

[Translation]

Introduction of Bhagalpur-Delhi-Model Train

432. SHRI JAGDAMBI PRASAD YADAV : Will the Minister of RAILWAYS be pleased to state :

(a) the reasons for not introducing Bhagalpur-Delhi Model train, which was already included in Railway Time Table, and the time by which it is likely to be introduced;

(b) the reasons for not introducing Bhagalpur-Patna inter-city Express which was announced earlier and the time by which it is likely to be introduced; and

(c) the reasons for not providing stoppage of inter-city Express at Bariyarpur where all the trains including Vikramshila and Bhagalpur-Muzaffarpur train stop ?

THE MINISTER OF RAILWAYS (SHRI RAM VILAS PASWAN) : (a) and (b) There is no proposal at present to introduce a train between Bhagalpur and Delhi or between Bhagalpur and Patna and no such trains were announced or included in the new time Table w.e.f. August, 1997.

(c) Stoppage of 3419/3420 Bhagalpur-Muzaffarpur intercity Express has been provided at Bariyarpur w.e.f. 1.8.97.

[English]

Action Plan of GSI

433. SHRI ANNASAHIB M.K. PATIL : Will the Minister of MINES be pleased to state :

(a) whether the Geological Survey of India has drawn out any plan of action for 1997-98/Ninth Plan within the ambit of restructured strategies and priorities as demanded by the process of globalisation and liberalisation;

(b) if so, the details thereof, region-wise;

(c) requirement of funds for various activities proposed to be undertaken-including modernisation of equipment and machinery to carry out minerals exploration of critical minerals and R & D programme relating to environmental and geotechnical activities; and

(d) the details of the programmes proposed during 1997-98 State-wise in general and particular for Maharashtra State ?

THE MINISTER OF STEEL AND MINISTER OF MINES (SHRI BIRENDRA PRASAD BAISHYA) : (a) and (b) Yes, Sir. Schemes-wise physical targets of work programmes of Geological Survey of India for the Ninth Plan and operational year 1997-98 (w.e.f. 1.10.97 to 30.9.98) with details of the States/regions for each programme are given in the attached Statement-I and -II respectively.

(c) Ninth Plan outlay of geological Survey of India is Rs.1381.95 crores out of which Rs.936.95 crores is for capital replacement and modernisation efforts, and the balance Rs.445 crores for the operations.

(d) The details of the programmes proposed during operational year 1997-98 with name of the States/regions for each programme are indicated in Statement-II referred to in reply to parts (a) and (b) above. The details of the field season programmes for the State of Maharashtra for the operational year 1997-98 are given in Statement-III.

Statement-I

Scheme-wise physical Target for the IX Plan period

Scheme		Activity & Target
1	2	3
I. MINERAL EXPLORATION		
A. Non-Coal Minerals/Metals		
1.	Basemetals Programme-45 Investigations in Rajasthan, Gujarat Karnataka, Bihar, Orissa, W. Bengal, Madhya Pradesh, J & K, Maharashtra, Arunachal, Meghalaya, Himachal Pradesh, Sikkim, Uttar Pradesh & Andhra Pradesh.	LSM-10,000 sq. km. DM-110 sq. km. Drilling—85,600 m. GCS-40,000 nos. GPS-1200 l.km. PT-2,000 cu.m.
2.	Gold Programme -55 Investigation in Andhra Pradesh, Karnataka, Tamila Nadu, Kerala, Bihar, Orissa, Madhya Pradesh, Maharashtra, Rajasthan & West Bengal.	LSM-18,000 sq.km. DM-134 sq.km. Drilling-1,70,000 m. GCS-79,000 nos. GPS-1,000 l km. PT-17,000 cu.m.

1	2	3
3.	Tin -Tungsten-Molybdenum Programme-10 Investigations in Tamil Nadu, Sikkim & Himachal Pradesh	LSM-4,000 sq km. DM -15 sq.km. Drilling-12,000 m. GCS 15,000 nos. GPS-200 l km. PT-3,000 cu.m.
4.	Platinum Group of Metal & REE Programme -10 Investigations in Andhra Pradesh, Karnataka, Orissa, Uttar Pradesh, Maharashtra, Manipur, Tamil Nadu, Bihar, Nagaland, Gujarat and J & K .	LSM-9,000 sq km. DM-25 sq km. Drilling-10,000 m GCS-30,000 nos.
5.	Diamond Programme -10 Investigations in Andhra Pradesh, Madhya Pradesh, Orissa & Bihar.	Rec. GM- 28,000 sq km. Drilling- 15,000 m. GCS-27,000 nos. PT-6,000 cu .m.
6.	Metallogenic Studies Programme -6 Investigations (Granite-Greenstone terrains, Ultramafic Complexes, Alkaline Complexes etc.)	LSM-15,000 sq.km. Drilling-6,000 m. GCS.-20,000 nos. GPS-150 sq km.
7.	Fertilizer Minerals -12 Investigations in Bihar, W.Bengal, Rajasthan, Karnataka, Tamil Nadu	LSM-600 sq km. Drilling- 12,000 m. GCS- 9000 nos. PT- 1000 cu.m.
8.	Ferrous Group of Minerals (Iron, Chromite, Manganese etc) -5 Investigations in Orissa, Goa, Madhya Pradesh, Andhra Pradesh, Karnataka .	LSM-6,500 sq .km. DM-100 sq.km. Drilling-35,000 m. GCS-20,000 sq.km. PT -1500 cu.m.
9.	Limestone & Dolomite, & other minerals -10 Investigations in Madhya Pradesh, Meghalaya, Karnataka, Rajasthan, Gujarat, Assam, Andaman.	LSM-10,000 sq.km. DM-30.0 sq.km. Drilling 47,000 m. GCS-16,000 nos. GPS-100 l km.
10.	Dimension Stone -20 Investigations in Andhra Pradesh, Karnataka, Tamil Nadu, Kerala, Maharashtra, Madhya Pradesh, Orissa, West Bengal, Bihar, Rajasthan, Assam, Meghalaya.	Rec/LSM-14,000 sq.km. DM-300 sq.km. Drilling-7000 m. OS-2,500 nos. GPS-2,600 sq.km.
11.	Other minerals (Glass Sand, Clay, Kyanite, Dunite etc.)-8 investigations in Karnataka, Gujarat, Rajasthan, Assam Meghalaya, Pondicherry	LSM-4,000 sq.km. DM-50.0 sq.km. Drilling-3,000 m. plus 500 Auger drilling GCS & OS-1,500 nos. PT-800 cu.m.
N.B. :	LSM- Large Scale Mapping (1:10,000 to 1:25,000) DM- Detailed Mapping (1:1,000 to 1 : 5,000) GCS: Geochemical Sampling PT— Pitting and Trenching	OS- Other Surveys GPS- Geophysical Surveys Rec. -Reconnoitary Surveys

1	2	3
B. Coal and Lignite		
1.	Damodar Valley Coal Basin-3 Projects	Area—382 sq.km. Drilling-52,500 m.
2.	Rajmahal-Birbhum Master Coal Basin-2 Projects	Area-75 sq.km. Drilling-30,000 m.
3.	Mahanadi Valley Coal Basin-5 Projects	Area-397 sq.km. Drilling-75,000 m.
4.	Son Valley Basin-2 Projects	Area-189.5 sq.km. Drilling-52,500 m.
5.	Son Valley Coal Basin-2 Projects	Area-50 sq.km. Drilling-15,000 m.
6.	Godavari Valley Coal Basin-6 Projects	Area-355 sq.km Drilling-97,500 m.
7.	East & West Coast Lignite Field (Tamil Nadu, Gujarat & Kerala)-4 Projects	Area-60.70 sq.km Drilling-45,000 m.
8.	Basin Studies in selected coal & lignite coalfields & their extensions-4 Projects	Drilling-7,500 m.
II. SYSTEMATIC GEOLOGICAL MAPPING		
1.	North Eastern India	55,579 km.
2.	Northern & Western Himalaya	6,370 km.
3.	Sikkim Himalaya	600 sq.km.
4.	Quaternary Terrains	11,264 sq.
III. SPECIALISED THEMATIC MAPPING		
1.	Granite/Granulite high grade Metasedimentar terrains	
2.	Granite greens tone -older metamorphic terrains	
3.	Proterozoic supracrustals, platform covers rift basins	
4.	Meascrocic-Cenozoic Mobile Belts	
5.	Geomorphic/Quaternary studies/nootectonics laterites	51,480 sq.km.
6.	High resolution biostratigraphic and sedimentary facies studies of basinal areas.	
7.	Critical studies on volcanics and igneous suites	
8.	Structural modelling and studies on basement configuration and crustal units	
9.	Palaeomagnetic studies.	
IV. GEOCHEMICAL MAPPING		
	In the Indian Peninsular Region barring the Deccan trap:	20,000 sq.km.
(a)	reconnaissance stage geochemical mapping stream sediment sampling (500 m interval)	5,000 sq. km.
(b)	Follow up survey by soil sampling : 200x200 m grid.	1,000 sq.km.
(c)	Detailed follow up survey by soil sampling 200x200 m grid.	

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V. DEVELOPMENT OF VILLAGE ECONOMY THROUGH RESOURCE APPRAISAL

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|---|--|
| (a) Appraisal of mineral resource potential at village level on cadastral map base. | 1400 villages of North-eastern states. |
| (b) Drilling (using low capacity drills) | 21,000 m. |

VI. AIRBORNE SURVEYS

A. Multi Sensor Surveys for mineral targetting by Twin Otter Airborne Survey System (TOASS)

- | | |
|---|----------------|
| 1. Northern margin of the Vindhyan adjoining Bundelkhand granites for Mimerberlite pipes. | 86,150 sq. km. |
| 2. Hutti Muski schist belt extending upto Sindhanur for auriferous zone in soil covered area | 35000 sq.km. |
| 3. Greenstone & Kimberlitic belt in A.P. for gold basemetal & Diamond | 13,500 sq.km |
| 4. Other schist belts in Karimnagar dt. A.P. | 21,650 sq.km |
| 5. Chepan-Renukoot-Dudhi Wyndhanganj area U.P. for tin, tungsten etc. | 1500 sq.km |
| 6. Banda-Hamirpur-Jhansi & Lalitpur dt. U.P. for basemetals, noble metals, tin tungsten & rare earths | 8000 sq.km |
| 7. Tons valley for basemetals in dolomite-shale horizon | 15,000 sq.km |
| 8. Chelthi -Nainital area for basemetal & gold | 2000 sq.km. |
| 9. Tyrsad-Barapani Shear zone, Meghalaya for configuration of shear zone & gold | 2000 sq.km. |
| 10. Dudhoni-Rongiong lineament zone Meghalaya | 1200 sq.km |
| 11. Umpyrtha-Rajapera Area, Meghalaya | 800 sq.km. |
| 12. Western & Central part of Arunachal Pradesh | 1000 sq.km. |
| 13. territorial zone along East & West Coast of India | 16,000 sq.km. |

B. Heliborne Aerogeophysical Survey

- | | |
|--|---|
| 1. Himalayan area, Eastern and Western Ghats, North Eastern States, Vindhyan and Satpura Range | 84190 sq.km.(below 2300 M. altitude)
1210 sq.km. (above 2300 m altitude) |
| 2. The other areas identified includes: | |
| (i) Mallapuram of Wynad dt. Kerala for gold | |
| (ii) Attapadi-Palghat dts. Kerala for tungsten | |
| (iii) Trivandrum dt., Kerala for tungsten | |
| (iv) Ambelavayalian Wynad dt., Kerala for molybdenum. | |
| (v) Chengannur in Allepy dt. Kerala for Molybdenum; | |

C. Multisensor Aerogeophysical Survey (MAS) 48,480 sq.km.

D. Regional Aeromaganetic survey in Collaboration with NRSA/NGRI- Processing of data

E. Ground evaluation of Aerogeophysical anomalies

F. Indian Magnetic Map (INDMAGAP) to prepare a consolidated magnetic map of Indian Subcontinent based on available areomagnetic data base

VII. MARINE SURVEY

A. Seabed Survey within EEZ/extended limit of continental shelf upto 350 n.milies from shore

Seabed Survey Indian Ocean around Carlsberg Ridge 218,000 sq.km.

<u>1</u>	<u>2</u>	<u>3</u>
	Survey for preparation of special charts under research project	
	Detailed mapping of continental shelf and slope in parts of Bay of Bengal.	45,000 sq.km.
	Survey for demarcation of micromanganese nodules in Arabian Sea, Bay of Bengal and Andaman Sea	1,00,000 sq.km.
	Survey to demarcate the outerlimit of continental shelf upto 350 n.miles.	22,00,000 sq.km.
	Bengal Fan Project	11,00,000 sq.km
	(The last tow project will be taken up subject to hiring of vessels by DOD /replacement of R.V.S. Samudramanthan)	
	B. resource evaluation of Seabed within EEZ Geochemical scan of hydrocarbons in the Seabed sediments within EEZ of India in collaboration with ONGC	1,22,000 sq.km.
	Survey of western outer continental shelf and slope to delineate phosphate rich sediments.	30,000 sq.km.
	Survey of the outer continental shelf for the calcereous sediments and heavy mineral concentration zones of Andhra Pradesh, Tamil, Nadu coast.	assessment of 8,000 sq.km.
	Delineation of calcereous sediment zone within EEZ West of Andaman & Nicobar Islands	20,000 sq.km.
	C. Seabed Survey within Territorial water programmes under International Geosphere & Biosphere (IGBP)	
	The mapping of the seabed within territorial waters of Tamil Nadu Coast.	27,000 sq.km.
	The mapping of the seabed within territorial waters of Gujarat, Maharashtra & Karnataka Coast.	15,000 sq.km.
	Resources evaluation within territorial waters Geotechnical Investigation for ports, SBM, jetties, Tidal Energy etc.	
	Biostratigraphy of Quaternary studies of continental shelves of India.	
	Geoenvironment studies in the near coastal area	
	D. Polymetallic Resource Evaluation in Western Basin (Subject to hiring or replacement of Samudra Monthan)	
VIII. GEOTECHNICAL INVESTIGATION		
A. Sponsored schemes		
	1. Water resource development	510 Project years
	2. Communication Projects	200 Project years
	3. Miscellaneous projects	150 Project years
	B. Geotechnical Evaluation of major river basins (3 year project.)	10 river basins
IX. ENVIRONMENTAL GEOLOGY STUDY		
	1. Terrain-specific geoenvironmental apraisal studies	55 projects
	2. Detailed theme oriented geoenvironmental studies	30 projects
	3. Activity specific geoenvironmental impact assessment studies and formulation of geoenvironmental management plan.	15 projects
	4. Studies related to natural geological hazard mitigation.	10 projects
X. ENERGY RESOURCE STUDY (Other than Coal & Lignite)		
	1. Geothermal study (reservoir evolution by deep drilling in Puga, utilisation studies of geothermal fluids and presence of rare alkali metals in geothermal fluids)	3 projects

1	2	3
	2. Glaciological studies for meltwater regimes and assessment	6 projects

XI. GEODATA MANAGEMENT INFORMATION AND GEOINFORMATICS

A. Setting up of Geoscientific Data Centre in GSI, creation of Geoscientific Databases on selected project areas(GSI-BRGM project) and further extension to other priority areas in respect of following subprojects

Bibliographic Databases	
Geoscientific thematic databases	
Digital Map making facilities	7 projects
Extension of Remote sensing facilities	
Multi-Criteria Data Processing	
Centre for study of Ore deposits & Metallogeny (CSOM)	
Computer Systems.	

B. Management Information Systems (GSI MIS) on selected priority norms under the following sub-sets

Manpower Management Information System (MANMIS)	
Financial management information system (FINMIS)	
Support Facility Management Information System (SUFMIS)	5 systems
Project Management information System (PROMIS)	
Equipment Management Information System (EQMIS)	

C. Pilot Projects implementation for different mineral belts in Regional offices

XII. GEOSEISMOLOGY & SEISMOTECTONICS (SEI) 30 Projects

1. Compilation of EQ database etc.
2. Complilation of seismotectonics maps & preparation of atlas.
3. Evaluation of seismotectonic parameters for various area(Khandwa Area, M.P. Deccan Shield, Maharashtra, Kopili valley, NER Talchir Barakar area, ER, Kangra valley- NR/Paleosiesmocity in Baspa valley, HP & Study & geomorphic features for neotectonic faults in outer Himalaya, Bangalore, Ongole-Vijayanagaram area. SR)
4. DST sponsored project on Khandwa: Telemetred seismic cluster for determination of local earthquake in Khandwa area.

XIII. TRAINING

A. Training Scheme in T.I, GSI	92 Courses
(i) Orientation Course	10 Courses
(ii) Basic Course	20 Courses
(iii) Inter disciplinary Course	7 Courses
(iv) Refresher Course	25 Courses
(v) Advance Course	10 Courses
(vi) Computer Course	5 Courses
(vii) Management Course	5 Courses
(viii) Special Course	10 Courses
B. Training Scheme in outside organisations India	245 personnel
(i) Computer application in CMC, NIIT, ISI, RCC etc.	110 personnel
(ii) Rock Mechanics in Roorkee/KGF	10 personnel
(iii) Experimental Petrology in Allahabad University	5 personnel
(iv) Geophysical modelling in NGRI	15 personnel
(v) Management course in IIM, ASCI, LBSAA etc.	100 personnel
(vi) Ore dressing NML, IBM	5 personnel
C. Training Schemes Abroad	270 personnel
(i) Mineral Exploration (Geostatistical Methods for modelling, Predictive metallogeny, Geochemistry, Advanced Geophysical exploration techniques o n ground and borehole Analytical Chemistry for ultralow porecision methods, Drilling techniques.	87 personnel

1	2	3
	(ii) Marine Geology (Geology & Geophysics)	41 personnel
	(iii) Airborne Geophysical Survey (Geophysics & Geology)	15 personnel
	(iv) Geotechnical, Environmental and related studies (Geotechnical, studies, Environmental Geology, Geo-Biosphere studies, Seismotectonic and Residual stress studies, Natural Hazard Management, Glaciology, Geothermal Exploration)	40 personnel
	(v) Advanced Research & Laboratory Studies (Experimental Petrology & Mineralogy, Geochronology & Isotope Geology, Biometric & Quantitative Palaeontology, Computerised Basin Analysis Studies, Geomathematics, Photogeology & Remote Sensing)	27 personnel
	(vi) Advanced Management Training	15 personnel
	(vii) Collation & synthesis of Geoscientific data	45 personnel
XIV. ANTARCTICA		
	Geological studies in XVII, XVIII, XIX, XX and XXI Antarctica Expedition	5,000 sq.km.
XV. DISSEMINATION OF DATA		
	1. Compilation and publication of geological maps	-280 maps.
	(i) All India level geological and other thematic maps and Atlas	
	(ii) Quadrangle geological maps.	
	(iii) Geological & Mineral maps of State & Regions.	
	(iv) District Resource maps.	
	(v) Aerogeophysical maps on different scales	
	(vi) Selected mineral belt maps.	
	(vii) Selected thematic maps.	
	(viii) Extra-Departmental & international maps.	
	2. Publication of geological data collected by GSI Officers as Memoirs, Records, Bulletins, Special Publications etc.	230 publications
XVI. RESEARCH AND DEVELOPMENT		
A. Petrology		
	1. Fluid Inclusion Studies	Development of Laboratory facilities and research.
	2. Experimental petrology studies	—do—
	3. Advanced Electron Probe Micro analytical techniques	—do—
	4. Meteorite and Planetary Geology Studies	—do—
	5. Intraplate mafic-ultramafic magmatism, rift related alkaline and carbonatite rocks, Archean Proterozoic greenstone belt.	—do—
	6. Quantified determination of P-T domains	—do—
	7. Archean-Proterozoic, Gondwana & present day river sediment analysis	—do—
	8. Petrography & chemistry of various Gondwana & Tertiary caol	—do—
	9. Ore petrography related to basemetal manganese, gold, REE and Sn-W deposits.	—do—
B. Palaeontology and Stratigraphy		
	1. Biosratigraphy (Proterozoic, lesses Himalaya, Gondwana, Cretaceous-Tertiary, Tertiary-Quaternary formations, Phanerozoic ophiolite belts etc.	Development of Laboratory facilities and research.

1	2	3
	2. Palynological Studies in the domain of organic remains.	Development of Laboratory facilities research
	3. Study on Precambrian life through analysis of geolipid and kerogen fractions of sediments	—do—
	4. High Resolution Stratigraphy	—do—
	5. Role of microbiota in concentrating iron ore and radioactive mineral.	—do—
	6. Study of dental ultra structure and bone histology of earliest mammals.	—do—
	C. Geochronology and Isotope Geology	
	1. Geochronological Studies on Radiometric Isotopes by (i) Rb-Sr-method (ii) Sm-Nd method (iii) U/Th-Pb method (iv) ³⁹ Ar- ⁴⁰ Ar method (v) Pb-Pb method	—do—
	2. Geochronological studies on Radio-Carbon dating	-do-
	3. Thermoluminescence studies	-do-
	4. Stable Isotope Studies	-do-
	D. Photogeology and Remote Sensing	
	1. Remote sensing application programmes for thematic and inaccessible area mapping	
	2. Special programme for standardisation of interpretation and analysis employing methodologies for study of special signatures on an attribute to various geological features.	
	3. Remote sensing as an aid to mineral investigation, geo-environmental studies and monitoring of hazards.	
	E. Chemical	
	1. Preparation of Standard Reference Material (SRM) of Rocks & Minerals	Research and Development of Laboratory
	2. Orientation for laboratory geochemistry	
	3. Methodology for ppb level determination	
	F. Geophysical	
	1. Simulation and Network Analysis	-do-
	2. EQ/MEQ Study (as part of seismotectonic Programme)	-do-
	3. Improvement in borehole/underground geophysical logging and exploration techniques.	-do-
	4. Production of geophysical maps with superimposition of geology.	-do-
	XVII. COLLABORATION AND ASSISTANCE PROGRAMMES (India & International)	
	1. Collaborative Programmes with CMDA. JNARDDC, ONGC, IBM, Universities and others.	30 Programmes
	2. International Collaborative Programmes like IGCP, Indo-French (BRGM), Indo-US, Indo-China, Indo-Japanes, Indo-Australian Programmes etc.	25 Programmes
	3. Participation in International Scientific bodies like CGMW, SAARC SCAR, ICSU, UNESCO, ESCAP etc.	10 Programmes
	4. Bhutan Scheme under the aegis of the Ministry of External Affairs	1 Programme
	XVII. ESTABLISHMENT OF COMMERCIAL UNITS	
	1. Development of commercial units in Geological Survey of India	
	2. Handling of sponsored Programmes in India and Abroad.	

Statement-II
Scheme-wise Physical target for the operational year 1997-98
(October 1997 to September, 1998)

Scheme	Activity & Target	
I. MINERAL EXPLORATION		
A. Non-Coal Minerals/Metals(112 items)		
1. Basemetal programmes (19 investigations in Rajasthan,U.P.,Madhya Pradesh West Bengal, Bihar, Haryana, Sikkim, A.P. and Tamil Nadu)	TM LSM Rec. DM Drilling PT. GP	325 lkm 470 sq.km. 150 sq.km. 5.2 sq.km. 10,200m. 189 cu.m. 190 lkm.
2. Gold programmes (40 investigations in Andhra Pradesh, Karnataka, Rajasthan, U.P., Maharashtra, Madhya Pradesh, Bihar, Orissa, West Bengal, Assam, Kerala, Himachal Pradesh and J & K.	TM LSM Rec DM Drilling PT GP	245 km. 447 sq.km. 620 sq.km. 10.53 sq.km 29,600 m. 43.54 cu.m. 40 lkm.
3. Tin Tungsten-REE programmes (6 investigation in West Bengal, Haryana, Himachal Pradesh, Tamil Nadu)	TM Rec DM Drilling PT GP	180 km. 300 sq.km. 0.80 sq.km. 400 m. 69 cu.m. 9 lkm.
4. Platinum Group of metal programmes (2 investigations in Orissa and J & K)	DM Drilling	0.5 sq.km. 1000 m.
5. Molybdenum programme (2 investigations in Tamil Nadu)	LSM Drilling	200 sq. km. 800 m.
6. Diamond programme-11 investigations in Madhya Pradesh, Orissa, Andhra Pradesh, Maharashtra and Karnataka.	TM LSM Rec. DM Drilling PT GP	600 sq.km. 100 sq.km. 3500 sq.km 1.8 sq.km. 500 m. 655 cku.m. 315 lkm.
7. Ferrous Group of minerals (8 investigations in Maharashtra & Orissa)	LSM Rec. DM Drilling PT	180 sq.km. 5 sq.km. 8 sq.km 3600 m. 225 cu.m
8. Limestone, dolomite, dimensiona stones & other minerals (25 investigations in Maharashtra, Madhya Pradesh, West Bengal, Bihar, Orissa, Arunachal Pradesh, Meghalaya, U.P. , Andhra Pradesh, Tamilnadu, Kerala and Rajasthan)	TM LSM Rec. DM Drilling PT	785 lkm. 4283 sq.km. 6800 sq.km. 9.6 sq.km 1400 m. 615 cu.m.

1	2
B. Coal and Lignite - 44 Projects	
1. Damodar Valley Coal Basin (7 Projects)	Drilling 7700 m.
2. Rajmahal-Birbhum Master Coal Basin (4 Projects)	LSM 2.0 sq.km Drilling 4400 m.
3. Mahandi Valley Coal Basin, Orissa (4 Projects)	LSM 8. sq.km. Drilling 6,600 m.
4. Mahanadi Valley Coal Basin, M.P. (4 Projects)	LSM 7.0 sq.km. Drilling 4400 km.
5. Son Valley basin, M.P. (4 Projects)	LSM 10 sq.km. Drilling 4400 m.
6. Son Valley Coalfield, M.P. (5 Projects)	Drilling 4400 m. GP 1200 lkm.
7. Wardha and Tawa Valley Coal Basin, Maharashtra (4 Projects)	LSM 70 sq.km. Drilling 4,400 m.
8. Godavari Valley Coal Basin, A.P. (Southern sub basin) (6 Projects)	LSM 30 sq.km. Drilling 10,000 m.
9. Lignite field, Tamil Nadu, Gujarat, and Rajasthan (6 Projects)	REC 150 sq.km. Drilling 7500 m. LSM 13.5 sq.km.
II. SYSTEMATIC GEOLOGICAL MAPPING	
1. North Eastern India	3484 sq.km
2. Northern & Western Himalaya	1885 sq.km
III. SPECIALISED THEMATIC MAPPING	
(39 investigations in Madhya Pradesh, Maharashtra, West Bengal, Bihar, Orissa, U.P., Haryana, Himachal Pradesh, Andhra Pradesh, Karnataka, Tamil Nadu, Rajasthan and Gujrat) on various theme as follows:	7490 sq.km.
1. Granite/Granulite high grade metasedimentary Terrains.	
2. Granite-greenstone-older metamorphic terrains.	
3. Proterozoic supracrustals, platform covers, rift basins.	
4. Mesozoic-Cenozoic mobile belts.	
5. Geomorphic/Quaternary studies/geotectonics/laterites.	
6. High resolution biostratigraphic and sedimentary facies studies of crustal areas.	
7. Critical studies on volcanics and igneous suites.	
8. Structural modelling and studies on basement configuration and crustal units.	
9. Palaeomagnetic studies.	
10. Establishment of stratigraphy.	
11. Study of wave dynamics and beach muprphology	
IV. AIRBORNE SURVEYS	
(a) Multisensor Airborne Geophysical surveys over parts of M.P., Orissa and Bihar to locate kimberlite pipe zones and identify areas for mineral targetting.	20,000 Lkm.(in 10,000 sq.km.)
(b) Ground evaluation of aerogeophysical anomalies, ground prospecting & exploration.	REC 4000 sq.km. TM 19 Lkm. LSM 9 sq.km. DM 2.3 sq.km. Drilling 4000 m. PT 66 cu.m. GP 1.5 sq.km.

1	2
V. MARINE SURVEY	
1. (a) Geochemical scan for hydrocarbons of Kutch in Arabian Sea by Samudra Manthan.	4200 sq.km.
(b) Sea bed survey in Andaman sea by Samudra Manthan.	19,500 sq.km.
(c) Sea bed mapping within territorial waters of Andhra Pradesh and Tamilnadu by Samudra Kaustubh.	1000 sq.km.
(d) Sea bed mapping within the Territorial Waters of Ganga delta by Samudra Kaustubh	
(e) Sea bed mapping within the territorial water of Kerala and Karnataka coast by Samudra Saudhikama.	1000 sq.km.
(f) Sea bed mapping within the territorial water of Gujarat coast by Samudra Saudhikama.	400 sq.km.
2. Mineral Investigation (4 items) and appraisal-with all three vessels and also mechanised boats.	3292 sq.km
3. Geotechnical investigations (8 items) with Samudra Kaustubh & Saudhikama.)	1285 sq.km
4. Geo-environmental evaluation & (2 items) with Samudra Saudhikama & mechanised boats.	
5. Laboratory Researches (11 items.)	
VI. DOVEMAP- (3 Programmes) Development of village economy through resource appraisal (i) Assam-200 villages (ii) Tripura-60 villages (iii) Meghalaya-40 villages	Villages-300 Drilling 5200 m.
VII. GEOTECHNICAL INVESTIGATION-29 (247 Projects) 1. Water resource development 2. Communication projects 3. Miscellaneous projects	23(237 Projects) 5(9 Projects) 1 (1 Projects)
VIII. GEOSEISMOLOGY & SEISMOTECTONICS -(20 programmes) (a) Preparation of sensmotectonic Atlas of India (b) Palaeoseismic studies (c) Neotectonic & seismotectonic Studies (d) Seismic hazards (e) Study of radon diskpersion	PRS.INT.MAP 2050 sq.km. REC 500 sq.km. GP 10,030 sq.km. TM 350 Lkm. MEQ As necessary.
IX. ENVIRONMENTAL GEOLOGY STUDY (43 Projects)	PRS.INT.MAP 37,449 sq.km. Them.Map 73,386 sq.km. LSM 250 sq.km.
1. Environmental impact study (6 items) in Raniganj Coalfield, Manda Industrial Estate, New Nagpur township (Maharashtra), Srisailam dam Andhra Pradesh, etc.	
2. Regional environmental appraisal (32 items e.g. state level, district level and site specific appraisal, drought prone areas of Nawapara (Orissa), Chhotanagpur (Bihar), Mehboobnagar, Andhra Pradesh, Meghalaya state, Calcutta Megacity Project etc.)	
3. Change in geoenvironmental condition in time domain (including study of Palaeoclimate and coastal dynamics)-1 item.	

1

2

4. Natural Hazard Studies (4 items)-Arsenic in groundwater (W.B. & adjoining dists. of Bangladesh, fluorine in ground water (Rajasthan & Haryana landslide in Mizoram, H.P. & U.P. Himalayas, Ravine development in M.P. etc.
- N.B LSM - Large Scale mapping (1:10,000 or 1.25,000)
 DM - Detailed mapping (1:1000 to 1:5000)
 Rec - Reconnaissance mapping
 TM - Traverse mapping
 GP - Geophysical traverse (magnetic/gravity/resistivity)
 PT - Pitting and Trenching
- X. ENERGY RESOURCE STUDY (other than coal & lignite)-5 Projects
- (a) Preparation of heat map and heat flow measurement of Central Region.
 (b) Caesium in thermal springs and drill holes of Puga geothermal field in Lakakh dist. J & K .
 (c) Glaciological studies for melt water regimes and assesment including glacier front fluctuation in Chenab, Goriganga and Dhauliganga basin.
 (d) Studies in 'Glacier melt' solute concentration and suspended sediment variations in glaciers of Spiti & Chandra basins, H.P.
 (e) Assessment of power generation and direct utilisation of potential geothermal fields expored in NR & CR (sponsored by MNES)
 (f) Glacier inventory of Zaskar basin H.P. & Ladakh dist. J & K . (on expedition basis)
- XI. GEODATA MANAGEMENT INFORMATION AND GEOINFORMATICS
- A. Setting up of Geoscientific Data Centre in GSI creation of Geoscientific Databases on selected project areas (GSI- BRGM Project) and further extension to other priority areas in respect of following subprojects-7 Projects**
- Bibliographic Databases
 Geoscientific thermatic databases
 Digital Map making facilities
 Extension of Remote sensing facilities
 Multi-Criteria Data Processing
 Centre for study of Ore deposits & Metallogeny (CSOM)
 Computer Systems
- B. Miscellaneous/Service items**
- *Preparation of computerised inventory of data on type fossils and other registered/fossils in collaboration with Curatorial Division, CHQ.
 *Updation, maintenance and management of earthquake data base.
 Development of application software/creation of data bases/miscellaneous services to user on demand
- XII. TRAINING
- A. Traninig Scheme In T.I. GSI** **25 courses**
- (i) Orientation Course
 (ii) Basic Course
 (iii) Inter disciplinary Course
 (iv) Refresher Course
 (v) Advance Course
 (vi) Computer Course
 (vii) Management Course
 (viii) Special Course
 (ix) Intergrated Course in Photo interpretation, Remote sensing, Digital Image Processing & GIS.
 (x) Marine geosciences programme sponsored by DOD.

1	2
B. Training Scheme in Outside Organisations, India	58 personnel
(i) Computer application in CMC, NIIT, ISI, RCC, etc.	10 Personnel
(ii) Experimental Petrology in Allahabad University	3 Personnel
(iii) Sponsored Training by DST	5 Personnel
(iv) Training in Management by DOPT	40 Personnel
C. Training schemes Abroad	88 Personnel
(i) <i>Mineral Exploration (Exploration Geology, Geophysical exploration, advanced technique in analytical chemistry & drilling)</i>	25 Personnel
(ii) <i>Marine Geology (Geology & Geophysics)</i>	10 Personnel
(iii) <i>Airborne Geophysical Survey (Geophysics & Geology)</i>	10 Personnel
(iv) <i>Geotechnical, environmental and related studies (Geotechnical studies, Environmental Geology, Geo-Biosphere studies, Seismotectonic and Residual stress studies, Natural Hazard Management, Glaciology, Geothermal Exploration)</i>	10 Personnel
(v) <i>Advanced Research & laboratory studies (Experimental Petrology & Mineralogy, Geochronology & Isotope Geology, Biometric & Quantitative Palaeontology, Computerised Basin Analysis Studies, Geomathematics Photogeology & Remote Sensing)</i>	18 Personnel
(vi) <i>Advanced Management Training</i>	5 Personnel
(vii) <i>Collation & synthesis of geoscientific data</i>	20 Personnel
XIII. ANTARCTICA	
Geological studies in XVI Antarctica Expedition	1,000 sq.km.
XIV. DISSEMINATION OF INFORMATION	
A. Map compilation and printing	
(a) <i>National Series:</i>	
(i) Geological, Mineral and other thematic maps/Atlases of India on 1:2.1M & 1:5M Scale.	
(ii) Geological & Mineral maps of States & Regions on 1:2M, 1:1M & 1:0.5M scale.	
(iii) Geological quadrangle maps on 1:250,000 scale.	
(iv) District resource maps on 1:250,000 scale.	
(v) Geological maps of coalfields.	
(vi) Sea bed sediment maps.	
(vii) Extra-Departmental and International maps.	
(viii) Mineral belt maps on 1:50,000	
(ix) Aerogeophysical maps on different scale	
(x) Selected thematic maps on 1:25,000 scale	
(b) <i>International Series:</i>	
(i) Geological Map of world (2nd ed. 1:5M) India and adjacent countries.	
(ii) Tectonic Map of Asia (1:75M)	
(iii) Mineral Atlas of the world (1:10M)-Compilation and synthesis of mineral commodity data of India.	
B. Publication & Information:	
Publication of books/ monographs/Journals/memoirs, records/bulletins/special publication etc.	
XV. RESEARCH & DEVELOPMENT	
A. Petrology	
(a) Development of laboratory facilities for research.	
(b) Studies of mafic-ultramafic rocks of contact zone of Iron ore Group and eastern Ghat rocks in parts of Sambalpur-Dhekana-Kalahandi dts., Orissa, Sung Valley alkaline-ultramafic complex, Meghalaya, Basic rocks in Chottanagpur granite gneiss and Singhbhum group of rocks on either side of Tamar-Porapahar shear zone.	

- (c) Study of coronites from Dudhi granite; conglomerate north of Singhbhum granite; Neo-Proterozoic peralkalin; dykes in western Part of Dharampuri district, Tamilnadu, Petrology and petrochemistry of metasediments of Sandur greenstone belt of Karnataka; metamorphism & deformation of Chaibasa and Dhalbhum Formation, Eastern Singhbhum Bihar.
- (d) Parsori-gold prospect, Maharashtra ore-microscopic and petrological study of selected gold and basemetal deposits of Rajashan; gold bearing lodes of Ramagiri-Paneracherla schists belts and adjoining amphibolites.
- (e) Petrological studies of selected chondritic meteorites.
- (f) Fluid inclusion studies in Tons Valley basemetal mineralisation belt U.P.
- (g) Experimental Petrological studies.
- (h) Studies on geological and geochemical attributes of incidence of arsenic in groundwater and sediments of Ganges delta, West Bengal.

B. Palaeontology & Stratigraphy

- (i) Evolution of metazoans and microfossils in rocks of Marwar Super Group of Birmania basin in part of Jaisalmer and Barmer district, Rajasthan.
- (ii) Biostratigraphy of Jurassic sediments of Jaisalmer dist. Rajasthan.
- (iii) Study of lignite-bearing Vaikam beds and associated sediments of South Kerala.
- (iv) Study of biogenic activity in Talcher formation, Orissa.
- (v) Palynostratigraphic evaluation of the subsurface Gondwana sediments in the Rajmahal Coalfields.
- (vi) Palynological study of Tertiary sediments of Darjeeling sub-Himalaya
- (vii) Micropalaeontological study of marine Tertiary rocks of Kalijhora Darjeeling, West Bengal.
- (viii) Study of plant fossils of lower Gondwana formation of Birbhum coalfield.
- (ix) Cretaceous sediments of the sea area of Shillong Plateau for biota and history of sedimentation.
- (x) Micromammals in the infra and inter-trappean horizons of A.P.
- (xi) Study of infra and inter-trappean Forams and Charophytes of A.P.
- (xii) Probe into early life and its biostratigraphic implications in western part of Cuddapah basin A.P.
- (xiii) Studies on microbial build up from the sea bed sediment and Andaman Islands (GCP 380)
- (xiv) Micro-vertebrates from infra and inter trappeans from Lalitpur dts. U.P.

C. Geochronology and Isotope Geology

- (a) *Rb-Sr dating*
 - (i) Intrusives along Eastern ghat mobile belt
 - (ii) Tonalite-Granodiorite, Sambalpur, Orissa.
 - (iii) Granitic rocks of Mishmi Tectonic belt.
 - (iv) Southern granulitic terrain.
 - (v) Migmatites and granitic rocks in Champaraaner Group and the older Gneissic complex of Gujarat.
 - (vi) Granodioritic/tonalitic enclaves occurring within the Bundelkhand granitic complex, U.P.
- (b) *Provisioning for a new TIMS.*
- (c) *Data base generation and updating of the Isotopic Age map of India*
- (d) *Inputs to various items of the region.*

D. Photogeology & Remote sensing

- (i) Extending laboratory inputs to the ongoing projects.
- (ii) Interpretation of marginal zone between Dahrwar craton/Eastern Ghats/Southern Granulitic Mobile belts and compilation of map of the marginal zone in Southern Peninsular India.
- (iii) Monitoring barren island volcanism
- (iv) Studies of drainage anomalies of Uttar Pradesh, Himachal Pradesh, Punjab, & Haryana.

E. Chemical

1. Preparation of standard reference material (SRM)
2. Orientation for laboratory geochemistry.
3. Methodology for precision analysis of noble metals and REE.

XVI. GEOPHYSICAL

1. Preparation of standard reference material (SRM)
2. Orientation for laboratory Geochemistry.
3. Methodology for precision analysis of noble metal and REE.

XVII. GEOPHYSICAL

1. Geophysical inputs through magnetic, resistivity and gravity survey to various mineral investigations
2. Improvement of borehole/underground geophysical logging and exploration technique.
3. Systematic regional Geophysical Survey.

XVIII. COLLABORATION AND ASSISTANCE PROGRAMME

1. Collaborative Programme with BRGM.
 - (a) Augmentation of digital image processing, Nagpur.
 - (b) Setting of geoscientific data centre/Rajasthan, Hyderabad and Calcutta.
 - (c) CSOM, Rajasthan.
 - (d) Geoscientific data base, Coal, CHQ.
2. Collaboration with Geological Survey of Vietnam.
3. GSI BHP Collaboration on acquisition and processing of Airborne geophysical data.
4. Bilateral collaboration with Mongolia, Laos, China, Mauritius and Australia
5. Indo-US collaboration on Sohagpur Coal basin M.P.
6. Indo-Bhutan scheme.
7. Participation in International scientific bodies.

XIX. ESTABLISHMENT OF COMMERCIAL UNITS

1. Development of commercial units in India.
2. Handling of sponsored programme in India & abroad.

Statement-II

*Field Season Programme in Maharashtra for the GSI
Operational Year 1997-98*

Maharashtra**I. MINERAL SURVEYS AND APPRAISAL****Gold****1. MIE/CR/MAH/1995/002 S.N.Upadhye(proj.Econ,Geol.)**

Exploration for gold in Marupar-Pular-Kosari Block of Pular-Parsori Gold Belf, Nagpur district (E-I/II stage) (1995-98)

To demarcate significant horizons of gold mineralisation in the area west of Maru nadi to trace the Western extension of Parsori (West)Block gold mineralisation and assess the gold potentiality of the area; DM 6 sq.km., P/T 1200 cu.m. SMPL 3240 nos.* , D 5000 m; DM nil sq.km. P/T 250 cu m, SMPL 1261 nos, D 2400 m. (Rigs 199,279,188): DM 6 sq.km. P/T 950 cu.m. SMPL 1979 nos, D-2012.45 m (* Revised)

**2. MIE/CR/MAH/1996/003 A.K. Saha, (Proj.Econ.Geol.)
S.Chattopadhyaya (C.P.L.)**

Exploration for Gold in Parsori S (East) block, Nagpur district,(E-II stage) (1996-98)

To establish the strike and depth persistence of the gold-sulfide-quartz lodes established in Parsori (West)

block further eastwards and to assess the ore reserves, PART-I:D 1800 m* ,SML 600 nos; D 800 m.(Rig U-386),SMLP 300 nos; D 631.80 m,SMPL 284 nos.PART II SMPL 100 nos*; SMPL 50 nos; SMPL 50 nos.(* Revised)

3. MIE/CR/MAH/1997/010 A.K. Saha (PT) (Proj.Econ.Geol.)

Exploration for gold and copper at deeper levels of Parsori West gold prospect, Nagpur district. (E-II stage)(1997-98)

To Explore the depth continuity of gold-copper mineralisation by selected drilling of deep bore holes and assess the economic potentiality of mineralisation ; D 1600 m, CS 300 nos; D 800 m Rig U-240), CS-150 nos; Nes Item.

4. MIP/CR/MAH/1997/011 M.P. Chawade (Proj.Econ.Geol.)

Exploration for gold in Pural (West,) Kosari, Kolari, Bhaonri and Ranmangli areas, Nagpur district.(P-II Stage)(1997-98)

To delineate significant zones of gold mineralisation and to assess the gold potentiality of the area; DM 2 sq.km, P/T 400 cu.m. SMPL 210 nos; DM 1 sq. km. P/T 200 cu.m. SMPL 105 nos; New Item.

**5. MIP/CR/MAH/1997/012 K.C. Mahapatra, S.Sekar
(Proj.Econ.Geol)**

Preliminary exploration for gold in Khairi-Kitari area Bhandara district, Maharashtra (P-II Stage)(1997-98)

To demarcate significant zones of gold mineralisation in the Khairi-Kitari area; Part -I: LSM-30 sq.km, P/T-100 cu.m., SMPL 300 nos; Part-II: DM 2 sq.km, P/T 200 cu.m., SMPL 200 nos. (One year Program) New Item.

Diamond

6. MIP/CR/MAH/1997/013 K. Shashidharan, D.V. Ganvir,
(Proj. Econ. Geol.), R. K.
Srivastava (PGRS) (PT), K. V. S.
Bhaskara Rao # DPP Punikar #
(# All PT from Geophysics)

Search: for kimberlite and lamproites in parts of Chandrapur, Nanded and Gadchiroli districts, Maharashtra, (P-1 Stage)(1997-99)

To locate kimberlite/lamproite intrusives into the Archean Bengpal gneiss and to assess their diamondiferous nature; PRS 2500 sq.km. (Satellite) 1500 sq.km. (Air Photo), Digital image processing 200 sq.km. LSM 200 sq.km SMPL-50 nos.(50 kg. each), PCS 50 nos., GP Surveys 15 L km: PRS 2500 sq.km (satellite) 750 sq.km; (Air Photo), Digital Image processing as nece., LSM 100 sq.km, SMPL 25 nos. (50 kg.each), PCS 25 nos. GP Surveys 15 L km: New Item.

Manganese

7. MIE/CR/MAH/1993/006 S. N. Meshram, (PT)
(Project: Archean Sausar Belt)

Investigation for manganese ores in Parsoda and Nagardhan-Chokhala area, Nagpur district, (E-I Stage) (1993-98)

To explore and assess the manganese ore potentiality (including that of ferro-manganese grade ore) in Parsoda and Nagardhan-chokhala area; D 1300m, LSM 110 sq.km, DM 2 sq.km, P/T 270 cu.m, SMPL 540, GP Surveys 70 L km.; D 600 m. (Rig U-197), LSM nil, DM nil, P/T nil, SMPL 150; D 624.900 m, LSM 110 sq.km, DM 2.3 sq.km, P/T 270 cu.m, SMPL 390 GP Surveys 70 L km.

8. MIP/CR/MAH/1997/014 S. N. Meshram, (PT) K. Patel (PT)
(Project: Archean Sausar Belt)

Investigation for Mn ore in Belda-Junewani area, Nagpur district, (P-II Stage)(1997-99)

Exploration and assessment of Mn ore potential (including that of ferro-manganese grade ore) in Belda-Junewai area, Nagpur district: DM 2 sq.km, SMPL 150 nos., DM 1 sq.km, SMPL 75 nos; New Item.

9. MIP/CR/MAH/1997/015 S. M. Godbole, (PT)
S. Y. Katti, (Proj. Deccan Trap
(West), H. Athawale

Assessment of manganese and associated iron ore in

Banda-Kalane and adjoining area, Sindhudurg district (P-II Stage) (1997-98)

To assess the resources of iron and associated manganese with the aim to propose for ferro-manganese alloy; LSM 30 sq.km, DM 2 sq.km. P/T 100 cu.m, SMPL 100 nos.(one year Program): New Item.

Dimension Stone

10. MIP/CR/MAH/1997/009 M. Mohan, S. Natesan
(Project Deccan Trap (E)

Assessment of potential of dimensional stone in Eastern Maharashtra. (1997-2000)

Evaluation of the suitability of the Archean and Proterozoic rocks as dimensional stone and Preparation of inventory of the granite resources; REC 1500 sq.km., LSM 120 sq.km, SMPL 120 nos; REC 400 sq.km, LSM 40 sq.km, SMPL 40 nos; New Item.

II. SPECIALISED THEMATIC STUDIES

11. STM/CR/MAH/1996/004 A. S. Khan, A. K. Huin (PT)
A. Chattopadhyay
(Proj. Archean Sausar Belt)

Specialized thematic mapping in the Sausar fold belt in Maharashtra for elucidation of stratigraphy, structure, metamorphic history, and tectonics (1996-1999)

To carry out geological, geochemical and geochronological studies of the Sausar Group and the adjacent gneiss-migmatites for understanding the stratigraphy, structure, metamorphic history, basement-cover relations, geochemical attributes of rocks and ores and tectonic framework of the Sausar belt; STM 1650 sq.km, PS-600 nos, PCS-100 nos; GCS 300 nos. STM-450 sq.km, PS-200 nos, PCS-30 nos, GCS-100 nos; STM-375 sq.k, PS-200 nos, PCS-20 nos, GCS-60 nos.

12. RP/CR/MAH/1995/015 H. Y. Bhai (Project Stratigraphy)
K. Rao, R. C. Paathak, K. J. Rao
(All PT from GP Div., CR)

Establishment of stratigraphy by regional scout boreholes in the covered terrain of the Wainganga river basin, Bhandara and Gadchiroli districts, Maharashtra (1995-98)

Identification of the geological formations in the covered terrain of the Wainganga river; D 1000 m, CS 100 nos,*, Surface SMPL 60 nos*, Pal studies 50 nos, GP Surveys 10 L km.*; D 600 m (Rig U-366), CS 60 nos, Surface SMPL 13 nos, Pal studies 50 nos, GP Surveys 10 L km; D 368.75 m, CS 40 nos, *surface SMPL 47 nos*, Pal studies nil nos., GP Surveys nil(* Revised.)

13. RP/CR/MAH/1995/005 M. Chandradas

Stratigraphic drilling to establish Gondwana

Stratigraphy below the Deccan Trap, north of Amravati district, Maharashtra (1995-98)

To resolve the stratigraphic status of the dissected patch of sedimentaries occurring below the Deccan Trap; D 1300 m*, SMPL 170 nos* ; D 800 m (Rig U-365), SMPL 124; D 407.20m, SMPL lab 46 nos. (* Revised)

Geophysics

14. GPM/CR/MAH/1996/001 **K.V.S. Bhaskara Rao
D.V. Punekar,
G.Venkateswarlu**

Regional Geophysical survey for tracing Gondwanas in Yectmal and Nanded Districts (1996-98)

To trace the extension of Gondwana formations under Deccan Trap cover, RGMS 2000 sq.km.* Res. Sound 40*; RGMS 1000 sq.km, Res Sound 25; RGMS 1000 sq.km. Res.Sound 15 (* Revised)

IV. GEOTECHNICAL AND SPECIAL INVESTIGATIONS

15. EG/C/CR/MAH/1969 -92/001 **M. Kumaraswamy,
M. Mahesh Babu,
P.S. Mishra, Pradeep Singh,
P.C.D. Momy, P. Venkataraju (PT),
(From Engg.Geol-II);
K.V.Rao, R.C. Pathak
K.J.Rao (All PT from GP Div.)**

Geotechnical evaluation of water resource development projects in Eastern Maharashtra.

To carry out preliminary/preconstruction/Construction stage geotechnical investigation of Hydro-electric projects, major and medium irrigation schemes reservoir competency studies and water supply schemes in Maharashtra.

PRIORITY-I

(a) Preliminary Stage Investigations

1. Chikhaldara Pumped Storage Scheme, Amravati district, Maharashtra

(b) Construction stage Investigations

2. Gosikhurd Irrigation project, Bhandara district, Maharashtra, Geophysical surveys will also be carried out to locate the possible seepage zone.
3. Bawanthadi Irrigation project, Balaghat district, Madhya Pradesh and Bhanwara district, Maharashtra.
4. Purna river project, Amravati district, Maharashtra.

PRIORITY -II

5. Chandrabhaga Medium Irrigation project, Amravati district, Maharashtra.

16. EG/C/CR/MAH/1969-92/001 **R.G.Sinha, V.P.Sable,
D.T. Kamble, R.K.Razdan,
(From EG Div.I,Pune)
K.V.Rao, R.C. Pathak,
K.J.,Rao (All PT from GP Div.)**

Geotechnical evaluation of water resource development projects in Western Maharashtra.

To carry out preliminary/preconstruction/Construction stage geotechnical investigation of hydro-electric projects, major and medium irrigation schemes, reservoir competency studies and water supply schemes in Maharashtra.

PRIORITY-I

Preliminary Stage Investigation

Irrigation Projects

1. Mahamadwadi Irrigation project (medium), Sindhudurg district, Maharashtra.
2. Sarambala Irrigation project (medium) Sindhudurg district, Maharashtra.
3. Arjuna Irrigation Project (medium), Ratnagiri district, Maharashtra.
4. Kajvi Minor Irrigation Project (Large), Ratnagiri district, Maharashtra.
5. Upper Pravara Project (Nilwande-II), Ahmadnagar district Maharashtra.
6. Feasibility geotechnical investigations of Damanganga-Pinjal link Project, Nasik and Thane districts in Maharashtra and Valsad districts in Gujarat and GP surveys for delineating the bed rock profile.

Hydro-electric schemes/Projects

7. Humbarli Pumped Storage Scheme (Vazarda), Satara district Maharashtra.
8. Sarambala river fall Hydroelectric project, Thane district, Maharashtra
9. Sanwade Canal Drop-Hydroelectric Project, Sangli district, Maharashtra.

Preconstruction stage Investigation

10. Talamba Irrigation Project (Major), Sindhudurg district, Maharashtra.

Construction stage investigation

11. Tillari Irrigation Project (Major), Sindhudurg district, Maharashtra.
12. Deogad Irrigation project (medium) Sindhudurg district Maharashtra.

Reservoir Competency Studies

13. Mahamadwadi Irrigation project (medium), Sindhudurg district, Maharashtra.

Priority-I Items are only spill over/continuity, not taken up items and are likely to be taken up during F.S. 1997-98 as indicated by Project Engineers.

Environmental Studies

17. ENV/CR/MAH/1996/005 **G. Gonnade (PT), N. V. Nitnavre, (Proj. Env. Geol.)**

Preparation of environmental impact assessment and management plan for new Nagpur township and Butibori industrial estate, Nagpur (1996-98)

Preparation of environmental impact assessment and management plan based on geofactors and generation of data base before development. Identification of impacts on geofactors *via-a-vis* development plan; preparation of thematic maps on geology, geomorphology, soil drainage, -315 sq.km, SMPL 30 nos, Preparation of maps on geology, geomorphology, soil and drainage-150 sq.km, SMPL -15 nos; preparation of thematic maps on geology, geomorphology, soil drainage, -165 sq.km, SMPL 15 nos.

18. ENV/CR/MAH/1996/006 **Prem Babu, T.G. Mohankar**

Preparation of Environmental impact assessment and management plan for MAUDA industrail estate on Nagpur-Bhandara Road, Nagpur district, Maharashtra (1996-98)

Environment impact assessment and management plan for Mauda Industrial estate. Preparation of maps on geology, geomorphology, soil and drainage, groundwater and land use-315 sq.km, SMPL-40 nos, SMPL for air quality-432 nos; preparation of maps in geology, geomorphology, soil, drainage, groundwater and land use-150 sq.km SMPL-15 nos, SMPL for air quality 216 nos; preparation of maps in gelogy, geomorphology, soil, drainage, groundwater and land use-165 sq.km SMPL-15 nos. for air SMPL for air quality 216 nos.

Geothermal Division

19. Service Item **D.K. Mukhopadhyaya (PT)**

Health flow measurements in parts of Central Region to prepare a National Heat flow map.

Thermal gradient and Thermal conductivity measurement (6 to 10 nos. each year) in M.P. and Maharashtra for preparation of Heat-flow map in respect of Central Region, at least one borehole in each degree sheet.

20. GT/C/CR/MAH/MP/1997/007 **D.K. Mukhopadhyaya (PT) + 1 G**

R & D Project on Geothermal studies on assessment of power generation and direct heat utilization and potential of explored geothermal sites in Central and Northern region. (1997-98)

To review the data on geothermal investigations done by GSI and classify the geothermal sites in various categories viz. ready for power generation, commercial utilization, deeper exploration and further systematic studies and to assess the total power generation and heat utilization potentiality.

Geoselsmology and Seismotectonic studies

21. Service Item **N.V. Venkataraman (PT from GSS Div.)**

Preparation of Seismotectonic Atlas of India (Sheet nos. 22,27,28,& 30)

22. Service Item **S.C. Nautiyal (GSS Div.)**

Macro and micro seismic investigation of reports of seismic events.

V. LABORATORY AND RESEARCH**Petrology**

23. RP/CR/MAH/MP/1997/002 **S.K. Bhowmik (PT), T. Pal (PT) (Petrology Div. CR)**

Petrotectonic implication of the granulite suite north of the Sausar Belt in the overall tectonothermal evolution of the Central Indian mobile belt (1997-99).

Correlation of granulites occurring to the north and south of Sausar Belt and to establish the mineral reactions and P-T path for understanding the overall tectonothermal evolution of the Central Indian mobile belt; Transect Mapping-200 lkm, SMPL-200, PCS-90 DS-10; Transect Mapping-100 lkm., SMPL-100, PCS-30; New Item.

24. RP/CR/MAH/1997/016 **A.K. Chatterjee (PT) (Pet, CR) S. Vaddadi (Mah-W)**

Petrography and geochemistry of the lava tubes and channels associated with Deccan Traps in Gunjale-Rahuri areas of Ahmednagar district, Maharashtra (1997-98)

To study the geochemical evolution and petrogenesis of the lava tubes/channels and to establish the genetic relationship between the lava tubes/channels and the host flows; PS-100, PCS-40, REE-30, XRD-As Nec., EPMA-10; PS-100, PCS-40, REE-30, XRD-As Nec. EPMA-10; New item.

Palaeontology

25. RP/CR/MAH/1997/003

D.M. Mohabey

Search for Dinosaur nest-track sites and associated skeletal remains from the late Cretaceous sediments of Chandrapur, Wardha and Nagpur districts and their systematic studies (1997-1999)

To search Dinosaur nest sites and track ways from Lameta sediments.

P.G.R.S.

26. PRS/CR/MAH/1997/005

S. Basu Mallick, S.G. Krishna,
R.K. Shrivastava, U.S. Dubey,
K.K. Naik (All PT from PGRS Div)
A.K. Das, (PT from GP Div.)
H.M. Ramachandra
(PT from Geodata div.)

Establishment of digital image processing centre in collaboration with BRGM, France, (1997-98)

Evaluation of both hardwares and softwares being installed at digital image processing centre in P.G.R.S. Division, in Collaboration with BRGM, France.

Geotechnical

27. RP/CR/MAH/1995/013

K.K. Chatterjee (PT)

Deformation mechanism studies using analogue material (1995-98)

To provide insight into deformation mechanism operative in rock.

VI. DATA MANAGEMENT AND DISSEMINATION

Geodata

28. Service Item

H.M. Ramachandra (PT)

Creation of database for the Sausar Belt. Collection and Compilation of geological and exploration data available for the Sausar Belt and Preparation of Database, electronic and hard copy publication for information dispersal. (1996-99)

29. Service Item

S.M. Godbole, M.K. Wanchoo

Database on Volcanics of Deccan Traps.

Preparation of Database on Deccan Flood Basalts from available published and unpublished reports of GSI.

Development of Database including creation of user queries etc. for fast and accurate data retrieval in desired types/formates for ultimate use in effective planning and implementation of studies on Deccan Flood Basalts.

30. RP/CR/MAH-MP/1996/010

B. Bhusari (PT) (M & C)
G.S. Gonnade (PT) (Env.)
A.K. Das GP, (PT) A.K. Saha (PT)
(Eco.Geo.) S.G. Krishna (PT)
(PGRS) U. Chakraborty (PT) (GD),
A.K. Huin (PT) (Arch.Saus),
P.K. Sinha, S. Chakraborty,
R.S. Shukla.

Project GEOISM; Geological information system Maharashtra-Madhya Pradesh (1996-99)

Creation of sectoral geological information system in the GIS domain mainly for non-renewable natural resources management in parts of the precambrian Shield of Central India based on geological database available with different collaborating organizations.

Map Compilation

31. MAP/CR/MAH/MP/1994/015 (I)

B. Bhaskar (PT)
S.D. Patbhaje (PT)

Compilation of Mineral belt maps on 1:50,000 scale

32. MAP/CR/MAH/MP/1994/015 (II)

B. Bhaskar (PT)
S.D. Patbhaje (PT)

Compilation of geological quadrangle maps

33. MAP/CR/MAH/MP/1994/015 (III)

B. Bhaskar (PT)
S.D. Patbhaje (PT)

District resource maps (Scrutiny and Printing)

34. MAP/OPM/CR/MAH/1996/009

S.S. Sahasrabudhe
(M & C and P Div.),
Amarjeet Singh, C.B. Raina,
(C (T) Div., Pune.)

District Resource Maps of Western Maharashtra.

To prepare and publish district resource maps with information on geology, mineral resources, geomorphology, structure, land-use, natural hazards and ground-water on 1:1,25,000 scale: total no. of dists-31. nos. Dists (target) 6, Latur, Osmanabad, Satara, Pune, Thane, and Sangli.

Publication

35. Service Item

K.K.K. Nair, S.G. Udhoji,
J.L. Mishri, V.A. Aglawe

Publication of GSI Records: Regional News, Miscellaneous Publications, scrutiny of mineral investigation reports and scientific papers.