

**PROPOSAL FOR PRELIMINARY EXPLORATION (G-3 STAGE) FOR
LIMESTONE IN PERIYAKURICHI BLOCK
(1.88 SQ. KM), DISTRICT- ARIYALUR, TAMIL NADU**

Commodity: Limestone

By

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Place: Nagpur

Date: 20.04.2022

Summary of the Block for Preliminary Exploration (G-3 Stage)

GENERAL INFORMATION ABOUT THE BLOCK

	Features	Details
	Block ID	-
	Current Exploration Agency	MECL
	Previous Exploration Agency	DGM, Tamil Nadu
	G4 stage Geological Report (Previous stage Geological Report)	Limestone mines of India Cement Ltd. is existing north of the block. G-3 proposal
	Commodity	Limestone
	Mineral Belt	Ariyalur Limestone belt, Tamil Nadu
	Completion Period with entire Time schedule to complete the project	08 Month
	Objectives	i) To demarcate the limestone occurrence within the area by drilling of 5 boreholes. ii) To estimate grade wise Limestone inferred resources in the Block area as per UNFC norms at G3 (333) level of exploration. iii) To carry out exploration as per Minerals (Evidence of Mineral Contents) Rule-2015 Mineral (Auction) Rules-2015 and MMDR Amendment Act-2015 in turn to facilitate the State Govt. (Tamil Nadu) in Auctioning of the Block.
	Whether the work will be carried out by the proposed agency or through outsourcing and details thereof. Components to be outsourced and name of the outsource agency	Work will be carried out by the proposed agency.
	Name/ Number of Geoscientists	01 Number of Geoscientists
	Expected Field days (Geology, Geophysics, Surveyor)	Surveyor- 30 days Geologist- 90 Days (Field)
1	Location	
	Latitude	Refer Block Description
	Longitude	
	Villages	Periyakurichi
	Tehsil/ Taluk	Sendurai
	District	Ariyalur
	State	Tamil Nadu
2	Area (hectares/ sq.km)	
	Block Area	188.01 ha. / 1.88 sq. km
	Forest Area	-
	Government Land Area	-
	Private Land Area	Private Land
3	Accessibility	
	Nearest Rail Head	Vriddachalam Railway Junction and Sendurai Railway Station
	Road	Ariyalur -Alathiyur Road
	Airport	Tiruchirapalli

4	Hydrography	
	Local Surface Drainage Pattern (Channels)	The block is drained by easterly flowing Vellar River forms the main drainage in the area. The drainage pattern of the area is dendritic in nature.
	Rivers/ Streams	Vellar River
5	Climate	
	Mean Annual Rainfall	1100 mm
	Temperatures (December) (Minimum)	22.5°C
	Temperatures (June) (Maximum)	41°C
6	Topography	
	Toposheet Number	58M/03
	Morphology of the Area	The area is generally flat and maximum area is covered by cultivated fields. The block area depicts plain with gentle slope towards North. The elevation of the area ranges from 80m to 100m above mean sea level.
7	Availability of baseline geoscience data	
	Geological Map (1:50K/ 25K)	Available (Bhukosh)
	Geochemical Map	Not Applicable
	Geophysical Map (Aerogeophysical, Ground geophysical, Regional as well as local scale GP maps)	Not Available
8	Justification for taking G-3 stage mineral exploration	Limestone mines exists nearby. MECL has been explored in nearby four blocks i.e., Alathiyur, Adanakurichi, Anandwadi and Unjini under NMET funding. This block falls in between above said blocks.

PROPOSAL FOR PRELIMINARY EXPLORATION (G-3 STAGE) FOR LIMESTONE IN PERIYAKURICHI BLOCK (1.88 SQ. KM), DISTRICT- ARIYALUR, TAMIL NADU

1.1.0 Block Summary:

The proposed study area falls in the vicinity of nearby limestone mines of India Cement Limited and Chettinad Cement Pvt. Ltd. Hence, Directorate of Geology, Govt. of Tamil Nadu identified two prospective limestone blocks in Ariyalur for G-3 stage exploration. Accordingly, Directorate of Geology, Government of Tamil Nadu requested MECL to take up exploration work for limestone in these 2 Blocks in Ariyalur District of Tamil Nadu under NMET funding vide letter no. Rc. No. 5538/MM11/2020-2, dated 25.02.2022. Periyakurichi Block is one of the prospective limestone block identified by DGM, Tamil Nadu. Initially MECL has prepared the exploration proposal involving 720m drilling in 9 boreholes for G-2 level in Periyakurichi Block and put up for approval of Technical cum cost committee of NMET.

On recommendation of Technical cum cost committee of NMET in 23rd meeting, MECL has prepared the revised exploration proposal involving 240m drilling in 4 boreholes of G-3 level and 300m drilling in 5 boreholes for G-2 level totalling to 540m drilling in 9 boreholes in Periyakurichi Block and resubmit for approval of Technical cum cost committee of NMET. It was not approved in EC.

In view of recent amendment in MEMC Amendment Rules, 2021 and Circular of NMET vide letter No. F. No. 6/4/2015-NMET/100 dated 24th August, 2021, Directorate of Geology, Government of Tamil Nadu requested MECL to take up exploration work for limestone in G-3 stage. Accordingly, MECL prepared the proposal for G-3 level of exploration involving 4000m drilling in 5 boreholes and submitted to TCC of NMET.

1.2.0 Physiography:

Ariyalur District is bounded on the North by Cuddalore, South by Thanjavur, East by Cuddalore and Thanjavur and West by Perambalur and Tiruchirapalli districts. In general, the district has an undulating topography covered by black cotton soil in the Northern and western part, the eastern part covered by red soil and river alluvium in the southern end. Average elevation of this region ranges from 80m to 100m above MSL and the regional slope is towards east. Denudational, structural and fluvial processes mainly control the geomorphic evolution of the area. Mainly the varying resistance of geological formations to those processes has governed the evolution of various landforms. Various land forms occurring in the area such as structural hills, erosional plains, residual hills rolling uplands and pediments of different facies belonging to the denudational and structural land forms. Fluvial landforms caused by the activity of Cauvery, Marudayar and Vellar river systems, include younger flood plains, older flood plains and buried pediments.

The proposed area is generally flat and maximum area is covered by cultivated fields. The block area depicts plain with gentle slope towards North. The elevation of the area ranges from 80m to 100m above mean sea level. The block is drained by easterly flowing Vellar River forms the main drainage in the area. The drainage pattern of the area is dendritic in nature.

It is well connected to all major cities by rail/road, and the nearest airport Trichy, which is at a distance of 100 km and Chennai airport is at about 240 km. All basic amenities such as school, hospital, market, etc. are available. Ariyalur is the nearest city and administrative headquarters, around 55 km from the proposed block. Power, Water, Fuel, Communication are available in vicinity of the proposed block **(Plate-1)**.

1.3.0 Background Geology

1.3.1 Regional Geology

a) The marine sediment sequence is exposed between Palar River in the north and Cauvery River in the south in three sub basins, namely the Pondicherry Sub Basin in the north, Vriddhachalam Sub Basin in the centre and Trichinopally Sub Basin in the south. The range in age from Cretaceous to Palaeocene and are classified under three groups, viz., Uttatur, Trichinopally and Ariyalur Groups starting from the oldest.

Only Ariyalur Groups of the rocks are exposed in the Pondicherry Sub Basin. The Trichinopally Sub Basin is the major Sub Basin is the major sub basin exposing rocks belonging to Uttatur, Trichinopally and Ariyalur Groups.

The central Vriddhachalam Sub Basin is bound by the Vellar – Manumukta River in the south and the Gadilam River in the north and its sediments are concealed below alluvial cover. Rock types belonging to Ariyalur Group are exposed in the western and central part of the sub-basin. The contact of the sub-basin with the Archean basement is faulted.

b) Blanford (1862) divided the Cretaceous formations of Tiruchirappalli district into three district groups, viz. Uttatur, Trichinopoly and Ariyalur groups. He divided the Ariyalur Group into three subdivisions. (i) lower fossiliferous beds, (ii) middle unfossiliferous beds and (iii) upper fossiliferous beds. Leveille (1889), while reviewing the geology of the area, proposed to include the upper fossiliferous Ariyalur beds of Blanford into Niniyur stage, corresponding to Danian on the occurrence of *Hercoglossadania*, a characteristic Danian form. The upper fossiliferous beds (of Ariyalur Group of Blanford) have been recognised as 'Niniyur Group' on the basis of lithological and palaeontological (find of rich algal flora) considerations by Rama Rao (1956) and Rama Rao and Pia (1936).

In recent years extensive work has been done on palaeontology and biostratigraphy by several geologists of G.S.I., Oil and Natural Gas Commission, various universities and institutions. During 1950 to 1965 Sastry et al., mapped Cretaceous basin of Tiruchchirappalli district and worked out biostratigraphy of the basin. They (1972) brought out litho-biostratigraphic classification of Ariyalur Group for the first time. They divided the group into four formations: Sillakkudi, Kallankuruchi, Ottakkovil and Kallamedu formations in the ascending order.

c) The Regional Stratigraphic Succession (Sundaram and Rao, 1979) is furnished in Table 1.1 below:

Table - 1.1
The Regional Stratigraphic Succession

FORMATION		LITHOLOGY				
Alluvium		Sand, Silt and Clay				
Cuddalore		Mottled Sandstone and Clay				
Ariyalur Area (Trichinopoly sub-basin)			Vriddhachalam area (Vriddhachalam sub-basin)		Puducherry area (Pondicherry sub-basin)	
GROUP	FORMATION	LITHOLOGY	FORMATION	LITHOLOGY	FORMATION	LITHOLOGY
ARIYALUR	Niniyur	Limestone, marl / calc shale	Aladi	Limestone	Manaveli	Fossiliferous clay / sandy clay and siltstone
		Sandstone		Clay / shale with limestone	Karasur	Fossiliferous limestone / sandy limestone with marl / calc shale
	Kallamedu	Sandstone with shale / clay		Fossiliferous sandy limestone	Nesal	Fossiliferous shale / clay, argillaceous sandstone with shell limestone / calcareous sandstone
				Calcareous sandstone		
				Sandstone		
	Kallan-kurichchi	Fossiliferous limestone with conglomerate at base	Mattur	Argillaceous sandstone		
	Sillakkudi	Sandstone with shale, gritstone and conglomerate	Patti	Fossiliferous calcareous sandstone / sandy limestone	Vanur	Argillaceous sandstone with sandy limestone
				Clay / shale with limestone		Fossiliferous limestone with calcareous shale
		Limestone and calcareous sandstone	Parur	Conglomerate / pebbly and cobbly sandstone with shale		
	TRICHINOPOLY	Anaipadi	Sandstone / gritstone with limestone	Not exposed		Not exposed
Shale / siltstone with limestone						
Kulakkal-nattam		Shell limestone (Coquinite), pebbly hard calc. Sandstone band				
		Gypseous clay / shale				
		Pebbly and cobbly sandstone / conglomerate				
		Gypceous clay, sandy clay, sandstone, limestone				
UTTATUR	Karai	Conglomerate	Not exposed		Not exposed	
		Gypseous clay / shale				
		Conglomerate				
		Gypseous clay / shale/ mud with marlstone				
	Maruvattur	Clay / shale with limestone				
		Limestone with marl / clay, boulder conglomerate				
	Upper Gondwana		Not exposed		Not exposed	
	Archaean		----- Basement -----			

1.3.2.1 Block Geology:

The stratiform and tabular limestone deposits of Sendurai area are irregular and belong to cretaceous age of Niniyur Formation. The Niniyur formation is underlain by Ariyalur beds and overlain by Recent Alluvium. The regional dip of Niniyur bed is 4 to 5 degrees towards south-east. These beds are

deposited during the transgression period of Cretaceous age. Niniyur limestone beds contain Foraminifera fossil remains.

The limestone beds of Niniyur formation extends from Kavanur in the south to Vellar River near Saundaracholapuram in the north over approximately of 26 Km in strike length towards N25°E direction. Part of this unit is overlain by sandstone between Manakudayan and Kanjamalaipatti villages over about 4.50 km length. This formation comprises bands of limestone, calcareous sandstone, shale, marl, soft sandstone and thin bands/lenses of white to yellowish chert having algae. The bands of limestone of this Niniyur Group of rocks are enriched with lime content which is suitable for manufacture of cement.

Limestone deposit of this area is characterized by fine grained, yellow to brown color deposits. The thickness of the limestone varies between 15 m to 60 m with various grades. The strike direction of the limestone deposit is NNE-SSW and dips towards south east with dip angle varying from 4° to 5°. Limestone mostly occurs as lenticular bands and is also nodular. The Regional geological map furnished in Plate-2.

d) The Stratigraphic Sequence of Litho-units exposed in and around the Block area is furnished in Table 1.2 below:

Table No-1.2
Stratigraphic Sequence of Litho-units exposed in and around the Block area

FORMATION		LITHOLOGY				
Alluvium		Sand, Silt and Clay				
Cuddalore		Mottled Sandstone and Clay				
Ariyalur Area (Trichinopoly sub-basin)			Vriddhachalam area (Vriddhachalam sub-basin)		Puducherry area (Pondicherry sub-basin)	
GROUP	FORMATION	LITHOLOGY	FORMATION	LITHOLOGY	FORMATION	LITHOLOGY
ARIYALUR	Niniyur	Limestone, marl / calc shale	Aladi	Limestone	Manaveli	Fossiliferous clay / sandy clay and siltstone
		Sandstone		Clay / shale with limestone	Karasur	Fossiliferous limestone / sandy limestone with marl / calc shale
	Kallamedu	Sandstone with shale / clay		Fossiliferous sandy limestone	Nesal	Fossiliferous shale / clay, argillaceous sandstone with shell limestone / calcareous sandstone
				Calcareous sandstone		
				Sandstone		
	Kallan-kurichchi	Fossiliferous limestone with conglomerate at base	Mattur	Argillaceous sandstone		
	Sillakkudi	Sandstone with shale, gritstone and conglomerate	Patti	Fossiliferous calcareous sandstone / sandy limestone	Vanur	Argillaceous sandstone with sandy limestone
				Clay / shale with limestone		Argillaceous and micaceous sandstone
			Fossiliferous limestone with calcareous shale			
		Limestone and calcareous sandstone	Parur	Conglomerate / pebbly and cobbly sandstone with shale		

1.4.0 Scope for proposed exploration:

To assess the quantum of limestone resources in proposed area in order to auction the block, G-3 level exploration is to be carried out in this region.

Table No-1.3

Sl. No.	Item of Work	Unit	Target
1	Topographic Survey & Geological Mapping on 1:4000 scale (Ha)	Ha.	188.01
2	Drilling	m.	400.00m 5 Bhs
3	Laboratory Studies		
	i) Chemical Analysis; Primary samples for 6 radicals i.e. CaO, MgO, Al ₂ O ₃ , SiO ₂ , Fe ₂ O ₃ and LOI by XRF	Nos.	200
	ii) Check sample (5% of internal and 10% external check samples) for analysis of 6 radicals i.e. CaO, MgO, Al ₂ O ₃ , SiO ₂ , Fe ₂ O ₃ and LOI by XRF	Nos.	30
4	Composite Samples for 12 radicals (CaO, MgO, Al ₂ O ₃ , SiO ₂ , Fe ₂ O ₃ , SO ₃ , P ₂ O ₅ , LOI, MnO ₂ , K ₂ O, Na ₂ O and Cl. by XRF	Nos.	25
5	Physical Studies		
	a) Petrological Studies	Nos.	5
	b) Specific Gravity Determinations	Nos.	5
6	Report Preparation (5 Hard copies with one soft copy)	Nos.	1
7	Preparation of Exploration Proposal (5 Hard copies with a soft copy)	Nos.	1

1.5.0 Recommendation of G4 stage mineral exploration report.

1.5.1 Directorate of Geology and Mining has carried out detailed geological investigation during March 1988 to prove limestone resources in Sendurai Taluk, Ariyalur District which covers the area presently proposed for G-3 stage exploration. As per the report, the chemical analysis of the core samples in the subject area indicates that the weighted average of total CaO content is between 46.5% and 48.5%, SiO₂ content 7 to 9.5% and Fe₂O₃ is less than 1%. The thickness of limestone encountered in the area is about 16m.

1.5.2 Resources can be estimated under inferred category (333) on higher level of confidence by drilling of 5 boreholes. Hence the level of exploration should be upgraded to G-3 level to facilitate state Government for auctioning of the block under ML.

1.6.0 Objectives

The exploration is proposed with the following objectives

1. To demarcate the limestone occurrence within the area by drilling of five boreholes to bring the deposit to G-3 level.
2. To estimate grade wise Limestone indicated resources in the Block area as per UNFC norms at G-3 (333) level of exploration.
3. To carry out exploration as per Minerals (Evidence of Mineral Contents) Rule-2015 & Minerals (Evidence of Mineral Contents) Amendment Rule-2015, Mineral (Auction) Rules-2015 and MMDR Amendment Act-2015 in turn to facilitate the State Govt. (Tamil Nadu) in Auctioning of the Block.

1.7.0 Previous Work:

1.7.1 Directorate of Geology and Mining, Tamil Nadu carried out an exploration at G4 level in Adanakurichi, Manakudayan, Periyakurichi Villages, Sendurai taluk, Ariyalur District.

1.7.2 This proposed area is contiguous to the existing mining leases of M/s. The India Cements Limited in the north and M/s Chettinad Cement Pvt. Ltd. in the south.

1.7.3 MECL has been explored nearby blocks of limestones under NMET funding. The blocks are namely Alathiyur, Adanakurichi, Anandwadi and Unjini.

1.8.0 Block description: Block boundary map attached as Plate No-3

Table-1.4

Block Corner Point/Cardinal Point	Coordinates (WGS 84)		Block Corner Point/Cardinal Point	Coordinates (WGS 84)		Block Corner Point/Cardinal Point	Coordinates (WGS 84)	
	Latitude	Longitude		Latitude	Longitude		Latitude	Longitude
1	11° 17' 06.4" N	79° 11' 17.9" E	36	11° 16' 53.3" N	79° 12' 01.9" E	71	11° 16' 27.9" N	79° 11' 16.7" E
2	11° 17' 06.4" N	79° 11' 21.2" E	37	11° 16' 48.2" N	79° 12' 00.8" E	72	11° 16' 28.8" N	79° 11' 17.1" E
3	11° 17' 06.5" N	79° 11' 21.3" E	38	11° 16' 48.2" N	79° 12' 00.7" E	73	11° 16' 30.0" N	79° 11' 16.9" E
4	11° 17' 06.5" N	79° 11' 21.8" E	39	11° 16' 45.6" N	79° 12' 00.8" E	74	11° 16' 30.1" N	79° 11' 16.6" E
5	11° 17' 07.0" N	79° 11' 25.2" E	40	11° 16' 44.7" N	79° 12' 00.8" E	75	11° 16' 31.7" N	79° 11' 15.8" E
6	11° 17' 07.2" N	79° 11' 28.3" E	41	11° 16' 40.6" N	79° 12' 00.9" E	76	11° 16' 32.7" N	79° 11' 15.8" E
7	11° 17' 06.6" N	79° 11' 30.7" E	42	11° 16' 37.9" N	79° 12' 01.1" E	77	11° 16' 34.3" N	79° 11' 16.2" E
8	11° 17' 05.7" N	79° 11' 30.9" E	43	11° 16' 37.6" N	79° 12' 01.1" E	78	11° 16' 36.1" N	79° 11' 16.6" E
9	11° 17' 05.9" N	79° 11' 31.5" E	44	11° 16' 37.1" N	79° 11' 56.8" E	79	11° 16' 35.9" N	79° 11' 17.1" E
10	11° 17' 06.5" N	79° 11' 31.4" E	45	11° 16' 37.0" N	79° 11' 55.5" E	80	11° 16' 39.4" N	79° 11' 16.4" E
11	11° 17' 06.9" N	79° 11' 32.9" E	46	11° 16' 36.8" N	79° 11' 53.0" E	81	11° 16' 39.5" N	79° 11' 16.5" E
12	11° 17' 10.0" N	79° 11' 33.1" E	47	11° 16' 36.4" N	79° 11' 49.3" E	82	11° 16' 40.4" N	79° 11' 17.5" E
13	11° 17' 10.5" N	79° 11' 37.1" E	48	11° 16' 36.3" N	79° 11' 48.2" E	83	11° 16' 41.7" N	79° 11' 17.4" E
14	11° 17' 10.8" N	79° 11' 39.3" E	49	11° 16' 35.9" N	79° 11' 45.5" E	84	11° 16' 42.8" N	79° 11' 18.2" E
15	11° 17' 11.1" N	79° 11' 42.6" E	50	11° 16' 35.7" N	79° 11' 43.4" E	85	11° 16' 43.7" N	79° 11' 18.5" E
16	11° 17' 11.9" N	79° 11' 47.7" E	51	11° 16' 35.4" N	79° 11' 40.9" E	86	11° 16' 44.0" N	79° 11' 19.0" E
17	11° 17' 12.0" N	79° 11' 50.8" E	52	11° 16' 34.8" N	79° 11' 36.8" E	87	11° 16' 47.3" N	79° 11' 19.2" E
18	11° 17' 12.0" N	79° 11' 54.4" E	53	11° 16' 34.4" N	79° 11' 36.9" E	88	11° 16' 48.1" N	79° 11' 19.7" E
19	11° 17' 13.9" N	79° 11' 54.5" E	54	11° 16' 31.3" N	79° 11' 37.7" E	89	11° 16' 48.6" N	79° 11' 18.7" E
20	11° 17' 15.2" N	79° 11' 54.9" E	55	11° 16' 30.7" N	79° 11' 37.9" E	90	11° 16' 49.2" N	79° 11' 17.9" E
21	11° 17' 15.9" N	79° 11' 55.7" E	56	11° 16' 29.7" N	79° 11' 38.2" E	91	11° 16' 50.2" N	79° 11' 16.9" E
22	11° 17' 19.9" N	79° 11' 55.7" E	57	11° 16' 29.3" N	79° 11' 38.1" E	92	11° 16' 51.5" N	79° 11' 16.8" E
23	11° 17' 20.7" N	79° 11' 57.7" E	58	11° 16' 29.2" N	79° 11' 38.1" E	93	11° 16' 52.5" N	79° 11' 16.2" E
24	11° 17' 20.6" N	79° 11' 58.3" E	59	11° 16' 23.7" N	79° 11' 39.8" E	94	11° 16' 53.0" N	79° 11' 15.6" E
25	11° 17'	79° 12'	60	11° 16'	79° 11'	95	11° 16'	79° 11'

	20.4" N	04.0" E			22.8" N	34.6" E			54.0" N	16.0" E
26	11° 17' 20.3" N	79° 12' 05.6" E		61	11° 16' 22.3" N	79° 11' 31.5" E		96	11° 16' 54.0" N	79° 11' 16.2" E
27	11° 17' 20.2" N	79° 12' 06.6" E		62	11° 16' 22.3" N	79° 11' 30.2" E		97	11° 16' 56.3" N	79° 11' 16.3" E
28	11° 17' 19.9" N	79° 12' 09.3" E		63	11° 16' 22.6" N	79° 11' 28.7" E		98	11° 16' 57.8" N	79° 11' 16.4" E
29	11° 17' 18.8" N	79° 12' 09.3" E		64	11° 16' 22.7" N	79° 11' 27.2" E		99	11° 16' 57.7" N	79° 11' 14.9" E
30	11° 17' 12.0" N	79° 12' 08.2" E		65	11° 16' 23.2" N	79° 11' 24.6" E		100	11° 16' 58.4" N	79° 11' 15.1" E
31	11° 17' 10.9" N	79° 12' 07.9" E		66	11° 16' 23.5" N	79° 11' 23.0" E		101	11° 17' 01.0" N	79° 11' 15.2" E
32	11° 17' 04.0" N	79° 12' 08.2" E		67	11° 16' 23.5" N	79° 11' 22.0" E		102	11° 17' 02.4" N	79° 11' 15.4" E
33	11° 17' 03.8" N	79° 12' 09.4" E		68	11° 16' 24.1" N	79° 11' 19.0" E		103	11° 17' 02.6" N	79° 11' 15.5" E
34	11° 16' 58.3" N	79° 12' 09.5" E		69	11° 16' 25.0" N	79° 11' 18.5" E				
35	11° 16' 53.7" N	79° 12' 09.8" E		70	11° 16' 26.6" N	79° 11' 16.2" E				

1.9.0 Planned Methodology:

1.9.1 Topographic Survey & Geological Mapping:

The Block boundary shall be surveyed by DGPS and total station in WGS-84 datum for demarcation of block boundary/corner points. Triangulation network will be laid down in the proposed study area of 188.01 ha. Contouring will be done on scale 1:4000 at 1m contour intervals along with survey of surface features. Borehole will be fixed on the ground. RL's and co-ordinates of survey and exploration points will be determined. Detailed Geological Mapping will be done in the proposed block on scale 1:4000. All the geological features will be recorded and litho contacts will be plotted for finalization of Geological map. This map will be used as base map for future work.

1.10.0 Surface Drilling:

1.10.1 The present exploration scheme is prepared by proposing of 400m drilling in 5 boreholes with an average depth of 80 m. for limestone. The borehole depth is planned upto intersection of 2-3m in bed rock below limestone. In G-3 level apart from geological mapping on 1:4000 scale, firm up the grade and resources of limestone across the length & breadth over 188.01 ha has been envisaged.

1.10.2 The proposed borehole location plan is enclosed as **Plate No.-3** and the tentative location of proposed boreholes at G-3 level are given in below Table No. 1.5

Table No. 1.5
Tentative Location of Proposed Boreholes (G-3 Level of Exploration) in Periyakurichi Block

BH ID	Proposed Depth (m)
PBH-1	80m
PBH-2	80m
PBH-3	80m
PBH-4	80m
PBH-5	80m

Note: Proposed Borehole depth is tentative and may vary subject to the geological and drilling conditions in the study area.

1.11.0 Drill Core Logging and Sampling

1.11.1 Detailed drill core logging will be done with consideration of weathering, grain size, fossil contents, and color of various formations, intercalation / parting of shale, stylolite, and structure. On the basis of these parameters, grade of limestone can be broadly presented and it will also be helpful in sampling.

Primary samples will be drawn at 1m interval subject to change in lithology and core recovery. The following parameters shall be considered while sampling the drill cores.

- 1) Colour, grain size.
- 2) Fossil variation.
- 3) Thin intercalations of shale/siltstone.
- 4) Partially weathered zone.

For preparation of samples the borehole core will be longitudinally split into two equal halves by using core splitter. One half will be powdered to -200 mesh size and the other half will be kept for future studies. The powdered material will be mixed thoroughly and about 100 gm of samples will be taken for chemical analysis by successive coning and quartering as primary samples and rest of the material (-200 mesh size) will be kept as duplicate half for future reference.

Total 200 numbers of primary samples are likely to be generated for Limestone, 10 Check samples (5% of primary samples) and 25 Composite samples, totaling 235 Nos. In addition, 10% of primary samples i.e. 20 nos. will be prepared as External Check samples and will be sent to NABL +accredited Labs for analysis of 6 radicals.

Composite samples will be prepared borehole wise based on primary sample data at every 8-m interval (8 m bench height). Composite samples will be prepared entire limestone zone demarcated at 38% & 44% CaO cut off. This will generate around 25 nos. of composite samples.

1.12.0 Laboratory Studies

1.12.1 Chemical Analysis: Primary samples (200 Nos.) will be analyzed for 6 radicals, CaO, MgO, Al₂O₃, SiO₂, Fe₂O₃ and LOI. 5% of primary samples around 10 Nos. will be analyzed as internal check for 6 radicals CaO, MgO, Al₂O₃, SiO₂, Fe₂O₃ and LOI. 10% of primary samples (20 Nos.) will be sent to NABL external labs as external check samples for analysis of 6 radicals CaO, MgO, Al₂O₃, SiO₂, Fe₂O₃ and LOI.

1.12.2 Composite Samples: 25 Nos. of composite samples shall be generated from borehole cores shall be subjected to analysis of 12 radicals, CaO, MgO, Fe₂O₃, SiO₂, Al₂O₃, SO₃, P₂O₅, MnO₂, K₂O, Na₂O, Cl & LOI.

1.12.3 Petrological Studies: Petrological studies will be done on 5 nos. of core specimen.

1.12.4 Specific Gravity Determination: Specific Gravity will be determined on 5 nos. drill core specimens.

1.12.5 Baseline Environmental Studies: Baseline environmental studies involving generation and collection of data viz land use, demographical, Hydrogeological, Noise, Pollution, Wind etc. within the radius of

10Km would be ascertained.

1.13.0 The Quantum of work

Quantum of proposed work as per table 1.3

1.15.0 Exploration Report:

Data generated from present exploration at G-3 level data shall be utilized in Report preparation.

a) **Manpower Deployment:** Manpower deployment List may be provided later.

b) Break-up of expenditure:

Tentative cost has been estimated based on Schedule of Charges (SoC) of projects funded by National Mineral Exploration Trust (NMET) w.e.f. 01/04/2020 and the total estimated cost is Rs. 96.37 Lakhs. The summary of tentative cost estimates for Preliminary Exploration (G-3 Level) is given in Table No.- 1.6 and details of tentative cost estimates is given in Table No- 1.7.

Table – 1.6
Summary of Cost Estimates for G-3 Level of Exploration

Sl. No.	Item	Estimated Cost (Rs.)
1	Drilling	3,348,860
2	Geology & Survey	3,154,100
3	Laboratory	1,113,350
	Sub Total (1 to 4)	7,616,310
5	Exploration Report	380,816
6	Proposal Preparation	159,943
6	Peer Review Charges	10,000
	Grand Total	8,167,068
7	GST 18%	1,470,072
	Total:	9,637,140
	Say Rs. in Lakhs	96.37

c) Timeline:

The proposed exploration programme envisages geological mapping, Survey, drilling, core sample preparation and laboratory studies, which will be completed within 6 months, geological report preparation with peer review will take 4 months with two months overlapping with lab work. Therefore, a total of 8 months is planned for completion of the entire proposed programme. Tentative Time schedule/action plan for proposed Preliminary Exploration (G-3) for Limestone is given in Table No.- 1.8.

d) References

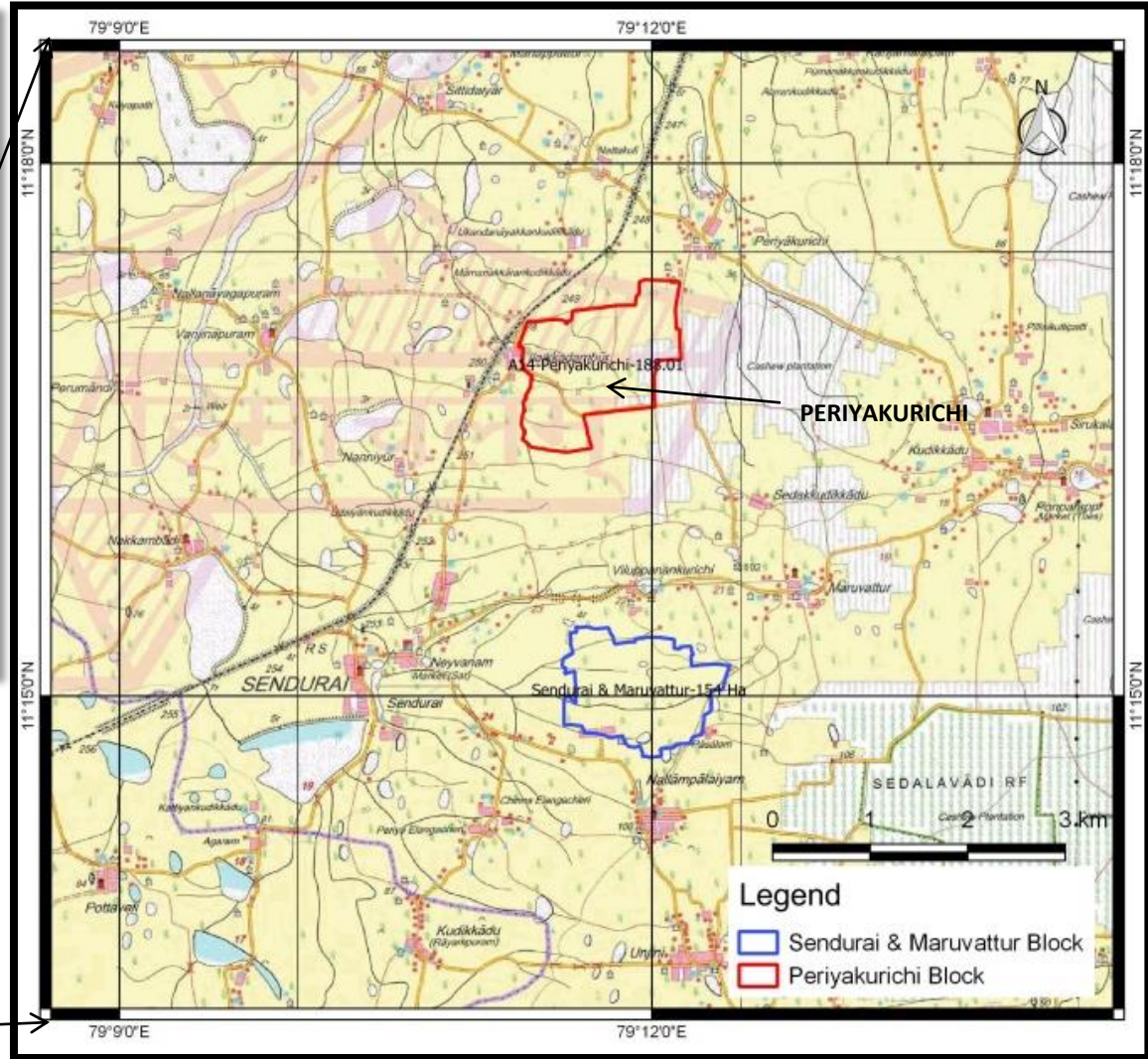
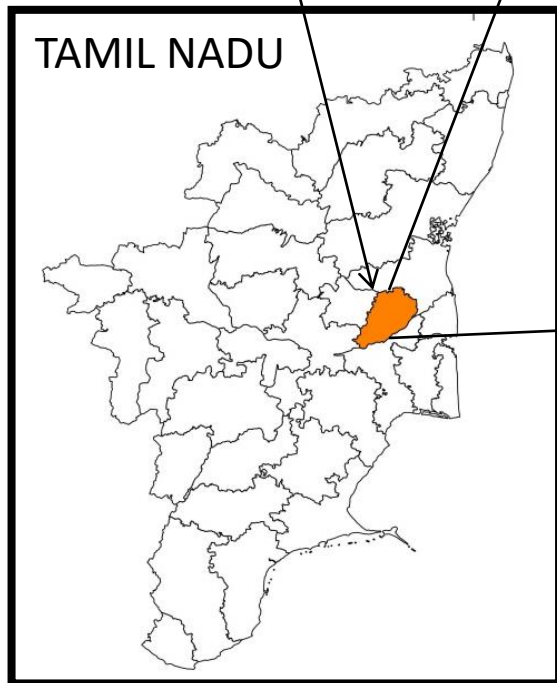
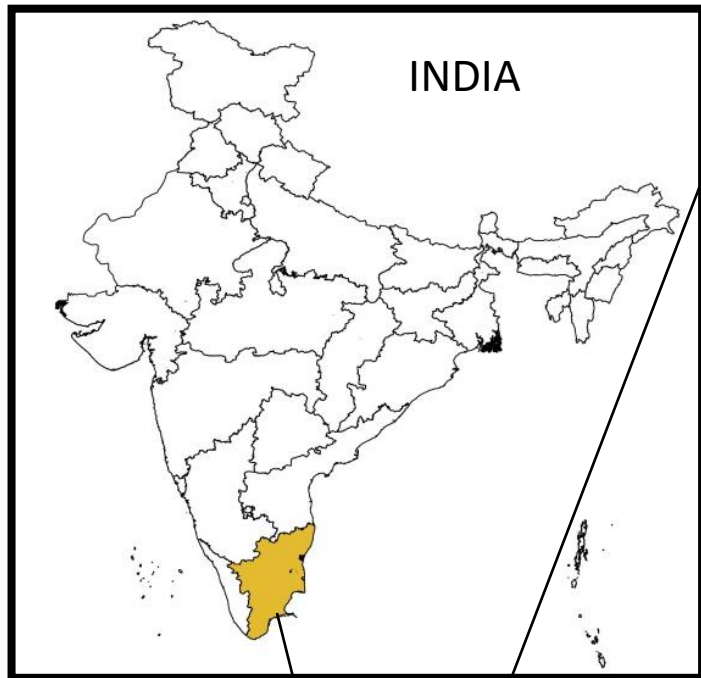
- i. Report on the detailed geological investigation for limestone deposit in Anandavadi Village, Ariyalur Taluk, Trichy District during the year march 1988 by Directorate of Geology and Mining, Tamilnadu.
- ii. Report on the detailed prospecting for limestone deposit in Adanakurichi & Manakudayan Villages, Sendurai Taluk, Ariyalur District over an extent of 49.28.5 Hectares.
- iii G.O.Ms. No-70 dt 17.03.1995 and G.O.(3D).NO-16 dt 03.02.2004 – Limestone Mining lease granted to The India Cements Limited.

List of Plates

Plate 1: Location Map

Plate 2: Regional Geological map showing Periyakurichi Block.

Plate 3: Proposed Borehole Location Map G-3 Level.



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LOCATION MAP OF PERIYAKURICHI BLOCK

DISTRICT : ARIYALUR

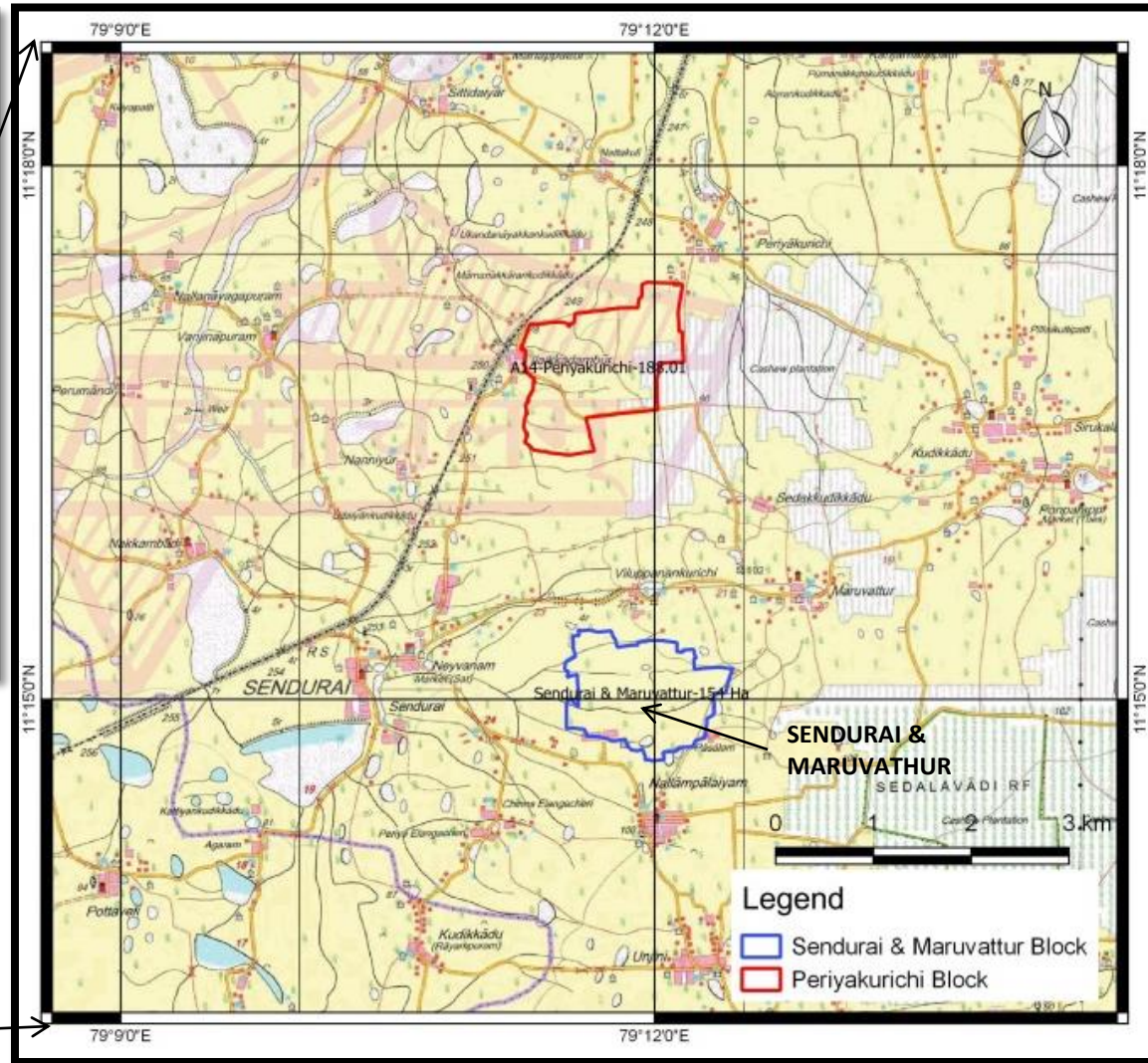
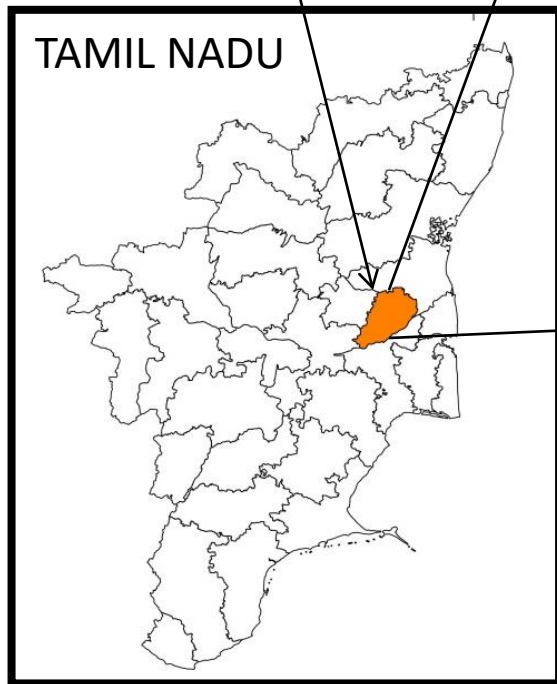
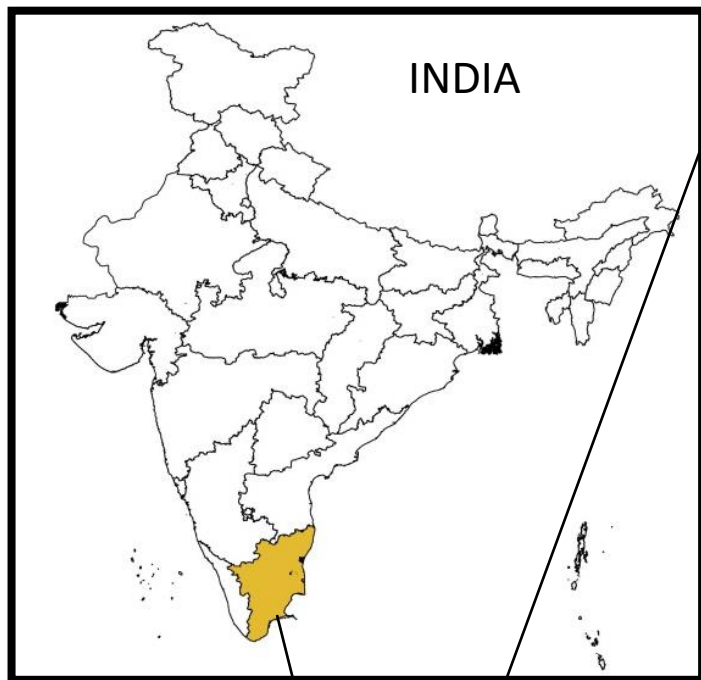
STATE : TAMIL NADU

R.F. Not to Scale

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M.E.C. Ltd., NAGPUR.

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PLATE NO. 1



MINERAL EXPLORATION CORPORATION LIMITED

LOCATION MAP OF SENDURAI & MARUVATHUR BLOCK

DISTRICT : ARIYALUR

STATE : TAMIL NADU

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PLATE NO. 1