GOVERNMENT OF ARUNACHAL PRADESH
DEPARTMENT OF GEOLOGY AND MINING
PAPUMPARE DISTRICT, ITANAGAR

Reconnitary Geo-Chemical and Geological Mapping of Limestone and Dolomite in and Around Menga Area of Upper Subansiri District of Arunachal Pradesh over an Area of 26 Sq.kms

(Base metals/ Ferrous/ Non-Ferrous/ Industrial/ Strategic & Critical/ Precious metals etc)

By

सत्यमेव जयते

Department of Geology and Mining Agency
Government of Arunachal Pradesh
Chandannagar, Itanagar, Arunachal Pradesh

Date: 18/04/2023

GOVERNMENT OF ARUNACHAL PRADESH
DEPARTMENT OF GEOLOGY AND MINING
PAPUMPARE DISTRICT, ITANAGAR

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GOVERNMENT OF ARUNACHAL PRADESH
DEPARTMENT OF GEOLOGY AND MINING
PAPUMPARE DISTRICT, ITANAGAR

Annexure IV

No: **Asstt./DRS/2023-24/** **Dated Yupia, 18th April, 2023**

To,

The Director,
National Mineral Exploration Trust,
Ministry of Mines,
F-114, Shastri Bhavan
New Delhi-110001

Sub: Format for Certificate to be Submitted Along With Project Proposal- Reg.

It is certified that

a. Project titled "**Reconnitary Geo-Chemical and Geological Mapping of Limestone and Dolomite In and Around Menga Area of Upper Subansiri District of Arunachal Pradesh over an Area of 26 Sq.kms**" along with an estimated Project Cost of Rs **9,12,44,255.872/- (Rupees Nine Crores, Twelve Lakhs, Forty Four Thousand and Two Hundred and Fifty Five Rupees and Eighty Seven paisa only) only** is submitted for consideration of NMET funding.

b. The Project proposal is prepared following the guidelines prescribed in Minerals (Evidence of Mineral Contents) Rules, 2015 in case of Mineral Exploration Project Proposals.

c. The proposal has duly examined and oncurred by associate finance in accordance with canons of financial propriety.

d. The Same Project Proposal or Project proposal with similar objectives has not been submitted to any funding agency by this organization and the project proposal bears no duplication with existing work/ ongoing projects taken by this agency

Yours faithfully,

Office of the Director Geology & Mining Govt. of A.P Itanagar

(**Shri Tasser Talar**),
Director, Department of Geology and Mining
Government of Arunachal Pradesh

GOVERNMENT OF ARUNACHAL PRADESH
DEPARTMENT OF GEOLOGY AND MINING
PAPUMPARE DISTRICT, ITANAGAR
Summary of the Block for Reconnaissance Survey (G4 Stage)
GENERAL INFORMATION ABOUT THE BLOCK

	Features	Details
	Block ID	
	Exploration Agency	Department of Geology Mining, Govt of AP
	Commodity	Limestone
	Mineral Belt	Information to be Extracted
	Completion Period with entire Time schedule to complete the project	1 Years since the date of Inception
	Objectives	a. To conduct field geological checking's on field and to prepare the geological map of the area in 1:12000. b. To understand the terrain and to prepare a geomorphological map of the area in 1:12500. c. To Prepare a DEM of the region using Ground coordinates of DGPS d. To conduct the DGPS survey of the blocks containing Minerals e. To conduct the geo-chemical and Petrographic analysis of the study area. f.Collection of 1000 samples from the study area and conducting geo-physical and geo-chemical assessment of the sample characteristics g. To prepare the land use/land use map of the region in a scale of 1:10000. h. To provide quantification of the quantity of resources available i. To develop a proper report an submission of the same to the Government j. To perform the environmental Clearance Plan for the exploration h. to perform drilling () nos. to study the quality of the materials to be explored
	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	The work will be carried out by the Proposed Agency through Outsourcing owing to non-availability of skilled technical manpower in terms of conducting the ground survey and mapping Outsourcing of the same shall be done to Consortium of M/s- Geovale-M/s- PCTEGIS-M/s-ET, Itanagar
	Name/ Number of Geoscientists	12
	Expected Field days (Geology)	180 Days

GOVERNMENT OF ARUNACHAL PRADESH
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	Features	Details
	Geological Party Days	
1.	**Location**	Near Menga Village, Upper Subansiri, Arunachal Pradesh
	Longitude / Latitude	28° 5' 57.8688" N to 28° 7' 12.9828" N and 94° 8' 46.0536" E to 94° 9' 32.0796" E
	Villages	Near Menga Village, Taliha Circle, Upper Subansiri District, Arunachal Pradesh
	Tehsil/ Taluk	Taliha Circle
	District	Upper Subansiri
	State	Arunachal Pradesh, India
2.	**Area (hectares/ square kilometers)**	
	Block Area	26.5 Sq.Km (Near Menga, Upper Subansiri)
	Forest Area	23 Sq.Km
	Government Land Area	0.218 Sq.Km
	Private Land Area	2.9 Sq.Km
3.	**Accessibility**	
	Nearest railhead	Naharlagun-Itanagar Railway Station
	Road	The entire Limestone and Dolomite bearing region of Menga Cave and adjoining areas is traversed by the Daporijo- Taliha Road
	Airport	Itanagar-Hollongi
4.	**Hydrology**	
	Local Surface Drainage Pattern (Channels)	The drainage pattern is dendritic to sub-parallel with medium drainage density.
	Rivers/ Streams	The major water bodies of the region include the Subansiri River and the Mengha River. The Mengha river is a tributary stream of the Subansiri River. The pattern of drainage is mostly dendritic with evidences of denudation and weathering of the banks
5.	**Climate**	
	Mean Annual Rainfall	1644mm - 1703 mm
	Temperatures (December) (Minimum) Temperatures (June) (Maximum)	Winter temperature varies between 4.50c to 21.90c and in summer 13.80 to 39.0c. Climate in the region is varied as rainfall and temperature differs from place to place. The region experiences sub-tropical humid set of climatic condition with maximum and minimum temperature recorded in the months of June and December respectively. Winter temperature varies between 4.50c to 21.90c and in summer 13.80 to 39.0c.The minimum temperature during winter generally goes down considerably to around 3-4°

	Features	Details
		C. The upper portion of Taliha circles remain snow clad. The total snow cover in the circle was 242 sq.km as revealed through Satellite imagery studies. However, the figure is in the decline due to the global warming phenomena and consequent retreat of glacier. Relative humidity in the region varies from 75 to 91%. Rainfall mainly occurs during the period of April to October. Average annual rainfall at Daporijo was recorded as 1644mm (1985-88). While the average rainfall recorded during the period of 2002-2005 was 1703 mm.
6.	**Topography**	
	Topo sheet Number	Topo Sheet No: NH46-15; Published by: US Army Corps; Year of Publication: 1944; Name of the Sheet: Kyimdong Dzong; Series:U-502; Edition: 1-AMS
	Morphology of the Area	Geomorphologically the entire proposed block of limestone lies within the category of Denudational Hills-Moderately dissected with an average elevation of 600metres to 640 Metres. The region is mountainous with rugged terrain. The unit has flat tops and moderate to steep slopes. It comprises of limestone, dolomite, phyllite, quartzite, and Shales of Miri Quartzite and Buxa formation of rocks. The hills are separated by 'U' shaped valleys. The average slope of the region is in between 50°-60°. The denudation processes were earlier active in the hills and remnants of original structural features like deep facets, strike trends could be seen in the formations.
7.	**Availability of baseline geosciences data**	Not Available
	Geological Map (1:50K/ 25K)	Not Available
	Geochemical Map	Not Available
	Geophysical Map (Aeromagnetic, ground geophysical, Regional as well as local scale GP maps)	Not Available
	Justification for taking up Reconnaissance Survey / Regional Exploration	The area has never been economically surveyed or explored in terms of the base metals but has enormous quantities available in terms of field

	Features	Details
		geology. The Menga Dolomitic Limestone is cement grade with CaO ranging from 41.20% to 55% and MgO from 7.37% to 9.98%. SiO_2 is present ranging from 8.21% to 11.3%. The Menga Formation is overlain by black shales, phyllites and siltstones of Sipi Formation, which in turn are followed by Raje Quartzite, a sequence of pink quartzite, diamictite and conglomerate as per small academic studies are being done by different universities and academic bodies.

1. Block Summary

1.1. Physiography

Physiographically the district can be broadly subdivided into two divisions 1. Hilly terrain, underlain by gneisses and schists with subordinate quartzite and phyllite etc and 2. Limited alluvial deposits in the valley fill. Majority of the district area is occupied by hills underlain by gneisses and Schists barring the restricted valley fills the Daporijo and Sippi.

The district constitutes principally a hilly terrain covered by thick forests. The hill ranges are generally aligned in NE-SW and NW-SE directions with moderate to steep slopes and narrow valleys and It occupies the lesser and inner Himalayan zones of the Great Himalayan Range. The hills are separated by rivers which flow mostly towards south and have deep gorges. The hills are comparatively higher in the northern side than the southern parts. The elevation, in general varies from 1,100 to more than 4000m above mean sea level. The maximum elevation of 5,664m above mean sea level exists in the North western side of the district and the lowest one is at the District Headquarters Daporijo located in the southern part of the Distict at an altitude of 305m above mean sea level.

1.2 Background Geology (Regional Geology, Geology of the Block).

The Menga Limestone is well developed in Upper Subansiri District, Arunachal Pradesh, North eastern Himalaya. The Buxa Group in the Lesser Himalaya of Arunachal Pradesh is represented by dolomites, limestone, cherty stromatolitic oolitic-intraclastic dolomite/limestone, calcareous quartzite, black carbonaceous shales and phyllites. In the Subansiri valley is named the Menga Limestone (Acharyya 1974,1980,1998; Tripathi *et al.* 1982,83; Kumar 1997 and the references therein; Bhusan *et al.* 1991; Srinivasan 1999,2001). Acharyya (1974) established the Buxa Dolomite to be older than the Late Palaeozoic Gondwana Group but younger than columnar stromatolite bearing Mesoproterozoic Shali- Deoban carbonates.

.A litholog showing details of the sedimentary facies of the Menga Limestone exposed about 2 km. from Menga village on Menga-Mara road section is given in Fig. 7. The strati graphic succession 'in the Menga area modified after earlier workers (Tripathi *et al.* 1982,83) is given in Table 3.

Acharyya *et al.* (1975) recorded the presence of diamictite above the Menga (Buxa) Carbonate at Sipi. This diamictite was correlated with the basal Gondwana diamictite, However,

the black shales at Sipi are devoid of organic remains and this correlation was unacceptable to the later workers (Tripathi *et a t* . 1982, 83).

The geology of the Sipi-Mara window in the Siang District from where the microstromatolites and the organic walled microfossils have been recorded (Tewari 2001 a, 2002)

is established by Tripathi *et al.* (1982, 83). The sedimentary rocks are divided into three formations, namely the Menga Limestone (microstromatolite and microbiota bearing), the Sipi Shale and the Raje Quartzite (Table 3). The Daporijo Gneiss overrides the Menga Limestone. It is mainly banded in nature and exposed in Daporijo-Sipi section. The Menga Limestone is best exposed along the Daporijo- Taliha road section (Fig. 8) and occupies the core of the window. It is light to dark grey, cherty, oolitic, intraclastic, stromatolitic dolomite, siliceous dolomite and pink limestone. It occurs in the form of lenticular bodies, and small patches of dolomite are seen within the limestone.

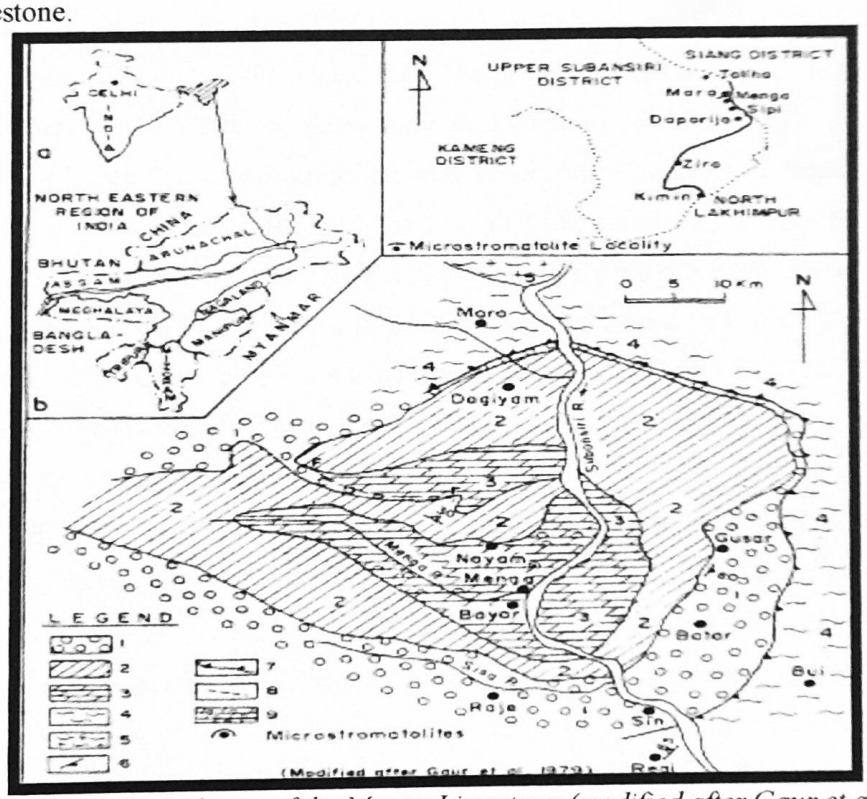

Fig 1: *Location and geological map of the Menga Limestone (modified after Gaur et al., 1979), Upper Subansiri district Arunachal Pradesh, NE Himalaya. I. Raje Quartzite, 2. Sipi Formation, 3. Menga* Formation 4. Mara Schists 5. Daporijo Gneiss

1.3 Mineral potentiality based on geology, geophysics, ground geochemistry etc

As per the information attended from Geological Survey of India and Internet although it has been confirmed through several sources that limestone and dolomite exist in Upper Subansiri District but no substantial work in this regards has been done by the GSI or any other agency. However many distinguished Academicians have conducted several studies previously which includes as follows:

"The Buxa Group in the Lesser Himalaya of Arunachal Pradesh is represented by dolomites, limestone, cherty stromatolitic oolitic-intraclastic dolomite/limestone, calcareous quartzite, black carbonaceous shales and phyllites. In the Western Arunachal Himalaya, it is known as the Chillipam Dolomite, the Rupa Dolomite or the Dedza Dolomite and its equivalent in the Subansiri valley is named the Menga Limestone (Acharyya 1974,1980, 1998; Tripathi *et al.* 1982,83; Kumar 1997 and the references therein; Bhusan *et al.* 1991; Srinivasan 1999,2001). The stratigraphic position and age of the Buxa Group needs to be properly established in the NE Himalaya (Tewari 1998 a,b, 2001 a,b,c,2002). The present paper for the first time describes the sedimentological facies variation, palaeobiological remains, carbon and oxygen isotopic excursions and the Laser Raman spectroscopic and geochemical analysis of the Buxa Group (Chillipam Dolomite; Dedza Dolomite and the Menga Limestone) of the Arunachal Lesser Himalaya" . Source: **Sedimentology, Palaeobiology and Stable Isotope Chemostratigraphy of the Terminal Neoproterozoic Buxa Dolomite, Arunachal** Pradesh, **NE Lesser Himalaya by** VINOD C. TEWARI; *Wadia Institute of Himalayan Geology, Dehra Dun - 248001, India ; Himalayan Geology; Volume 24(2); 2003; pp.; 1-8, Printed in India.*

Menga (28°06':94°09') limestone and dolomite: A band of light to grey dolomite and greyish white to white limestone with occasional pink limestone pockets has been located about 20 km from Daporijo on Taliha road. It is exposed over a distance of approximately 8 km along the road stretch and occupies an area of approximately 20 sq km. It is associated with dark grey to black iron stained shale, siltstone and slate (sometimes phyllitic) and light grey to white and pink, fine to medium grained quartzite.

The Menga Limestone is overlain by black shales, phyllites and siltstones of the Sipi Shale, which in turn is followed by the Raje Quartzite, a sequence of pink quartzite, diamictite

and conglomerate. Palaeo-biological activity in the Menga Limestone (microstromatolites, sponge spicules) has been recorded by Tewari (2001, 2002) and suggests Terminal Proterozoic age. Earlier workers have assigned an Upper Precambrian to Devonian age for Menga-Sipi-Raje sedimentary succession of the present area based mainly on the lithological correlation with other parts of the Eastern Himalaya.

1.4 Scope for proposed exploration

Field observation, geological map, and satellite image showed that the tectonic Unconformity and minor faults are present in the limestone rocks found in Upper Subansiri is associated with increasing of impurities in minerals.

. Comparing properties of limestone of Menga area indicates that limestone marked in medium purity categories and that meet the requirements of different chemical industries includes: paint, paper, ceramic, rubber, adhesive, sealants, agriculture and water industry with only slightly modification in iron oxide concentrations for some industries. Hence manufacturing or similar industry can be set up in its vicinity or the minerals can be used as raw materials in any of these industries.

This is a preliminary study with limitations in industrial tests used (due to its currently unavailability). The study emphasized the interest in limestone available at Menga, which is available in economic quantities with moderate quality that meet the requirements of many industries currently based on imported limestone. It also stressed the importance of locally available limestone in industrial uses rather than construction, which is extracted randomly.

1.5 Observation and Recommendations of previous work

No previous studies has been conducted in the aforesaid region

2.0 Previous Work

No studies in this regards has been done in this region prior to these.

3. Block description (Menga Limestone)

Block Corner points Cardinal Points	Latitude	Longitude
A	28°6'20.1024"N;	94°8'56.1048" E
B	28°6'32.38838"N,	94°9'15.83698"E
C	28°6'36.25679"N,	94°9'23.12802"E
D	28°6'36.73718"N,	94°9'23.46326"E
E	28°6'37.71372"N,	94°9'24.37999"E
F	28°6'50.16737"N,	94°9'34.07008"E

4. Planned Methodology

GIS based Mapping Works

A. Co-registration and digitization of available geological maps and further updating of the litho boundaries using satellite data.

B. Co-registration, Mosaicing of Aster Level 1A Aster data, Collection of samples of– Limestone from the field for chemical analysis and spectral profile generation for facilitating image processing.

C. Spectra profile analysis of limestone and associated rocks and identification of– diagnostic spectral signatures.

D. Data processing and analysis of Aster data to be done for spatial mapping of– Limestone. Carbonate rocks have characteristic absorption at 2.35 micrometer wavelength. This spectral feature of Limestone have been applied to different mapping algorithms like Constraint Energy Minimization (CEM), Multi-Range Spectral Feature Fitting (MRSFF), Spectral Angle Mapper (SAM), to identify Limestone surface exposures by comparing the end member spectra's with the image spectra and extending the existing boundaries

Prospecting of Minerals, Borehole Drilling, Trenching and Allied Processes

All over the world, the limestones are generally mined from a quarry or the open pit mining. It is the easiest way to remove the limestone without causing much destruction. In surface mining or open pit mining, the top soil and the overburden covering the mineral is removed. Then by the process of drilling the rocks or broken. Overburden or large rocks that are difficult to break through drilling are removed by the explosives to extract the limestone. Then the ore is hauled to the crushing plant. The equipment varies according to each process based on each operation. Surface mining requires only simple machines to operate the mine when compared to underground mining. There are many factors to consider in surface mining are the selection of equipment required at each operation, production capacity, size and shape of the deposit, haul distances, estimated life of the operation and transportation cost to reach the urban centers.

Figure 9-1. Crushed Rock Flow Diagram

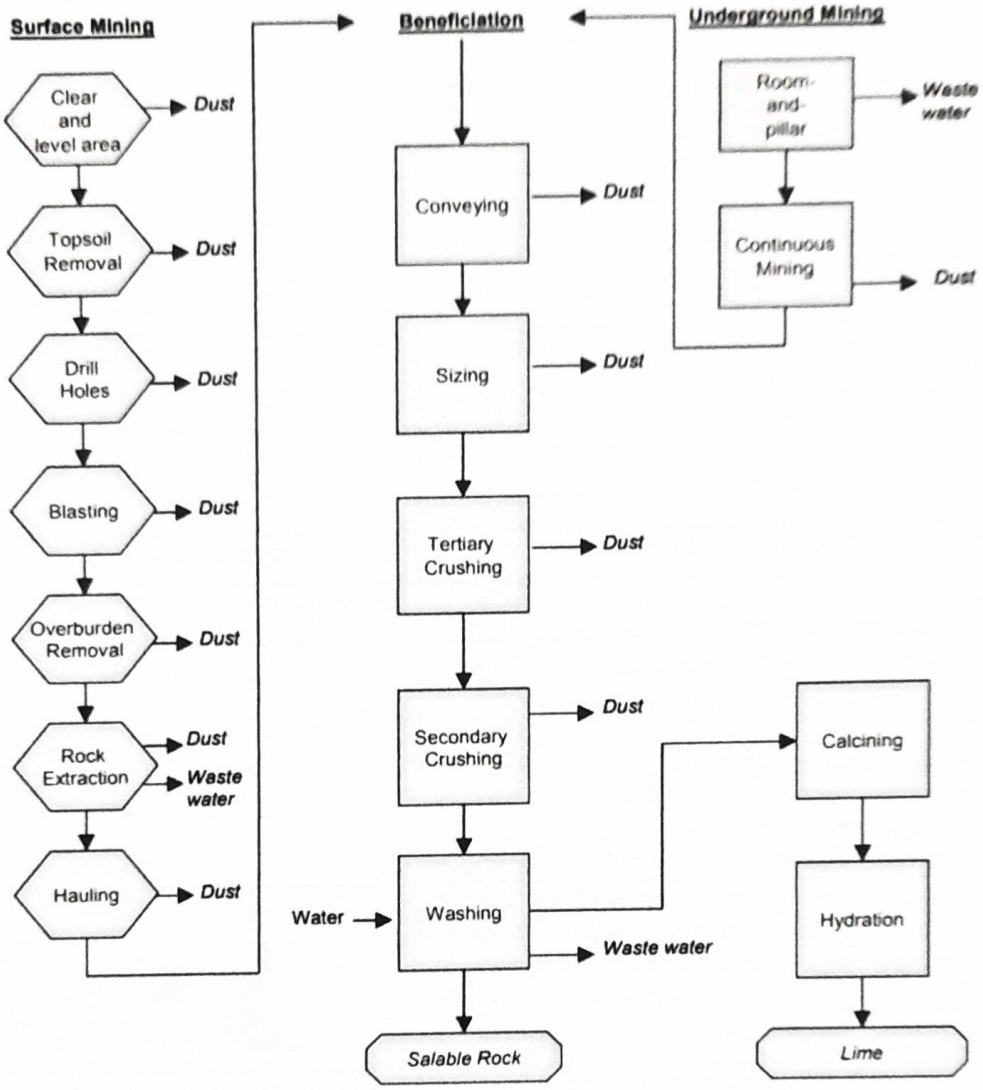

Fig 1: Showing the Methodological Framework of the Study

5. **Nature Quantum and Target**

NO previous exploration was done here in any regards over this region.

6. **Deployment of Manpower**

Sl.No	Name of the Position	1st. Quarter (03 months)	2nd. Quarter (06 months)	3rd. Quarter (09 months)	4th. Quarter (12 months)
1	Geologist (02 nos)				
2	GIS Engineer (01 nos.)				
3	Surveyors (04 Nos.)				
4	Image Analyst (01 nos.)				
5	Logistics Manager (01 nos.)				

Details of Manpower in addition to the Existing Manpower in the Department: 06

Total man Months: 12

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(**Shri Tasser Talar**),
Director, Department of Geology and Mining
Government of Arunachal Pradesh

7. Pert Chart on Work Schedule of the Work

Sl. No	Name of the Work	Duration (Months)/days	1	2	3	4	5	6		7	8	9	10	11	12
1	Setting up of Camp	months													
2	Conducting Detailed topographical Survey of the region	Months							R						
3	Geological Mapping	Months							E						
4	Sampling Party	Months													
5	Camp Winding	Months							V						
6	Laboratory studies including testing of the samples, geo-chemical analysis, petrographic studies, etc	Months							E I W						

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Sl. No	Name of the Work	Duration (Months)/days	1	2	3	4	5	6		7	8	9	10	11	12
7	Preparation of Report by the Geologist	Months													
8	Peer review of the report and vetting	Months													
9	Final presentation and submission and allied activities	Months													

(**Shri Tasser Talar**),
Director, Department of Geology and Mining
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7. Breakup of Expenditure

Annexure I

1.	Satellite data Cost & Ancillary Data Collection including Field Visits						
SL	**Job Description**	**Total Area**	**Unit Price** (in INR)	**Quantity**	**Total Price** (in INR)	**Justification**	**Remarks**
1	IRS Resource Sat -2 PVI, LISS III data, Orthorectified, full scene, 141 Km x 141 Km	26 Sq. Km	14,000/Scene	10	1,40,000	Forms the core and raison-de-tier of the project, essential to perform the image and GIS based analysis. To be purchased from NRSC, Hyderabad	To be purchased from NRSC, Hyderabad
2	Topographical Sheets Procurement & Procurement of Geological Maps from GSI at 1:250,000 scales	26/Sq.Km	Lumpsum	Lumpsum	10,000	For delineating administrative boundary, base layers, contours	
3	Collection of Ground Control Points/Pre & Post Field Visits	26/Sq.Km	2000	50,000	10,00,000.00	For pre and post field checks	Using DGPS
4	Creation of Digital Elevation Model	26/Sq.Km	2,24,029/Sq.Km	26 Sq.Km	58,24,750	Essential to perform the geological, Geomorphological analysis and from mineral potentialling	To understand the landscape
5	Digitization of Contours	26 Sq.Km	49,944.08	26 Sq.Km	12,98,546.00	To be extracted through DEM	For proper drilling and plan

				Sub-total	**82,73,296.00**		
	Database Creation & Mineral prospecting						
		Total Area					
SL	**Job Description**	25,470.92 Sq.Km	**Unit Price**	**Quantity**	**Total Price**	***Justifications***	**Remarks**
1	**Generation of Geological Maps@ A0 sheets (full and part)		1650/A0 sheet	100	165000	To be used as Ancillary information	As per SRSAC rates. Itanagar
2	**Generation of Drainage Layers@ A0 sheets(full and part)		3125/A0 Sheet	100	312500	To be used as base layers and geological investigations	As per SRSAC rates. Itanagar
3	**Generation of geomorphology Layers@ A0 sheets(full and part)		1375/A0 sheet	100	137500	Will be generated in course of GIS based analysis and image interpretation. Will be used in Geological investigations	As per SRSAC rates. Itanagar
4	**Generation of Land use/land cover @ A0 sheets(full and part)		2500/A0 Sheet	100	250000	For subsequent analysis	As per SRSAC rates. Itanagar
5	**Generation of Layers, like, slope, etc @ A0 sheets(full and part)		1375/A0 sheet	100	137500	For geological investigation and Alteration zone mapping	As per SRSAC rates. Itanagar
6	Mapping of existing mineral block areas@ A0 sheets(full and		310/A0 sheet	100	31000	For mineral potential analysis	

	part)						
7	**Generation of base layers		775/A0 sheet	100	77500	For preparing the base map	
8	**Generation of Accumulation Maps(full and part)		1000/A0 Sheet	100	100000	Geological investigations	
8	**Symbolization, Annotations, etc(full and part)		1613/A0 Sheet	100	161300	For cartographic generalization	
9	**LSED based Mineral resource modeling and fry Analysis(full and part)		3739/A0 Sheet	100	373900	To evaluate the mineral potential	
				Sub Total	**17,46,200.00**		
***Department of Space Approved Rates*							
3	**Identification of Mineral Accommodation Zones and Prospecting**						
SL	**Job Description**		**Unit Price**	**Quantity**	**Total Price**		
1	Digital Image Processing Functions: band Ratioing, contrast stretching, PCA analysis, Filtering, etc to depict the location of minerals		2,97,884.62/Sq. Km	26 Sq.km	7745000	Image Analysis, Classifications and Mineral predictivity Mapping	
2	Supervised Classification & general of Final Mineral maps		3,07,500/Sq.Km	26 Sq.Km	7995000	Mineral mapping	
				Sub-total	**1,57,40,000.00**		

4	Capital Goods: Permanent Infrastructure						
SL	**Job Description**		**Unit Price in INR**	**Quantity**	**Total Cost**	**Justification**	**Remarks**
1	Workstation Purchase@ 65,000		1,12,500.00	10	11,25,000	Will be used for DIP and GIS based analysis	As per market rates
2	Software Purchase (Arc GIS, ENVI) in addition to the existing license in the Department		Lumpsum	Lumpsum	25,00,000	DO	As per market rates
3	Camera @ 25,000 for Ground truthing		2,00,000.00	**02**	4,00,000	For ground truthing	As per market rates of good DSLR
				Sub-total	**40,25,000.00**		
5	**Map generation Costs**						
			Unit Price	**Quantity**	**Total cost**		
1	Cost of Paper per map (Glossy Paper)		1000	500	5,00,000	For map generation	As per available market rates
	Cost of paper per map (Coated Paper)		170	220	37,400.00	Do	As per available market rates
	Contingency cost including cost of cartridges, scanning, printing, etc		Lumpsum	Lumpsum	10,00,000	Contingency	
	Cost of a Auto Plotter		2600	500	13,00,000.00	For map Printing	As per available market rates
				Sub Total	**28,37,400.00**		

	Sampling and Petrographic Studies						
SL	**Job Description**		**Unit Price in INR**	**Quantity**	**Total Cost**		
6	Testing of physical and chemical properties of samples in laboratory		**6400.00**	100 nos.	6,40,000.00		
1	Petrographic studies		**2000.00**	100 nos.	2,00,000.00		
	Subtotal				**8,40,000.00**		

	Bore Hole Drilling and Mineral Prospecting						
Sl.No	Job Description		**Unit price in INR**	Quantity	Total Cost	Justification	Remarks
7	Bore hole Drilling and prospecting of the Reserves		**10,000/Metre**	20 bhs (400m x 400 m) grid. Suppose the depth of borehole 200 m approx, Reserve Calculation with Report-6 Lakh	4,06,00,000.00		
	Sub total				**4,06,00,000.00**		
	Sub Total (1+2+3+4+5+6+7+8)				7,40,61,896.00		
	Institutional Overhead Charges		**25,51,530.6**		74,06,189.6		

	@10%						
	GST @12%		97,76,170.272				
	Total Project Cost		**9,12,44,255.872**				

- **Total Project Cost Rs. 9,12,44,255.872/-**
- **Rupees Nine Crores, Twelve Lakhs, Forty-Four Thousand and Two Hundred and Fifty-Five Rupees and Eighty-Seven paisa only.**

Office of the Director Geology & Mining ★ Govt. of A.P Itanagar ★ सत्यमेव जयते

(**Shri Tasser Talar**),
Director, Department of Geology and Mining
Government of Arunachal Pradesh

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