Proposal for Limestone in Paradva-Amrapar- A-B-C-D, Jamnagar District, Gujarat State for G3 Stage Mineral Exploration under NMET

Commodity: Limestone

By

Commissioner of Geology and Mining
Gujarat

Place: Gandhinagar **Date: November 2025**

Summary of the Block for G3 stage exploration

	Features	Details			
	Block ID	**CGM/NMET/Limestone/11/2024-25**			
	Current Exploration Agency	Commissioner of Geology & Mining, Gujarat			
	Previous Exploration Agency	Commissioner of Geology & Mining, Gujarat			
	Commodity	Limestone			
	Mineral Belt	Miliolite Formation			
	Completion Period with entire Time schedule to complete the project	08 months			
	Objectives	To assess & identify qualitative and quantitative mineral resource of Limestone mineral at G3 stage in the proposed block area.			
	Whether the work will be carried out by the proposed agency or through outsourcing and details thereof.	Work will be carried out through outsourcing			
	Name/ Number of Geoscientists	Geologist: 1 (Field) + 1(HQ)			
	Expected Field days (Geology, Geophysics, Surveyor)	120 days: Field Geologist			
		45 days: HQ Geologist			
		30 days: Surveyor			
1	**Location**				
	Co-ordinates (Latitude, Longitude) of Block Boundary	Block	Point No.	Latitude	Longitude
		A	1	21°45'26.88"N	70° 2'7.14"E
			2	21°45'28.72"N	70° 3'13.47"E
			3	21°44'45.21"N	70° 3'16.11"E
			4	21°44'44.87"N	70° 2'45.63"E
			5	21°44'48.47"N	70° 2'45.13"E
			6	21°44'49.26"N	70° 2'35.68"E
			7	21°44'57.62"N	70° 2'35.24"E
			8	21°44'57.50"N	70° 2'10.59"E
		B	1	21°45'26.88"N	70° 2'7.14"E
			2	21°45'28.72"N	70° 3'13.47"E
			3	21°44'45.21"N	70° 3'16.11"E
			4	21°44'44.87"N	70° 2'45.63"E
			5	21°44'48.47"N	70° 2'45.13"E
			6	21°44'49.26"N	70° 2'35.68"E
			7	21°44'57.62"N	70° 2'35.24"E
			8	21°44'57.50"N	70° 2'10.59"E
		C	1	21°44'12.11"N	70° 1'48.68"E
			2	21°44'11.65"N	70° 2'3.16"E

			3	21°43'51.08"N	70° 2'4.45"E
			4	21°43'46.97"N	70° 2'38.21"E
			5	21°42'57.62"N	70° 2'39.72"E
			6	21°42'57.94"N	70° 1'36.54"E
		D	1	21°44'37.19"N	70° 2'0.82"E
			2	21°44'43.97"N	70° 2'9.16"E
			3	21°44'20.39"N	70° 2'30.87"E
			4	21°44'6.59"N	70° 2'15.47"E
			5	21°44'27.24"N	70° 2'10.15"E
			6	21°42'57.94"N	70° 1'36.54"E
			2	21°44'43.97"N	70° 2'9.16"E
			3	21°44'20.39"N	70° 2'30.87"E
			4	21°44'6.59"N	70° 2'15.47"E
			5	21°44'27.24"N	70° 2'10.15"E
			6	21°42'57.94"N	70° 1'36.54"E
	Villages	Paradva, Amrapar			
	Tehsil/ Taluk	Jam jodhpur			
	District	Jamnagar			
	State	Gujarat			
2	**Area (hectares/ square kilometres)**				
	Block Area	9.07 (Sq. Km)			
	Forest Area	Nil			
	Government Land Area	NA			
	Private Land Area	NA			
3	**Accessibility**				
	Nearest Rail Head	Jamjodhpur railway station – 16.00 km			
	Road	151K – 17.00 km			
	Airport	Jamnagar airport – 80.00 km			
4	**Hydrography**				
	Local Surface Drainage Pattern (Channels)	The district has no perennial rivers and all the rivers are rainfed coastal drainages.			
	Rivers/ Streams	Small nallas presents in the area.			
5	**Climate**				
	Mean Annual Rainfall	951 mm (GSDMA website)			
	Temperatures (December)	Minimum – 16° C			
	(Minimum)				
	Temperatures (June)	Maximum – 43° C			
	(Maximum)				
6	**Topography**				
	Toposheet Number	41K/01, 41K/2			

	Morphology of the Area	The proposed area is generally covered by dry barren and agricultural fields as well as hilly terrain. The topography of the proposed region is looking gently slope toward N-E to S-W direction. The elevation of the area ranges from 114 mts to 206 mts above mean sea level.
7	**Availability of baseline geoscience data**	
	Geological Map (1:50K)	Plate-1
	Geochemical Map	Not available
	Geophysical Map	Not available
8	**Justification for taking up G3 stage mineral exploration**	A part of the nearby area was previously explored by CGM through drilling in 2004-2005, The chemical analysis of limestone indicated a variation from chemical grade to cement grade, with CaO content ranging from a maximum of 52.82% to a minimum of 40.64%. As a result of investigation, the estimated reserves of Chalk are 37.36 million Tones and Limestone is 83.69 million Tones.
		Lithology of the target area have milliolitic limestone deposit & proposed block is nearby lease area. so, this area can be studied as an extension of the already existing mineable deposits.
		We have collected 06 grab samples during the recent geological travers survey of CGM geologist, the analysis results of these samples indicated Cao% from 51.98 % to 49.07 %.
		Exploration increases the level of confidence on quantity and quality of reserve/ resource which will attract the investors. Hence based on the lithology and previous exploration report, the block is suggested for G3 level of exploration for limestone.

Detailed description:

1. Block Summary

Physiography

The study area is situated in Jamjodhpur Taluka, Jamnagar District, along the western coastal region of Gujarat. Jamnagar district is situated in the northern part of the Saurashtra Region of the Gujarat State. it is surrounded by Morbi District in northern side, Rajkot in the east, Porbandar in the south, Devbhoomi Dwarka on west, while Gulf of kachchh is in the North western side. The geographical area of the district is about 6065 sq.km with is divided into six talukas (Jamnagar, Dhrol, Jodiya, Kalavad, Lalpur and Jamjodhpur) and a total of 432 villages. physiographical the district is divided into the Hilly areas and Coastal & alluvial Plains. The 200 km long coastline of Jamnagar accommodates several renowned oil companies

Background Geology (Regional Geology & Geology of the Block).

The sedimentary limestone is the most common and important rock type exposed in the coastal belt of Saurashtra region. Jamnagar district has volcanic rock and associated intrusive belonging to the Deccan Volcanics Upper Cretaceous to Eocene age; laterites of Bhatia Formation (Palaeocene age) sediments belonging to the Gaj Formation Lower to Middle Miocene age, Old Dwarka Formation of Middle Miocene to Pliocene age; and undifferentiated alluvium sand dunes Rann clay, mud and coral reef of Recent period. Basalt is the prominent rock type and is traversed by basalt and dolerite dykes. Rhyolite flows and of intrusive of microgranite, felsite granophyre and olivine gabbro are other important rock types associated with the Deccan Volcanic. Laterite occurs as impersistent capping over the basalts. The Eocene sediments include clays, limestone, sandstone, marl and conglomerate. These rocks ate fossiliferous. Miliolites Formation, containing limestone, sandstone, clay and conglomerates, forms blanket - like deposits. The Recent deposits have been deposited by marine, fluvial and aeolian agencies.

Stratigraphic Unit	Lithology	Age
Recent Deposits	Brown Sand, soils, alluvium, fluvio-marine deposits	Holocene
Milliolite Formation	Foraminiferal limestone (gritty, pellitic and shelly), calcareous sandstone, calcareous clay	Pleistocene
Dwarka Formation	Limestone (shelly and sandy); Clay, Marl, sandstone, sandy and shelly limestone	Pliocene
Gaj Formation	Shelly limestone, foraminiferal limestone, calcareous sandstone	Lower Miocene to Middle
Bhatia Formation	Laterite	Palaeocene to Eocene
Deccan Trap	Basalt dolerite dykes	Cretaceous to Eocene

Gaj Formation

Gaj formation includes an intercalated sequence of marl/clay and limestone, dominated by the former. The marl/clay is light yellow to grey and it is difficult to distinguish between the two in transitional cases. Gaj limestone is light to deep yellow to brown, compact, and cryptocrystalline. At places, this limestone contains very little free silica or is almost devoid of it. The thickness of limestone band is highly variable and often a quite thick band pinches abruptly within short distance., In almost all places, where Gaj Formation is exposed a, thin crust (less than 2 m thick) of compact, dark coloured limestone, which is a secondary leaching product, is present followed downward by Gaj clay/marl. Gaj Formation is rich in marine mega- and micro- fossils. Mega fossils include pelecypods, gastropods, cephalopods, echinoids, Alcyonaria, Decapoda and Bryozoa. Earlier workers have assigned an Upper Miocene age to Gaj Formation but Mathur et al (1980) advocated that the Gaj Formation is at least of Mid Miocene age, if not older, as it contains fossils of Taberina malabaricane a Lower to Middle Miocene foraminifer.

Dwarka Formation

Dwarka Formation is equivalent to the Dwarka bed of Fadden (1884). It overlies the Gaj Formation. Although there are pebbly or conglomeratic bands at the contacts, in most places the relation is conformable. The Dwarka Formation, as exposed in this

area, generally comprises grey and gritty to sandy limestone almost devoid of mega fossils. Near Dwarka, the Dwarka formation was divided into Upper and Lower Dwarka Member by Jain and Agarwal (1989-90). The lower Member, which overlies Gaj Formation, is an intercalated sequence of clay and kankar, friable/compact sandstone, yellow and red marl beds and yellow ferruginous and greyish sandy limestone. The Upper Dwarka is mainly bioclastic limestone, often cavernous and contains very little silica. In the mapped area the exposed Dwarka Formation is mostly represented by Lower Dwarka Member of Jain and Agarwal (1990), although there are some pockets, which are less in free silica.

Milliolite Limestone

The consolidated Quaternary deposits are termed as Miliolite Formation because of preponderance of tests of foraminifer Miliolidae. This is the most widespread lithounits in the coastal belt overlapping in all earlier lithounits. The colour of the limestone varies from white to pale yellow to pink. In majority of places the milliolitic limestone varies from white to pale yellow, relatively soft, friable, thinly laminated with alternate bands rich in foraminiferal tests and micrite. The Milliolite occur as whitish, buff coloured, current bedded limestone in the form of coastal ridge This Limestone primarily comprise of broken shells of foraminifer-Miliolite around which calcite grains have been formed. However, this is not a pure limestone and thin horizons of sandstone, grit and conglomerate are also found within Milliolites. The Milliolite are thought to be windblown deposits and are also found occurring along the hill slopes further inland.

Soil and Alluvium

Major portion of the area is covered with soil or alluvium. This can be divided as the type formed due to weathering of limestone and the type formed due to deposition of clays brought by rivers. The soil formed due to weathering of limestone is regur soil and that of river is sticky black clayey soil.

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

It was noted that the Milliolite limestone is the only rock formation which is exposed as outcrops in the entire sea-coast and especially in the area of investigation. It is exposed on the surface in forms of low mounds.

The typical characteristic of this limestone formation is its erosional feature. Due to chemical and differential weathering, solution holes, channels, cavities with alternate groove and ridge formation giving the area honeycomb appearance. This topography is known as Karst topography.

The limestone found is mostly light coloured, mostly white with shades of grey, buff, brown and yellow. The presence of impurities mostly iron is responsible for this colour variation. The rock is hard and compact. The texture of rock is mostly fine to medium grained at times ranging into coarse grade also. At places false and current beddings are also observed. In this limestone deposit the thickness is variable due to its topography.

Scope for proposed exploration

1. Location: - Village Paradva, Amrapar Tehsil:Jamjodhpur, District: Jamnagar, State: Gujarat.
2. Quantum of work: The approximate core drilling work is 160 meters.
3. Rock formations to be drilled: Various types of soil, sub-soil, Limestone, Calcarenite, Marl, clay, etc.
4. The boreholes shall be in depth range of approximately 20 m. However, this is indicative only and may vary as per actual geological conditions.
5. Type of Drilling: Core drilling by Hydraulic Drilling Rigs.
6. Borehole size: The holes shall be derived in NQ sizes.
7. The core recovery in all the formation should be at least 90% except in fault zone, weathered zone, soil, sand and structurally disturbed area
8. CGM will provide proposed borehole location plan of all the areas to be covered under exploration.
9. Sampling: There will be 1 one mineral/rock sample for each 1-meter run of economically viable mineral. Each sample should be cut by core splitter. Each run shall be marked properly by plastic cards and the core boxes shall be numbered properly. Each sample shall be reduced to an approximate quantity by following the standard sampling procedures such as homogenizing, coning, quartering and pulverizing into 100/200 mesh and be prepared into two packets of 100-200 gm each. The final sample pockets shall be properly labelled with BH number, sample run.

Recommendations of G4 Stage Mineral Exploration Report.

Limestone sand witches the chalk directly rest either on Basalt or weathered trap. This limestone is Light yellow in colour medium grained & porous. It gives profuse of CO2 with HCL & can be easily scratched by pen knife. The thickness of limestone varies from 0.65 mts to 12.20 mts. (J.H Vayeda 2004-2005)

Objectives of Exploration

- To know the continuity of the mineral body both along the strike and dip.
- To map the extent of the ore body and lithology of the area.
- To ascertain the grade of Limestone deposit.
- Ore resource/reserve estimation in accordance with MEMC Rule-2015

2. Previous Work

Previous Exploration in proposed block area as well as adjoining area: All the sample (bed rock/trench/ groove/soil), borehole location should be plotted on the geological map and analytical data should be discussed briefly

During the 2000–2001 field season, CGM carried out an assessment of the quality and quantity of chalk and limestone. A total of 33 boreholes were drilled at a grid interval of 200 meters, covering an area of 1.44 sq. km. Against the planned target of 900 meters, 611.18 meters of drilling was completed. In total, 87 samples were collected, including 83 core samples for chemical analysis, three samples for petrographic study, and one sample for specific gravity determination. The chemical analysis of limestone indicated a variation from chemical grade to cement grade, with CaO content ranging from a maximum of 52.82% to a minimum of 40.64%.

J.H Vayeda has done detailed investigation by drilling for Chalk & Limestone arround Villages Amrapar, Malanka, Sindhpur, Helabeli and Dhruvada of Jam-Jodhpur & Kutiyana Talukas of Jamnagar & Porbandar districts was taken up during the field season 2004-2005 to assess the quality & quantity of Chalk and Limestone. Total 89 boreholes were drilled at a grid interval of 500 mts. covering an area of 9.88 sq.km, Total 1148.94 mts of drilling was done as against the target of 1800 mts, and chalk was encountered in 41 boreholes and limestone encountered in 65 boreholes.

The study of Lithological section encountered in the borehole shows the chalk is lying between Milliolite limestones. As a result of investigation, the estimated reserves of Chalk is 37.36 Million Tones and Limestone is 83.69 Million Tones.

The Quality of Chalk CaO % varies from 33.57 to 49.75 and SiO2 % varies from 5.38 to 27.16 so it is a good quality of Chalk and can be used for paint industry, in limestone CaO % varies from 18.74 to 51.47 Mostly the limestone of these area are of cement grade.

It is recommended to continue drilling operation towards north direction of Amrapar village around paradva, Malavda villages from the present investigated area.

3. Block description

Block: A

Block corner points	Latitude	Longitude
1	21°45'26.88"N	70° 2'7.14"E
2	21°45'28.72"N	70° 3'13.47"E
3	21°44'45.21"N	70° 3'16.11"E
4	21°44'44.87"N	70° 2'45.63"E
5	21°44'48.47"N	70° 2'45.13"E
6	21°44'49.26"N	70° 2'35.68"E
7	21°44'57.62"N	70° 2'35.24"E
8	21°44'57.50"N	70° 2'10.59"E

Block: B

Block corner points	Latitude	Longitude
1	21°45'26.88"N	70° 2'7.14"E
2	21°45'28.72"N	70° 3'13.47"E
3	21°44'45.21"N	70° 3'16.11"E
4	21°44'44.87"N	70° 2'45.63"E
5	21°44'48.47"N	70° 2'45.13"E
6	21°44'49.26"N	70° 2'35.68"E
7	21°44'57.62"N	70° 2'35.24"E
8	21°44'57.50"N	70° 2'10.59"E

Block: C

Block corner points	Latitude	Longitude
1	21°44'12.11"N	70° 1'48.68"E
2	21°44'11.65"N	70° 2'3.16"E
3	21°43'51.08"N	70° 2'4.45"E
4	21°43'46.97"N	70° 2'38.21"E

5	21°42'57.62"N	70° 2'39.72"E
6	21°42'57.94"N	70° 1'36.54"E

Block: D

Block corner points	Latitude	Longitude
1	21°44'37.19"N	70° 2'0.82"E
2	21°44'43.97"N	70° 2'9.16"E
3	21°44'20.39"N	70° 2'30.87"E
4	21°44'6.59"N	70° 2'15.47"E
5	21°44'27.24"N	70° 2'10.15"E
6	21°42'57.94"N	70° 1'36.54"E

4. Planned Methodology

1. Preparation of Geological map. Field traverse, mapping on 1:4000 and collection of grab/ channel samples from outcrop/ river cutting/ old dug wells.
2. To carry out DGPS survey and identified location of Road, River, Settlement, Electric line, Telephone line or any other permanent structure.
3. Preparation of Land use, Land pattern map along with ownership details.
4. Preparation of proposed borehole location plan based on the previous work, grab sampling report and feasibility of drilling.
5. Carry out systematic & scientific core drilling activity along with preparation of Lith units, core drilling registers, sampling and preparation of samples for further physical, chemical and petrographic analysis.
6. Carry out physical, chemical and petrographic analysis and interpretation of their result in borehole lithology.
7. Preparation of draft Geological report as per specified format of NMET as per MEMC Rules,2015 & its amendments.
8. Submission of draft Geological report to designated Geological expert for peer review.
9. Submission of final Geological Report incorporating comments of peer review to NMET for final approval.
10. Submission of Geological reports to state auction cell for further auction process.

5. Nature Quantum and Target

Components	G3
Aerial reconnaissance	NA
Geological Survey	1:4000
Systematic drilling	Refer below (Plate-2)
Petrographic and mineral graphic studies	Bulk Density & Petrographic
Synthesis of all available **data**	i) Integration of regional/ detailed geophysical, geological and geochemical data, if not done earlier. ii) Synthesis of all available data and Report writing

Borehole spacing (As per MEMC, 2015)

Type of deposit	Bedded Stratiform and Tabular deposit of regular habit (Minerals to be identified)	Bedded stratiform and tabular deposits of irregular habit (Minerals to be identified)	Lenticular bodies occurring on echelon Lenses, pockets. (Different minerals)
G3 Stage	800 m	Not applicable	Not applicable
	(Vertical depth of intersection of mineralised zone for different level boreholes should be specified, number of boreholes (first, second, third), borehole spacing, approximate length of different level of boreholes may also be specified).		

6. Exploratory Drilling

- The boreholes shall be in depth range of approximately 20 m. However, this is indicative only and may vary as per actual geological conditions.
- Type of Drilling: Core drilling by Hydraulic Drilling Rigs.

- Borehole size: The holes shall be derived in in NQ sizes.
- While drilling, wherever water table is encountered, depth of the water table should be recorded and to be mentioned in the driller logs.
- The core recovery in all the formation should be at least 90% except in fault zone, weathered zone, soil, sand and structurally disturbed area.

7. Manpower deployment

Annexure 4B

Time Schedule/ Action plan of Preliminary Exploration (G3) for Limestone in Paradva-Amrapar Blocks A-B-C-D, Jamnagar District, Gujarat

Sl. No.	Activities	Unit	MONTHS								
			1	2	3	Review	4	5	6	Review	7	8
1	Camp Setting	Month										
2	Surface Drilling	m.										
3	Survey Party days (1 Party)	day										
4	Geologist Party days in field (1 Party)	day										
5	Sampling Party days, Core Sampling (1 party)	day										
6	Laboratory Studies	Nos.										
7	Camp Winding	Month										
8	Geologist Party days in HQ (1 Party)	day										
9	Geological Report Writing with Peer Review	Month										

8. Break-up of expenditure

The cost has been estimated based on actual schedule of rates mandated in the circular OM No. 61/1/2018/NMET dated 31st March 2020 for NMET funded projects which is **Rs. 131.86 Lakhs.** The detailed cost sheet for G-3 exploration for Limestone in proposed Paradva-Amrapar-A-B-C-D Block is given below:

Sl. No.	Item of Work	Amount (₹ Lakh)
A	Geological Mapping & Field Work	31.59
B	Survey Work (DGPS & Topography)	12.68
C	Drilling after review (Outsourced)	32.13
D	Laboratory Studies	22.17
E	Geological Reports (4 Blocks)	10.00
F	Peer Review Charges	1.20
G	Exploration Proposal Preparation	1.97
	Total Cost (Excluding GST)	111.74
	GST @ 18%	20.11
	Grand Total (Including GST)	131.86

9. References

- Report on detailed investigation for limestone by drilling around Pransla & Amrapar villages of upleta & jamjodhpur taluka of Rajkot& Jamnagar Dist. By M.K Joshi 2001-2002

- Report on detailed investigation for Chalk & Limestone by drilling around Amrapar & Malanka, Sindhpur, Helabali and Dhruvada Villages of Jam-Jodhpur and Kutiyana Talukas of Jamnagar by J.H Vayeda 2004-2005.

- CGWB Website par recent data.

List of Annexures

List of Plates

Sr. No.	Sample ID	Location		SiO_2	Al_2O_3	Fe_2O_3	TiO_2	CaO	MgO	Na_2O	K_2O	P_2O_5	SO_3	LOI	Total
		Latitude	Longitude	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
1	Sample-01	21°45'13.37"N	21°45'13.37"N	4.48	1.05	2.15	0.05	51.34	0.99	0.09	0.06	0.05	0.03	39.63	99.90
2	Sample-02	21°45'16.90"N	70° 2'9.18"E	3.74	0.74	2.13	0.04	51.65	1.00	0.07	0.05	0.04	0.03	40.16	99.65
3	Sample-03	21°45'0.33"N	70° 2'20.91"E	3.42	0.87	2.15	0.05	51.57	0.99	0.07	0.05	0.11	0.04	40.61	99.63
4	Sample-04	21°44'55.07"N	70° 2'20.29"E	3.59	0.83	2.14	0.05	51.14	0.85	0.07	0.06	0.06	0.04	40.86	99.68
5	Sample-05	21°44'43.05"N	70° 2'9.86"E	7.55	1.28	2.17	0.07	49.07	1.03	0.07	0.08	0.08	0.03	37.77	99.20
6	Sample-06	21°44'49.23"N	70° 2'21.73"E	6.12	1.30	2.15	0.07	51.98	1.04	0.07	0.07	0.03	0.03	37.12	99.98

Annexure-1: Block-A

Sr. No.	Sample ID	Location		SiO2	Al2O3	Fe2O3	TiO2	CaO	MgO	Na2O	K2O	P2O5	SO3	LOI	Total
		Latitude	Longitude	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
1	Sample-01	21°43'56.67"N	70° 3'29.33"E	4.98	1.51	2.15	0.08	50.40	1.15	0.07	0.10	0.05	0.03	38.92	99.42
2	Sample-02	21°43'52.88"N	70° 2'48.05"E	4.65	1.00	2.14	0.05	49.93	1.06	0.07	0.08	0.08	0.05	40.44	99.55
3	Sample-03	21°43'53.59"N	70° 2'47.31"E	5.22	1.11	2.14	0.07	49.55	1.01	0.08	0.08	0.10	0.05	40.09	99.49
4	Sample-04	21°44'18.92"N	70° 3'7.28"E	3.64	0.70	2.14	0.05	52.43	0.78	0.06	0.06	0.03	0.03	39.70	99.62

Annexure-1: Block-B

Sr. No.	Sample ID	Location		SiO_2	Al_2O_3	Fe_2O_3	TiO_2	CaO	MgO	Na_2O	K_2O	P_2O_5	SO_3	LOI	Total
		Latitude	Longitude	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
1	Sample-01	21°42'53.70"N	70° 1'12.65"E	4.06	0.68	2.13	0.05	51.49	1.02	0.06	0.06	0.16	0.06	40.05	99.83
2	Sample-02	21°42'52.29"N	70° 1'4.30"E	5.65	1.72	2.16	0.08	49.54	1.14	0.07	0.12	0.12	0.04	38.73	99.36
3	Sample-03	21°42'52.19"N	70° 2'12.10"E	13.26	3.70	2.23	0.15	43.83	2.47	0.08	0.14	0.00	0.02	33.28	99.16

Annexure-1: Block-C

Sr. No.	Sample ID	Location		SiO_2	Al_2O_3	Fe_2O_3	TiO_2	CaO	MgO	Na_2O	K_2O	P_2O_5	SO_3	LOI	Total
		Latitude	Longitude	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
1	Sample-01	21°42'53.70"N	70° 1'12.65"E	7.55	1.28	2.17	0.07	49.07	1.03	0.07	0.06	0.08	0.03	37.77	99.20
2	Sample-02	21°42'52.29"N	70° 1'4.30"E	9.31	2.77	2.20	0.10	47.00	1.34	0.08	0.13	0.08	0.02	36.33	99.36

Annexure-1: Block-D

Annexure-2: Detailed Cost Estimation Sheet

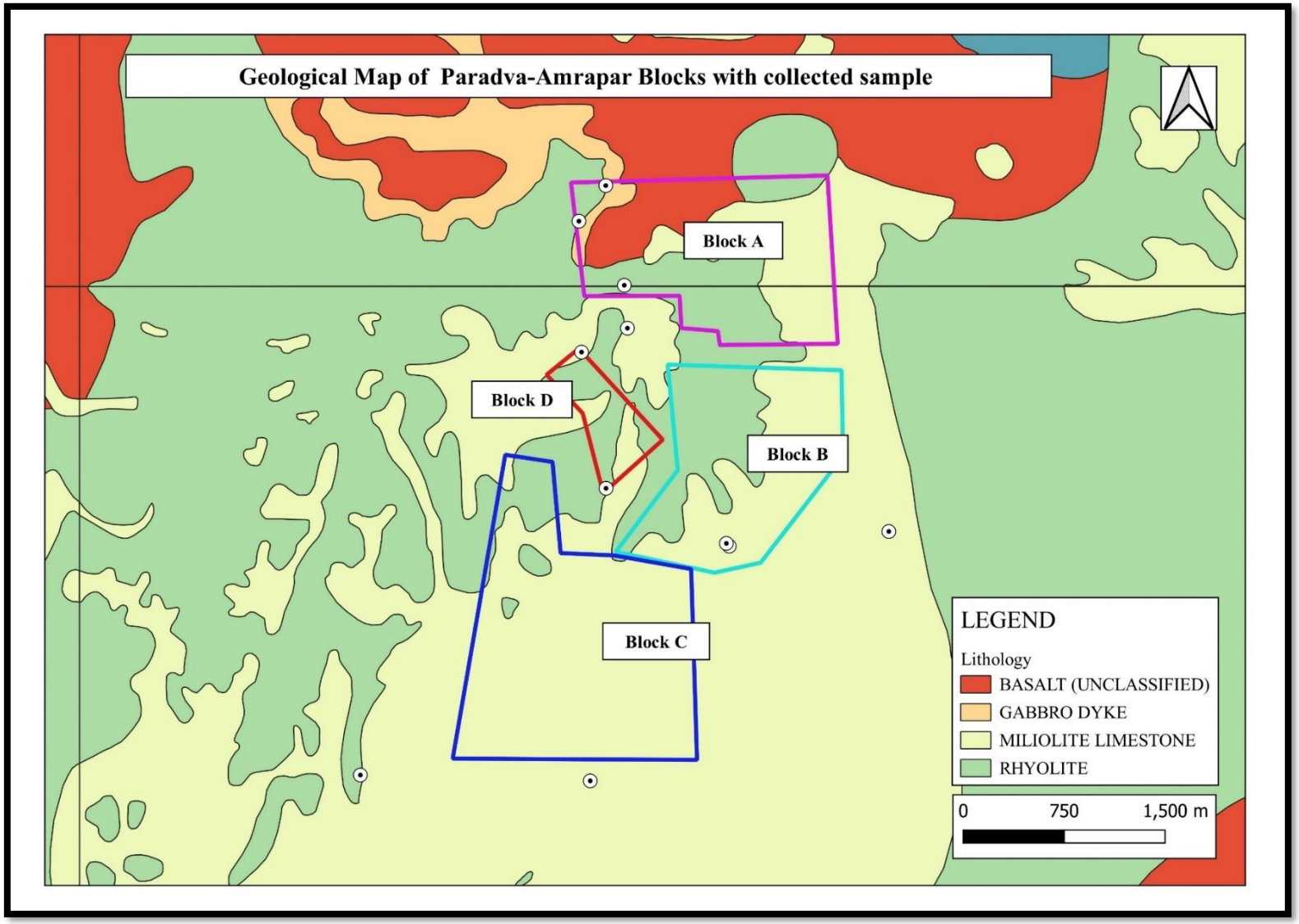
							Annexure 4A
Preliminary Exploration (G3) for Limestone in Paradva-Amrapar Blocks A-B-C-D, Jamnagar District, Gujarat Area: 9.07 sq.km, Total Drilling: 420 m, BH Nos.: 21, Depth: 20m, Timeline: 8 months, Review: After 3 and 6 months							
S. No.	**Item of Work**	**Unit**	**Rates as per NMEDT revised SoC 2025-26**		**Estimated Cost of the Proposal**		**Remarks**
			SoC-Item - Sl No.	**Rates as per SoC**	**Qty.**	**Total Amount (Rs)**	
A	**Geological Mapping Other Geological Work & Surveying**						
	Geological mapping including contouring (1:4000 scale)		1.1	18300	9.07	1,65,981	
i	a. Charges for Geologist per day (Field) for geological mapping & drilling work	day	1.2.1a	14500	120	17,40,000	Detailed Geological Mapping on scale 1:4000, Core logging, Sampling
ii	Labours Charges (2 Nos)	day		541	240	1,29,840	
iii	Charges for Geologist per day (HQ)		1.2.1a	10,500	45	4,72,500	
iv	Charges for one Sampler per day (1 Party)	one sampler per day	1.2.1b	7850	65	5,10,250	
v	Labours (4 Nos)	day		541	260	1,40,660	
	Sub Total- A					**31,59,231**	
B	**Survey work**						
a	DGPS Survey for BH fixation & RL determination/ Boundary Point	Per Point of observation	1.3.2	24000	37	888000	21 BH + 16 cardinal points for all the 4 blocks
b	Charges of Surveyor (1 party) for survey layout work & Block boundary demarcation	one surveyor per day	1.3.1	10500	30	315000	Topographic survey - contour interval: 4 m.
c	Labours Charges for survey work; (4 Nos)	day	5.7	541	120	64920	
	Sub-Total B					**12,67,920**	

C	**DRILLING (after review) (outsourced)**						
1	Drilling (Outsourcing)	m	2.2.1.1 c	5500	420	23,10,000	Paradva-Amrapar-A Block (100 m) Paradva-Amrapar-B Block (80 m) Paradva-Amrapar-C Block (180 m) Paradva-Amrapar-D Block (60 m)
2	Land / Crop Compansation (in case the BH falls in agricultural Land)	per BH	5.6	21	30,000	6,30,000	As per actuals
3	Construction of concrete Pillar (12"x12"x30")	per borehole	2.2.7	2000	21	42,000	
10	Technical Supervision for outsourcing of drilling		6	In case of outsourcing of work, the Technical Supervision cost shall be 10% of the sum of all the outsourced work components with a maximum ceiling of ₹ 20 lakh.		2,31,000	420 m core to be preserved
	Sub Total C					**32,13,000**	
D	**LABORATORY STUDIES**						
1	**Chemical Analysis**						
i)	**Geochemical Sampling-Surface samples (Bedrock/Channel /Soil/Stream sediment)**						
	a. Primary analysis (major oxides by XRF analysis)	Nos	4.1.17a	4200	50	2,10,000	Bed rock samples
ii)	**Surface Check samples (10% External)**						

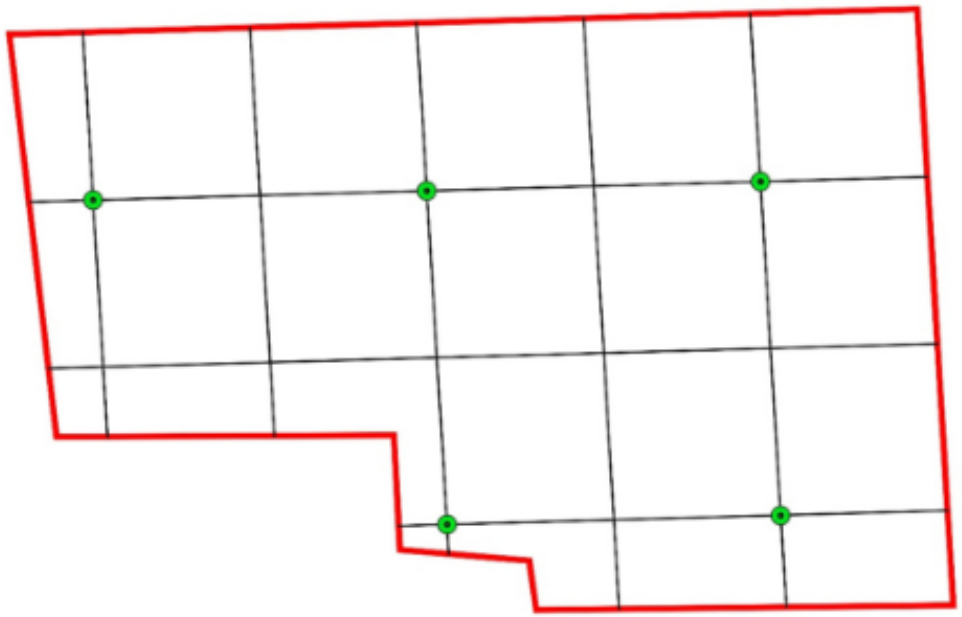
	a. Primary analysis (major oxides by XRF analysis)	Nos	4.1.17a	4200	5	21,000	Bed rock samples
v)	**BH Core samples**						
	a. Primary analysis (major oxides by XRF analysis)	Nos	4.1.17a	4200	420	17,64,000	
	c. For PGE	Nos					
vi)	**BH Core samples (10%External)**						
	a. Primary analysis (major oxides by XRF analysis)	Nos	4.1.17a	4200	42	1,76,400	
2	**Physical & Petrological Studies**						
i	Preparation of thin section	Nos	4.3.1	500	10	5,000	
ii	Study of thin section	Nos	4.3.4	2800	10	28,000	Complete petrography study (along with 5 nos. digital photo micrographs)
vii	Bulk Density	Nos	4.8.3	2,500	5	12,500	
	Sub Total D					**22,16,900**	
E	**Total A to D**					**98,57,051**	
I	**Geological Report Preparation**	**5 Hard copies with a soft copy**	5.2 (ii)	Total cost exceeding ₹50 lakh but less than 150 lakh: ₹2.5 lakh	**2.5 lakh * 4 (reports)**	**10,00,000**	Paradva-Amrapar-A Block (5 copies) Paradva-Amrapar-B Block (5 copies) Paradva-Amrapar-C Block (5 copies) Paradva-Amrapar-D Block (5 copies)
J	**Peer review Charges**		**As per EC decision**	30,000	**30000*4**	**1,20,000**	

K	**Preparation of Exploration Proposal (5 Hard copies with a soft copy)**	**5 Hard copies with a soft copy**	**5.1**	2% of approved project Cost or Rs. 5 Lakhs whichever is lower		**1,97,141**	EA will be reimbursed after submission of the Hard Copies and the soft copy of the final proposal along with Maps and Plan as suggested by the TCC-NMET in its meeting while clearing the proposal.
L	**Total Estimated Cost without GST**					**1,11,74,192**	
M	**Provision for GST (18%)**					**20,11,354.56**	GST will be reimbursed as per actual and as per notified prescribed rate
N	**Total Estimated Cost with GST**					**1,31,85,547**	
				or Say Rs. In Lakhs		**131.86**	
Note:							
1	**Strict adherence to the Ministry of Finance's and GFR guidelines is mandatory. Every transaction must adhere to GFR rule 21.**						
2	**In case of delay/non- performance, the appropriate action will be taken by competent authority against delinquent agency as per prevailing govt. of India rules/guidelines on procurement**						
3	**If any part of the project is outsourced, the amount will be reimbursed of NMET SoC and Item no. 6 of NMET SoC. In case of execution of the project by NEA on its own, a Certificate regarding non outsourcing of any component/project is required.**						
4	**Necessary efforts should be made to minimize any adverse impact on the environment during exploration activities.**						
5	**Any item of work not mentioned above shall be added as per SoC.**						
6	**All the Geological Reports and data are to be uploaded on NGDR as per MERT template by the agency**						

Plate:1


Geological Map of Paradva-Amrapar Blocks with collected sample
Block A
Block D
Block B
Block C
LEGEND
Lithology
BASALT (UNCLASSIFIED)
GABBRO DYKE
MILIOLITE LIMESTONE
RHYOLITE
0
750
1,500 m

Borehole Location Plan of Paradva-Amrapar Block-A, Jamnagar District



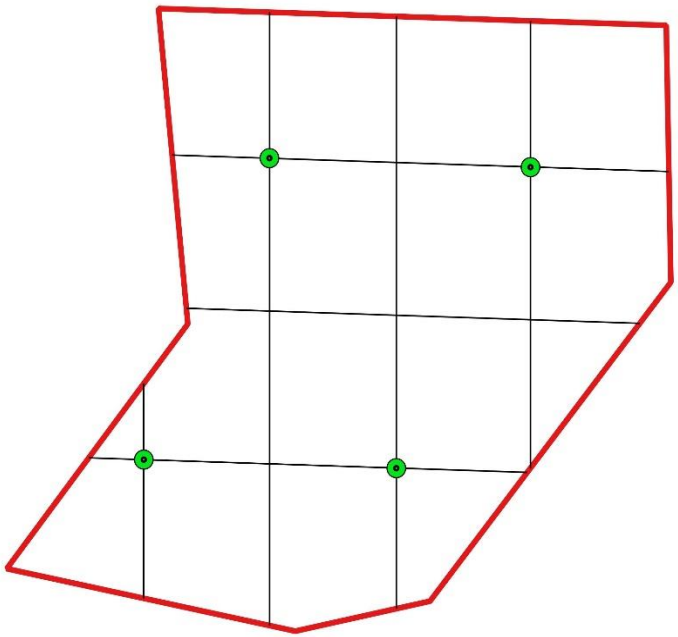
0 250 500 m

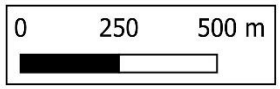
LEGEND

BLOCK BOUNDARY

PROPOSED BH POINT

Borehole Location Plan of Paradva-Amrapar Block-B, Jamnagar District



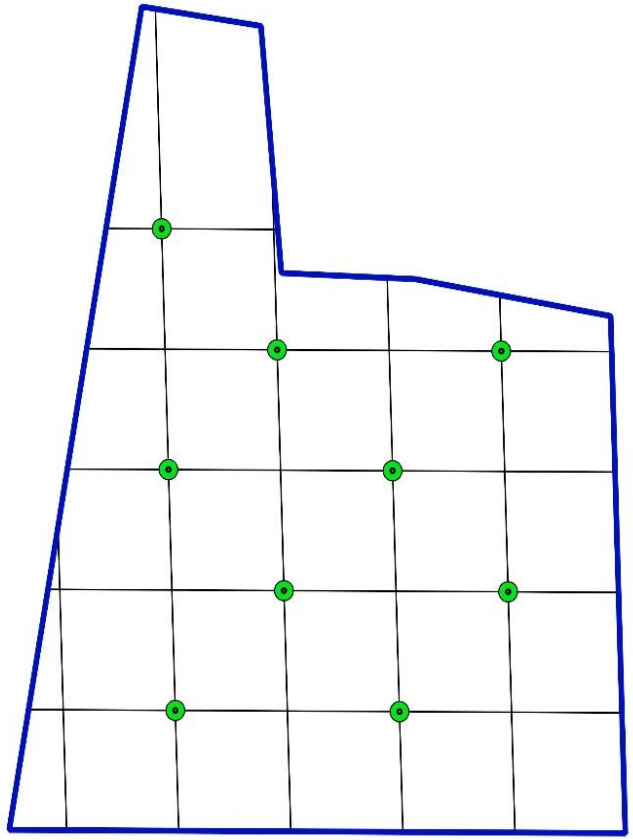


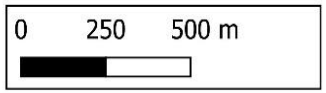
LEGEND

BLOCK BOUNDARY

PROPOSED BH POINT

Borehole Location Paln of Paradva-Amrapar Block-C, JamnagarDistrict



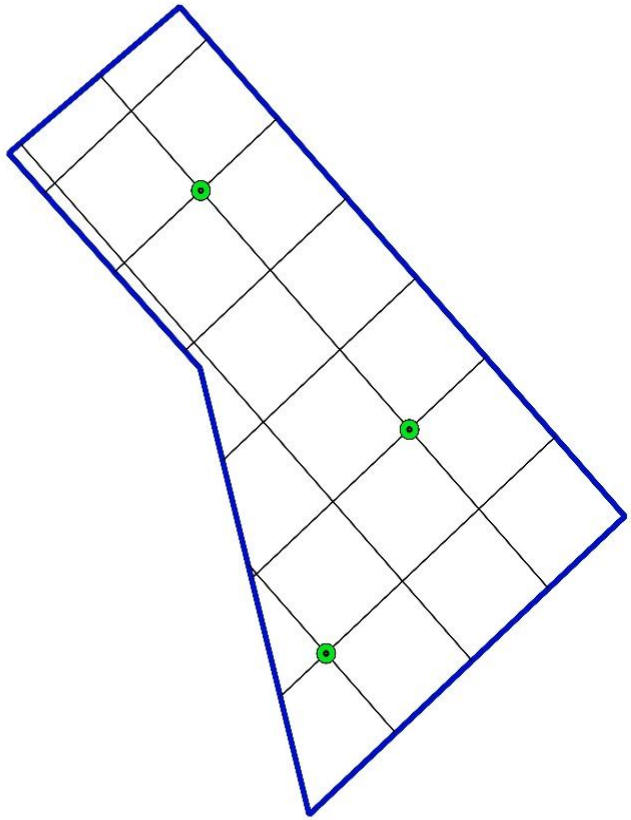


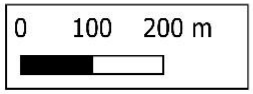
LEGEND

BLOCK BOUNDARY

PROPOSED BH POINT

Borehole Location Plan of Paradva-Amrapar Block-D, Jamnagar District





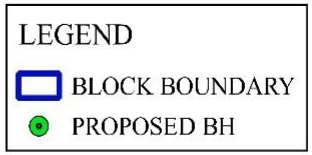


Plate:3

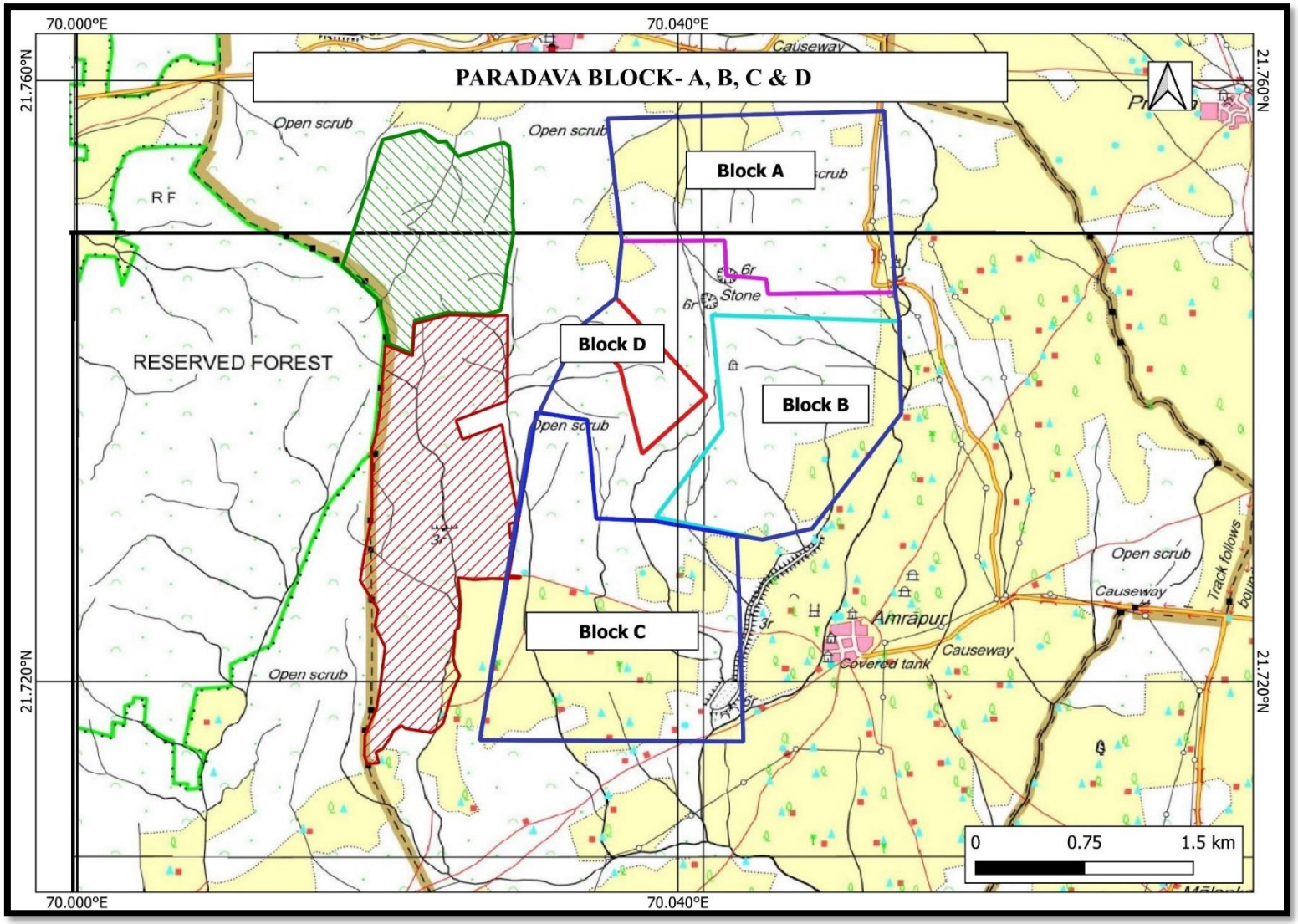

PARADAVA BLOCK- A, B, C & D
Block A
Block B
Block C
Block D
RESERVED FOREST
RF
Open scrub
Stone
Causeway
Amrapur
Covered tank
Track follows
70.000°E
70.040°E
21.760°N
21.720°N
0
0.75
1.5 km

Plate 4: Satellite View of Proposed Paradva-Amrapar Block