

**DETAILED PROJECT REPORT (DPR) FOR RECONNAISSANCE SURVEY (G-4 STAGE) FOR ALUMINOUS LATERITE, BAUXITE AND ASSOCIATED CRITICAL MINERALS & ASSOCIATED MINERALS IN HEMAL-BARPATOLI BLOCK, AMRELI DISTRICT, GUJARAT**

**(54.70 sq. km Area)**

**COMMODITY: ALUMINOUS LATERITE & BAUXITE**

**To  
NATIONAL MINERAL EXPLORATION DEVELOPMENT TRUST (NMEDT)**

*Submitted by*



**M/s APC DRILLING & CONSTRUCTION PRIVATE LIMITED  
NAMAKKAL  
E-mail:apcdrilling@gmail.com**

**MAY 2026**

**Summary of the Block for Reconnaissance Survey (G-4)  
for Aluminous Laterite, Bauxite and Associated Minerals in Hemal- Barpatoli  
Block, Amreli District, Gujarat**

**GENERAL INFORMATION ABOUT THE BLOCK**

	Features	Details
	Block ID	<b>HEMAL-BARPATOLI BLOCK</b>
	Exploration Agency	APC Drilling & Construction Private Limited
	Previous Exploration Agency	GSI and DGM,Gujarat
	Commodity	Aluminous Laterite, Bauxite
	Mineral Belt	The area is Eastern extension of Mangrol- Keshod laterite belt in coastal Saurashtra, Gujarat
	Completion Period with entire Time schedule to complete the project	10 months.
	Block allocation	The proposed area is the part of Report No RN-29 <b>“Report On The Bauxite Deposits In Some Of The Village Of Bhavnagar, Amreli And Junagadh Districts, Gujarat State”</b> allocated by NMEDT to M/s. APC Drilling & Construction Pvt Ltd for upgradation through exploration, as per the <u>“Minutes of the 3rd Joint Meeting of TCC-I &amp; TCC-II NMEDT for allocating 51 No’s of Blocks to NPEAs and NEAs for upgradation under NMEDT fund”</u> held on 4th September 2025.
	Objectives	<p>The present Reconnaissance Survey (G4) has been formulated to fulfill the objectives of delineating the occurrence of Aluminous Laterite, Bauxite and associated critical minerals in the proposed area and decipher its disposition both surface and subsurface by carrying out the following activities</p> <ul style="list-style-type: none"> <li>❖ Geological Mapping on 1:12,500 scale</li> <li>❖ Surface Sampling (Grab/Bedrock/soil samples) &amp; chemical analysis</li> <li>❖ Pitting work</li> <li>❖ To drill a few scout boreholes to prove lateral (strike)</li> </ul>

		<p>and vertical (depth) continuity of mineralized zones depending on results of Geological Mapping, Geochemical Studies, Geophysical Investigation and Pitting</p> <p>❖ To estimate reconnaissance category resources (334) of Aluminous Laterite, Bauxite and associated minerals in the block as per UNFC norms &amp; MEMC Rule- 2015 and Minerals (Evidence of Mineral Contents) Amendment Rules, 2021.</p>															
	<p>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</p>	<p>Geological Mapping, Geochemical Studies, Pitting, Drilling, core logging, sampling and Geological Report writing will be carried out by APC Drilling &amp; Construction Private Limited.</p> <p>Surface Geophysical investigation will be carried out through outsourcing.</p> <p>Chemical Analyses and Petrographic Studies will be carried out by NABL accredited Laboratories.</p>															
	Name/ Number of Geoscientists	<p>Geologists: 01 HQ Geologists: 01 Field</p>															
	<p>Expected Field days (Geology, Surveyor) Geological Party Days</p>	Geologist: 60days															
<b>1.</b>	<b>Location</b>	The proposed block is located to the South of district Headquarter Amreli. The nearest town is Timbi and Chhelana															
	Latitude & Longitude	<table border="1"> <thead> <tr> <th>Block Corner points / Cardinal Points</th> <th>Latitude</th> <th>Longitude</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>N20.95896</td> <td>E71.29850</td> </tr> <tr> <td>B</td> <td>N20.98733</td> <td>E71.38604</td> </tr> <tr> <td>C</td> <td>N20.98032</td> <td>E71.39094</td> </tr> <tr> <td>D</td> <td><b>N20.95283</b></td> <td>E71.34275</td> </tr> </tbody> </table>	Block Corner points / Cardinal Points	Latitude	Longitude	A	N20.95896	E71.29850	B	N20.98733	E71.38604	C	N20.98032	E71.39094	D	<b>N20.95283</b>	E71.34275
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	Villages	Hemal, Nageshree, Barman Nana, Chotra & Barpatoli															
	Tehsil/ Taluk	Jafarabad															
	District	Amreli															
	State	Gujarat															
<b>2.</b>	<b>Area (hectares/ square kilometers)</b>																
	Block Area	54.70 sq.km															
	Forest Area	No Forest															
	Government Land Area	Data not available															
	Private Land Area	Data not available (mostly agricultural land)															
<b>3.</b>	<b>Accessibility</b>	The area under investigation is approachable from Timbi and Chhelana towns by NH No. 51. The Una-Mahuva Road is passing through the area.															
	Nearest Rail Head	Mahuva Datha Road and Bhadrod															
	Road	The proposed block is well connected by internal roads and chhelana/ Timbi towns. The NH-51 touching Una-Mahuva is passing in the central part of the block															
	Airport	Diu in the SW (35 km)															
<b>4.</b>	<b>Hydrography</b>	The area is drained by a few small seasonal streams, flowing towards the Arabian sea.															
	Rivers/ Streams	A seasonal river flowing within the block area from North to South and joins Arabian sea															
<b>5.</b>	<b>Climate</b>	Climatically the area is generally dry and hot. The maximum temperature during summer season rose up-to 40°C to 45°C. The minimum temperature in winter goes to 10 to 14°C															

	Mean Annual Rainfall	The average annual rainfall between 600 to 750 mm per annum
	Temperature	Winter: Minimum temperatures 10 <sup>0</sup> C (December-January) Summer: Max.45 <sup>0</sup> C ( in May- June)
<b>6</b>	<b>Topography</b>	
	Toposheet Number	No.41 P/05 & 41 P/01
	Morphology of the area	The area under investigation is gently undulating with cultivated plains. The elevation in the east is around 27 AMSL and in the central north elevation is around 91 m AMSL
<b>7</b>	<b>Availability of baseline geoscience data</b>	
	Geological Map (1:50K/ 25K)	Geological map on 1:50,000 scale (Source: NGDR/Bhukosh)

	Geochemical Map	<b>Not Available</b>
	Geophysical Map (Aeromagnetic, ground geophysical, Regional as well as local scale GP maps)	<b>Not Available</b>
<b>8.</b>	<b>Justification for taking up G4 stage mineral exploration</b>	<p><b>Justification:</b></p> <p>Directorate of Geology and Mining, Gujarat during 1965-1966 carried out an investigation for Bauxite Deposits around the villages of Bhavnagar, Amreli and Junagadh Districts and have proved the existence of bauxite near Longadi, Otha, Talgajarda, Balanivav, Chhelana and Ratad villages. Estimated reserves of bauxite in the investigated area is 1.46 million tons. It was observed that the bauxite of the area is earthy, massive and siliceous in nature with shades of pink and fine grey colors. It is soft and clayey in nature.</p> <p>The chemical analysis results of samples from boreholes show average Al<sub>2</sub>O<sub>3</sub> of 53.70 % with SiO<sub>2</sub> around 6.76%.</p> <p>The satellite imagery indicates the presence of laterite/bauxite deposits in the area. (Ref Gujarat Mineral Wealth Published by CGM Gujarat)</p>

		<p>In the last week of September 2025, the Geology Team from APC conducted site visits and collected of samples (4Nos) in the proposed block area.</p> <p>The analysis results of samples in the proposed block are as follows:</p> <ol style="list-style-type: none"> <li>1. Al<sub>2</sub>O<sub>3</sub>: 17.55 - 33.24 %</li> <li>2. Fe<sub>2</sub>O<sub>3</sub>: 31.41- 43.74%.</li> <li>3. Titanium (TiO<sub>2</sub>): 1.47 - 2.63%</li> <li>4. Vanadium: 767 to 1445 ppm</li> </ol> <p>In view of the significant presence of Titanium and Vanadium along with Bauxite and laterite, the block may be good prospect for multi-commodity minerals.</p>
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## Detailed description

### 1.0.0 Background information

NMEDT has allocated the Bauxite blocks in Bhavnagar, Amreli and Junagadh districts of Gujarat (Report No. RN-29) to M/s. APC Drilling & Construction Pvt Ltd for upgradation through exploration, as per the “Minutes of the 3rd Joint Meeting of TCC-I & TCC-II NMEDT for allocating 51 No’s of Blocks to NPEAs and NEAs for upgradation under NMEDT fund” held on 4th September 2025.

Subsequently, CGM, Gujarat vide official email dated Sep 20, 2025, requested some NPEA’s including APC to send an expression of Interest (EoI) to take up exploration in 42 blocks for upgradation to G4/G3. Out of the 42 blocks, 2 Bauxite blocks viz. Longadi (10.40 Sq.km) and Chhelana (9.18sq.km) are located in Bhavnagar and Amreli Districts respectively, and are part of the Report No.RN-29 allocated to APC by NMEDT. In view of the above, earlier APC submitted the proposal for Longadi and Chhelana Bauxite Blocks for an area of 10.40 Sq.km and 9.18 sq.km respectively, after conducting field visit in the last week of September 2025 and collecting a total of 21 samples from Bhavnagar, Amreli and Junagadh (Gir Somnath) areas.

In the 14th TCC-2meeting held on 7th & 8th of October 2025, the proposals were discussed. At the time of meeting, the chemical analyses of only one sample (out of 21 samples) were available. The Committee opined that the area of 9.18 sq.km (Chhelana) & 10.40 Sq.km (Longadi)are small for G4 level of Exploration and also the analysis of one sample is not sufficient to take any decision. Accordingly, it was suggested to collect more

samples to enhance the confidence level for mineral evidence and the proposal would be reviewed based on the results of the samples collected by APC.

Accordingly, after availability of analysis results of samples collected in the block by APC team, which are encouraging, the fresh G4 proposal was submitted for Hemal-Barpatoli Block covering a larger area of 109.13 Sq.km.

The chemical analysis is given below:

1. Al<sub>2</sub>O<sub>3</sub>: 17.55 - 33.24 %
2. Fe<sub>2</sub>O<sub>3</sub>: 31.41- 43.74%.
3. Titanium (TiO<sub>2</sub>): 1.47 - 2.63%
4. Vanadium: 767 to 1445 ppm

The proposal was discussed in 88<sup>th</sup> TCC-I meeting held on 16-17 January 2026. In the meeting, CGM Gujarat informed that the proposed Hemal-Barpatoli Block (G4 stage) overlaps with some other workshop blocks of CGM for which NoC is under process. It also overlaps with some existing ML area.

In view of above, TCC-I advised APC to submit the DPR proposal after modifying the block area, excluding overlapping exploration blocks/ ML areas and after getting NoC from CGM, Gujarat.

While CGM, Gujarat is being perused to get NoC, the DPR proposal for G4 stage Exploration is submitted for modified block area of 54.70 Sq.km, considering the Wildlife Sanctuary Buffer zone of 7.00 km. (earlier 109.13 sq.km).

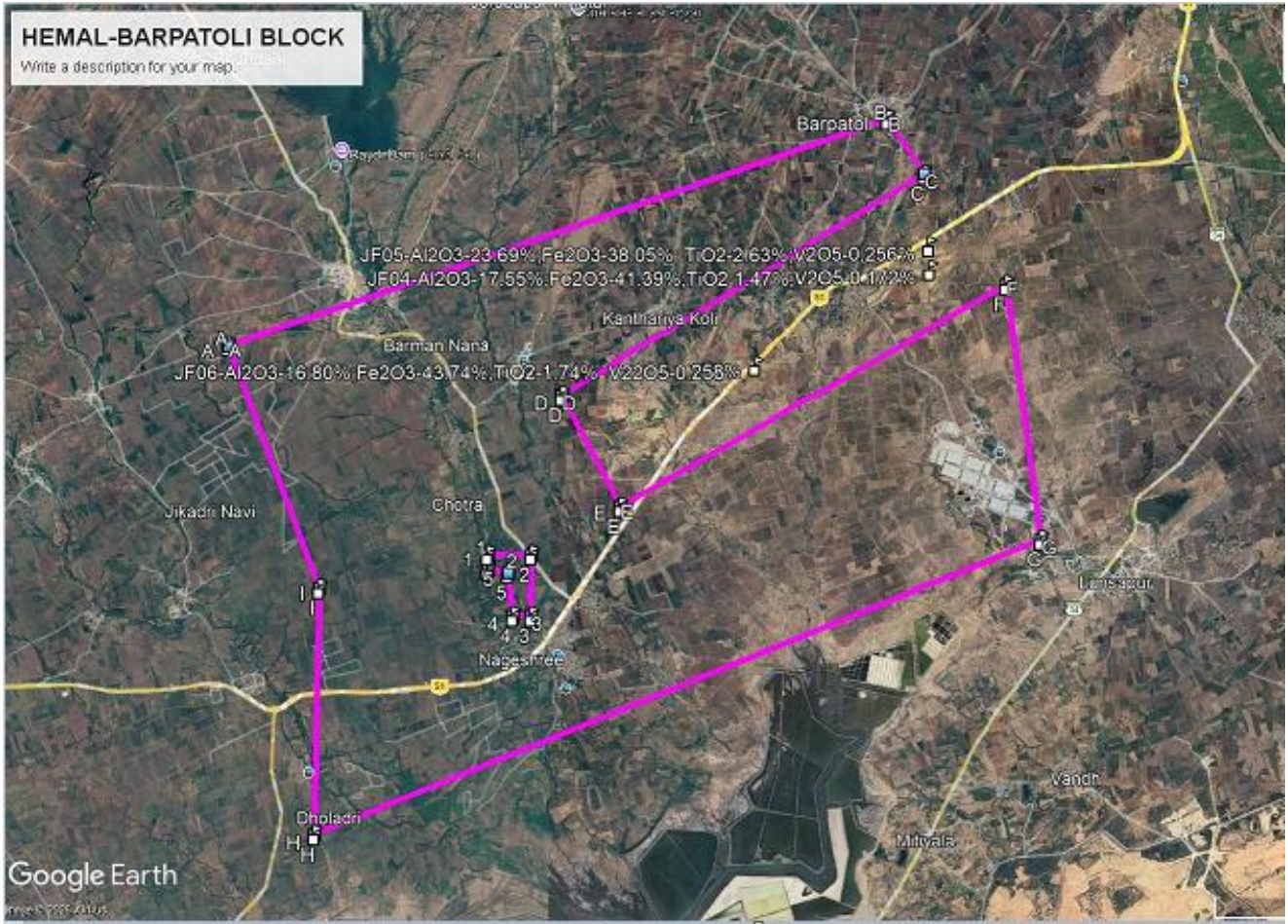
### 2.0.1 Location and Accessibility

The Hemal - Barpatoli Aluminous Laterite, Bauxite block falls in Survey of India Toposheet No.41P/01 & 41 P/05 and is bounded by the following co-ordinates in Amreli district of Gujarat.

Proposed Hemal - Barpatoli Block Boundary Coordinates

Block Corner points / Cardinal Points	Latitude	Longitude
A	N20.95896	E71.29850
B	N20.98733	E71.38604
C	N20.98032	E71.39094
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E	N20.93909	E71.35054
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**Figure-1: Location of Hemal-Barpatoli Block on Google image**

**RECONNAISSANCE SURVEY (G4) FOR BAUXITE-ALUMINOUS LATERITE IN HEMAL- BARPATOLI ON GEOLOGICAL MAP (1:25000)**

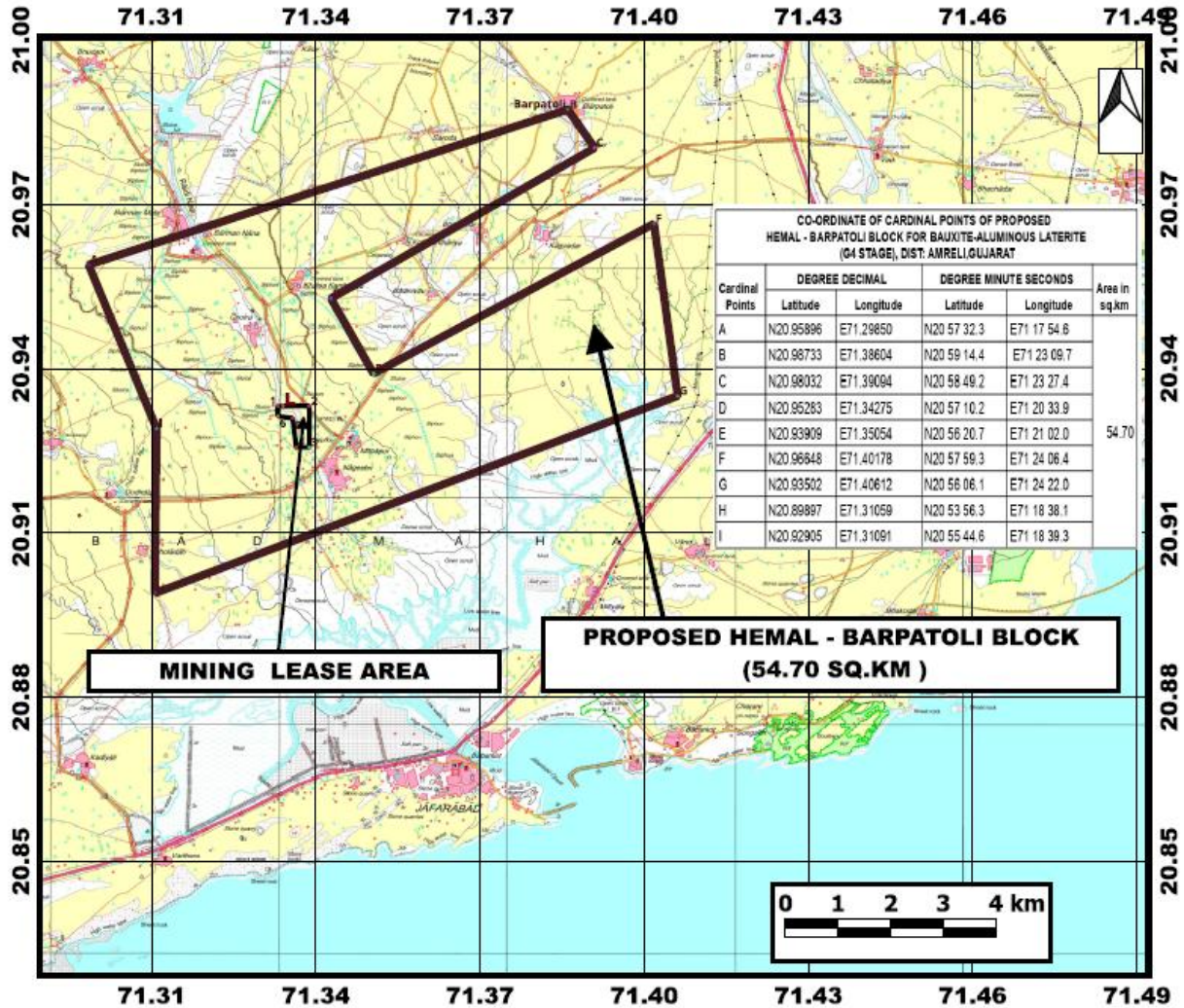


Figure-2: Location of Hemal-Barpatoli Block on Toposheet No. 41P/1 & 41P/5(1:15000)

**2.0.2 Physiography**

Saurashtra has a characteristic physiography. The geological characteristic is indicative of the cone and crater type of origin of a number of hills. Physiography the area is almost plain gently sloping towards the sea in southwards. There are several flat topped mounds separated by agricultural land.

### 3.0.0 Previous Work

The proposed area was preliminarily investigated during 1965-66 by the Directorate of Geology and Mining, Gujarat. Carried out trenching and drilling and estimated the geological resource of 1.46 million tons of bauxite. The chemical analysis results of samples from boreholes showed average Al<sub>2</sub>O<sub>3</sub> of 53.70 % with SiO<sub>2</sub> around 6.76%. The satellite imagery indicates the presence of laterite/bauxite deposits in the area. CGM, Gujarat recommended area for G4 stage exploration.

During the field season 1975-77, GSI carried out an investigation for concealed bauxite in the Mangrol- Keshod area laterite belt in Junagadh district located on the western side of the proposed area. GSI drilled 85 drillholes and based on the surface and subsurface geological data, a total of ten pockets of concealed bauxite/bauxitic clay deposits were delineated and estimated bauxite resources of around 2.43 million tonnes.

### 4.0.0 Brief Regional Geology and Structural framework

#### 4.0.1 Regional Geology

Saurashtra is a rocky table land fringed by coastal plains. Deccan lava flows mainly occupy the central part of Saurashtra while Tertiary and Quaternary sediments form narrow borders swerving round it. Bhavnagar district occupies almost the entire eastern Saurashtra Region which forms an upland with E-W trending ridges. The morphology of the upland, to some extent, is controlled by the sub horizontal basaltic flows. Tertiary sediments in this area are classified as Gaj formation of Eocene to Miocene age. Lithological assemblage comprises calcareous sandstone, pebbly sandstone, pebble bed, clay and marl. Sedimentary structure and fossil assemblage favours fluvio-deltaic origin (Merh, 1995) of Gaj sediments.

**4.0.2 Geological sequence:** The geological sequence established by the earlier workers, summarized on the basis of observation made during the field work is as under:-

<b>Alluvium:</b>	<b>Recent</b>
<b>Milliolite limestone Gaj sediments:</b>	<b>Post Pliocene</b>
<b>Gritty, calcareous and variegated clays:</b>	<b>Miocene</b>
-----unconformity-----	
<b>Bentonite/Deccan trap:</b>	<b>Oligocene</b>

Traps and limestone are the dominant country rocks covering the major portion of the area. The area in general is covered by black cotton soil and out-crops of laterite are noticed in some of the canal sections of the vicinity. The laterite forms low humps, hardly rising two to three meters above the plains. Laterites are of two types, one the hard compact ferruginous laterite and the other soft and clayey.

The area is found covered mostly by medium to fine grained basalts and Phyllites. They are occasionally amygdaloidal with agate, chalcedony and quartz. Traps are found along the northern margin of the laterite belt. The traps are generally horizontal but at places show dips of 3° to 4° due South.

**4.0.3 Lithounits:** The lithounits of the proposed area comprises Deccan traps, Bentonite clay, Laterite and Bauxite, Gaj beds & Milionitic Limestone.

**4.0.4 Geophysical Exploration :** No previous geophysical Investigation has been carried out

### **5.0.0 Scope for proposed exploration.**

The proposed Reconnaissance Survey (G4 Stage) for Bauxite- Aluminous Laterite, Bauxite and associated Critical Minerals in Hemal-Barpatoli Block, Dist:Amreli, Gujarat, comprises of Geological mapping of 54.70 Sq.km area on 1:12,500 scale, Surface/ Geochemical sampling (Bedrock, soil), Pitting, Drilling of 16 scout boreholes involving about 330 m drilling, associated survey, chemical analysis, Petrological analysis and estimation of resources under G4 category and Geological Report preparation.

### **6.0.0 Planned Methodology**

The exploration program is proposed in accordance with the objective set for reconnaissance survey (G-4) of the block. The Exploration shall be carried out as per Minerals (Evidence of Mineral Contents) Rules-2015 and Amendment 2021. Accordingly, the following scheme of exploration is formulated.

#### **6.0.1 Topographic Survey:**

The area under investigation, measuring 54.70 Sq. Km will be surveyed with a triangulation network in 1:12500 scale. Contouring is to be carried out at a 5m interval. The block boundary and the borehole points will be surveyed by DGPS & Total Station in WGS-84 Datum.

#### **6.0.2 Borehole Collar Point Survey by DGPS**

RL's and co-ordinates of survey and Borehole points will be determined with reference to the Survey of India Bench Mark as available. All the important surface features, survey stations, geological outcrop & Pits will be surveyed

#### **6.0.3 Geological Mapping (1:12,500 Scale)**

Geological Mapping will be carried out in Large Scale Mapping (LSM) on 1:12,500 scale in the block by taking geological traverses to demarcate the surface manifestations and lateral disposition of the mineralized zones with the structural features i.e. strike, dip, lineation / foliations etc. The contacts of different formations, identification of different lithological units, structural features, etc., will be carried out in detail. The geological map will be generated on the 1:12,500 scale.

#### **6.0.4 Geochemical Sampling (BedRock/ Soil/Stream/ channel/Pit)**

#### **6.0.5 Bed Rock Sampling**

During the course of Geological mapping, the bed rock / soil/stream samples shall be collected. A total of 50 nos. Bed rock/ soil/stream/ samples will be collected from the proposed block. Total 5 nos. check samples (10% External) will be analyzed for Major oxides (WD XRF)- (oxides+ traces -24 elements).

#### **6.0.6 Pitting**

Pitting will be carried out on the surface up to a depth of 2 m after removal of soil/weathered column in the area. Pitting shall be carried out in the potential zones identified, based on the observations of geological mapping and the results of geochemical sampling and Geophysical Investigation. A provision of pitting in mineralized zones (1m x 1m X 2m deep) of 100 cubic meters is proposed from 50 No. of pits with provision of 50 Nos. of primary & 5 nos. check samples (10% External).

#### **6.0.7 Core Drilling**

A total of 16 vertical boreholes (coring) is proposed for the G-4 stage of Exploration, on basis of the results of surface exploration such as Geological Mapping & Geochemical Survey and Pitting in an area of 54.70 Sq.km. The average depth of the boreholes is considered to be 20 m and a total of 330 m of drilling is proposed in selected locations to find out the continuity of mineralized zones in strike & dip direction and to assess subsurface disposition of the targeted mineralized bodies.

#### **6.0.8 Borehole Core Logging and Sampling**

Geological core logging will be carried out carefully by recording minute details and lithological characters of the rock formations including colour, texture, mineralogical composition, structural details and lithological variations encountered in the boreholes.

#### **6.0.9 Core Sampling**

The drilled borehole cores will be sampled for a uniform length of 1.00m so that each sample falls between fixed reduced levels in all the boreholes. But the top and the bottom samples will usually be less than 1.00m length as the R.L of the collar of the borehole and the floor of the mineralized zone will be in fraction of the whole number. Around 130 core samples will be generated from 16 boreholes. Each sample thus obtained, will be crushed to (-) 60mesh size and its quantity will be further reduced to 500 grams by coning and quartering. The material will be further crushed to (-)120 mesh size. Representative samples weighing about 100grams each will be taken from this, one of which will be sent for primary analysis for for Major oxides (WD XRF)- (oxides+ traces -24 elements) and other part of the samples needs to be kept for the purpose of check analysis.

**6.0.10 Check Samples:** 10% of the total primary samples (23 No. of samples) shall be analyzed for 6 radicals as stated above.

### 6.1.1 Spectroscopic Studies:

23 drill core samples shall be studied for Analysis of one rock/ soil sample for quantitative analysis of 14 REE elements + 9 trace element (U,Ta,Ge,Be,Hf,Sn,As,Rb,Th) by ICPMS (sequential technique) including Ga and Sc to be carried out by mass spectroscopic studies.

### 6.1.2 Mineralogical and Petrographic Studies:

During the course of Geochemical sampling and core logging, to know about the mineralogical composition and interrelation among the constituent minerals 5 rock specimens will be taken up for Petrographic studies. 5 nos. of ore specimens from the mineralized zones will also be studied in a polished section to know about the constituent ore minerals, their mode of occurrence, textures and other mineralogical characteristics.

**6.1.3 X-Ray Diffraction Studies:** A total of 5 Nos Bauxite- Aluminous /Ferruginous Laterite-Titanium-Vanadium samples representing the deposit will be subjected to X-Ray Diffraction studies to know about the general distribution pattern of the constituent minerals of the ore.

### 6.1.4 Specific Gravity Determination

2 nos. of samples are proposed to be subjected for specific gravity determination.

## 7.0.0 Nature Quantum and Target

### Proposed Quantum of work:

Sl. No.	Description and Nature of Work	Unit	Target
<b>A</b>	<b>GEOLOGICAL WORK AND SURVEYING</b>		
1	Geological Mapping (1:12,500 scale)	Sq. km	54.7
2	Topographic Survey (Contour interval 5m) at 1:12500 scale		54.7
3	Bore Hole Fixation and determination of co-ordinates & Reduced Level (RL) of the boreholes and demarcation of lease hold boundary points by DGPS	Nos.	16
5	Bedrock samples		50
<b>B</b>	<b>PITTING</b>		
10	Pitting (1m x 1m x 2m)	Cum.	100
<b>C</b>	<b>EXPLORATORY DRILLING</b>		
11	Drilling (Soft Rock)	m	330
12	Drill Core Preservation	Per m	300
<b>D</b>	<b>Sampling &amp; Chemical Analysis</b>		
13	Primary samples to be analyzed for Major oxides (WD XRF)- (oxides+ traces -24 elements)		230
i)	Bedrock samples	Nos .	50

ii)	Pit samples	Nos .	50
iii)	Borehole Core samples	Nos .	130
iv)	Check samples (10% external)	Nos .	23
15	<b>Physical,Petrological, Mineralogical Studies</b>		
i)	Preparation of thin polished section	Nos.	5
ii)	Complete petrographic study report	Nos.	5
iii)	Complete mineragraphic study report	Nos.	5
iv)	X-RD studies for mineral identification		5
v)	Analysis of one rock/ soil sample for quantitative analysis of 14 REE elements + 9 trace element (U,Ta,Ge,Be,Hf,Sn,As,Rb,Th) by ICPMS (sequential technique) including Ga and Sc		23
vi)	Specific Gravity Determination		2
<b>F</b>	<b>Geological Report Preparation -As per MEMC Rules-2015</b>	Nos.	1

### 8.0.0 Time Schedule and Cost Estimates

**Time Schedule:** The total duration of the project proposed is 10 months.

Scheduled time for Reconnaissance Survey (G-4) for Aluminous Laterite, Bauxite and associated critical minerals in Hemal-Barpatoli Area, Amreli District, Gujarat														
Sl.	Activities	Units	Months											
No.			1	2	3	4	5	6	7	8	9	10		
1	Camp Setting	Months	■											
2	Geological Mapping & Sampling (Bed Rock /Pit/Grab)	Months	■	■										
3	Pitting	Cu.m	■	■										
4	Coring Drilling	m.				■	■	■						
5	Geological Work (1 Geologist)	Days	■	■										
6	Sampling Work -BRS/Pit/Core Samples	Days	■	■										
7	Camp Winding	Months						■						
8	Laboratory Studies	Months		■	■		■	■	■		■	■		
9	Geological Work, HQ	Days											■	
10	Geological Report Preparation,Peer Review & Submission	Months											■	■

### 9.0.0 Cost Estimates:

Tentative cost has been estimated based on the Schedule of Charges (SoC) of projects funded by NMEDT. The total cost estimate of Rs.99.83 Lakhs (Including GST) is being proposed for completion of exploratory work up to G-4level. Activity wise break up of cost is given in table below.

Activity wise break up of cost of the project

Sl.No.	Item	Total Cost
1	Geological Work	2999394
2	Pitting	472500
4	Laboratory Studies	1289800
5	Drilling	3257750
	<b>Sub total</b>	<b>8019444</b>
6	Report	250000
7	Peer Review	30000
8	Proposal Preparation	160388.88
	<b>Total</b>	<b>8459832.88</b>
	GST (18%)	1522770
	<b>Total cost including 18% GST</b>	<b>9982603</b>

#### 10.0.0 Justifications

- The proposed area is the part of Report No RN-29 “**Report on The Bauxite Deposits in Some of The Village of Bhavnagar, Amreli and Junagadh Districts, Gujarat State**” allocated by NMEDT M/s. APC Drilling & Construction Pvt Ltd for upgradation through exploration.
- The proposed area was preliminarily investigated by the Directorate of Geology and Mining, Gujarat in Bhavnagar district and the geological resource of 1.46 million tons for bauxite has been assessed with average Al<sub>2</sub>O<sub>3</sub> of 53.70 % and SiO<sub>2</sub> around 6.76%.
- The satellite imagery indicates the presence of laterite/bauxite deposits in the area.
- CGM, Gujarat recommended area for G4 stage exploration.
- APC team has visited the block area, collected samples (4Nos.) and analysed. The results are encouraging with following values
  - Al<sub>2</sub>O<sub>3</sub> : 17.55 - 33.24 %
  - Fe<sub>2</sub>O<sub>3</sub> : 31.41- 43.74%.
  - Titanium (TiO<sub>2</sub>) : 1.47 - 2.63%
  - Vanadium : 767 to 1445 ppm

In view of the significant presence of Titanium and Vanadium along with Bauxite and laterite, the block may be good prospect for multi-commodity minerals.

List of Plates:

1. Location Plan of Proposed Hemal-Barpatoli Block on Toposheet No. 41P/01& 41P/05 (1:25000) (ANNEXURE-1)
2. Location of Proposed Hemal-Barpatoli Block on Geological Map (1:25000) (ANNEXURE-2)

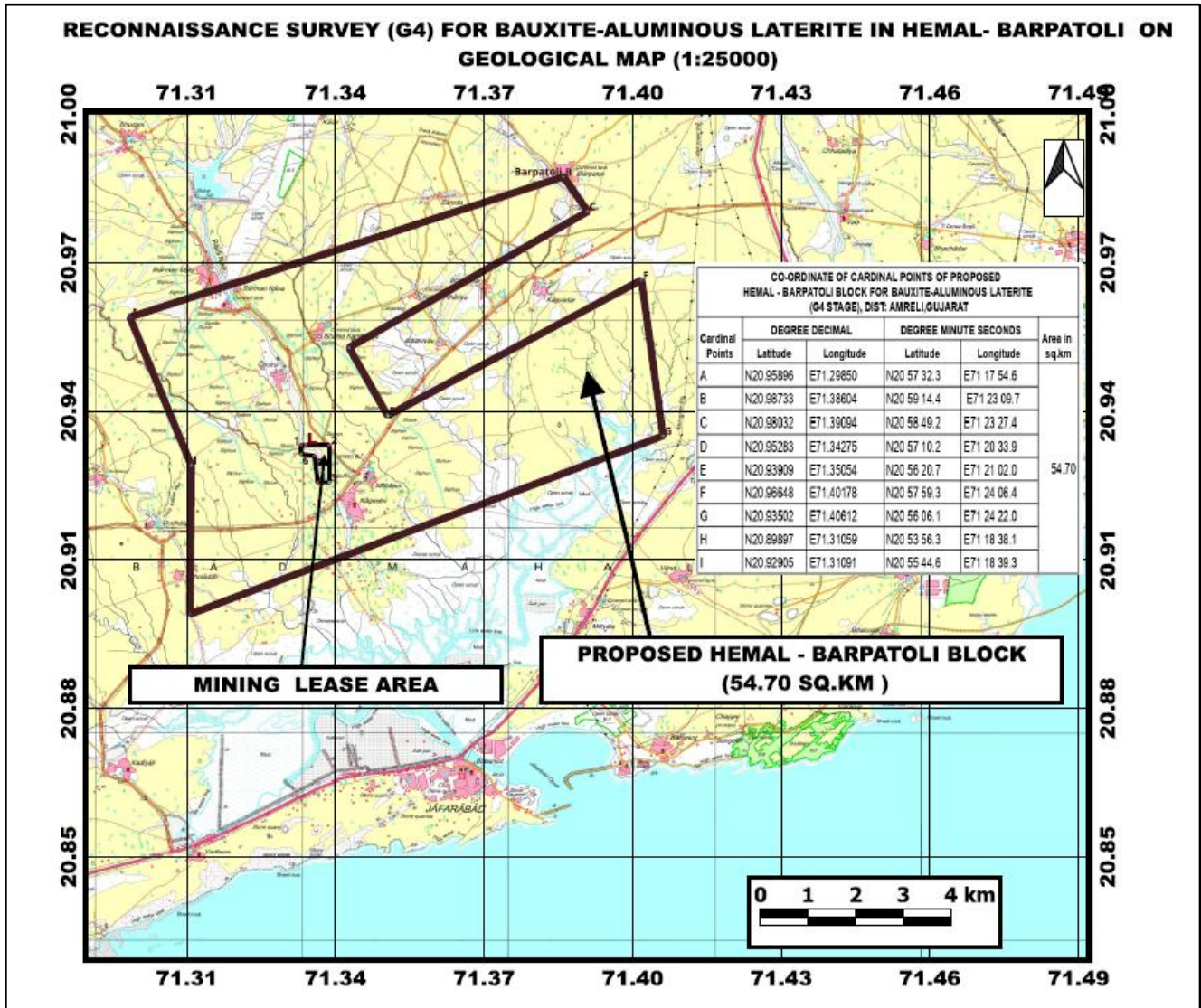


Figure-3: Location Plan of Proposed Hemal-Barpatoli Block on Toposheet No. 41P/01 & 41P/05(Scale 1:25000)

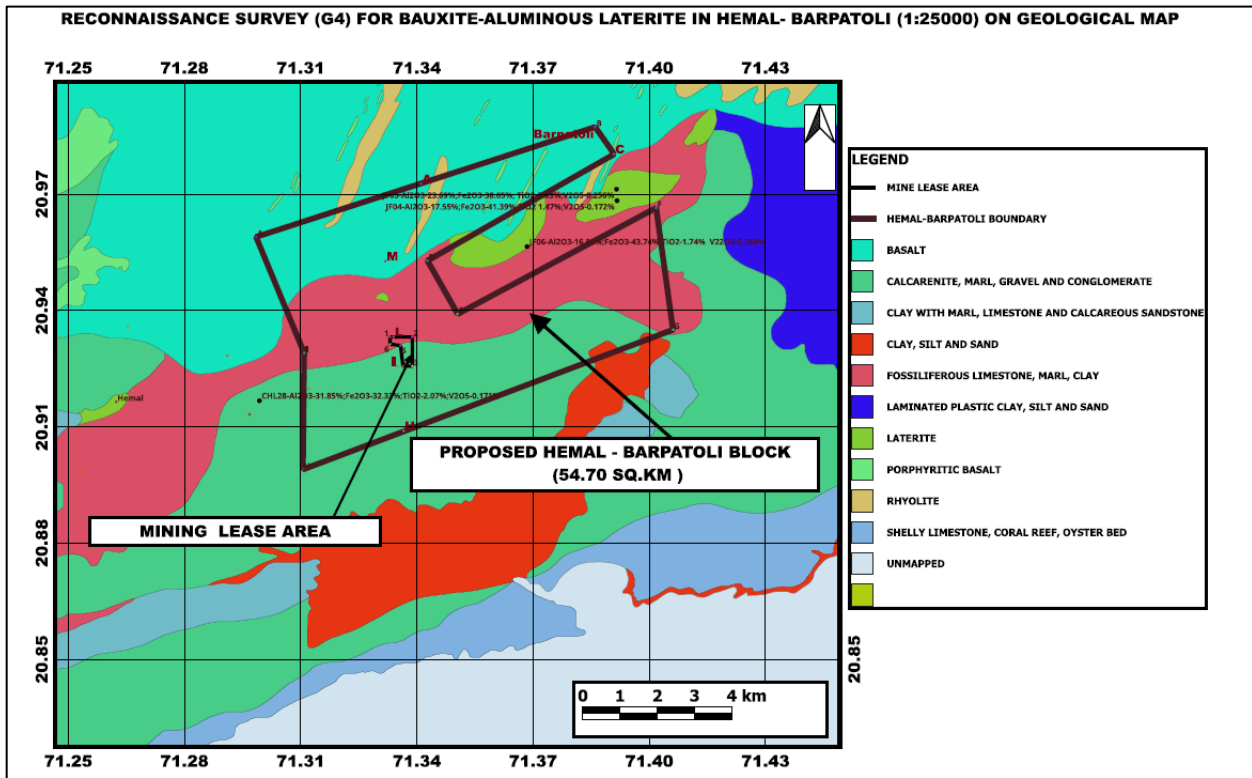


Figure-4: Location of Proposed Hemal-Barpatoli Block on Geological Map (1:25000)

## Detailed estimated cost of the project

Reconnaissance Survey (G-4) for Aluminous Laterite, Bauxite and associated critical minerals in Hemal-Barpatoli Area, Amreli District, Gujarat [Block area-54.70 sq. km; BH-16 Nos (depth 20 m range); Drilling-330 m (15 BH of 20 m and 1 Stratigraphic BH of 30 m); Schedule timeline- 10 months; Review- After 3 and 6 months]							
SL No.	Item of Work	Unit	Rates as per NMET SoC		Estimated Cost of the Proposal		Remarks
			SoC-Item - SI No.	Rates as per SoC	Qty	Amount (Rs)	
A	<b>GEOLOGICAL WORK &amp; TOPOGRAPHICAL SURVEY (1:12500 scale)</b>						
i	Geological Mapping (1:12.500 Scale)	sq.km	1.1	18300	54.7	1001010	
ii	Charges for Geologist- Field	day	1.2.1a	14500	60	870000	
iii	Charges for Geologist - HQ	day	1.2.1a	10500	30	315000	
iv	2 labours / Party(As per rates of Central Labour Commissioner)	day	5.8	556	120	66720	Amount will be reimburse as per the notified rates by the Central Labour Commissioner or respective State Govt. whichever is higher
v	Sampling Party days-1 Samplers Labour charge not included	day	1.2.1b	7850	36	282600	
vi	4 labours/ party (As per rates of Central Labour Commissioner)	day	5.8	556	144	80064	Amount will be reimburse as per the notified rates by the Central Labour Commissioner or respective State Govt. whichever is higher
vii	Fixation of borehole and determination of co-ordinates & Reduced Level (RL) of the boreholes by DGPS (including charges for labours deployed for the work)	day	1.3.3	24000	16	384000	
	<b>Sub Total- A</b>					<b>2999394</b>	
C	<b>PITTING</b>						
i	Pitting(1 x1 x2 m)50 No. of Pit	Cu m	2.1.2	4725	100	472500	Pit Samples -50
	<b>Sub Total- C</b>					<b>472500</b>	
D	<b>DRILLING</b>						
i	Drilling (Soft Rock)	m	2.2.1.1c	5500	330	1815000	16 BHS @20 m depth
ii	Land / Crop Compensation	per BH	5.6	30000	16	480000	
iii	Construction of concrete Pillar (12"x12"x30")	per borehole	2.2.7	2000	16	32000	
iv	Miscellaneous charges -Transportation of Drill Rig, Accomodation of Drill Camp, Camo	Limpsu m	2.2.9			453750	If drilling cost is <50 lakhs , then 25% of the

	setting & winding, Construction of Approach Road						drilling cost
v	Drill Core Preservation	Nos	5.3	1590	300	477000	16 Boreholes(One complete borehole plus mineralised cores of all the remaining BHs)
	<b>Sub Total- D</b>					<b>3257750</b>	
E	<b>LABORATORY STUDIES</b>						
1	<b>Chemical Analysis</b>						
i	Primary & Check samples BRS/Pit/Chip/Channel/Stream/Soil/BH samples)						
	a. Primary Samples for Primary Samples for Major oxides (WD XRF)- (oxides+ traces -24 elements	Nos	4.1.17a	4,200	230	966000	BH-130, BRS-50, Pit-50
	b. Check samples(10%) for Major oxides (WD XRF)- (oxides+ traces -24 elements	Nos	4.1.17a	4,200	23	96600	
2	<b>Physical, Petrological, Mineralogical Studies</b>						
i	Preparation of thin polished section	Nos	4.3.1	800	5	4000	
ii	Complete petrographic study report	Nos	4.3.4	2800	5	14000	
iii	Complete mineragraphic study report	Nos	4.3.2	2800	5	14000	
iv	X-RD studies for mineral identification	Nos	4.5.2	4,000	5	20000	
v	Analysis of one rock/ soil sample for quantitative analysis of 14 REE elements + 9 trace element (U, Ta, Ge, Be, Hf, Sn, As, Rb, Th) by ICPMS (sequential technique) including Ga and Sc	Nos	4.1.15	7400	23	170200	
vi	Specific Gravity Determination	Nos	4.8.1	2500	2	5000	From BH
	<b>Sub Total- E</b>					<b>1289800</b>	
E	<b>Total A to E</b>					<b>8019444</b>	
F	Geological Report Preparation - including charges of typing text,, table etc., degitization of maps/ sectinons etc.,		5.2	Cost per 5 copies of report along with soft copy		250000	7.5 lakhs for Total cost of the project exceeding 150 lakhs. Reimbursement will be made after submission of the final Geological Report in Hard Copies (5 Nos) and the soft copy to NMET.
G	Peer review Charges		As per EC			30000	
H	Preparation of Exploration Proposal	5 Hard copies with a soft copy	5.1	2% of the Cost or Rs. 5.0 Lakhs whichever		160388.88	2% of the approved project cost or 5 lakhs which ever is lower

				is lower		
I	Total Estimated Cost without GST				<b>8459833</b>	
J	Provision for GST (18% of I)				<b>1522770</b>	GST will be reimburse as per actual and as per notified prescribed rate
K	Total Estimated Cost with GST				<b>9982603</b>	
					or Say Rs. In Lakhs	<b>99.83</b>
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 as per the 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.					