

**PROPOSAL FOR RECONNAISSANCE
SURVEY FOR Zinc and Associated Mineralization
(G-4 STAGE)**

JAMUA AREA

DISTRICT– GIRIDIH, JHARKHAND

NMET FUNDED PROJECT



सेन्ट्रल माईन प्लानिंग एण्ड डिजाइन इन्स्टीच्यूट लिमिटेड
(कोल इण्डिया लिमिटेड की अनुषंगी कम्पनी / भारत सरकार का एक लोक उपक्रम)
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(A Subsidiary of Coal India Limited / Govt. of India Public Sector Undertaking)
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CORPORATE IDENTITY NUMBER - U14292TH1975GOI001223

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**Proposal for Reconnaissance Survey (G-4 level) for Zinc and
Associated minerals in Jamua Area,
District: Giridih, State: Jharkhand, India.**

1.0.0 Introduction:

Historically, Base Metals were few among the first metals to be worked by human hands. They are soft, malleable and ductile metals with very high thermal and electrical conductivity. At Present Zinc (Zn) is used to galvanise other materials such as iron to prevent rusting. It is also used to make some alloys such as brass etc.

Cu is being extensively used in electrical appliances and wiring, construction, making alloys and jewellery.

Lead (Pb) is a dull silvery-grey heavy metal. It is soft, malleable metal with low melting point. Lead is still widely used for batteries, pigments in paints, ammunition and in some types of soldering.

- 1.1** Initially considering earlier exploration data available in Bhukosh of GSI, CMPDI has identified an area 120 Sq. Km under the Topo sheet No – 72L/03 for taking up G4 stage of Exploration for Zinc and associated minerals.
- 1.2** An MOU has been signed between Department of Mines and Geology (DMG), Government of Jharkhand and Central Mine Planning & Design Institute Limited (CMPDI) for exploration of various mineral blocks by CMPDI in the state of Jharkhand. Accordingly CMPDI has prepared the scheme of exploration for Reconnaissance Survey (G-4 level) for Zinc and Associated minerals in Jamua Area, District: Giridih, State: Jharkhand, India.

1.3. Location of the Block:

The Block area is around 27 km North West of Giridih district headquarter extending up to south of Jamua town. Giridih-Koderma rail line passes through the block and Jamua is the nearest railway station around 1 km north of the block. The block is located in Survey of India Toposheet No. 72L/3. Co-ordinates of the corner points is given below in the table and covers an area of around 120sq. km.

Point	Longitude	Latitude
A	86° 2' 27.168"	24° 17' 11.292"
B	86° 2' 27.168"	24° 22' 48.432"
C	86° 9' 25.128"	24° 22' 48.432"
D	86° 9' 25.128"	24° 17' 11.292"

1.4. Physiology and Drainage:

As evident from the Toposheet of the proposed area and satellite imagery, the block area is expected to be covered by few high ridges in places whereas, most of the area is covered by plain-land and undulating terrain with isolated hillocks. Highest elevation of 378m above mean sea level is in the central part of the area. General ground elevation is 330-360m above mean sea level.

The streams in this area form dendritic pattern forming tributaries of westerly and south-westerly flowing nalas.

2.0.0 Previous work:

- 2.1** Occurrence of Cerusite in Baramasia area (East of proposed block) was reported first by Mallet (La Touche Bibliography of Indian geology & physical geography, 1918).
- 2.2** Preliminary investigation for Copper, Lead & Zinc in the Baramasia Area, (A.K. Sen, 1965) identified occurrence of four occurrence of Copper, Lead and Zinc (predominantly Galena, chalcopyrite and sphalerite) within highly garnetiferous diopside granulite rocks east of proposed block.
- 2.3** Report on the reconnaissance of airborne electro-magnetic anomalies and associated magnetic features in parts of Deoghar, Monghyr and Giridih Districts, Bihar: Toposheet nos: 72L/03, 72L/04, 72L/07 & 72L/11 by GSI (Mukhopadhyay & Ray, Sep,1985) in which detailed mapping and sampling was carried out near Mananpur just east of the project area (24°21'45"N, 86°12'15"E) and based on soil samples two zones of Pb-Zn-Cu mineralisation were picked with strike extension in N70°E-S70°W.
- 2.4** Ancient smelting activities in vicinity of old workings have been reported just east of the proposed area in Mananpur by GSI and based on the recommendation of Mukhopadhyay & Ray (Sep,1985) and subsequently a test drilling of total 532.65m in

5 boreholes were also drilled by GSI (Prasad, R.K, 1987-88). Details of mineralization encountered within borehole are tabulated below.

Sl No.	Bh. No.	Depth Range (Th) in meter	Cu	Pb	Zn
1.	MBH-2	28.10-31.10 (3.00)	0.1%-0.95%	---	0.12%-0.84%
2.	MBH-2	34.30-34.80 (0.50)	---	---	2.6%
3.	MBH-3	27.45-28.10 (0.65)	0.11%	--	2.0%

2.5 GSI during Field season, 2013-14 carried out Regional geochemical mapping in and around Ghoranji, Jamua and Fatehpur area in Toposheet nos.72L/3, 4 and southern part of 72L/2. This report also recommends further studies in Jamua, Mananpur area due to higher concentration of Copper in samples.

Mean Zn concentration in the all samples collected from Toposheet 72L/3 comes out to be 150.3ppm with Standard deviation of 231.1ppm. However, 2 of these samples show Zn concentration of more than 612ppm with the highest value of 1030ppm. Similarly, Mean Cu concentration in the samples collected from Toposheet 72L/3 during regional geochemical mapping comes out to be 34.0ppm with Standard deviation of 28.8ppm. However, 5 of these samples show Cu concentration of more than 92ppm with highest value of 127ppm.

Mean Pb concentration in the all samples collected from Toposheet 72L/3 comes out to be 30.4ppm with Standard deviation of 9ppm. However, one of these samples show Pb concentration of more than 48ppm.

3.0. Regional Geology and Structure of the Area.

Major rock type exposed in the area is Archean-Proterozoic gneissic rock of Chhotanagpur Gneissic Complex (CGC). The oldest rock exposed in the area is Archean unclassified metamorphic rocks which include amphibolite/hornblende schist, quartz mica schist, quartzite and calc- silicate rocks. Archean-Proterozoic rocks are

further intruded by pegmatite and quartz veins and dolerite dykes are intruded in all older formations.

The regional geological succession of the area is as given in the table below:

Rock Type	Formation	Group	Age
Sand, silt and clay			Quaternary
-----Unconformity-----			
Dolerite			Jurassic-Cretaceous
-----Unconformity-----			
Pegmatite and quartz vein, Dolerite dyke			paleo Proterozoic
Granitoid gneiss		Chhotanagpur Gneissic Complex	Archean-paleo Proterozoic
Amphibolite/Hornblende Schist, Quartzite, Quartz schist/Quartz mica schist/mica schist		Unclassified metamorphics	Archean-Paleo Proterozoic

Metamorphic rocks, e.g. granite gneisses and the schistose formations are generally well foliated. Strike of foliation is N70°W to 75°W and is consistent but occasionally may vary to N70°E. The dip of the foliation planes is variable between 50° to 80° and is generally high. They dip either to north or south, as the case may be and are sometimes vertical

4.0. Objective of the proposed exploration program:

Available basic Geoscience data of GSI has been studied and evaluated. Based on the evaluation the present exploration programme has been formulated to fulfil the following objectives:

- To find out the potential zone of Cu-Pb-Zn ore and associated mineralization, if any.

- To carry out geological mapping on 1:12,500 scale and demarcate the rock types of base metal bearing formations with structural features to identify the surface manifestations and lateral disposition of ore body.
- To collect surface samples to analyse them for Cu-Pb-Zn and associated elements/minerals and to decide further course of exploration programme.

5.0 Justification:

Preliminary geological work has been carried out by GSI in and the around areas of the proposed block boundary under the Topo Sheet 72L/3. The details are given below.

FSP Year	Commodity/Work	Position w.r.t. proposed block	Area Covered
Completed work of GSI			
1963-64	Copper, Lead and Zinc mineralisation (G4)	East	Baramasia area, Giridih District
1983-84	Airborne electromagnetic anomalies and associated magnetic features		72L03,04,07 & 11
1987-88	Test drilling for sulphide mineralization	East	Mananpur area
2013-14	Regional geochemical Mapping		72L02 (part),03 & 04

- Occurrence of Cerussite in Baramasia area which is located in east of proposed area was reported first by Mallet (La Touche Bibliography of Indian geology & physical geography, 1918).
- Previous exploration works have revealed the presence of old workings and favourable geological setting of sulphide mineralization around Mananpur, Giridih District, these old workings located over enclaves of Calc silicate and Actinolite Tremolite rock within gneissic complex are oriented E-W.
- Test Drilling in the Manapur area which is present in east of proposed area has indicated encouraging sulphide mineralization but nature of occurrence of mineralization and host rock is highly discontinuous. In the Report of GSI on "Test

Drilling for Sulphide mineralization in Manapur Area” published in 1990 further drilling is recommended in the area.

- During the regional geochemical mapping of the Toposhhet no 72L/2,3 & 4 anomalous value for Zinc 526ppm,1030ppm,659ppm,531ppm & 477ppm have been observed in proposed area. The crustal abundance of Zinc is about 70ppm and background value of the Zinc in the area during geochemical mapping has been observed around 70ppm which shows good correlation with crustal abundance value of Zn.

The above facts signify that the proposed area has potential for Copper-Lead-Zinc occurrence and may have a good prospect to be explored further for up-gradation to G-3 level.

6.0 Proposed scheme of Exploration:

The Govt. of India enacted the MMDR Amendment Act-2015 duly introducing the system of auction for allocation of Mineral Concessions. In view of the MMDR Amendment Act-2015, Minerals (Evidence of Mineral Contents) Rule-2015 and Mineral Auction Rule-2015, Ministry of Mines, Government of India has directed State Governments for exploration through NMET funding to facilitate the auctioning of blocks. Accordingly, to expedite mineral exploration and make more blocks available for auction through mining lease or composite license, on request of CMPDI, Directorate of Mines and Geology.

Accordingly, the following scheme of exploration is formulated in order to achieve the objective. The details of different activities to be carried out are presented in subsequent paragraphs.

6.1 Geological mapping:

Geological Mapping will be done in the total area of 120 Sq. Km. on 1:12,500 scale. Rock types, their contact, structural features will be mapped. Surface manifestations of the ore bodies available along with their surface disposition will be marked on map. Surface samples of various litho-units for petrological studies and from ore bodies with accessory minerals will be taken during the course of geological mapping.

6.2 Geochemical Sampling

Surface sampling (Bed Rock Samples/Soil Samples/Stream Sediments)

During the course of Geological mapping the Bed rock shall be collected from the out crops. A total of 120 no's bed rock samples shall be collected, prepared and analyzed. 60 number each of Soil samples & stream Sediment samples are proposed to be collected & analyzed during course of exploration.

6.3 Surveying:

Survey party will be associated with Bed rock sample collection by taking up the points and plotting its location on map for proper interpretation of the sample data. Survey party will also be associated with Geological Mapping. Rock types, their contact, structural features etc. will be observed during Geological mapping and the Litho-contacts will be plotted for finalization of Geological map on 1:12,500 scale.

6.4 Trenching/Pitting:

Since most of the block is expected to be under cover of soil cover. Thus to expose the underneath rock type for understanding and collection of suitable samples, 100 Cu.M of Pitting/Trenching may be required.

6.5 Chemical Analysis:

Samples collected (BRS, Soil Samples, Stream sediment samples & PTS) shall be subjected to analysis for five radicals (Zn, CU, Pb, Cr & Ni) to check their variation in chemical composition. Few samples are also proposes for Fire assay in order to check occurrence of Gold. ICPMS study shall also be carried out for few samples for trace elements.

6.6 Petrological & Minerographic study Studies:

During the course of Geological mapping, 10 samples from various litho-units from surface will be studied for petrography and 10 samples from mineralized zones will be studied for the ore mineral assemblages and their distribution, alteration, enrichment etc in polished sections. 5 sample have been proposed for SEM & EPMA studies.

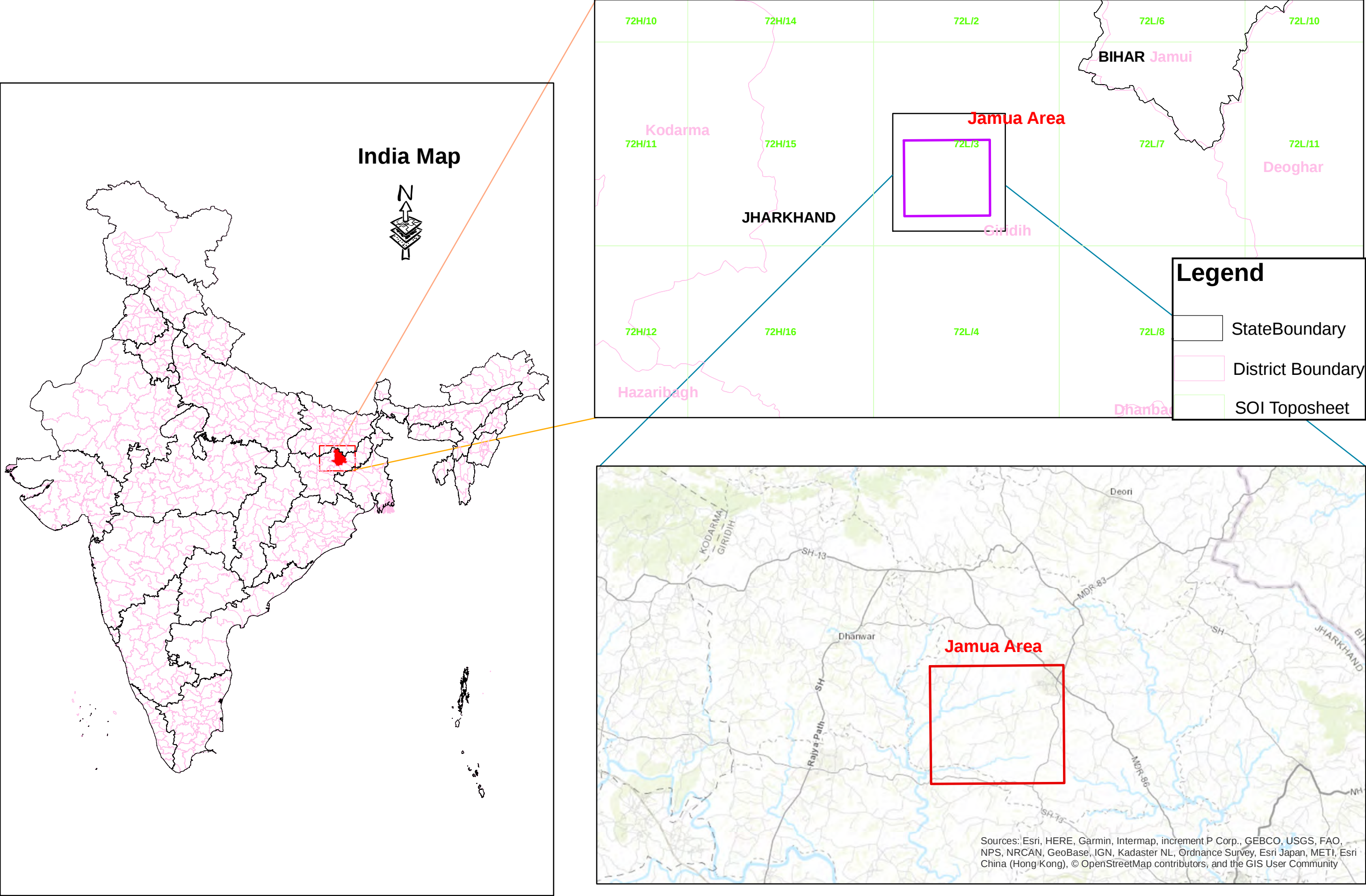
Proposed Quantum of Works

Sl no.		Particularas	Unit	Proposed Quantity
1		Geological Mapping (on 1:12,500 Scale).	Sq. Km	120
2		Trenching and Pitting		
		Trenches/Pit	Cu.Meter	100
3		Sample Preparation and Laboratory Studies		
	A.	BRS samples		
	i.	Chemical analysis For Five Radicals (Cu,Pb,Zn,Cr & Ni)	No	120
	ii.	Internal Check samples (5% of Primary samples)	No	6
	iii.	External Check samples (10% of Primary samples)	No	12
	iv.	Fire Assay For Gold	No	10
	v.	ICPMS for Trace Elements/REE	No	10
	B.	Soil Sample		
	i.	Chemical analysis For Five Radicals (Cu,Pb,Zn,Cr & Ni)	No	60
	ii.	Internal Check samples (5% of Primary samples)	No	3
	iii.	External Check samples (10% of Primary samples)	No	6
	iv.	Fire Assay For Gold	No	5
	v.	ICPMS for Trace Elements/REE	No	10
	C.	Stream Sediment		
	i.	Chemical analysis For Five Radicals (Cu,Pb,Zn,Cr & Ni)	No	60
	ii.	Internal Check samples (5% of Primary samples)	No	3
	iii.	External Check samples (10% of Primary samples)	No	6
	iv.	Fire Assay For Gold	No	5
	v.	ICPMS for Trace Elements/REE	No	10
	D	Pit/Trench Samples		
	i.	Chemical analysis For Five Radicals (Cu,Pb,Zn,Cr & Ni)	No	100
	ii.	Internal Check samples (5% of Primary samples)	No	5
	iii.	External Check samples (10% of Primary samples)	No	10
	iv.	Fire Assay For Gold	No	10
	v.	ICPMS for Trace Elements/REE	No	10
4		Petrographic Studies		
	A.	Preparation of Thin Section	No	10
	B.	Study of Thin Section	No	10
5		Mineragraphic Studies		
	A.	Preparation of Polished Section	No	10
	B.	Study of Polished Section	No	10
6		SEM/EDX	No	5
7		EPMA	No	5
8		Geological Report Preparation	No	1
9		Exploration Scheme Preparation	No	1

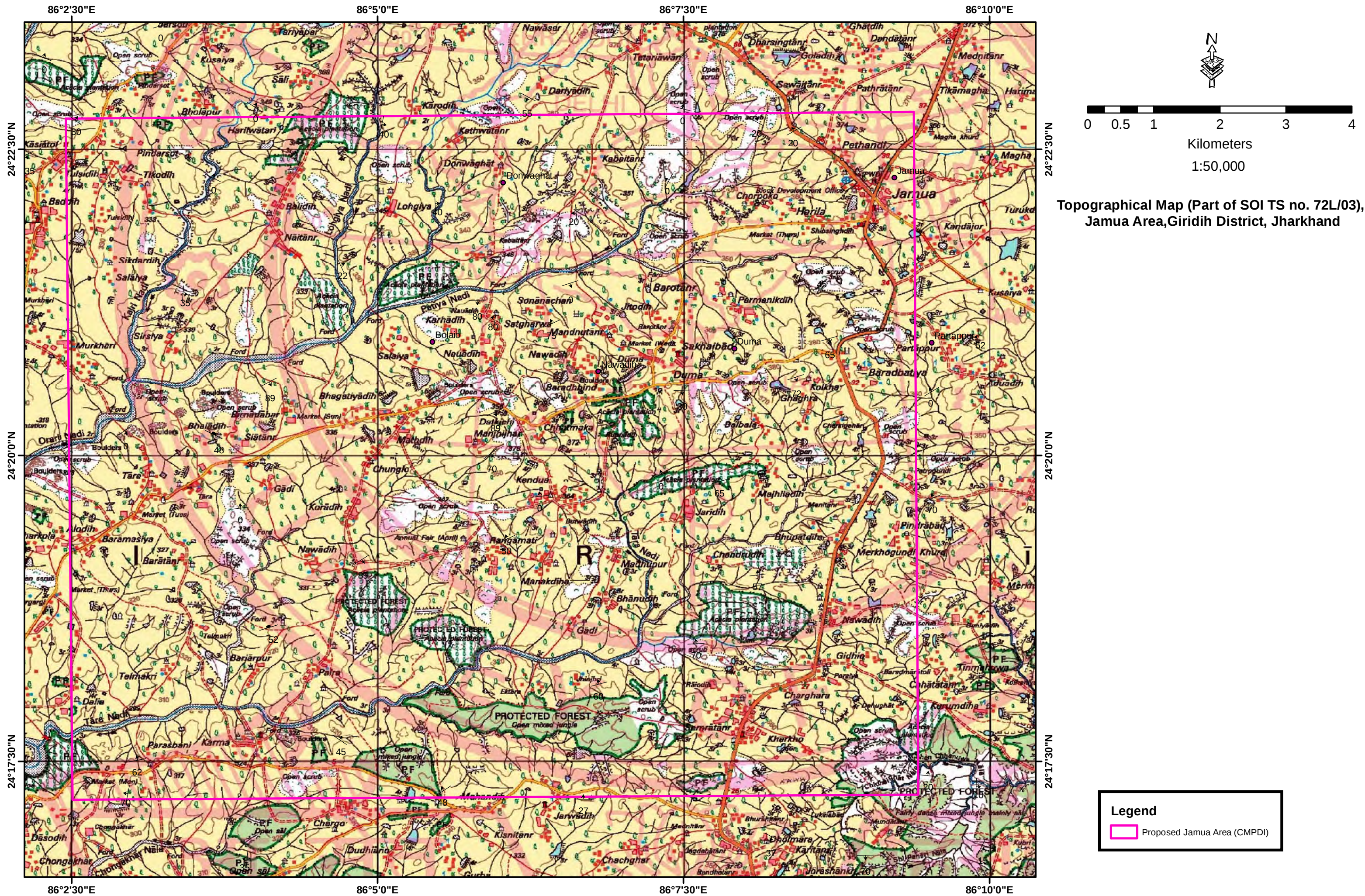
Plates:

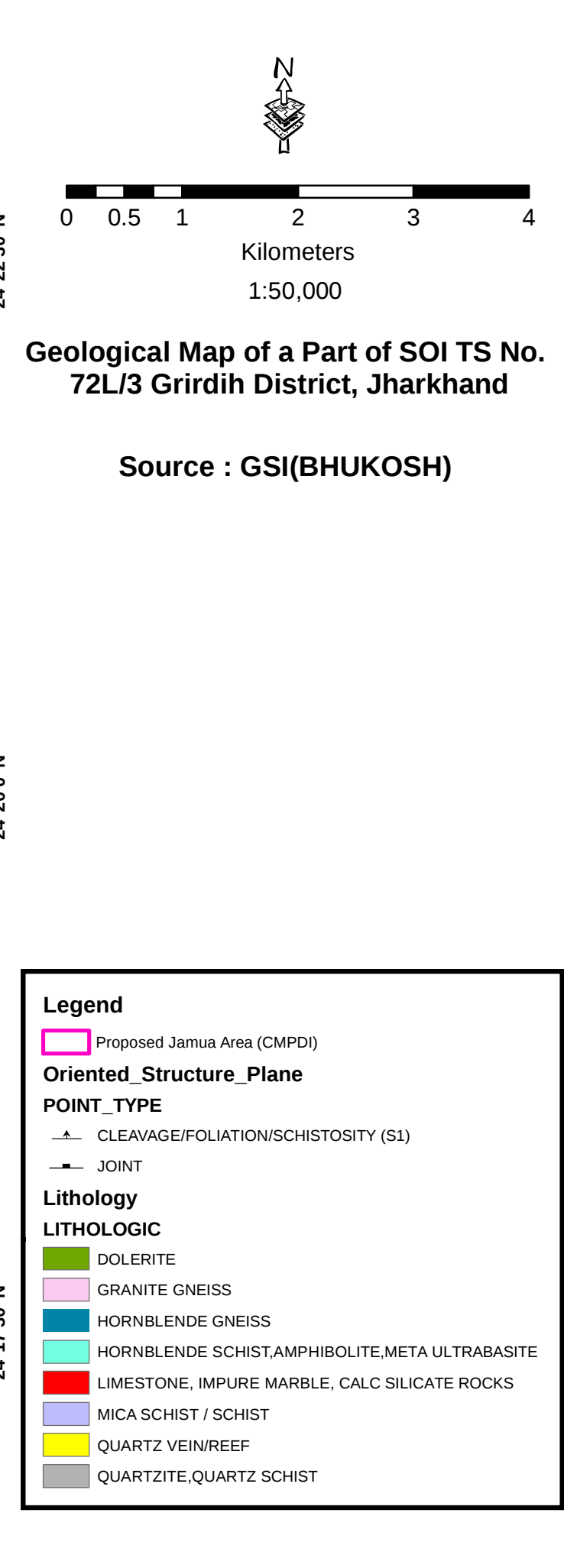
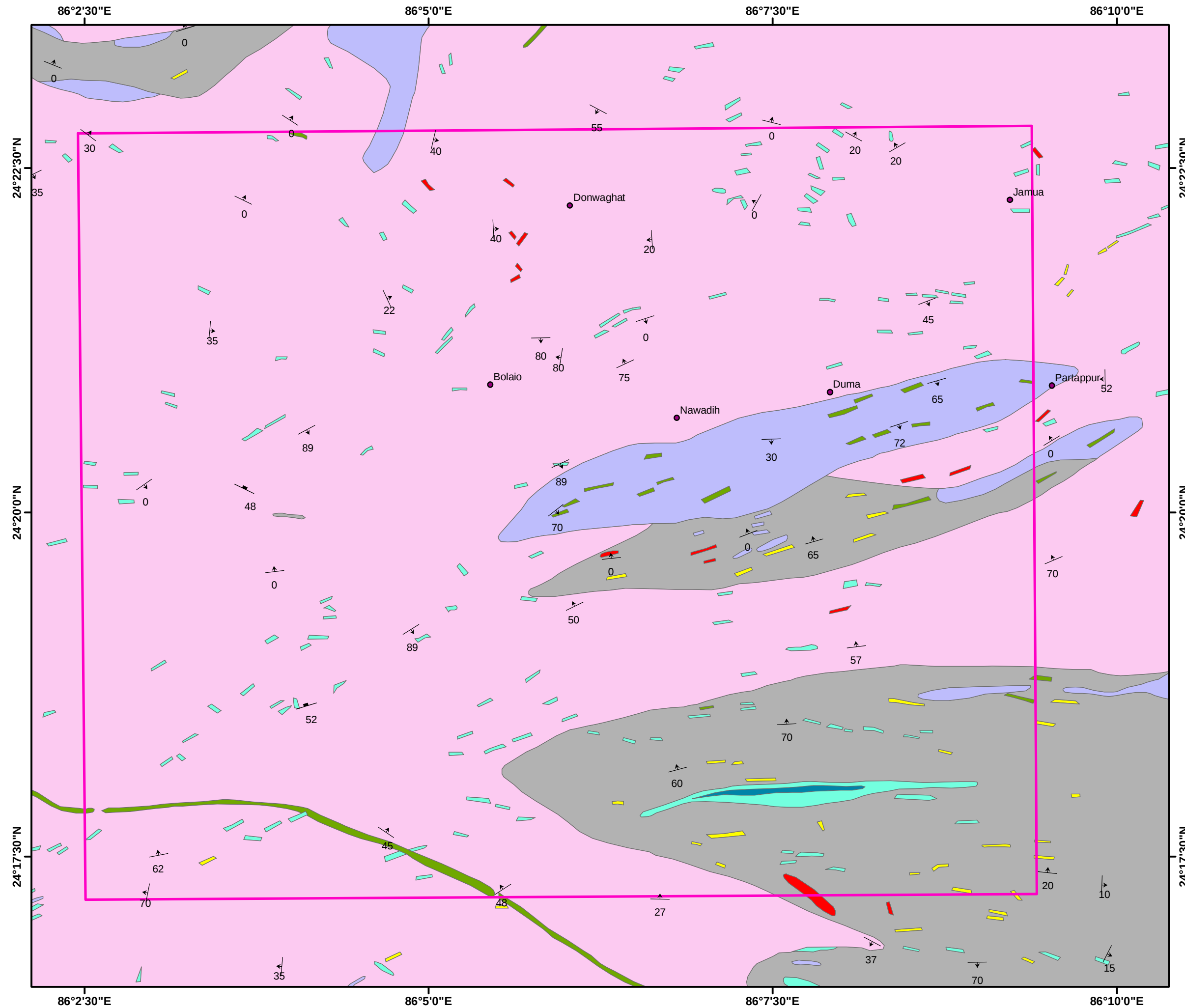
1. Location Map
2. Topographical Map
3. Geological Map (1:50000)
4. Exploration Status Map

Location Map, Jamua Area, District ; Giridih,Jharkhand

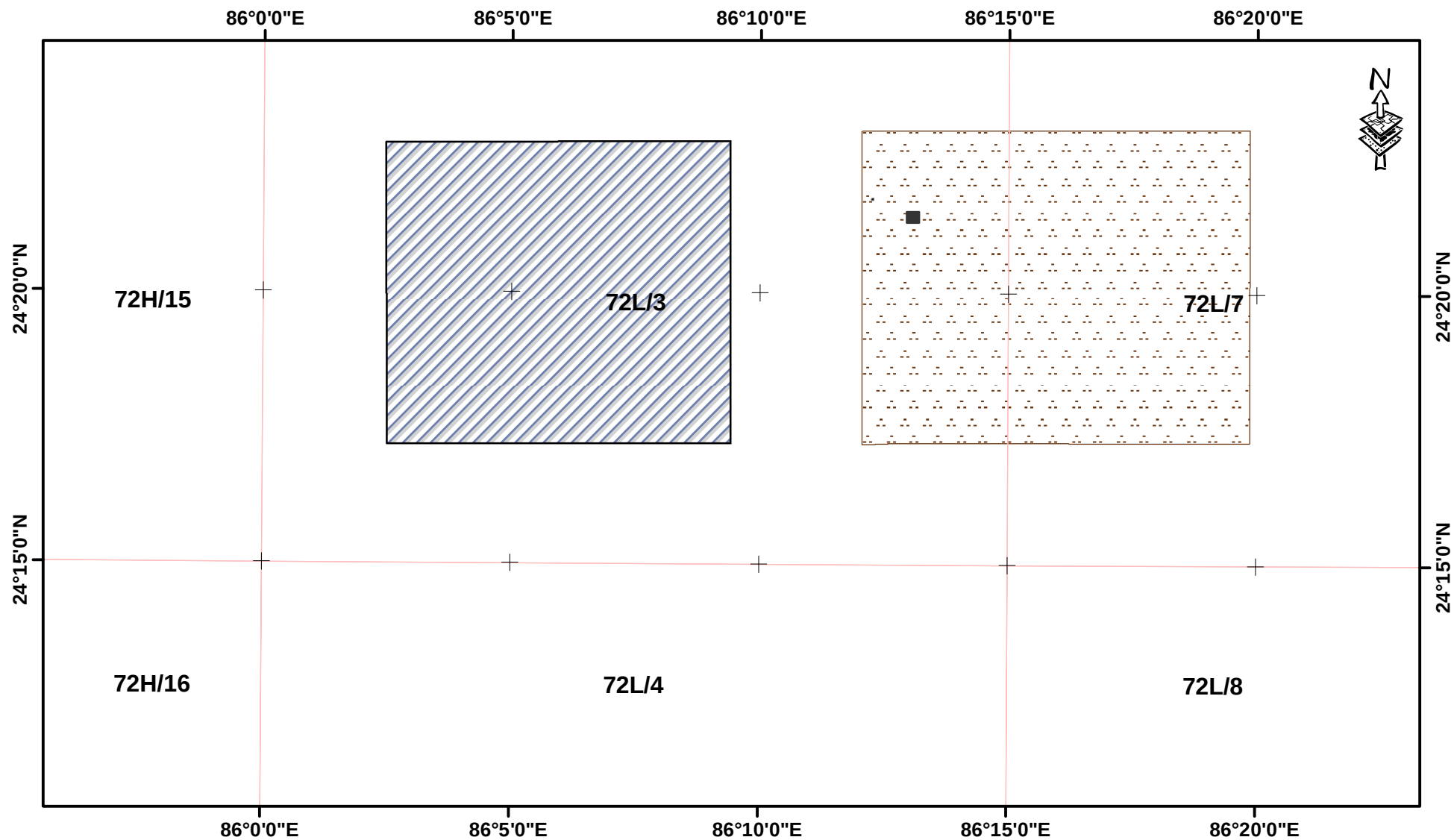


All Maps Not to Scale





Exploration Status of Jamua Area, Giridih District, Jharkhand Proposed by CMPDI for Exploration of Base metals



- Toposheet_no
- A report on test drilling for sulphide mineralization, Mananpur Area, Giridih District Bihar, TS No. 72L/3, GSI, FS:1987-88
- A NOTE ON THE PRELIMINARY INVESTIGATION FOR COPPER, LEAD, ZINC IN THE BARAMASIA AREA, HAZARIBAGH DISTRICT, BIHAR, GSI, FS:1963-64
- Jamua Area Proposed BY CMPDI

Project Cost Estimate for Reconnaissance Survey (G4) for Zince & associated minerals in Jamua area, Giridih District, Jharkhand (Total Block area 120 sq.km (approx); completion time- 12 months)

Sl. No	Item Work	Item no in SoC	Unit	Rates as per SoC of NMET	Qty.	Total
						Amount (Rs) In Lakh
A	GEOLOGICAL WORK					
1a	Geological Party days (1 party) Field	1.2	Day	11000	200	2200000
1b	Geological Party days (1 party)HQ	1.2	Day	9000	90	810000
1c	4 labours/ party (Rs 477/day/labour), As per rates of Central labour Commission)	5.7	Day	1908	200	381600
	Sub Total A					3391600
B	Sampling					
2a	Sampling - 1 sampler without Labour	1.5.2	Day	5100	150	765000
2b	4 labours/ party (Rs 477/day/labour), As per rates of Central labour Commission)	5.7	Day	1908	40	76320
	Sub Total B					841320
C	SURVEY WORK					
3a	Survey Party days (1 party) without Labour for contouring of mineralized zone	1.6.1a	Day	8300	60	498000
3b	4 labours/ party (Rs 477/day/labour), As per rates of Central labour Commission	5.7	Day	1908	30	57240
3c	Fixation of block boundary by DGPS	1.6.2	Per point	19200	10	192000
	Sub Total C					747240
D	PITTING- TRENCHING					
4a	Pitting (1mx 1m x1m)- 50 no	2.1.2	Cu m	3800	50	190000
4b	Trenching (1mx 1m x5m)- 10 no	2.1.1	Cu m	3330	50	166500
	Sub Total D					356500
E	Laboratory Studies					
	Chemical Analysis/ ICPS Studies					
I	BRS Samples					
7a	Primary Sample for 5 radicals (Cu, Pb, Zn, Cr & Ni)	4.1.7a	Per sample	2506	120	300720
7b	Internal (5%) & External (10%) Check samples of 5 radicals	4.1.7a	Per sample	2506	8	20048
7c	Analysis of Gold by Fire assay	4.1.5a	Per sample	2380	10	23800
7cd	ICP-MS studies for REE (34 element)- i.e. (Mn, Co REE etc)	4.1.14	Per sample	7731	10	77310
II	Pit/Trench Sample					
7d	Primary Sample for 5 radicals (Cu, Pb, Zn, Cr & Ni)	4.1.7a	Per sample	2506	60	150360
7e	Internal (5%) & External (10%) Check samples of 5 radicals	4.1.7a	Per sample	2506	9	22554
7f	Analysis of Gold by Fire assay	4.1.5a	Per sample	2380	5	11900
7g	ICP-MS studies for REE (34 element)- i.e. (Mn, Co REE etc)	4.1.14	Per sample	7731	10	77310
IV	Stream Sediment					
7h	Primary Sample for 5 radicals (Cu, Pb, Zn, Cr & Ni)	4.1.7a	Per sample	2506	60	150360
7i	Internal (5%) & External (10%) Check samples of 5 radicals	4.1.7a	Per sample	2506	9	22554
7j	Analysis of Gold by Fire assay	4.1.5a	Per sample	2380	5	11900
7k	ICP-MS studies for REE (34 element)- i.e. (Mn, Co REE etc)	4.1.14	Per sample	7731	10	77310
IV	Soil/Regolith					
7l	Primary Sample for 5 radicals (Cu, Pb, Zn, Cr & Ni)	4.1.7a	Per sample	2506	100	250600
7m	Internal (5%) & External (10%) Check samples of 5 radicals	4.1.7a	Per sample	2506	15	37590
7n	Analysis of Gold by Fire assay	4.1.5a	Per sample	2380	10	23800
7o	ICP-MS studies for REE (34 element)- i.e. (Mn, Co REE etc)	4.1.14	Per sample	7731	10	77310
	Sub Total E					1335426
F	Physical & Petrological Studies					
8a	Preparation of thin section	4.3.1	per sample	2353	10	23530
8b	Complete Petrographic studies	4.3.4	per sample	4232	10	42320
8c	Preparation of polished section	4.3.2	per sample	1549	10	15490
8d	Complete mineragrapic study report	4.3.4	per sample	4232	10	42320
8e	SEM Studies	4.4.2	Per hour	2940	5	14700
8f	EPMA Studies	4.4.1	Per hour	8540	5	42700
	Sub Total F					181060
G	Miscellaneous Charges					
9a	Preparation of Exploration Proposal (2% of approved Project cost or 3.8 lakh whichever is lower)	5.1	lump sum	380000	1	137263
9b	Geological Report Preparation (1.5 lakh or 5% of total work value whichever is more)	5.2			1	350020
9c	Peer Review Charges			10000	1	10000
	Sub Total G					497283
	Sub Total (A+B+C+D+E+F+G)					7350429
	GST (@18%)					1323077
	Grand Total					8673507

1) Minimum Wages of Unskilled Labour @Rs 477/- as per Central Labour Commission as per notification dated 28.9.22
2) Rs 10000/- for Peer review is budgeted rate.

Time Schedule/ for Reconnaissance Survey (G4) , Jmau Giridih District , Jharkhand																
S. No	Activities														Remarks	
		Months	1	2	3	4	5	6	7	8	9	10	11	12		
1	Mobilising	Months	↔												1 months	
2	Geologist Party days, Field (1 Party)	Days		←-----→											200 Days	
3	Survey Party days (1 Party)	Days						←-----→							60 Days	
4	Sampling (1Party)	Days			←-----→										150 Days	
5	Laboratory Studies	Nos.							←-----→						340 sample	
6	Geologist Party days, HQ (1 Party)	Days									←-----→				90 Days	
7	Report Writing & Peer Review	Months										←-----→			3 Months	

Note: Please add activities accordingly and timeline (months)

Total Time Period of Completion of Project- 12 months from Sanction of Project