SUMMARY

OF

DRAFT EIA/EMP REPORT

FOR

ROUGHSTONE QUARRY

EXTENT - 4.94.50HA

PRODUCTION CAPACITY - 9,82,419m³ OF ROUGHSTONE & 28,080m³ OF TOPSOIL FOR A PERIOD OF 5 YEARS

SURVEY NO -170 (PART), VILLAGE – KUNNAVAKKAM, TALUK – THIRU KAZHUKUNDRAM, DISTRICT – CHENGALPATTU, STATE – TAMILNADU.

GOVERNMENT LAND, LEASE PERIOD 5 YEARS

PROJECT PROPONENT

TVL.SALEM MINES & AGGREGATES, THIRU.R.GOPAL (PARTNER)

No.9, Nagarathinam Nagar Extension,
Thiruneermalai Road, West Tambaram,
Chennai-600 045.

CONSULTANT

CREATIVE ENGINEERS & CONSULTANTS

NABET accredited vide Certificate no. NABET/EIA/2023/RA 0187,
9B/4, Bharathwajar Street, East Tambaram, Chennai–600 059.
Ph: 09444133619, Email : cecgiri@yahoo.com,

JANUARY 2022

SUMMARY

1.0 GENERAL:

M/s. Salem Mines & Aggregates propose to operate a Rough Stone Quarry at Survey No.170 (Part) over an area of 4.9450 Ha in Kunnavakkam Village, Thirukazhukundram Taluk, Chengalpattu District, Tamil Nadu, TOR approved production capacity of 9,82,419m^3 of Rough Stone and 28,080m^3 of Topsoil formation at a restricted depth of 41m for the period of Five years (11m above ground level and 30m below the general ground level). Entire land is Government poramboke land leased to the proponent through auction route by the State Government. Rs 7.255 crores is already remitted to the State government as lease amount.

Precise area communication letter was obtained from the District Collector, Chengalpattu District vide letter no. Rc.No. 2646/Kanimam/ 2020dated 04.05.2020. Mine plan for this project was approved by Joint Director / Assistant Director (i/c) Department of Geology & Mining Chengalpattu vide Rc.No.2646/Kanimam/2020 dated 08.06.2020.

As per precise area communication letter issued by the Government, 50m safety distance for the transmission line passing in the northern & NW side of the lease area and 10m for the Thirukazhukundram – Periyakattupakkam village road on the western side is left

Although the individual lease area of this project is less than 5 Ha, including the other existing quarries within the 500m radius along with this subject project works out to >5 Ha and as such this proposal is considered **under cluster Category – B1** and public hearing is to be conducted.

ToR for this project has been received from SEIAA, Tamil Nadu vide their letter No. SEIAA-TN/F.No.8567/SEAC/TOR-1029/2021 dated 26.08.2021. Based on the ToR granted by SEIAA, Tamil Nadu and in conformance with the MOEF&CC 2006 guidelines, EIA/EMP report has been prepared. Salient details of the EIA/EMP report are as follows:

2.0 SITE DESCRIPTION:

The salient features of the project are briefly given below.

S.No	Particulars	Details
1	Name of the Project	Roughstone quarry of M/s. Salem Mines & Aggregates
2	Location of the project	Kunnavakkam Village, Thirukazhukundram Taluk, Chengalpattu District, Tamil Nadu

3	Mining Lease area (ML area)	4.950 Ha
4	Latitude & Longitude	**Latitude:** 12°33'30"N to12°33'41"N **Longitude:** 80°04'17"E to 80°04'26"E
5	Mine site topography	95m above MSL
7	Type of land	Government Poromboke Land
8	Temperature (°C)	The general minimum and maximum temperature are 20°C & 37°C.
9	Average Annual rainfall	The normal annual rainfall over the district varies from 1105 mm to 1214mm..
10	Nearest Highway	(SH-58)Thirukazhukundram–Kalppakam - 2.90Km (N)
11	Nearest Railway station	Ottivakkam – 12.3 km (NW)
12	Nearest Airport	Chennai - Meenambakkam – 48.0 Km (NE)
13	Nearest major water bodies	Tank - 290m – SE Tank - 450m – SW Kaluvaliar River - 2.7km – S Palar River - 3.8km – S
14	Environmental sensitive areas, Protected areas as per Wildlife Protection Act, 1972 (Tiger reserve, Elephant reserve, Biospheres, National parks, Wildlife sanctuaries, community reserves and conservation reserves)	Nil within 10m radius
15	Reserved / Protected Forests	Navalur R F - 4.0km – NW Thirukazhukundram R F -5.6km – NW Salur R F - 6.3km – NW Oragadam R F - 6.4km - N
16	Notified Archaeologically important places, Monuments, Tourist places	Thirukazhukundram Temple – 5.4km
17	Nearest Town	Thirukazhukundram – 5.0km (NW)
18	Nearest village	Kunnavakkam –500m (S) side
19	Seismic Zone	Zone – II (Least Active)

2.1 PROJECT DESCRIPTION:

<table>
<tr><th>S.No</th><th>Particulars</th><th>Details</th></tr>
<tr><td>1</td><td>Geological resources</td><td>Roughstone : 24,74,860 m^3
Topsoil: 49,499 m^3</td></tr>
<tr><td>2</td><td>Mineable reserves</td><td>
<table>
<tr><th>Mineable Reserves</th><th>Roughstone(m^3)</th><th>Topsoil(m^3)</th></tr>
<tr><td>Upto 56m</td><td>11,34,679</td><td>28,080</td></tr>
<tr><td>Upto 41m</td><td>9,82,419</td><td>28,080</td></tr>
</table>
</td></tr>
<tr><td>3</td><td>Five Year Production Capacity</td><td>
<table>
<tr><th>Year</th><th>Roughstone(m^3)</th><th>Topsoil(m^3)</th></tr>
<tr><td>I</td><td>226970</td><td>28080</td></tr>
<tr><td>II</td><td>226694</td><td>-</td></tr>
<tr><td>III</td><td>223700</td><td>-</td></tr>
<tr><td>IV</td><td>228180</td><td>-</td></tr>
<tr><td>V</td><td>76875</td><td>-</td></tr>
<tr><td>Total</td><td>982419</td><td>28080</td></tr>
</table>
</td></tr>
<tr><td>4</td><td>Life of the mine</td><td>5 years</td></tr>
<tr><td>5</td><td>Total Waste generation and management</td><td>There is no waste generation anticipated in this quarry operation since the entire excavated material will be utilized.</td></tr>
<tr><td>6</td><td>Method of mining</td><td>Opencast semi mechanized mining using jackhammer drilling, blasting, excavation through excavator & mineral transport through tippers will be carried out.</td></tr>
<tr><td>7</td><td>Bench parameters</td><td>Bench height - 5 m, bench width - 5m</td></tr>
<tr><td>8</td><td>Ultimate mine depth</td><td>The quarrying depth has been restricted from mine plan approved depth of 56m(11m above ground level and 45m below the general ground level) to 41 m (11m above ground level and 30m below the general ground level) based on the conditions of the Terms of Reference.</td></tr>
<tr><td>9</td><td>End use</td><td>The excavated rough stone will be excavated and loaded into tipper to the needy buyers for producing crusher aggregates, M Sand.</td></tr>
<tr><td>10</td><td>Manpower</td><td>The project will provide employment opportunities totally to 32 people.</td></tr>
<tr><td>11</td><td>Water Requirement & sourc</td><td>The total water requirement for this project will be 7.5KLD. The water will be sourced initially from outside agencies if necessary or rainwater harvested in the nearby mined out pit will be used. Later rainwater harvested in the mine pit shall be used.</td></tr>
<tr><td>12</td><td>Power Requirement</td><td>All the equipment will be diesel operated. No electricity is needed for mining operation. The minimum power requirement for office, etc will be met from state grid.</td></tr>
</table>

S.No	Particulars	Details
13	Site services	Site services like mine office, first aid room, rest shelters, toilets etc. will be provided as semi-permanent structures.
14	Project Cost	Rs.8.16 Crores
15	Community Development Budget	Rs.16.5 Lakhs

3.0 EXISTING ENVIRONMENTAL SCENARIO:

3.1 GENERAL:

The studies and data collection have been carried out systematically and meticulously as per relevant IS codes, CPCB and MoEF&CC guidelines and as per approved ToR during **Post monsoon Season (October 2021 to December 2021)** For the purpose of this study, the area has been divided into two zones, namely, core and buffer zones. Core zone is considered as the total lease area, while buffer zone encompasses an area of 10 km radius distance from the periphery of core zone.

3.2 SOCIO-ECONOMIC STATUS:

i. Core Zone:

The total mine lease area of 4.94.50 Ha. Entire ML area is a Government poromboke land with no forest or agricultural area involved.

ii. Buffer Zone:

Based on 2011 census data, in the 10km radius there are 88 Rural villages from 3 Taluks namely Thirukazhukundram, Chengalpattu, Cheyyar and 2 urban area Tirukalukundram (TP) & Pudupattinam (CT) of Thirukazhukundram Taluk. Chengalpattu District.

The distribution of population is as below:

- Male - 83485 (50.22%)
- Female - 82758 (49.78%)
- Total - 166243 (100%)
- Scheduled caste - 30.68%
- Scheduled tribes - 1.98%
- Total literacy rate in the area - 69.25% of the people are literate.

The occupational structure of the area is as below:

Total main workers - 56984 (34.30 %)

Total marginal workers	-	17511 (10.50 %)
Total non-workers	-	91748 (55.20%)

3.3 EXISTING ENVIRONMENTAL QUALITY:

3.3.1 Ambient Air Quality:

The ambient air quality data for PM_{10}, $PM_{2.5}$, SO_2, NO_2, CO studied at 5 locations as per prescribed guidelines/ methods. The AAQ monitored data for all locations for above parameters are shown in below.

Values in µg/m^3

S.No	PARAMETERS	Cat.* (R,I,S)	PM_{10}	$PM_{2.5}$	SO_2	NO_2
1	**CORE ZONE** (1 Location)	I	41.2 to 67.3	19.2 to 32.3	4.4 to 7.5	6.5 to 9.9
2	**BUFFER ZONE** (4 Locations)	R	35.2 to 59.2	16.6 to 30.4	3.2 to 7.2	5.5 to 9.1
CPCB LIMITS			**PM_{10}**	**$PM_{2.5}$**	**SO_2**	**NO_2**
2009 Notification			**100**	**60**	**80**	**80**
*** Note: BDL- Below Detectable Limit, DL- Detectable Limit.**						
Conclusion: The existing Ambient Air Quality levels in the monitored locations for PM_{10}, $PM_{2.5}$, SO_2, NO_2 & CO are within the prescribed CPCB limits.						

3.3.2 Water Environment:

	No of Samples – 5 Bore well water samples									
Parameter	**pH**	**EC (µmhos /cm)**	**TDS (mg/L)**	**Chloride (mg/L)**	**Total Hardness (mg/L)**	**Total Alkalinity (mg/L)**	**Sulphate (mg/L)**	**Iron (mg/L)**	**Nitrate (mg/L)**	**Fluoride (mg/L)**
BUFFER ZONE (**5** Locations)	6.95 to 7.61	359.3 to 924.3	216 to 560	80.5 to 210	101 to 452	92.4 to 265	18.6 to 52.6	BDL to 0.08	1.24 to 2.55	0.28 to 0.52
Limits* Permissible	**6.5-8.5**	**-**	**2000**	**1000**	**600**	**600**	**400**	**0.3**	**45**	**1.5**
	Conclusion: The water quality of the collected ground water samples were found to be within the prescribed permissible limits of IS: 10500:2012 Norms for Drinking in the absence of an alternative source*.									

3.3.3 Noise Environment:

No of locations – 5				
Noise Level In dB(A)	**Core Zone dB(A)** (1 Location)	***Work zone exposure limit dB(A)**	**Buffer Zone dB(A)** (4 Locations)	**MOEF&CC Norms dB(A)**
Day Equivalent	40.9	**90**	42.0 to 46.6	**55**
Night Equivalent	36.1		35.7 to 40.9	**45**

*Permissible noise for industrial workers as laid down by CPCB (at 8 hrs Exposure Time)
Conclusion: While comparing with the MoEF&CC Norms, the monitored ambient noise levels are within the limit values for Residential areas.

3.3.4 Soil Quality:

No of locations – 5								
Parameter	**pH**	**Electrical Conductivity (µmhos/cm)**	**Soil Type**	**Organic matter content %**	**Total Nitrogen mg/kg**	**Phosphorus mg/kg**	**Sodium mg/kg**	**Potassium mg/kg**
Range of values	7.01 – 7.59	45.89 – 90.24	Sandy Loam & Silt Loam	0.75– 1.34	231 – 751	0.57 – 2.21	360 – 745	206 - 320
Conclusion: The soil quality data for the 5 samples collected and analyzed are provided in **Table No – 3.4.**								

3.3.5 LAND EVIRONMENT:

For the present study on land use pattern in the study area, remote sensing satellite data have been used. The area estimated of land use categories around the 10km buffer zone is provided below:

S.No	Landuse Feature	Area (Sq.Km)	Percentage
1	Crop Land / Plantation	60.16	19.40
2	Fallow Land	152.10	49.05
3	Reserve Forest	6.16	1.99
4	River	11.90	3.84
5	Water Bodies	4.21	1.36
6	Land without Scrub	29.67	9.57
7	Land with Scrub	33.66	10.85
8	Settlement/Infrastructure	11.44	3.69
9	Mining Area	0.80	0.26
	Total	**310.11**	**100.00**

From the above table it is seen that 19.40 % of the study area is agriculture land and 49.05 % are fallow land. Land with scrub constitutes 10.85 %, lands without scrub constitute 9.57%, Water bodies constitute 1.36 % and others constitute 9.77%.

3.3.6 BIOLOGICAL ENVIRONMENT:

The lease area is a non forest, Government land with scrub and bushes. The lease area is dominated with Prosopis juliflora, Calotropis gigantean, Lantana camara etc. In the buffer zone,

the dominated with species such as Azadirachta indica, Delonix elata, Pongamia pinnata, Acacia auriculiformis, Morinda tinctoria, Acacia catechu, etc. Patches of Banana and rice cultivation, are also observed in the study area. No Wild Life Sanctuary or National Park within the study area of 10 km. Domesticated animals and common birds are observed in the study area.

3.3.7 HYDROLOGICAL STUDY:

In the study area, the shallow aquifer is developed through dug wells and deeper aquifer through tube wells. The groundwater has revealed that potential fractures are encountered at deeper levels. From the Geophysical survey, it is found that the subsurface litho units are gravel, weathered layers poorly fractured and terminated with hard and compact massive rocks with fully devoid of fractures. The occurrence of groundwater mainly in the porous soil are weathered layers, very negligible amount of groundwater percolated through the poorly fractured layer. Besides, the mining area consists of hard compact rock, no major water seepage within the mine is expected. From the nearby working mines no such seepage is observed.

4.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES:

This is a proposed project and Semi – Mechanized Open Cast mining will be carried out to quarry out Rough Stone, & Gravel. The identified impacts due to this mine during mining and associated activities have been studied in relation to various environmental components like Air, water, noise, vibration, land, transport etc.

4.1 AIR ENVIRONMENT:

The proposed mining and allied operations may cause deterioration of air quality due to pollution arising from the project operation if prompt care is not taken. The principal sources of air pollution in general due to mining and allied activities will be:

Dust generation in the mine due to:

- Excavation of material
- Movement of HEMM such as Excavators, tippers etc.
- Loading and unloading operation
- Transportation

In case of this mine, the following measures will be adopted to control impact on the air quality due to mining operations in the lease area:

- Deployment of mobile water sprinkler for fugitive dust suppression in haul roads.
- Wet drilling / Covering of drill holes with wet clothes
- Proper maintenance of roads.
- Avoiding crowding of trucks by properly spacing them to avoid the concentration of dust emission at any time.
- Transportation of material by tarpaulin covered trucks
- Proper maintenance of HEMM to minimize gaseous emission
- Imparting sufficient training to operators on safety and environmental parameters
- Development of green belt/ plantation in various areas within the mine lease area etc.

Besides, in the safety zone left on the western side for the local road, it is proposed to form an earthern embankment after fencing over which green mesh barricade for about 12ft shall be formed.

By adoption of all these measures, no adverse impact on air quality is envisaged due to this proposed opencast mining operation.

The impact on air quality due to the proposed project is estimated using AERMOD View Gaussian Plume Air Dispersion Model developed by Lakes Environmental Software which is based on steady state Gaussian plume dispersion.

The resultant added concentrations with baseline figures even at worst scenario show that the values of ambient air quality with respect to PM_{10} are in the range of 50.1 μg/m3 to 79.9 μg/m3 and with respect to PM2.5 are in the range of 26.1 μg/m3 to 39.1 μg/m3 which are within the statutory limits in each case.

For preservation of environment in this mine strict enforcement of management schemes will be undertaken for taking corrective actions, as needed. By adopting the effective implementation of all the mitigative measures, no adverse impact on Air quality due to the mining operation in this lease area is expected.

4.2 WATER ENVIRONMENT:

The total water requirement for this project will be 7.5 KLD. The water will be sourced initially from outside agencies. Later the rainwater collected in the mine pit sump will be used for this purpose.

The domestic effluent to be generated from the project will be collected in septic tank with soak pits arrangements. This being a mining project there will not be any process effluent. The rain water falling in the quarry will be harvested in the sump at the lowest level of the quarry. This sump will act as a settling pond to prevent solids escaping along with discharge, before outlet. etc. Towards surface runoff management, garland drain will be constructed around the quarry and will be connected to a settling pond with silt traps. The supernatant clear water from the settling pond will be flow to the downstream users.

There are no drainage courses within the lease area. There are two tanks situated at a distance of 290 m in the south east direction and 450m in the southwestern direction of the lease area. There is no proposal to discharge any effluent into these water bodies. No major impact is envisaged on the nearby water bodies due to project operations. Proper maintenance and desilting of these ponds will be carried out under CSR activities to augment the water holding capacity of the ponds.

4.3 NOISE ENVIRONMENT:

During mining operation there will be noise generation due to working of excavators, movement of vehicles, etc. However, it will be felt near the active working area only and at away from its source it will get reduced. Due to natural attenuation effects, by proper green belt development, design / maintenance of machines, etc., the impact on noise levels will be negligible and are expected to be well within the prescribed limits.

4.3.1 VIBRATION:

In the proposed mine workings, blasting & vibration effects will be controlled by following measures.

- Carrying out controlled blasting using Nonel millli second delay detonator.
- Optimum design for burden and spacing.
- Reducing explosive charge per delay to minimum.
- Use of suitable initiating sequence and millisecond delay detonators.

- Proper care and supervision during blasting by a competent and experienced person to be carried out.

By adoption of above measures, it will be ensured that ground vibrational levels due to blasting will be maintained within the prescribed DGMS conditions of 10 mm/s for the domestic houses/structures. Standard Operating Procedure (SOP) for blasting will be followed before carrying out blasting to protect the zone.

4.4 IMPACT ON LAND ENVIRONMENT:

In the post mining stage, entire 3.370 Ha will be left as water body. 0.020 Ha will be the mine roads and 1.545 Ha will be covered with vegetation, 0.01.0 will be infrastructure Entire mined out area will be properly fenced to prevent in advert ant entry of men and animals. In the post mining stage the rainwater harvested in the mined out void shall be utilized in the area in consultation with the authorities.

4.5 BIOLOGICAL ENVIRONMENT:

Other than clearing the shrubs and bushes withthin the lease area, no clearance of major vegetation is involved. Necessary mitigative measures like dust suppression, proper maintenance of equipments etc., will be carried out to prevent dust generation & any further impact on the vegetation.

4.6 SOCIO ECONOMIC ENVIRONMENT:

Entire Land is Government land. There are no habitations or hutments in the core zone area, no rehabilitation or resettlement problems will arise here.

The mining operations in the proposed mine will provide the following socio economic benefits:

- Direct Employment for about 32 persons.
- Indirect opportunity to more people through various service related activities connected with the project operations like:
  - ✓ Project related logistical operations for transport of Rough Stone & Gravel, etc,
  - ✓ Various trading services for consumer goods, spare parts, sundry items, etc.
  - ✓ Contractual services connected with the project.
  - ✓ Green belt development

- Improvement in medical care system for the locals.
- Benefit to State and central exchequer by way of royalty, taxes.

In the nearby existing operations, M/s. Salem Mines and Aggregates have carried out extensive beneficiary works under their CSR programs to various nearby schools and deserving people.

The proponent will continue such measures during the period of operation of this project also. An amount of Rs.16.5 Lakhs is allocated towards community developmental (CD) activities in the lease area. The activities identified under community development will be implemented in a phased manner in the following areas:

- Provision of RO water facilities
- Improvement in nearby school infrastructure and Providing Educational support to needy students.
- Conducting periodical Medical camp in the area.
- Desilting of nearby village ponds
- Providing treated drinking water facilities.

In consultation with the locals based on the need & priority it will be implemented.

By carrying out systematic and scientific mining and implementing all the environmental mitigative measures it will be ensured that there will be no adverse impact on this front.

4.7 IMPACT ON LOCAL LOGISTICAL SYSTEM DUE TO PROJECT:

From this proposed quarry the entire output will be transported to the consumers. There will be hardly about 8 trips per hour. The transport route can easily absorb this negligible traffic due to this project. The following mitigative measures are suggested for mitigation of adverse impacts on the logistical aspect of the project:

- Water sprinkling on transport road and Rough stone in the transport vehicles before transporting, so that no dust nuisance during transport will arise.
- Proper maintenance of transport roads
- Proper maintenance of transport vehicles.
- Avoiding overloading of material
- Covering of loaded vehicles with tarpaulins sheet if warranted.

4.8 OCCUPATIONAL HEALTH AND SAFETY ASPECTS:

In order to ensure minimisation of occupational health and safety problems in the project operation, the following preventive remedial measures will be effectively exercised in the project operations, so as to comply with applicable standards.

- Medical examination of workers at pre-entry level stage of workers, etc., by qualified doctors, with periodical examination of all workers/staff at least once a year, as per DGMS circulars.
- Regular awareness campaigns amongst staff and workers
- Staff will be provided with PPE to guard against excess noise levels, Dust generation and inhalation, etc., as per standards prescribed by DGMS.

4.9 WASTE MANAGEMENT:

There is no process effluent generation from this mine. Hence no liquid waste is generated. Single use plastics/ use and throwaway plastics will be banned in the site as directed by the Tamil Nadu Government vide GO(Ms)No.84 regarding ban on use of plastic products. The employees will be encouraged to use compostable material or reusable material.

5.0 ENVIRONMENTAL MONITORING PROGRAME:

Regular, systematic and sustained programme schedules for implementation and monitoring of various control measures are devised with clear cut guidelines of various concerned plans for keeping a continuous surveillance on the various environmental quality parameters in the area.

The Mines Manager/Mine Incharge will undertake effective monitoring and implementation of various above said environmental control measures promptly and effectively and to oversee various environmental management schemes for air quality control, water quality status, noise level control, plantation programme, social development schemes, etc in the mine. Towards EMP measures, Rs. 7.0 lakhs is allocated under capital cost. Besides, Rs.12.50 lakhs per annum will be spent under recurring cost.

6.0 CONCLUSION:

Although the individual lease area of this project is less than 5 Ha, the other existing and proposed quarries within the 500m radius along with this subject project works out to >5 Ha. As such cluster situation applicable and this EMP is prepared. There are 2 other contiguous leases of the proponent nearby of which validity of one lease is expected to get lapsed shortly and the other one by next year.

M/s. SALEM MINES & AGGREGATES are carrying our quarrying operations in the nearby lease and allied crusher operations in a scientific and systematic way preserving as well as improving the environmental conditions by implementing activities such as mobile water sprinkling, controlled blasting, planting of around 5,000 trees in various places like mine periphery, crusher and other places, etc. Besides, they have carried out various community developmental activities also in the area. All these measures will be effectively carried out in this lease also.

The baseline monitoring carried out for this project reflects the cumulative impact of these existing quarries. Considering that the lease period of the existing quarries will be coming to an end shortly, this proposed quarry will serve more as a replacement for the existing quarries to ensure meeting the present roughstone demands.

By systematic and scientific mining adhering to all the statutory norms and enforcing and strictly implementing the above said mitigation measures mentioned in this report, no adverse impact is envisaged.

The proposed mining project will benefit this region in the fields of potential employment opportunities, improved income for local people, improved social welfare facilities in respect of education, medical healthcare systems, etc. in its own way and also revenue to Government through royalty, taxes etc.

* * * * * * * * *