EXECUTIVE SUMMARY

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT OF SAND QUARRY

(As per EIA Notification, 2006 dated 14.09.2006 and amendments Enforcement & Monitoring of Sand Mining Guidelines, 2020)

Category: B_1

Extent	: 20.00.0 Ha
S. F. Nos.	: 321/1(part)
Village	: Vadarangam
Taluk	: Sirkazhi
District	: Nagapattinam

PROPONENT

THE EXECUTIVE ENGINEER
Public Works Department,
Mines and Monitoring Division,
Thanjavur.

CONSULTANT

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The Executive Engineer of Sand quarry over an extent of 20.00.00 Ha in SF No: 321/1 (Part) is located in Vadarangam village of Sirkazhi Taluk, Nagapattinam District. The area is marked in the survey of India Toposheet No.58-m/11. The area lies between northern latitude of 11˚17'0.9.70"N to 11˚17'35.56"N and eastern longitude from 79˚38'38.47"E to 79˚38'46.84"E. The mining plan was approved in favor The Executive Engineer Rc.No.402/Kanimam/2018 dated 09.02.2019 for a period of 18 months.

As per the Environmental Impact Assessment (EIA) Notification dated 14th September 2006, the project falls under 1(a) Mining of minerals, Category – B1 in view of lease area>25 and <50 Ha. In view of the above the proponent submitted the application to SEIAA/SEAC on 11.11.2019.The proposal has been placed in 139th STATE APPRAISAL COMMITTEE MEETING on 23.11.2019 and granted Terms of Reference vide Lr. No. SEIAA-TN/F. No.7254/SEAC/TOR-689/2020 dated 10.02.2020.

1.1 SCOPE OF THE PROJECT

The proposal for Environmental Clearance of Proposed Sand quarry of **The Executive Engineer** requires EIA/EMP Report as per Terms of Reference vide Lr. No. SEIAA-TN/F. No.7254/SEAC/TOR-689/2020 dated 10.02.2020.

1.2 PROJECT DESCRIPTION

Table No 1.1 Project Details

Project Details	
Proponent	The Executive Engineer
Total Mine Lease Area	20.00.00 Hectares (Govt. land)
Survey No.	321/1 (Part)
Site Location	Vadarangam village, Sirkazhi Taluk, Nagapattinam District
Geographical Co-ordinates	Latitude: 11˚17'0.9.70"N to 11˚17'35.56"N Longitude: 79˚38'38.47"E to 79˚38'46.84"E
Toposheet No.	58-m/11
Elevation	6.120m above MSL
Accessibility	
Nearest Habitation	Keezhaparuthikudi–1.0 Km–NW

	Paluranpadugai–1.2 Km–NE Vellur-1.5 Km-SW Keezhavadi-510m-SE Pattiyamedu-307m-E
Nearest Town	Lalpet – 7.45 km - NW
Nearest Roadway	NH-45A –Sirkazhi Road Chennai - Nagapattinam-7.6km-E NH-227 –Chidambaram- Kattumanar koil –2.6km-NW MDR Kollidam-Kallanai Road – 200m - E
Nearest Railway station	Kollidam Railway station – 8.8 Km E
Nearest Airport	Puducherry – 77Km NE
Environmental Sensitiveness	
Interstate Boundary	Nil within 10 km. Andhra Pradesh-Tamil Nadu Interstate boundary-195 km-NE
Coastal Zone	Bay of Bengal –20.8km (E)
Reserve Forest	Casuarina Plantation (Kollidam River Bank) – 5.54Km-NE But the proposed sand quarry does not affect the Plantation in any way. There is no Reserve forest within the10 km radius.
Wildlife sanctuary	There is no wild life sanctuary within the10 km radius
Water bodies	This project itself falls in water body (Coleroon river) Poongudi pond – 2.51Km-E Viranam Eri-10.45Km-W Thillai Pond – 5.8 km- SW North Rajan Channel – 1.90 km – NW Uppanar River – 3.9 km – NW Khan Shahib Canal – 4.15 km – NW Palavar River 4.4 km - SE
Habitations	Keezhaparuthikudi- 1.0 Km- NW- 180 population Paluran Padugai – 1.2 Km- NE – 150 Population Vellur – 1.5 Km-SW- 360 population Keezhavadi – 510 m-SE -120 population
Defense Installations	Nil within 10km radius
Quarries around 500m radius (AD Letter furnished)	No Quarries found around 500m radius
Seismic Zone	Zone-II, Low damage risk zone as per BMTPC,

	Vulnerability atlas Seismic zone of India IS: 1893-2002
Mining Details	
Method of Mining	Semi-Mechanized Open-cast.
Geological resources	6,00,000m^3
Mineable reserves	4,79,364 m^3 Sand and Sand Shoal
Production	2,00,000$m^3$of Sand and 2,79,364 m^3ofSand shoal.
Topsoil	-
Sand Rejects	-
Depth of Mining	1.0m (Proposed) below the theoretical bed level
Water Table	6-8 m bgl
Overall Pit Slope	45°
Period of Lease	18 months
Project Cost	Rs 7,75,70,400/- (including EMP cost)

1.3 Description of the environment

1.3.1 Base line environmental study

Collection of baseline data is an integral part of the preparation of Environmental Impact Assessment reports. The baseline monitoring study has been carried out during the pre-monsoon season (December1st, 2019– February29th, 2020) to assess the existing environmental scenario in the area. For the purpose of EIA studies, quarry lease area was considered as the core zone and area outside the quarry lease boundary up to 10 km radius from the lease boundary was considered as buffer zone.

Table No 1.2 Baseline Data

Particulars	Details	Standards
Meteorology (December 1st,2019 –February29th, 2020)		
Rainfall (Avg.)	125 mm	--
Temperature (Avg.)	26-36°C	--
Wind speed	3.01 m/s	--
Wind Direction	SWto NE to	
Ambient Air Quality (NAAQS)		
PM_{10}	37 – 57µg/m^3	100 µg/m^3
$PM_{2.5}$	17 –31 µg/m^3	60 µg/m^3

SO_2	4.3 – 12.4 µg/m^3	80 µg/m^3
NO_x	4.4 – 14.5 µg /m^3	80 µg/m^3
Noise Level (CPCB Standards)		
Day time (6:00 am - 10:00 pm)	Core zone –33.2 – 34.8 dB (A) Buffer zone –41.5 – 43.5 dB (A)	Industrial Area Day Time - 75 dB (A) Residential Area Day Time – 55 dB (A)
Night time (10:00pm – 06:00 am)	Core zone –29.7 – 31.6 dB (A) Buffer zone –32.2 –35.5 dB(A)	Industrial Area Night Time – 70 dB(A) Residential Area Night Time – 45 dB (A)
Water Quality IS 10500:2012 (Desirable limits)		
pH	8.25 – 8.30	6.5 to 8.5
TDS	384-448 mg/l	500 mg/l
Total Hardness as $CaCO_3$	119.9-232mg/l	200 mg/l
Soil Quality		
pH	7.6 – 8.1	Neutral to moderately alkaline
Bulk density	1.50 – 1.57 g/cc	Favorable physical condition for plant growth.
Hydro Geology		
Depth of Mining	1mbgl	Quarrying activity 5-7m above ground water table
Water Table	6-8m bgl	

1.4 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

1.4.1 Air Environment

The air borne particulate matter is the main air pollutant by opencast mining. The mining operation will be carried out by adopting semi–mechanized methods which involves excavation, loading and transportation.

AERMOD - Model was used for prediction of impact of PM_{10}during conditionsLoading/unloading and transportation of ore by trucks on Haul roadsTotal

predicted 24-h maximum GLC of PM_{10} at project site for loading-unloading and transportation was 75µg/m^3 occurred at the project site after superposition of base-line value 54 µg/m^3 over the incremental 21 µg/m^3 due to combined impact of loading and unloading and transportation over the haul road. Meteorological data under worst case scenario providing 24-h maximum average GLC was discussed above.

1.4.2 Noise Environment

Noise pollution poses a major health risk to the mine workers. Following are the sources of noise in the open cast mine project such as. Loading, Unloading and during movement of vehicles.

The noise generated by the mining activity is dissipated within the core zone. This is because of distance involved and other topographical features adding to the noise attenuation. From the results, it can be seen that the ambient noise levels (day time and night time) at all the locations will remain within permissible limits prescribed by CPCB and 90dB (A) norms of DGMS. At present there is no mining activity carried out. However, the expected noise levels are not likely to have any effect. Precaution will be made to keep down the noise exposure level of 85 dB (A) to the operating personnel for 8 hrs duration.

1.4.3 Water Environment

Mining operations can affect groundwater quality in several ways. The most obvious occurs in the mining below the water table, either in underground workings or open pits. This provides a direct conduit to aquifers. Groundwater quality is also affected when waters (natural or process waters or wastewater) infiltrate through surface materials (including overlying waste or other material) into ground water. But this Sand quarry is devoid of any such impacts.

The mining activity will not intersect ground water table and it is 6-8m below groundlevel. Compared to core zone (Surface water), the water sample (ground water) from the Paluran Padugaiis very high in TDS, TH and Chlorides. It clearly shows that there are no geological fractures between lease area and nearby village. Therefore due to proposed mining activity, chemical properties of nearby ground water will never change. The water sample from core zone is very high in iron content and also poor on biological testing. Then the water sample from Paluran Padugai is good on biological

testing and poor on chemical testing. Based on water quality index level the water sample from core zone is unfit for drinking purposes without proper pretreatment such as filtration, coagulation, boiling and the water sample from Paluran Padugai is suitable for drinking purposes with the help of reverse osmosis.

1.4.4 Soil Environment

There is no soil present in the quarry area.

1.4.5 Waste (overburden/Reject) Dump and Municipal Solid waste Management

There are no wastages anticipated during the quarrying operation. The entire Sand and sand shoals will be transported to the needy customer site. Sanitary facility will be constructed as semi-permanent structure. So municipal solid waste will be collected in semi-permanent structure and disposed safely and periodically as per the PCB norms

1.4.6 Biological Environment

There are no notified endangered species in the area, which may be affected due to the quarry activities; therefore the biological environment will not have significant impact due to quarrying activity. The impact on the biological environment due to amount of dust generation is minimized by well-developed green belt in and around the quarry lease area.

1.4.7 Land Environment

Mining in the riverbed may change complete land use pattern including channel geometry, bed elevation. Land requirement for the project has been assessed considering functional needs. The excavated area shall be replenished during the next rainy season. The removing of sand will have only the positive impacts since it increases the water carrying capacity of the river. No release of toxic elements into the ground. No adverse impact is anticipated on land use of buffer zone associated due to the mining activity, as all the activities will be confined within the project site.

The land use analyses show that the area is of predominantly Agriculture followed by buffer zones of the study area. After excavating the sand from proposed quarry, the river carrying capacity gets increased. As a result the river flow direction never gets diverted and does not affect any crops and properties. It is generally agreed that the total volume of production from year to year may increase. Some fallow land

also increases due to seasonal crop production, which shows a positive impact due to mining activity.

1.4.8 Socio Economic Environment

The mining activity will definitely increase the employment opportunity (directly as well as indirectly) in the project area. Some of these impacts would be beneficial. The expectation of the people of the area is concerned towards employment, education, and health facilities. The literacy rate may be increased with the economic benefits may arises from the mining activities.

Table 1.3 Environmental Management Plan

S.No	Parameters	Mining Activity	Mitigation measures
1	Air Environment	Loading	○ Water sprinkling be done before loading by making it moist
		Transportation	○ Water sprinklers along the sides of haul road shall be fixed to control fly of dust while transporting minerals and waste ○ Overloading will be prevented ○ Trucks/Dumpers covered by tarpaulin covers
		DG Sets	○ DG sets will be used only during power failure ○ Adequate stack height for DG sets will be provided as per CPCB norms
		General measures	○ Avenue trees along roads around ML boundary shall be planted as per the norms of MoEF to control fly of dust. ○ 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. ○ Regular health check–up of workers and nearby villagers in the impacted area should be carried out and also regular occupational health assessment of employees should be carried out as per the Factories Act ○ Ambient Air Quality Monitoring will be conducted on regular basis to assess the quality of ambient air.

2	Water Environment	Surface water	o There is no waste water produced due to sand quarry.
		Ground water	o The mining of sand is 1m depth and the water table is 6-8m bgl. So the mining activity will not intersect the ground water table
		Storm water	o Basically the mining area is river body. During rainy season, the storm water will flow through river body in the river flow direction. o During river flow, the mining activity will be stopped.
		General measures	o Regular monitoring and analyzing the quality of water
3	Noise Environment	Transportation	o Proper and regular maintenance of vehicles, machinery and other equipments. o The noise generated by the machinery will be reduced by proper lubrication of the machinery and other equipments. o Speed of trucks entering or leaving the mine will be limited to moderate speed to prevent undue noise from empty vehicles. o Adequate silencers will be provided in all the diesel engines of vehicles. o Minimum use of horns and speed limit of 10 km/hr in the village area. o It will be ensured that all transportation vehicles carry a valid PUC Certificates

		General measures	○ Use of personal protective devices i.e., earmuffs and earplugs by workers, who are working in high noise generating areas ○ Provision of Quiet areas, where employees can get relief from workplace noise. ○ The development of green belts around the periphery of the mine to attenuate noise. ○ Regular medical check–up and proper training to personnel to create awareness about adverse noise level effects.
4	Soil Environment	Topsoil	There is no soil present in the quarry area.
5	Waste Dump	Stabilization of Dumps	○ There are no wastages anticipated during the quarrying operation. The entire Sand and sand shoals will be transported to the needy customer site. Sanitary facility will be constructed as semi-permanent structure. So municipal solid waste will be collected in semi-permanent structure and disposed safely and periodically as per the PCB norms.
6	Plantation	Mine lease boundary and waste dump	○ Provision of green belt all along the periphery of the lease area for control of dust and to attenuate noise ○ It is strongly recommended that the loss of plant in each year will be counted and again planted in subsequent plantation. ○ The plant should be planted taken from nursery, where

			the survival rate is high.
7	Land Environment		o The excavated area shall be replenished during the next rainy season.
8	Socio Economic		o Good maintenance practices will be adopted for machinery and equipment, which will help to avert potential noise problems. o Green belt will be developed around the project site as per Central Pollution Control Board (CPCB) guidelines. o Appropriate air pollution control measure will be taken so as to minimize the environmental impact within the core zone. o An emergency preparedness plan will be prepared in advance, to deal with firefighting, evacuation and local communication. o For the safety of workers, personal protective appliances like hand gloves, helmets, safety shoes, goggles, aprons, nose masks and ear protecting devices has been provided which meet 'BIS' (Bureau of Indian Standards). o As a part of CSR activities community welfare measures will be taken by Proponent through local Panchayat.
9	Occupational Health		o First-aid facilities as per provisions under Rule (44) of Mines Rules 1955 o Initial and Periodical medical examination shall be conducted for the employees under Rule 29B & 45 (A). o Insurance will be taken in the name of the labourers

			working in the quarry o Workers involved in quarrying work shall be provided protective equipments such as Thick Gloves, Goggles, ear plugs, safety boot wears, etc…

1.5 Analysis of Alternatives

We have analyzed all the option for alternatives of the proposed mine site. This project is sand specific project and existing land use of mine lease classified as River Body which will continue to be so even after the current mining project is over, hence no alternate site is suggested for this project.

1.6 Environmental Monitoring Program

Environmental Monitoring program will be conducted for various environmental components as per conditions stipulated in Environmental Clearance Letter issued by SEIAA & Consent to Operate issued by TNPCB.

Table No: 1.4 Post Project Environmental Monitoring Program

S. No.	Environment Attributes	Location	Monitoring		Remarks
			Duration	Frequency	
1	Meteorology and Air Quality	Continuous monitoring weather station in core zone/ nearest IMD station	24 hours	Monthly Once	Wind speed, direction, Temperature, Relative humidity and Rainfall.
2	Air Pollution Monitoring – $PM_{2.5}$, PM_{10}, SO_2 and NO_x	6 locations (One station in the core zone and at least one in nearby residential area, one in the upwind, two station on the downwind direction and one in cross wind direction).	8 hours	Yearly Once	Fine Dust Sampler and Respirable Dust Sampler
3	Water Pollution Monitoring	Mine effluents, Set of grab samples during pre and	–	Once in a year	Physico–chemical, microbiological

		post monsoon for ground and surface water in the vicinity.			characteristics
4	Hydrogeology	Water level in open wells in buffer zone around 1km at specific wells	-	Once in 6months	Water level monitoring devices may be used.
5	Noise	Mine Boundary, high noise generating areas within the lease and at the nearest residential area	24 hours	Monthly Once	Sound level meter
6	Soil	Core Zone and Buffer zone (Grab samples)	–	Once in a year	Physical and Chemical characteristics

1.7 Project Benefits

The proponent, **The Executive Engineer** is very much conscious of their obligations to society at large. Under plantation program, it is suggested to develop green belt in village, Govt School, along village road. Apart from the green belts and aesthetic plantation for eliminating fugitive emission and noise control, all other massive plantation efforts will be executed with the assistance of experts and cooperation of the local community. The mining activity will create rural employment. In addition there will be indirect employment to many more people in the form of contractual jobs like construction of infrastructural facilities, transportation of sand to destinations, sanitation, supply of goods and services to the mine and other community services, etc…The local population will have preference to get an employment. Part of the royalty is given to local bodies by the State Govt. for the welfare and development of the village. The proponent help in socio economic development of the village by providing education facilities to children's, procuring sports equipments, welfare amenities like drinking water to school, road facilities to villages and employment opportunities to

nearby villagers. CSR budget is allocated as 2.5% of the profit. Other than this social development of village will be considered as per social activities.

1.9 Conclusion

As discussed, it is safe to say that the project is not likely to cause significant impact on the ecology and environment of the area, as adequate preventive measures will be adopted to contain the pollutants within permissible limits. The total operation shall be carried out with ease & minimum risk of the workers. The proposed Environmental Management Plan will keep the area in a safe environment with negligible impact on the environment. Plantation will substantiate the impact due to the mining activity. Mining activity will help in improving the socio–economic benefits in areas like employment, communication and infrastructure development etc.