

ENVIRONMENT MANAGEMENT PLAN

Executive Summary

The applicant, THE EXECUTIVE ENGINEER, Public Work Department, Water Resources Department, Mining and Monitoring Division, Tiruchirappalli District has been applied for sand Quarrying in Vellaru River, over an extent of 1.20.0 Hectares in S.F. No. 302(P), in Sannasinallur Village of Sendurai Taluk, Ariyalur district, Tamil Nadu.

The District Collector, Ariyalur has directed the applicant vide his precise area communication letter Rc.No.236/G&M/2018 dated 27.02.2020 to get approved Mining plan and Environmental Clearance from the state Environmental Impact Assessment Authority (SEIAA) for grant of Sand Quarry in S.F. No. 302 (P), Sannasinallur Village of Sendurai Taluk, Ariyalur district, Tamil Nadu for a period of one year.

The mining plan is prepared as per the District Collector's proceedings letter. No. Rc.No.236/G&M/2018 dated 27.02.2020 under Rule 41& 42 of Tamil Nadu Minor Minerals Concession Rules, 1959 for quarrying Sand with due consideration of environmental parameters so as to obtain Environmental clearance (EC) from EIA Authority (SEIAA/DEIAA), as per the EIA Notification, 2006 and EM- Sand Mining Guidelines, 2020. The project cost is about Rs 3.25 lakhs and EMP cost is Rs 2.50 lakhs.

Open cast, manual mining method will be adopted to extract Sands of required size from the area for which lease applied for. Before opening a mine, several aspects should be considered like construction of semi-permanent structures, planning for the development / production works, formation of faces, lying of approach for movement of bullock carts, recruitment of man power, deployment of machinery, etc.

Geological reserves are estimated at 65784m³ depths of 5.482m and recoverable reserve is estimated as 1200m³ to depth of 1.0m and 60m³ or 85 loads per day @ 0.71m³ capacity of bullock carts for 200 days per annum.


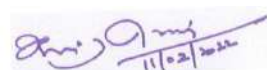

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Table No: 1.1. Salient features of the proposed project

FEATURE	DETAILS
Project and Proponent details	
Name of the Proponent and address	THE EXECUTIVE ENGINEER, Public Works Department, Water Resources Organization, Mining and Monitoring Division, Tiruchirappalli.
Existing/New Quarry	New
Classification of the area (Ryotwari/Poramboke/Others)	The proposed site is located in River basin of a Poramboke land.
Ownership /occupancy of the Applied area (Surface Rights)	THE EXECUTIVE ENGINEER
Category	B ₂
Type of Project	Sannasinallur Sand Quarry
Site Location	S.F. No. 302 (P), in Sannasinallur Village of Sendurai Taluk, Ariyalur district, Tamil Nadu
Period of Lease	One year
Mining Details	
Method of Mining	Open cast Manual mining
Mining lease area	1.20.0 Ha
Geological Resources	65784m ³
Mineable Reserves	41784m ³
Production	12000m ³ , 60m ³ or 85 loads per day @ 0.71m ³ for 200 days per annum.
Depth of Mining	1m below the theoretical bed level
Water Table	Water table in this area is 6m from BGL.
Existing Pit Dimension	Nil
Proposed bench height & Width	Nil
Machineries	
Types of Machineries used in the	It is open cast manual mining method, Bullock




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quarry	carts of 0.71m ³ Capacity.
Blasting Pattern and Explosive	
Blasting Pattern	No blast is proposed
Types of Explosive	
Measures proposed to minimize ground vibration due to blasting	
Storage of explosive	
Approvals	
Mining plan approval	Assistant Director, Geology and Mining, Ariyalur vide Rc. Rc.No.236/G&M/2018 dated 27.02.2020
AD Letter for 500m radius cluster certificate.	Rc.No.236/G&M/2018 dated 27.02.2020.
Precise area Communication Letter	Rc.No.236/G&M/2018 dated 27.02.2020
General conditions	
Does it attract any general conditions specified in the EIA notification, 2006?	<p>1. Forest (Conservation) Act 1980: No reserve forest with in 10km radius. The area does not attract the Forest (Conservation) Act 1980</p> <p>2. Wild Life (Protection) Act, 1972: There is no wild animal sanctuary within 10 km radius from the project site under the Wildlife (Protection) Act, 1972.</p> <p>3. Coastal Zone: The proposed quarry is located 71kms away from Bay of Bengal on towards Eastern side. Hence, the project doesn't attract the C.R.Z. Notification, 2011.</p>
Defence installations	Nil within 10 km
Archaeological features	Nil within 10 km
Ecological sensitive zones	Nil within 10 km
Interstate Boundary	Interstate boundary is located at 165kms from site to Tamil Nadu – Andhra Pradesh border line on

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	the NW directions
Nearest streams/ rivers/ water bodies	The project site located at vellaru River.
Seismic zone	Zone-II, Low damage risk zone as per BMTPC, Vulnerability atlas Seismic zone of India IS: 1893-2002.
Requirement (Water and Man power)	
Man Power	30 Persons
Water requirement	Total water requirement – 3.5 KLD Drinking and Utilities 0.75 KLD, Dust suppression 0.75 KLD Green Belt 2 KLD. Source: Mineral water supply and water tank
EMP Cost	Rs 2.50 Lakhs
Project Cost	Rs. 3.25 Lakhs
Infrastructure facilities	
Nearest habitation	Sannasinallur– 250m - West
PMHC	Keezheperambalur – 5km East
Nearest Town	Pennadam– 8.5km- NE
Nearest Railway station	Eachangadu– 5.5km East
Nearest Airport	Thiruchirappalli Airport- 84km-SW
Climatic Conditions	
Climatic condition	<ol style="list-style-type: none"> 1. Generally tropical climatic condition. 2. This district receives rain both in south west and north east monsoon. 3. Rainfall: Northeast is 485mm and southwest is 357mm. 4. Temperature Max: 30°C Mini: 25.1°C
Survey details	
Survey number	302 (P)
Geographical features	The area applied for mining lease is a River Bed,


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with elevation varying from **53.214m (minimum)** **54.338 m** (Maximum) to above MSL. It is represented in the Survey of India **Topo sheet No.58 M/3** and **Latitude of 11°22'35.03740"N to 11°22'39.35336"N** and **Longitude of 79°10'05.02120"E to E 79°10'11.18934"E**.

Land use pattern	S.No	Description	Present area (Ha)	Proposed land use (Ha)
	1	Area under mining	0.00.0	1.20.0
2	Roads	0.00.0	0.00.0	
3	Green belt & Dump	0.00.0	0.00.0	
4	Infrastructure	0.00.0	0.00.0	
5	Unutilized Area	1.20.0	0.00.0	
Total			1.20.0	1.20.0

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ENVIRONMENT MANAGEMENT PLAN

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

TABLE NO: 2: ENVIRONMENTAL MANAGEMENT PLAN


S.No	Parameters	Mitigation Measures
1	Water Environment	<ul style="list-style-type: none"> ▪ Mining activity will be above the ground water level and hence ground water table will not be affected. ▪ Drinking water utilized from Mineral water industries ▪ Total Water requirement will be 3.5 KLD
2	Air Environment	<ul style="list-style-type: none"> ▪ Water sprinklers along the sides of haul road shall be fixed to control fly of dust while transporting minerals and waste ▪ Avenue trees along roads around ML boundary shall be planted as per the norms of MoEF&CC to control fly of dust, noise etc. ▪ Labours engaged in such dust prone areas should be provided with safety devices like ear muff, mask, goggles as per the MMR, 1961 amendments and circulars of DGMS.
3	Noise Environment	<ul style="list-style-type: none"> ▪ This eco-friendly quarrying operation does not involve any blasting and drilling methods. Bullock carts is less than 40db. ▪ Hence noise will be minimal and this is only due to the movement of bullock carts only.

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		<ul style="list-style-type: none"> ▪ Plantation will help in arresting noise at source ▪ Periodical monitoring of noise and vibration to ensure safety environment for workers.
4	Soil Environment	<ul style="list-style-type: none"> ▪ No top soil, it is river bed.
5	Land Environment	<ul style="list-style-type: none"> ▪ By permitting quarrying of sand from this silted bed can be deepened and it will enable to increase the water holding capacity of the tank. ▪ Greenbelt will be developed around the mine lease boundary
6	Ecology and Biodiversity	<ul style="list-style-type: none"> ▪ No rare species of flora and fauna identified except regional common species.
7	Waste Management	<ul style="list-style-type: none"> ▪ There is no wastage is encountered during the quarrying operation the entire quarry is utilized.
8	Occupational Health and Safety	<ul style="list-style-type: none"> ▪ Workers involved in quarrying work shall be provided protective equipments such as Thick Gloves, Goggles, ear plugs, safety boot wears, etc... ▪ First Aid station as per provision under Rule (44) – schedule III of the Mines Rules 1955 to be provided. ▪ Qualified First Aid personnel should be appointed /nominated to attend emergency first aid treatment. ▪ Periodic medical examination has to be made for occupational health once in six months in addition to attending medical treatment of occupational injuries under

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		Rule 45 (A).
9	CSR Activities	<ul style="list-style-type: none">▪ The proponent is proposed to spend CSR @ 2.5% of profit as per the Companies Act, 2013 and CSR Rules, 2014 through local Panchayat for maintenance of road, street light, school sanitation etc., The CER will be @ 2% of the project cost.


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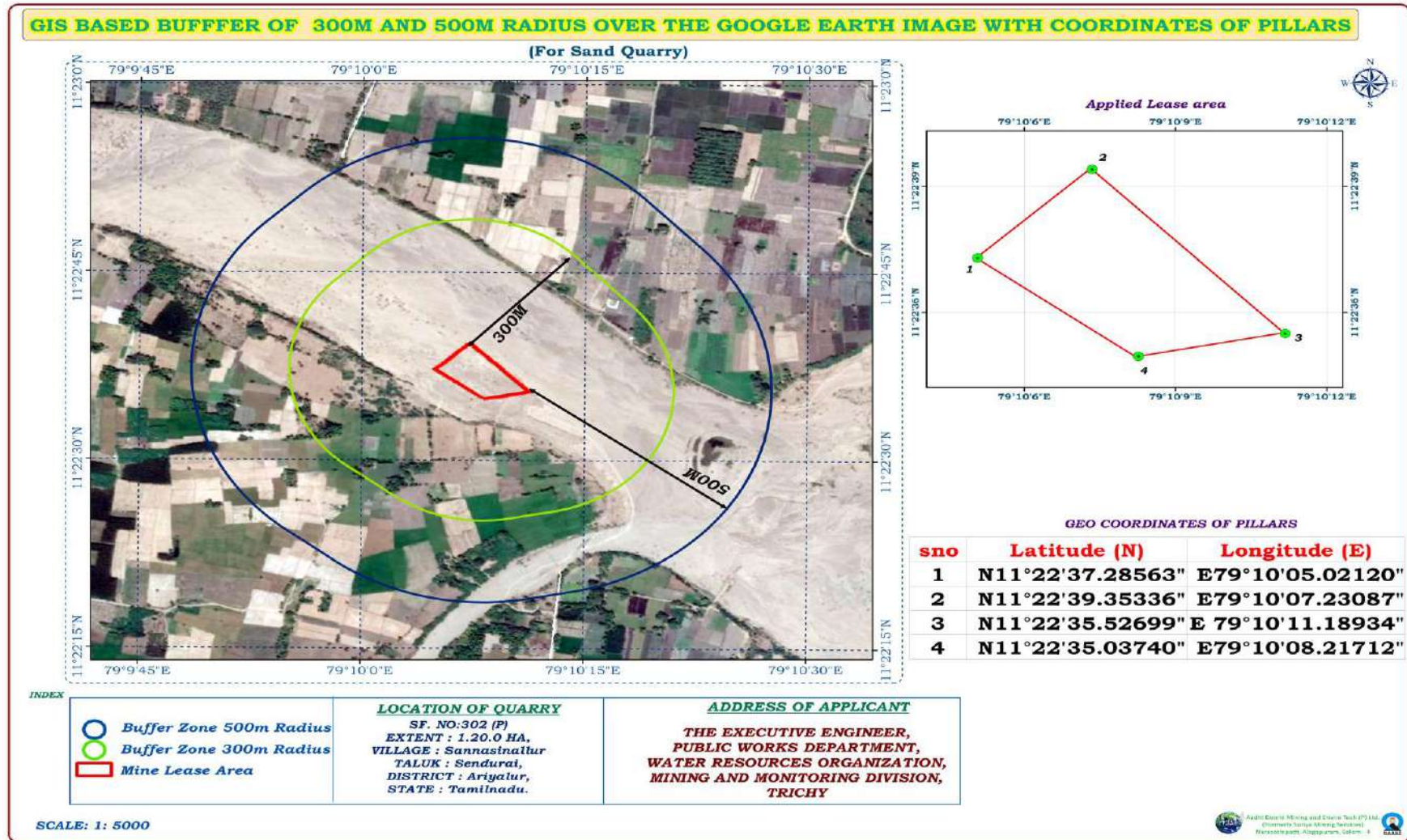


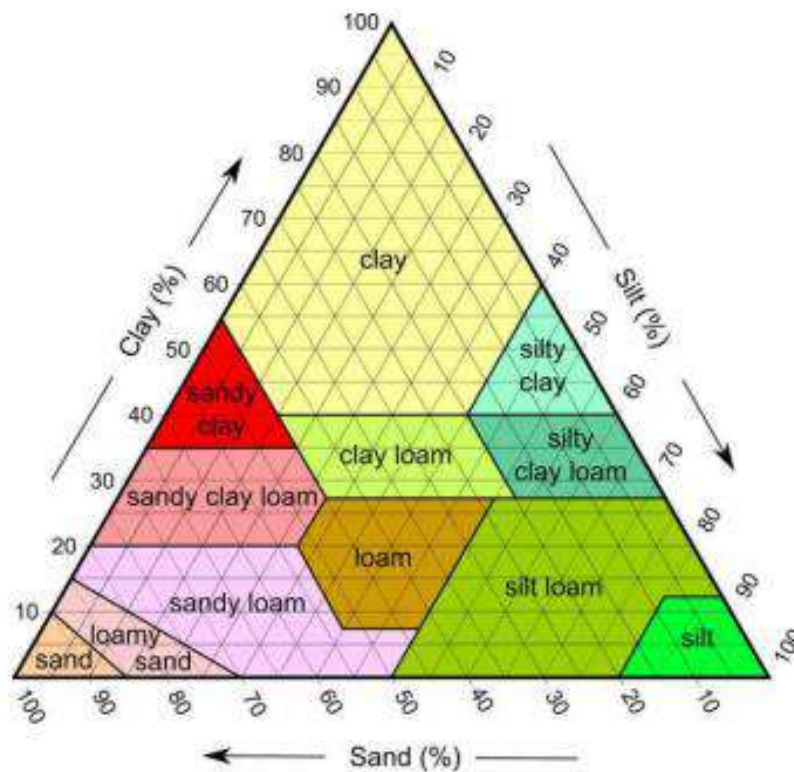
Fig No: 1. GIS Based buffer of 300/500M radius over Google Earth image.

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SOIL CLASSIFICATION

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

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



Textural triangle of Soil

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Collection soil Sample

TABLE NO: 3: SOIL TEXTURE ANALYSIS

PARAMETERS	RESULTS
pH value (10% solution)	8.82
EC@ 25°C (Micromhos/cm) (10% solution)	176
moisture	2.44 %
Bulk density	1.68kg/m ³
Texture	Sand = 62.96% : Silt = 37.14% “ Sandy Loam”

CHEMICAL PARAMETERS

PARAMETERS	RESULTS
Alkalinity	0.009%
Calcium	0.1397%
Magnesium	0.086%
Sodium	0.0018%
Potassium	0.0014%
Iron	1.22%
Copper	0.0013%
Chlorides	0.02543%
Organic Matter	13.67%
Water Holding Capacity	40%
Caco ₃	0.3%

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WATER QUALITY

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



Fig: No: 3: Collection of Water sample of Ground water and Surface water.

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TABLE: NO: 4 SURFACE WATER QUALITY ANALYSIS- SAMPLE - 1**Physical and Chemical Properties**

Sl. No	Parameters	Units	Sample 1 (surface water) result	Sample 2 (ground water) result	As per is 10500:2012	
					Requirement (acceptable limit)	Permissible limit in the absence of alternate source
1	pH value at 25°C	-	8.25	8.40	6.5 – 8.5	6.5 – 8.5
2	Turbidity	NTU	-	-	1	5
3	Electrical conductivity at 25°C	Micromhos/cm	477	1876	-	-
4	Total Suspended Solids	mg/l	0.02	0.002	-	-
5	Total Dissolved Solids	mg/l	382	1534	500	2000
6	Total Hardness as CaCO ₃	mg/l	95.92	555.9	200	600
7	Chlorides as Cl	mg/l	71.44	500.146	250	1000
8	Sulfates as SO ₄	mg/l	-	-	200	400
9	Total Iron as Fe	mg/l	-	-	0.3	0.3
10	Silica (Reactive) as SiO ₂	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	-	2/ml	Shall not be detectable in any 100 ml
2	E.coli	MPN / 100ml	-	Absent	Shall not be detectable in any 100 ml

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i. Mitigation Measures

- The quality of ground water is fairly good. There is no liquid waste discharge from quarrying activity, which is likely to pollute water.
- People already consuming this water for drinking purposes and no health implications reported.
- Total water requirement will be 3.5 KLD

• NOISE AND VIBRATION

This site there is no excavation, drilling blasting, loading and vehicle movement during transportation of minerals. With the starting of quarrying operations, it is imperative that noise levels shall increase. In order to assess the impact baseline ambient noise level, noise monitoring has been carried out at different points using Sound level meter



Fig: No: 4: Measuring Noise Level

TABLE: NO: 6 AMBIENT NOISE LEVELS

S. No	Location	Noise levels dB (A)	Limits as per TNPCB dB(A)
			(Day Time: 6:00 AM – 10:00PM)
1	Core zone	35.0	Industries – 75dB (A) Residential – 55 dB (A)
2	At Pillars lease boundary	36	
		36.3	
		37.4	
		35.9	

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

i. Mitigation Measures

- Greenbelt will be developed around the mine lease as well as safety zones which will help in arresting noise at source
- Safety devices provided to workers, where noise is more than 80dB (A)
- Limiting time exposure of workers to excessive noise
- Proper and regular maintenance of vehicles, machinery and other equipments
- Periodic inspection of all equipments and risk prone areas
- Regular lubrication & replacement of worn out parts etc...

Air Quality

Drilling and blasting operations are source of fugitive dust emission but its effect is more or less localized. Ambient Air monitoring has been carried out in the core zone.



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Fig: No: 5: Ambient Air Monitoring

The major part of the dust generated during such operations usually gets settle down and thus the effect of such operation will be localized phenomenon.

TABLE: NO: 7 AMBIENT AIR QUALITY MONITORING

S. No	Parameters ($\mu\text{g}/\text{M}^3$)	Measured Value	NAAQS
1	Particulate Matter ($\text{PM}_{2.5}$)	24	60
2	Respirable Particulate Matter (PM_{10})	40	100
3	Sulphur Dioxide (SO_2)	7	80
4	Nitrogen Dioxide (NO_2)	11	80
5	Ozone (O_3)	24	180
6	Lead (Pb)	BDL (DL=0.1)	1
7	Carbon Monoxide (CO) 1 hour	BDL (DL=1.10)	4
8	Ammonia (NH_3)	24	400
9	Arsenic (As)	BDL (DL=1.0)	6
10	Nickel (Ni)	BDL (DL=0.1)	20
11	Benzene (C_6H_6)	BDL (DL=0.1)	5
12	Benzo (a) Pyrene	BDL (DL=0.1)	1
BDL = Below Detectable Limit, DL = Detection Limit NAAQS = National Ambient Air Quality Standards			

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

i) Mitigation Measures

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

EIA General Conditions

Table No: 8: General conditions

Reserve Forest	No within 10km radius
Interstate Boundary	Interstate boundary is located at 165kms from site to Tamil Nadu – Andhra Pradesh border line on the NW directions
Wild animal sanctuary/ Park	No within 10km radius
Coastal Zone	Bay of Bengal – 71km - East

1. Power Lines (HT / LT)

There is no HT or LT lines are found in 50m radius.

2. Water bodies

The groundwater table is reported as 6m depth in nearby bore wells on this area. The de silting of the tank will facilitate rain water harvesting and recharging of the water table in the surrounding area. For quarry operation water is not required.

3. Archaeological / historical Monuments

There is no Archeological / Historical Monuments within a radius of 500 km.

4. Road (NH, SH others).


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The NH-532 road is situated at 18kms away from site a connecting Salem-Vridhachalam and S.H-141 situated 1.6Km on Northern side. A Village road is available nearby the site on the Southern side for transportation of materials.

5. Places of worship (Temple, Church, Mosque etc.,)

No infrastructures like residential building, places of special interest like temples, Sanctuaries etc., are found in the radius of 300m.

No quarry is found around 500m radius. The quarry lease area does not attract the general conditions as per EIA Notification, 2006. The project cost is about Rs. 3.25 Lakhs and EMP cost is Rs 2.50 Lakhs.



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