7	Carbon Monoxide (CO) (1 Hour)	IS 5182 Part 10-2014	mg/m^3	BDL (DL=1.15)	4
8	Ammonia (NH_3)	SOP-EA-009	µg / m^3	20	400
9	Arsenic (As)	SOP-EA-010	ng / m^3	BDL (DL=1.0)	6
10	Nickel (Ni)	SOP-EA-011	ng / m^3	BDL (DL=0.1)	20
11	Benzene (C_6H_6)	IS 5182 Part 11-2017	µg / m^3	BDL (DL=0.1)	5
12	Benzo (a) Pyrene	IS 5182 Part 12-2014	ng / m^3	BDL (DL=0.1)	1

4.5.12Flora 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.	VivasaayaMullu Maram	*Acasia bushes*	Innumerable	

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2.	Panai/ Palmyra tree	*Borassusfiabellifer*	Innumerable	
3.	Thailamaram	*Eucalyptus*	Innumerable	
4	ThennaiMaram	*Cocosnucifera*	Innumerable	

d) HERBS:

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

S.No	Tamil Name	Botanical Name	Number of Plants	Photograph
1.	Erukku Chedi	*CalotropisGigantea*	Innumerable	
2.	Nanel	*Cyperusrotundus*	Innumerable	

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Thanjavur

3.	Oomathi	*Datra alba nees*	Innumerable	

Fauna:

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

a) Mammals:

Table No.4.8A 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:

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

S. No.	Tamil & English Name	Zoological Name
1.	Kalugu (*Black kite)*	Milvis migrans
2.	Myna (*Black drogue*)	Dicrurus macrocercus
3.	Kakka (*House crow*)	Corvus splendens
4.	Chittukuruvi (*Indian Robin*)	Saxicoloides fulicatus
5.	*Parunthu(***Brahminy Kite***)*	*Haliastur indus*

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c) Butterfly/Insects:

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

S.No.	Tamil & English Name	Zoological Name
1.	Theil (*Scorpion*)	Scorpiones
2.	Vannthupoochi (*Millipedes*)	Diplopoda

4.13. OTHER PERMANENT STRUCTURES

4.13.1 Habitations / Village:

Population of Veeramangudi (Devangudi)village 2596, it is small village inTaluk and Thanjavur District. Other Village hamlets were given in the following table,

Table No.4.9. Human settelement

Direction	Name of Village	Distance from Mines in Km (Approx)	Population
SW	Veeramangudi	1.5	3025
S	Devanangudi	1	2596
N	Elakurichi	1	6008
E	Govindanattucheri	2.3	3088

4.13.2 Power Lines (HT / LT): There is no HT or LT lines is found nearby 50m radius.

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

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

4.13.5 Road (NH, SH others):

The NH-45croad is situated at 3.8km away from site connecting Thanjavur -Kumbakonamon SE side. SH 22situated about 1.9km Connecting Thanjavur–Kumbakonam on S side. A Village road is available nearby the site on the SE side for transportation of materials.

4.13.6 Places of worship: Nil

4.13.7 Reserved forest / Forest / Social forest / wild life sanctuary etc.,:

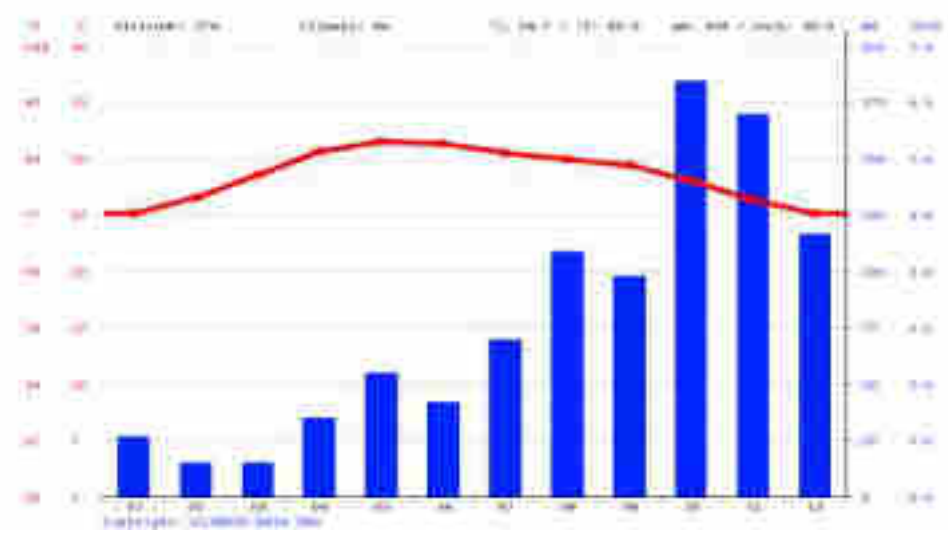
The following reserve forest is located within the 10km radius.

1. Alagaimanavalam RF is located about 2km on the NE side.
2. Kuruvadi RF is located about 6km on NE side.
3. Thiruvenganur RF is located about 3.6km on NW side.

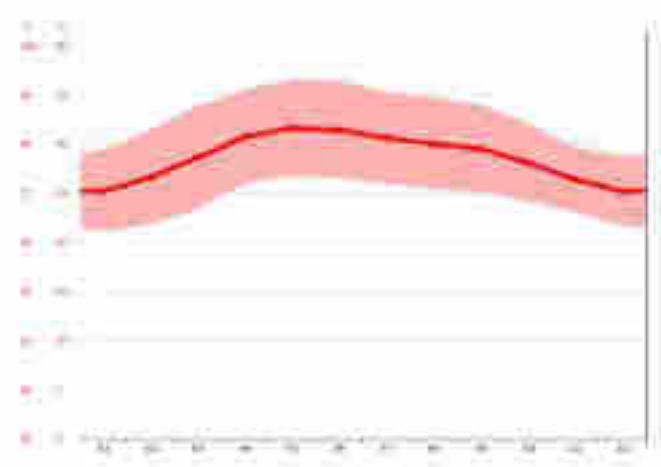
4. Karaipakkam extension RF is located 8.7km on Western side

4.7 Climatic Conditions

The Thanjavur lies on 57m above sea level This city has a tropical climate. When compared with winter, the summers have much more rainfall. According to Köppen and Geiger, this climate is classified as Aw. The average temperature in Thanjavur is 28.7 °C | 83.6 °F. Precipitation here is about 938 mm | 36.9 inch per year.



The least amount of rainfall occurs in February. The average in this month is 15 mm | 0.6 inch. In October, the precipitation reaches its peak, with an average of 185 mm | 7.3 inch.



THANJAVUR AVERAGE TEMPERATURE

The temperatures are highest on average in May, at around 31.6 °C | 88.9 °F. At 25.2 °C | 77.4 °F on average, January is the coldest month of the year.

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	January	February	March	April	May	June	July	August	September	October	November	December
Avg. Temperature (°C)	25.2	26.6	28.6	30.7	31.6	31.4	30.6	30	29.5	28.1	26.4	25.2
Min. Temperature (°C)	21.1	21.8	23.4	26	26.7	26.5	26	25.4	25.1	24.2	23.1	21.7
Max. Temperature (°C)	29.4	31.4	33.8	35.5	36.6	36.4	35.3	34.7	34	32.1	29.7	28.7
Avg. Temperature (°F)	77.4	79.9	83.5	87.3	88.9	88.5	87.1	86.0	85.1	82.6	79.5	77.4
Min. Temperature (°F)	70.0	71.2	74.1	78.8	80.1	79.7	78.8	77.7	77.2	75.6	73.6	71.1
Max. Temperature (°F)	84.9	88.5	92.8	95.9	97.9	97.5	95.5	94.5	93.2	89.8	85.5	83.7
Precipitation / Rainfall (mm)	27	15	15	35	55	42	70	109	98	185	170	117

The variation in the precipitation between the driest and wettest months is 170 mm | 7 inch. The variation in annual temperature is around 6.4 °C | 43.5 °F.

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 Three years only. The proposed working is by opencast Mechanized 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 below theoretical bed level 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

Population Characteristics –Veeramangudi (Devangudi) Village

In Papanasam taluk, Veeramangudi village had a total household 669 in 2001 which is increased to 844 in according to census 2011. Village had a total person of 3287 in 2011 census previous census 3025 persons in 2001. There were about 1654 men (50%) according to 2011 census and 1547men (51 %) in 2001 census marking an increase of 107 men over the previous census. During 2001 there were about 1478 women (48%), which is increase to 1633 (50 %) in 2011 census.

Veeramangudi village had a literate accounted for 1725 persons (57%) in 2001 and increased to 2071 persons (63 %) in 2011. There were about 64 percent males in 2001 and 69 percent in 2011. There were about 723 (49%) females increased to 919 (56 %) classes as literates in 2011.

Sex composition is the most important demographic characteristics that affect the incidence of birth and death. The average sex ratio in Papanasam taluk, Veeramangudi village was 955 during 2001 census an increase to 987 the year of 2011. The highest sex ratio may be either due to the migrants for educational purpose and employment opportunities.

Population Characteristics- Veeramangudi (Devangudi) Village, Papanasam Taluk, Thanjavur District (2001-2011)

Sno	Characteristics	2001	%	2011	%
1	Total Household	669		844	
2	Total Population	3025		3287	
3	Male Population	1547	51.14	1654	50.32
4	Female Population	1478	48.86	1633	49.68
5	Total Literacy	1725	57.02	2071	63.01
6	Male Literacy	1002	64.77	1152	69.65
7	Female Literacy	723	48.92	919	56.28
8	Sex Ratio		955.4		987.3

Occupational Characteristics- Veeramangudi (Devangudi) 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 Veeramangudi village had 1625 workers accounting for 54 percent of the total population of the Village. During 2011 there were about 1414 (43%) according to the census. There were about 1033 men (66%) during 2001 which is decreased to 1001 persons (60%) according to census 2011. There were about 592 (40%) female according to 2001 which is decreased to about 413 (25%) female during 2011 marking increased to 179 women over the previous census 2001.

In Veeramangudi village had a total main workers accounted of 948 (31%) persons during 2001 census which is an increase to 985 (30 %) persons during 2011. There were about 254 (17%) women in 2001 and 180 women according to the census 2011 marking an increases of 74 women over the previous census.

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. Papanasam taluk in Veeramangudi village had agricultural labourers 569 (40% of the total workers) agricultural labourers during census 2011. There were about 433 (43% of male workers) men in 2011 which is decrease to 260 (25% of male workers) according to census years 2001. Veeramangudi village had female agricultural laborer increased 176 (29% of female workers) census 2001 compare to the census 2011 about 32 % of female workers increases.

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 Veeramangudi village area between 2001 and 2011. Secondary workers during 2001 and 2011 it could be stated that this may be due to the opening of a number of manufacturing units in the study area.

The tertiary workers include the labour force engaged in service sector such as education, medical, judicial, finance, administration, recreation, trade and commerce and transport. In Veeramangudi village had tertiary workers accounted for about 5 percent of the workers during 2001 census it is increased 10% according to census 2011.

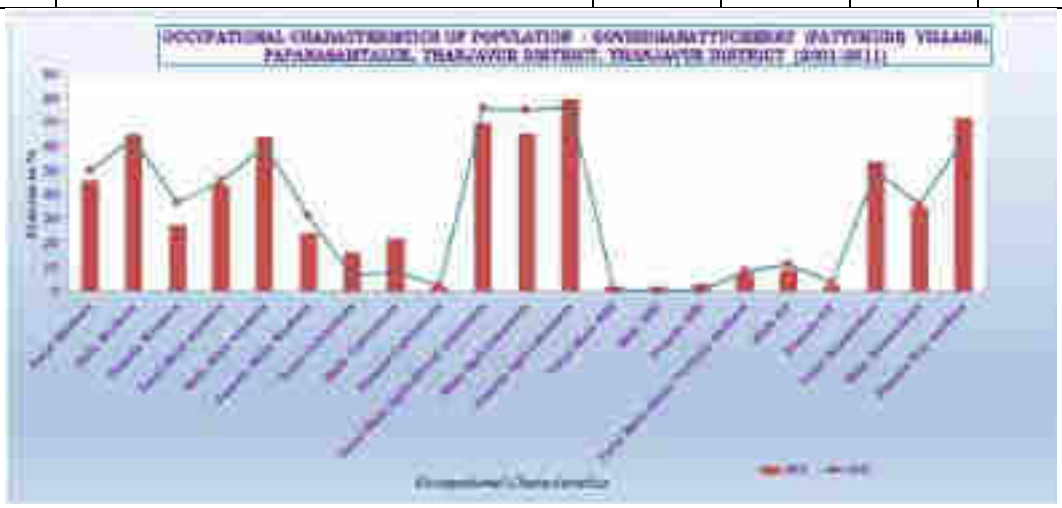
The study area has experienced a change in the occupational structure in the form of a decline in the proportion of cultivators, agricultural laborers and an increase in the proportion of Non workers.

In Veeramangudi village had non workers population accounted of 1873 (57% of the total population) according to census 2011. Which is decreased from previous census 2001 had population 1400 (46%). Because of more number of people are educated most of people living the village had agriculture labourers and cultivators both are working in the village life.100 days employment opportunity increased.

Occupational Characteristics of Population -Veeramangudi (Devangudi) Village,Papanasam Taluk, Thanjavur District (2001-2011)

Sno	Characteristics	2001	%	2011	%
1	Total Population	3025		3287	
2	Male Population	1547	51.14	1654	50.32
3	Female Population	1478	48.86	1633	49.68
4	Total Workers	1625	53.72	1414	43.02
5	Male Workers	1033	66.77	1001	60.52
6	Female Workers	592	40.05	413	25.29
7	Total Main workers	948	31.34	985	29.97
8	Male Main workers	694	44.86	805	48.67
9	Female Main Workers	254	17.19	180	11.02
10	Total Cultivators	355	21.85	239	16.90
11	Male Cultivators	326	31.56	226	22.58
12	Female Cultivators	29	4.90	13	3.15
13	Total Main Agricultural Labourers	436	26.83	569	40.24
14	Male Agri.Labourers	260	25.17	433	43.26
15	Female Agri.Labourers	176	29.73	136	32.93

16	Total Main HHI	68	4.18	34	2.40
17	Male HHI	33	3.19	28	2.80
18	Female HHI	35	5.91	6	1.45
19	Total Main Other Tertiary workers	89	5.48	143	10.11
20	Male OT	75	7.26	118	11.79
21	Female OT	14	2.36	25	6.05
22	Total Nonworkers	1400	46.28	1873	56.98
23	Male Nonworkers	514	33.23	653	39.48
24	Female Non workers	886	59.95	1220	74.71



There are some people who are engaged in trading of sand, gravel, Rough stone and Bajri. Therefore due to quarrying, the per capita income of local people has been improved. The local people have been provided with either direct employment or indirect employment such as business, contract works and development work like roads, etc. and other welfare amenities such as medical facilities, conveyance, free education, drinking water supply etc. The job/ business opportunities have improved the economic conditions of the persons. They are in a position to utilize this money for purchase of tractors, trucks, jeeps, etc. which may be invested into use for business purposes. Part of money has also been utilized in starting of some business as per personal skills.

Infrastructure Improvements

There can be significant infrastructure improvements with the construction of a quarry. Most mining operations of any size are served by roads, water supplies, sanitation systems, and electricity. If these are restricted to use by the company, and designed solely for company objectives, they may be of little relevance to anyone else. With some advanced planning and willingness to consult with the community, these can bring lasting benefits at

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little or no added cost. The development of infrastructure may facilitate development of other forms of economic activities such as business centre.

Benefits:

The local people have been provided with either direct employments or indirect employment such as business, contract works and development work like roads, etc. and other welfare amenities such as medical facilities, conveyance, free education, drinking water supply etc.

Awareness and opinion of the people about the project for the assessment of awareness about the project activities and opinion about it, following salient observations were recorded:

- during survey it was observed that only nearby villagers are aware and other villagers are not aware about the proposed project
- People in the region expect job opportunities and improvement in educational, transportation and sanitation facility from project authority.

ENVIRONMENTAL IMPACT AND MITIGATION MEASURES

Socio Economic Environment

The mine area does not cover any habitation. Hence the mining activity does not involve any displacement of human settlement. No public buildings, places, monuments etc exist within the lease area or in the surrounding area for 300m. The mining operation will not disturb/ relocate any village or need resettlement. Thus no adverse impact is anticipated. The impact of mining activity in the area is positive on the socio-economic environment of the region. Sand mine in Veeramangudi (Devangudi) village is providing employment to local population and it will be give preference to the local people for the man power.

General

The project will bring overall improvement in the locality, neighborhood and the state by bringing industry, roads, water supply, electricity, employment, living standard and economic growth.

Employment

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The socio-economic conditions of the surrounding villages are poor as there is no significant source of earning. The occupational activities are agriculture, cattle rearing and employment in mines but on daily wages. The mining activity will provide employment to local people which will increase socio economic status of the area.

Improvements in Physical and Social Infrastructure

The opening of the proposed project will enhance the socio-economic activities in the adjoining areas. This will result in following benefits:-

- Improvements in physical infrastructure.
- Improvements in Social Infrastructure.
- Increase in Employment Potential
- Contribution to the Exchequer.
- Prevention of illegal mining.
- During and Post-mining enhancement of green cover.

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 Green belt:

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

Suggested plant species for Greenbelt development around the project:

Table No.6.1 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.	Prosofis juliflora	Neer Karuvai	A bushy thorny tree

6.4 Social infrastructure:

The area is accessible from Thanjavur to Thiruvaiyaru by 12.5Km via SH22Road. Then10Km travel to reach Pattugudi road viaSH22Road. Further 1.4Km travel to reach the Kollidamkallanai road. Another 2.7km travel to reach Devanagudi. From here, site is located 800m Northern side. A Village road is available nearby the site. . 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 Thanjavur to Thiruvaiyaru by 12.5Km via SH22Road. Then10Km travel to reach Pattugudi road viaSH22Road. Further 1.4Km travel to reach the Kollidamkallanai road. Another 2.7km travel to reach Devanagudi. From here, site is located 800m Northern side. A Village road is available nearby the site.

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

The requirement of water will be of drinking water need for the labours, which will be around 0.5 KLD. Drinking water is obtained by Mineral water industries by water canes. Dust suppression and green belt is obtained from the open wells in the adjacent wells of coleroon river..

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 ousters, land ousters, 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.

PROJECT COST & EMP BUDGET

a) Project cost / investment

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

b) EMP

i.	Environmental Monitoring	= Rs 1,25,000
ii.	Sanitary arrangements	= Rs 50,000
iii.	Safety kits,	= Rs 75,000
iv.	Water supply for dust control	= Rs 1,00,000
v.	Afforestation etc.	= Rs 50,000
	Total	**= Rs 4.0 lakhs**

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

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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 Applicant
Along with address

Executive Engineer, WRD
Mining and Monitoring Division
Thanjavur.

THE EXECUTIVE ENGINEER
Public Works Department,
Water Resources Organization
Mining and Monitoring Division,
Thanjavur, Tamil Nadu.

Signature of EIA Coordinator

For Aadhi Boomi Mining & Enviro Tech (P) Ltd

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

Date: 18.02.2022
Place : Salem

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Thanjavur