

**Proposal for G-3 Stage Exploration of Raghunathapalem Limestone Block in  
Raghunathapalem Cluster-3 at Mattampally Mandal, Suryapet District, Telangana**

**(For NMET)**

**(Industrial Mineral)**

**By**

**Telangana Mineral Development Corporation Limited**

**Hyderabad**

**Place: Hyderabad**

**Date:**

### Summary of the Block for G-3 stage exploration

	<b>Features</b>	<b>Details</b>
1.	Block ID	Raghunathapalem Block
2.	Current Exploration Agency	TGMDC Ltd.,
3.	Previous Exploration Agency	TGMDC Ltd.,
4.	<u>G4</u> stage Geological Report (Previous stage Geological Report)	G-4 Stage report was completed
5.	Commodity	Limestone
6.	Mineral Belt/ Basin	Palnad Basin
7.	Completion Period with entire Time schedule to complete the project	10 months
8.	Objectives	1. To carry out Topographical and Geological Mapping on 1:4000 scale. 2. To Assess the quantity & quality of cement grade limestone in the blocks up to 50m vertical depth 3. To Delineate block boundary with the help of DGPS
9.	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	Exploration to be carried out by officers of TGMDC with outsourcing of survey, drilling & chemical analysis components. Outsourcing of components for identifying agencies will be done through e-tendering.
10.	Name/ Number of Geoscientists	02
11.	Expected Field days (Geology, Geophysics, Surveyor)	Geology = 240 days (Geological mapping, core logging & sampling) Surveyor = 30 days (Establishing block coordinates, Topographic mapping, & locating boreholes)
<b>12.</b>	<b>Location</b>	
	Latitude	16° 44' 41.8" N
	Longitude	79° 53' 49.6" E
	Villages	Raghunathapalem
	Tehsil/ Taluk	Mattampally
	District	Suryapet
	State	Telangana
<b>13.</b>	<b>Area(hectares/square kilometres)</b>	
A	Block Name	Raghunathapalem Block
	Block Area	5.38 Sq.km
	Forest Area	
	Government Land Area	
	Private Land Area	
<b>14</b>	<b>Accessibility</b>	
	Nearest Rail Head	Miryalaguda
	Road	Mattampally to Raghunathapalem
	Airport	Hyderabad
<b>15</b>	<b>Hydrography</b>	
	Local Surface Drainage Pattern (Channels)	A few nalas originates in the cluster and joins the krishna river in the south.
	Rivers/ Streams	Krishna river
<b>16</b>	<b>Climate</b>	The area experiences tropical wet and dry climate.
	Mean Annual Rainfall	The average annual rainfall in the area is 821 mm.

	Temperatures (December) (Minimum) Temperatures (June) (Maximum)	In winter the temperature comes down to 9-11°c during December –January The temperature often exceeds 45°c during May- June
<b>17</b>	<b>Topography</b>	
	Toposheet Number	56 P/14
	Morphology of the Area	The proposed area is a part of Palnad sub-Basin
<b>18</b>	<b>Availability of baseline geoscience data</b>	
	Geological Map (1:50K/ 25K)	<b>Available</b>
	Geochemical Map	<b>Not Available</b>
	Geophysical Map (Aero geophysical, Ground geophysical)	<b>NA</b>
<b>19</b>	<b>Justification for taking up G-3stage Exploration.</b>	<p>TGMDC Ltd carried out G-4 stage investigation for delineating cement grade limestone in the Raghunathpalem Cluster over an area of ~ 47 sq km during 2018-19 field season and delineated cement grade limestone. Reconnaissance resource of about 380 million tonnes was estimated. In view of the positive results obtained from G-4 stage investigation in the area one block were delineated within cement grade limestone area in Raghunathpalem cluster after taking into consideration the leasehold status. The delineated block is proposed to be explored with G-3 stage exploration to gather all necessary information required in G-3 stage to assess the quantity &amp; quality of cement grade limestone resources in the area and classify the resources as per UNFC and Minerals (Evidence and Mineral Contents) Rule, 2021 norms. The exploration will be carried out with the help of geological &amp; topographical mapping on 1:4000 scale &amp; drilling and after successful completion of exploration the TGMDC shall handover the block to State Govt for putting the assessed blocks for auction.</p> <p>TCC committee has approved in principle the next stage of exploration in the delineated block after successful completion of G-4 stage investigation and review by the TCC. The review of the G-4 investigation was completed on 12<sup>th</sup> November 2019. The amount have already been approved for carrying out G-3 stage investigation in Raghunathpalem block through letter number F. No. 6/2/2015, dated 21.06.2018</p>

## **Detailed description on the following titles to be made in the proposal**

### **1. Block Summary**

#### **A. Physiography**

The proposed Raghunathapalem block is mostly a plain land with highest elevation of the ground is around 92 Meters MSL and drains towards West.

#### **Background Geology (Regional Geology & Geology of the Block)**

##### **Regional Geology:**

Raghunathapalem cluster (Cluster-3) forms part of Palnadu sub basin (~ 3400 sq km). Palnad sub- Basin is located in the northeastern part of Cuddapah basin. Regionally the area exposes Archaean age crystallines of PGC-II and sediments of Kurnool Group equivalents of Neoproterozoic age. The supracrustals of Peddavuru Schist Belt are represented by quartz sercrite schist (metarhyolite), amphibolites and banded magnetite quartzite (BMQ). These rocks occur as enclaves/rafts and as narrow/linear patches in PGC-II trending in NW-SE and NE-SW direction. The PGC-II comprises biotite granite gneiss, hornblende granite, pink biotite granite, pink granite, and leuco granite. The grey biotite gneiss is coarse grained, exhibits crude foliation and composed of quartz, plagioclase, orthoclase and biotite. A number of quartz veins trending NNE - SSW are seen traversing PGC-II. Swarms of dolerite dyke trending NW-SE, NE-SE, WNW-ESE and ENE-WSW are exposed in the area. These are dark grey to black, fine to medium grained with pyrite disseminations and composed mainly of clinopyroxene and plagioclase with sub – ophitic to ophitic texture.

In the southern part, the PGC – II is overlain by Banaganapalle Quartzite and Narji Formation of Kurnool Group belonging to Neoproterozoic age. Conglomerate, Quartzite and shale of Banganapalli Quartzite and massive and flaggy limestone of Narji Formation are exposed towards south and belong to Kurnool Group. They are deposited over granites and gneisses and the basal conglomerate is exposed as patches consists of angular to sub angular pebbles of quartz, quartzite and chert cemented in siliceous and ferruginous matrix. Quartzite lies directly over granite/gneiss, or as brown, medium grained, gritty and arkosic with sporadic pyrite. Shale overlies the quartzite. Shales are grey, khaki green, yellow, purple and reddish brown with / without pyrite crystals. They are succeeded conformably by massive and flaggy limestone belonging to Narji Formation. Limestone is massive and grey, white pale green, brown or purple in colour, Flaggy limestone is argillaceous is exposed. Kurnool Group of rocks trend NE – SW to ENE – WSW direction trend with gentle dips towards southeast. Banaganapalle quartzite shows cross bedding and ripple marks. Foliation in granites trend NW – SE with steep dips towards... (NE or SW). All these rocks show joints trending N-S, E-W, ENE-WSW and WNW-SSE.

AGE	SUPER GROUP	GROUP	FORMATION	LITHOLOGY
Neoproterozoic		Kurnool	Narji	Flaggy Limestone
				Massive Limestone
			Banaganapalli	Shale
			Quartzite	Quartzite
Palaeoproterozoic			Basic Intrusive	Dolerite
Archaean to Paleoproterozoic	PGC -II			Quartz vein
				Grey hornblende granite
				Leuco granite
				Pink biotite granite
				Pink granite
				Grey biotite genesis
				Grey hornblende biotite gneiss
			Peddavuru Schist Belt	Banded magnetite quartzite
				Meta-rhyolite
				Meta-basalt

### Geology of the Area:

Most part of the area of Raghunathpalem is soil covered & have scanty outcrop of mostly massive to flaggy limestone & impure (Silica rich) limestone of Narji Formation of Kurnool Group. The uniform horizontal to sub horizontal disposition of the sedimentary sequence in the area of investigation indicates that the area has not undergone any major tectonic disturbance. Among the orimary sedimentary structures, bedding planes nd laminations are common. The secondary structures observed in the area joints. The generalized strike of the strata is NE-SW with dips varying 3° to 15° degree towards southeast.

### Stratigraphic succession of the area around Raghunathpalem is as follows:

GROUP	FORMATION	LITHOUNITS
Kurnool Group	Narji Formation	Upper variegated limestone
		Middle Grey massive limestone
		Lower purple Shale

C. potentiality based on geology, geophysics, ground geochemistry etc.

Cement grade limestone occupies an area of 31.73 Sq km in Raghunathpalem area and has reconnaissance resources (334) of about 1616 million tonnes. Thus area has high potential for cement grade limestone.

#### **D. Scope for proposed exploration**

As the area has high potential for cement grade limestone, the delineated Raghunathpalem block in the area must be explored by G-3 stage exploration to assess the quantity & quality of cement grade limestone resources in the delineated one block and classify the resources as per UNFC and Minerals (Evidence and Mineral Contents) Rule, 2021 norms before the block is handed over to State Government for auctioning.

#### **E. Recommendations o f G4 Stage Mineral Exploration**

It is recommended to take up G-3 Stage Exploration in identified limestone block from G-4 stage Exploration in Raghunathpalem area in Suryapet district of Telangana

#### **F. Objectives:**

1. To carry out Topographical and Geological Mapping on 1:4000 scale.
2. To Assess the quantity & quality of cement grade limestone in the blocks up to 50m vertical depth
3. To Delineate block boundary with the help of DGPS

#### **2. Previous Work:**

The Raghunathpalem area forms part of Palnad Sub-basin (TS no. 56P/14) and is located north of River Krishna in the north-eastern portion of the Cudappah Basin. The earliest geological account of Palnad Sub-basin was documented by William King (1872). Mukherjee and Syed Kazim (1947) of erstwhile Hyderabad Geological Survey carried out geological mapping of Palnad Basin covering parts of Nalgonda district. Systematic geological mapping and mineral investigation in this part of Palnad Sub-basin was carried out by Ziauddin and Sharma (1959-61); Appavadhanulu et al., (1963-64); Rajurkar (1972); Ramalingaswamy (1971-72, 1973-74); Hazra et al. (2005) and Sekhram A (1978-79).

Recently G-4 stage exploration was carried out by TGMDC for delineating cement grade limestone in the area during 2018-19. An area of 31.73 Sq km of cement grade limestone was delineated in Raghunathpalem area and reconnaissance resources (334) of about 1616 million tones was estimated. The authors recommended to take up G-3 Stage Exploration in one identified limestone block.

## 2. Block description:

### Raghunathpalem Block

Block Corner points / Cardinal Points	Latitude	Longitude	Area in Sq. Km
1	16° 43' 38.715" N	79° 53' 44.627" E	5.38 Sq. Km
2	16° 43' 37.403" N	79° 54' 38.420" E	
3	16° 43' 26.587" N	79° 54' 41.899" E	
4	16° 43' 9.758" N	79° 54' 55.356" E	
5	16° 42' 57.445" N	79° 54' 59.145" E	
6	16° 42' 54.667" N	79° 54' 52.017" E	
7	16° 41' 46.515" N	79° 54' 4.914" E	
8	16° 41' 45.395" N	79° 53' 43.049" E	
9	16° 42' 0.935" N	79° 53' 44.788" E	
10	16° 42' 31.224" N	79° 53' 42.112" E	
11	16° 42' 59.525" N	79° 53' 44.595" E	

## 3. Planned Methodology

The proposed Raghunathpalem limestone blocks shall be explored under the Preliminary Exploration (G-3) stage through detailed topographical and geological mapping, core drilling, and chemical analysis, in order to assess the quantity and quality of cement-grade limestone resources. Borehole spacing shall be planned at 800 X 800 meters grid (As per MEMC, 2021).

**5. Nature of Quantum and Target work**

<b>RAGHUNATHAPALEM BLOCK</b>			
<b>Quantum of Work Carried out by TGMDC Ltd.</b>			
<b>In Raghunathapalem Block , Mattampally Mandal, Suryapet District, Telangana State</b>			
<b>S. No.</b>	<b>Item Work</b>	<b>Unit</b>	<b>Quantum of work Proposed</b>
1	Topographic Survey (on 1:4000)	sq.km	5.38 sq.km
2	Geological Mapping (on 1:4000)	sq.km	5.38 sq.km
3	Drilling	m	400 (08 BHs)
4	Laboratory Studies		
	i) Chemical Analysis for Primary Check samples for 6 radicals i.e. CaO, MgO, Al <sub>2</sub> O <sub>3</sub> , SiO <sub>2</sub> , Fe <sub>2</sub> O <sub>3</sub> and LoI	Nos.	450 Primary
	ii) Internal Check Samples (10% of Primary) for 6 radicals i.e. CaO, MgO, Al <sub>2</sub> O <sub>3</sub> , SiO <sub>2</sub> , SO <sub>3</sub> & P <sub>2</sub> O <sub>5</sub> , Fe <sub>2</sub> O <sub>3</sub> and LoI	Nos.	0
	iii) External Check Samples (5% of Primary) for analysis 6 radicals i.e. CaO, MgO, Al <sub>2</sub> O <sub>3</sub> , SiO <sub>2</sub> , Fe <sub>2</sub> O <sub>3</sub> and LoI	Nos.	45
	iv) Composite Samples for 12 radicals (CaO, MgO, Al <sub>2</sub> O <sub>3</sub> , SiO <sub>2</sub> , Fe <sub>2</sub> O <sub>3</sub> , SO <sub>3</sub> , P <sub>2</sub> O <sub>5</sub> , LoI, MnO <sub>2</sub> , K <sub>2</sub> O, Na <sub>2</sub> O and Cl)	Nos.	45
5	Physical Studies		
	Petrological Studies (Petrographic Studies)	Nos.	10
6	Buoy Density	Nos.	05
7	Report Preparation (Digital format)	Nos.	1

**In Raghunathapalem Block, Mattampally Mandal, Suryapet District, Telangana**

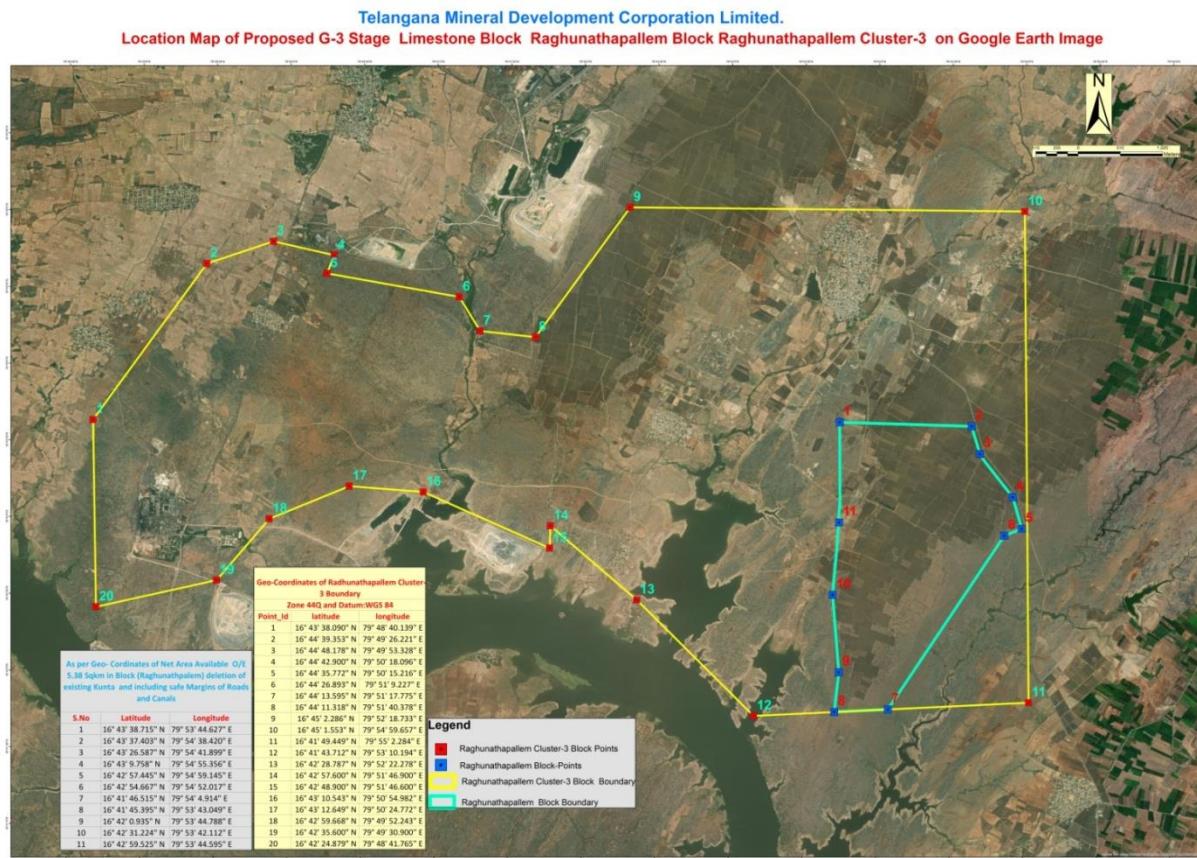
<b>SUMMARY OF COST ESTIMATES</b>		
<b>S. No.</b>	<b>Item</b>	<b>Total Estimated cost (Rs)</b>
1	Geological, Survey & Sampling Work	<b>3186960.00</b>
2	Drilling	<b>3153300.00</b>
3	Laboratory Studies	<b>2232040.00</b>
4	Tendering Cost	<b>171446.00</b>
5	Operational Charges	<b>428615.00</b>
6	Preparation of Exploration proposal	<b>171446.00</b>
7	Geological Report Preparation	<b>428615.00</b>
8	Peer Review Charges	<b>30000.00</b>
9	TOTAL	<b>9802422.00</b>
10	GST @ 18%	<b>1764435.96</b>
11	GRAND TOTAL	<b>11566857.96</b>
12	Rs. In Lakhs	<b>115.66</b>

**COST ESTIMATE FOR LIMESTONE G-3 EXPLORATION OF RAGHUNATHAPALLEM BLOCK, SURYAPET DISTRICT, TELANGANA**

S. NO	Item of Work	Unit	Rates as per NMET SoC 2020-21		Estimated Cost of the Proposal	
			SoC-Item- Sl. No.	Rates as per SoC	Quantit y	Amount
a	b	c	d	e	f	g
<b>A</b>	<b>Geological work</b>					
1	Geological Mapping (1:4000) with Topographical Survey, Core logging, Sampling & report writing					
	a) Survey work - Surveyor	per day	1.6.11a	8,300	30	249000.00
	b) 4 labours / Party (Rs 526 / day / labour) (As per rates of Central Labour Commissioner)	day	5.7	526	120	63120.00
	C) Demarcation of lease boundary, Fixation of borehole and determination of co-ordinates & Reduced Level (RL) of the boreholes by DGPS	per point of observation	1.6.2	19,200	19	364800.00
	d) Charges for Geologist party days in field	Per day	1.5.1a	11,000	150	1650000.00
	e) 2 labours / Party (Rs 526 / day / labour) (As per rates of Central Labour Commissioner)	day	5.7	526	300	157800.00
	f) Charges for Geologist party days ( at H Q)	Per day	1.5.1a	9,000	30	270000.00
	e) Sample processing work	Sampler per day	1.5.2	5,100	60	306000.00
	f) 4 labours / Party (Rs 526/ day / labour) (As per rates of Central Labour Commissioner)	day	5.7	526	240	126240.00
	<b>Sub total - A</b>					<b>3186960.00</b>
<b>B</b>	<b>Drilling- Out Sourced</b>					
1	Surface drilling	Per Mtr	2.2.1.1B	5242	400	2096800.00
2	Accommodation	ONE Month	2.2.9	50000	0	0.00
3	Appoach road making for flat terrain	Per km	2.2.10a	22020	0	0.00
4	Land or Crop Compensation	per bore hole	5.6	20000	0	0.00
5	Camp setting	per drill	2.2.9a	250000	0	0.00
6	Camp winding	per drill	2.2.9b	250000	0	0.00
7	Drilling Tendering process cost	One time	2.3	500000	1	500000.00
8	Transportation of drill rig & truck associated per drill	K.M	2.2.8	36	0	0.00

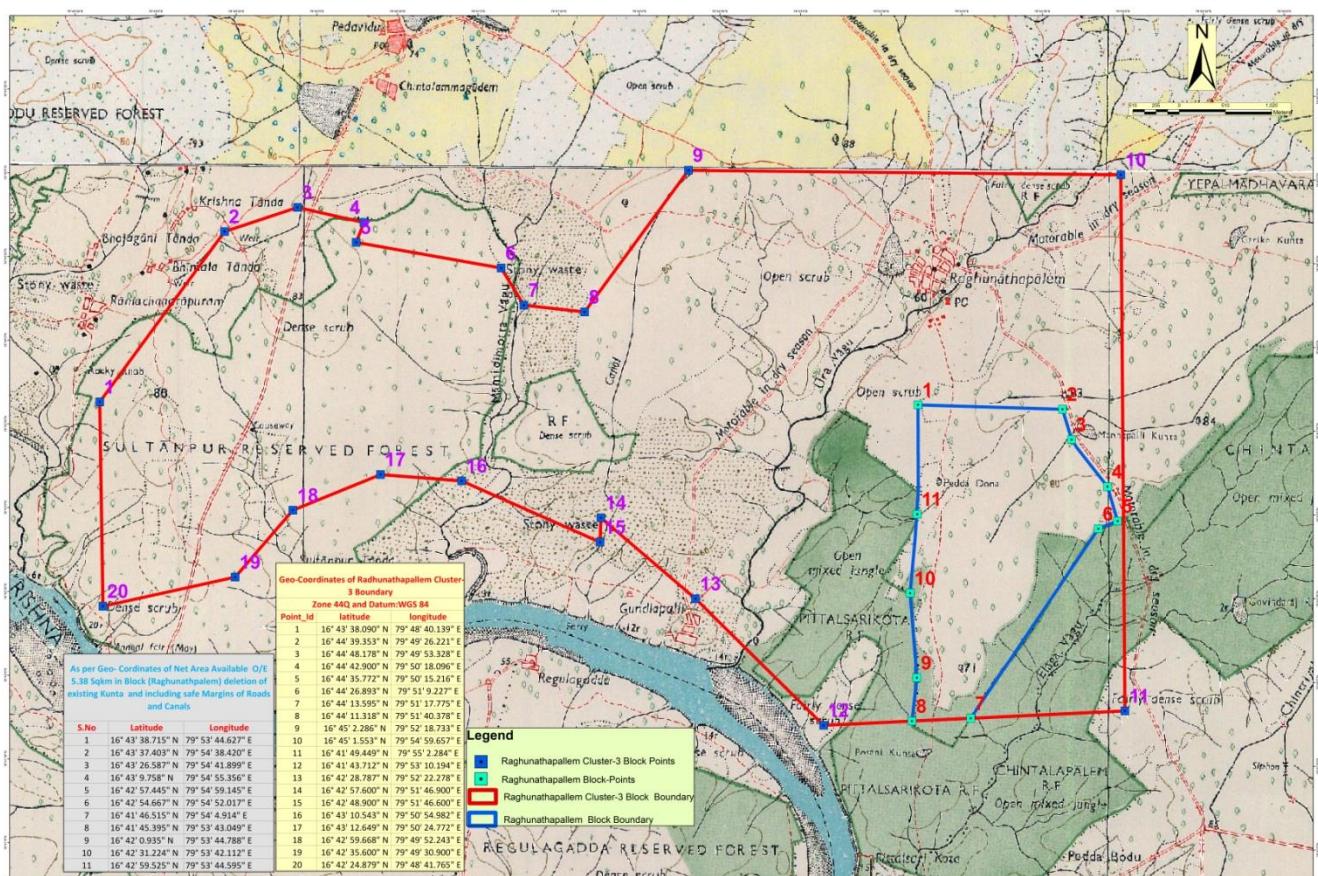
9	Vehicle & POL Charges for field	Month	N.A.	40,000	0	0.00
10	Drill Core Preservation	Per Mtr	5.3	1,590	350	556500.00
	<b>SUB TOTAL B</b>					<b>3153300.00</b>
<b>C</b>	<b>Laboratory studies</b>					
<b>1</b>	<b>Chemical analysis</b>					
	a) Primary core Samples -XRF method - Major Oxides	per sample	4.1.15 a	4200	450	1890000.00
	b) Internal Check Samples for 8 radicals i.e. CaO, MgO, Al <sub>2</sub> O <sub>3</sub> , SiO <sub>2</sub> , Fe <sub>2</sub> O <sub>3</sub> and LoI	Per sample	4.1.9	3511	0	0.00
	c) External Check Samples 10 % XRF method - Major Oxides	Per sample	4.1.9	2841	45	127845.00
	d) Composite Samples for 6 radicals CaO, MgO, Al <sub>2</sub> O <sub>3</sub> , SiO <sub>2</sub> , Fe <sub>2</sub> O <sub>3</sub> , and LoI	Per sample	4.1.9	2841	45	127845.00
<b>2</b>	<b>Physical analysis</b>					0.00
	a) Preparation of thin sections	Nos.	4.3.1	2353	10	23530.00
	b) Petrographic studies	Nos.	4.3.4	4232	10	42320.00
	c) Bulk density	Nos.	4.1	3540	5	17700.00
	Digital Photographs	Nos.	4.3.7	280	10	2800.00
	<b>SUB TOTAL C</b>					<b>2232040.00</b>
	<b>TOTAL (A+B+C)</b>					<b>8572300.00</b>
	<b>Tendering Cost</b>		<b>2.3</b>			<b>171446.00</b>
	<b>Operational Charges</b>		<b>6</b>	<b>1</b>		<b>428615.00</b>
<b>E</b>	<b>Preparation of Exploration proposal</b>		5.1			<b>171446.00</b>
<b>F</b>	<b>Geological Report Preparation</b>		5.2	2		<b>428615.00</b>
<b>G</b>	<b>Peer Review Charges</b>		<b>As per EC Decision</b>			<b>30000.00</b>
	<b>TOTAL (A+B+C+D+E+F+G)</b>					<b>9802422.00</b>
<b>H</b>	<b>GST @ 18%</b>					<b>1764435.96</b>
<b>I</b>	<b>GRAND TOTAL</b>					<b>11566857.96</b>
<b>J</b>	<b>Rs. In Lakhs</b>					<b>115.66</b>

**List of Plates:**



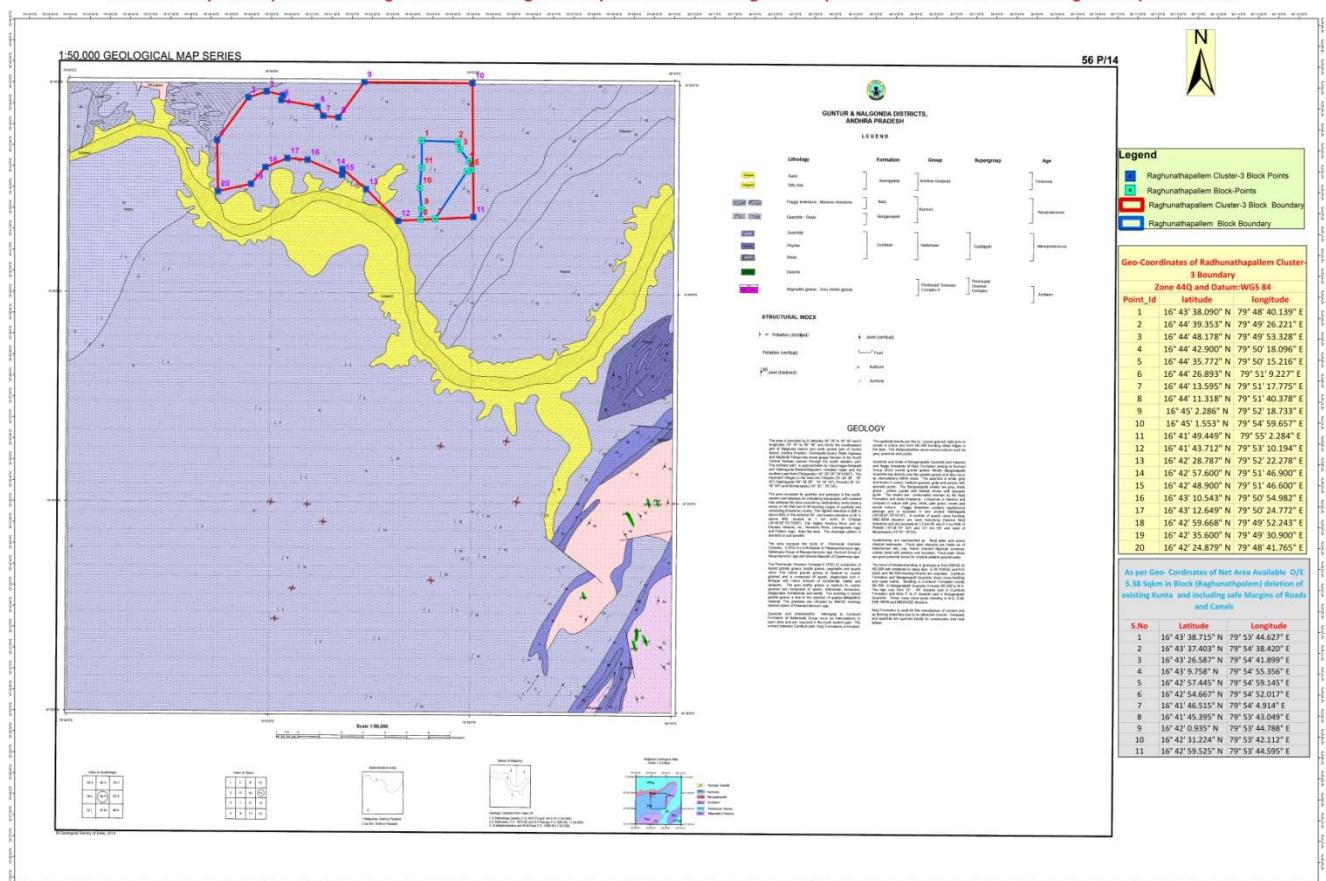
**Telangana Mineral Development Corporation Limited.**

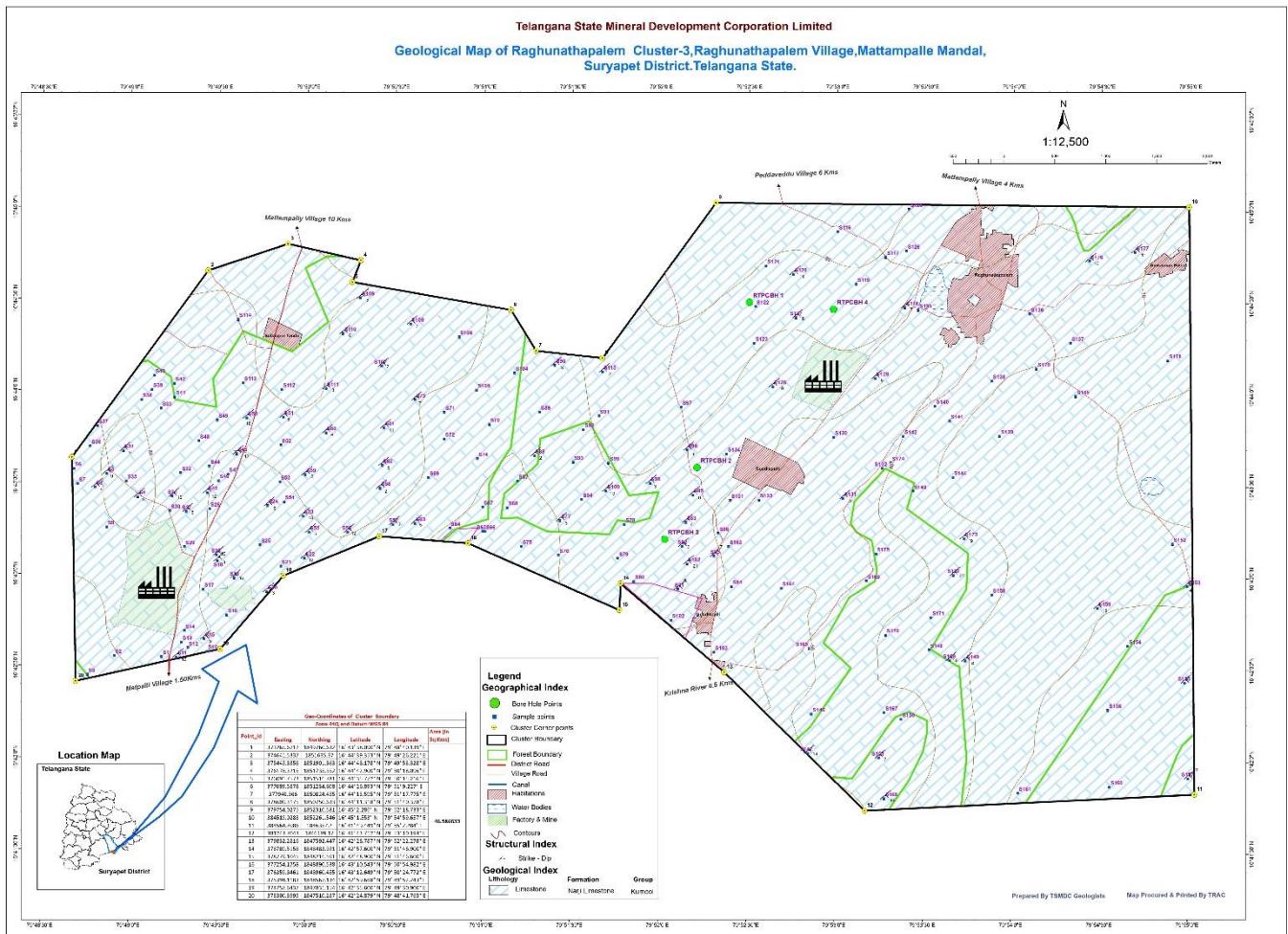
**Location Map of Proposed G-3 Stage Limestone Block Raghunathapalem Block Raghunathapalem Cluster-3 on Part of Toposheet No.56P/14**

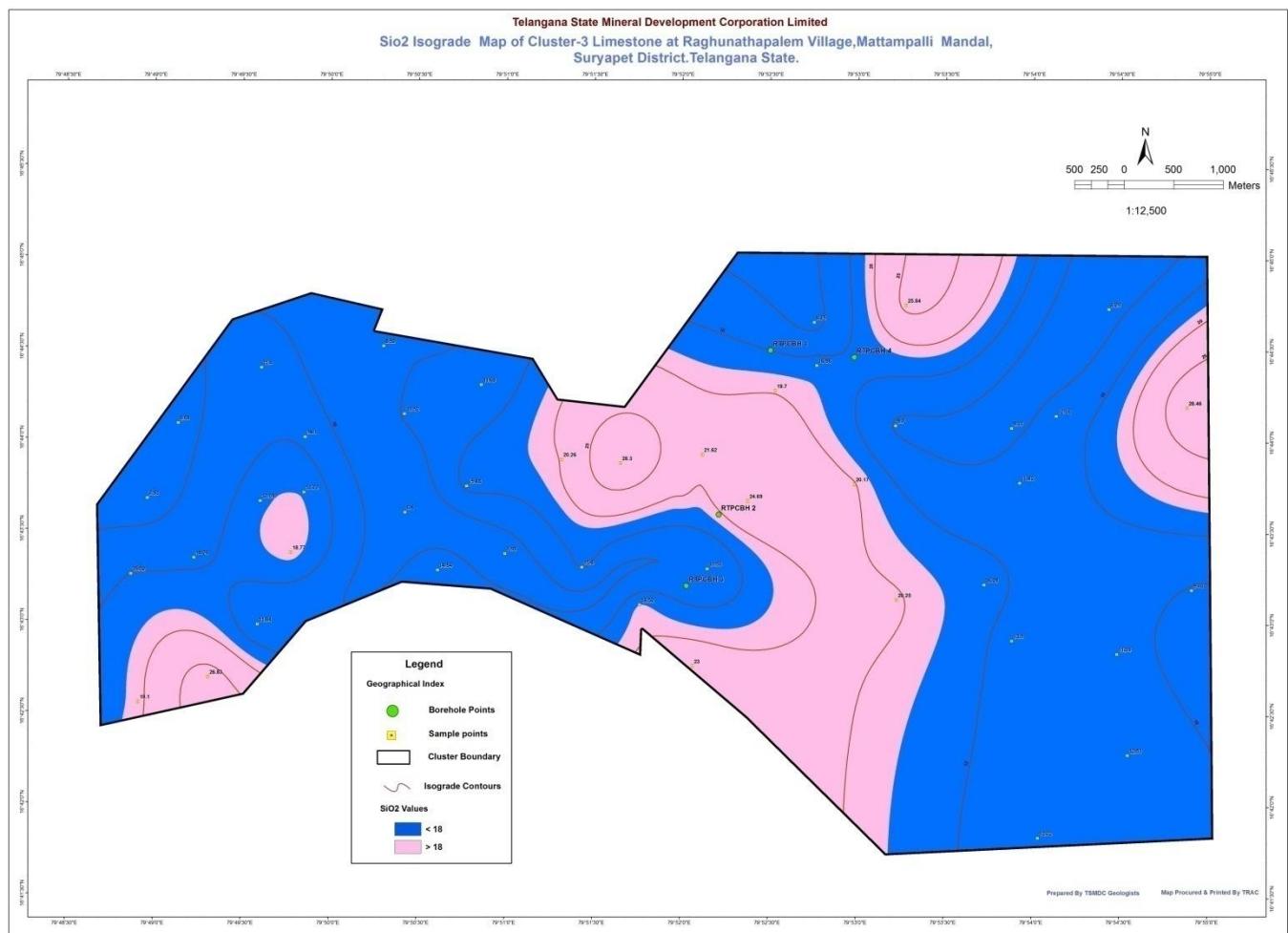


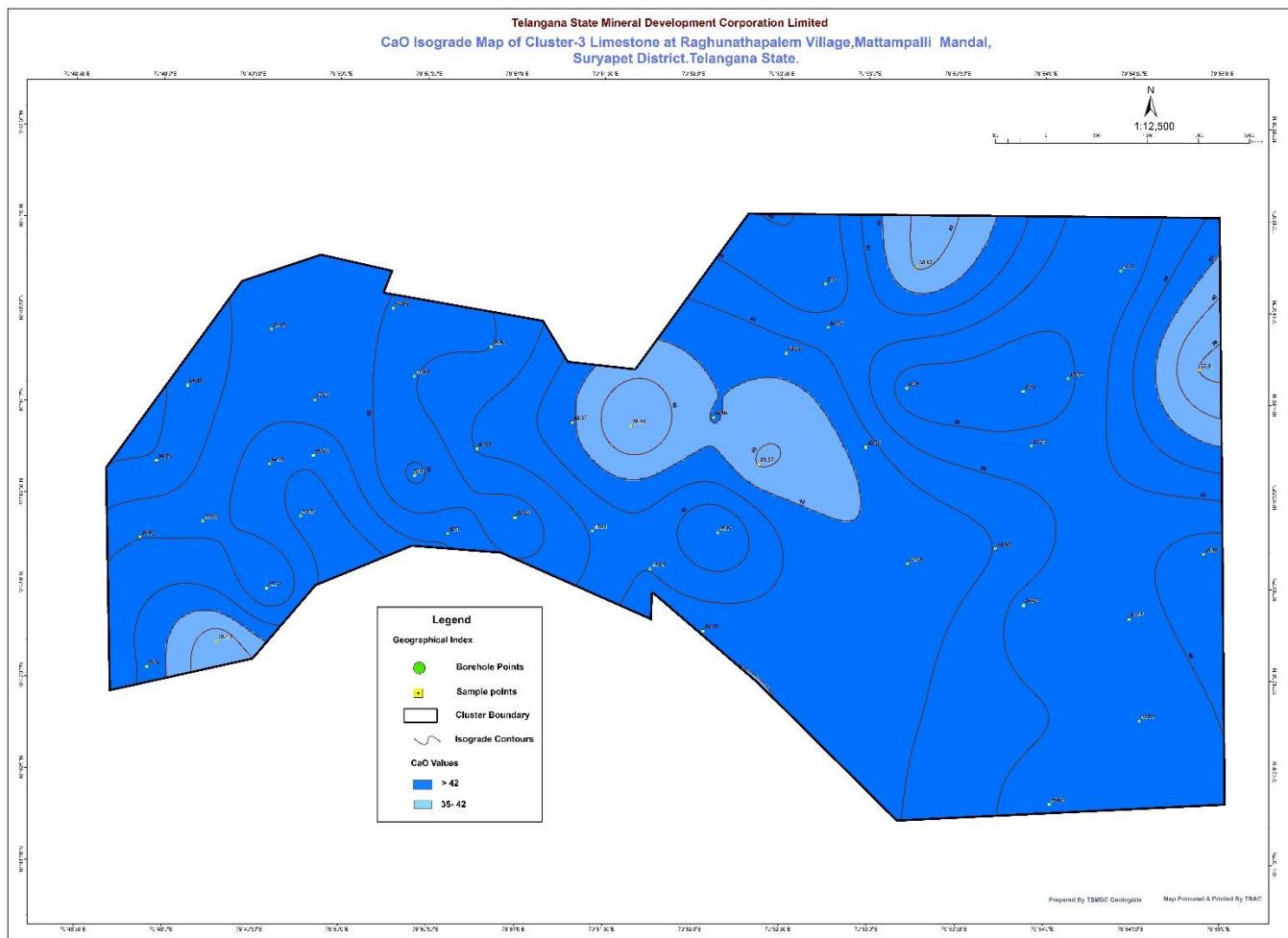
**Telangana Mineral Development Corporation Limited.**

**Location Map of Proposed G-3 Stage Limestone Raghunathapallem Block in Raghunathapallem Cluster-3 on GSI Geological Map No.56P/14**









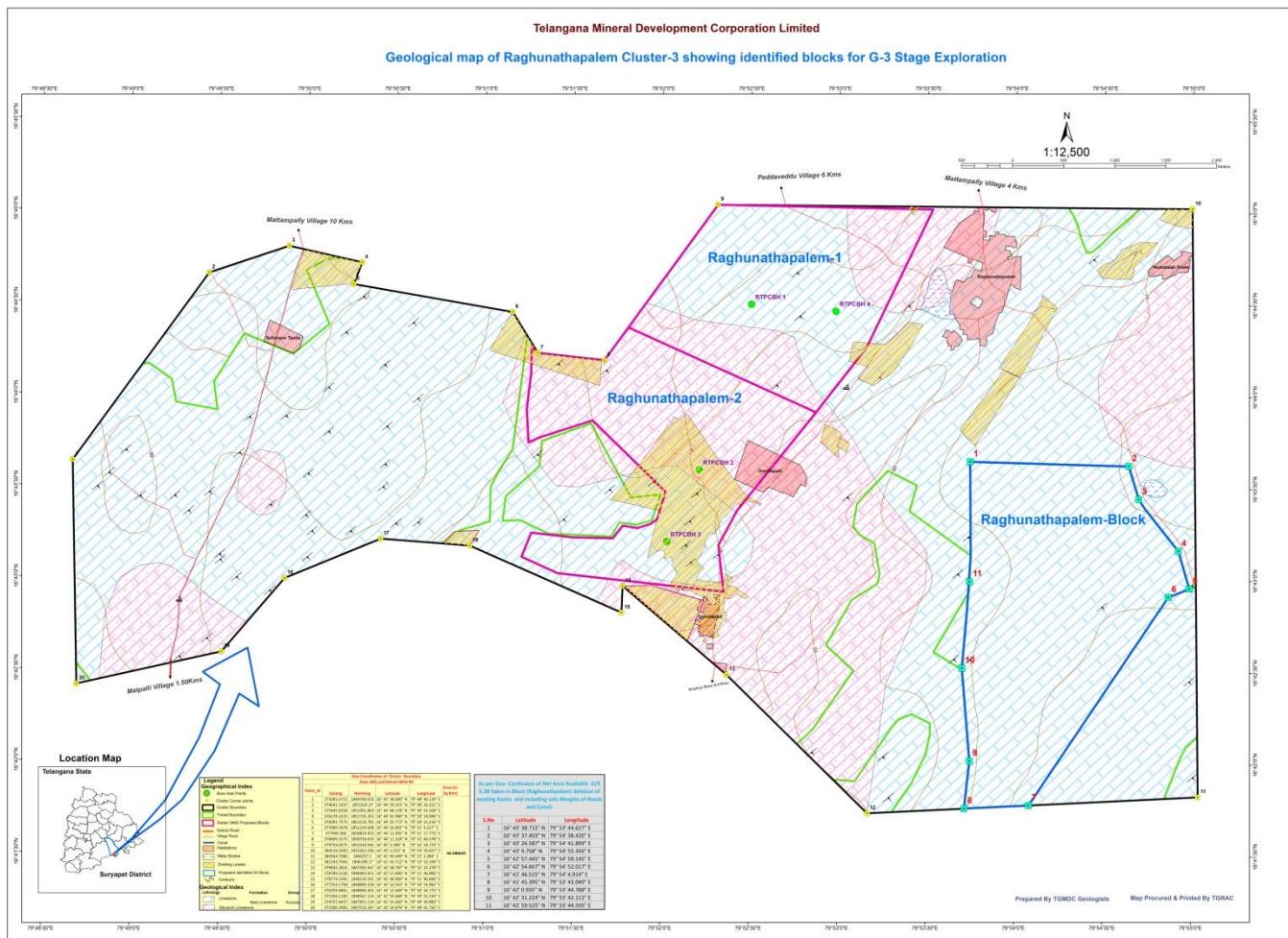


Plate - 3a

Telangana State Mineral Development Corporation Limited  
**Subsurface Exploration -Borehole Details**  
**Cluster -3, RTPCBH-1(P-11), Drill unit: KOREA**

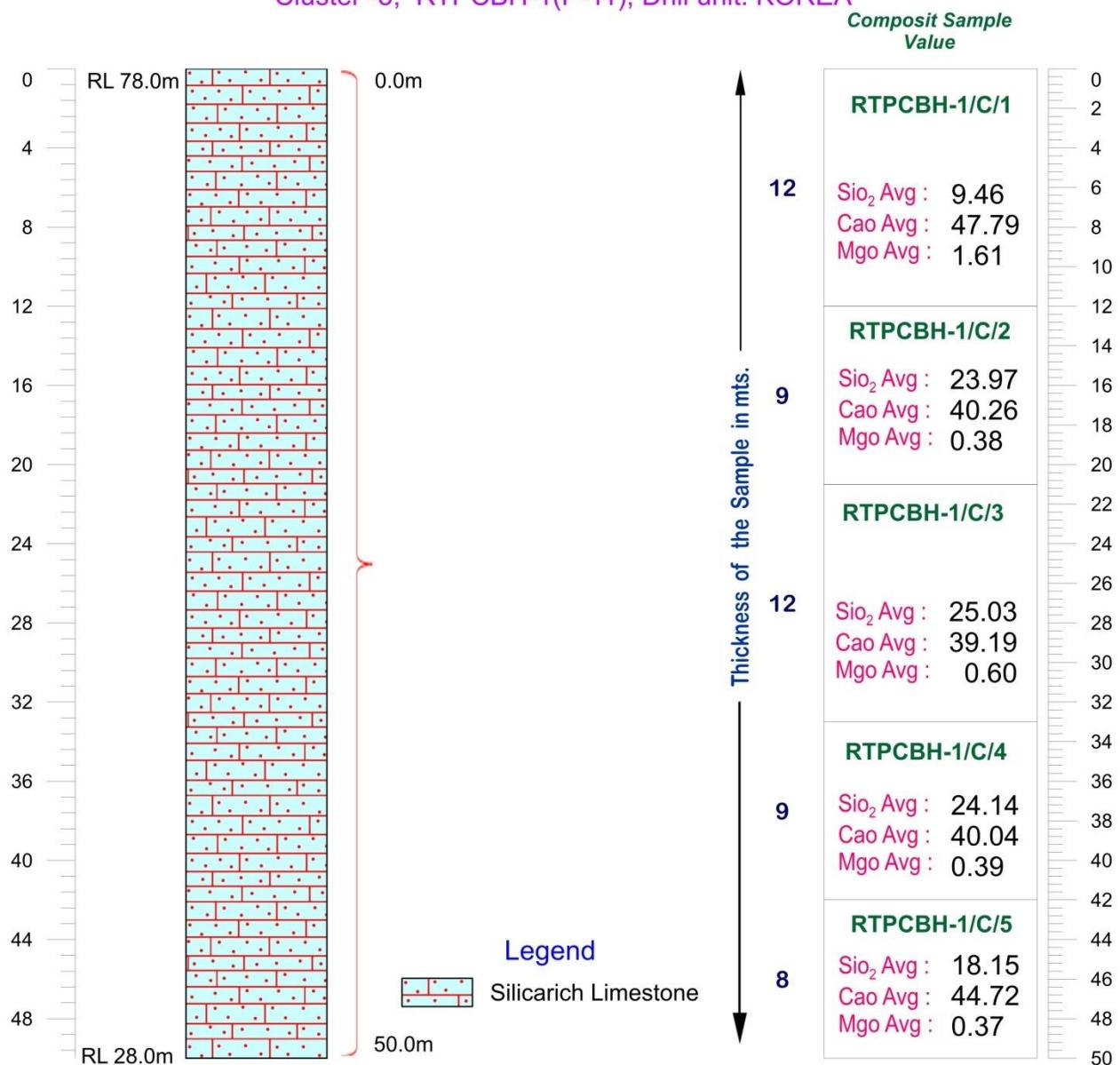
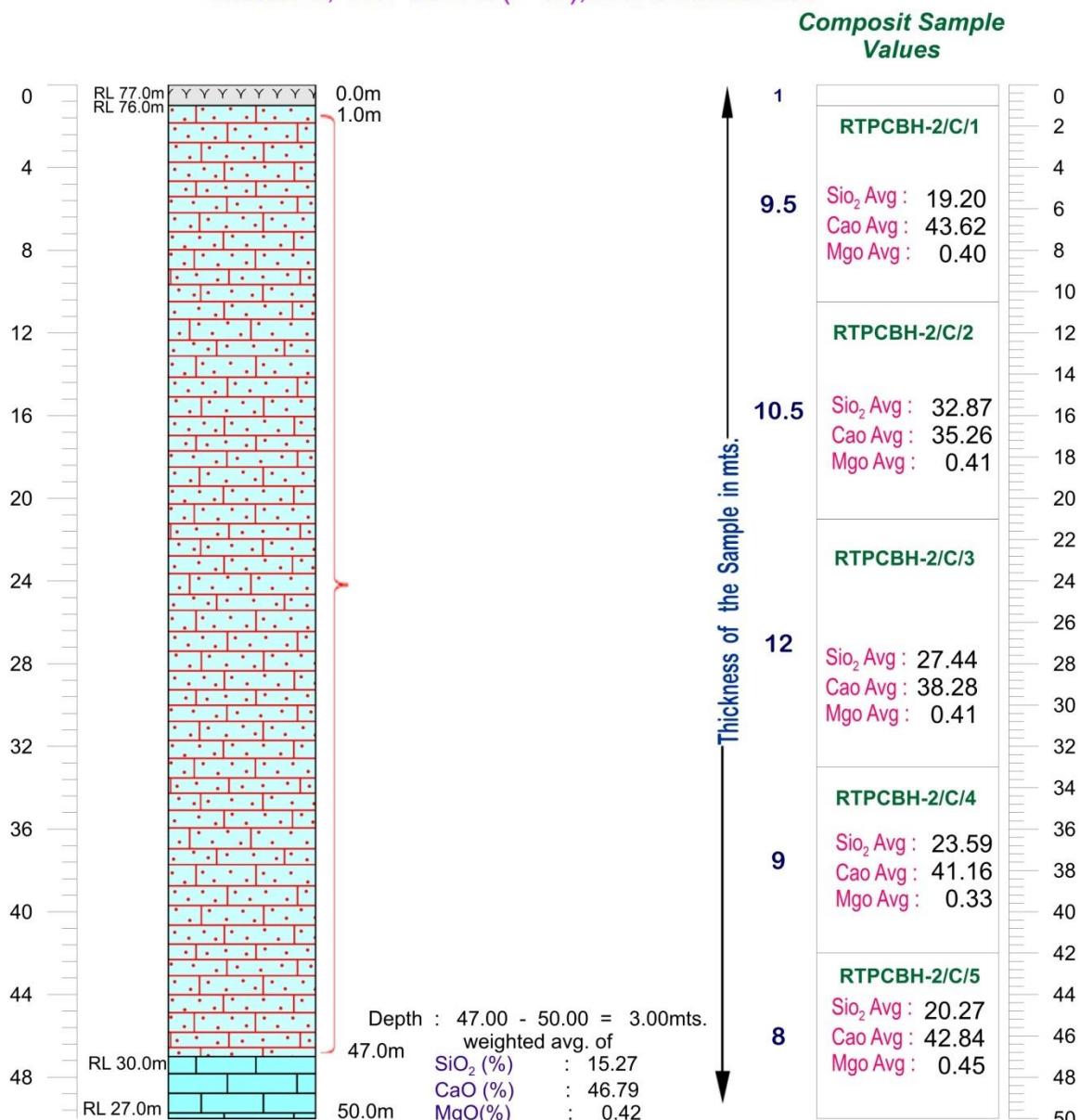


Plate - 3b

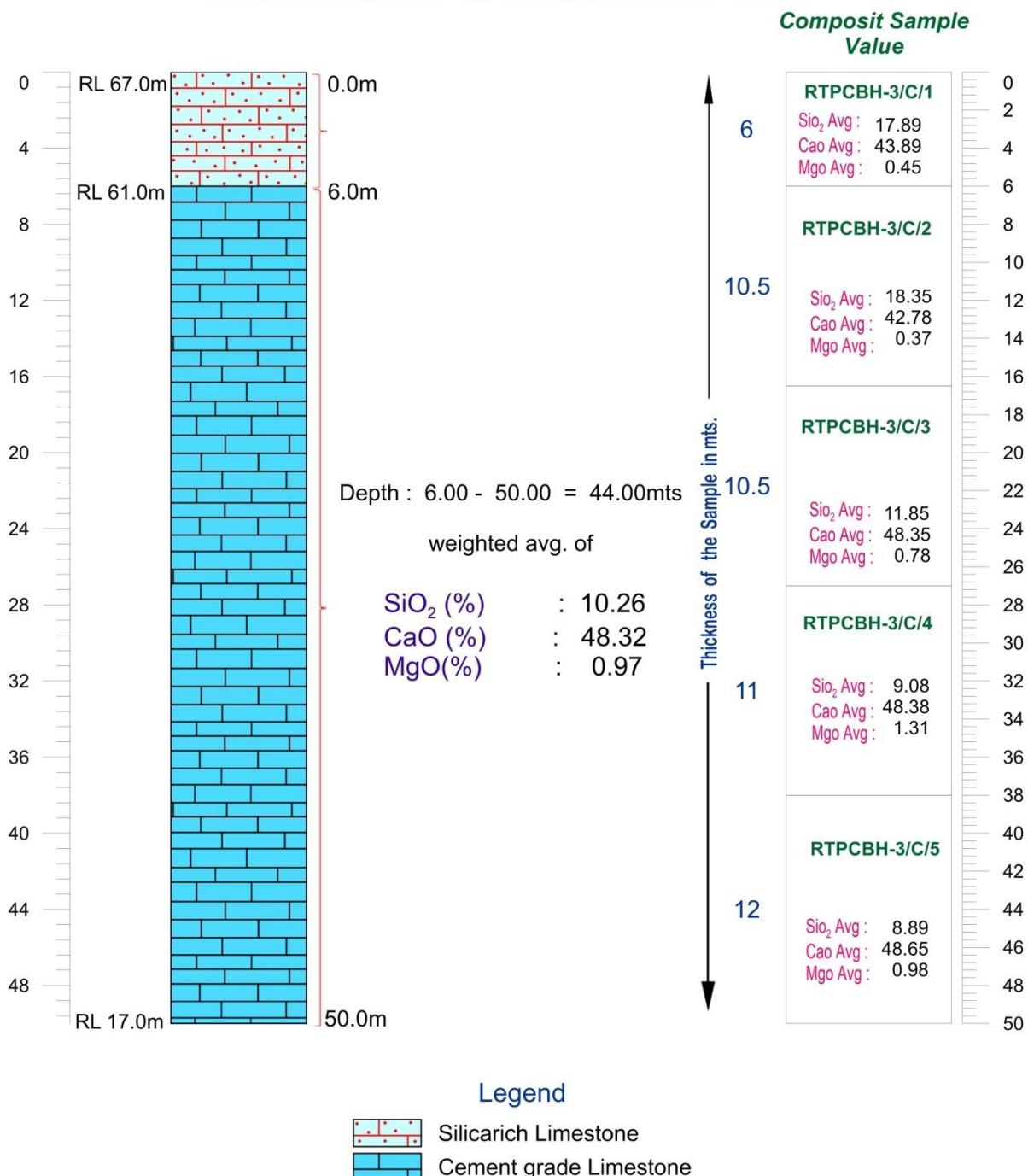
Telangana State Mineral Development Corporation Limited  
 Subsurface Exploration -Borehole Details  
 Cluster-3, RTPCBH-2 (P-11), Drill unit: KOREA



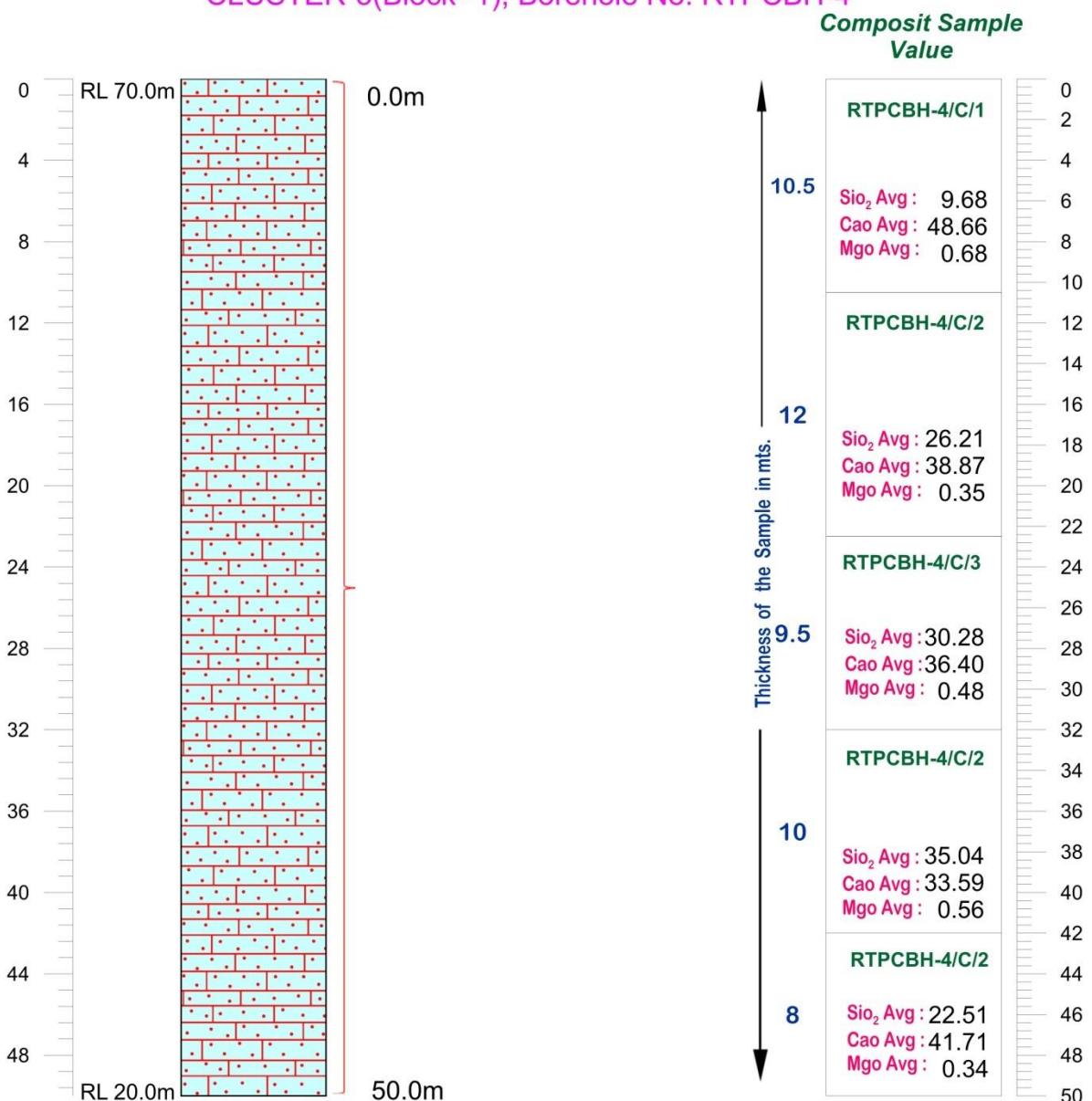
**Legend**

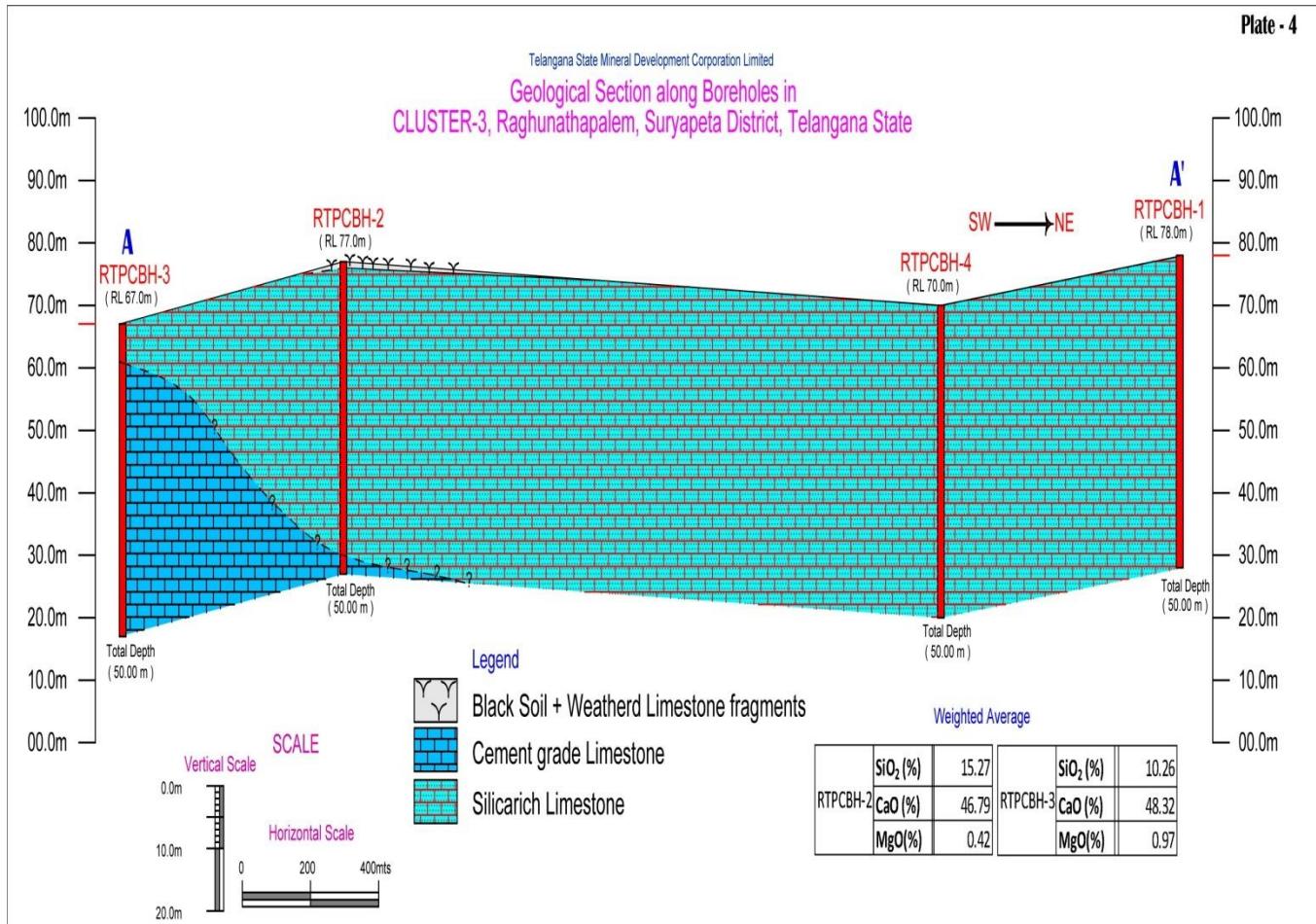
-  Black Soil + Weathered Limestone fragments
-  Silicarich Limestone
-  Cement grade Limestone

Telangana State Mineral Development Corporation Ltd.  
**Subsurface Exploration -Borehole Details**  
**CLUSTER-3(Block- 2), Borehole No: RTPCBH-3**



Telangana State Mineral Development Corporation Ltd.  
**Subsurface Exploration -Borehole Details**  
**CLUSTER-3(Block- 1), Borehole No: RTPCBH-4**





## BOREHOLE GRID MAP

N

## MAP SHOWING THE BOREHOLE GRID OF THE RAGHUNATHAPALLEM BLOCK PROPOSED FOR LIMESTONE G-3 EXPLORATION IN SURYAPET DISTRICT, TELANGANA

**Area = 5.38 Sq. Kms.**

## Parts of Toposheet No's: 56P/14

0      330      660      1,320      1,980      Meters



## Legend

800 X 800 DTH = 8 (G3-Exploration)

 Proposed Block Boundary with buffer of 200mts

### Proposed Block Boundary

TIME LINE FOR G-3 EXPLORATION LIMESTONE BLOCK												
Sl.No	Activities	Unit	Months									
			1	2	3	4	5	6	7	8	9	10
1	Topographical ( 1 : 4000) DGPS Survey work	Month										
2	Camp Mobilisation	Month										
3	Surface Drilling	Month										
4	Core logging and Sampling Geological party	Month										
5	Laboratory Studies	Month										
6	Geologist Party days(1 party)	Month										
7	Synthesis of data and Geological report Writing	Month										
8	Peer review work	Month										
9	Finalisation of Geological Report & Printing	Month										