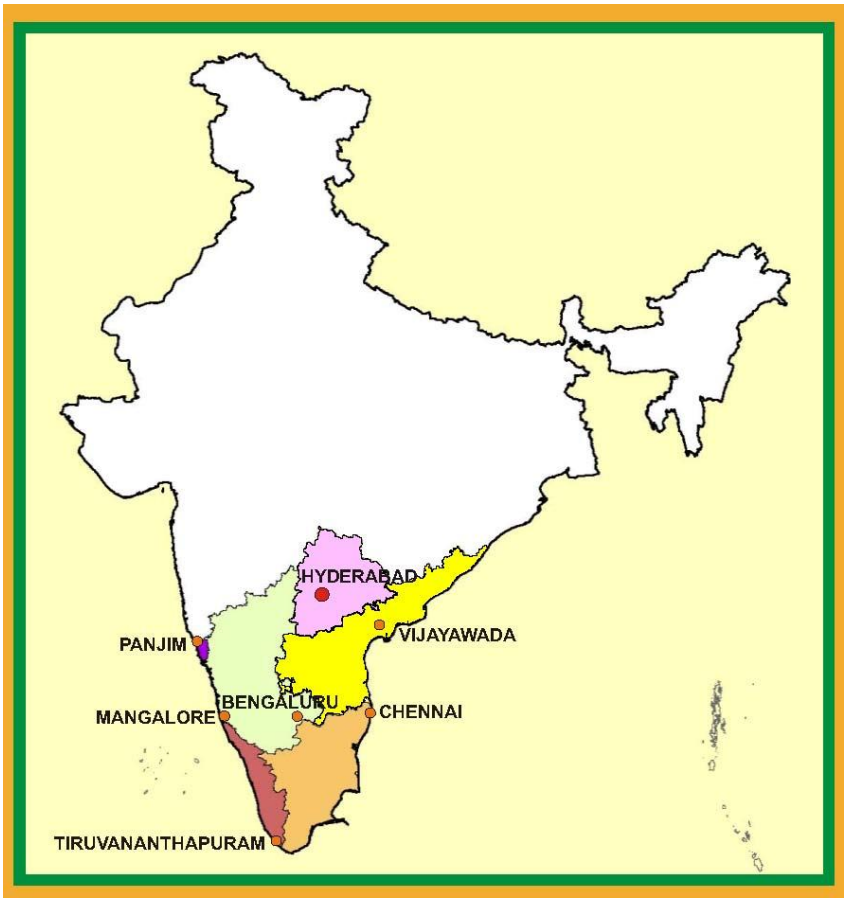
BRIEFING BOOK



GEOLOGICAL SURVEY OF INDIA
SOUTHERN REGION

MARCH, 2015

CONTENTS

ANNEXURES

EXECUTIVE SUMMARY OF THE BRIEFING BOOK OF SOUTHERN REGION UPTO MARCH, 2015

1. Geological milieu and mineral resources of South India as well as geology and mineral resources of different constituent states units of GSI, Southern Region, are presented in geological context in the introductory chapter. The digitized geological map (generalized) of South India as also the geological and mineral maps of all the State Units - Andhra Pradesh, Telangana, Karnataka & Goa, Tamil Nadu & Puducherry and Kerala depicting the distribution of various mineral commodities are included in the first chapter.

2. Organizational structure of GSI, Southern Region, in Region ï Mission hybrid matrix mode is shown by an updated organogram, as a single page ñflow chartò on the last page.

3. Under activity domain, the activities of Southern Region in Mission mode have been enumerated.

4. The ongoing projects under execution during FS 2014-15 have been listed mission wise under activity domain of the Region.

5. The envisaged target for FS: 2014-15 and achievements upto 31st March, 2015 are tabulated and presented under activity domain. Prorata targets assigned have been achieved for most of the items and the envisaged targets are achieved. Accomplishment of Southern Region along with the brief background and highlights of the work carried out under different heads have been presented under the ñBrief on the work carried out in Southern Regionò.

6. Status of STM, GCM and GPM showing area covered up to F.S: 2013-14 and the area under investigation during the current F.S: 2014-15 in Southern Region as well as different SUs have been plotted on the geological maps of the respective states.

7. During F.S. 2014-15, under Mission-I, 12 STM items and 43 GCM items are under execution as against 11 STM items and 31GCM items carried out during FS 2013-14. Four items of GPM, 27 items of Marine and Coastal surveys and one Geomorphological and lineament mapping item under RS Division are being carried out during the current field season.

8. Under Mission - II, a total of 39 mineral investigations (under Mission-IIA- 32 items & Mission-IIB-7 items) have been taken up during the ongoing field season as against 34 items carried out during FS 2013-14. Out of these; 4 investigations are for PGE, 8 for gold, 5 for diamond, 3 for Basemetal, 4 for Iron ore, 1 each for chromite, Tungsten, Dunite and Graphite besides, 7 for coal/lignite and 4 for REE. One service item of maintenance of Diamond Processing plant at Wajrakarur under Mission ï II is continued during the current Field Season. State-wise break up of investigations taken up for different mineral commodities are given in Table-11.

9. Nine mineral investigations (M-IIA-6, M-IIB-3) are under UNFC G-3 stage while the thirty items are under G-4 stage of preliminary investigation. The G-3 stage mineral investigation items are as under:
    i. Reappraisal of Basemetal minerlisation in Karempudi Block of Agniundala Basemetal Belt, Guntur Distict, Andhra Padesh.
    ii. Reappraisal of Graphite and Tungsten mineralisation at Burugubanda in Rampachodavam Taluk, East Godavari district, Andhra Pradesh.
    iii. Regional exploration o coal by drilling in Pagaderu (East) sector, southern part of main basin of Godavari valley coalfield, Khammam district, Andhra Pradesh.
    iv. Investigation for gold in Ajjanahalli block-G, Tunkur district, Karnataka.
    v. Exploration for gold in Bangaugatti block, Shimoga scist belt in parts of T.S.No. 48I/16, Dharwar district, Karnataka.
    vi. Exploration for Platinum group of elements by drilling in T3 sector of Tasampalaiyam block in Sittampundi anorthosite complex, Namakkal district, Tamil Nadu.
    vii. Reappraisals for graphite by dilling in Arasanur (village) block in the western part of Sivaganga graphite belt, Sivaganga district, Tamil Nadu.
    viii. Regional exploration for lignite in Uttarakosamangai sector, Ramnad sub-basin, Ramanatapuram district, Tamil Nadu.
    ix. Regional exploration for lignite in Kalari west sector, Ramnad sub-basin, Ramanatapuram district, Tamil Nadu.

10. Under Mission - III, 34 items (Geodata/Geoinformatics-21 (8 standard & 13 Service Items), 12 MCPI (5 standard & 7 Service items), Publication-1) are taken up during the current field season. It includes Integration of geological, geochemical, geophysical, aero-geophysical and remote sensing data of 57F and 57E degree sheets. Preparation o 1:50K

print ready RGB layouts as a link up item with the M&C Division of Southern Region. And one service item on OCBIS link item with Geodata CHQ.

11. Under Mission - IV, a total of 32 items (under Mission-IVA ï 15 (10 standard & 5 service items, MissionIVB- 17 (16 standad & 1 service item)) encompassing geotechnical evaluation and water resource development projects, earthquake geology and landslide investigations, and research projects under Petrology, Palaeontology,RS division, geophysics, M & CSD, PPOD, Bangalore have been undertaken during the field season 2014-15. The work of Engineering Geology Division is spaced round the year and largely the programmes are sponsored and taken up on payment basis.

12. F.S.P. Implementation: Field work was completed in M-I items in all State Units for FS 2014-15. In mineral investigations/ RP items proposed under M - II and IV, for FS: 2014-15 the efforts have been made to achieve the prorata targets and completed all the targets except drilling due to various technical reasons. In NGCM five new items have been taken up in State Units like SU: AP & T, SU: K & G and TNP and completed the assigned targets. Item - wise targets, achievements, number of field days spent by the officers, the total and unit expenditure incurred for each field item are given in Annexure-4.

13. Field Supervision: Annual programme implementation and its effective monitoring are actively pursued by the supervisory officers through regular field visits for necessary technical guidance and to ensure the high quality of work. Details of field visit of Supervisory officers are tabulated and presented under Chapter-6.

14. RCA Management: RCA recoupment & pendency are closely monitored and a relevant statement of RCA details in the prescribed format, including the data inputs of date of application, initial sanction and recoupment received etc is regularly sent to the Director (Finance-Monitoring) in DGCO, New Delhi and to the Dy.Director General (IT), CHQ Kolkata for uploading to GSI Portal. Data as on 5th April, 2015 regarding the status of RCA recoupment and pendency in respect of individual officer is presented in respective tables under RCA management.

15. Status of Reports: All Reports pertaining to FS 2013-14 are submitted and circulated as per the time line fixed and uploaded to portal except two PGE reports belongs to SU: TNP which were pending due to non receipt of chemical analyses. Details of status of pending progress reports are given in Annexure-6.

16. Chemical Analysis: A total of 14,259 samples (which includes Non-NGCM, NGCM and water samples) were analysed and 1,09,542 determinations were made in different laboratories located under Southern Region during the quarter. Package wise chemical analysis is under progress.

17. UNFC Code: UNFC compliance of all the 177 mineral investigation reports enlisted for Southern Region has been accomplished within the stipulated time frame. The certificate on UNFC compliance with appropriate code assigned for these reports have been uploaded along with the abstract of the reports available (Annexure ï IB).

18. Detailed Information Dossiers (DIDs): DID updation documents in respect of Southern Region have been submitted for Diamond, Basemetal, Iron Ore, Chromite, Manganese as well as Gold.

19. Uploading of Progress Reports: Softcopy conversion of 1834 Pre-2004 unpublished progress reports of SR are under progress on outsourcing basis. 1834 reports have been supplied for softcopy conversion. Out of that 1519 reports have been keyed and uploaded in the portal upto the end of December, 2014. Remaining 315 reports are to be keyed and uploaded. A total of 266 post-2004 unpublished reports are uploaded upto the end of March, 2015 against a total of 288 reports available in SR Library.

20. Quality Management: Quality Management Cell/s at Regional Headquarters (RHQ) and State Headquarters (SHQ) are working in tandem to improve the quality of work carried out in the Region.

21. Case Studies: Case Studies (45 Nos. including Miscellaneous items) from Southern Region have been uploaded to GSI Portal till March, 2015 (Annexure-8). Few case studies are under process for uploading and some more case studies are in different stages of scrutiny and modification etc.

22. RAC Meeting of Region: 12th Regional Advisory Council meeting of Southern Region under XII Plan was held on 17th March, 2015 at GSI, SR, Hyderabad. Minutes of the XII_SR_12 RAC meeting are uploaded to GSI portal.

23. OAC Meeting of State Units: All the State Units have conducted the 12th OAC meetings of the XII Plan as per the schedule given below and minutes of all the OAC meetings have been uploaded to GSI Portal (Annexure-11):-

    i. SU: Andhra Pradesh (XII_AP_OAC_12) - held on 16.3.2015
    ii. SU: Karnataka & Goa (XII_KG_OAC_12) - held on 13.3.2015
    iii. SU: Tamil Nadu & Puducheery (XII_TNP_OAC_12) - held on 11.3.2015
    iv. SU: Kerala (XII_KRL_OAC_12) - held on 13.3.2015

24. Term Review Meetings: Term Review meetings for FS: 2014 -15 pertaining to State Units and Headquarter Divisions of Southern Region was held on 9th & 10th January, 2015.

25. SGPB Meetings: All the Statesô Directorates of Mines & Geology are regularly requested by the respective State Units to hold their SGPB meetings before the scheduled CGPB meeting. The last SGPB meetings held by the different State Governments are as under:

    i. 47th SGPB meeting of AP - 12.12.2013
    ii. 48th SGPB meeting of Karnataka - 3.11.2014
    iii. 57th SGPB meeting of Tamil Nadu - 16.2.2012
    iv. 51st SGPB meeting of Kerala - 20.9.2014

26. Training & Capacity Building: Training courses conducted by RTI, SR during January to March, 2015 have been given in Annexure-10. Core faculty and guest faculty (GSI, Ex-GSI etc.) invited for various courses.

27. ñRolling Planò and ñShelf of programmesò for the next two years, Mission-wise proposed for different SUs of SR are included in the briefing book as Annexure-2B & 2C respectively.

28. Finance: Fund disbursement for the 4th quarter of the Financial Year 2014-15 have been done judiciously done keeping in view the demand & fund availability. Utilization of fund against the fund allotment of Southern Region for 2014-15 uptill now has been satisfactory in the overall assessment.

29. Financial outlay figure, approved plan funds and actual expenditures for the 4th quarter of XII plan period as on March 31st March, 2015 are included in Annexures-3A, 3B, &3C.

30. HRMIS: HRMIS data are constantly updated with regards to transfers, promotion and other details. All the officers and Staff have been directed to update the records regarding field of specializsation, deputation/training etc. which the officers/officials have to update/upload individually with the assistance of Geodata division and e-Governance Cell.

31. Claim modules: Pay roll module has been fully implemented in Southern Region at HQ as well as in all the State Units and Marine & Coastal Survey Division and pay is disbursed through ECS. Increasing number of employees are applying for leave, tour approvals etc., through portal

32. Statement of Grievance cases, Vigilance cases and Legal cases with the current status are incorporated in the Briefing Book. Nature & Status of legal cases are summarized in Annexure-16.

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GEOLOGICAL SURVEY OF INDIA
Southern Region

1. INTRODUCTION

- Geological Survey of India (GSI) was set up in 1851 with its headquarters at Kolkata, primarily to locate coal deposits for Railways.
- Subsequently, in order to study the various geological provinces / milieus and conduct detailed mineral exploration in geologically unique territories spread over the country, six Regional Offices were set up at Lucknow, Jaipur, Nagpur, Hyderabad, Shillong and Kolkata. State offices were also set up in all the States of India to conduct geological / mineral investigations in the States of the Union, and to assist the State Governments in their endeavours in geological work.
- Geological Survey of India, Southern Region (SR) with its headquarters at Hyderabad was set up in November, 1961 under the Directorship of K. R. Khedkar

The Southern Region Office comprises (i) State Unit Andhra Pradesh at Hyderabad; (ii) State Unit Tamil Nadu & Puducherry at Chennai; (iii) State Unit Kerala at Thiruvananthapuram; and (iv) State Unit Karnataka & Goa at Bengaluru. After implementation of the HPC recommendations and Mission mode operations in SR, the activities of Four Marine and Costal Surveys (M&CS) Divisions (Kochi, Mangalore, Visakhapatnam and Chennai) under Mission 1C,, two Divisions of Coal and Lignite under Mission II B--Natural Energy Resource (NEnR) and two units of Remote Sensing and Airborne Surveys (RSASð Hyderabad and PPOD, Bangalore) of Mission IB have been brought under SR. Similarly the Regional Training Institute (RTI), Hyderabad and FTCs at Kothagudem and Wajrakarur are working under Southern Region headquarters whereas the Field Training Centres (FTCs) at Salem and Chitradurga are attached to the respective State Units under jurisdiction of which they are situated. Recently M & CSD has opened an operational office at Chennai (Op: EC -IV) to cater to the needs of Tamil Nadu coastal stretch.

GEOLOGICAL CONTEXT

Southern peninsular India comprising States of Andhra Pradesh, Karnataka, Kerala, Goa, Tamil Nadu and the Union Territory of Puducherry exposes lithological assemblages from Archaean to Holocene. It is divisible into four physiographic units namely, (i) East and West Coastal Plains, (ii) Eastern Ghats, (iii) Deccan Plateau and (iv) Western Ghats. The Deccan Plateau constitutes the region predominantly and it is flanked on either side by linear stretches of coastal plains and is drained by major easterly flowing rivers like the Godavari, Krishna, Tungabhadra, Pennar, Palar, Cauvery and Vaigai, as also a few westerly flowing rivers such as Mandovi, Zuari, Netravathi, Bharathapuzha, Periyar and Pamba, which originate from the Western Ghats.

GEOLOGICAL MILIEU OF SOUTH INDIA

Archaean to Proterozoic

Southern peninsular India is a shield area comprising Dharwar Craton in the north and Southern Granulite Terrian in the south; a boundary called the Fermor Line separates these two. Dharwar Craton encompasses major parts Karnataka and Andhra Pradesh States. Dharwar Craton is a typical Archaean-Proterozoic granite-greenstone terrain. An array of granitic lithounits such as tonalite, trondhjemite, granodiorite, adamellite and granite constitute this Archaean-Proterozoic granitic terrain. These are deformed and metamorphosed into complex gneisses. The granitic rocks of varying composition and the gneisses are together known as Peninsular Gneissic Complex (PGC). The PGC contains several linear, deformed and folded greenstone / schist belts. Prominent intra-cratonic Proterozoic sedimentary basins namely Cuddapah Basin, Kurnool Basin, Bhima Basin and Kaladgi Basin have formed over the basement of Dharwar Craton. The craton is bounded in the east by Eastern Ghats Mobile Belt, in the northeast by the Bastar Craton, and is overlain in the northwest by the basalt flows of Deccan Trap. Eastern Ghats Mobile Belt is a granulite terrain made up of charnockite, khondalite, quartzite, calc-granulite, pyroxene-granulite, granite and leptynite. This belt extends into Orissa in a northeasterly direction. In the northern part, Dharwar Craton is partly covered by Proterozoic sediments of Pakhal Supergroup and Phanerozoic sediments of Gondwana in a NW-SE trending rift basin called as Godavari Basin / Rift / Graben. They are flanked on either side by Proterozoic sedimentary sequences of Penganga and Sullavai basins. Different types of Charnockites and Gneisses (PGC I & II) are the predominant rock types in the States of Kerala and Tamil Nadu. In these states Neo-Proterozoic magmatism is represented by intrusives of alkaline group of rocks and granitoids. Meso-Proterozoic dykes are present in the area to the North of Palghat Cauvery Lineament and the Mesozoic dykes are seen in the western part of Kerala.

Palaeozoic and Mesozoic Sediments:

Rocks of Gondwana Supergroup are exposed along the Pranhita-Godavari valley in Andhra Pradesh. In Tamil Nadu, Lower Gondwana Formations occur in north south trending linear belts in the southern part of the Palar Basin. Upper Gondwana rocks occur in Tiruchirappali, Sivaganga and Palar sub basins. Recent Borehole intersections (2010) indicate the presence of Upper Gondwana plant fossils at depth in Vridhachalam sub basin. Gondwana sediments of the Godavari Valley host rich coal deposits in Andhra Pradesh. In the coastal belt of Tamil Nadu, marine Cretaceous rocks distributed in Tiruchirapalli, Vriddhachalam and Pondicherry sub basins have been lithostratigraphically divided into different groups. Some of the formations under these groups are very rich in their fossil content, mostly, lamellibraches, gastropods and brachiopods. The 26 m long fossil tree occurs in ôTrichinopoly Groupô

Deccan Trap:

Basalt flows of Deccan Trap with their infratrappean and intertrappean sedimentary beds, cover a vast area of Karnataka and Andhra Pradesh over an area of about 42,000 sq km in the northern and northwestern parts of South India. Adilabad, Nizamabad, Medak, Ranga Reddy, Mahbubnagar, East Godavari and West Godavari districts of Andhra Pradesh and Bidar district and parts of Belgaum, Bijapur and Gulbarga districts in Karnataka expose Deccan Trap.

Tertiary Sediments:

Tertiary sedimentary sequence in Andhra Pradesh is represented by Rajahmundry Formation, along the coast between Samarlakota and Eluru. In Tamil Nadu Lower Tertiary sediments are seen in Tiruchirappali and Pondicherry sub basins. Upper tertiary sedimentary sequence is represented by Cuddalore Formation which occupies thousands of sq. km along East Coast. Huge lignite deposits occur in these sediments. NLC is exploiting these lignite deposits. In the southern part of the west coast, particularly in Kerala, Tertiary sediments are represented by Warkalli and Quilion formations.

Quaternary and Holocene Sediments:

The Quaternary sediments in the southern peninsular India occur along inland river valleys and along the coastal tracks interrupted by the prograding deltas of major rivers. They are represented by thick blankets of alluvium, gravel and colluvial deposits, beach sand, kankar, soils of various types and laterite.

MINERAL RESOURCES OF SOUTH INDIA

The southern Indian States are endowed with rich mineral wealth. Significant mineral deposits such as ferrous, non-ferrous and noble metals, precious and semi-precious stones, strategic minerals, fossil fuels and other industrial minerals are found in diverse geological formations ranging from Archaean to Quaternary. The Archaean high grade metamorphic rocks such as Sargur Group host mica, copper, barytes and gemstones; the greenstone belts of Dharwar Craton are repositories of gold and iron ore; Peninsular Gneissic Complex is the host for diamondiferous kimberlite pipes, apart from bearing potential for dimension stones, chromite and semi-precious stones. Granulites of Eastern Ghats Supergroup and Southern Granulite Terrain contain bauxite, manganese, graphite, apatite, gemstones, tungsten and dimension stones. The Proterozoic rocks that are confined in the intra-cratonic basins, contain basemetals, barytes, asbestos, limestone, dolomite, diamonds, iron and manganese ores, magnesite, phosphorite and uranium. Late Palaeozoic to Early Mesozoic rocks of Gondwana Supergroup contain coal deposits and clay. The Tertiary and Quaternary rocks contain oil and natural gas, lignite, beach sands, clay, diamond and other gemstones. Mineral deposits linked to the growth of Gross Domestic Product (GDP) are limestone, bauxite, iron, barytes, coal, lignite, gold, diamond, dimension stones, manganese, mica, oil and natural gas. The Southern States offers favourable geological milieu to host all the mineral deposits linked with GDP growth.

GEOLOGY AND MINERAL RESOURCES OF SOUTHERN STATES
ANDHRA PRADESH

Geology:

The State of Andhra Pradesh, occupies an area of 160,205 sq km and lies between 12°41' and 17°54'N latitude and 76° 46' and 84°40'E longitude. Andhra Pradesh has got a coastline of around 972 km, one of the longest coastline in the nation with an average width of about 40 km. Two major rivers traversing the State are Godavari and Krishna. Other minor rivers such as Vamsadhara and Nagavalli originate in the Eastern Ghats and flow easterly to join the Bay of Bengal. Penna River drains in the southern part of the state. The deltas of the rivers Godavari and Krishna constitute the dominant component of the coastal plains. There are two prominent lakes in the State, of which Kolleru is a fresh water lake occupying about 250 sq km area. The Pulicat Lake is a salt-water lagoon situated near the border with Tamil Nadu. The Eastern Ghats extending from Odisha in the north-east run parallel to the coast and extends into Tamil Nadu in the south. It has two segments separated by a major gap formed across its length by the flood plains of the rivers Krishna and Godavari. The northern segment of the Eastern Ghats comprise a series of parallel hill ranges trending NE-SW to NNE-SSW with associated plateau at different altitudes and the maximum being about 1580 m in Visakhapatnam District. The southern segment encompasses Nallamala Hills and the associated Lankamala and Velikonda Hills with a general N-S trend and attaining an altitude of about 1040 m towards the south.

Geologically Andhra Pradesh is situated in the southeastern part of the Precambrian Shield of India. Anhauesser et.al (1969) proposed modern Precambrian classification into Craton comprising low-grade greenstone belt and granites with relative stability having older radiometric ages compare to mobile belts bordering the Craton with high grade rocks and plutons with younger radiometric ages. These rocks are with younger tectonic signatures. On the similar lines, Ramakrishnan & Swaminath, et.al., (1978) described greenstone belts under Dharwar Craton (DC) with the Cratonic margins encircled by namely Eastern Ghats Mobile Belt (EGMB), and Southern Granulite Terrain (SGT). The Dharwar Craton is divided into Western Tectonic Block (WTB) represented by two cycles of greenstone and associated granites totally included in Karnataka and Eastern Tectonic Block (ETB) comprising greenstone ï granite included in Karnataka, Telangana and Andhra Pradesh and both blocks being roughly separated by linear N-S trending Closepet batholith. Present demarcation of block is with respect to NS trending Eastern Chitradurga Fault which is parallel to the western contact of Closepet batholith. Also recent studies on similar lines of WTB were carried out in parts of Telangana and Andhra Pradesh of ETB of DC. Both WTB and ETB are with intracratonic Proterozoic Basin. The craton is bounded in the north-east by the EGMB, which consists mainly of granulites and extends into Odisha in a north-easterly direction. In the northern part of state, the craton is covered partly by the Phanerozoic Gondwana sediments along the NW-SE trending Godavari Rift/Graben, which is flanked on either side by the Proterozoic sedimentary sequences of Pakhal, Penganga and Sullavai basin the major part of which falls in Telangana. The Proterozoic sediments, constituting the well-known Cuddapah Basin, also occupy large tracts in the southcentral part. Isolated minor outcrops of the Cretaceous-Tertiary rocks and the Quaternary sediments are confined mostly to the coastal area. Laterite (bauxite) of Tertiary age is seen in certain areas along the coast and also in the main land, significant deposits of which are seen in the form of blanket cappings over the Eastern Ghats.

Mineral resources:

Andhra Pradesh is endowed with rich mineral wealth. Significant mineral deposits, namely, ferrous, non-ferrous and noble metals, precious & semiprecious stones, strategic minerals, fossil fuels and other industrial minerals are found in diverse geological formations ranging from Archaean to Quaternary. The Archaean metamorphic rocks are the hosts for several mineral deposits such as Dharwar Greenstones -gold and iron ore; Peninsular Gneisses - diamonds, dimension stones, chromite and precious & semi-precious stones and Eastern Ghats granulites - bauxite, manganese, graphite, apatite, gemstones, tungsten and dimension stones. The Proterozoic rocks, confined mostly to the intra-cratonic basins, contain

basemetals, barytes, asbestos, limestone, dolomite, diamonds, iron, and manganese ores, magnesite, phosphorite and uranium. The late Palaeozoic- early Mesozoic rocks, referred to as Gondwanas mostly seen along the coast refered as coastal Gondwana contain rich clay deposits. The Tertiary and Quaternary rocks contain oil and natural gas, beach sands, diamond and other gemstones. The mineral deposits of national importance are limestone, bauxite, barytes, coal, gold, diamond, dimension stones, manganese, mica, oil & gas. The state has large reserves of different grades of limestone. Besides the cement grade limestone, significant reserves of BF, SMS and high grade limestones are also found. Andhra Pradesh ranks next to Odisha in bauxite reserves with good quality bauxite occurring as high level cappings over the khondalite-charnockite suite of rocks in the Eastern Ghats covering parts of East Godavari, Visakhapatnam and Vizianagaram Districts. The reserves of bauxite estimated in these districts are placed at 615.267 Mt. The deposits in Andhra Pradesh and Odisha with a total reserve of about 2423.538 Mt constitute one of the largest bauxite deposits in the world. The largest barytes deposit in the world with a reserve of 69 Mt is located in Mangampeta in Cuddapah District seen within the Pullampet shale of the Cuddapah Supergroup.

Archaean greenstone belts, the major repositories of gold constitute the Dharwar Supergroup. They occur as linear, narrow and subparallel N-S to NNW-SSE trending schist belts amidst the Peninsular Gneissic Complex. These are Ramagiri-Penakacherla, Kolar (southern extension), Kadiri, Veligallu and Jonnagiri schist belts. The state has the distinction of having produced many of the historically famous diamonds like the Koh-i-noor, the Great Mogul, the Hope and the Orloff. Both primary and secondary source rocks of diamond occur in different parts of the state. Andhra Pradesh has immense potential for granite based dimensional stone industry. The Archaean-Proterozoic granite-gneiss terrain occupying more than 60% of the state, is a store-house of multicoloured rocks of which the Galaxy Granite (hypersthene gabbro norite) occurring in Prakasam District has high export potential. The state contributes about 6% of the manganese ore production in the country which is mainly associated with kodurites of the Khondalite Group in Eastern Ghats. Significant prospects of oil and natural gas have been identified over an area of about 40,000 sq km on-shore and off-shore areas in the Krishna-Godavari basins in parts of East and West Godavari and Krishna districts. The state is endowed with significant occurrences of strategic minerals/metals, which include monazite, ilmenite, tungsten, uranium and molybdenum. These are found in various geological environments. A number of occurrences of precious and semiprecious stones are known within a 50 km wide and about 250 km long belt distributed in East Godavari, Visakhapatnam and Vizianagaram districts. This belt, situated in the Eastern Ghats, extends into Odisha. Andhra Pradesh occupies a significant position among the states in the country, contributing about 9 % of the total value of the mineral production. The mineral deposits of national and local importance make the state an attractive and potential target area for investment in the promotion and growth of mineral based industries such as aluminium, cement, copper, lead, zinc, dimensional stones, refractories, ceramics, chemicals, iron, ferro-alloys and fertilizers.

TELANGANA

Geology:

The State of Telangana has an areal extent of about 114,840 sq km lying between 16º 00' and 20º 00' North latitudes and 77º 00' and 82º 00' East longitudes. It is broadly divisible into two physiographic units namely i) Gondwana graben and (ii) the Deccan Plateau forming a wide expanse of flat to low-undulatory terrain of plains and small hills. It has a general altitude ranging between 200 m and 600 m with a gentle easterly slope. The Godavari and the Krishna are the major rivers flowing through the State. Originating in the neighbouring States, these rivers enter Telangana and drain the Deccan Plateau and cut across the Eastern Ghats in Andhra Pradesh to debouch into the Bay of Bengal. Some the minor rivers drains in the state are Manjeera, Musi, Kinnersani, Manair and Munneru.

The area of Telangana State forms part of Southern Precambrian Tectonic Province or Southern Peninsular Shield and the shield elements are described under Dharwar Craton consisting of greenstone -granite suite with relative stability yielding relative older radiometric ages followed by intra cratonic basins (Cuddapah, Pakhal, Bhima and Godavari Graben comprising Gondwana sediments); and are bordered by Eastern Ghats Mobile Belt (EGMB) having highgrade granulites with younger thermal events. Dharwar Craton is divided into two tectonic Blocks with reference to its North-South trend. The Western Tectonic Block (WTB) covering major areas of Karnataka with two cycles of greenstones and geosyncline piles and the Eastern Tectonic Block (ETB) relatively narrow linear greenstone belts diapiric granites and the division is with respect to the N-S trending Closepet Batholith (Viswanatha and Ramakrishnan, (1976). The craton is covered partly by the Phanerozoic Gondwana sediments along the NW-SE Godavari Rift/Graben, which is flanked on either side by the Proterozoic sedimentary sequences of Pakhal, Penganga and Sullavai basins. A small portion of the Proterozoic Bhima Basin extends into the State from Karnataka in the west. The late Mesozoic Deccan Trap cover of the central and western India has its extension marginally into the north-western part of the State. Isolated minor outcrops of the Cretaceous-Tertiary rocks and the Quaternary sediments are confined mostly to the Inland river basins of Krishna, Godavari and their major tributaries over a very narrow zone bordering them. Laterite and Bauxite of Tertiary age are formed in certain areas over the Deccan traps.

Mineral resources:

Telangana is endowed with a variety of mineral deposits. Significant mineral deposits, namely, ferrous, non-ferrous and noble metals, precious & semiprecious stones, strategic and other industrial minerals are found in diverse geological formations ranging from Archaean to Proterozoic. The Archaean high grade metamorphic rocks contains copper, barytes and gemstones; Dharwar Greenstones - gold and iron ore; Peninsular Gneisses ï diamonds and precious & semi-precious stones and Eastern Ghats granulites ï bauxite and dimension stones. The Proterozoic rocks, confined mostly to the intra-cratonic basins, contain basemetals, barytes, limestone, dolomite, diamonds, iron ores, magnesite, phosphorite and uranium. The late Palaeozoic ï early Mesozoic rocks, referred to as Gondwanas contain coal deposits and clay.

The mineral deposits of national importance are limestone, barytes, coal, gold, diamond, dimension stones. The state has large reserves of different grades of limestone. Besides the cement grade limestone, significant reserves of BIF, SMS and high grade limestones are also found. The coal bearing formations are confined to the Godavari Valley covering an area of 17,000 sq km in Telangana State occupying parts of Adilabad, Karimnagar, Warangal, Khammam and West Godavari districts and potential area for the coal is estimated to be about 11,000 sq km. Coal seams associated with the Barakar Formation are found in Ramagundam- Manuguru- Kothagudem-Yellandu sectors. The total reserves of coal estimated up to 1200 m depth are of the order of 22054.58 Mt (April, 2011). Archaean greenstone belts, the major repositories of gold constitute the Dharwar Supergroup. They occur as linear, narrow and subparallel N-S to NNW-SSE trending schist belts amidst the Peninsular Gneissic Complex. These are Peddavuru, Yerrraballi, Gadwal and Ghanpur schist belts. The state has the distinction of having produced many of the historically famous diamonds like the Koh-i-noor, the Great Mogul, the Hope and the Orloff which were recovered from gravels of river Krishna near Kolluru and Chandralapadu in A.P. Both primary and secondary source rocks of diamond occur in different parts of the state. Telangana has immense potential for granite based dimensional stone industry. The Archaean - Proterozoic granite-gneiss terrain occupying more than 60% of the state is a store-house of multicoloured rocks. Manganese ore is mainly associated with Penganga beds in the Pakhal Basin.

Table-1: Major mineral resources of Andhra Pradesh & Telangana

(Reserves in million tonnes unless otherwise stated)

S.No.	Ore / Mineral	2005	2000	1995	2010
1	Asbestos	0.049	0.055	0.051	0.056531
2	Barytes	69.896	75.774	0.08	68.4784
3	Bauxite	615.267	612.756	551.479	615.267
4	China clay	73.675	72.785	52.504	74.18
5	Chromite	0.187	0.187	0.116	0.187
6	Copper ore	8.248	8.248	5.449	8.25
7	Diamond (M.Carats)	1.823	1.182	0.005	1.82
8	Dolomite(B.T)	1.146	1.130	0.129	1.182452
9	Gold	12.098	8.553	3.791	12.1
10	Graphite	0.427	0.427	0.219	0.427199
11	Iron ore Hematite(B.T) Magnetite (B.T)	 0.163 1.463	 0.140 1.463	 0.051 0.418	 0.381478 1.463541
12	Lead ï Zinc ore	6.62	6.62	1.954	22.689
13	Limestone (B.T)	35.18	35.219	15.059	35.18
14	Magnesite	0.08	0.08	NA	0.080
15	Manganese ore	15.583	18.287	11.905	17.598
16	Mica (M.Kgs)	111.3	40.36	44.837	220.786228
17	Sillimanite	8.776	8.776	7.898	9.644500
18	Tungsten	14.802	14.802	14.395	14.802300

(Source ï IBM Yearbook 2001, 2004, 2008, 2010)
B.T. = Billion Tonnes , M.Kgs = Million Kilograms, M. Carats= Million Carats
NA- Data not available

TAMILNADU & PUDUCHERRY

Geology:

Tamil Nadu, with an area of 1,30,058 sq.km. is situated in the SE part of the Indian peninsula between North Latitudes $08^0 00'$ and $13^0 30'$ and East Longitudes $76^0 00'$ and $80^0 18'$. The western part comprises the Western Ghat roughly trending N-S and marked by a continuous range of Hills. The central part of the state is a vast track of dissected pediments and pediplains with residual hills. A coastal plain with associated landforms marks the eastern part. The Union Territory of Puducherry is located on the East Coast, about 160 km. south of Chennai and occupies an area of 492 sq.km.

Crystalline rocks of Archaean to late Proterozoic age occupy over 80% of the area while the rest is covered by Phanerozoic sedimentary rocks mainly along the coastal belt and in a few inland River valleys. The hard rock terrain comprises predominantly of Charnockite and Khondalite groups and their migmatitic derivatives, supracrustal sequences of Sathyamangalam and Kolar groups and Peninsular Gneissic Complex (Bhavani Group), intruded by ultramafic-mafic complexes, basic dykes, granites and syenites. The crystalline rocks are derived through a complex evolutionary history during Archaean and Proterozoic times with multiple deformations, anatexis, intrusions and polyphase metamorphic events. The sedimentary rocks of the coastal belt include fluviatile, fluvio-marine and marine sequences ranging in age from Carboniferous to Mi-Pliocene and sediments of Quaternary age.

The Pre-Crambrian terrain of Tamil Nadu is extensively fractured and deeply faulted particularly in the northern and central parts. The Phanerozoic sediments are relatively unaffected. The Phanerozoic sediments show well-preserved bedding planes where the dips vary from horizontal to 10^0. The crystaline rocks on the other hand, had undergone polyphase deformation and metamorphism resulting in well-developed foliation (S_1, which follows the litho contacts at many places. Subsequent deformations have induced local development of new S fabrics. In the northeast, the regional structure trend is NNE-SSW. This sector is characterised by long linear canoe-shaped folds as a result of F_2 deformation. The northwest is characterised by nearly N-S regional structural trend. Although polyphase folding has been recognized in this terrain, no distinct regional structures have been interpreted. In the central part, the regional structureal trend is E-W often swerving to ENE-WSW and WNW-ESE. The southernmost sector, to the south of Tambaraparani River shows a distinct NW-SE structural grain. A number of shear zones have been recognized in the Pre-Cambrian terrain. This includes Moyyar, Bhavani, Salem-Attur, Cauvery, Dharmapuri, Gangavalli and Achankovil shear zones.

Mineral resources:

Tamil Nadu is endowed with varieties of minerals. The chief mineral resources are fossil fuels (lignite, petroleum and natural gas), metalliferous minerals (iron ore, bauxite, gold, platinum, molybdenum and poly-metallic sulphides) and non-metallic and industrial minerals (limestone, dimension stone, magnesite, ceramic raw materials, graphite, gypsum, heavy mineral, silica sands, vermiculite, quartz, feldspar and gemstones). There is scope for getting coal bed methane in the deep level lignite beds. Lignite is associated with Cuddalore Formation in Cauvery basin. A total of 31327 million tonnes of lignite has been estimated in Cuddalore, Perambalur, Puducherry, Ramanathapuram, Thanjavur and Tiruvarur districts. About 0.79 million tonnes of poly-metallic mineralisation, mainly zinc and lead has been estimated in Mamandur, Tiruvannamalai Districts. A total of 26.85 million tonnes of bauxite ore has been estimated for the State. Bauxite occurs as irregular lenses - pockets and high-level laterite cappings over charnockite in the Nilgiri, Shevroy, Kollimalai and Palani Hills. Gold occurs associated with quartz confined to shear zone in the Nilgiri district and associated with granite greenstone belt in Krishnagiri District. The State possesses around 500 million tonnes of low grade iron ore resources, mainly magnetite, with an average grade of 38% iron. The major deposits occur in Salem, Vellore, Tiruvannamalai, Villupuram, Dharmapuri, Thiruchirappalli, Namakkal and Perambalur districts. Molybdenum occurs in different geological settings - in Alangayam, Vellore district it is associated with quartz-barite veins, in Harur- Uttangarai Belt (HUB), Dharmapuri District it is confined to a shear zone traversing epidote hornblende gneiss and quartzofeldspathic gneiss and in Karadikuttam area, Dindigul District molybdenum is assocated with pegmatite intrusive into migmatitic gneiss. Layered mafic and ultramafic complexes of the state are the repositories of PGE. Sittampundi UM Complex in Namakkal District and Mettupalaiyam UM Copmplex in Erode district are currently being prospected.

Substantial limestone deposits occur in Tamil Nadu. Non-crystalline (sedimentary) limestones of marginal garde are located in parts of Cuddalore, Perambalur and Tiruchirapalli districts, confined to the Creatceous formations of Cauvery Basin. Tertiary coralline limestone is exposed in the series of islands in Gulf of Mannar, Palk Bay and Rameswaram. High grade crystalline limestone occurs in parts of Salem, Karur, Madurai, Virudhunagar and Coimbatore districts as pockets in the migmatite terrain. The total limestone reserves of the state are estimated as 1282 million tonnes (IBM, 2008). Prominent deposit of magnesite is located on Chalk Hills, Salem district. Magnesite occurs as criss-cross veins traversing dunite / peridotite. About 45.52 million tonnes of ore has been estimated. Graphite occurs in Sivaganga District, Kurinjankulam in Tirunelveli District, Palakottai Hill and near Pudupalaiyam in Vellore District and Tirumangalam, Ponnamangalam in Madurai district. A total of 7.91 million tonnes of resource has been estimated in the Sivaganga Graphite Belt which is currently under exploitation. Gypsum reserves of Tamil Nadu are estimated to be 27.311 mt mainly reported from Perambalur and Lalgudi in Tiruchirapalli district. The State has major heavy

mineral deposit (ilmenite**, r**utile, monazite and garnet-bearing sands) that occur as beach placers. About 8.62 mt of zircon, 28.35 mt of garnet, 106.68 mt of ilmenite, 5.11 mt of rutile and 4.91 mt of leucoxene has been estimated for the southern coastal area (IBM year book 2008). Apatite occurs in hybrid rocks (syenite-pyroxenite) and in the carbonatite near Sevattur, Vellore District, with total reserves of 2, 40,000 tonnes. Phosphatic nodules occur in association with gypseous clay and shale of Karai Formation, Uttattur Group of Cretaceous age, in Tiruchirapalli district. A total probable reserve of 1,27,000 tonnes was estimated. The P_20_5 content of the nodules varies from 21.14 to 26.50%. Tamil Nadu is the dimensional stone capital of the country. Rasipuram Blue, Moonstone/Raw, Black granite, Olive/sea Green, Columbu Jubrano, English Teak/ Someka Red/Black, Sappire Blue, Paradiso, Pink Multi, Red Wave, Red Mond, Hosur Grey, Tiger Skin, Kashmir White and Kunnam Black are some of the commercial varities produced in the State. A probable resource of 30.39 million cu m has been estimated up to 2008. Apart from these, other commodities like asbestos, barytes, clay, corundum, feldspars, gemstones, mica, ochre, moulding / glass sand, quartz, sillimanite, steatite and vermiculite are also present. Minor occurrences of minerals such as beryl, celestite, columbite-tantalite, garnet, ilmenite, kankar, nickel ore, pyrite, allanite and salt are also recorded

In the Union Territory of Puducherry, ilmenite and garnet sands occur along the coast of Karaikal with reserves of 17,26,862 tonnes (source AMD). In Puducherry, china clay (2 mt) and limestone (15 mt) are also available.

Table-2: Major mineral resources of Tamil Nadu
(Reserves in million tonnes unless otherwise stated)

S.No.	Ore / Mineral	Tamil Nadu			
		1995	**2000**	**2005**	**2010**
	Barytes	0.117	0.222	0.222	0.2224
	Bauxite	22.648	25.156	26.845	24..820
	China clay	44.968	56.897	56.897	56.897
	Chromite	0.24	0.282	0.282	0.283
	Copper ore	NA	0.79	0.79	0.790
	Dolomite	1.627	2.145	2.145	2.145
	Gold	NA	0.067	0.067	0.0670
	Graphite	0.423	1.287	7.914	8.2388
	Iron ore Magnetite (B.T)	1	NA	0.481	0.5070
	Lead ï Zinc ore	0.462	0.79	0.79	0.790
	Limestone (B.T)	0.805	1.2	1.18	1.1824
	Magnesite	48.919	68.044	45.517	40.511
	Molybdenumite	0.036	6.975	9.965	-
	Sillimanite	15.62	17.926	17.926	17.9524
	Lignite	17354 MT	18377 MT	20350 MT	32892.92 MT
(Source ï IBM Yearbook 2001, 2004, 2008, 2010) NA- Data not available B.T. = Billion Tonnes , M.Kgs = Million Kilograms, M. Carats= Million Carats, MT= Million Tonnes					

KARNATAKA & GOA

Geology:

The State of Karnataka occupying an area of 1,91,792 sq.km. is bounded by north latitudes $11^0 32'$ and $18^0 30'$ and east longitudes $74^0 05'$ and $78^0 32'$ whereas the State of Goa bounded by latitudes $14^0 54'$ and $15^0 48'$ and east longitudes $73^0 48'$ and $74^0 20'$ along the West Coast between Western Ghats and Arabian Sea has an area of 3,701 sq.km.

The States of Karnataka & Goa forming a part of the Indian Shield are constituted of rock formations ranging in age from 3300 m.a. to 5 m.a. Barring a narrow coastal strip of about 5000 sq.km. of Tertiary and Quaternary sediments and another 31,250 sq.km. of Deccan basalts, the remaining area is occupied by Archaean-Proterozoic rocks. Major part of the state is constituted of Dharwar Craton comprising greenstone belts, gneisses and granites which, at the southern margin of the craton, give way to granulite suite of rocks. The greenstone belts, host a variety of mineralization, essentially consist of meta-volcano-sedimentary sequences, surrounded and dissected by granite-gneiss complex. Dharwar craton is considered to comprise two tectonic blocks viz; the Western Tectonic Block and the Eastern Tectonic Block. The green stone belt in the Eastern block are considered as true greenstone belts whereas those of the Western block are considered as schistose belts. The greenstone belts of the western block include the Sargur Group and the Dharwar Supergroup. The main litho-assemblages in the Sargur Group are meta ultramafics such as serpentinised komatiite, talc-tremolite schist, amphibolite, high grade metapelites such as fuchsite quartzite, kyanite-sillimanite schist, carbonates and Banded Iron Formation. The Dharwar Supergroup is divided into lower Bababudan Group, consisting largely of volcanic suites with shelf/platformal metasediments rich in iron and manganese precipitates; and the upper Chitradurga Group, largely made up of meta-sedimentary sequences of argillite-greywacke assemblage with meta-volcanics. Litho assemblage of the eastern belts comprises greenstone suite consisting of bimodal mafic-felsic volcanics, and pyroclastics and minor amount of meta-sedimentary sequence consisting of quartzite, meta-pelites, marbles and Banded Iron Formation. The peripheral zones of these belts are extensively migmatised by the younger phase of Peninsular Gneiss, hence the basement-cover relationship remains ambiguous. Characteristically these belts are endowed with gold mineralisation. The craton preserves a billion year orogenic history from 3400 m.a. to 2400 m.a. Epicratonic or intracratonic sedimentary basins called Purana Basins occupy the northern segment of the craton whose northern part in turn is concealed by Deccan basalts. The southern coastal tracts of Dakshina Kannada district expose beds of shelly limestone, clay and grit, intercalated with lignite layers which are considered to be the extension of Warkalli Beds of Kerala. The majority of the rock sequences of Karnataka are lateritised due to their exposure to suitable climatic condiditions for a prolonged period. These laterites occur as extensive cappings in the Western Ghats and in coastal plains. The other rock types exposed belong to Quaternary formations and include Recent Soil and Alluvium.

The State of Goa comprises a narrow strip of land measuring about 100 km. in north-south direction and 20-50 km. in east-west direction, along the West Coast. The Goa State constitutes the northwesterly extensions of the granite-greenstone terrain of Karnataka comprising gneisses, migmatites, schists, meta-volcanics (both acid and basic), meta-greywacke, banded ferruginous quartzite associated with mangniferous phyllite / argillite, limestone, dolomite and thin bands of quartzite intruded by granite and ultramafic complexes. Basaltic flows of Deccan Traps are exposed in northeastern border of Goa.

Mineral resources:

Karnataka occupies the premier position in terms of metallic mineral production. This state is the sole producer of felsite and the leading producer of gold accounting for 94% of the total production of gold in the country. Karnataka State is second largest producer of metallic ores and occupies seventh place in mining non metallic minerals. No fuel minerals of economic grade and scale are reported. Total reserves in terms of percentage contributed by the state to the all India resources is 64% of gold, 36.5% of manganese ore, 80% of magnetite and 22.5% limestone. Manganese, chromite and ores of iron (both haematite and magnetite) are the principal commodities being exploited for decades; the state still holds huge reserves of the same in the geographic domains of Chitradurga belt, Kudremukh belt, Western Ghat belts and Sandur basin. Aluminium rich laterite cappings, a residual product of selective and sustained weathering and leaching of Deccan basalts and basement granitoids/gneisses in parts of coastal districts constitute the notable metallic ore of aluminium of Karnataka. Major mineral deposits and estimated reserves are narrated here in brief.

Table-3: Major mineral resources of Karnataka
(Reserves in million tonnes unless otherwise stated)

S.No.	Ore / Mineral	Karnataka			
		1995	**2000**	**2005**	**2010**
1	Asbestos	0.29	8.282	8.282	8.2824
2	Barytes	0.009	0.015	0.015	0.01517
3	Bauxite	27.332	44.981	49.503	55.705
4	China clay	12.857	255	257	2.5852
5	Chromite	1.452	1.87	1.789	1.632
6	Copper ore	5.669	34.404	34.404	33.535
7	Dolomite	346.152	535.239	633.509	662.116
8	Gold	12.863	24.232	66.172	66.1724
9	Graphite	0.262	0.267	0.267	0.6731
10	Iron ore Hematite(B.T) Magnetite (B.T)	 1.072 2.784	 1.148 7.883	 1.676 7.811	 2.15867 7.8017
11	Limestone (B.T)	17.439	51.210	51.885	51.8858
12	Magnesite	1.229	3.754	3.857	4.046
13	Manganese	41.054	86.568	82.736	96.188
14	Molybdenumite	0.9	1.32	1.320	1.3209
15	Sillimanite	0.475	0.983	0.983	0.9827
16	Tungsten	NA	36.68	36.68	36.6778
(Source ï IBM Yearbook 2001, 2004, 2008, 2010) B.T. = Billion Tonnes , M.Kgs = Million Kilograms, M. Carats= Million Carats NA- Data not available					

Goa, though has a limited area, it is well endowed with economic mineral deposits, particularly iron and manganese ores. Because of their proximity to the sea port, they are being mined extensively for export. Besides iron and manganese, a number of deposits of bauxite, silica sand, low grade limestone, clays, low grade chromite and quartzite are also known from Goa.

Table-4: Major mineral resources of Goa
(Reserves in million tonnes unless otherwise stated)

S.No.	Ore / Mineral	Goa			
		1995	**2005**	**2000**	**2010**
1	Bauxite	51.26	50.355	53.072	58.001
2	China clay	0.015	0.016	0.016	0.016
3	Iron ore Hematite(B.T) Magnetite (B.T)	 0.745 0.164	 0.712 0.214	 0.642 0.215	 0.9271 0.22267
4	Manganese ore	16.865	19.057	23.271	
(Source ï IBM Yearbook 2001, 2004, 2008, 2010 B.T. = Billion Tonnes , M.Kgs = Million Kilograms					

KERALA

Geology:

Kerala is bounded by N Latitudes $8^0$17ô and $12^0$47ô and E Longitudes $74^0$52ô and $77^0$25ô and has an area of 38,864 sq.km. spread in a linear stretch along the southwest coast of India. The land is divisible into four physiographic features ï (i) a low-lying coastal plain fringing the Lakshadweep Sea in the west, (ii) vast stretch of laterite-capped midland region between 30 and 200 m height above MSL, (iii) the moderate to gently sloping foothills of the Western Ghats, between 200 and 600m elevation above MSL and (iv) the rugged high mountains of the Western Ghats, which rise to heights of over 2500 m above MSL. While hard crystalline rocks occupy about 35,955 sq.km. of the total area, the rest of 2,909 sq.km. area is covered by soft sedimentary formations. The major rock types found in the State belong to the Khondalite and Charnockite Groups and the Peninsular Gneissic Complex of Precambrian age. Meta-basic, meta-ultrabasic and meta-sedimentary rocks belonging to the Archaean Wayanad Group (equivalent to the Sargurs of Karnataka) are the oldest rock units in the State, which are found as large enclaves, mainly within the Peninsular Gneissic Complex occupying the northern parts of the State. Granites, syenites, granodiorite, quartzo-feldspathic veins, gabbro and dolerite dykes are the youngest acid and basic intrusives, found across the State. The only sedimentary formation found in the State is the Tertiary Warkalli Formation. Detached, linear outcrops of Warkalli Formation are found all along the west coast, with the type section exposed at the Warkalli cliff. Quaternary deposits of marine fluviomarine and fluvial origin are extensively found over the coastal plains and within major river basins.

Mineral resources:

Kerala is not a rich State as far its mineral wealth is concerned. However, its clay and heavy mineral rich beach placer deposits are being effectively exploited. General Cullen (1840-60), had discovered graphite deposits at Vellanad and Venganur in Thiruvananthapuram district in the erstwhile Travancore (now South Kerala) and during the period 1898-1912, these deposits were under active mining. Bruce Foote (1883) and William King (1875, 1878, 1882) of the Geological Survey of India had taken traverses across the State and recorded their findings on geology and mineral resources. In 1907, a Geology Department was formed in Travancore for the systematic survey of minerals.

The important mineral deposits found in the State are- china clay, beach sand rich in heavy minerals like ilmenite, rutile, monazite, zircon, garnet, sillimanite etc; bauxite, glass-sand, iron-ore, limestone, lime shell, gold, graphite, dimension stones, gems and semi-precious stones. The resource potential of important minerals found in the State is given below.

Table-5: Major mineral resources of Kerala

(Reserves in million tonnes unless otherwise stated)

S.No.	Ore / Mineral	Kerala			
		1995	**2005**	**2000**	**2010**
1.	Bauxite	8.426	14.098	14.161	14.096
2.	China clay	127.48	630.652	468.801	663.834
3.	Gold	0.558	0.558	0.558	0.5585
4.	Graphite	0.533	1.45	1.45	1.5853
5.	Iron ore Magnetite (B.T)	0.036	0.083	0.083	0.08344
6.	Limestone	154.376	206.985	210.051	206.985
7.	Magnesite	0.035	0.04	0.04	0.040
8.	Sillimanite	9.607	9.248	9.906	7.150049
9.	Ilmenite	-	102.00	-	114.229707
10.	Rutile	-	6.82	-	3.775852
11.	Leucoxene	-	4.87	-	9.66852
12.	Zircon	-	5.99	-	2.759107
(Source ï IBM Yearbook 2001, 2004, 2008, 2010, B.T. = Billion Tonnes , M.Kgs = Million Kilograms					

2. ORGANIZATIONAL STRUCTURE OF THE REGION: IN MISSION – REGION MODE

Organizational Structure of the Region:

GSI has its Central Headquarters in Kolkata and six Regional Offices, geographically based at Kolkata, Lucknow, Jaipur, Nagpur, Hyderabad and Shillong, and has State Units in all the States. GSI is now an Attached Office of the Ministry of Mines. Till July, 2009 it was a subordinate office of the Ministry. Its upgradation follows recommendation of a High Powered Committee set up in 2008.

The Union Cabinet had constituted a High Powered Committee (HPC) to review the functioning of Geological Survey of India and assess its capacity to meet the emerging challenges taking into account the technological and manpower resources of the organization. The report of the committee was accepted by the Government. As per the recommendations of the HPC the organizational structure of GSI is undergoing changes commensurate with its new-found status. The organizational structure of GSI is already substantially reoriented to meet the needs of specialization as well as multidisciplinary study. Accordingly, changes in organizational setup were made based on the Mission ï Region ï Hybrid Matrix Mode of functioning of the organization. However, to meet the challenge and to take up the task envisaged, GSI has to expand its human resource potential and infractural facility to manifold which can be achieved only over a period of time. The process is on and continuous, perceptible changes are taking place.

Implementation of the Mission-Region Hybrid Matrix mode of functioning is already effected by the Southern Region. The current organizational setup of the GSI, SR in Region-Mission mode is shown in the Organogram attached at the last page.

3. ACTIVITY DOMAIN OF THE REGION

A) IMPORTANT ACTIVITIES OF SOUTHERN REGION IN MISSION MODE:

I) Mission – I

Mission IA

i. Systematic geological mapping/specialised thematic studies.
ii. Geochemical mapping.
iii. Geophysical mapping/surveys.

Mission IB

iv. Geomorphological and Lineament Mapping
v. Photogeology and Remote Sensing

Mission IC

vi. Marine and Coastal Surveys Division

II) Mission –II

Mission -IIA

vii. Mineral Resource assessment.

Mission -IIB

viii. Natural Energy Resource (Coal and Lignite)

III) Mission- III

ix. Geodata and Geoinformatics
x. Map compilation and Map Publication
xi. Publication and Information Delivery

IV) Mission- IV

xii. Geotechnical studies.
xiii. Lanslide studies
xiv. Earthquake geology studies.
xv. Medical Geology
xvi. Fundamental Geoscience - Petrology, Palaeontology and Mineral Physics.

V) Mission- V

xvii) RTI / FTC Programmes

VI) S & T Support System (STSS)

xviii. Laboratory support
xix. IT infrastructure connectivity
xx. Chemical Laboratory support
xxi. Drilling
xxii. Transport

Administrative Support System:

xxiii. Finance
xxiv. Personnel
xxv. Legal Cell
xxvi. HRD
xxvii. Information and Publications
xxviii. Core Repository
xxix. Geoparks and Museums
xxx. Estates.

Policy Support System:

xxxi. Science Policy & coordination
xxxii. Planning & Monitoring
xxxiii. Commercial Operations
xxxiv. Geoscience partnerships
xxxv. Survey
xxxvi. Technical Consultancy Service

B. ONGOING PROJECTS IN SOUTHERN REGION (FS 2014-15)

Annual Field Season Programmes for F.S. 2014-15 has been initiated in April, 2014. The annual programme has been formulated in accordance with the departmentôs priorities as per XII Plan document. The FSP is in Project mode with well defined time line and financial requirements. All the items of the Annual Programme 2014-15 have been peer reviewed by internal as well as external experts and approved by the Central Geological Programming Board (CGPB). The approved FSP items Mission wise for SR are listed below:-

Sl.No.	Title
	MISSION-I
	Mission - IA : Ground Surveys
	Specialised Thematic Mapping
1	Specialised thematic mapping of granitoids and associated shear zones in parts of **Karimnagar** and **Medak** districts, NE part of eastern Dharwar Craton, Andhra Pradesh with special reference to molybdenite and other associated mineralisation.
2	Specialised thematic mapping of the Pakhal sediments in parts of **Khammam** & **Warangal** districts, Andhra Pradesh
3	Specialised thematic mapping of the granitic terrain and associated shears in Palkurti-Torur- Mahabubabad - Panditapuram area, parts of **Warangal** and **Khammam** districts, Andhra Pradesh
4	Specialised thematic mapping in Amangal- Chintapalli area in parts of **Mahbubnagar** and **Nalgonda** districts with special reference to shear zones/faults and associated mineralization in the eastern part of Dharwar Craton, Andhra Pradesh**.**
5	Specialized thematic mapping of ultrapotassic volcanic rocks and associated magmatism in Nallamalai Fold Belt of Proterozoic Cuddapah Basin and their bearing on mineralization around Rajampeta area , **Cuddapah** district, Andhra Pradesh
6	Tectonostratigraphic relation of Bababudan Group, PGC and Karadi granite in the Kibbanhalli arm of Chitradurga Schist Belt around Banasandra-Karadi-Gopalanahalli areas, **Tumkur** district, Karnataka.
7	Tectonostratigraphy of high grade litho-assemblages, migmatites and Closepet granite around Kollegal, Hanur, and Ajjipura, **Chamrajanagar** district, Karnataka
8	Tectonic evolution of eastern part of the Moyar ï Bhavani ï Attur lineament, **Erode**, **Salem** and **Namakkal** districts, Tamil Nadu
9	Specialised thematic mapping in parts of Kadavur structural basin, **Dindigul, Karur** and **Tiruchirapalli** districts, Tamil Nadu.
10	Specialised thematic mapping to trace the extension of the shear zones associated with Mamandur polymetal sulphide mineralization in **Villupuram** and **Tiruvannamalai** districts, Tamil Nadu.
11	Study on the sanukitoid type rocks and structure in the western extension of Palghat-Cauvery Lineament and its geological implications, **Palakkad** district, Kerala
12	Study of geology of the ôPeriyar Lineamentô around Malayattur ï Kotamangalam - Neriyamangalam area, **Ernakulam** and **Idukki** districts, Kerala.
	National Geochemical Mapping
13	Geochemical mapping in parts of **Anantapur & Mahbubnagar** districts, Andhra Pradesh and **Chitradurga & Bellary** districts, Karnataka (toposheet no. **57B/13** and parts of **56L/4)**
14	Geochemical mapping in parts of **Anantapur & Mahbubnagar** districts, Andhra Pradesh and **Chitradurga & Bellary** districts, Karnataka (toposheet no. **57B/14** and parts of **56L/4)**
15	Geochemical mapping in parts of Anantapur, **Cuddapah and Kurnool** districts, Andhra Pradesh (toposheet no. **57J/1**, parts of **56L/4)**
16	Geochemical mapping in parts of **Anantapur**, **Cuddapah and Kurnool** districts, Andhra Pradesh (toposheet no. **57J/2**, parts of **56L/4)**
17	Geochemical mapping in parts of **Mahbubnagar** district, Andhra Pradesh (toposheet no. **56H/15**, parts of **56L/4**)
18	Geochemical mapping in parts of **Mahbubnagar** district, Andhra Pradesh (toposheet no. **56H/16**, parts of **56L/4**)
19	Geochemical mapping in parts of **Mahbubnagar** district, Andhra Pradesh and **Raichur** district of Karnataka (toposheet no. **56H/11**, parts of **56L/4**)
20	Geochemical mapping in parts of **Mahbubnagar** district, Andhra Pradesh and **Raichur** district of Karnataka (toposheet no. **56H/12**, parts of **56L/4**)
21	Geochemical mapping in parts of **Mahbubnagar and Rangareddy** districts, Andhra Pradesh (toposheet no. **56H/9**, parts of **56L/4**)

22	Geochemical mapping in parts of **Mahbubnagar** district, Andhra Pradesh (toposheet no. **56H/10**, parts of **56\L/4**)
23	Geochemical mapping in parts of **Mahabubnagar and Rangareddy** districts, Andhra Pradesh (toposheet no. **56H/13**, parts of **56L/4**)
24	Geochemical mapping in parts of **Mahbubnagar** district, Andhra Pradesh (toposheet no. **56H/14**, parts of **56L/4**)
25	Geochemical mapping in parts of **Vizianagaram** district, Andhra Pradesh (toposheet no. **65N/6**, parts of **65N/8**)
26	Geochemical mapping in parts of **Vizianagaram** and **Visakhapatnam** districts, Andhra Pradesh (toposheet no. **65N/7**, parts of **65N/8**)
27	Geochemical mapping in parts of **Srikakulam** and **Vizianagaram** districts, Andhra Pradesh (toposheet no. **65N/10**, parts of **65N/8**)
28	Geochemical mapping in parts of **Mahabubnagar and Ranga Reddy districts, Telangana State** (toposheet no. 56L/1 (A1, B1, C1 quadrants) (New Item) ï 320 sq.km
29	Geochemical mapping in parts of **Bagalkot, Koppal and Gadag** districts, Karnataka (toposheet no. **57A/1** and A1 quadrant of **57 A/11**)
30	Geochemical mapping in parts of **Koppal and Gadag** districts, Karnataka (toposheet no. **57A/2** and A2 quadrant of **57 A/11**)
31	Geochemical mapping in parts of **Bagalkot, Koppal and Raichur** districts, Karnataka (toposheet no. **57A/5** and B1 quadrant of **57 A/11**)
32	Geochemical mapping in parts of **Koppal and Raichur** districts, Karnataka (toposheet no. **57A/6** and B2 quadrant of **57 A/11**)
33	Geochemical mapping in parts of **Raichur** district, Karnataka (toposheet no. **57A/9** and B3 quadrant of **57 A/11**)
34	Geochemical mapping in parts of **Koppal and Raichur** districts, Karnataka (toposheet no. **57A/10** and C1 quadrant of **57 A/11**)
35	Geochemical mapping in parts of **Koppal and Raichur** districts, Karnataka (toposheet no. **57A/13** and C2 quadrant of **57 A/11**)
36	Geochemical mapping in parts of **Raichur, Koppal and Bellary** districts of Karnataka and **Kurnool** district of Andhra Pradesh (toposheet no. **57A/14** and C3 quadrant of **57 A/11**)
37	Geochemical mapping in parts of **Bellary, Koppal and Gulbarga** districts of Karnataka (toposheet no. **57A/15** and A3 quadrant of **56D/9**)
38	Geochemical mapping in parts of **Bellary and Gulbarga** districts of Karnataka and **Ananthapur** district of Andhra Pradesh (toposheet no. **57A/16** and B3 quadrant of **56D/9**)
39	Geochemical mapping in parts of **Tumkur** district of Karnataka and **Ananthapur** district of Andhra Pradesh (toposheet no. **57G/2** and C1 quadrant of **57 G/3**)
40	Geochemical mapping in parts of **Tumkur and Kolar** districts of Karnataka and **Ananthapur** district of Andhra Pradesh (toposheet no. **57G/6** and B1 quadrant of **57 G/8**)
41	Geochemical mapping in parts of **Tumkur, Kolar and Bengaluru** districts, Karnataka (toposheet no. **57G/7** and C1 quadrant of **57 G/8**)
42	Geochemical mapping in parts of Kolar and Bangalore district, Karnataka & Chittoor district, AP (toposheet no. **57K/8 (A3, B3, C2, C3** quadrants) (New Item) -320 sq.km
43	Geochemical mapping in parts of Kolar and Bangalore district, Karnataka & Chittoor district, AP (toposheet no. **57K/2 (A1, A2, B1, B2** quadrants) (New Item) ï 320 sq.km
44	Geochemical mapping in parts of Gulbarga district of Karnatakaa (toposheet no. **56D/13 (A2, A3, B2**, B3, C2, C3 quadrants) (New Item) ï 480 sq.km
45	Geochemical mapping in parts of **Tiruppur** district,Tamil Nadu (toposheet no. **58E/8**)
46	Geochemical mapping in parts of **Karur, Tiruchirappalli, Dindigul** and **Tiruppur** districts, Tamil Nadu (toposheet no. **58 J/1** & part of **58 E/8**)
47	Geochemical mapping in parts of **Tiruppur** district, Tamil Nadu (toposheet no. **58 F/9** & part of **58E/8**).
48	Geochemical mapping in parts of **Karur and Tiruppur** districts, Tamil Nadu (toposheet no. **58 F/13** & part of **58 E/8**)
49	Geochemical mapping in parts of **Erode, Tiruppur and Coimbatore** districts, Tamil Nadu (toposheet no. **58 E/3** & part of **58 E/8**)
50	Geochemical mapping in parts of **Coimbatore and Tiruppur** districts, Tamil Nadu (toposheet no. **58 E/4** & part of **58E/8**)
51	Geochemical mapping in parts of **Erode and Tiruppur** districts, Tamil Nadu (toposheet no. **58 E/6** & part of **58E/8**)

52	Geochemical mapping in parts of **Dharmapuri, Krishnagiri, Tiruppur** districts, Tamil Nadu and **Mysore** district, Karnataka (toposheet no. **57 H/16** & part of **58 E/8**)
53	Geochemical mapping in parts of Nilgiri, Coimbatore and Erode districtss, Tamil Nadu (toposheet no. **58 A/15** in A2,A3, B2, B3, C2, C3 quadrants)- 480sq.km (New Item)
54	Geochemical mapping in **Kannur and Kasaragod** districts, Kerala and **Kodagu** district of Karnataka **(**toposheet no. **48P/12** & part of **48 P/4**)
55	Geochemical mapping in **Kasaragod and Kannur** districts, Kerala and **Dakshina Kannada** district of Karnataka **(**toposheet no. **48P/2** & part of **48 P/4**)
	National Geophysical Mapping (NGPM)
56	Regional Gravity and Magnetic (TF) Surveys in toposheet nos. **58 E / 1, 2, 5, 13, and 14 in parts of Tamil Nadu and Karnataka** states.
57	Regional Gravity and Magnetic (TF) Surveys in toposheet nos. **57 M / 1, 2, 3, 5 and 6 in parts of Andhra Pradesh** state.
58	Regional Gravity and Magnetic (TF) Surveys in toposheet nos. **57 A / 5, 6, 9, 10 and 11 in parts of Karnataka** state.
59	Regional Magnetic (TF) Surveys in toposheet nos. **57 F/3, 4, 8, 11, 12, 15 and 16, in parts of Andhra Pradesh and Karnataka** states.
	National Geomorphological and Lineament Mapping (NGLM) (Mission-IB)
60	**All India** mosaic of National Geomorphological and Lineament mapping on 1:50,000 scale using satellite data
	M**&CS Division (Mission-IC)**
56	**SR-006***:Geological and Geophysical investigations in Cauvery-Mannar offshore basin and Krishna-Godavari offshore basin, Eastern continental margin of India for the gas hydrates studies (NIO)
57	**SR-007:** Morphotectonic and sediment characteristic studies of Laxmi Ridge
58	**SR-00**8: Detailed assessment of Lime mud in the continental margin off Gujarat for estimation of resource.
59	**SR-009**: Appraisal of Lime mud in the continental shelf off Kakinada-Visakhapatnam coast
60	**SR-010**: Systematic Seismic, magnetic and gravity surveys in the Bay of Bengal over 85^{o} E Ridge and 90° E Ridge
61	**SD-255**: Evaluation of sand resources beyond TW off Kodungallur, Kerala
62	**SD-256**: Delineation of buried palaeochannels and sand bodies, off Hangarkatta, Karnataka coast.
63	**SD-257**: Mapping of the seabed off Okha
64	**SD-258**: Multibeam Bathymetric Survey Of Part Of Gulf Of Kachchh Off Mandvi, Gujarat.
65	**SD-259**: Swath bathymetric survey of part of Arabian sea off Karwar beyond TW, Karnataka (Block-I).
66	**SD-260**: Swath bathymetric survey of part of Arabian sea off Karwar beyond TW, Karnataka (Block-II).
67	**SD-261:** Evaluation of heavy mineral sands off Muttamtura, Tamil Nadu
68	**ST-237**: Mapping of seabed in the TW north off Rameswaram, Tamil Nadu coast.
69	**ST-238**: Placer mineral resource evaluation in the territorial waters off Santapalle, North of Bimunipatnam, Andhra Pradesh
70	**ST-242**: Parametric (Magnetic and Seismic) survey within Territorial Waters off Vainateyam Godavari River and Vasisihta Godavari River mouths, Andhra Pradesh Coast
71	**ST-243**: Geotechnical appraisal of shallow sea bed off Ponnaiyar and Gadilam River mouths,Tamilnadu coast
72	**Item 080**: Coastal survey between Nileswaram and Ezhimala, Kasaragod & Kannur Dts Kerala for identification of heavy mineral occurrences.
73	**Item-083**: Mapping of nearshore gap areas and assessment of Heavy Mineral potential off Anjengo, Kerala
74	**Item-108** Geo environmental appraisal of coastal and inshore zone along Kakinada-Bangarampeta coast
75	**Item-082**: Preliminary evaluation of REE in the marine sediments from west coast of India.
76	**Item -110**: Morphometry and geochemistry of volcanic glass shards from Carlsberg Ridge, Indian Ocean: insights into the magma genesis, fragmentation and phreatomagmatic activity in the mid-oceanic ridge system
77	**Item -074** Study of environment and neo-tectonic aspects of the coastal area and study of beach and seabed sediments off Setrunji River Delta, South of Bhavnagar Dist., Gujarat***(Continuing Programme)***
78	**Item -089:** Coastal survey between Apsarakonda and Swarnagadde near Honavar, Uttar Kannada Dt, Karnataka for identification of heavy mineral occurrences **(Continuing Programme)**.
79	**Item- 090:** Coastal survey near Ullal, Dhakshina Kanada District, Karnataka **(Continuing Programme)**
80	**Item-RP-077**: Planktonic foraminifer productivity changes in the northern tropical equatorial Indian Ocean

	during Last Glacial - Interglacial Transition ï The role of Paleomonsoon **(Continuing Programme)**
81	SR-004: Seabed mapping, morphology, sediment composition and sediment transport in the continental slope, Off Cochin, Kerala. (Add)
82	SR-005: Seabed mapping, morphometry, sediment composition and sediment transport in the continental slope, off Cochin, Kerala.

MISSION-II

Sl.No.	Title
	MISSION-IIA (Natural Resource Assessment)
	State Unit : Andhra Pradesh
1	Investigation for **gold** and associated minerals in **Gani and Kalava area** of Cuddapah basin, **Kurnool** district, Andhra Pradesh **(G4).**
2	Search **for kimberlite/lamproite** in **Jadcherla -Yeljal** block in **Mahbubnagar, Rangareddy and Hyderabad** districts, Andhra Pradesh **(G4)**
3	Search for **kimberlite/lamproite** in **Kolhapur and Srirangapur** blocks in **Mahbubnagar and Kurnool** districts, Andhra Pradesh (**G4**)
4	Search for **kimberlite/lamproite** in parts of **Koilkonda and Daverkadra** blocks in **Mahbubnagar** district, Andhra Pradesh.
5	Investigation for **chromite & PGE** mineralization in the **Chimalpahad ultramafic complex, Khammam** district, Andhra Pradesh **(G4**).
6	Reappraisal of **base metal** mineralisation in **Karempudi** block of **Agnigundala base metal belt, Guntur** district, Andhra Pradesh (**G3**).
7	Preliminary investigation for **base metal** and other associated mineralisation **west of Karempudi to east of Khandrika area** of Agnigundala mineral belt, **Guntur** district, Andhra Pradesh (**G4**).
8	**Deep lithostratigraphic - cum - structural drilling** to assess the base metal potential at lower stratigraphic level below the bedded barite deposit of **Mangampeta**, **Cuddapah** district, Andhra Pradesh (**G4**).
9	Preliminary investigation for **iron ore** around **Yerrabali** area, **Karimnagar** district, Andhra Pradesh (**G4**).
10	Preliminary investigation of **iron and manganese ore** around **Vedullacheruvu-Krishnapuram**, Chandragiri and Srikalahasti taluk, **Chittoor** district, Andhra Pradesh (**G4**).
11	Reappraisal for **graphite and tungsten** mineralisation at **Burugubanda** in Rampachodavaram taluk, **East Godavari** district, Andhra Pradesh (**G3**).
12	Preliminary investigation for the possible occurrence of **REE and other Rare Metal** mineralization in and around Chetlamallapuram, Kurnool district, Andhra Pradesh (**G4**).
13	Maintenance of **diamond processing** plant at **Wajrakarur**, Andhra Pradesh. (Service Item)
	State Unit: Karnataka & Goa
14	Regional survey to locate **kimberlites** in **Kudligi** block, **Bellary & Chitradurga** dists., Karnataka (**G4**)
15	Regional survey to locate **kimberlite** clan rocks in **Molakalmuru** block, **Bellary and Chitradurga** districts, Karnataka (**G4**).
16	Investigation for **gold** in **Ajjanahalli block - G**, **Tumkur** district, Karnataka (**G3**).
17	Investigation for **gold** in **Ajjanahalli block- H**, **Tumkur** district, Karnataka (**G4**).
18	Exploration for **gold** in Bangaragatti block, **Shimoga shist belt** in parts of TS no 48I/16, **Dharwar** district, Karnataka (**G3**).
19	Preliminary investigation for **gold** in **Shimoga shist belt** around Hulkoppa in part of **Dharwar** district, Karnataka (**G4**).
20	Investigation for **gold** in **Kudrekonda-Palavanahalli** area, **Shimoga** district, Karnataka (**G4**).
21	Preliminary investigation for **gold** in **Nyamati-Kunchenhalli** area (parts of toposheet no 48N/12), ***Shimoga*** district, Karnataka (**G4**).
22	Investigation for **nickel, cobalt, copper and PGE** in **J.C. Pura - Antaraghatta** belt, **Hassan and Tumkur** districts, Karnataka (**G4**).
23	Preliminary investigation for delineating the **REE** bearing zones around **Wanadurg**, **Gulbarga** district, Karnataka(**G4**).
24	Preliminary investigation for delineating the **REE** bearing zones around **Gogalgatti, and Lingadahalli** areas, **Raichur** district, Karnataka(**G4**).
25	Investigation for **iron ore** in **Sirur-Kamatagi- Amingarh** areas, Hungund taluk, **Bagalkote** district, Karnataka (**G4**).
26	Investigation for **iron ore** in **Basavapatna-Kerebilichi** block, Channagiri Taluk, **Davangere** district, Karnataka (**G4**).

	State Unit : Tamil Nadu & Puducherry
27	Exploration for **platinum group of elements** by drilling in **T3 sector of Tasampalaiyam** block in **Sittampundi anorthosite complex**, **Namakkal** district, Tamil Nadu (**G3**)
28	Investigation for Platinum Group of Elements in **Tattayyangarpettai area**, Namakkal and Tiruchirappalli disticts of Tamil Nadu (G-4) (***Proposed in lieu of Item No. ME/SR/TNP/2014/077)**
29	Investigation for **REE** and **associated minerals** in parts of **Paramathi-Sarkar Valavandi-Kavundanur** areas of **Namakkal** district, Tamil Nadu (**G4**)
30	Reappraisal for **graphite** by drilling in **Arasanur** (village) block in the western part of Sivaganga graphite belt, **Sivaganga** district, Tamil Nadu (**G3**)
31	Reapraisal for **dunite** in **Namakkal** district of Tamil Nadu (**G4**).
	State Unit : Kerala
32	Preliminary investigation for **gold** in Mundanpara, Chittur and Katalakkandi areas in the southern part of **Attapadi valley**, **Palakkad** district, Kerala (**G4**)
33	Preliminary exploration for **platinum group elements** in Vellamari block, **Attapadi valley**, **Palakkad** district, Kerala (**G4**)
	Mission-II B (Natural Energy Resources)
	State Unit: Andhra Pradesh
34	Preliminary investigation for coal in S**irpur-Sitanagar area**, eastern part of Sirpur-Kagaznagar exploration block, Godavari valley coal field, **Adilabad** district, Andhra Pradesh (**G4**).
35	Preliminary investigation for coal in **Rudrakshapalli-Ganugalapalli** area, in southern sub-basin of Godavari valley coalfield, **Khammam** district, Andhra Pradesh (**G4**).
36	Regional exploration for coal by drilling in **Pagaderu (east)** sector, southern part of main basin of Godavari valley coalfield, **Khammam** district, Andhra Pradesh (**G3**).
37	Preliminary investigation for coal bearing formations in **Bayyaram-Cherla** area, main basin of Godavari valley coalfield, **Khammam** district, Andhra Pradesh (**G4**).
38	Preliminary investigation for coal in **Mangrude** village, **Bela mandal**, main basin of Godavari valley coalfield, **Adilabad** district, Andhra Pradesh (**G4**).
	State Unit: Tamil Nadu& Puducherry
39	Regional exploration for **lignite** in **Uttarakosamangai** sector, **Ramnad sub-basin, Ramanathapuram** district, Tamil Nadu (**G3**).
40	Regional exploration for **lignite** in **Kalari west sector**, **Ramnad sub-basin**, **Ramanathapuram** district, Tamil Nadu (**G3**).

MISSION – III

Sl.No.	Title
	Geodata Division & Regional Data Integration Cell, SR
1	Integration of Geological, Geochemical, Geophysical, Aero-geophysical and Remote Sensing data of 57F and 57E degree sheet.
2	Preparation of 1:50 K print ready RGB layouts.
3	Service Item: OCBIS Link item with Geodata CHQ.
4	Service Item: A) Network Management-Administration of Southern Region Local Area Network. B) Computer/software assistance c) Portal applications.
	Map & Cartography Division, SR
5	Compilation of New Series (Second Edition) of Geological Quadrangle Maps, 1: 250 K GQM**.**
6	Service Item: Composing and Printing of Unpublished Geological Maps as per user demand.
	Publication & Information and Library, SR
7	Service Item: Compilation and printing of Publications, distribution and sale of Publications, Updating of Bibliographic database, Procurement of books, Scrutiny of scientific papers submitted by technical officers.
	MCPI Division SU: AP
8	Compilation of New Series (Second Edition) of Geological Quadrangle Maps, 1: 250 K GQM.
9	Service Item: Jobs involved in scrutiny, formatting, approval, reprography and circulation of progress reports.
	Geoinformatics Division, SU: AP
10	Preparation of 1:50K print ready RGB layouts.

11	Service Item: Data Repository & Management ï Map compilation, technical support to all Divisions/Projects of the State Unit in computer related matters.
	MCPI Division, SU: Karnataka & Goa
12	Compilation of New Series (Second Edition) of Geological Quadrangle Maps, 1: 250 K GQM
13	Service Item: Jobs involved in scrutiny, formatting, approval, reprography and circulation of progress reports.
	Geoinformatics Division, SU: Karnataka & Goa
14	Preparation of 1: 50K print ready RGB layouts.
15	Updation and linking of Oracle database with 50K GMS (Geological Map Series) spatial database and additional data entry in Geoscientific database.
16	Service Item: Data Repository & Management ï Map compilation, technical support to all Divisions / Projects of the State Unit in computer related matters.
	MCPI Division, SU: Tamil Nadu & Puducherry
17	Compilation of new series (second edition) of Geological Quadrangle Maps, 1: 250K GQM.
18	Service Item: Data repository and management jobs involved in scrutiny, formatting, approval, reprography and circulation of progress reports.
	Geoinformatics Division, SU: Tamil Nadu & Puducherry
19	Preparation of 1: 50K print ready RGB layouts.
20	Service Item - Data repository & management, map compilation; technical support to all Division / Projects of the State Unit in computer related matters.
	MCPI Division, SU: Kerala, Thiruvananthapuram
21	Compilation of New Series (Second Edition) of Geological Quadrangle Maps, 1: 250 K GQM.
22	Service Item - Data repository & management map compilation; technical support to all Division / Projects of the State Unit in computer related matters.
	Geoinformatics Division, SU: Kerala, Thiruvananthapuram
23	Preparation of 1: 50K prints ready RGB layouts.
24	Service Item - Data repository & management map compilation; technical support to all Division / Projects of the State Unit in computer related matters.
	Geophysics Division, SR
25	Service Item :1a) Integration of gravity and magnetic data 1b) Documentation and Report Processing Centre
	Marine & Coastal Survey Division, SR
	Map & Cartography Division, OP: West Coast-I, Mangalore
26	Compilation of the sea bed sediment distribution map within TW of West Coast of India on 1:50K
	Geoinformatics Division, OP: West Coast-I, Mangalore
27	Network Management and System Administration.
28	Enrichment of Geoscientific Database.
29	Checking, organising & archiving of swath bathymetry data from different M&CSD offices.
	Geoinformatics Division , OP: East Coast-II, Visakhapatnam
30	Network Management and System Administration
31	Enrichment of Geoscientific Database
32	Preparation of sediment distribution and bathymetric map of Territorial Waters
	Map & Cartography Division, OP: East Coast-II, Visakhapatnam
33	Compilation of the sea bed sediment distribution map within TW of West Coast of India on 1:50K

MISSION-IV

Sl.No.	Title
	MISSION – IVA: GEOTECHNICAL, LANDSLIDE & SEISMIC STUDIES
	Engineering Geology Division, SR, Hyderabad
1	Water resource development projects in Andhra Pradesh.
2	Compilation of data on Geotechnical investigations of Telugu Ganga Project, Andhra Pradesh.
	Engineering Geology Division, SU: TNP
3	Geotechnical evaluation of water resources development projects in Tamil Nadu.
	Landslide Division, SU: TNP
4	Preparation of 1:50,000 scale landslide susceptibility map of Varshanad hills in toposheet nos. 58 G/5 & 6 on GIS platform.
5	Empirically-derived rainfall threshold based early warning System for landslide in part of Coonoor river basin, Nilgiri and Coimbatore districts, Tamil Nadu.
6	Landslide inventory in and around community areas and along transportation corridors in anaimalai hills, Coimbatore district- updation of data base of Tamil Nadu
7	Post event landslide studies in Tamil Nadu.
	Engineering Geology & Landslide Division, SU: K&G
8	Preparation of a GIS-Based 1:50,000 scale Landslide Susceptibility Map for mountainous/hilly region using site-specific rating and weighting systems of toposheet No 48J/11(Jogfalls-Honnawar Road Section).
9	Preparation of a GIS-based 1:50,000 scale landslide Susceptibility Map for mountainous/ hilly region using site-specific rating and weighting systems of toposheet no 48E/15 and 48E/16 (parts of Goa).
10	Post disaster studies in Karnataka & Goa.
	Engineering Geology & Landslide Division, SU: Kerala
11	Geotechnical evaluation of water resources development projects in Kerala.
12	Preparation of a 1:50,000 scale landslide susceptibility Map for TS 49M/14 and 58A/3 in Kozhikode, Wayanad and Malappuram districts, Kerala
13	Post disaster studies in Kerala
	Earthquake Geology, SR
14	Seismic hazard microzonation study of areas in and around Cochin and Ernakulam urban agglomerations, Ernakulam district, Kerala.
15	Macroseismic investigation of significant seismic events in Southern Region
	MISSION-IV B (FUNDAMENTAL AND MULTIDISCIPLINARY GEOSCIENCES)
	Petrology Division, SR
16	Petrological studies of the surface and subsurface lithosections of Pullampet Formation, Mangampeta area, Cuddapah district, Andhra Pradesh.
17	Petro-mineralogical and geochemical evaluation of argillaceous sediments/ultra-potassic rocks for Rare Earth Elements within Cumbum/Pullampet Formations of Nallamalai Fold Belt.
	PPOD, RSAS, Bangalore
18	Petrogenesis of Metapelitic granulites from Varushanad Hills and Rajapalayiam to understand the general nature of tectonic evolution of Madurai Block of the Southern Granulite Terrain
19	Petrogenesis and source characteristics of base metal mineralization in Betul belt, Madhya Pradesh through stable isotope studies.
20	Elemental mobility and dispersion in the supergene environment in the mafic-ultramafic rocks of the Dharwar craton.
21	Genesis of gold mineralization in Ajjanahalli Gold Prospect, Tumkur district, Karnataka by petrological, fluid inclusion and stable isotopic (C, O & S) studies.
22	Fluid inclusion studies of quartz veins in the Tungsten deposit of Agargaon to reveal its genesis.
23	Petrogenesis and source characteristics of REE hosted Carbonatite body from Barmer district of Rajasthan.
24	Mineral and elemental characterization of mill tailing of Kolar Gold Field, Kolar, Karnataka with special reference to gold.
25	Tectono-metamorphic evolution of the transitional zone between East and West Dharwar Craton (EDC & WDC) in the Kunigal- Yediyur Sector, Karnataka

	Palaeontology Division, SR
26	Biostratigraphy of the Quaternary sediments along the Kerala coastal tract and midland rivers .
27	Search and study for dinosaur and vertebrate fossil remains in the Kota Formation and Mesozoic vertebrates from the other Upper Gondwana formations of the Pranhita - Godavari Valley in Southeastern part of Adilabad district, Andhra Pradesh**.**
	M & CSD, Op: WC – I
28	Sedimentological study of nearshore marine and beach sediments to identify littoral drift and silting of Kollam Port.
29	Preliminary evaluation of REE in the marine sediments from west coast of India.
30	Bathymetry and sediment characteristics of Poringalkuttu Reservoir, Trichur District, Kerala.
	Geophysics Division, SR
31	Measurement of Physical properties of rock samples.
32	Research project for study of kimberlites and diamonds from Narayanapet area, Mahbubnagar, Kurnool districts, Andhra Pradesh and Gulbarga, Raichur districts, Karnataka, Dharwar Craton, India (MOU between GSI & De Beers India Pvt Ltd (DIPL)
	Quternary and Environmental Geology Division
33	Deciphering sea level changes and climatic vicissitudes along the Andhra Pradesh Coast.

MISSION – V

Sl.No.	Title
1	Exploration strategy for REE & Rare Metals.
2	A Course on Computer Awareness for Group óBô Non-Gazetted and Group óCô Ministerial Staff of SR and CR.
3	Refresher Course for National Geochemical Mapping.
4	Basic training course in Drilling Technology
5	Workshop on United Nation Framework Classification System.
6	Training on Administration, Finance & Vigilance in GSI for Group A & B officers of GSI
7	Workshop on compilation of Second Edition Quadrangle Geological Maps (1:2,50,000)
8	Exploration strategy for Industrial and Fertilizer Minerals

C. ENVISAGED TARGET OF SOUTHERN REGION FOR THE F.S.: 2014-15

Sl. No.	Major activities	Target for FS: 2014-15					
		SU:AP	SU:K&G	SU:TNP	SU:KERALA	HQ Div., SR	TOTAL, SR
MISSION – I: BASELINE GEOSCIENCE							
1.	**Ground Geological Surveys** Specialised Thematic Mapping (1:25,000 scale) in sq.km.	1750	700	1050	525	-	4,025
2.	**National Geochemical Mapping** NGCM ï area in sq.km.	12000	10,400	6000	1614	-	31934
	NGCM ï no. of stream sediment samples	12000	10,920	5948	1614	-	30,482
3.	**Ground Gephysical Surveys** Geophysical mapping - area in sq.km.	-	-	-	-	15,840 (with DGPS) 11500(without DGPS)	15,840
MISSION – II: NATURAL RESOURCE ASSESSMENT							
4.	**Large Scale Mapping** (1:10,000/12,500) sq.km.	828	650	300	150	-	1,928
5.	**Reconnaissance Mapping** (1:50,000) sq.km./l.km.	2430	1440	-	-	-	3,870
6.	**Detailed Mapping** (1:1000/2000/5000)sq.km	4	8	1	1.5	-	14.5
7.	**Pitting & Trenching** Cu.m.	400	1025	400	75	-	1,900
8	**Drilling** in metres	8,300	2000	6500	Nil	-	17000 (includes 200m Auger Drilling
MISSION – IV: FUNDAMENTAL & MULTIDISCIPLINARY GEOSCIENCE							
10	**SPT Drilling** in metres	-	-	-	-	450	450

Targets: SU : A.P: Mission-IIA+Mission-IIB : 3800 + 4700= 8500m (200m Auger drilling in Proj : Diamond, SU : AP & T)
SU : K&G : Mission-IIA+ Mission-IIB : 2000+ --- = 2000m
SU: TNP : Mission-IIA+ Mission-IIB : 2600+ 3900= 6500m
SU: Kerala: Mission-IIA+ Mission-IIB : ----+ ------ = ----

Grand Total: IIA+IIB= 8400+ 8600= 17,000m

D. TARGET ACHIEVEMENT OF SOUTHERN REGION FOR THE F.S: 2014-15

Sl. No.	Major activity areas	Targets for FSP 2014-15	Achievement during the quarter (Jan-March..,2015)	Achievement from April, 2014 to current month
MISSION I - BASELINE GEOSCIENCE				
1	GROUND GEOLOGICAL SURVEYS Thematic mapping (1:25,000 scale) Sq.Km.	4025	1187	4039
2	NGCM - area in Sq. Km.	31934	14454	32701
	NGCM - no of stream sediment samples	31947	15420	32194
3	GROUND GEOPHYSICAL SURVEYS Geophysical mapping - area (Sq. Km.)	15,840	6860	12,795
MISSION II - NATURAL RESOURCES ASSESSMENT				
4	Large scale mapping (1:10,000/12,500) (Sq. Km.)	1928	719	1,991+1(MoU item in Bayyaram)
5	Reconnaissance mapping (Sq.Km/ L.Km) (1:50,000)	3870	1248	3,735
6	Detailed mapping (1:1,000/2,000/5,000) (Sq. Km.)	14.5	8.17	15.3
7	PT in Cu. m.	1900	1322.24	1,941.24
8	Drilling (in meters)	17,000 (includes 200m Auger drilling)	4862.50+ 1444.20*	12,941.6 + 1663.80*
Mission IV – FUNDAMENTAL & MULTIDISCIPLINARY GEOSCIENCE				
10	SPT Drilling (in meters)	450	294.2 (8 boreholes)	414.20 m (14 Boreholes completed

Drilling Progress Mission wise in meters:

Mission	April, 2014	May, 2014	June, 2014	July, 2014	Aug, 2014	Sept, 2014	Oct, 2014	Nov, 2014	Dec, 2014	Jan. 2015	Feb., 2015	March, 2015	Total
M - IIA	Nil	36.00	85.45	308.20	371.55	480.20	**379.05**	**632.45**	**780.50**	957.30	718.05 + 80.00*	1003.55+ 984.80*	**5773.30^+ 1064.80***
M - IIB	504.50	431.15	464.75	560.75	523.80	557.35	**555.75**	**690.35**	**635.80+ 268.30***	574.40+ 459.40*	707.05 + 71.30*	902.15+ 0*	**7168.30^+ 799.00***
Total	504.50	467.15	**550.20**	**868.75**	**895.35**	**1037.55**	**934.80**	**1322.8**	**1416.30+ 268.30***	**1531.70 + 459.40***	**1425.10+ 151.30***	**1905.70+ 984.80***	**12,941.6^ +1863.80***

^ In house drilling * Outsourced Drilling

Progress of Spill over Drilling in meters:

April, 2014	May, 2014	June 2014	July 2014	Aug. 2014	Sept2014	Oct. 2014	Nov, 2014	Dec. 2014	Jan. 2015	Feb. 2015	March 2015	Total
20.0^ + 142.50*	**57.0^ + 28.50***	**46.25^ + 156.00***	**28.30^**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**151.55^ + 327.00***

^ In house drilling * Outsourced Drilling

E. BRIEF ON THE WORK CARRIED OUT IN SOUTHERN REGION

MISSION-IA

(i) GEOLOGICAL MAPPING:

Systematic geological mapping on 1:63,360/1:50K scale of the entire mappable area of Southern Region in the State of Andhra Pradesh, Karnataka, Goa, Tamil Nadu, Kerala and Union Territory of Puduchery has been completed. This is a great achievement accomplished through the dedicated efforts of the geoscientists of the department. The data generated through geological mapping has been providing base line data to all the earth science related activities and programmes.

Table- 6: STATUS OF SYSTEMATIC GEOLOGICAL MAPPING (AS ON SEPTEMBER, 2010)

(In sq.km)

Region/ State	Total Area	Hard rock area	Quaternary area	Area covered (Upto September,2010)		Unapproachable area	Coverage %
				Hard Rock	Quaternary		
ANDHRA PRADESH	2,76,800	2,58,686	18,114	2,45,576	18,114	13,110	95.26
KARNATAKA	1,91.792	1,91,617	175	1,91,617	175	-	100
TAMILNADU	1,30,550	1,07,800	22,750	1,07,800	22,750	-	100
KERALA	38,864	35,.955	2,909	35,955	2,909		100
GOA	3,701	3,201	500	3,201	500	-	100
SOUTHERN REGION (TOTAL)	6,41,707	5,97,259	44,448	5,84,149	44,448	13,110	97.95

(ii) SPECIALISED THEMATIC MAPPING :

To address the specific aspects of scientific enquiry, for resolving critical geological problems or at times to cater to the needs of various specialized activities, Southern Region has started Specialized Thematic Mapping (STM) on large scale (1:25,000 or larger) from VII plan period onwards. Specialized Thematic Mapping under different themes of geology was undertaken in geologically significant terrain, in areas of mineral potential, in granitoids and associated shear zones in parts of Karimnagar and Medak, districts, NE part of eastern Dharwar Craton, - Pakhal sediments in parts of Khammam & Warangal districts, granitic terrain and associated shears in Palkurti-Torur- Mahabubabad-Panditapuram area, parts of Warangal and Khammam districts, Amangal- Chintapalli area in parts of Mahbubnagar and Nalgonda districts with special reference to shear zones/faults and associated mineralization, ultrapotassic volcanic rocks and associated magmatism in Nallamalai Fold Belt of proterozoic Cuddapah Basin in AP, Bababudan Group, PGC relationship, lithoassemblages, migmatites and closepet granite around Kollegal, Hanur, and Ajjipura, Chamrajanagar district in Karnataka, Moyar ï Bhavani ï Attur lineament, Kadavur structural basin, shear zones associated with Mamandur polymetal sulphide mineralization in Tamil Nadu, Palghat- Cauvery Lineament and its geological implications, Palakkad district, ôPeriyar Lineamentô around Malayattur ï Kotamangalam - Neriyamangalam area, Ernakulam and Idukki districts in Kerala.

Table 7: STATUS OF SPECIALIZED THEMATIC MAPPING. (in Sq.km)

REGION/ STATE	**AREA COVERED (Upto March, 2014)**	**PROGRAM TARGET (FS 2013-14)**	**ACHIEVE-MENT FS 2013-14 (April – Mar.,2014)**	**PROGRAM TARGET (FS 2014-15)**	**ACHIEVEMENT FS 2014-15 (Jan.to Mar, .2015**	**Achievement from April, 2014 to March, 2015**
ANDHRA PRADESH	22,707	1400	1402	1750	**486 (57.08%)**	**1752 (100.11%)**
KARNATAKA & GOA	26813	700	700	700	**280 (56.86%)**	**700 (100%)**
TAMILNADU& PUDUCHERRY	41671	1050	1060	1050	**257 (58%)**	**1067 (101.6%)**
KERALA	15585	525	525	525	**164 (52.57%)**	**525 (100%)**
SR (TOTAL)	**1,06,776**	**3,675**	**3687**	**4025**	**1187 (70.98%)**	**4044 (100.47%)**

During the FS 2013-14, eleven items of Specialised Thematic Mapping were carried out in Southern Region. Out of these eleven items, three field items have been completed during FS 2013-14, three are continuing during FS 2013-14. Nine new items of STM have been taken up in FS 2014-15. Therefore, a total of twelve STM item are being carried out during FS 2013-14. Five STM items have been taken up in SU:AP, two STM items in SU:K&G, three STM items in SU:TNP and two items in SU:Kerala. All the State Units have been achieved the assigned targets with a total of 4044 sq.km has been achieved against the target of 4025 sq.km during the FS 2014-15 .

HIGHLIGHTS OF THE WORK CARRIED OUT DURING FS 2014-15:

SU: ANDHRA PRADESH

During F.S. **2014-15** five items on Specialized Thematic Mapping (STM) were taken up.

i) Specialised thematic mapping of granitoids and associated shear zones in parts of Karimnagar and Medak districts, NE part of Eastern Dharwar Craton Andhra Pradesh with special reference to Molybdenite and other associated mineralization (STM/SR/AP/2014/001) :
Highlights:

1. Molybdenite mineralisation were discovered, as disseminated specks within sheared porphyritic monzogranite at SW of Kuchunapalli and concentrated within thin (2 cm) quartz vein in granodiorite (well dump) at 1 km E of Gatla Maliala.
2. A few disseminated grains of scheelite were identified under UV lamp in samples of pegmatite vein within monzogranite at 2 km north of Kundinenepalli and within monzogranite 1 km NNE of Ganapuram.

Mineralisation occurs as disseminated grains, stringers and specks within sheared porphyritic monzogranite and equigranular monzogranite as well as in NE-SW trending pegmatite vein at places, suggesting bimodal mineralisation. Two bands of Banded Magnetite Quartzite (BMQ) of Yerraballi schist belt having length and width of 350 m & 50 m and 200 m & 25 m respectively are observed between Magdumpur and Ankshapur.

ii) Specialised thematic mapping of the Pakhal sediments in parts of Khammam & Warangal districts, Andhra Pradesh. (STM/SR/AP/2014/002):
Highlights: Polyphase deformation features in the Pandikunta formations of Pakhal Supergroup which are belonging to F1, F2 and F3 generations has been studied to build up the deformation history of Pakhal basin. Within the quartzites of Bollapalli Formation, some isolated iron rich pockets (Hematite) were found at the top of the hills, yielding around 32% CaO as indiacted by the analytical results from the dolomite of Gunjeda Formation.

iii) Specialised thematic mapping of the granitic terrain and associated shears in Palkurti-Torur-Mahabubabad-Panditapuram area, parts of Warangal and Khammam districts, Andhra Pradesh. (STM/SR/AP/2014/003):
Highlights:

- During ore petrographic study pyrite, chalcopyrite and sphalerite ore minerals were noticed as disseminations with in quartz reef and sulphide minerals (chalcopyrite, pyrite, pyrrhotite) was noticed in the form of stringers and disseminations in norite.
- Four quartz reefs has been mapped in the study area trending NNW-SSE direction, near Mahabubabad, east & west of Betol and Nallela village. Reefs are smoky with development of gossans, sheared & fractured. These reefs are isolated in nature with length ranging from 250 to 300 m and 11 to 21 m width.
- Quartz vein / reef is smoky in nature at places, shows sulfide stains and consists of disseminated minerals mainly pyrite & magnetite. South of Nallela village, trending N60°W having length of 300 meter and width of 100 meter. Mineralisation in respect of gold (45ppb) although not encouraging but significant because the sampled vein is mineralised and sulphide rich and follows the NW-SE trending fracture plane.

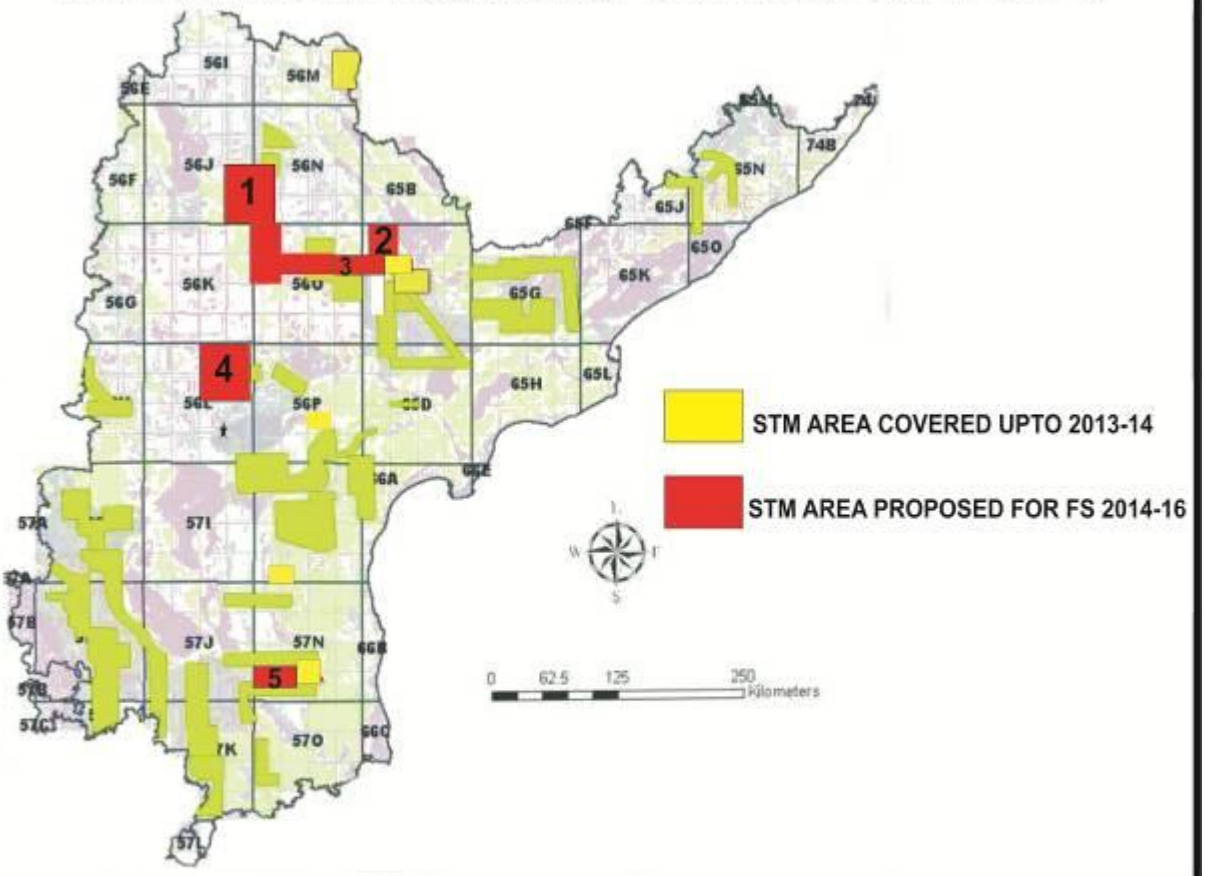
(iv) Amangal-Chintapalli area in parts of Mahbubnagar and Nalgonda districts with special reference to shear zones/faults and associated mineralization in the eastern part of Dharwar Craton, Andhra Pradesh. (STM/SR/AP/2014/004):
Highlights: Molybdenite specks are reported from younger leucogranite intruded within TGM suite of rock from Mudhivenu Reserve Forest. Highly brecciated and silicified quartz reef of approx. 150 m wide and 500 m length was observed at W of Maisigandi. It shows faulted contact with pegmatite dyke towards W. It hosts millimeter scale veins of specularite mineral. EPMA of ultramafic rock shows that, it is composed of clinopyroxene which are mostly uralitised and altered to amphiboles and chlorite.

(v) Specialized thematic maping of ultrapotassic volcanic rocks and associated magmatism in Nallamalai fold belt of proterozoic Cuddapah basin and their bearing on mineralization around Rajampeta area, Cuddapah District, Andhra Pradesh. (STM/SR/AP/2014/005):

Highlights: A new tuff band is found in toposheet no. 57N/7 east of Velagacherla village. The tuff band is 100 meter long and 15-20 meter thick. The tuff band is white, fine grained, shows well-defined millimeter scale lamination and strong development of S1 schistosity. The tuff band is sandwitched between shale of Cumbum Formation. Thin section studies of basic and acidic rocks have been carried out. Basic dyke are mainly composed of laths of plagioclase and pyroxene. Plagioclase grains are altered to epidote (zoisite) and pyroxene grains are altered to some fibrous mineral, may be serpentine? Both ophitic and sub-ophitic textures are visible.

STM STATUS MAP

MAP SHOWING THE LOCATION OF STM ITEMS FOR FS 2014-16



1.Parts of Karimnagar,Medak & Warangal Districts,AP
2.Parts of Warangal & Khammam Districts,AP
3.Parts of Mahabubabad & Nalgonda Districts,AP
4.Parts of Mahabubabad & Nalgonda Districts,AP
5.Parts of Cuddapah District,AP

KARNATAKA & GOA:

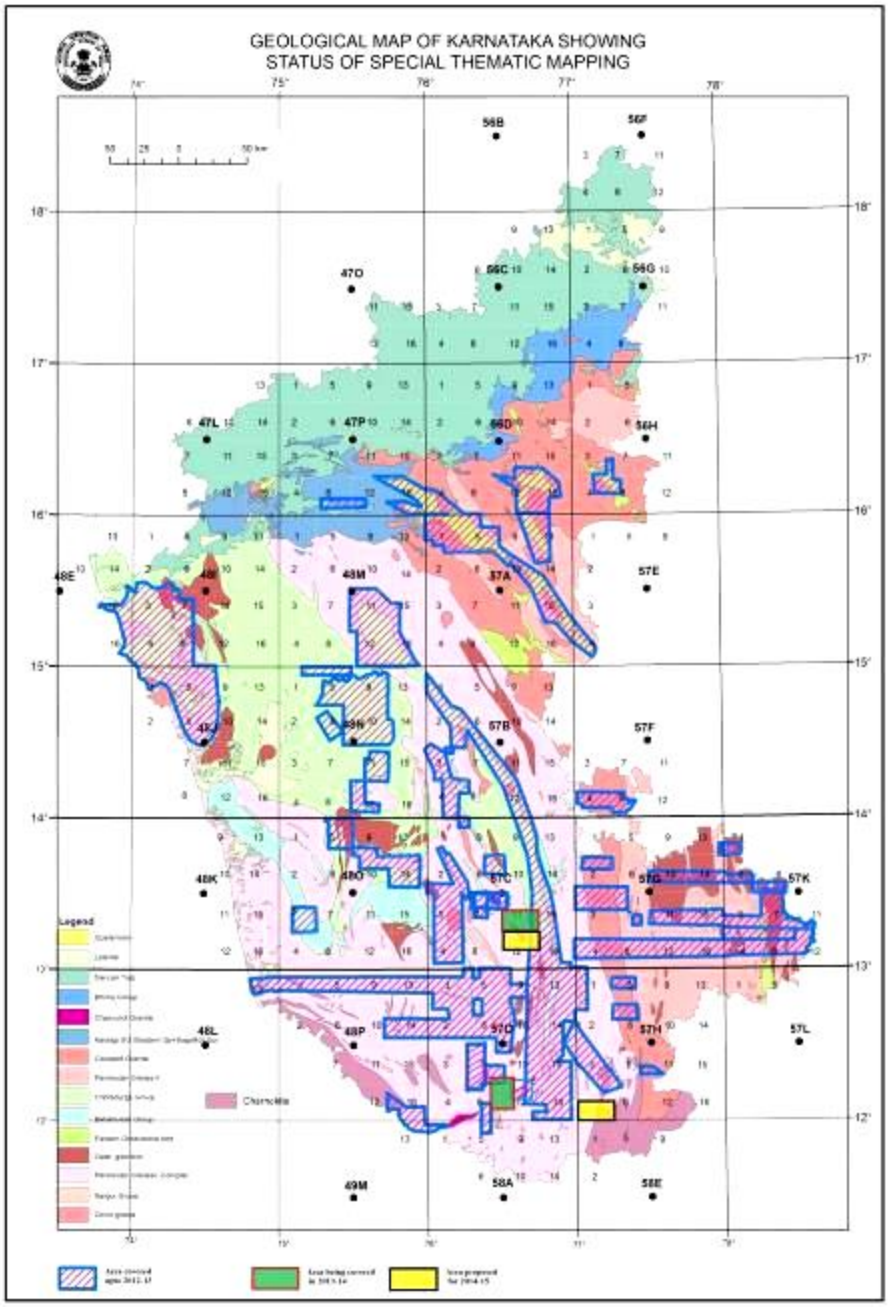
During F.S. **2014-15** two items on Specialized Thematic Mapping (STM) were taken up.

i) **Tectnostratigraphic relation of Bababudan Group, PGC and Karadi Granite in the Kibbanahalli arm of Chitradurga Schist Belt around Banasandra- Gopalanahalli areas, Tumkur District, Karnataka. (STM/SR/KG/2013/006):**

Highlights: Recently available PGE result shows some good amount of Pt, Pd values (57 C/11) for the FS 2013-14. BMS disseminations gives 325ppb Pt and 483 ppb Pd in Talc-Chlorite schist of Siddapura area and 162ppb Pt and 283 ppb Pd values in Talc-Tremolite schist of Marasandra area. In the northern part of the study area (South of Kodihalli and South of Banasandra) the Sargur supracrustal rocks are noticed within the metabasalt of the Bababudan Group.Sheared PGC is found NW of Mangikuppe with minor fold and deformed quartz feldspar. The ultramafics and amphibolites of the Sargur Group of rocks are observed as enclaves within the PGC. The ultramafics were found NE of Govinaghatta trending N35 W. In the Eastern part of the study area ultramafic rocks were noticed in contact with PGC and metabasalt of the Bababudan Group of rocksIn the Hullekere area the PGC shows minor isoclinals folds with brittle ductile deformation, within this PGC a thin band of quartz vein (1/2 m width) is noticed along with same major foliation trend with stains of malachite. Five set of chipped granite samples from Karadi Granite area were collected for U-Pb/Pb-Pb dating and submitted to CHQ, G&IG Division, Kolkatha.Some of the field areas have been revisited for the modification of the map (57 C/11&C/12). After successful completion of mapping and sample collection, GSI Camp was closed on 15th March 2015

ii**) Tectonostratigraphy of high grade lithoassemblages, migmatites and closepet granite around Kollegal, Hanur, and Ajjipura, Chamrajanagar District, Karnataka. (STM/SR/KG/2014/007):**

Highlights:. During the current period an area of 140 sq.km was mapped on a scale of 1:25000, with collection of 28 PS, 19PCS and 09 samples for PGE/REE. Major part of the area mapped exposed rocks of the Charnockite suite of rocks. It comprises of charnockites, pyroxene granulites and non greasy felsic granulites. The charnockites varied from massive to foliated and at places migmatitic. Pyroxene granulites occur as dykes within the charnockites. They show gradational to sharp contacts. Pyroxene granulite dykes were delineated near Gavirayana Betta which are not present in the existing 50K geological map. Leptynites occur as irregular patches within the charnockites. They are granular to well foliated (even sheared at places), composed of quartz, feldspar and at times show presence of garnets. When well foliated, close to tight meso folds are observed with the fold axis trending N 25E plunging 20-30 degree northerly, though rare southerly plunges have also been observed. Two BIF bands were mapped west of Uganiya village in contact with pyroxene granulites. A BIF band was also delineated near the eastern boundary of the area associated with quartzite (not present on existing 50K geological map), indicating it is part of the Sargur Group. It occurs as a thin band of 25 metres width and extends for a length of 700m, but the thickness of the band is not constant. It is banded at places and in some areas, almost massive. A small patch of acid volcanic (could be rhyolite) was mapped within the gneisses. It is observed to be cutting across the gneissosity. It is fine grained, with euhedral quartz and feldspar grains. The charnockites show concordant relationship with the gneisses as the regional foliation is the same in both (varying from N10W to N 25E, with dips varying from 65-90 easterly). The target was achieved as per NQT and the camp was closed on 15th March, 2015. Time slot has been given for EPMA analysis to be carried out in the second week of May.


GEOLOGICAL MAP OF KARNATAKA SHOWING
STATUS OF SPECIAL THEMATIC MAPPING
Legend
Charnockite

SU: TAMIL NADU & PUDUCHERRY

During F.S. **2014-15** three items on Specialized Thematic Mapping (STM) were taken up.

I)Tectonic Evolution of Eastern Part of the Moyar-Bhavani-Attur Lineament, Erode, Salem and Namakkal Districts, Tamil Nadu. (STM/SR/TNP/2013/02): Specialized Thematic Mapping has been carried out on 1:25,000 scales in parts of topo sheet no. 58E/15 and I/3 with an objective to delineate and demarcate the possible eastern extension of Moyar-Bhavani Shear zone and to locate possible mineralization. In course of mapping, the older enclaves of both mappable and unmappable bands of amphibolite, meta-pyroxenite, meta-gabbro, crystalline Limestone, banded magnetite quartzite and calc-gneiss of Sathyamangalam Group of rock were encountered within the gneiss. At the eastern part of the study area consisting of charnockite indistinctly occurring together with hornblende-biotite gneiss. The hornblende- biotite gneiss along with migmatite gneiss is widely exposed and forms a part of Bhavani Gneissic Complex which is correlatable with Peninsular Gneissic Complex.

A number of ductile shear zones viz., NE-SW and NW-SE shear zone mostly dextral with some sinistral variety, confined to certain zones in the area, defines the extension of E-W trending Moyar-Bhavani shear zone. Shear zones are characterized on the basis of S-C fabric, mylonites, grain size reduction, rotation of porphyroclasts, asymmetrical folds, off sets of marker, pressure shadows, intrafolial fold (ózô & óSôshaped). Re-crystallisation of grain size within gneissic banding is also being recorded.

Based on the presence of asymmetric folds on plan, it can be inferred that the eastern block move towards south and western block move towards north and based on stretching lineation on foliation surface i.e the hanging wall has gone down with respect to footwall. The target for the F.S.2014-15 has been fully achieved and the field camp was closed on 04-02-2015.

Officers were engaged in head quarter work for finalization of geological map and compilation of structural data. They also carried out petrographic studies for different rock types of the study area. Under thin section the charnockite is composed of orthopyroxene, K-feldspar, Plagioclase, quartz. Hornblende biotite gneisses consisting of quartz, plagioclase, K-feldspar, biotite and hornblende. Meta-gabbro is composed of mainly plagioclase, pyroxene ± opaque. Samples collected from high strained zone showing the cross cutting relationship of foliations, swerving of foliations, intense quartz ribbon, grain size refinement and distributions under microscope. Shri. Siddhartha Karmakar attended brainstorming session for preparation of IGC 2020 at Hyderabad on 18th and 19th February, 2015.

ii) Specialised Thematic Mapping in Parts of Kadavur Structural Basin, Dindigul, Karur and Tiruchirapalli Districts, Tamil Nadu (STM/SR/TNP/2014 /008):

Specialized Thematic Mapping has been carried out on 1:25,000 scales in parts of toposheet no 58J/2 around Kadavur area in Dindigal district.. The study area of Kadavur Sector lies in the central part of Tamil Nadu and forming a structural basin. The major rock types exposed in the Kadavur area are of quartzite, calc-granulite and garnet-biotite sillimanite gneiss belonging to Khondalite Group of rock. Charnockite, pyroxene granulite, metagabbro and amphibolite are the Charnockite Group. Hornblende-biotite gneiss, biotite gneiss and augen gneiss belong to Migmatititic Complex. Besides, differentiated sequence of anorthosite, gabbroic anorthosite and anorthositic gabbro, basic intrusives (dolerite) and acid intrusive (pink granite). The younger intrusive are represented by pegmatite, aplitic and quartz veins.

The rock types exposed in the study area have undergone multiple phase of deformation. Three sets of shear directions are noticed. These are trending in N30^{0}E-S30^{0}W, N20^{0}W-S20^{0}E and N70^{0}E-S70^{0}W directions. The shear zone exhibits S-C fabric, feldspar porphyroblast, mylonite and down dip lineation.

As far as mineralization is concerned, few specks of magnetite, mica books and titano-ilmenite patches are noticed within zone pegmatite vein gabbroic body and quartzite. The final phase of folding (F_4) is noticed as broad warping with their axial plane varying from N10^{0}E- S10^{0}W to N10^{0}W- S10^{0}E. A major fault plane has been noticed around of Sevapuram area, where the disposition of quartzite and meta gabbro and the trend of fault plane

The emplacement of anorthosite is correlated with the D_2 deformation and subsequently it has also deformed during $D_{3\ deformation}$. The basic and acidic intrusive of dolerite and granite are later phases formed during the broad warping. The titano-ilmenite patches are associated within anorthosite gabbro 1km southeast Sevapuram and 1km west of Idiyappatti in the Ponnar River section. Officers are also imparted training from 28.01.15 to 31.01.15. in geological mapping to Master degree student of Madras University.

The assigned target for the F.S.2014-15 has been fully achieved and the field camp was closed on 23.02.2015. The officers were engaged in petrography study of different rock types, interpretation of geological map and preparation of draft report writing. Under thin section the charnockite is composed of orthopyroxene, K-feldspar, Plagioclase, quartz. Hornblende biotite gneisses consisting of quartz, plagioclase, K-feldspar, biotite and hornblende. Meta-gabbro is composed of mainly plagioclase, pyroxene ± opaque. Anorthosite/ gabbroic anorthosite/ anorthositic gabbro are predominantly consisting of plagioclase feldspar/ plagioclase-pyroxene/ pyroxene-plagioclase respectively.

iii) Specialised Thematic MappingTo trace the extension of the shear zones associated with Mamandur polymetal sulphide mineralization in Villupuram and Tiruvannamalai Districts, Tamil Nadu.(STM/SR/TNP/2014/009):

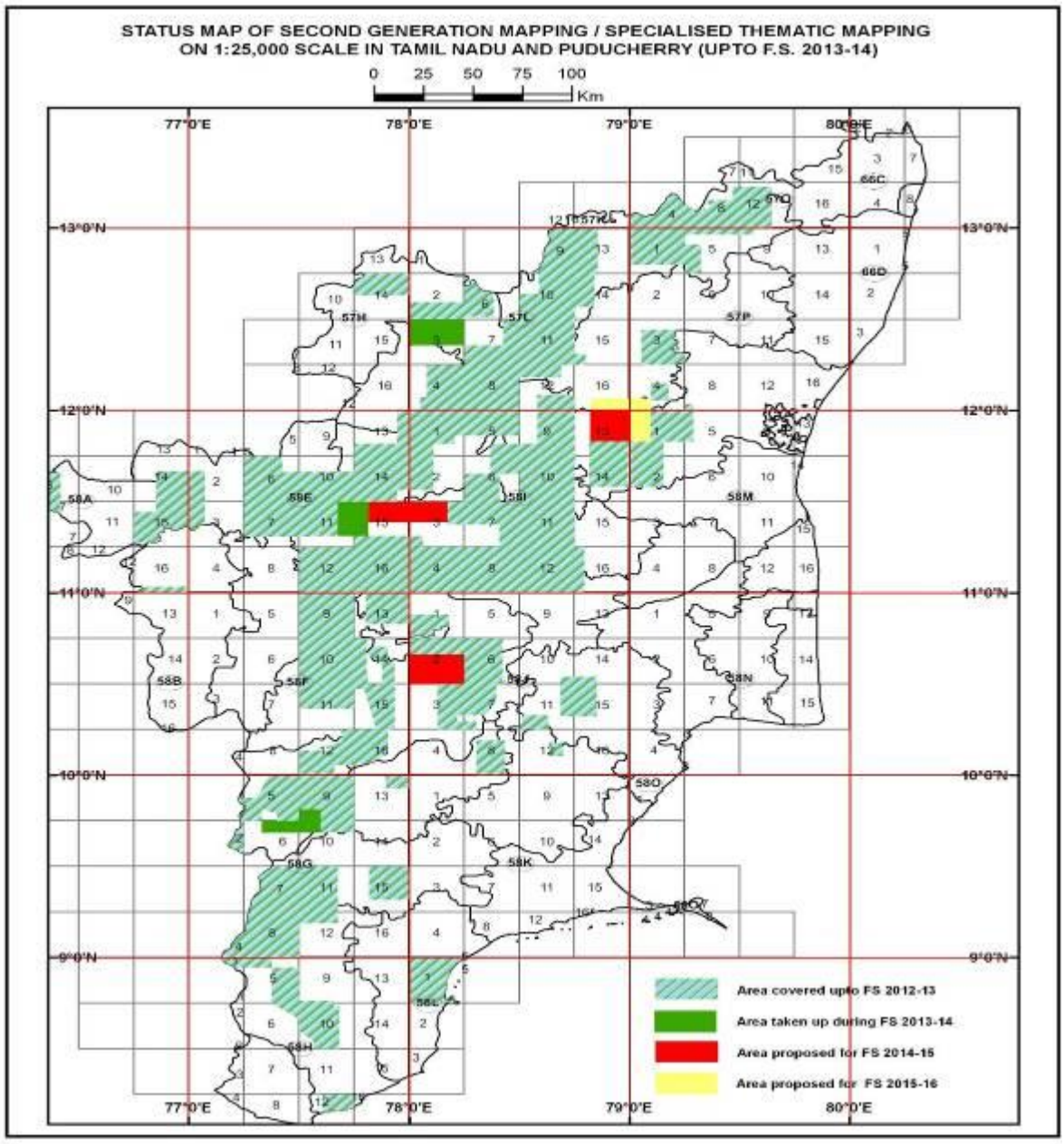
Specialized Thematic Mapping was carried out on 1:25,000 scale around Sankarapuram-Mamandur area, Villupuram District, in parts of Toposheet 58I/13 and an area of 230 sq.km has been covered. The main objective of the item is to delineate and characterize the shear zones associated with polymetal sulphide mineralization in and around Mamandur

area and to trace the possible strike extension of the mineralized zones/ parallel zones. During the course of mapping, rock types like Banded Magnetite Quartzite, amphibolite, Garnet-biotite sillimanite gneiss, charnockite, pyroxene granulite, hornblende-biotite gneiss/quartzo-feldspathic gneiss±garnet, grey migmatite gneiss±garnet, granite (homophanous, pink) and basic dykes were identified.

Foliation (S_1) is noticed commonly in gneissic rock and charnockite. The general trend of foliation is NNE-SSW with moderate to steep dips towards SE. Structurally, three phase of deformation were brought by them (D_1,D_2 & D_3).Tight isoclinal minor folds with inclined to reclined geometry with apprised hinges are noticed in migmatite gneisses, pyroxene granulite and charnockite,whereas open to tight folds are noticed in amphibolite and banded ferruginous quartzite. The third phase of deformation (D_3) represents the development of brittle-ductile shear zone showing both sinistral and dextral sense of movement. Three types of shear were identified by them which are trending NE-SW, N-S and ENE to E-W. They are mostly ductile in nature, discontinuous with varying length and SW width, showing both sinistral and dextral sense of movement. The length of shear band varies from 10cm-1.5m and width from 5-15cm. Sulphide mineralisation like chalcopyrite,malachite were observed along the shear band and contact of meta gabbro and pyroxene granulite at few places around Toluvanthangal and Kanankadu, where minerlisation appears to be structural and litho controlled. Smoky quartz vein. with malachite stains and specks of multi metals such as bornite, covellite and azurite are noticed in the western part of study area. Strike length of mineralised band ranges from 10-30m and width varies from 1.5-2m.T They are observed as concordant bodies ranging from 75-100m long and 5-10m wide. Primary bedding (S_0)/ colour banding is seen in banded ferruginous quartzite Foliation (S_1) is noticed commonly in gneissic rock and charnockite. The general trend of foliation is NNE-SSW with moderate to steep dips towards SE and at places in the western part, dip is towards NW. Structurally, three phase of deformation were brought (D_1, D_2 & D_3).Tight isoclinal minor folds with inclined to reclined geometry with apprised hinges are noticed in migmatite gneisses, pyroxene granulite and charnockite, whereas open to tight folds are noticed.

Shear movement is prominently noticed in the study area. Both sinistral and dextral senses of shear movement have been observed in hornblende biotite gneiss. Three types of shears have been recorded in operational area. The trend is mostly in NNE-SSW and few in E-W and N-S direction. The length of shear band varies from 10cm-1.5m and width from 5-15cm. These shears are having both horizontal and vertical component and based on that the shear movement can be concluded as oblique normal/ oblique reverse movement. Stretching lineation observed on shear plane signifying the vertical component of shear.

Sulphide mineralisation like chalcopyrite, covellite, malachite and sphalerite along the shear direction and lithological contact are noticed in the study area. The Cu mineralization appears to be shear controlled. Gossanised smoky quartz vein with dissemination of sulphide mineralization are also noticed in quartz-feldspathic/migmatised gneiss±garnet and charnockite at few places in the study area in the strike extension of NE-SW trending shear of Mamandur prospect. Allanite bearing granite exposed in the form of sheet rock noticed northeast of Mukkanur and southwest of Ariyalur. The assigned target for the F.S.2014-15 has been fully achieved and the field camp was closed on 21-02-2015.


STATUS MAP OF SECOND GENERATION MAPPING / SPECIALISED THEMATIC MAPPING
ON 1:25,000 SCALE IN TAMIL NADU AND PUDUCHERRY (UPTO F.S. 2013-14)
0 25 50 75 100
Km
77°0'E
78°0'E
79°0'E
80°0'E
13°0'N
12°0'N
11°0'N
10°0'N
9°0'N
Area covered upto FS 2012-13
Area taken up during FS 2013-14
Area proposed for FS 2014-15
Area proposed for FS 2015-16

SU: KERALA:

During F.S. **2013-14** two items on Specialized Thematic Mapping (STM) were taken up.

1. Study on the Sanukitoid type rocks and structure in the western extension of Palghat-Cauvery Lineament and its geological implications, Palakkad District, Kerala (STM/SR/KRL/2014/010):

This STM was taken up to delineate the sanukitoid type rocks reported during the F.S.2013-14 from the western extension of Palghat-Cauvery shear zone. Major rock types observed in the area are sanukitoid, biotite gneiss, quartzo-feldspathic gneiss, amphibolite and metapyroxenite. The amphibolite and the metapyroxenite are the oldest rock types and they represent the supracrustal units.

Biotite gneiss is the major lithounit and the supracrustal units occur as enclaves and bands within it. This feature is very prominent near Kunnangad, Kongad and Pudanur areas. Quartzo-feldspathic gneiss occurs as 2 to 5m wide bands within biotite gneiss in the northern part of the area.

The sanukitoid is mainly seen in the northern part of the area. Sanukitoid series of rocks are seen in association with biotite gneiss and amphibolite. Sanukitoid is medium grained and composed of quartz and feldspar as the felsic minerals. The mafic minerals include biotite and hornblende. The mafics occur as clots and it gives a spotty look to the rock. At places the sanukitoid is sheared. A big biotite gneiss xenolith is also noted in the sanukitoid showing that the sanukitoid is younger than the TTG gneiss in the area. This biotite gneiss xenolith is 3.5m long and 70 cm wide.

At Kamba area, the sanukitoid is deformed as indicated by its foliation. Minor Z-shaped folds are also noted on these quartzo-feldspathic bands.

Sanukitoid type rocks are noted in the southern part of the area also (Toposheet 58B/10). At a location near Kuttanur, a small exposure of sanukitoid is seen. It is almost massive and the mafics present are mainly biotite and hornblende and they occur as clots giving a spotty look to the rock. Augen gneiss is the major rock type observed in the southern part of the area. This rock has a sheared fabric at many of the locations. The effect of shearing is manifested by the strong foliation and highly stretched and flattened porphyroblasts and quartz ribbons. These porphyroblasts are not single feldspar grains, but these are aggregates of minerals like alkali feldspar, plagioclase, quartz and biotite.

Amphibolite occurs as 10 to 30m bands within biotite gneiss in the northern part of the area. Amphibolite bands are very rare in the southern part of the area. The amphibolite is dark coloured and composed of hornblende and plagioclase. At places, the amphibolite has pyrite and chalcopyrite dissemination. Metapyroxenite is generally coarse grained and massive. They are very rarely seen.

Pegmatites are observed all over the area cutting across all the lithounits. They were emplaced mainly along joint planes. Most of the thicker pegmatites are syenitic in composition as their quartz content is very less. Very rarely aplite veins are also noted. Lamprophyre-type veins of thickness varying from 5cm to 4m are also seen all over the area and these veins trend ENE-WSW and ESE-WNW. The lamprophyre is fine grained dark coloured and composed of biotite and plagioclase. Quartz veins are very rare in the area.

In the northern part of the area, three generations of folds are seen. The oldest generation folds (F_1) are very rare and they are seen on amphibolite and quartzo-feldspathic bands in biotite gneiss. The F_2 generation folds folded the axial plane (S_1 foliation) of the F_1 folds and they are the most conspicuous structure in the area. Third generation folds (F_3) occur as broad warps on S_1 with steep northerly or southerly dip. South of the shear zone only one set of fold is seen and it has northeasterly plunge. The three different generations of folds observed in the northern part of the area are not seen in the southern part of the area. Minor ductile shear planes (striking NE-SW) giving sinistral sense of movement is also noted in the area.

The sanukitoid series of rocks observed in the area is tectonically very significant. They are minor but a widespread component of many Archean terrains. They are considered to be generated during the Archean-Proterozoic transition period by the re-melting of the metasomatised mantle wedge. Thus, the presence of sanukitoid along the Palghat-Cauvery shear zone clearly suggests that this zone represents a Neoarchean subduction zone. The E-W trending shear zone identified in the F.S.2013-14 is traced further eastward.

At Nochchippulli area, bands of amphibolite with limonitic stains and fresh sulphides are observed. The metapyroxenite band observed near Chitali contains disseminations of pyrite.

ii) Study of geology along either side of The 'Periyar Lineament' around Malayattur – Kotamangalam - Neriyamangalam area, Ernakulam and Idukki Districts, Kerala. (STM/SR/KRL/2013/003):

This is continuing item and 350 sq.km was covered by thematic mapping and collected 25 samples for PCS, 79 samples for PS, 10 samples for EPMA,10 samples for REE and 4 samples for geochronologyduring FS 2013-14. A total of 1400 sq.km of area has been scanned/studied using satellite imageries and aerial photographs. Two sets of lineaments could be demarcated. One trending NW-SE (north of Neriyamangalam and also along the Idamala Ar.) and another trending E-W (near Puyankutti Ar.) using ERDAS image processing software with the help of IRS imagery LISS-3. The drainage pattern is mainly dendritic, trellis and at places rectangular.

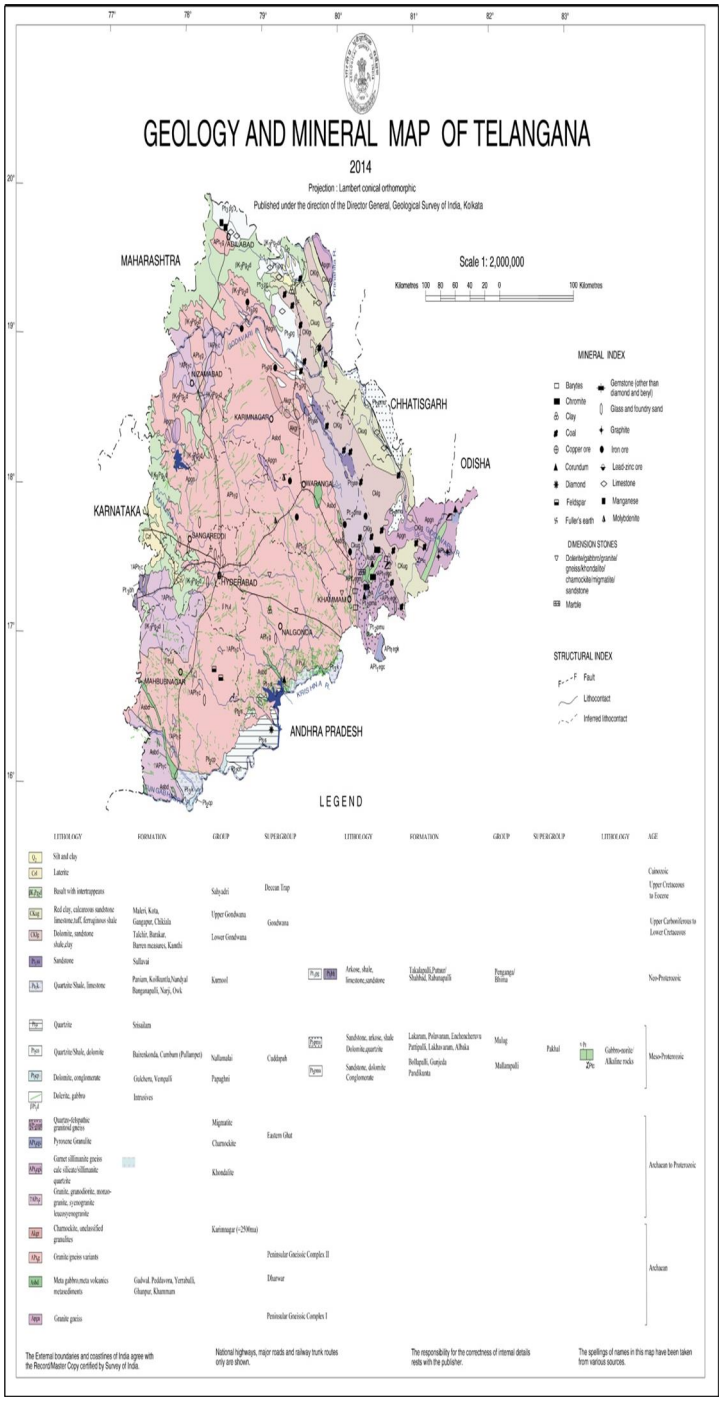
Charnockite and biotite-gneiss are the country rocks exposed in the area. Dolerite and pegmatite are found to occur as intrusive within the country rock. Many quarries are present in the study area and these quarries have thoroughly been studied to bring out interrelationships. The predominant rock type, charnockite coarse to medium grained and shows variation in felsic and mafic contents. The gneissosity is observed in the charnockite at places. The gneiss is dominantly composed of mafic minerals (biotite, magnetite and some hornblende) and felsic minerals (quartz and feldspar). Magnetite grains occur as an important accessory mineral in the gneiss mainly in and around Kudamunda and Kuttampuzha areas.

Field relations clearly point to charnockitisation process after the migmatisation event in the gneisses. Relict enclaves of older TTG gneiss with migmatitic textures are common in the charnockites and they are very well observed in some quarry sections, for example, near Puliampara. The sequence of events in the area suggests that TTG gneiss formation was followed by widespread migmatisation and subsequent charnockitisation. Sulphide and minor magnetite are present both in charnockite and gneiss.

The biotite gneiss at places (Cheradi and Madiyur) is garnetiferous. However, the garnets are only sporadically present and the rock does not appear to be a metapelite. Supracrustal rock units like amphibolite and BIF are totally absent in the mapped area. A 25m long and 3m wide dolerite dyke with strike N60ęW occur as intrusive within gneiss in Urulantanni area. Two sets of pegmatites, one trending N-S and another trending E-W are present. But the pegmatite veins occur as small unmappable units

In the process of charnockitisation, the earlier gneissic structure has been largely obliterated and become massive. The main structure in the rocks is the gneissic foliation defined by alternate mafic and felsic bands in the gneiss (S_1). The gneissic foliation present in the study area generally trend in the NW-SE to E-W directions with moderate to steep dips towards SW to S. Occassionally, the F2 generation folds are observed in these rocks. These folds are small to medium scale and have formed by folding of the gneissic foliation (S_1). These folds show moderate to gentle plunges towards SE to S. Near Kudamunda and Puyankutti pinching and swelling along with boudinage structures can indicate that the zone has undergone extensional deformation.

Mapping carried out so far do not reveal any major lithological differences on either side of the Periyar lineament. Also there are no differences in the structural trends across the Periyar lineament. Field work carried out along the lineaments so far does not show any evidence for shearing.


GEOLOGY AND MINERAL MAP OF TELANGANA
2014
Projection : Lambert conical orthomorphic
Published under the direction of the Director General, Geological Survey of India, Kolkata
Scale 1: 2,000,000
Kilometres 100 80 60 40 20 0 100 Kilometres
MAHARASHTRA
CHHATISGARH
ODISHA
KARNATAKA
ANDHRA PRADESH
NIZAMABAD
KARIMNAGAR
WARANGAL
RANGAREDDI
HYDERABAD
KHAMMAM
NALGONDA
MAHBUBNAGAR
MINERAL INDEX
Barytes
Chromite
Clay
Coal
Copper ore
Corundum
Diamond
Feldspar
Fuller's earth
Gemstone (other than diamond and beryl)
Glass and foundry sand
Graphite
Iron ore
Lead-zinc ore
Limestone
Manganese
Molybdenite
DIMENSION STONES
Dolerite/gabbro/granite/gneiss/khondalite/charnockite/migmatite/sandstone
Marble
STRUCTURAL INDEX
Fault
Lithocontact
Inferred lithocontact
LEGEND
LITHOLOGY
FORMATION
GROUP
SUPERGROUP
LITHOLOGY
FORMATION
GROUP
SUPERGROUP
LITHOLOGY
AGE
Silt and clay
Laterite
Cainozoic
Basalt with intertrappeans
Sahyadri
Deccan Trap
Upper Cretaceous to Eocene
Red clay, calcareous sandstone limestone,tuff, ferruginous shale
Makri, Kota, Gangapur, Chikiala
Upper Gondwana
Gondwana
Upper Carboniferous to Lower Cretaceous
Dolomite, sandstone shale,clay
Talchir, Barakar, Barren measures, Kamthi
Lower Gondwana
Sandstone
Sallavai
Arkose, shale, limestone,sandstone
Takalamalli,Pottner/ Shahbad, Rahanapalli
Penganga/ Bhima
Quartzite Shale, limestone
Pavuru, Koilkuntla,Nandyal Banganapalli, Narji, Owk
Kurnool
Neo-Proterozoic
Quartzite
Srisailam
Quartzite Shale, dolomite
Bairenkonda, Cumbum (Pullampet)
Nallamalai
Cuddapah
Sandstone, arkose, shale Dolomite,quartzite
Lakavaru, Polavanam, Enchenkcheruvu Pottipalli, Lakkavaram, Albaka
Malteg
Pakhal
Gabbro-noritic Alkaline rocks
Meso-Proterozoic
Dolomite, conglomerate
Gulcheru, Vempalli
Papaghni
Sandstone, dolomite Conglomerate
Bollapalli, Gunjeda Pandikunta
Mallampalli
Dolerite, gabbro
Intrusives
Migmatite
Quartzo-feldspathic granitoid gneiss
Eastern Ghat
Pyroxene Granulite
Charnockite
Garnet sillimanite gneiss calc silicate/sillimanite quartzite
Khondalite
Granitic, granodioritic, monzo-granitic, cyenogranitic leucocyenogranite
Charnockitic, undassified granulites
Karimnagar (~2500ma)
Archaean to Proterozoic
Granitic gneiss variants
Peninsular Gneissic Complex II
Archaean
Meta gabbro,meta volcanics metasediments
Gadwal, Peddavura, Yerrabelli, Ghanpur, Khammam
Dharwar
Granite gneiss
Peninsular Gneissic Complex I
The External boundaries and coastlines of India agree with the Record/Master Copy certified by Survey of India.
National highways, major roads and railway trunk routes only are shown.
The responsibility for the correctness of internal details rests with the publisher.
The spellings of names in this map have been taken from various sources.

(iii) GEOCHEMICAL MAPPING:

National Geochemical Mapping (NGCM) programme of the entire country was launched by GSI during F.S.2001-02, to generate baseline data for monitoring variations in the levels of chemical elements at the Earthôs surface and to identify new potential locales for undiscovered mineral resources. Geochemical Mapping is not only useful in locating/developing natural resources but, also finds wide application in environmental, agriculture, public health and other societal concerns.

Systematic coverage under geochemical mappings is carried out on 1:50,000 scale with sampling and analysis of stream sediment, soil, humus and surface water etc. Under this program, from each 1 km. x 1 km. grid, one stream sediment sample is to be collected from appropriate streams and sites, and these samples are to be composited for every 2 km. x 2 km. grid for analysis. Soil (Regolith and C-horizon) and stream water samples are to be collected on a 5ô x 5ô grid. The programme also envisages collection and analysis of humus samples (where available), and flood plain sediments from rivers having drainage basin area of 500 ï 1000 sq.km. Chemical analysis of samples are carried out for 68 elements (Package A-27, B-1, C-2, D-4, E-1, F-2, G-1, H-22, I-2, J-6).

In Southern Region the geochemical mapping has gained momentum for its accelerated coverage. Special thrust has been given especially in the mineral prognosticated areas. After the initiation of NGCM programme in F.S.2001-02, in SR a total area of 94,474 sq.km. has been systematically covered upto F.S.2013-14 along with sampling. The current status of Geochemical mapping is summarized in the Table below and the comprehensive coverage of the area by Geochemical Mapping in Southern Region is shown in the map.

Table 8: STATUS OF GEOCHEMICAL MAPPING ((in sq.km.)

REGION/STATE	AREA COVERED (Upto March, 2014)	PROGRAM TARGET (FS 2014-15)	ACHIEVEMENT FS 2014-15 (Jan. – Mar .2015)	Achievement from April, 2014 to March, 2015
ANDHRA PRADESH	36882	12320	**5163 (41.91%)**	**12574 (102.06%)**
KARNATAKA & GOA	23998	11040	**6054 (54.84%)**	**11460 (103.81%)**
TAMILNADU & PUDUCHERRY	20904	6480	**1975 (32.92%)**	**6549 (101.06%)**
KERALA	12690	2094	**1262 (60.27%)**	**2118 (101.15%)**
SR (TOTAL)	**94,474**	**31934**	**14454 (45.95%)**	**32701 (102.40%)**

During the FS 2013-14, thirty one items of Geochemical Mapping were taken up, of which twelve items were in Andhra Pradesh, ten items in Karnataka & Goa, six items in Tamilnadu & Pondicherry and three items in Kerala. All the field items were successfully completed, with achievement of total 24,850 against the target of 21,412. Forty three NGCM items have been taken-up in SR during the FS 2014-15, covering 31,934 sq.km. area. The main degree sheets proposed to be covered are;56D, 57A, G, D, 58E,F, J& 48P. Out of a total of forty three (additional 5 new items) new items,during the FS 2014-15, sixteen items are in SU:AP, fifteen items in SU:K&G, nine items are in SU:TNP while three items are in Kerala.

A brief account on the highlights of the work done in the State Units are given below:

SU: ANDHRA PRADESH

During F.S. 2014-15, sixteen items were taken up under Project: NGCM in 57 B, 57 J, 56 H, 56 L & 65 N degree sheets covering toposheets 57 J/1 & J/2, 65 N/6, N/7, N/8 & N/10 of Anantapur, Cuddapah, Kurnool, Srikakulam, Visakhapatnam & Vizianagaram districts of Andhra Pradesh and toposheets 56 H/9, H/10, H/11, H/12, H/13, H/14, H/15 & H/16, 56L/1 & 56L/4, 57 B/13 & B/14 of Mahabubnagar & Ranga Reddy districts of Telangana. The total area covered upto 31st March, 2015 is **12574** sq.km. The total target assigned for FS 2014-15 has been achieved and the samples were submitted to chemical division, SR, Hyderabad. In toposheet nos. 65N/6, N/7 & N/10 **manganese mineralisation** were recorded.

SU: KARNATAKA & GOA:

National Geochemical Mapping of the states of Karnataka and Goa was undertaken from FS: 2002-03 onwards with a view to generate baseline data, that is not only useful in locating, developing natural resources but also finds wide application in environment, agriculture, public health and other societal concerns. During F.S. 2014-15, a total of fifteen items (two new additional items) are proposed covering an area of 11040 sq.km in degree sheets 57 A,D, G, K, 56D. During the field season, all the targets assigned has been achieved covering an area of 11460 sq.km.

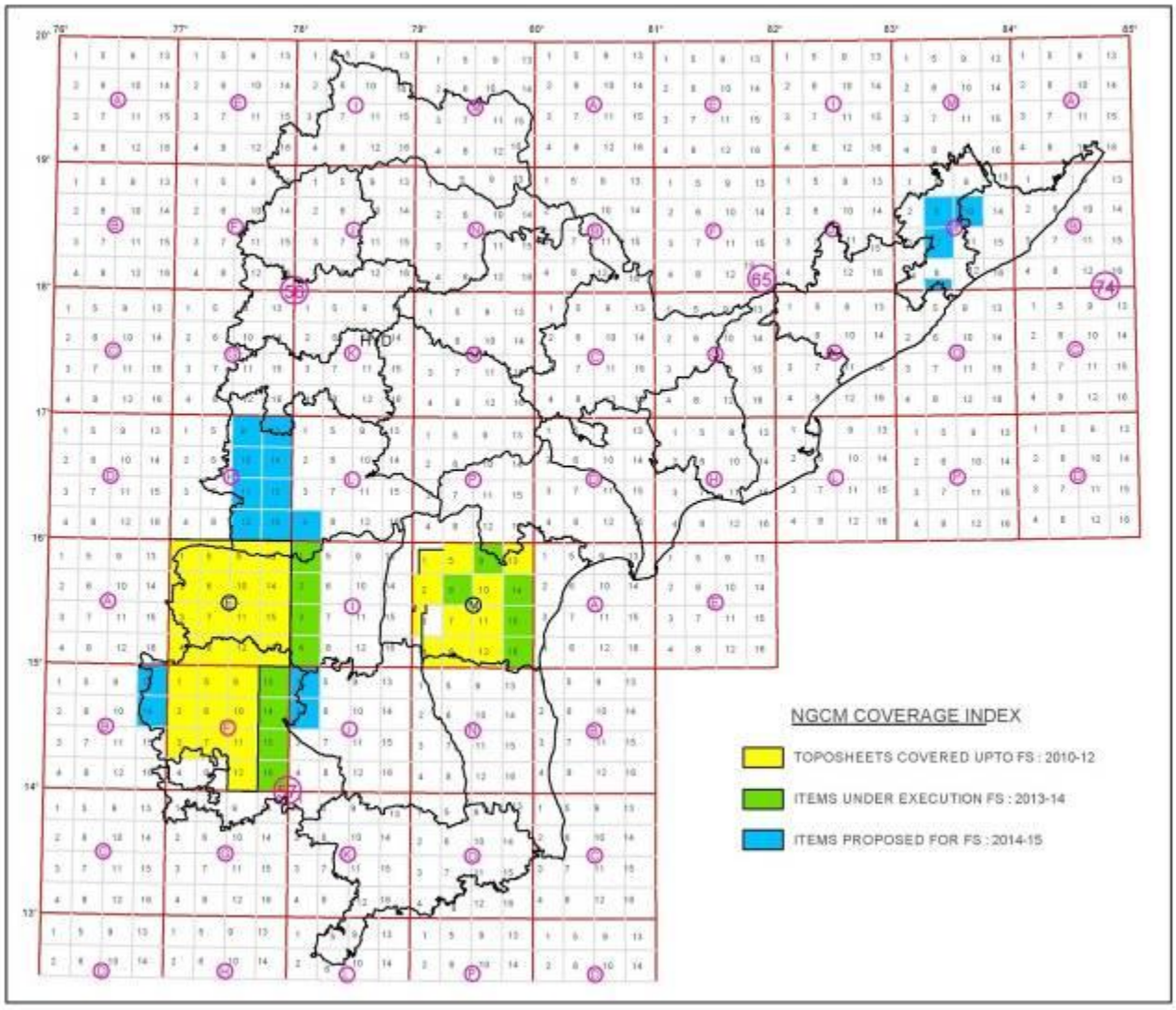
SU: TAMIL NADU & PUDUCHERRY

During the Annual Programme of 2013-14, six items were taken up for geochemical mapping in with a total taget of 4512 sq.km. and an area 4404 sq km was covered up to the end of March, 2013. For the F.S.2014-15 nine items (one new additional Item) were taken up with a target of 6480 sq.km covering T.S.Nos 58E/3,4,6,8,58J/1, 58F/13 and 57H/13, 58A/15. During the field season an area of 6480 sq.km was covered against the target..

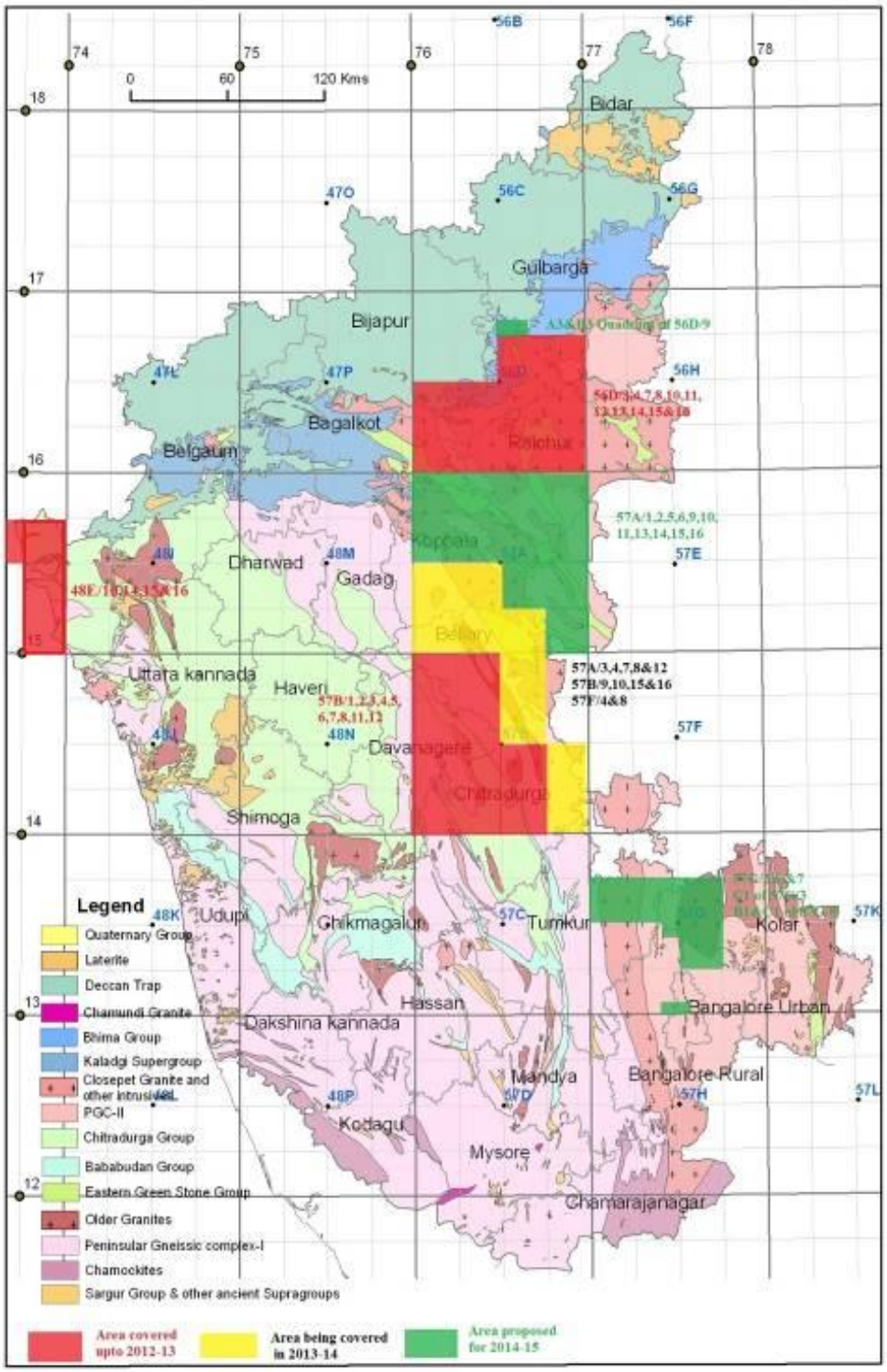
SU: KERALA

During the Annual Programme of 2014-15, three NGCM items covering an area of 2094 sq.km. falling in Toposheets T.S. No. 48P/12, 48P/2 and part of 48P/4 Kannur, Kasargod of Kerala and Kodagu and Dakshina Kannada districts of Karnataka are proposed. During the field season an area of 2118 sq.km was covered against the target.

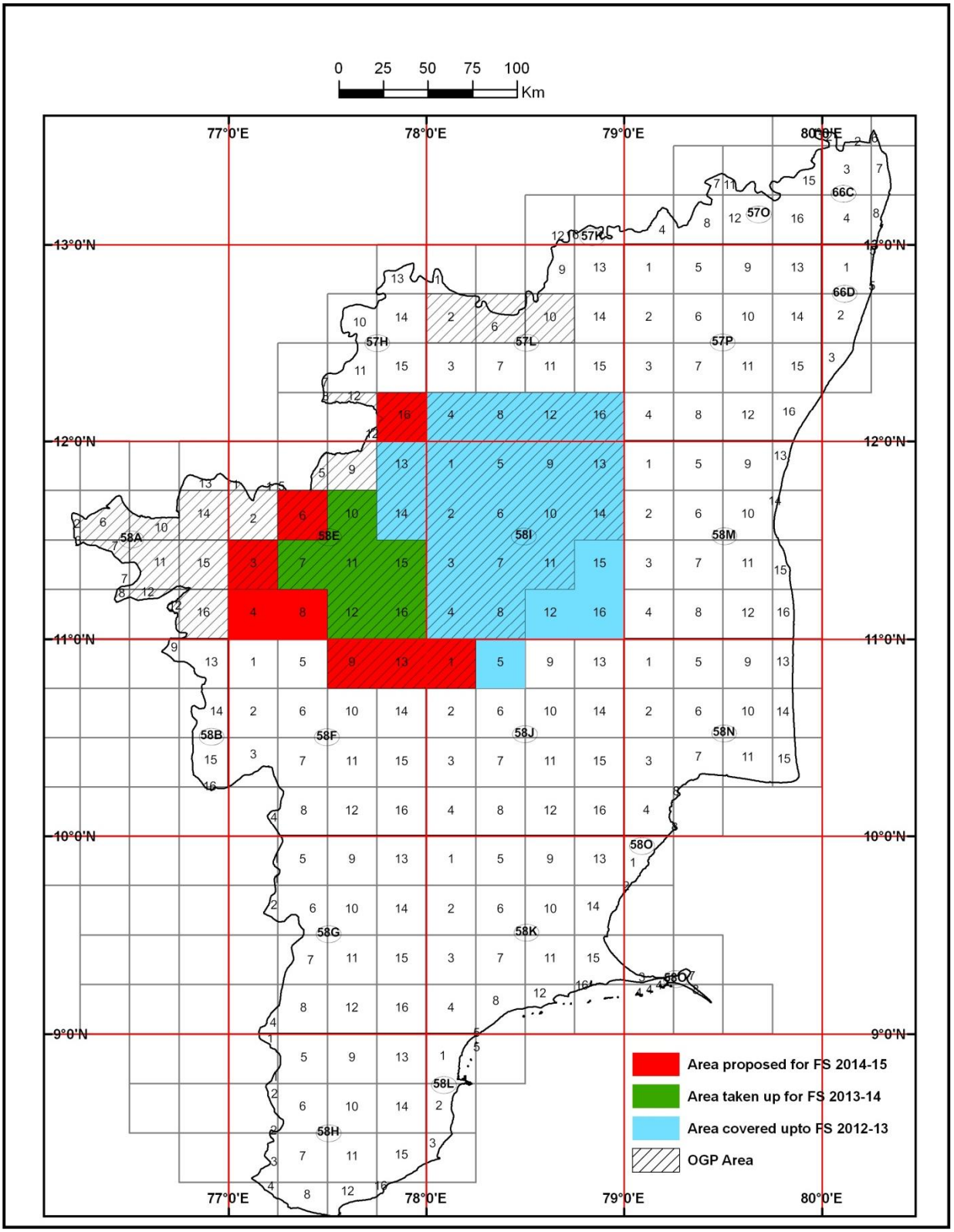
STATUS MAP OF NGCM PROJECTS IN ANDHRA PRADESH



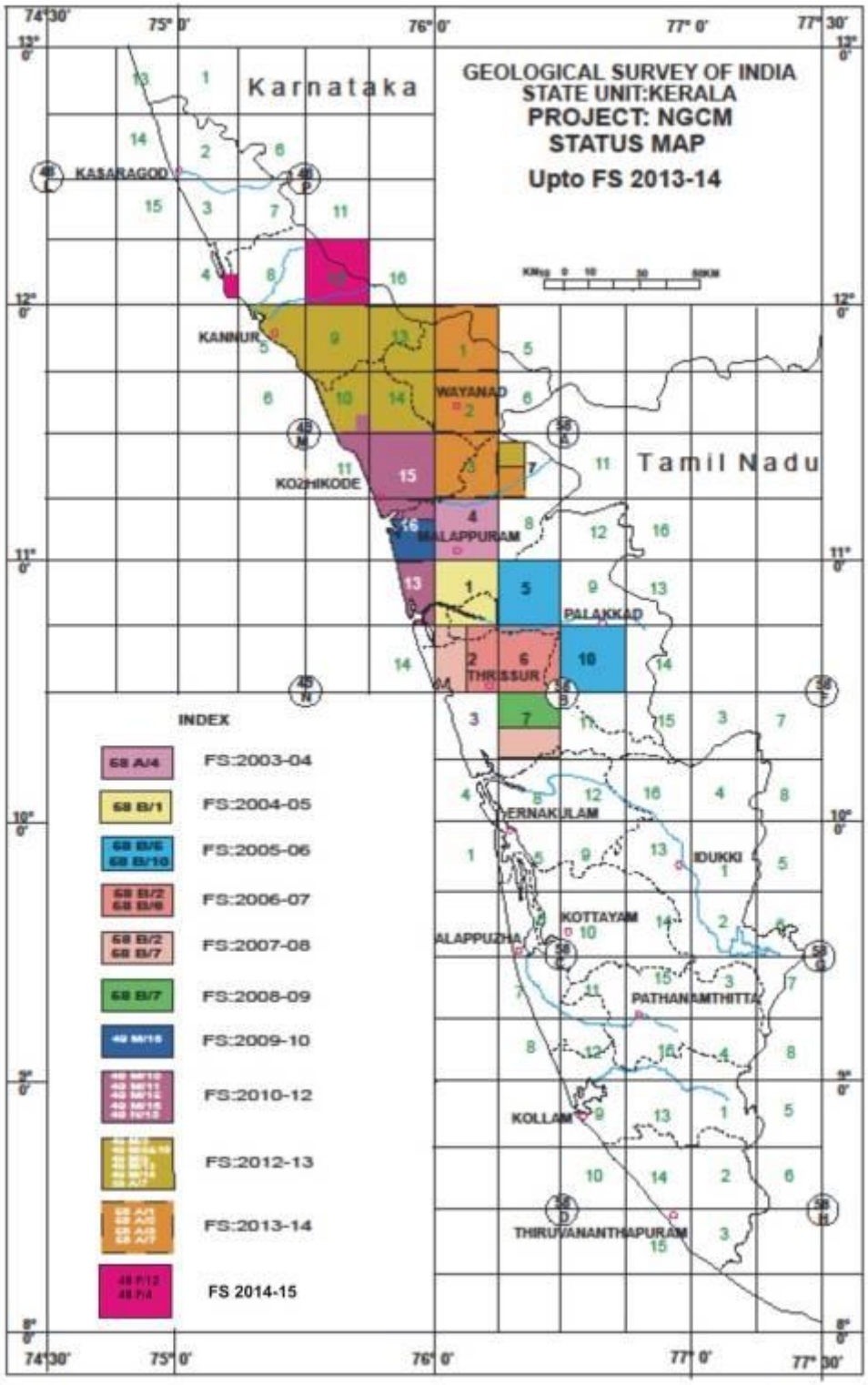
GEOLOGICAL MAP OF KARNATAKA AND GOA SHOWING THE STATUS OF NGCM



STATUS MAP OF NGCM PROJECTS IN SU: TNP



STATUS MAP OF NGCM PROJECTS IN SU: KERALA



(iv) GEOPHYSICAL MAPPING:

Systematic Geophysical Mapping has been initiated with the objective to prepare gravity and magnetic map of the country. The compiled geophysical anomaly map on 1:50,000 will provide the baseline data over which various strategies of interest can be worked out. The baseline geophysical data is of immense importance to focus on potential/probable target areas for mineral exploration in concealed area at deep as well as shallow level.

In Southern Region a total of 84,941 sq.km. area has been covered by GM survey upto March, 2014.

During F.S. 2013-14, three items of Geophysical Mapping (GPM) in Toposheet Nos. 58E/6,9 and 10 in Tamil Nadu, and two items in Andha Padesh in T.S. Nos.57I/3, 4,7, 57F/2,6,7 were taken up.

During the Annual Programme 2014-15, four items of Regional Gravity & Magnetic (TF) suverys in Toposheet Nos. 58E/1,2,5,13 and 14 in parts of Tamil Nadu and Karnataka states, 57M/1,2,3,5 and 6 in parts of Andhra Padesh, 57A/5,6,9,10 and 11 in Karnataka, 57F/3,4,8,11,12,15 and 16 in AP and Karnataka under the Project: Geophysical Mapping have been taken up with a total taget of 15, 840 sq.km (with DGPS) and 11,500 (without DGPS). During the field season a total of 12795 sq. km was covered against the assigned target of 11, 500 sq.km (without DGPS) with an achievement of 111.26%.

A brief account on the highlights of the work done by the Division in State Units are as follows:

TAMILNADU

During F.S. 2014-15 one item on GPM was taken up.

i) REGIONAL GRAVITY & MAGNETIC (TF) SURVEYS IN TS NO'S. 58 E / 1, 2, 5, 13 & 14 IN TAMIL NADU, UNDER PROJECT: NGPM (2014-15/GPM/SR/TN/2014/049):

Regional gravity & radio metric surveys have been carried out in Toposheet No.57F/4 and parts of 57F/3, 6,7 and 8 have been carried out under the Project: National Geophysical Mapping (NGPM) with station density of one station per 2.5 sq.km area, in and around Pavugada area, Andhra Pradesh. Camp was closed on 30-3-2015, data under process to analyze the GM maps.

ANDHRA PRADESH:

During F.S. 2014-15 one item on GPM was taken up.

ii) **REGIONAL GRAVITY & MAGNETIC (TF) SURVEYS IN TS NO'S. 57 M / 1, 2, 3, 5 & 6 IN ANDHRA PRADESH, UNDER PROJECT: NGPM (2014-15/GPM/SR/AP/2014/050):**

Regional gravity and magnetic surveys have been completed under the project: National Geophysical Mapping (NGPM) with a station density of 1 station per 2.5 sq.km in toposheet nos. 57 M / 1, 2, 3, 5 in and around Markapur area, Andhra Pradesh. Camp was closed on 19-3-2015, data under process to analyze the GM maps.

KARNATAKA:

iii) REGIONAL GRAVITY & MAGNETIC (TF) SURVEYS IN TS NO'S. 57 A / 5, 6, 9, 10 & 11 IN KARNATAKA, UNDER PROJECT: NGPM (2014-15/ GPM/SR/KAR/2014/051) :

Regional Gravity and Magnetic (TF) surveys have been carried out in toposheet nos. 57A/5,6,9 under the project: NGPM in parts of Karnataka, covered an area of 2160 sq.km during the FS. Area covered by Levelling work during the month: 462 sq.km. Camp was closed on 20-03-2015 data under process to analyze the maps.

ANDHRA PRADESH & KARNATAKA:

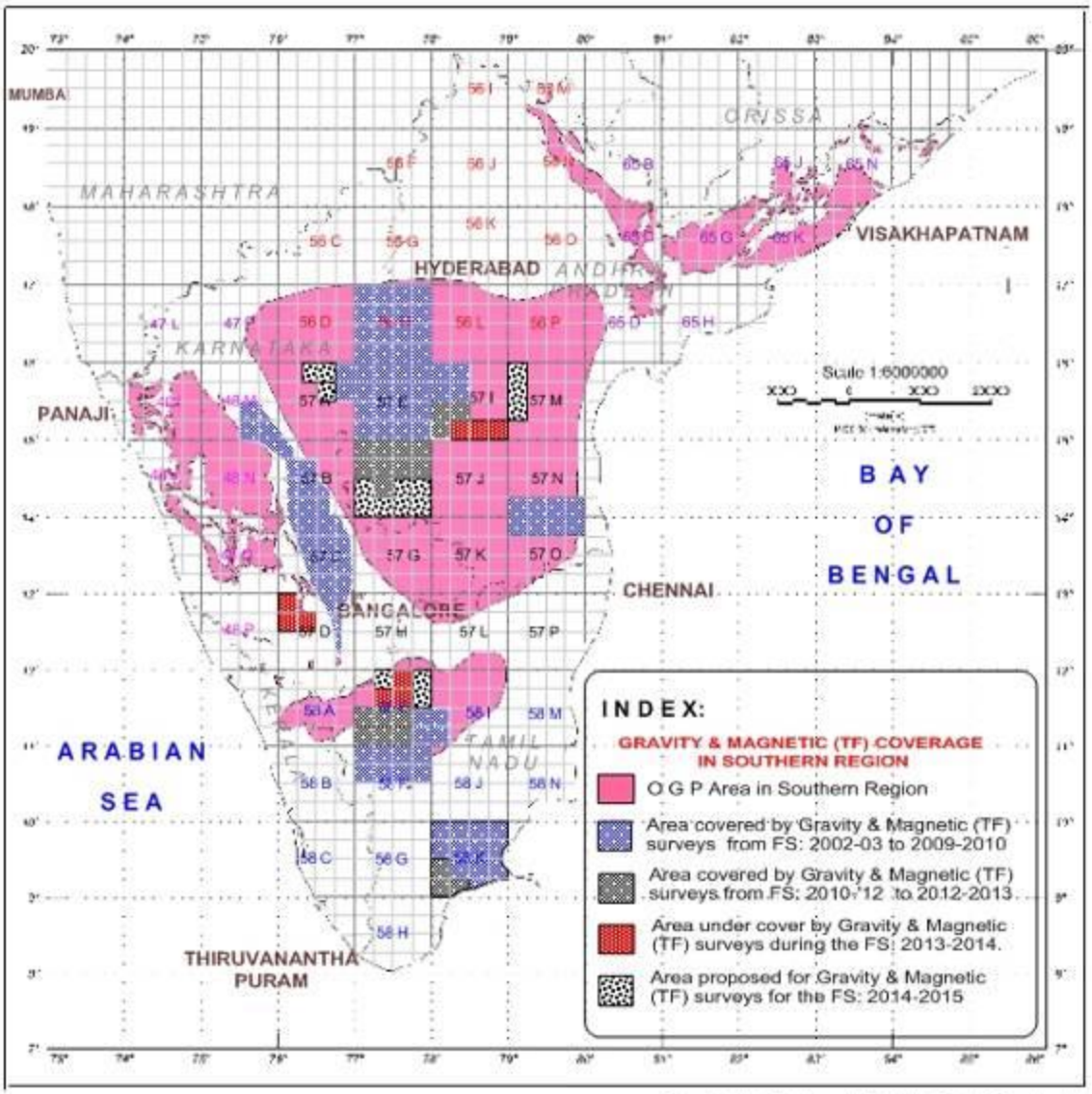
IV) **REGIONAL MAGNETIC (TF) SURVEYS IN TS NO'S. 57 F/3,4,8,11,12,15 & 16 IN AP & KARNATAKA, UNDER PROJECT: NGPM (2014-15/ GPM/SR/AP,KAR/2014/052:**

Regional Magnetic Surveys carried out under the Project NGPM with a station density of 1 station per 2.5 sq.km. in toposheet nos 57F/ 3, 4, 8, 11, 12, 15, 16, in parts of AP and Karnataka. The data is under process. Camp was closed on 20-03-2015.

Table 9: STATUS OF GEOPHYSICAL MAPPING: (in sq.km.)

REGION/STATE	AREA COVERED (Upto March, 2014)	PROGRAM TARGET FS 2014-15)	ACHIEVEMENT FS 2014-15 (Jan. – Mar.2015)	Achievement from April, 2014 to March, 2015
ANDHRA PRADESH	33,341	3600	**1440 (40%)**	**2880**
KARNATAKA&GOA	27,260	3600	**960 (26.67%)**	**2160**
TAMILNADU & PUDUCHERRY	24,340	3600	**1500 (41.67%)**	**2535**
ANDHRA PRADESH & KARNATAKA	Nil	5040	**2960 (58.73%)**	**5220**
KERALA	Nil	Nil	**Nil**	**Nil**
SR (TOTAL)	**84,941**	**15,840 (with DGPS) 11,500 (without DGPS)**	**6860 (43.31%)**	**12795 (111.26%) (without DGPS)**

STATUS OF GRAVITY & MAGNETIC (TF) MAP OF SOUTHERN REGION UNDER OGP AREA



Compiled by R. Ananda Reddy, Senior Geophysicist

MISSION IB :

v) REMOTE SENSING DIVISION:

All India Mosaic of National Geomorphological and Lineament Mapping on 1:50,000 scale using satellite data (NGLM), FSP Code No: GMLM/CHQ/M-IB/2014

SOP for preparing inter state mosaic of entire southern states was received from CHQ. Checking of mosaiced NGLM Database of Southern region and creation of features in the gap areas along the inter-state boundaries and also edge matching of landform features were carried out as per the SOP and the final Mosaicked Geodatabase for the entire southern region was sent to PGRS division CHQ, Kolkata.

MISSION-IC:

v. **MARINE AND COASTAL SURVEYS:**

As per office Order No. ----/Planning/ Del. of fin. Powers/2014 dated 24th September 2014 HOD Status has been given to Head, M&CSD Mangalore . The Annual Programme for the FS 2014 ï 2015 (April 2014 ï March, 2015) of Marine & Coastal Survey (MCS) Division under the Mission-IC Baseline Geoscience Data Generation of Geological Survey of India includes multidisciplinary offshore survey and exploration within the Exclusive Economic Zone (EEZ) of India including Territorial Waters (TW). Till March 2015 of FS 2014-15, systematic seabed mapping has been completed for 1,32,585 sq km out of 1,50,000 sq km in 5 km x 2 km grid within Territorial Waters and 18,54,534 sq km out of 18,64,900 sq km in the EEZ beyond Territorial Waters on reconnaissance scale of 40 km x 20 km grid. The total EEZ coverage including TW is 19, 87, 119 sq km out of a total EEZ area of 20,14,900 sq km.

STATUS OF MARINE AND COASTAL SURVEYS REGION/STATE	LENGTH OF THE COAST IN KM	AREA OF TERITORIAL WATERS (12 NM = 22.224 KM) SQ.KM.
GUJARAT	1915	42559
MAHARASHTRA	510	11334
ANDHRA PRADESH	970	21557
KARNATAKA & GOA	400	8890
TAMILNADU & PUDUCHERRY	910	20224
KERALA	540	12000
SR (TOTAL)	5245	116564

Marine and Coastal Survey Division with its Headquarters at Mangalore functions through its operational offices at Kolkata, Visakhapatnam, Mangalore, Kochi Bhubaneswar, Chennai and Gandhinagar to undertake seabed survey in the EEZ and beyond with its ocean going research vessel Samudra Ratnakar and twin coastal launches R.V Samudra Kaustubh and R.V. Samudra Shaudhikama. Vast resources of economic placer minerals and relict sands have been delineated besides identifying encouraging occurrence of lime mud, phosphate bearing sediments and Fe-Mn encrustations within the EEZ of India. In view of the geoscientific studies carried out over decades with the specialised laboratory backup, the Marine and Coastal Survey Division has developed adequate expertise to provide consultancy services in the fields of seabed mapping with geological, geophysical and geochemical parameters, resource evaluation for placer minerals, survey for single buoy mooring system, offshore structures, jetties, development of ports/harbours, laying of underwater pipelines and cable, geochemical scan for hydrocarbons, etc.

RV Samudra Kaustubh and R.V. Samudra Shaudhikama, the twin coastal launches are operating in the east and west coasts respectively, each with 7 days endurance and equipped with single beam dual frequency (33 & 200 kHz) Bathy-1500 echo sounder, single channel digital seismic system, cesium magnetometer, side scan sonar system, current meter, DGPS and GPS systems, grab sampler, gravity / piston corer, box corer, vibro corer, dredge and water samplers. Multichannel bathymetric survey system is non operationa in both vessels. A new unit for R.V. Samudra Kausthubh has already been purchased and is under installation.

It has been suggested in Para 5.3 of National Mineral Policy, 2008 that co-operation between Ministry of Earth Science (MoES) and GSI is to be institutionalised so as to achieve the objective of comprehensive topographic mapping by swath bathymetry within the EEZ in a time bound framework. This issue was discussed during several meetings of the Committee VI of CGPB on Marine Geology, Exploration and Coastal Geoscience and the Secretary, MoES has agreed in

principle that MoES and GSI should work together. Accordingly an MoU was signed between GSI (MoM) and NCAOR (MoES) at Mangalore on 21st August, 2013 to undertake swath bathymetric mapping of EEZ of India in a phased manner. Till 31-03-2015 an area of 4,39,317 sq. km was covered by GSI in deep water (> 500 m water depth) and 2851 sq km in shallow water (< 500 m water depth). It has been decided to compile the data already collected so far by both the organizations and make a database for future use. Swath bathymetric survey programmes is being undertaken since FS 2008-09 and have been included in the Annual Programme of Marine and Coastal Surveys which would form a part of the joint programme with MoES.

A programme for investigation for gas hydrate has also been launched with the collaboration of NIO, Goa. Under this programme SR-006 cruise was held off Kanyakumari in the month of Feb- March 2015. A total of 2100 lkm seismic survey was conducted and during the course of cruise defiit indications of occurrence of gas hydrate has been identified. Processing of data and interpretation are progressing.

In accordance with the thrust areas of marine surveys as projected in the XII Plan, several programmes have been proposed for geological and geophysical mapping of the seabed on the continental shelf and in the deep sea domain within EEZ of India and beyond during the FS 2014-15.

In the deep water domain, Multibeam Bathymetric Survey in the continental shelf off Gujarat, over Laxmi Ridge has been proposed with R.V.Samudra Ratnakar. Two mineral investigation cruises for exploration for Lime mud along Gujarat and Andhra Pradesh are also planned for the season in addition to two multi channel seismic cruises, one for gas hydrate studies with the collaboration of NIO and another over Bay of Bengal over 85 degree channel.

The coastal vessels were principally used for Mapping the sea bed, parametric survey and marine mineral exploration. Utilising the Coastal Vessels RV Samudra Kaustubh and RV Samudra Shaudhikama within the continental shelf in the east and west coast of India, systematic seabed mapping is proposed in the hitherto unmapped areas off Gujarat and Tamilnadu. RV Samudra Shaudhikama in addition to one HM placer investigation off Kerala and one Parametric survey for delineating buried channels off Karnataka. One cruise, SD- 255 for identifying sand resources off Kerala has already been completed in April 2014. One mineral investigation cruise for determining the HM placer resources off Andhra Pradesh has also been completed in April by R.V. Samudra Kausthubh. One parametric cruise and another geotechnical cruise off Tamilnadu are planned in the current FSP for this vessel. Multibeam cruises could not be taken up due to due failure of the equipment. Efforts are being made to replace them with new equipments.

Modernisation of ships, equipment and Laboratories Marine and Coastal Surveys of GSI is in the process of acquisition of one geotechnical research vessel with drilling capability up to 30 m in waters as shallow as 6 m. The vessel is intended of drilling the sea bed for geotechnical evaluation mineral exploration etc.

Geotechnical Vessel: The procurement action for the new geotechnical vessel was rewieved by MoM and they has suggested to restart the procurement process afresh. In this regard a meeting was conducted on 25-02-2015 and decisions were forwarded to DG, GSI. After getting the approval from DG, GSI letter regarding cancellation of previous tender was sent to M/s TEBMA Shipyard Ltd along with the Original Bank guarantee on 23-03-2015. Permission from DG, GSI has been obtained for constitution of a task force for the procurement of new GTV and new task force was constituted on 23-03-2015.

The process of upgradation of the instrument systems is being continued. Proposal has been submitted for upgradation of multibeam echosounder in the coastal vessels. The two chemical laboratories under the jurisdiction of SR are located at Visakhapatnam and Mangalore are equipped with AAS (having VGA and GTA facilities) and Spectrophotometers. Monitoring of day-to-day functions and operations of Net Server and seamless connectivity amongst all the nodes of the CAN, WAN and IP phone installation has been coordinated at operational offices. Antivirus program has been periodically updated for providing up-to-date virus protection.

RV Samudra Manthan was decommissioned and was out of operation since 1st January 2014. Attempts to convert the vessel into a museum was made with consultant services of Indian Maritime University, Chennai as per their recommendations it was decided to dispose the vessel through M/s MSTC Kolkata. The party has been identified through e-auctioning and an MoU has been signed for receipt of payment. SCI has been requested to arrange necessary documentsfor handling over the vessel to the bidder for disposal.

It is planned to modernize the labs to make them centers of excellence. Processing and storage of various types of data coming from the vessels are planned to be centralized. A taskforce has been constituted for establishing marine data storage facility for archiving offshore data at suitable centers

Till 31st March 2015 the following programmes were takenup by M & CSD in FS 2014-15.

R.V.Samudra Ratnakar

SR-004 (SR) Seabed mapping, morphology, sediment composition and sediment transport in the continental slope, Off Cochin, Kerala.

SR-008 (SR) Preliminary assessment of lime mud in continental margin off Gujarat.
SR-007: Morphotectonic and sediment characteristic studies of Laxmi Ridge
SR-005 (SR) Seabed mapping, morphometry, sediment composition and sediment transport in the continental slope, off Cochin, Kerala.
SR-006 (SR) Geological and Geophysical investigations in Cauvery-Mannar offshore basin and Krishna-Godavari offshore basin, Eastern continental margin of India for the gas hydrates studies (a collaborative programme with NIO).

RV Samudra Kaustubh
ST-238 (SR) Placer mineral resource evaluation in the territorial waters off north of Bhimunipatnam (Off Santapalle), Andhra Pradesh.
ST-242(SR) Parametric(Magnetic and Seismic) survey within Territorial Waters off Vainateyam Godavari River and Vasishta Godavari River mouths, Andhra Pradesh Coast, Bay of Bengal.
ST- 237(SR) Mapping of seabed within Exclusive Economic Zone north off Rameswaram, Tamil Nadu Coast.

RV Samudra Shaudhikama
SD-255 (SR) Evaluation of relict sand resources off Kodugallur, Kerala.
SD-256 **(**SR) Delineation of paleo channels and sand bodies, off Hangarkatta, Karnataka coast
SD-257 **(**SR) : Mapping of the seabed off Okha
SD-261 (SR) Evaluation of heavy mineral sands off Muttamtura, Tamil Nadu.

Coastal Projects
Item No-083: Mapping of nearshore gap areas and assessment of Heavy Mineral potential off Anjengo, Kerala.
Item No-089: Coastal survey between Apsarakonda and Swarnagadde near Honavar, Uttar Kannada Dt, Karnataka for identification of heavy mineral occurrences.
Item No-090: Coastal survey near Ullal, Dhakshin Kanada District, Karnataka.
Item -074 Study of environment and neo-tectonic aspects of the coastal area and study of beach and seabed sediments off Setrunji River Delta, South of Bhavnagar Dist., Gujarat***(Continuing Programme)***

R & D: Palaeontology:
Item-077 RP: (SR) Planktonic foraminifer productivity changes in the northern tropical equatorial Indian Ocean during Last Glacial - Interglacial Transition ï The role of Palaeo-monsoon.
Item No-081*(SR-108):* Geo environmental appraisal of coastal and inshore zone along Kakinada-Bangarampeta coast.

Item-082: Preliminary evaluation of REE in the marine sediments from west coast of India.

During the above cruises of R.V. Ratnakar, baseline geoscience data collection of **70, 341** sq km of multibeam bathymetry, was done during the FS 2014-15.

(vii) NATURAL RESOURCE ASSESSMENT -IIA:

During FS 2014-15, thirty nine investigations will be taken up. These include 17 (12 M-IIA & 5 M-IIB) items in SU: Andhra Pradesh, 13 items in SU: Karnataka & Goa,7 (5 M-IIA & 2M-IIB) items in SU: Tamil Nadu & Puducherry and 2 in SU: Kerala. Among these, 31 are under G-4 stage, 8 are under G-3 stage investigations besides one service item of maintenance and monitoring of Wajrakarur diamond processing plant, catering to the needs of various diamond prospecting and exploration activities of GSI,SR was taken up.
Commodity wise, mineral investigation items, taken up by the different SUs of the region during the F.S.2014-15 and F.S.2014-15 are summarized below:

Table- 11: MISSION-II: NATURAL RESOURCE ASSESSMENT ITEMS

REGION/STATE UNITS	ACTIVITY/ MINERAL COMMODITY	NO. OF ITEMS F.S. 2013-14	NO. OF ITEMS F.S. 2014-15
SR	Total items	34	39 (32 M-IIA & 7 M-IIB) + 1 (Service Item)
ANDHRA PRADESH	Total items	14	17+ 1(Service Item)
	Gold	1	1
	Diamond	2	3
	PGE	1	-
	Chromite	1	1
	Limestone	3	-
	Basemetals	-	3
	Iron Oe	-	2

	REE	1	1
	Phosphorite	1	-
	Tungsten	-	1
	Coal	4	5
KARNATAKA & GOA	Total Items	12	13
	Gold	6	6
	Diamond	3	2
	PGE	2	1
	REE	-	2
	Iron Ore	-	2
	Manganese	1	-
TAMILNADU & PUDUCHERRY	Total items	6	7
	PGE	4	2
	Graphite	-	1
	Lignite/Coal	1	2
	REE	1	1
	Dunite	-	1
KERALA	Total items	2	2
	PGE	1	1
	Gold	1	1

Highlights of the work carried out during FS 2014-15:

SU: ANDHRA PRADESH M – II A

Under Mission ï IIA thirteen items (13) were taken up which includes five items on precious metals & minerals (one G-4 stage item of Gold, three G-4 stage items of Diamond, one service item in Diamond processing plant, Wajrakarur), three G-4 stage items of Ferrous group (one Chromite & two Iron ore), three items on Basemetal, one G-4 stage investigation for REE and one G-3 stage investigation for Tungsten and five items under Mission ï IIB (4 G-4, 1 G-3) ((Energy minerals). Under Mission II-B items on Coal exploration are taken up in Godavari Valley. The brief highlight of the work is given below:

i) Investigation For Gold And Associated Minerals In Gani And Kalava Area Of Cuddapah Basin, Kurnool District, Andhra Pradesh (Me/Sr/Ap/2014/53) (G-4):
Highlights:

03 nos of trenches were excavated based on the recommendations of the geophysical surveys. One trench in the old working of the Kalava block intersected a quartz-carbonate vein along the shale-basic sill contact with sulphide mineralization represented by chalcopyrite disseminations and malachite staining. Sulphidic quartz vein of width varying from 0.5m to 1.0 were exposed in the KST-1 and KST-3, whereas in trench no. KST-2 one sulphidic quartz vein and two non-sulphidic quartz veins were exposed. The sulphidic quartz vein intersected in trench KT-1 & KT-3 in Kalava east block analysed 0.32% and 0.24% Cu respectively.

In the area 1 km SE of Gudembai Tanda, two quartz veins trending along NE and ENE -WSW direction in gabbroic sill extends for a cumulative strike length of 700 m and width of 0.5 to 2 m with malachite staining and chalcopyrite disseminations.

The grid pattern samples from Kalava east block have analysed <25ppb Au which supports the field observation that due to the lack of wall rock alteration the Au dispersion is absent in the area except the sulphidic quartz/quartz-carbonate veins in the old working and its extension which analysed 30-85ppb Au .

ii) Search For Kimberlite/Lamproite In Jadcherla-Yeljal Block In Mahabubnagar, Rangareddy And Hyderabad Districts, Andhra Pradesh (Me/Sr/Ap/2013/038) (G-4):
Highlights:

Based on the intersection and frequency of lineaments, 13 blocks have been identified in structural interpreted lineament map for detailed geological traverses in search of diamond source rocks. A total of 150 stream sediment samples from appropriate trap sites have been collected and processed and heavies were recovered. A total of 30 numbers of regional stream sediment samples (covering 25 to 30 sq. km.) and 90 numbers of detailed stream sediment samples (5 sq. km.) from appropriate trap sites have been collected and processed to recover heavies. Out of the 120 samples, 100 samples were scanned under binocular microscope to identify kimberlite indicator minerals (KIMs). A lamprophyre (?) dyke (16°56'6.8"N:78° 6'36.7"E), located 1.5 km north of Raghavapuram is trending in N-S direction and approximately 50 m in length and 30 cm in width. A hornblendite, located 3 km SE of Bodijanampeta (16°54'38.6"N: 78° 14'8.1"E) trending in N40°W direction and having 150

m X 80 m dimension, is noticed. It consists of phenocrysts of 2 cm to 3 cm size euhedral crystals of amphiboles and having amphiboles and feldspars in groundmass. A lamproite dyke, located 1.5 km southwest of Chintalapalli, trending in E-W direction is approximately 1 km long (as inferred from stray boulders lying in agricultural field).

iii) **Search For Kimberlite/Lamproite In Kolhapur And Srirangapur Blocks In Mahbubnagar And Kurnool Districts, Andhra Pradesh (Me/Sr/Ap/2014/54) (G-4):**

Highlights:

Using structural interpreted lineament map, geological traverses were conducted to locate primary diamond source rocks and approximately 438 sq. km. area was covered in Kolhapur Block. In addition to field traverses, stream sediment sampling is also being carried out and so far 95 numbers of samples have been collected. Their processing is being done in camp itself to get heavies. So far 78 numbers of heavy mineral concentrates are examined under binocular microscope to identify KIMs. Few suspected KIMôs (spinel) are submitted for EPMA and all are confirmed as Cr-spinel showing their Kimberlite affinity. Two new lamproite clusters were located first time near Somasila village, Kolhapur Mandal, Mahabubnagar District, at the NW margin of the Cuddapah basin. The ultrapotassic rocks are emplaced into the lower Cuddapah sedimentary sequences along WNW-ESE trend. So far seven numbers of lamproite bodies are discovered in Somasila area. The lamproite bodies are intersected in the hills of Cuddapah sedimentary sequences and found up to the height of 320 m in the Vempalle dolomite. Presently out of these, one body is confirmed as ñlamproiteò by petrological and chemical analysis. The trend of lamproite dykes from the both lamproite clusters are uniform indicating they are tectonically similar and may have large regional connection.

iv) Search For Kimberlite/Lamproite In Parts Of In Koilkonda And Deverakadra Blocks, Mahbubnagar District, Andhra Pradesh (Me/Sr/Ap/2012/049) (G-4):

Highlights:

The Koilkonda and Devarkadra blocks (1440 sq. km.), part of Mahabubnagar and Rangareddy Districts was covered during FS: 2012-14 by orientation stream sediment sampling and field traverses in Toposheet No. 56H/13 and 56H/14. During FS: 2013-14, stream sediment sampling had led to finding of the Kimberlites indicator minerals (KIMs) in Devarakadra block in five sub blocks namely Gurakonda, Koilsagar, Chinnamungalchedu, Manikonda and Komreddipalli Sub blocks. The identified minerals are Picro-ilmenites, chrome spinel, Cr-diopside and Pyrope Garnet. Midterm review committee recommented one year extension to cover all five sub blocks separately in detail. A total sum of 150 nos. of stream sediment samples were collected from five sub blocks namely Gurakonda, Koilsagar, Chinnamungalchedu, Manikonda and Komreddipalli Sub blocks. The samples were processed and examined to locate kimberlites. Suspected kimberlite zones identified in Gurakonda sub block after the recovery of fresh and coarser Kimberlite indicator minerals. Comparison of calcrete chemistry of Gorakonda subblock matches with Wajrakrur calcretes (Chigicherla cluster) was done. Those calcrete zones which have kimberlitic affinity were identified for pitting / auger drilling. Drilling target of 200 m is completed.

v) Investigation For Chromite & PGE Mineralization In The Chimalpahad Ultramafic Complex, Khammam District, Andhra Predesh (ME/SR/AP/2013/039) (G-4):

Highlights:

The area mainly constitutes the lithounits of the Chimalpahad ultramafic complex represented by anorthosite, luecogabbro, gabbro, pyroxenite which are intruded within amphibolites of Khammam schist belt. The chromite occurs as podiform lenses within the ultramafic unit viz. dunite, pyroxenite, websterite and talc tremolite schist forming thickened sheaths within the layered sequence. These Ultramafic units may be emplaced along the shear zones trending in N-S and NE-SW direction.

Identified the potential zones of chromite mineralization within ultramafic units around known mineralized area / old chromite quarries on the basis of abandoned mines, float ores and scattered ultramafic assemblages. Pitting & Trenching has been initiated in these areas to delineate and correlate the subsurface ultramafic assemblages. During pitting and trenching the weathered anorthosite along with leucogabbro in trench T3 and T4, weathered talc tremolite schist in T5 & T6 were encountered. This weathered talc tremolite schist may contain chromite mineralization. 7-8 zones of Ti-V magnetite has been traced near Rampuram Tanda, Ramanapalem, Vinobanagar, Rangapuram, Bajumallayagudem and Burdaraghavpuram villages which may be favourable locale for PGE mineralisation. The EPMA analysis of chromite shows Cr_2O_3 content ranging from 50.319 to 51.841%, FeO ranging from 29.663% to 30.993%, Al_2O_3 ranging from 14.235% to 15.05% and MgO ranging from 2.523 to 10.21%. As per the data so far received from chemical laboratory the layered anorthosite and massive anorthosite from Chimalpahad ultramafic complex shows Cr % values ranging from 100-3807 ppm with 10-389 ppm copper and 10-1540 ppm nickel, while float chromite ore from the quarry shows 41.09 % of Cr. Whole rock analysis of ultramafics in the area shows low PGE concentration: Ir = 21 ppb, Ru = 96 ppb, Rh=5 ppb, Pt = 12 ppb and Pd=23 ppb. The chemical analysis of V-Ti magnetite shows FeO upto 46.94 %, TiO_2 upto 49.06 %, Cr_2O_3 upto 0.81% and Vanadium upto 6990 ppm.

vi) Reappraisal Of Basemetal Mineralisation In Karempudi Block Of Agnigundala Basemetal Belt, Guntur District, Andhra Pradesh (Me/Sr/Ap/2014/55) (G-3):

Highlights:

The Karempudi drilling bock lies in the eastern part of the ENE-WSW trending Karempudi-Papayapalem mineralised dolomite band having 6.5 km strike length which is located in the extreme northern part of the 50 km long Agnigundla

mineralised belt of Cuddapah basin. Some of the salient points of the drilling block are as below: (1) The ENE-WSW trending northern limb of anticline of the dolomite band extends about 700 m long having 12m thickness showing gradational contact with phyllite hosts basemetal mineralization (mainly galena) within a 4.5 m zone in central part. Study along trench sections/outcrops indicates segregation of mineralization (galena) is mainly along the zones where proliferations of quartz veinlets are present. (2) The central part of the dolomite is massive and has galena mineralization in them. AAS analysis of dolomite from central part of the Trench-1 samples (north of KD-1 proposed borehole location) shows up to a maximum of 1.9% Pb and 5804 ppm Zn. (3) Pitting and trenching across an E-W trending dolomite band of about 24 m strike length and width up to 5 m shows incidence of disseminated chalcopyrite, galena and bornite (?) which is about 30 m SSW of proposed borehole KD-1. (4) XRD analysis: Dolomite samples (nos. KD-1/5X & K9/x) from trench-1 in general has given 67%-90% dolomite, 7-17% quartz, 1-6% muscovite, etc. with ~1% Owyheeite (Pb7Ag2(Sb,Bi)8S20, 2% cerrusite (PbCO3) & 1% galena. (5) Ore petrographic study suggests that the concentration of galena along with sphalerite is dominant in the central part of the dolomite, where as chalcopyrite and sphalerite are relatively more towards the margins of the dolomite. The same is also corroborated by the dispersion pattern of the Pb, Zn and Cu shown in the trench-1.

vii) Preliminary Investigation For Basemetal And Other Associated Mineralisation West Of Karempudi To East Of Khandrika Area Of Agnigundala Mineral Belt, Guntur District, Andhra Pradesh (Me/Sr/Ap/2014/56) (G-4).
Highlights:

1. A few gossanised bands in association with grey to black dolomite and chert are reported for the first time in the area at 4 km NW of Remedicherla. The gossan is highly silicified and contains sulphide disseminations such as **sphalerite, pyrite, chalcopyrite,** etc. A potential block of about 1 sq. km (1.75 km × 0.6 km) is identified**.**
2. A few silicified, breciated & gossanised lensoidal chert bands are also reported for the first time in the area. Its details area as follows-The silicified and brecciated lensoidal chert bands occurs along the eastern margin of the purple dolomite which is in contact with shaly dolomite and are noticed at 2 km east of Domalugundam. These bands extend over a cumulative strike length of about 1 km having a maximum width up to 15 m. They are gossanised at a few places containing disseminated sulphides such as sphalerite, pyrite etc.
3. A few silicified, breciated & gossanised lensoidal chert bands are also reported for the first time in the area. Its details area as follows-The silicified and brecciated lensoidal chert bands occurs along the eastern margin of the purple dolomite which is in contact with shaly dolomite and are noticed at 2 km east of Domalugundam. These bands extend over a cumulative strike length of about 1 km having a maximum width up to 15 m. They are gossanised at a few places containing disseminated sulphides such as sphalerite, pyrite etc.
4. The details of the proposed two baselines for geophysical surveys are as follows -
a. The first base line is given between the previous geophysical surveyed Peddagavala konda block in the south and Chenchukula Thanda block in the north owing to the fact that both these blocks showed promising IP anomalies. b. The second baseline is given over the gossanised block lying at 4 km NW of Remidicherla to know its mineral potentiality. Mineralisation : (1) Two potential zones for mineralisation are worked out in the area. First is a gossanised zone (1.75 km × 0.6 km) 4 km NW of Remedicherla. A detailed map of this has also been prepared on the instruction of Project Director in 1:2000 scale with the help of GPS and Tape. Second is Chert lenses within the purple dolomite 2 km east of Domalugundam. These chert lenses having a maximum thickness of about 15 m are highly silicified and gossanised. (2) Mineralisation is mostly observed in the chert bands assocaiated with the dolomites. The chert bands are full of pyrite disseminations but a few specs of galena or chalcopyrite are also common. Apart from this the cherty dolomite is also seen to contain mneralisation at few places as disseminations of galena.

viii) Deep Lithostratigraphic-Cum-Structural Drilling To Assess The Base Metal Potential At Lower Stratigraphic Level Below The Bedded Barites Deposit Of Mangampeta, Cuddapah District, Andhra Pradesh (Me/Sr/Ap/2014/57) (G-4).
Highlights:
Large scale mapping of 52 Sq.km area on 1: 12,500 scale has been carried out and completed.
Major rock types of the areas are quartz crystal tuff, white tuff, black/carbonaceous tuff and dolomites. A reverse fault/thrust zone (?) of 100m thick is reported in the eastern part of the Northern Barytes lens N20W/40NE. It is indicated by a zone of small scale reverse fault and isoclinal folds whose vergence is towards the movement direction 13. Sulphide mineralization in the form of pyrite is observed in black shales along the bedding with minor chalcopyrite. At places, the sulphides are observed in massive dolomite within fractures and silicified zones. Driling started from the month of February, 2015. This item will be continued as a spill over item for F.S. 2015-16.

xi) Preliminary Investigation For Iron Ore Around Yeraballi Area, Karimnagar District, **Andhra Pradesh (Me/Sr/Ap/2014/58) (G-4).**
Highlights:
- Two bands of BHQ/BMQ was delineated in the area.

- 1. Banded magnetite/ haematite quartzite trending NW-SE/ dipping 50ę-55ę towards north east, with a width varying from of 50m to 70 m and extends up to a strike length of 4.5 km.
- 2. to the east of the above band, which is also trending NNW to SSE with a strike length of 2km length and a width of 30m. The BIF bands are mainly concentrated on the top of hill.
- 3. A total of 110 BRS and 10PTS are collected from the banded magnetite quartzite, banded heamatite quartzite, magnetite, ferrugenous quartzite.. BRS were collected by making grooves (approx. 1 mt) and chips in a grid pattern from 10 secs grid intervals and the same was submitted to chemical division.
- 4. The results of 30 samples are received the percentage of total iron(Fe2O3) within the banded magnetite/heamatite quartzite varies from 30.94 to 80.22.

x) Preliminary Investigation For Iron And Manganese Ore Around Vedullacheruvu-Krishnapuram, Chandragiri And Srikalhasti Taluk, Chittoor District, Andhra Pradesh (Me/Sr/Ap/2014/59) (G-4).

Highlights:

The NW - SE trending intercalated sequence of quartzite and phyllite extends hosts iron and manganese bands. A number of bands are traced during mapping. However the band very close to the contact with massive quartzite is the thickest with width ranging from 8 ï 12 mts for a strike length of around 1. 5 kms. The iron and manganese bands exhibit botroidal appearance and are associated with chert. The mode of origin of the iron and manganese is leaching. Another significant band is in the east central part of the intercalated sequence of quartzite and phyllite with average thickness of 8 mts. The iron bands are dragged with strike changing from ENE ï WSW to NW ï SE. Several minor iron bands are traced from within the intercalated sequence of quartzite and phyllite.

i) Reappraisal For Graphite And Tungsten Mineralisation At Burugubandain Rampachodavaram Taluk, East Godavari District, Andhra Pradesh
(Me/Sr/Ap/2014/60) (G-3).

Highlights:

In Boreholes BBD-1, 2 & 3 one mineralized zone is seen sandwiched between the garnetiferous quartz-pegmatite, where as in borehole BBD-4, three thin mineralized zones and in borehole BBD-5, two mineralized zones are sandwiched by garnetiferous quartz-pegmatite. The surface width of the mineralized zone is nearly matching with the sub-surface mineralized zone intersected in the boreholes. One core sample of BBD-1 analyzed 13.9% of fixed carbon and 750ppm of tungsten. Core samples studied under UV-lamp indicated the presence of disseminated scheelite mineralization in quartz-rich pegmatite portions. The graphite and tungsten mineralization of Burugubanda area confines to the E-W trending two isolated eastern and western graphite gneiss lenses occurring within the porphyritic charnockite belongs to Eastern Ghat Mobile Belt (EGMB). These graphite gneiss lenses extend over a strike length of about 180 metres having a width upto 12 metres each are separated apart by 180m in the Burugubanda area. Thin quartz rich pegmatite veins are seen emplaced along the foliation planes of the graphite gneiss which appears to bethe carriers of the tungsten mineralisation in the area. Concentration of graphite mineralization is nearer to the quartz rich pegmatite vein. Rocks exposed in the area are garnet-sillimanite-gneiss, charnockite and migmatite gneiss. The general trend of the rocks in the area is E-W with vertical to sub-vertical dips due southerly.

xii) Preliminary Investigation For The Possible Occurrence Of Ree And Other Rare Metal Mineralization In And Around Chetlamallapuram, Kurnool District, Andhra Pradesh. (Me/Sr/Ap/2014/61) (G-4).

Highlights:

Detailed mapping has been carried out near Bastipadu, to understand the presence of quartz in a pegmatite dominated setting. It is found that K-feldspar dominating rock with pegmatoidal texture is the first to get emplaced along a fault, later reactivation led to brecciation of this unit with subsequent emplacement of quartz and hematite veins. This is the result that suddenly quartz dominates in a pegmatitic country. Heavy mineral separation of the leucogranite has been carried out by jigging in order to separate the zircons from others to use it for U-Pb dating. All the minor K- feldspar bearing pegmatite outcrops are brought out in the map to trace the actual length of the pegmatites. A pink K-feldspar bearing pegmatite trending ENE-WSW having a width upto 25m shows prolific malachite stains in an old working (20m x 8m x 5m) is reported from 500m west of Chetlamallapuram.

The pink K-felspar bearing pegmatite is discontinuously exposed along an ENE-WSW extension from Chetlamallapuram to Nayakallu. This pegmatite is highly brecciated, silicified and ferrugenised and also found to contain tourmaline crystals at places.

Analytical results indicated copper up to 1041ppm and Niobium up to 152ppm from pink feldspar and tourmaline bearing pegmatite north of Chetlamallapuram, which is already confirmed through EPMA studies earlier. High Ce and La values are obtained from sheared granite of Gorantla and granite clasts of agglomerate near Ulindakonda. Colluvial samples are collected from all the pegmatites to separate heavy minerals for further studies (Chemical analyses/ EPMA studies).

Syn-plutonic mafic dykes trending NW-SE within granite-granodiorite units of TGM suite are recorded from west of Gorantla. The syn-plutonic dykes are preferably sheared compared to the host granite. The shear sense is sinistral in nature.

All the pink feldspar bearing pegmatites emplaced along WNW-ESE trending fault planes bear multiple injections of specular hematite. Malachite stains are also recorded in this zone. An old working probably for gold is located in this zone. Euxenite (Nb-Ta_U) mineral is identified with the help of BSE studies of pink pegmatite from Chetlamallapuram.

NATURAL ENERGY RESOURCE- M – II B
SU: ANDHRA PRADESH

Four G-4 and one G-3 stage investigations have been taken up during FS 2014-15 for coal in **GODAVARI VALLEY COALFIELD.**

xiii) Preliminary Investigation For Coal In Sirpur-Sitanagar Area, Eastern Part Of Sirpur-Kagaznagar Exploration Block, Godavari Valley Coalfield, Adilabad District Andhra Pradesh. (Me/Sr/Nenr/2014/082): (G-4):

Highlights:On the basis of dip section from MK-13, 22 borehole drilled by MECL, part of Reconnaissance Survey(1:25000), LSM (1:10000) & profile mapping helps the finalized the borehole location GSS-1 (19^0 23ô 36.48ò; 79^0 33ô 11.58ò Elevation 200m. Drilling was commenced on 1st December 2014. Drilling & logging data gives the clear picture of lithological variation of formation. Megascopically Kampthi Formation exposed on surface to approximately 50 ï 60 m depth. It is brownish coloured, ferruginous nature with altered feldspar. Afterwards grey coloured, varies grained size micaceous sandstone observed. Thinly laminated siltstone, Grey shale, Carbonaceous material with plant leaf impression at the depth 64 m gives the indication of presence of organic material. It may be Barren Measure Formation. Borehole encountered Kampthi Formation as well as Barren Measure Formation with < 30cm carbonaceous bands/coaly bands at depth of 102 m, 118m 170 m & 173 m.

xiv) Preliminary Investigation For Coal In Rudrakshapalli-Ganugalapalli Area, In Southern Sub Basin Of Godavari Valley Coalfield, Khammam District, Andhra Pradesh. (ME/SR/NEnR/2014/083): (G-4):

Highlights:

Field work was carried out and the target (300 sq km) of reconnaitory survey for FS 2014-15 has been achieved. On the basis of geological evidence from the reconnaitory survey, an area of 25 sq km is identified to take LSM and also initited (1:10,000) and around 4 Sq km is covered. During the mapping (Reconnaitory Survey) and LSM mainly four Formational units were identified in the area. The additional observation and findings is also given herealong:

(i) Gangapur Formation- Whitish colour, fine grained sandstone composed mainly quartz and feldspar (Feldspar is mainly kaolonised). Occasionally sandstone is argillaceous in nature.

(ii). **Kota Formation**- Grayish white to variegated colour sandstone with clay gall/ siltstone of varying size (5mm to 150mm), highly ferruginous concretion is seen which is local in extent.

A total 21 rock sample were collected and 6 samples submiited to petrology division (rest of the samples will be submitted) and their results are awaited. Some of the samples from Gangpur Formation is suspected to contain fossil impression in the area and were collected and submitted to Paleontology division, GSI,SR, Hyderabad for further study and later advised to collect few more samples. During the course of mapping fossil wood (>1 mt) is also encountered in the mapping area within the Kota Formation. Geological map of the area is also updated by the reconnaitory survey.

xv) Regional Exploration For Coal By Drilling In (*Pagaderu (East) Sector*, Southern Part Of Main Basin Of Godavari Valley Coalfield, Khammam District, Andhra Pradesh. (Me/Sr/Nenr/2013/055): (G-3):

Highlights:

The area composed of the litho units of Upper, Middle and Lower Kamthi formations. Geological map is finalised based on the subsurface data from the boreholes GPDE-1,2 and 3 and the outrcrop of Upper Kamthi Formation exposed in the north western and north eastern part of the block. In GPDE-1 borehole a cumulative thickness of 9.15 m (pre-analysis by CIMFR) of coal intersected within the Lower Kamthi Formation ranging its thickness from 0.50 to 1.20 m in 12 split sections.It also intersected coal bands/seams of Barakar Formation with a cumulative thickness 38.02 m (pre-analysis by CIMFR) ranging its thickness from 0.50 to 11.64 m in 28 split sections. GPDE-1 borehole intersected hot water artesian aquifer at 340.00 m m depth having an average temperature of 60o C at surface. In GPDE-2 borehole a cumulative thickness of 5.78 m (pre-analysis by CIMFR) of coal intersected within the Lower Kamthi Formation ranging its thickness from 0.50 to 1.00 m in 9 split sections.It also intersected coal bands/seams of Barakar Formation with a cumulative thickness 22.36 m (pre-analysis by CIMFR) ranging its thickness from 0.50 to 4.34 m in 19 split sections. In GPDE-3 borehole a cumulative thickness of 10.64 m (pre-analysis by CIMFR) of coal intersected within the Lower Kamthi Formation ranging its thickness from 0.50 to 1.20 m in 14 split sections.It also intersected coal bands/seams of Barakar Formation with a cumulative thickness 2.32 m (pre-analysis by CIMFR) ranging its thickness from 0.55 to 1.22 m in 3 split sections. In this sector a total of 896 m was geophysically logged in GPDE-1 and GPDE-2 boreholes, updation of coal field map of the area on 1: 50,000 scale was carried out for about 5.50 Sq. Km, LSM of 5 Sq Km was done on 1:10000 scale.

xvi) **Preliminary Investigation For Coal Bearing Formations In Bayyaram-Cherla Area, Main Basin Of Godavari Valley Coalfield, Khammam District, Andhra Pradesh.**
(Me/Sr/Nenr/2014/084): (G-4):
Highlights:

Petrified wood was reported about 2.5km NW of Janampeta ($18^0$05ô58.74òN, $80^0$40ô33.87òE) in old building stone quarry (Max. Size 0.90 m length and 0.65m width). The study area is covered by the rocks of Upper Kamthi, Maleri and Kota Formations. The drilling of Borehole GBC-1 commenced on 22.08.14 and progressed to a depth of 403.3 m till Dec 2014 passing through Maleri, and Kamthiss. 1st coal seam of 0.25m was intersected within lower Kamthi Formation at 295.92m depth. A cumulative thickness of 4.05 m coal was obtained in 06 splits ranging in thickness from 0.50 to 1.00m, within Lower Kamthi Formation.

xvii) Preliminary Investigation For Coal In Mangude Village, Bela Mandal, Main Basin Of Godavari Valley Coalfield, Adilabad District, Andhra Pradesh.
(Me/Sr/Nenr/2014/085): (G-4):
Highlights:

A sandstone body is been identified as well as itôs surfacial extension delinated on the field.The body is been located south of the Mangrud village and most of the exposures are been identified in a nala section (E-W trending) .The sandstone exposures are mostly weathered in nature but in few fresh exposures are also been identified.The sandstone is dirty white coloured,medium grained,poorly sorted with kaolinised feldspar grain identifiable.There is reported occurrence of coal in an agricultural borewells duged by locals at a very shallow depth of 15mt.Moreover,in a place called Mukutban in Maharasthra around 4Km Nortth-east from the present area there is 3 operative open cast mine are running .One coal seam of around 2mt thickness at a very shallow depth is being mined in that mines. So, this sandstone area (appx 1.5 km) mapped can be taken for drilling of scout borehole around 100mt±50mt can be taken for further study.The sandstone area mapped is earlier been mapped as limestone belonging to Mangruda formation of Penganga Supergroup. (3) An interesting observation is made at the contact between the sandstone of Barakar Formation and shale of Talchir Formation.An exposure of sandstone resembling Pillow has been observed near the Mangrud village(19°44´51.3ö and 78°49´51.24ö). The structure is elliptical to subrounded in nature,red in colour with layering (may be due to expfoliation).This structure is called sand pseudomorph structure. This is for the first time sand pseudomorph structure reported from Godavari valley Coalfield. Previously this structure is also been reported from IB-River Coalfield.

SU: <u>KARNATAKA & GOA:</u> <u>M- II A</u>

During the Field Season 2014-15, State Unit: Karnataka a total of 13 (Diamond-2, Gold-6, , PGE-1, REE- and Ion Ore-2) were taken up under Mission-II.

1. 1. Regional survey to locate kimberlites in Kudligi block, Bellary and Chitradurga districts, Karnataka. (ME/SR/KG/2014/063) (G-4):

Highlights: A shear zone about 0.5 km width trending in N35^{o}W-S35^{o}W direction is found to the south east of Vaderahalli which is characterised by stretching of quartz grains. A N70^{o}E-S70^{o}W trending fault is intersecting the above mentioned shear. The fault is identified by silicification, brecciation, mylonitisation and the dislocation of quartz veins on outcrop scale. PGRS study and study of Vasundhara lineament map reveals this to be extension of Wajrakarur Fault. Another shear marked north west of Ramdurg , evidenced by stretching and rotation of quartz grain. The shear trends N10^{0}E-S10^{0}W and is around 1Km in length. The width of shear zone is 50m-70m. Ten suspected grains were analysed for EMPA. Out of which fives are low chrome diopsides, two Mn-ilmenites, one Mn-garnet and two monazite grains. None of these are of kimberltitic affinity.

2. Regional survey to locate KCR in Molakarmuru block, Bellary and Chitradurga districts, Karnataka (ME/SR/KG/2014/064) (G-4):

Highlights: On the basis of PGRS study, 4 km NE of Hirehalli several parallel lineaments were marked. These lineamnents when checked in the field and were found to be the major prominent vertical joints trending NW-SE and NE-SW. Lineaments are also represented by joints and shears. For example, a lineament 2.5 km NE of Hirehalli represents the prominent vertical joint. A shear zone trending N 30^O E was recorded along Pedda Vanka river. The river flows towards SE direction but suddenly due to the presence of this shear changes its course and flows in the NE direction. 11 no. of suspected grains were were analysed for EMPA but none of the grains show any kimberltitic affinity. At 2.5 km S of Marlahalli, soil exhibits the lighter tone than the surrounding red soil. A soil sample was collected at this point for analysis.

3. Investigation for gold in Ajjanahalli block-G, Tumkur district, Karnataka ME/SR/KG/2014/065 (G-3):

Highlights: During this period in Ajjanahalli Block-G total **401.85m** of drilling was done in three boreholes (AGG-7 to 9). The borehole AGG-7 drilled up to 142.70m and it has intersected the BIF from 108.30m to 120.20m and from 129.85m to 140.00m. The borehole AGG-8 has intersected the BIF band from 104.15m to 115.65m and from 118.65m to 120.45m and closed at 122.65m. The borehole was drilled up to 136.50m. It has intersected the BIF band from 83.00m to 88.65m and from 92.90m to 129.35m. BIF is sheared in nature and brecciated at places. Sulphide mineralization occurred as stringers and

vein/veinlets. The sulphide minerals are mostly pyrrhotite, arsenopyrite, pyrite and chalcopyrite. The other lithounits intersected in the boreholes are metabasalt, argillite and carbon phyllite. Quartz-carbonated vein/veinlet intrusions can be seen in all the lithounits. Total 167 nos. of borehole core samples are collected and sent for chemical analysis during this period.

In Dabbakuntte-Rammanahalli Block (SSE), a total of **50.0** sq km area was covered by large scale mapping (LSM) on 1:12500 scale (G-4). Total 157 cu. m. trenching has been done and 98 nos. of trench sample has been collected. Total 82 nos. of bed rock samples have been collected. The major lithounits found in the area are BIF, meta basalt & argillite/greywacke suite of rocks. Two parallel BIF bands striking $N15^0W$ to $N20^0W$and dipping vertical to sub vertical was encountered, one at eastern and another at western part of the area within the argillite unit. The width of the BIF bands varies from 15m to 30m. They are sheared nature with quartz-carbonate veins/veinlets and oxidized in nature. Quartz-carbonate veins/veinlets intrusions and leached out sulphide mineralization can be seen within the BIF band. Meta basalt is schistose in nature with foliation $N30^0W$ and dipping 65^0 towards NE. Argillite is well foliated in nature with foliation varies from $N15^0$ to $N35^0W$ with 60^0 to 85^0 towards SW and NE as well. Sometimes dip of the foliation is vertical.

4. Investigation for gold in Ajjanahalli block-H, Tumkur district, Karnataka, ME/SR/KG/2014/066 (G-4):

Highlights: Completed detailed geological mapping of 0.8 sq.km, bed rock sampling 59 nos., and trench logging 58 cu.m of Ajjanahalli H- Block. During field traverse, there are one carbonated BIF band, three major BIF bands and one minor BIF band (BIF IV) and other two minor BIF bands between BIF-II & III were delineated. In carbonated BIF band, a total strike length of 550m have been demarcated by detailed mapping in which some part of the band is massive and some part is brecciated, In BIF band ï I, a total strike length of 1800m have been demarcated by detailed mapping in which the BIF shows some part massive and some part is brecciated and silicified. In BIF band ï II & III, a total strike length of 1630m and 1850m respectively have been demarcated by detailed mapping in which the BIF shows some part massive and some part is brecciated and silicified in nature. In BIF band-IV, a total strike length of 1700m have been demarcated by detailed mapping, this band is very thin and having a width of max.2m. The general strike of BIF band is S_0/S_1 $N10^0$ E- $S10^0W$ with steep dips of 60^0 to 85^0 westerly as well as easterly . Au values varying from 0.04g/t/1m to 0.15g/t/1m in bed rock as well as trench samples. The other lithounits present in the area are argillite- it is well foliated and altered, metabasalt- it is fine grained, foliated and greenish in colour, ferrodolomite, quartz veins and quartz- carbonate veinlets. Foliation (S_2) developed predominantly along $N15^0E$-$S15^0W$ to $N10^0W$ to $S10^0E$.

5. Exploration for gold in Bhangarghatti Block Shimoga Schist Belt in parts of Toposheet no. 48I/16, Dharwar district, Karnataka (ME/SR/KG/2014/067)(G-3) :

Highlights: The present work is aimed at establishing the nature, strike continuity depth persistence of the mineralized and assessing the economic potential of the prospect by exploratory drilling. During this period a total of 541.2m drilled. A total of 109 core samples have been collected. The results received from the laboratory is very much encouraging. Core samples : BG-2/2/1g/t/0.50cm, BG-2/3/0.7g/t/0.50m, BG-2/4/0.40g/t/0.50m and BG-3/4/0.7g/t/0.50 and Bed rock samples: BGB-13/ 0.45g/t/1m, BGB-23/0.35g/t/1m. The detailed mapping was carried out in the western block part of the Bangaragatti central part for 0.5 sq km on 1:1000 scale. Geologically the area consists of meta sedimentary rocks like Argillite and Banded iron formation. A total of 38 BRS collected, 32 petrological samples and 14 ore microscopic samples collected. The sulphides are pyrites, pyrrhotite and showing alteration and removal of sulphides showing box work. The BIF band is much of sulphidic facies, oxidized and limonitised at places and presence of fewer amounts of oxides sulphides/fresh sulphides. At places quartz veins shows minor amount of sulphides, mainly pyrite and phyrhotite.

6. Preliminary investigations for gold in Shimoga Schist Belt around Hulkoppa in part of Dharwar district, Karnataka (ME/SR/KG/2014/068) (G-4) :

Highlights: The area exposes argillite-greywacke assemblage with BIF bands, traversed by younger gabbro dykes and quartz veins of different generations. During the period **0.70Sqkm** was mapped at Hulkoppa block & Banadur block. At Hulakoppa block four BMQ bands were delineated in the area which are named as band nos I,II,V,VI. A total cumulative strike length of 1860mts is established in Five BMQ bands. All the BMQ bands are trending N225°W to N35°W and 45° to 82° degree dipping towards easterly.Gold mineralization here is mainly confined to quartz carbonat veins/ veinlets hosted by the sheared BMQ that contain pyrite and pyrrhotite and few specks of arsenopyrite and also shows wall rock alterations all along the bands and minor shear zones indicating contains Mineralisation is of epigenetic nature.Trenching have been done for 59 cu.m accros the BMQ bands at 100-150mts intervels and trench samples collected 1metre intervels. All the trench samples send to chemical lab Bangalore. BRS and trench samples send to chemical lab GSI, Banglore and result shows Au Value <25 ppb to 150ppb in BRS and >25ppb to 180ppb in trench samples. Remaining samples result is awaiting.

7. Investigation for gold in Kudrekonda-Palavanahalli area, Shimoga district, Karnataka (ME/SR/KG/2014/069) (G-4):

Highlights: An area of 51 sq.km is covered on 1:12,500 scale between Kudrekonda and Palavanahall1. The area exposes PGC, metabasalt, quartz-chlorite schist, quartz-sericite schist, BIF, quartzite and three generations of quartz veins. Detailed mapping of 1.45 sq.km. was carried out within Kudrekonda and Yeraganalu blocks on 1:1000 scale. The quartz-ankerite-ferrodolomite veins within metabasalts are supposed to be the carriers of gold. Such veination and other gaseous veins are exposed at .660 hillock at Yeraganalu. Alternate layers of fuchsite and chert/quartz are the other characteristic feature along the mineralized zones of the area. A strike length of 700 meters of mineralization zone is covered within Yeraganalu block

during detailed mapping. The area is characterised by carbonatised metabasalt with quartz- ankerite veins. The main alteration zone is running along the .660 hillock and a parallel sulphidiferous zone of 200 m strike length is noted 100m west of the hillock. Ancient workings and shafts are also noticed in north and south of Palavanahalli village. The suspected mineralization zone is charecterised by ankerite veins hosted by carbonatised metabasalt with calcite and anchorite crystals. Wall rock alteration of fuchsite and sericite is also observed.The samples from ultramafic body (Serpentinite) north west of Salabalu yielded good Ni and Cr values ranging from 1000ppm to 4000 ppm. Petrochemical, Petrological, ore microscopic and fluid inclusion samples are collected from the area for detailed studies. All the bedrock samples and trench samples collected from the area send for chemical analysis. The analytical results of 71 samples are received till date and no encouraging gold values are reported.

8. Preliminary Investigation for gold in Nyamati-Kunchenhalli area, in parts of Toposheet No. 48N/12, Shimoga district, Karnataka (ME/SR/KG/2014/070) (G-4):

Highlights: Analytical result of 42 BRS samples for Au and associated elements were received in the month of February 2015, though the samples are not showing Au values but associated elements like Cu, Ni, Cr,Zn and Co are showing encouraging values in ferruginous chert, BIF and metabasalt . BRS-3 (Ferruginous chert) showing Cu-values 1000 ppm, BRS-6 (Ferruginous chert N14^0 03ô2.5ò E 75^0 35ô25.8ò) Cu- **1100 ppm** , Pb- 600 ppm, Zn- 380 ppm and Ni-610 ppm and BRS-9 (BIF) is showing Cu value **1600 ppm** which is located around 700m NE of Budigere village. BRS 13A (Metabasalt N14^0 03ô44.0ò E 75^0 36ô20.0ò) is showing Cu- **4500 ppm, Zn- 115** ppm & BRS 13B (Metabasalt) is showing Cu**- 4200** ppm and Zn- 110 ppm which is located around 1 km SW of Musinhal vaillage. Similarly BRS-30 (Quartz-carbonate rock with in metabasalt N14^0 03ô44.0ò E 75^0 36ô20.0ò) is showing Cu-540 ppm, Ni- **1500pmp**, Cr- **3200** ppm and Co- 95 ppm which is located around 2km NW of Musinhal villag, this sample collected from the contact of sheared granite & metabasalt which is highly silicified and carbonated. Found **gold grains (Size 1 mm)** during panning at foothills of Harangatta Reserve Forest, 3-3.5km, E & SE of Palavanahalli village.

9. Investigation for Nickel, Cobalt, Copper and PGE in J.C Pura-Antharghatta Belt, Hassan and Tumkur districts, Karnataka (ME/SR/KG/2014/071) (G-4):

Highlights: The study area comprise of altered komatiite/peridotitic komatiite (chlorite-serpentine, chlorite schist ± tremolite /talc schist), tholeiite/ picritic tholeiites (hornblende schist/hornblendite) rocks defining the mafic-ultramafic suite; metatexitic and diatexitic migmatite gneiss (PGC), quartz-sericite-muscovite schist (± fuchsite), epidote gneiss (pegmatoidal) and granite (Arsikere Granite) traversed by younger gabbro/dolerite (N50W-S50E, N30E-S30W and N20W-S20E) and pegmatite veins. The palaesomal component includes both amphibolite (dominant) and ultramafites, at places the ampbibolites are migmatized to epidote gneisses (Neosome). Both massive (adcumulus) and schistose ultramafic variants are recorded in the area. Serpentinization has affected the ultramafic rocks of the J. C. Pura belt followed by carbonitization, overprinted by chloritization event. Yellow/ green-spotings (high Ni?), reddish brown (magnetite alteration) in ultramafic variants are recorded at places. Sulfide mineralization in the form of pyrrhotite- pyrite is recorded in a younger gabbro dyke near Rattanahalli, Yereganahalli and Ramanahalli. Presence of vermicullite, magnesite, muscovite veins and birbiritzed patches in ultramafic variants implies late alterations. Asbestiferous veins (1 ï 5 cm) are noted along fractures in meta-dunite/peridotite units near Mallenahalli, Borinakere, east of Rampura and South of Sasivala. Analytical results for 61 nos. samples for gold show all values below 25 ppb and PGE results are awaited. The area, north of Gollarahatti along the Sasivala ï Kamasamudra road is selected for detailed mapping (1:2000 RF) on the basis of field evidences. The block covers 0.5 Sq. Km in extent and exposes carbonated peridotitic ultramafite and its variants; amphibolite, gabbro intrusive besides multiple generations of pegmatite, quartz vein. Structurally, the area preserves northerly plunging antiformal closure, where the N50W-S50E trend swerves to N70E-S70W dipping 65- 86 degree NE & SW. Evidence of extreme ductile to brittle-ductile regime is preserved even in the toughest quartzite in the form of S-C fabric and shear fractures etc

10. Preliminary investigation for delineating the REE bearing zones around Wanadurg, Gulbarga district, Karnataka ME/SR/KG/2014/072 (G-4):

Highlights: A total area of 45 Sq. Km was mapped on 1:12,500 scales in toposheet No.56D/10 during this period. The area is exposed with different variety of younger granites (Closepet Granite) which were intruded into the PGC. The granites are pink biotite granite, pink granite, leucogranite and patches of grey granite bodies within the pink granite.The Peninsular Gneissic Complex comprises biotite gneisses and migmatite. NW and Southern part of study area comprising of biotite gneiss. The white colour medium to coarse grained leucogranite ±epidote were observed (N16°38ô29. 4ôE 76°43ô39 .7ô) in eastern part of Wanadurg and at SE, exposing pink biotite granite along with small patch of gray migmatite (N16°37ô0.1 ôE 76°44ô38 .8ô). Mingling and mixing of granitic and basic magma are also observed here at places. Presence of Garnet (N16°37ô2.3 ôE 76°44ô12.4ô) within biotite flakes of pink biotite granite and S-C fabrics at places indicating phases of deformations and further metamorphism under went by the study area. Lenticular bodies of mafic enclaves (ME), particularly of porphyritic ME with mafic and felsic phenocrysts were seen at NW part of the study area. Orientation of elongated euhedral feldspars with in pink granite, pink biotite granite and leucogranite shows primary magmatic foliations with a general trend of NW-SE. Schlierens, biotite-rich segregations within the host rock are also defining primary foliation fabric. Well developed of S-C mylonitic foliations were seen at places. Shear plane of mylonitic fabric were also trending parallel to the primary magmatic foliation of the granitic pluton i.e., NW-SE. Three sets of vertical joints are noticed all along the

granitic body i.e., N20E-S20W, N65E-S65W and N-S. As per the instruction of director and the anomaly values of particular locations derived during NGCM Project (Fs 2010-12), locations were identified for trenching and detailed mapping. Trenching or pit sites were marked by the distribution of smoky quartz pebbles available in the area. During trenching, it observed that, up to 1 m the area is mostly soil covered and not holding any pegmatite vein or quartz vein which were suspected. Although, it observed that secondary quartz filling within fractures resulting the quartz pebbles (smoky) of size 2 to 7 cm in the area. Bedrock samples and stream sediment samples were collected from the study area for various observations and measurements in the laboratory.

11. Preliminary investigation for delineating the REE bearing zones around Gogalgatti and Lingadahalli areas of Raichur district, Karnatak (ME/SR/KG/2014/073) (G-4):

Highlights: Carried out reconnaitary traverses in and around Gogalgatti, Kakkeri and Tinthini areas. In Tamankal and Raidurg, during LSM, a 6-8m wide and 27-30m length pegmatite vein trending N80^{o}E was observed in the area with suspected REE characteristic unit. The pegmatite vein exhibits various alterations like iron leaching, limonitisation, manganese layering, silicification in the form of veinlets and some metallic pits. The suspected mineralized portion appears dark grey in colour with fine grain nature. Some veinlets of metallic concentration was also observed. Systematic sampling was carried out for chemical analysis. During the LSM at and around Gogalgatti a 20-25m wide and 1.7km length quartz reef trending N10^{o}E was observed in the area with suspected REE characteristic unit. The pegmatite vein exhibits various alterations like iron leaching, limonitisation, manganese layering, silicification in the form of veinlets and some metallic pits. The suspected mineralized portion appears dark grey in colour with fine grain nature. Some veinlets of metallic concentration was also observed. Systematic sampling was carried out for chemical analysis. During LSM at and around Bandihalli metallic mineralization was observed in pegmatite bodies (N45^{o} W). In Bandori grey quartz veins trending in the North- South direction were observed. They are brecciated and silicification are observed. Pegmatite veins observed in Tintini with metallic mineralization with sporadic occurrence trending N45W. At Bandiholi quartz vein trending N-S direction exposed length around 30m long and 4m wide with Fe leaching. Similar quartz veins were also observed at Yeragoti. Metallic mineralization also recorded. Trenches T1 and T2 were performed to excavate the quartz carbonate vein near Aidbhavi. Detailed mapping was carried out in Mincheri Block demarcating the quartz vein within the country rock PGC=II extending upto 1.3km strike length.

12. Investigation for Iron ore in Sirur-Kamatagi-Amingarh areas, Hungund taluk, Bagalkot district, Karnataka (ME/SR/KG/2014/074) (G-4):

Highlights: A total of 6 nos of BHQ/ bands have been traced within quartz-chlorite schist/phyllite and Argillite during the end of field season (2014-15). The width of the BHQ bands varies from 10m-35m and trending NNW-SSE dipping moderate to steeply in both westerly and easterly and a band has been traced upto maximum 3.5 km of strike length east of Huvinahalli. The bands are highly folded, micro-anticlinorium, syclinorium, antiform, synform, s, z assymetric fold were observed on mesoscopic scale. Hematite, specularite, jasper, limonite are the ores of Iron and platy, lumpy, powdery and nodular forms of Iron ore are also observed in mapped area. At few places lateritic ores are also observed. Two minor bands occur as linear bodies within Argillite and it seems reappearance of BIF bands between Kaladgi indicating Schist belt concealed below the Kaladgi group. A BIF band have been traced from SE of Bevial to SW of Hire-Maggi upto 1.5km and width varies from 5-10. Breeciated quartzite with variable clasts (hematite, epidote rich quartz vein, yellow shale, limonite, chert, BHQ,BHJ) are also observed in hill top. Intercalation of Iron ore seen within quartz-chlorite schist. **Ladder vein** is filled with hematite observed in Field near SE of Ramthal Iron bands are flaky, friable to powdery in nature. A band (1.5km SE of **Ramthal**) has been assessed and the analytical results of 8 nos of bed rock sample yielded Fe_2O_3 value upto 45% and trench sample also yielded Fe_2O_3 upto 45% . Hence this band is promising for Iron ore deposits and the analytical results of 2 nos of PCS sample yielded Fe_2O_3 varies from 46.49% to 95.86%. The PCS sample (PCS-1) collected from brecciated zone yielded high value (95.86%) and iron ore is having high specific gravity and magnetic in nature. Sulphide mineralization observed in the form of pyrite, pyrrhotite, chalcopyrite and sulphide stain also observed in BHQ in Hire-Maggi hill and also observed in BHQ and quartz-chlorite schist in east of Madapur and near Hullihall

13. Investigation for Iron ore in Basavapatna-Kerebilichi block Channagiri Taluk, Davangiri district, Karnataka(ME/SR/KG/2014/075) (G 4):

Highlights: During this period an area of 45 sq km were covered by LSM. BIF exposed in the study area has been folded into a broad syncline with the western limb runs from north of Yalavadahalli to Basavapatna to Hosahalli to Sulekere trending N20 to 40W ï S 20 to 40 E dipping NE. The converging of dips on the ridges both sides of the Sulekere clearly indicate itôs a syncline plunging NNW. The BIF are mainly banded and at places they are massive. The BIF in the area is mainly Banded Haematite Chert. The BIF in the study area is dominantly of oxide facies with haematite dominate, silicates facies is also observed in which iron silicates are noticed, but has to be confirmed with thin section study. Sulphide facies are also noticed in the area indicated by bornite stains and carbonate facies in the sidda ashram area**.** Major fault is present in the north western part of the area and displaces the litho units. Phyllite in the study area is exposed in the lower flanks of the NW-SE trending ridge running from Sulekere to Basavapatna in contact with BIF and also in the western part of the area in association with quartz chlorite schist forming the Jhandimatti formation. At places it is ferruginous with iron rich material, but at rest of the places it is non -ferruginous with purplish to grey to khaki green colour, fine grained, foliated and friable. Exposures of acid volcanic rocks (rhyolite/quartz porphyry) and tuff are exposed in the forest area from Madhurainakanahalli to Arasanaghatta.

During the Traverse from Komaranahalli to Madhuranaikanahalli acid volcanics were exposed with cycles of formation and variation in composition from acidic to intermediate to basic. Hard, compact, light grey to bluish in colour, massive, clots of biotite, black opaque minerals and feldspars present. Quartz porphyry? with different generations of quartz were observed - blue quartz, white quartz and opalescent quartz. An ultrabasic body has intruded as sill into the metasedimentaries along the outer arc of the U-shaped ridge. The targets were achieved as per the NQT. 52 BRS samples and 165 samples were sent for chemical analysis, Chemical lab, Bangalore.The chemical analysis results of the samples are awaited.

SU:TAMIL NADU & PUDUCHERRY (M-II-A)

During the field season 2014-15 a total of seven investigations were taken up under Mission ï II which included five items under Mission-IIA and two item under Mission ï IIB ((Energy minerals).

i) Exploration For Platinum Group Of Elements By Drilling In T_1 And T_2 Sectors Of Tasampalaiyam Block In Sittampundi Anorthosite Complex Of Tamil Nadu (G - 3) (ME/SR/TNP/2012/076):

In T3 Sector in order to understand the depth continuity and strike extension of the PGE mineralization in the Northern zone, 12 first Level boreholes are planned. Trench work covering 300 cu.m was also carried out to delineate the strike extension as well as for surface and subsurface correlation of loads. Close spaced trenching carried out in T3 sector indicated the discontinuous nature and limited strike length of the chromitite / meta-pyroxenite bands. However, scout drilling and first level borehole drilled in this sector has proved the depth extension of these bands up to 30m vertical depth.

Out of eight boreholes, core logging and sampling were completed for seven boreholes and the detail logging of eighth borehole is in progress.

DRILLING IN T_3 SECTOR OF TASAMPALAIYAM BLOCK (FIRST LEVEL)

Drilling was carried out in T_3 sector for the first level (30m vertical depth) intersection of PGE mineralization in the Northern Zone. The ninth borehole in T_3 sector, T3BH-9 (I^{st} Level) drilled 284m west of scout borehole TBH-15 in the eastern part of Segment ñFò along the profile O-Oô Trench TPT-27 opened along this profile which has exposed two chromitite bands. The borehole T3BH-9 drilled to intersect the chromitite band (II) which has analysed 3.70ppm (1833+1858 ppb of Pt+Pd) over 0.25m width at 30m vertical depth (RL. 163.00m). It is also planned to intersect the chromitite band-I exposed on the hanging wall side of band-II which has analysed 2.40ppm (862+1546 ppb of Pt+Pd) over 0.25m width. The borehole, T3BH-9 initiated on 16.01.15 drilled up to 59.80m and closed on 24.01.2015. In this borehole two chromitite bands with 0.10&0.20m width, 0.30m amphibolite with sulphide and thin layers of chromitite were intersected.

The tenth borehole T3BH-10 drilled 140m west of borehole T3BH-9 in the central part of Segment ñFò along the profile P-Pô Trench TPT-28 opened along this profile has exposed a chromitite band (I). The borehole T3BH-10 drilled to intersect the chromitite band (I) which has yield 0.60ppm (387+213 ppb of Pt+Pd) over 0.90m width at 30m vertical depth (RL. 161.50m). The borehole T3BH-10 was initiated on 30.12.14, drilled up to 55.00m and closed on 09.01.15. In this borehole two chromitite bands with 0.11 & 0.24m width, meta-pyroxenite with 0.50m width were also intersected.

The eleventh borehole T3BH-11 (I^{st} Level) drilled 73m west of borehole T3BH-10 in the central part of Segment ñFò along the profile Q-Qô Trench TPT-28A opened along this profile has exposed a chromitite band. The borehole T3BH-11 drilled to intersect the chromitite band with 0.50m width (Analytical result of the sample collected from this band is awaited) at 30m vertical depth (RL. 161.00m). It is also planned to intersect three mix zones (II,III &IV) exposed in TPT-29A which is 30m west of the profile and the strike extension of these zones are observed along this profile in the form of boulders. The borehole, T3BH-11 initiated on 31.01.15, drilled up to 91.25m and was closed on 14.02.15. In this borehole four chromitite bands with width varying from 0.10 to 0.58m were intersected.

The twelth borehole T3BH-12was drilled 79m west of borehole T3BH-11 in the central part of Segment ñFò in T_3 sector along the profile R-Rô Trench TPT-29C opened along this profile has exposed a chromitite band (I). The borehole T3BH-12 is planned to intersect the chromitite band (I) which has analyzed 2.30ppm (1593+714 ppb of Pt+Pd) over 1.15m width at 30m vertical depth (RL. 161.00m). It is also planned to intersect three mix zones (II,III &IV) exposed in TPT-29A which is 30m east of the profile and the strike extension of these zones are observed along this profile in the form of boulders. The borehole T3BH-12 initiated on 22.02.15 drilled upto 91.35m and closed on 28.02.15. In this borehole a chromitite band with 0.80 m width is intersected.

A total of 43 core samples were generated from four boreholes (T3BH-6-2, T3BH-7-14, T3BH-15&T3BH-10-12) and submitted to Chemical Lab, Hyderabad for PGE analysis.

DRILLING IN T_3 SECTOR OF TASAMPALAIYAM BLOCK(SECOND LEVEL)

Drilling was carried out in T_3 sector for the second level (60m vertical depth) intersection of PGE mineralization in the Northern Zone. The first borehole in T_3 sector, T3PH-1(II^{nd} Level) was drilled 52m S30°W of scout borehole TBH-9 (I^{st}

Level) in the easternmost part of Segment ñAòalong the profile B-Bô Trench TPT-18F opened along this profile has exposed seven bands/layers of chromitite/chromiferous meta-pyroxenite/mix zone. Sample collected from Band-III at surface has analysed 0.79ppm over 0.92m. The Band-III intersected in first level borehole TBH-9 has analysed 1.04ppm (446+601) over 1.83m. The borehole T3PH-1 is drilled for the second level intersection of band-III at 60m vertical depth (RL147.50m). It is also planned to intersect the other six chromitite bands exposed in TPT-18F and also intersected in TBH-9. In TBH-9, band-II has analysed 1.78ppm (964+789) over 1.45m, band-IV 0.96ppm (694+270) over 0.88m and band-VI 0.69ppm (363+329) over 1.90m. The borehole, T3PH-1 initiated on 06.03.15 and closed on 19.03.15 at 123.85m. In this borehole two chromitite bands with width varying from 0.06 to 0.84m, ten meta-pyroxenite bands with width varying from 0.10 to 0.72m and eight mix zones of meta-pyroxenite+anorthosite with width varying from 0.30 to 2.25m were intersected.

The borehole T3PH-2 (second Level) is drilled 40m S10°W of scout borehole TBH-12 (Ist Level) in the central part of Segment ñCò along the profile H-Hô Trench TPT-19D opened along this profile has exposed five bands/layers of chromitite/chromiferous meta-pyroxenite/mix zone. Sample collected from Band-III at surface has analysed 0.87ppm over 1.60m. The Band-III intersected in first level borehole TBH-12 has analysed 1.02ppm (418+610) over 1.60m. The borehole T3PH-2 is drilled for the second level intersection of band-III at 60m vertical depth (RL. 141.50m). It is also planned to intersect the other chromitite/meta-pyroxenite bands exposed in TPT-19D and also intersected in TBH-12. In TBH-12, band-Ia has analysed 3.67ppm (1974+1696) over 1.15m, band-Ib -0.89ppm (270+625) over 1.00m and band-II- 0.24ppm over 0.40m, band-IV-0.51 ppm (270+245) over 0.45m and band-Va- 0.57ppm (320+255) over 0.45m. The borehole, T3PH-2 initiated on 23.03.15and progressed up to 66.70m as on 31.03.15.

A total of 27 core samples collected from T3BH-11&12 were processed (4 samples at camp and 23 samples at Petrology Division, GSI, Chennai through pulveriser) for PGE analysis. 10 core samples collected from T3PH-1 were submitted to Petrology Division, GSI, Chennai for processing through pulveriser.

ii) Investigation for Platinum Group of Elements in Tattayyangarpettai area, Namakkal and Tiruchirappalli disticts of Tamil Nadu (G-4) *Proposed in lieu of Item: (ME/SR/TNP/2014/077) (G-4):

The earlier work carried out by GSI during the FS 1986-88, has indicated that bed rock samples collected from the ultramafic bodies viz. pyroxenite, meta-pyroxenite, talc tremolite schist, dunite have analysed 5 ppm to 1000 ppm of Cr (high values restricted to few samples only). The Ni values range from 40 to 610 ppm and one high value of 2200 ppm has been reported. Based on the overall geological set-up and sporadic occurrence of chromite from this area, a G_4 item for PGE investigation is taken up to delineate the meta-ultramafites and to identify possible new target areas for PGE investigation.

Large Scale mapping was carried out on 1:12,500 scale covering an area of 50 sqkm in parts of Tiruchirapalli district, Tamil Nadu falling in toposheet no: 58 I/8. The area around Tattayyangarpettai, Devanur, Payattamparai, Valaiyeddupu, Serigudi, Arachhi and Krishnapuram were studied to delineate the ultramafic rocks and to bring about their disposition and to explore the possibility of PGE mineralization from this study area. The major rock types exposed are hornblende gneiss and charnockite (± garnet) besides garnet pyroxene granulite / gneiss, pyroxenite, magnetite quartzite and dunite which are occurring as linear and lensoidal bodies. In addition, younger acid intrusive of pegmatite and quartz veins are also exposed.

The altered dunite with ramified magnesite veins occurs as a linear body with a near ENE-WSW trend 750m west of Tattayyangarpettai. This dunite band is traced for a strike length of 500m with width varying from ~ 30 to 60 m. These outcrops are often covered by kankar. Serpentinisation and development of vermiculite are found at the contact zone between gneiss and dunite. A number of pyroxenite and altered ultramafics (talc-tremolite) bands occur as discontinuous bands/ lenses, which vary in width from 10m to 70m and in length from 100 m to 800m and are exposed in a 10 km wide zone to the south of Tattayangarpetai and Kasturippatti.

A total of 104.24 cu.m trenching work has been carried out in different places such as north & south of Devanur, east of krishnapuram. Trench has been excavated to fulfill the following objectives in study area.

(i) To trace strike extension of the concealed pyroxenite/altered pyroxenite.

(ii) To study contact relationship between ultramafic (pyroxenite and altered pyroxenite) and country rock (hornblende gneiss).

(iii) To study sub-subsurface structure of the area.

A total of 250 nos. of Trench samples have been collected and the samples were submitted to chemical Lab

The assigned target for FS14-15 has been fully achieved and the field camp was closed. In headquarters the officer is engaged in Finalization of maps, preparation of profile section, Thin section & petrographic studies and preparation of draft report for the F.S.2014-15.

iii) Investigation for REE and associated Minerals in parts of Paramathi-Sarkar Valavandi-Kavundanur Areas of Namakkal District, Tamil Nadu.(ME/REE/SR/TNP/2013/053)(G-4):

An area of 0.55 sq km have been covered by detail mapping on 1:2,000 scale in three blocks (Sukkampatti, Chinnathambipalayam and Ayyampalayam blocks) based on the REE analytical results and Scintillometer survey carried out during FS2013-14. Radiometric survey was carried out in the DM.

The major rock type observed in the study area viz. Garnet sillmanite-biotite gneiss, calc granulite/impure limestone, hornblende-biotite gneiss/grey gneiss, meta-gabbro/gabbro, pink grey gneiss, pink migmatite, leuco granite, pegmatites and quartz veins. In the study area, REE mineralization are seen in the form of dissemination or isolated spots within the granitic gneiss, Pink migmatite, pink grey gneiss and also at the contact of these rocks with country rock hornblende gneiss.

The large scale mapping carried out in the area around Paramatti-Mavureddipalayam-Karattupalayam-Velur. The western part of the area, west of Paramatti mostly cultivated and data were collected from well section. The main rock type exposed in the western part of the area hornblende-biotite gneiss, granite gneiss/pink migmatite and meta-gabbro. The trend of foliation is varying from N30ºW-S30ºE to N30ºE-S30ºW moving from south to north in western part of the area. Bouldary outcrop of Charnockite is exposed around Karattupalayam which are showing crude foliation and banded nature. The 53 groove samples have been collected from the study area. The samples which have given high REE analytical values were selected for preparing and studying under reflection light and for EPMA studies.

The EPMA study carried out during the first week of Marchô 2015 and to identify the causative mineral phases, which have contributed the REE value in chemical analysis were carried out. The major mineral phases, which have given anomalous value of REE, include mostly monazite- the phosphate phase and allanite-the silicate phase. All the monazite and allanite grains were altered and the REE phases got assimilated along the periphery as well as along the weak planes, particularly along the grain boundaries. Apart from the REE bearing phases, sphene, thorianite, pegmatite, xenotime and apatite were also observed.

Preparation and finalization of large scale geological map (LSM) on 1:12,500 scale and detailed map (DM) on 1: 1,000 scale of the area. The detailed map (DM) of the all the three blocks viz. Sukkampatti, Ayyampalayam and Chinnathambipalayam were separately prepared with all available geological information. The maps were scanned and ready for digitization.

The officers has submitted the draft for FS: 2013-15 with available chemical data on 27/03/2015.

iv) Reappraisal for Graphite by drilling in Arasanur (Village) block in the western part of Sivaganga Graphite Belt, Sivaganga district, Tamil Nadu (G-3) (ME/SR/TNP/2014/078):

Boreholes so far completed confirmed the depth persistence of graphite at 30m below ground level and the resource estimation will be done after completion of all boreholes.

Graphite mineralisation observed mainly in Biotite Gneiss, Quartzo Feldspathic Gneiss and to some extent in Brecciated Quartzite.

Graphite mainly occurs as flaky type and also as disseminations to concentrations.

Concentration of graphite is more in biotite Gneiss and quartzofeldspathic gneiss.

Graphite bearing biotite gneiss and quartzofeldspathic gneiss occur as linear bands and lenses .

The bands exhibit pinching and swelling and shows en-echelon shifts.

Graphite mineralisation is not a strata bound and is stratiformType and it is structurally controlled.

Out crops are very rare and the mineralisation is concealed below lateritic soil.

The officer is engaged in Core logging, Core sampling of borehole GRAR-8,,9,10 &11. Submitted the powdered core samples (176 nos.) pertaining to borehole GRAR-3,6,7&8 to Chemical division, SU:TNP, Chennai.

The borehole GRAR-8 is located at 51.5m due 340° from $0/W_{700}$ and planned along the profile H-H' to intersect the trench profile of ATR-9,9A. The borehole GRAR-8 was initiated on 01.01.15 and closed at a depth of 74.60m on 11.01.15. The borehole deviation test is carried out on 11.01.15. From the borehole GRAR-8, a total of 45 numbers of core samples are generated from the mineralized zones

The borehole GRAR-9 is located at 20m due 160° from $0/W_{200}$ and planned along the profile I-I' to intersect the trench profile ATR-6 The borehole GRAR-9 is initiated on 19.01.15 and progressed from 61.70m and closed at 121.30m depth. The borehole deviation test and geophysical logging was carried on 02.03.15 & 01.03.15 respectively.

The borehole GRAR-10 is located at 10m due 160° from 0/0 and planned along the profile J-J' to intersect the trench profile ATR-1, 1A. The borehole GRAR-10 is initiated on 06.03.15 and closed at 118.85m depth on 19.03.15.

The borehole GRAR-11 is located at 47m due 340° from $0/W_{525}$ and planned along the profile K-K' to intersect the trench profile ATR-10, The borehole GRAR-11 is initiated on 25.03.15 and progressed upto 64.40m depth on 31.03.15.

vi. **Reapraisal for dunite in Namakkal Dist, Tamil Nadu (ME/SR/TNP/2014/079) (G-4):**

Preliminary investigation (G4) for dunite in parts of Namakkal and Tiruchirapalli districts, Tamil Nadu (Toposheet no 58 I/8) is taken up with an objective to delineate all the dunite bodies, to bring about their disposition, to carry out comprehensive study of the dunite bodies and to assess the reserves. Investigation for dunite in Valasiramani East Block [Segment A (Valasiramani)] by scout drilling (G4) is being carried out to assess the reserves of fresh unaltered dunite suitable for refractory purposes. The northern dunite band occurs along the southern limits of the Kollimalai hills as discontinuous bands with a cumulative strike length of 8 km with an average width of 50m. The southern dunite band occurs between Ichchavari in the west and Kalingappatti in the east over a strike length of about 20 kms. The outcrop width of this intermittently exposed southern dunite band varies from 10m to 125m with an average width of 60m. These exposed outcrops are highly altered and are often covered by kankar with thin / sporadic development of magnesite at places within the dunite. It is observed from the well sections, that the altered / weathered dunite extends upto ~ 5-12 m below the ground level.

The second scout borehole VLS-2 (angular) was initiated on 29.12.14 along the profile B-Bô drilled upto 87.30m depth (vertical depth of 60m) and was closed on 12.01.15. Along this borehole, the top soil, pellets, fragments of broken cores of the garnet pyroxene gneiss extends from 0.00m to 4.85m depth, followed by cores of weathered dunite to a depth of 18.50m. From 18.50m onwards, weathered dunite with ramified magnesite veins is intersected upto a depth of 33.30m (25m vertical depth). Fresh and unaltered dunite is intersected from 33.30m onwards along the borehole and continued to the entire depth of 87.30m. As per the term review recommendations for drilling to the vertical depth of 60.00m, the borehole (VLS-2) was closed after reaching the vertical depth of 60.00m (ie 87.30m drill depth). The spacing between the first scout borehole (VLS-1) and the second scout borehole (VLS-2) is 330m.

The third scout borehole VLS-3 [VERTICAL BOREHOLE, as per the recommendations of the term review committee] is initiated on 20.01.15 along the profile C-Cô on 160m south of 0/E-315 point to intersect the dunite for a vertical depth of 60m, which is exposed for around 102m along the profile. The spacing between the scout boreholes VLS-2 and VLS-3 is 240m. The borehole VLS-3 has progressed to a drill depth of 62.40m. The soil cover has extended to a depth of 2.50m from the surface. Highly weathered dunite with intercalations of magnesite veins occur from the depth of 2.50m to 19.70m. From 19.70m, dunite with lesser degree of weathering and presence of magnesite veins was encountered with intense fracturing at places. The borehole is closed at a depth of 62.40m. The HF acid tests (borehole deviation studies) carried out in the inclined boreholes VLS-1 & 2 reveal the deviation of 2º to a depth of 165.15m and 87.30m successively.

A 0.15 sq.km of detailed mapping was carried out using total station in Valasiramani east block and borehole profiles were drawn along F-Fô, G-Gô and H-Hô. The fourth (vertical) scout borehole VLS-4 was initiated on 10.02.15 at 120m south of 0/E500 point along the profile D-Dô to intersect the dunite for a vertical depth of 60m, which is exposed for around 78m along the profile. The spacing between the scout boreholes VLS-3 and VLS-4 is 215m. From the core logging it is deciphered that the weathering zone in dunite extends to a depth of 19.70m, followed by the less altered zone extending upto 22.70m, below to which the fresh dunite occurs upto the entire drilling depth of 60.00m.

The fifth (vertical) scout borehole VLS-5 was initiated on 21.02.15 at 63m south of 0/E715 point along the profile E-Eô to intersect the dunite for a vertical depth of 60m, which is exposed for around 92m along the profile. The borehole was closed on 26.02.15 after reaching the drilling depth of 60.00m. The spacing between the scout boreholes VLS-4 and VLS-5 is 215m. From the core logging it is deciphered that the weathering zone in dunite extends to a depth of 20.00m, followed by the less altered zone and fresh dunite occurring to the entire drilling depth of 60.00m.

The borehole VLS-6 was initiated on 02.03.15 along the profile F-Fô at S50/E1000 drilled upto 60.00m and was closed on 07.03.15. The borehole VLS-7 was initiated on 10.03.15 along the profile G-Gô at S25/E1250 drilled up to 60.55m and was closed on 14.03.15.. The borehole VLS-8 was initiated on 19.03.15 along the profile H-Hô at S43/E1500 drilled upto 60.40m and was closed on 26.03.15. A total of 326nos of core samples has been generated from the boreholes VLS-1 to 7, which were pulverized, processed and submitted for chemical analysis. The 31nos of core samples sampled from borehole VLS-8 is under the process of pulverization. From the study of the drill cores of all the boreholes, it is observed that the soil + highly weathered dunite (overburden) occurs to a depth of 18-19m from the surface. The serpentinised/ altered dunite occurs between 18-23m depth, followed by the occurrence of fresh/unaltered dunite.

NATURAL ENERGY RESOURCE-IIB

SU: TAMILNADU & PUDUCHERRY

i) Regional exploration for lignite in Uttarakosamangai Sector, Ramnad sub basin, Ramanathapuram district, Tamil Nadu (ME/C/SR/NEnR/2010/035) G-3: Lignite potentiality in the virgin tracts of Ramnad sub basin of Cauvery basin, Tamil Nadu was established by concept oriented exploration that commenced in October 2002. Regional exploration was carried out over an area of 160 sq km and lignite potential was proved in 100 sq km. Exploration in Misal, Tiyanur, Bogalur and Bogalur East area / block / sector of Ramanathapuram district has augmented the lignite resource of the country by **910.84 million tonne.**

Regional exploration in the Uttarakosamangai Sector, Ramnad Sub-basin, Tamil Nadu, started on 20th February 2012 (sponsored by Ministry of Coal under promotional scheme) during the Field Season 2010-2012, to establish the strike continuity of the regional lignite seams towards the south and west of the previously explored Misal Area and Tiyanur Block. Exploration strategy was based on the interpretative study of sub-surface and geophysical borehole data generated in adjoining areas. A total of 11141.35m have been drilled in twenty seven boreholes during the Field Season 2010-12 to 2014-15. The investigation was closed on 11th October 2014. The Uttarakosamangai Sector, the west central part of Ramnad sub basin, is covered by alluvium with profuse development of calcretes and thin zones rich in ferricretes. Thickness of the alluvium varies from 78.00 m to 107.00 m. Marine equivalents of Cuddalore i.e., Tittacheri Formation are predominantly developed in Ramnad sub basin comprising creamy white to light yellow sandstone, calcareous sediments and dark grey to black clays with pelecypod and gastropod fossils. Maximum intersected thickness of the Cuddalore / Tittacheri Formation is 230.00m.

Lignite was intersected in all the boreholes. The lignite seam encountered splits in to three and coalesce along the dip as recorded in boreholes in this sector at depths between 301m and 405m. The cumulative thickness of seams varies between 0.90 m and 21.00m. The continuity of lignite seams has been proved for about 10 km in the strike direction and about 8.7 km in dip direction. The analytical results of all the lignite samples have been received. Generally, it is observed that the óinitial moistureô content of lignite seams of Neyveli and Mannargudi Lignite Field varies from 40% to 50% and therefore, an average 45% óinitial moistureô is assumed for Ramnad sub basin and the ash percentage, volatile matter, fixed carbon and calorific value in band-by-band analysis were accordingly recalculated. The weighted analysed value of moisture in the lignite samples from Uttarakosamangai Sector ranges from 18.00% to a maximum of 53.00 %. The recalculated weighted value of volatile matter range between 16.96% and 35.51%. The weighted recalculated value of ash content ranges between 3.52% and 29.89%. The weighted recalculated value fixed carbon content varies between 8.97% and 24.62%.

Recalculated calorific value of lignite samples of Uttarakosamangai Sector ranges from 1328.80 K.Cal/Kg to 3703.07 K.Cal/Kg. Seventy five percent of the sample analysed a calorific value of more than 3000 Kcal/Kg and belong to lignite ñAò grade, twenty percent of the samples analysed indicated a value between 2000Kcal/Kg and 3000Kcal/Kg and belongs to the lignite ñBò grade and rest five percent of the samples analysed indicated a value between 1000Kcal/Kg and 2000Kcal/Kg and belongs to the lignite ñCò grade. Chemical analysis of lignite ash indicated that most of the samples from Uttarakosamangai Sector contains less than 40% of silica and is suitable for use in power plants. Also the Fe_2O_3 content of lignite samples analysed were less than 15% which also reflects the quality of lignite in Uttarakosamangai Sector. The Initial Deformation Temperature (ash fusion temp) of all the composite samples from Uttarakosamangai Sector are more than 1200^0C, indicating their suitability to conventional boiler design.

A total of 1363.25m has been drilled up to 31-03-2015 in the borehole TRKW-02, to TRKW-8. A total of 78m has been drilled in TRKW-03 during the month and closed on 30th Jan 2015 at a depth of 451.65m after Geophysical logging (N. Gamma, SP, SPR, long Normal, Short Normal LSD, HSD) on 30th January 2015 up to 449.00m by Geophysics Division Sothern Region, GSI. The borehole intersected lignite at depths of 399.00m (7.00m) 409.00m (12.00m) and 425.00m (3.00m). In borehole TRKW-02, 137.00m was drilled and is progressing in Neyveli formation at a depth of 347.60m. TRKW-4 commenced on 29th Dec 2014, 237m was drilled and is passing through Cuddalore / Tittacheri Formation at a depth of 315.00m

The bore hole TRKW-2 has intersected 5 lignite horizons between depths of 410m to 460m with a recovery of 3.70m of lignite. A total of 102m has been drilled in TRKW-4 and has intersected 4 lignite horizons between depths of 370m to 415m with a recovery of 1.75m of lignite. The lignite horizons in these two boreholes will be finalised after geophysical logging which is expected to be carried out in next few days. TRKW-5 commenced on 11th of the month is passing through Cuddalore Tittacheri Formation after intersecting Quaternary / Cuddalore Contact at 115m is at a depth of 142.65m.

TRKW-2 closed at a depth of 460.60m after geophysical logging (N. Gamma, SP, SPR, long Normal, Short Normal LSD, HSD) up to 459.00m on 05.03.15. Four lignite seams (cumulative 20m) were intersected at depth of 409(3m), 415(8m), 424(3m) and 436(6m). TRKW-4 closed at a depth of 426.00m after geophysical logging (N. Gamma, SP, SPR, long Normal, Short Normal LSD, HSD) up to 425.00m on 04.03.15. Five lignite seams (cumulative 12m) were intersected at depth of 374(7m), 388(1m), 390(1m), 392(2m) and 413 (1m). 207m were drilled during this month in borehole TRKW-5 is progressing at 349.65m is expected to touch lignite in next 20-30m of drilling. Boreholes TRKW-7 and TRKW-8 were commenced on 16th and 20th of this month respectively is at depths of 169.65m and 168.00m and are intersecting Cuddalore/ Tittacheri Formation.

SU: KERALA:

During F.S.: 2014-15, two mineral investigations one on Gold and one on PGE were taken up.

i) Preliminary investigation for gold in Mundanpara, Chittur and Katalakkandi areas in the southern part of Attapadi valley, Palakkad district, Kerala – (2014-15/ME/SR/KRL/2014/080) G-4:

As part of pre-field studies, remote sensing studies (100sq.km) of the terrain were carried out by using geo-coded landsat-imagery and google map of the terrain. Structural fabrics interpreted include lineaments and folds. Two sets of lineaments (NE-SW and N-S trending) are present very prominently in the area.

Panning of stream sediments has been used as a rapid method to target gold-bearing host rocks in the area. Emphasis was given for panning of first order streams to delineate the mineralised zone. This method was adopted mainly in the southwestern parts of the study area such as Kurukkankundu, Jellipara and Mundanpara. This area is important because this forms the SW extension of the Puttumala West Block, which has not been explored in the past. Panning showed the presence of three to four grains in the first order streams of the area. On rare occasions upto nine grains were found along with pyrite grains. For a particular first order stream, the number of gold grains encountered during panning can be taken as a measure of the gold-content in the source area/rocks. Number of gold grains on panning was comparatively higher in the areas where deformation of country rock (biotite gneiss) is strong. A total of 130 streams (mostly first order) were panned for reconnaissance analysis for gold. Sixty one streams yield gold on this panning, mainly from southwestern parts.

Large scale mapping (1: 12,500 scale) showed that the area comprises of biotite gneiss, hornblende gneiss, granite gneiss and granite with a general trend of NE-SW to E-W. Biotite gneiss occasionally consists of large (upto 1.5cm size) patchy aggregate of biotite within the quartzo-feldspathic ground mass. Generally, this unit is found as strongly foliated and even sheared at few places.

Hornblende gneiss is greyish in appearance, is made of well-developed hornblende within quartzo-feldspathic minerals. Granite gneiss is massive and flesh colored in appearance and foliated with the banding of biotite and sometimes with few hornblende grains. In Kottamala area, granite gneiss and amphibolites show an interfingering relationship. Linear band of amphibolites were mapped within biotite gneiss as well as granite gneiss. The dark coloured massive rock occurs as 10-15 m width size to large bodies. Many amphibolites are sulphidic in nature, were sampled for petrography and chemical analysis. Quartz veins of few mm to 2m width size are found, are generally cross-cutting the foliation. Sulphide bearing quartz veins have been mapped from Kadirampadi area and have been targeted for chemical analysis. Few small bands of metapyroxenite and mafic dykes were also been mapped.

A BIF (Banded Iron Formation) band with widths ranging from 1 to 5m has been mapped intermittently for approximately 2.1 km from SW of Puttmumala to Kurrukankundu. The BIF is quartz-rich and occasionally sulphide-bearing and is found associated with amphibolite. Primary bedding is very prominent due to the colour change between quartz and very thin iron layers. Since, the panning results adjacent to the BIF band are encouraging, the area has been selected for soil sampling. A baseline has been laid along N65E along strike of the BIF and soil sampling has carried out on 100 x 25m interval. Soil samples are taken from the interval between the C-horizon and B-horizon wherever possible. A total of 274 soil samples have been collected over a length of 2.1 km. A trench of 4 cubic metres has been made in Paravalavu area to see the continuity of sulphidic BIF band and sampling. A trench of 20 metre length has been opened at 25m from 0/0 baseline towards SW direction to see the rock type and sampling. Both soil and bedrock samples were collected from this trench to analyse the gold potential. Another ridge in Ommala area has been selected for soil sampling as the streams adjacent to this ridge yield gold on panning. This area has also been sampled as per baseline-traverse pattern along the trend of the hill. A total of 68 samples have been collected and a trench of 16 cubic metres is made across the baseline to check the bedrock and its sampling. A ridge in between Jellipara and Mundanpara is also been sampled as per positive panning results on gold panning. A total of 58 soil samples have been collected for analysis. Strongly foliated biotite gneiss is the major rock type in the area, is trending EW and dipping towards north. Trend of the dip is uniform but the amount is varying in between 60^0 to 80^0.

Samples from quartz veins, BIF, Sulphide-bearing gneiss, mafic and ultramafics were collected for different types of study including BRS (100 samples) Petrography (30 samples), Ore-petrography (20 Nos.), Petrochemical (20 Nos.), REE (20 Nos.), XRD (10 Nos.) and EPMA (10 Nos).

Out of 109 soil sample analysis (received till date), 11 samples are giving Au values above 25 ppb.

ii) **Preliminary exploration for Platinum Group Minerals in Vellamari block, Attapadi valley, Palakkad district, Kerala – (2014-15/ME/SR/KRL/2014/081) G-4:**

Pre-field study carried out includes satellite image interpretation with the help of Erdas and Arc GIS software and perusal of geological maps and consultation of reports pertaining to project: PGE (FS: 2014-15), Attapadi valley.

Major rock type of the area is hornblende-biotite gneiss/biotite gneiss/quartz-feldspathic gneiss/granitic gneiss and charnokite gneiss. Archean Supracrustal rocks, which are exposed as linear bands in different dimensions include mafic and ultramafic rocks and banded-magnetite-quartzite (BMQ) ± grunerite. Ultramafic rocks include metapyroxenite, talc-tremolite-actinolite rock and dunite whereas mafic rocks are represented by amphibolite, gabbro and older and younger basic intrusives. Garnet bearing - metapelites are observed at Narasimukk and Bhutivali area. Emphasis was given on study of mafic and ultramafic rocks as they generally host PGE. Disseminated sulphides were identified mainly in the mafic rocks. At places, the metapyroxenite grade into talc-tremolite-actinolite-chlorite rock and it is difficult to differentiate these two varieties. Tremolite-actinolite minerals are randomly oriented within fine-grained talcose matrix. The rock is mainly composed of amphiboles, which appear to be formed as pseudomorphs after pyroxenes. In large scale mapping area, metapyroxenite/talc-tremolite-actinolite rocks occur as linear bands, mainly exposed in and around Kavundikal, Kunnanchala, Narasimukk, Bhutivali, east of Dodagatti and Kalpatti area. In the area north of Bhavani River, mainlly gneisses are exposed with a few thin linear mafic-ultramafic bands.

During detailed mapping in Kalkandi area of Vellamari block, the mafic and ultramafic rocks are mapped along with the gneissic country rock. The ultramafics are represented by metapyroxenite, talc-tremolite-actinolite rock and dunite and mafics are represented by gabbro and amphibolites. The metapyroxenites exhibit relict cumulus texture. The metapyroxenites are represented by websterite, clinopyroxenite and orthopyroxenite. Two types of metagabbro are exposed,which include metagabbro with garnet and without garnet. The amphibolites show a salt-pepper texture. Metagabbro is generally medium grained massive in appearance and occasionally foliated. The mafics are occasionally sulphide bearing wereas, the ultramafics are rarely sulphide bearing. Only in the abandoned magnesite quarry section in kalkandi area, the chromite bearing ultramafics are exposed. Other rock types include BMQ, sheared granite and anorthosite. The gneisses include hornblende-biotite gneiss, quartz-feldspathic gneiss and granite gneiss. General trend of these lithounits varies between NE-SW to ENE-WSW.

Since the chromites in the area are known to be PGE - bearing, importance was given to trace the chromite - bearing zones in the ultramafics. Bed rock sampling was done from chromite ± sulphide-bearing ultramafics. A total of 50 sq km area in 1:12,500 scale and 1.5 sq km area in 1:2000 scale are mapped. A total of five trenches with total 41.5 cu.m have been excavated during this work. Based on the study of trenches, the chromites are found to be continued intermittently for a strike length of approximately 350 m along NE-SW direction. In all these trenches, chromite - bearing ultramafics have been

exposed. A total of 36 nos. trench samples from the chromite bearing ultramafics have been collected for PGE analysis. In addition, samples from mafic and ultramafics were collected for different types of studies include BRS- 201, Petrography-15 samples, Ore-petrography-15 samples, Petrochemical-15 samples, REE-12 samples, XRD-5 samples and EPMA-10 samples. BRS, PTS, Petrochemical, REE, XRD samples are processed and submitted for chemical analysis.

MISSION-III (GEOINFORMATICS)

vii. GEODATA
I. STANDARD ITEMS:

1. REGIONAL DATA INTEGRATION CELL (RDIC), GEODATA DIVISION, SR

Supervisory Officer : M. Raghupathy, Director

PROGRAMME : INTEGRATION OF GEOSPATIAL DATA

Item No.120

Code: DI/SR/M-III/GDB/RDIC/2014/087

Personnel: Saudipta Chattopadhyay (PT) (M II), Gauri Motghare (PT), Minakshi Waghmare (PT), Geodata , R. Ananda Reddy, Suptdg. Geophy.SR, & Haraginadoni Channabasana Gouda (GP), RSAS, Bengaluru.

Progress of work at GEODATA, SR; *from 1st January, 2015 – 31st March, 2015*

Objective: Integration of target areas of mineralisation by spatial data modelling through the integration of Geological, Geochemical, ground-geophysical, aero-geophysical and remote sensing data of 57F & 57E pertaining to Gadwal, Jonnagiri, Wajrakarur and Ramagiri-Penakacherla mineral belts in GIS environment, using established statistical logic.

During the period under review the officers associated with the project involved in collating and processing the data pertaining to various themes.

Status of data collation

Layers	Source	Status
Faults & Lineaments	50K GMS, Geodata, SR	Extracted lineaments from LISS-III data & DEM. Lineament mapping and analysis for the 57 E & F degree sheets has been done.
GEOCHEMICAL Data	GCM, Geo-chemical Lab, SR	Analytical data of Package Collection and compilation of NGCM data of 57F/4, 8, 13-16 sheets pertaining to package B, C, E, F & G has been done.
		The data is arranged in .xls format, so as to convert into GIS map.
GEOPHYSICAL DATA	Geophysics, SR and RSAS, Bengaluru	Compilation and processing of Aero-geophysical data for both 57E & F has been done.

Programme: PREPARATION OF 1:50K GMS PRINT READY RGB LAYOUTS

Item No.121

Code: 2014-15/MAP/SR/M-III/2013/058
Personnel: Gauri Motghare, (PT) & Minakshi Waghmare (PT), Geodata Division & M. Bawanhun Mawthoh (PT) & R.Bharathi (PT), M&C Division, SR.
Objective: Preparation of 1:50K RGB layouts from the edge-matched 1:50K GMS
Achievements: Preparation of RGB layouts of 50 K maps using colour schemes and pattern library as per the guidelines given by the M&C, Southern Region.

Name of Work	Total Workload	a)Expected year of completion	Work already completed in FSP 2013-14	Work proposed for 2014-15	Work already completed from 1st January to 31st March 2015
Preparation of 1: 50K print ready RGB layouts	GDC- 183	March 2016	50 sheets	Layouts-70 sheets	Layouts: 57E/05 & 9 ; 65G /02, 03, 13 ; 56I/ 06, 07, 08, 10,11,12,14,15 & 16 ; 65C/01 to 15 submitted to M&C for scrutiny during this quarter. Attended modification of 57E/13 & 16, 56N/, 02, 03, 04, 08, 09, 11, 12, 13, 14 & 15 as suggested by M&C, SR. FS target of total **70** sheets (56N ï 16 sheets, 57E ï 16 Sheets, 65C -15 sheets, 56I ï 10 and 65G ï 13 sheets) have been achieved. Till date a total 42 hard copies and 28 soft copies have been submitted to M&C division. So far a total of 18 sheets are ready for approval after incorporating suggested corrections from RMH-III.

2. Programme: Implementation of OCBIS in collaboration with Geodata, CHQ
Item No.122
Code: 2014-15/DB/CHQ/M-III/2012/054
Personnel: from CHQ + All Missions + Support systems + Regions
Objective: Development of an integrated Web enabled interactive system
Achievements: Yet to be initiated from CHQ.

II. SERVICE ITEMS: SER/SR/HQ/2014/005

1. **Title: Network Management- Administration of SR Local Area Network**
Personnel: Gauri Motghare, (PT), Geologist
Services rendered: Co-ordination and maintenance of computer systems, Servers & switches, LAN networking & Broad Band connectivity (FTTH). Need based extensions, configuration of proxy server for better security. Periodical upgradation of Antivirus in all the systems of SRO. Upgraded the existing MPLS IP VPN circuit from 2 to 8 Mbps. Additional LAN-nodes allotted by CHQ are laid by M/s:HCL Comnet. The work is completed.
Title: Computer/ software assistance
Personnel: Gauri Motghare, (PT) & Minakshi Waghmare (PT), Geologists
Continuous monitoring and rendering service to all the officials of SRO & State Units for all the modules of transactional applications including FSPMIS & HRMIS has been done. Technical support was rendered in

computer applications, processing of data and preparation of maps using software like ArcGIS, Surfer etc. Scanning and printing of maps to various divisions of SR as per the user requirement.

3. GSI PORTAL: At Regional Level

- Progress in finalization of phase-III proposal: Being implemented at CHQ.
- Progress in enhancement of Portal applications:

FSPMIS: Proposals of FS: 2014-15 uploaded to the portal and are in various approval stages. Coordinated with all the State Units and Divisions of SR for uploading the reports of the FS 2013-14.
HRMIS:- The HRMIS records are constantly updated with regards to transfers, promotions etc., like change of base site and other details.

Payroll:- Payroll module is functional for the entire SR and pay is made through ECS clearing.

Claims:-. Employees can apply for CL, RH, EL HPL and Joining report through portal. EL and HPL have been updated. Tour sub-module is operational as part of Claims module.

Claim Description	Submitted Claims	Approved & Accepted Claims
Joining Report	142	0
Leave Application	334	125
Leave Cancellation	13	0
Leave Extension	32	14
Station Leaving	22	15
Travel Advance	0	0
Travel Approval	59	49
Travel Adjustment	0	0

APAR Tracking System:- It is operational for all officers and Staff of SR

Year	No of records
2014-15	201

IPR:- Immovable Property Returns application is operational.

Year	No of records
2014	1955

SU: KARNATAKA & GOA:

SSN	Item	Target	Progress for the quarter ending Mar'15
11	Compilation of New series II edition GQM, 1:250K GQM (*Link item with Geodata Division, SU:K &G* - SR/KG/2012/084) (Proposal id-20141006)	6 degree sheets : 48K, 48M, 48N, 56D, 56H and 57A	• Completed 56H and 57 A during this period and 100% target achieved.
22	Preparation of 1: 50K prints ready RGB layouts. *(Link item with MCPI Division, SU:K &G)* MAP/SRM-III/2013/061 (Proposal id-20141014)	70 Maps	• Completed 53 Layouts in all respects during this period and 100% target achieved
33	Service Items SER/SR/KG/Geoinf/2014/010 (Proposal id-2014652)	1. Final scrutiny, formatting, approval from SRO, reprography and circulation of progress reports of field season. 2. Scrutiny and processing of	• Circulated addendum report of Project Diamond FS 2013-14 by Shri S. S. Gawade and Mrs. Sibi P. S., Geologists. • Submitted statement on sale of maps (internal resource generation) for the past three

		material for Extended Abstract, Annual General Report, GSI News, Specific write ups, etc will be attended. 3. Scrutiny of Scientific papers meant for publication in various journals/seminars, etc. 4. Maintaining inventory of the geological maps. 5. Sale of maps and reports/publication. 6. Providing cartographic support for the different projects in finalization of maps and other drawings 7. Supervision and up keep of Library, procurement of scientific books and journals, arranging for collating and circulating important geological notes/news pertaining to GSI and related topics published in Newspaper.	years. • Provided cartographic support for the different projects by tracing 10 maps of 50K scale pertaining to corrections in 50K maps including those of border sheets of Karnataka and Maharashtra for bringing uniformity in the Deccan Trap flows. • During the period total revenue generated by sale of 38 maps of different series = 10,120/-. • Submitted status of 8 priced unpublished progress reports in terms of condition of plates, maps etc as per list received from TCS, SR, Hyderabad and submitted the same to DDG, SU: K & G. Also submitted security guidelines from CHQ and SR about unpublished progress reports of GSI in response to sale of reports to DMG, Karnataka.

44	Service Items SER/SR/Geoinf/011 (Proposal id-2014623)	1. Necessary guidance and service support in integration of various layers of 1:50K and preparation of layout as per demand. 2. Scanning and printing as per existing infrastructure. 3. Network management, LAN /WAN /IP security, GSI Enterprise portal related job. 4. Necessary service support in indenting, processing, procurement and maintenance of IT store (Hardware / Software) 5. Maintenance of computer / peripherals through AMC 6. Necessary service support in processing of geological data using application Software like SURFER, Audesk MAP, Arc GIS. **Cartographic Support** • Map and Cartographic support: Map support and lamination of old valuable maps and documents. Cartographic drawing support to different Divisions and Projects of State Unit Karnataka & Goa. • Catering the service of issuing and taking return of toposheets	1 ï Assisted NGCM projects by preparing and printing (A4 size) stream sediment, regolith, slope wash and water sample locations in the drainage map of toposheet no. 57A/01. Also assisted Shri Raj Kumar, Geologist from Kerala in finalising 56D/13 (1:50K GMS). 2 - Scanning / printing support by: Scanning: A0 - 56 sheets. . A1 ï 53 sheets and print outs: A0- 38;A1-03; A3-02 3- Necessary service support in maintenance of biometrics attendance system and computers / printers has been provided. 4 ï Re-indented for 20 mono colour laser and 3 ink jet Epson printers. Recommended for procurement of ammonia printer and installation of centralized UPS in each floor of the office. 5 - Maintenance of peripherals which are under AMC

GEODATA, SU: KERALA:

i) Preparation of print ready RGB layouts of 1: 50K maps.

Print ready RGB layout of 62 geological maps of 1:50K pertaining to Kerala state has completed include TS No. 58 D/9 ,D/10,D/13,D/14 & D/15; 58B/1, B2, B/3,B/4, B/5, B/6, B/7, B/8, B/9,B/10, B/11, B/12, B/13, B/14, B/15 & B/16 ; 58C/1&5,C/6 ,C/7 ,C/8 ,C/9, C/10, C/11,C/12,C/13, C/14, C/15 & C/16 ; 58A/1, A/2, A/3, A/4, A/6, A/7, A/8 and A/12 ;

49N/13 & N/14, 49M/5, M/6 & 10, M/9, M/11, M/13, M/14, M/15 & M/16 ; 58G/1, G/,2, G/3 & 58G/4, 48L/14, 48P/4, 48P/3, 58H/1, 58H/2, 58H/3 and 58 F/4. All the major themes were verified, checked and compared with the validated sheets and necessary modifications were carried out where ever required. The missing components in uploaded maps in portal and attribute tables were also updated accordingly. The problem of Clospet granite occurred in 58A sheets was resolved.

ii) Service Item: Data Repository & Management– (Publication Division)

Scrutiny and finalisation of material for extended abstract and Annual General Report, uploading the interim report/progress reports of NGCM, STM and MII projects in portal, preparation and finalization of material for GSI SR News and final reprography and circulation of progress reports of field season 2013-14. In addition**,** the officers were engaged in verification of petrology and stationery stores and uploading of FSPMIS.

iii) Service Item: Data Repository & Management – Map compilation

Extended support to field officers for preparation of geological map in Arc GIS platform. Engaged in maintenance and up keeping of Geodata lab, procurement of computer and spares, constant checking and monitoring of HRMIS data, besides attending works in connection with claims module of GSI portal. The officers were also engaged in facilitation and supervision of maintenance works pertaining to desktops, scanners, printers and LAN. The newly supplied computers to SU: Kerala has been distributed effectively based on the need and workload.

a)MAP COMPILATION:

M & C, SR

I) **Item Sl. No. 079**

Title: Compilation of New Series (Second Edition) of Geological Quadrangle Maps 1:250K GQM

Personal: M.Bawanhun Mawthoh, Senior Geologist
Dr. R.Bharathi, Assistant Geologist

S.No	GQM(second edition)		Achievement
1	K&G	56D	Scrutunized and sent back for new cross section preparation and received after incorporation
2	AP &T	65L, 66A&E, 66B and 65K	Scrutunized
		56K, 56O	Under scrutiny

II) FSP No.: SR/M-III/2013/058

Title of the programme: Preparation of 1:50K GMS Print Ready RGB Layouts,
Link Item with Geodata Division, SR.

1) 42 sheets received (2nd draft=16) from Geodata, SR, Hyderabad in hard copy on 22-01-15& 05-03-15.
2) 10 sheets received from AP&T in hard copy on 8-1-15.
3) 7 sheets received from TNP(FS 2013-14) in hard copy on 14-1-15
4) 11 sheets received from K&G in soft copy on 3-2-15 & 27-2-15.
5) 37 sheets scrutinized and remaining sheets are under processing.

Total sheets (2014-15): a) Hard copy: Geodata, SR-42, AP&T-10, TNP-7(2013-14);
b) Soft copy: K&G-61, KL-18.

A. Service Item: SER/SR/HQ/M&C/2014/006 Item No. 125

Composing **1:50K Unpublished Geological Maps** as per User demand for sale - 01

B. Miscellaneous:

Activity	MAP SALES	MAP SECTION	
1.No of maps sold /cost	112 Rs. **70,055/-**	NA	Maps =103, Atlas= 0; Scanned prints= 08; Unpublished 50K= 01
2. No of maps issued	08	19	
3. No of maps returned to section	15	174	
4. No of geological maps consulted	90	16	

5. No of unpublished scanned Maps received from M&C -01, MPD-09, Geodata-0	10	NA	
6. NDC issued	Nil	Nil	
7. Map parcels	Nil	NA	
8. Lamination	NA	21	
9. Mounting of maps	NA	09	
10. Ledger issues & Returned	NA	Entered (193)	
11. Scanned geological maps	NA	20	

B) PUBLICATION DIVISION, SR

1. **GSI Rec.Vol.148, Part-5 (Extended Abstracts of Progress Reports of Southern Region for F.S. 2013-14):** Printing of the volume has been completed and the same volume is released at 54th CGPB meeting held at New Delhi on 5th & 6th February, 2015.

2. **Miscellaneous Publication No. 30: (2 State units):-**

- **Telangana :** The Printing of Misc.PubNo.30 Part VIII A ï Geology and Mineral Resources of Telangana State (First edition) and Misc.PubNo.30 Part VIII B ï Andhra Pradesh State(First edition) has been completed and the same volumes were released by the Shri Harbans Singh, Director General, GSI on 20-03-2015.
- **Andhra Pradesh** : The Printing of Misc.PubNo.30 Part VIII B ï Geology and Mineral Resources of Andhra Pradesh (First edition) and Misc.PubNo.30 Part VIII B ï Andhra Pradesh State(First edition) has been completed and the same volumes were released by the Shri Harbans Singh, Director General, GSI on 20-03-2015.
- The Printing of the Geological and Mineral Maps of Misc.PubNo.30 Part VIII A- Geology and Mineral Resources of Telangana & Misc.PubNo.30 Part VIII B- Geology and Mineral Resources of Andhra Pradesh were completed by the Map Printing Division, SR, Hyderabad

3. **GSI NEWS, SR, Vol. 31 No.1 &2 (January 2014 to December 2014)** : The collection of the material for the GSI, SR, News volume is under progress.
4. **Pictorial Atlas Cuddapah Basin -** The collection of photographs and material is under progress. Total No. of Photographs collected ï 515 no.s and Photographs with captions ï 143no.s
5. **Bulletin Series A** : Economic Geology Bulletin Series (PGE Resources of Tamil Nadu): The State Unit: Tamil Nadu expressed inability to submit the volume before end of this Field Season.
6. **Bulletin Series B** : The manuscript has been sent to the Central Headquarters, Kolkata for scrutiny and approval.
7. Processing for scrutiny of abstracts/papers for publication in various seminars and Journals:. 5 Abstracts
8. Sale of GSI publications generated resource of Rs 9802/- (Rupees nine thousand eight hundred and two only)
9. Cross checking of the soft copies of unpublished progress reports which are available in the Library main data base is under progress.
10. Corrections of bibliographic details of Unpublished Reports database is under progress.
11. Provided data from SR, Library database of unpublished reports to officers of Southern Region on demand.

MCPI Divisions of State Units:

During the Annual Programme of 2014-15, the MCPI Divisions of respective SUs (including that of Kerala which is a unified Division with Geoinformatics) will be engaged in the compilation of new series (second edition) of geological quadrangle maps, 1:250K GQM;. In addition, they will also be engaged in works related to scrutiny of RGB layouts, report processing & circulation, scrutiny of extended abstracts etc.

MAP PRODUCTION DIVISION, SR:

1. Geological Quadrangle Maps (GQMs): Digital processing completed for maps viz., 78D, 79A and 79B and Printed off 5 copies each along with previously completed GQMs of 77D, 78A, 78B, 78C and 78F (all restricted) with out topo base for internal use only, as suitable raster topo base is not available.

2. State Map Series: Geological & Mineral Map of Andaman and Nicobar Islands (1:0.5M) along with brochure has been printed off 5 copies and sent to MIIIB, CHQ, Kolkata, as the MOD cleared the map under ñRestrictedò category.

3. Quaternary Geological Atlas: After scrutiny of 42 sheets SOI returned 19 sheets along with correction tracings of international boundary and coast line. The suggested corrections have been incorporated and resubmitted the 19 sheets for scrutiny and certification. Subsequently SOI certified all the 42 sheets. MOD has conveyed the clearance for 32 sheets and

indicated some corrections in 10 sheets. The suggested corrections have been incorporated and resubmitted for further clearance. As advised by DDG, M-IIIB, CHQ, color inkjet plots of the maps pertaining to each Region have been generated and sent to respective Regions, for scrutiny and suggestions / modifications if any.

4. Outside FSP Items:

a) Printed off 503 copies of Geological and Mineral map of Tamil Nadu & Puducherry (1:2M) for Misc.Pub.30 and are sent to Director, Publication Division, SR.

b) Printed off 475 copies each of Geological and Mineral Maps of Andhra Pradesh and Telangana (1:2M) for Misc.Pub.30 and sent to Director, Publication, SR.

c) Printed off 700 copies each of Geological and Mineral Maps of Uttar Pradesh & Uttarakhand and Himachal Pradesh (1:2M) for Misc.Pub.30 and sent to Director, Publication, NR.

d) Provided print out of posters and banners for GSI stall at Indian Geospatial Forum exhibition held at Hyderabad Convention Centre and for IGC Brain storming session held at GSI, SR, Hyderabad.

e) Provided print outs of DRMs and other maps to M&C division for sale and scrutiny purpose.

5. Disaster Data Recovery Centre (DRC), GSI Portal, Hyderabad: Maintenance of all servers, LAN, WAN and other electrical components at DRC, MPD in collaboration with Director, Mission IIIA, CHQ, Kolkata.

ix) MISSION – IV (FUNDAMENTAL AND MULTIDISCIPLINARY GEOSCIENCE)

MISSION-IVA

a)ENGINEERING GEOLOGY, SR

Title: Water Resource Development Projects in Telangana (EG /C / SR / HQ / 2014 / 089)

Region	**:**	**Southern Region**
Mission	**:**	**IV: Fundamental and Multidisciplinary Geosciences.**
Division	**:**	**Engineering Geology Division, Hyderabad**
F S P No.	**:**	**EG /C / SR / HQ / 2014 / 089**
F S P Year	**:**	**2014 –15**
Title	**:**	**Water Resource Development Projects in AP & TS**
Objective	**:**	To offer consultancy services on geotechnical aspects for dam Foundations lift irrigation schemes, including pump house foundation and rock mass characterization of tunnels; Hydel projects and their appurtenant structures. To carry out site specific geotechnical investigations and recommend necessary corrective measures.

Name & Designation of Supervisory Officer : Shri. B. K. Bhandaru, Director (G)

Name & Designation of Officers : 1). B. Ajaya Kumar,(P/T) Superintending Geologist
2). G.J.S. Prasad, Senior Geologist
3).T. Nagaraj, Senior Geologist

Geotechnical Investigations taken up in Andhra Pradesh & TS from 1st January, 2015 to 31st March, 2015.

Sl. No.	Name of the Project	Nature of work	Quantum of work done
Dr. B. R. Ambedkar Pranahita Chevella Sujala Sravanthi Scheme			
1.	Construction stage geotechnical investigation of tunnel Package-23, Dr. B.R. Ambedkar Pranahita Chevella Sujala Sravanthi Scheme, Cherial, Medak & RR Dist, TS.:	3-D geological mapping of tunnel:	1721Lm on 1: 200 scale.
2.	Construction stage geotechnical investigation of Kakarla N.O.F dam, PS Veligonda Project, Prakasam dt., AP.	Foundation geological mapping of NOF dam Blocks:	870 sq m, on 1: 100 scale
3.	Pre- Construction Geotechnical Investigation of Sun- Kosi diversion Scheme, Sapta Kosi-Sun Kosi Hydro Electric Project, Nepal.	1.Geological mapping along the proposed penstock alignment, power house complex area, along tail race channel alignment on 2. Geological mapping along the proposed along the Diversion Tunnel:	1250Lm on 1:1000 scale: 11000Lm on 1: 10000 scale.
4.	Construction stage Geotechnical investigation of Twin Tunnels, Package-7, Dr. B.R. Ambedkar Pranahita Chevella Sujala Sravanthi Scheme, Karimnagar dist., Telangana State:	3-D geological mapping of tunnel:	5510Lm on 1: 200 Scale.
5.	Indira Sagar Polavaram Multi-purpose Project:- construction stage geotechnical investigations of Power house:	Geotechnical assessment of progressive excavations of power house between Berm 1 and 3 along Left wall of PH.:	2300 Sq.m on 1: 200 scale
6.	Construction Stage Geotechnical Investigation of Parts of Cut off Trench of Earth Dam for Sankara Samudram Balancing Reservoir, Rajiv (Bhima) LIScheme (Lift-II), Mahabubnagar Dist., Telangana State.	3D geological mapping of Cut off Trench:	219Lm on 1: 200 scale

7.	Geotechnical investigation of Kosini Balancing Reservoir under Komaram Bhim Project, Adilabad dt, Telangana:	Geological assessment of H.C Weir foundations	
8.	Geotechnical investigation of Tunnel Project, Package-20, Dr. B.R. Ambedkar Pranahita Chevella Sujala Sravanthi Scheme, Nizamabad dt, Telangana:-	Geological mapping of tunnel:	4.970 L km on 1: 200m scale
9.	Construction Of Submersible Weir At 14.6 Km D/ Of Srisailam Dam, Across River Krishna, Prakasam And Mahabubnagar Districts.	Geotechnical assessment of right and left abutment s of submersible weir	
10.	Construction Stage Geotechnical Investigation of Part of Cut off Trench of Earth Dam across Peddavagu River near Nilwai Village, Adilabad District, Telangana.	3D geological mapping:	50 Lm on 1: 200 scale.
11.	Construction Stage Geotechnical Investigation Of Spillway Blocks Of Mid Manair Reservoir Project, Karimnagar Distict:	1. 3 D Geological mapping of cut off trench: 2. Foundation Geological Mapping:	150 LM on 1:200 scale 336 sq.m on 1:100 scale.
12	Construction stage geotechnical investigation for the Tunnel from Dharmasagar Tank to R S Ghanpur Tank, J. Chokka Rao Devadula Lift Irrigation Scheme, Phase-III, Package-IV, Warangal District, Telangana.	3D Geological mapping tunnel:	2500 Lm on 1: 200 scale.
SERVICE ITEM			
13.	SERVICE ITEM No .SER/SR/HQ/EG/026 (ITEM NO.154) Compilation Report of Geotechnical investigations carried out on Telugu Ganga Project, Andhra Pradesh	Submitted for Publication Division for Bulletin series	

SU: TAMIL NADU & PUDUCHERRY

Geotechnical evaluation of water resources development projects in Tamil Nadu (EG/C/SR/TNP/2014/090):

Preliminary stage investigation

1. DPR Stage Geotechnical Investigation of Sillahalla Pumped Storage H.E. Project, Nilgiri Dist., T.N:

The Sillahalla Pumped Storage H.E. Project (SPSHEP) proposed by TANGEDCO envisages impounding the Sillahalla River, under the Kundah river basin in the Nilgiris district. The Project is proposed to be constructed in two phases, the first phase ï Sillahalla Energy Augmentation Scheme involves construction of a 90.8 m high concrete gravity dam across Sillahalla river and a 2.75 km long interconnecting tunnel between Avalanche-Emerald reservoir and proposed Sillahalla reservoir. The inter-connecting tunnel will have a provision for two-way flow. The Sillahalla dam will act as a balancing reservoir between the Avalanche-Emerald dam and the downstream Pillur dam. The second phase involves construction of water conductor system between Sillahalla and Pillur dam, comprising 3800 m long Head Race Tunnel, Head Race Surge Shaft, 3900 m long twin Pressure Shaft, 8980 m long Tail Race Tunnel, Tail Race Surge Shaft, 5750 m long access tunnel to Power House and an underground power house with an installed capacity of 2000 MW (4 x 500 MW) of power utilising 1500 m hydraulic head (difference between level of Avalanche-Emerald-Sillahalla dams and that of Pillur reservoir).

During the period under review , logging and assessment of cores were carried out on the 7 nos. of bore holes drilled along the alignment of proposed Sillahhalla Dam, as well as 4 nos. drilled along the proposed interconnecting tunnel, between Emerald Dam and proposed Sillahalla Dam. The logging and assessment of the cores from Dam alignment indicate deeper foundation grade rock in the right bank then compared to the left bank. The B.H.4 drilled at the Dam alignment reported about 4 m of non-core recovery, with water loss which is presumed to be overburden, but interpretation is under progress, due to want of more data from the project authorities. The interconnecting tunnel did not indicate any rock cover problem since all the 4 B.H indicated fresh rock at shallow level from surface. The core recovery and RQD mostly remained 100%, except for the reaches of weathered joint planes. The recommendation and further course of exploration for the right bank is under progress.

During February 2015, Geological traverse cum inspection of the proposed Dam and the Interconnecting tunnel sites were carried out, during the inspection visit of Director, E.G. Division and geotechnically evaluated the site with special reference to the landslides observed in the either flanks close the dam alignment. 2 nos. of landslide were observed in both the flanks, while a land subsidence has been observed on the right flank, along the alignment near B.H. 4 & 5, which has indicated about 30 m overburden. It has been recommended for carrying out a detailed geological mapping of the Dam site, covering 500 m u/s and d/s , up to 200 m above the river bed level.

2. **Geological & Geotechnical Investigations for DPR of the Ponnaiyar (Nedungal Anicut) – Palar Link Project**

The DPR stage geotechnical investigation of Ponniayar ï Palar Intra State River Linking Project has been taken up

in pursuance of the MoU with National Water Development Agency (NWDA) on 18th June 2014, to carry out the Geological & Geotechnical Investigations along the link canal and at major CD/CM structures of the Ponnaiyar (Nedungal Anicut) ï Palar link canal project.

Geotechnical investigation and assessment for bore hole proposals were carried out along the proposed canal alignment and along the major Cross Drainage (CD) works at 13 locations, at the river/stream, road and railway crossings, upto the outfall at Godd Ar (R.D.54.15 km). A total of 8 nos. of exploratory bore holes were proposed 2 each at Intake and out fall reach and 4 B.H. at selected locations of proposed CD structures. However, additional B.H. requirements may arise after completion of geotechnical investigation of entire stretch.

3. **Request received from V.O.C. Port, Tuticorin for Quarry Site study and awaited for advance payment of consultancy charges to take up the work**

Construction stage investigation

4. **Kundah Pumped Storage Hydroelectric project, Nilgiri Dist., Tamil Nadu:**

Kundah pumped storage hydroelectric project (KPSHEP) with an underground power house of installed capacity of 500 MW (4 x 125), proposed to divert 240 cumec of water from Upper reservoir (Porthimund reservoir) through a 8.5 m dia., 1261 m long HRT, a surge shaft, 436 m long 5.4 m dia. Pressure shaft, 3.8 m dia. penstock tunnel to feed the underground power house to generate power, utilising 300 m gross head . The tail water will be let through a TRT surge, 8.5 m dia, 1250 long TRT tunnel into the lower reservoir (Emerald Reservoir). During the period under review the following work has been carried out,

a. Geotechnical assessment of the Control Cable Cum Ventilation Tunnel (CCVT)

Geotechnical evaluation has been carried out for the intalet reach of CCVT, as per the request of the project authorities for the reported problem due to thick overburden. During the inspection the open excavation was under progress from intake of CCVT at RL 2028 m exposing lithomarge clay and highly weathered rock (W-IV). After assessing the site condition and analysing the geological cross section, interpreted from bore hole data, drilled near the alignment, it was suggested that tunnel grade rock would be available from the R.L.2015m and therefore, tunnelling would be involved in overdurden/weathered rock, till it the driving reaches R.L.2015m. It was recommended to protect the cut slope by gentling the slopes and to provide shotcrete + wiremesh, along with provision of inclined drainage holes with perforated pipes.

The CCVT was inspected later during January 2015 and it was observed that the open excavation was completed and erection of Steel Rib was under progress from inlet of CCVT exposing lithomarge clay and highly weathered rock (W-IV). ch 0 to 3m is left open for false portal, but ISMB (300x140) steel ribs were erected from ch. 3 to 13 m, with 0.5 m c/c spacing. Ch. 3 to 5 m the ribs are placed without any slope, but from ch.5 onwards, slope is 1 in 10.14 m. It was suggested to drain the pore water in the cut wall by inserting perforated pipes, after shotcreting with wire mesh, to avoid any instability in cut slope area.

b. Geotechnical assessment of Main Access Tunnel (MAT)

Geotechnical assessment of the MAT has been carried out for the selected reaches from ch.308 to 308 m, for the reported water seepage. The water seepage was mainly concentrated around ch.308 m, along the left wall between the spring and crown level of the tunnel. The seepage water is reported to be around 20 LPM along the left wall from 3 places and near the crown of about 10 LPM. It is controlled along the prominent joint plane trending N40°E ï S40°W dipping 50° towards N50°W. It was also observed that another joint plane whose strike is at N20°W ï S20°E dipping 75° towards S70°W, makes intersection with the earlier joint plane form a structural wedge, consequently forming over breaks during tunnelling. A small stream is aligned in the direction of tunnel above the seepage reaches is suspected to be the source, however, the vertical cover in this is around 54 m.

Strict monitoring of the seepage water is recommended, noting down the seepage rates periodically and along with details of dissolved soil particles, if any. It was also recommended to channelize the seepage by means of perforated drainage pipes, diverted towards the invert and the collected seepage water can be diverted to a sump in the invert for dewatering.

c. 3D Geological Mapping of the Main Access Tunnel :

3D Geological mapping of the Main Access Tunnel (MAT) have been carried from ch.96.9 m to ch.315 m, on 1: 200 scale. The tunnel is self supporting in the mapped reaches, however, random rock bolting have been provided by the project authorities, while driving the tunnel. The mapped reach comprises garnetiferous charnockite, mafic dykes and quartz veins aligned parallel to the foliation plane. Mylonite filled, slickenslided shears were observed occurring parallel to the foliation planes. 3 sets of prominent and random joint planes occur along the mapped reach. The tunnel is driven perpendicular the regional foliation direction, thus considered favourable according to the RMR. The RMR values ranges from 52 to 77 and the Bartonôs óQô value ranges from 1.14 to 10.3, with Class ï II to Class ï III and Poor to Good Rock mass respectively. It is recommended for systematic rock bolting in the crown and the walls with wiremesh along with shotcrete in the crown for selected reach.

d. Geotechnical assessment of HRT alignment:

Geological traverse were taken along the proposed modified HRT alignment to prepare the longitudinal section of the water conductor system, as requested by TANGEDCO. The traversed reaches of the HRT alignment covers most part of the reserved forest with thick vegetation and was devoid of any outcrops except near the reservoir rim at HRT intake, observed with W-III to WIV grade of charnockites and W-I charnockite was observed along the nala sections around ch.665 m. Besides assessed and logged cores drilled from the inclined bore hole located along proposed Pressure shaft location at ch. 1550m. Core recovery ranges from 40 to 100%, while the RQD varied from 18 to 100%, the poor core recovery and RQD of 42% and 18% encountered between 46.5 and 49.00 m is attributed due to shear, observed with mylonite along the prominent sub-vertical joint plane.

Geological traverse was taken along the modified HRT alignment, starting from the proposed HRT Intake area, in the Porthimund Reservoir rim, up to the proposed pressure shaft area. Exposure of highly weathered (W-III to WIV) charnockite was observed in the HRT intake area and fresh charnockite was observed in the nala section near ch.665 m, but since most part of the alignment falls in the reserved forest area covered with thick vegetation, outcrop was restricted to the nala section only. Three sets of joint planes was observed at HRT intake area, i. N45°E- S45°W dipping vertically, ii. N20°W-S20°E dipping vertically, iii. N70°E-S70°W, dipping 80° towards S20°W (foliation joint). Similarly, 3 sets of joints were also observed near ch.665 m nala crossing, near B.H. 27 ï i. N10°W- S10°E to N-S dipping vertically towards SW to S. ; ii. N50°W- S50°E dipping 75° to 80° towards N40°E; iii.N20°E-S20°W dipping 75° towards S70°E. The data was collected to prepare the geological section along the water conductor system (WCS) (for the modified/revised HRT alignment) as requested by the project authorities.

e. Geotechnical assessment of cores drilled at Pressure Shaft alignment: Logging and assessment of Inclined Bore Hole cores located at proposed pressure shaft alignment (now ch.1629 m; 1550 m as per DPR) was made to assess the depth and width of the anticipated shear. The actual inclination of bore hole suggested by GSI is 75° (from horizontal) in the direction S80°E (100°), whereas, when the bore hole inclination was measured over the drilling machine, it was observed that the bore inclination is 80° instead of 75°. Therefore, corrections were incorporated during the logging and accordingly the dip amount of joint and shear plane were measured. The RL of B.H. is 2165.556 m , and the overburden comprising soil & lithomargic clay is inferred upto 10.50 m depth , beynd that upto 87.40 m (total depth) hard compact Charnockite was intercepted with silification in most part of the run. The core recovery ranges from 40 to 100%, while the RQD varied from 18 to 100%. The poor core recovery and RQD of 42% and 18%, respectively, is encountered between 46.5 and 49.00 m is attributed due to shear, observed with mylonite along the prominent sub-vertical joint plane and in the shear/mylonitised joint plane were also prominently observed in the sub-horizontal joint plane with dip amount of about 25° to 35°.

f. Geotechnical assessment of cores drilled at Power House Site: Assessment of the bore hole cores drilled on the top of the Power House cavern at ch.1734 m was made to understand the behavior of shear that was intercepted in the Pressure Shaft alignment. But logging could not be carried out, due to time constraint, however, critical core pieces were examined. The total depth of bore hole is intended to be drilled upto the crown of the P.H. cavern i.e, 1953.50 m , while the R.L of the bore hole color is 2199.80m, therefore the total depth of the bore hole would be around 246.30 m. During the inspection, the depth of bore hole was around 165 m , a quick assessment of the cores indicated that heavy cores loss is reported at the depth between 136 and 139 ; 145 and 148 m , this is presumed to be attributed by the sheared joint planes with mylonite fillings. It was suggested to continue the drilling downto the cP.H. crown level, with reduced speed and double barrel drilling, to gain high core recovery.

5. **3D Geological Mapping of offshore submarine Sea Water Intake Shaft, PFBR, Kalpakkam, Kanchipuram Dist., T.N.:**

As per the request of the M/s. Gammon India Ltd, for the upcoming Prototype Fast Breeder Reactor, at Nuclear Power Plant, Kalpakkam, 3D Geological mapping of the 5.5 m dia. submarine Sea Water Intake Shaft has been carried out after executing an Mutual agreement. The 3D Geological mapping has been carried out offshore, for a depth of about 28 m below sea level, from RL. -15 m to -43 m. on 1: 100 scale. The initial reaches of the surge from the sea level and -15 m is concreted and the fresh charnockites were exposed below these reach, which has already been grouted with Polyurethane (PU) to seal sea water seepage through joint planes distressed due to blasting. 3 sets of joint planes were observed, of which the steeply westerly dipping joint plane and E-W trending subhorizontal dipping joint planes are prominent. Based on the RMR & Q values, 66 to 71 and 5.28 to 13.33, respectively the rock mass is classified in to Class-II, Good rock mass category and the shaft is self supporting. However, since, the tunnelling is made off shore below the sea level, constant water pressure will be exerted on the shaft leading to distress in the joint planes, the effectiveness of PU grouting made earlier has to be ascertained.

6. **Site Assessment of Fast Reactor Fuel Cycle Facility (FRFCF) Foundation, IGCAR, Kalpakkam, Kanchipuram Dist., T.N. :**

As per request of the M/s. L&T ltd (for M/s. BHAVINI, Kalpakkam) Site assessment of the proposed FRFCF at IGCAR, Kalpakkam was carried out to assess the nature of the foundation medium and to evaluate the feasibility of taking this project and to prepare the MoU.

1. ENGINEERING GEOLOGY, SU: KERALA

Title: Geotechnical Evaluation of Water Resources Development Projects in Kerala(FSP Code : 2014-15/EG/C/SR/KRL/2014/096)

During the period under review, geotechnical investigations were carried out for a total of eleven projects of which ten are hydro electric projects of Kerala State Electricity Board (KSEB) and one is Irrigation project. The highlights of the individual projects are as given below.

HYDRO ELECTRIC PROJECTS

1. ***Peechad Small Hydro Electric Project, Idukki District***

A hydropower project conceived and designed to generate 3 MW of power by constructing 8.97m high, 60m long concrete gravity weir and a surface power house. Drilling of five bore holes, of which three along weir axis, and one each at surge/valve house and penstock bifurcation is the subsurface exploration programme recommended by the department during the previous field season. During the season taken up subsurface data collection and interpretation of these boreholes

Quantum of work done:

1. Logging and assessment of cores of 5 boreholes - **101.07m.**
2. Samples collected for strength test - **3 Nos.**

Hornblende biotite gneiss with intrusive veins of granite/pegmatite is assessed to be the foundation media of weir, surge/valve house and penstock blocks. The foliation with dip varying from 5° to 71°, foliation parallel joints and two sets of joints are the discontinuities present in the rock mass. The depth to bedrock varies from 8.96 m to18.8 m at weir site, 2.6 m at valve house and 6 m at the penstock bifurcation. The foundation media of the weir in general is rated as good to very good with the RQD varying from 79 to 100% except in one of the run in borehole NBH-3 where it is fair with 58% RQD. The foundation medium at valve house and in the anchor block at penstock bifurcation is very good with the RQD varying from 90-100 %. Analysis of the WPT test results indicate that the foundation media is highly impermeable with the water loss of about 1-2 Lugeons.

2. ***Vellathooval Small Hydro Electric Project, Idukki District***

The project envisages generation of 3.6 MW of power harnessing the tail water of Sengulam Powerhouse by constructing 15.80m high, 78m long concrete gravity weir and a surface power house on the downstream left side. The project is under construction and the investigation pertains to construction stage geotechnical evaluation.

Quantum of work done:

Geological mapping of weir foundation on 1: 100 scale : **412 sq. m.**

Geological mapping of power house pit on 1: 100 scale : **335 sq. m.**

Migmatite with intrusive pegmatite is the rock types exposed in the foundation of both the weir and the powerhouse. Foliation/gneissocity, three prominent and one random joints sets and one set of shear zone are the discontinuities present in the rock mass. A shear trending N 85° W ï S 85° E direction and dipping 55° northerly with thickness varying from 30cm to 70cm is present cutting across the entire power house foundation. In general, the foundation rock mass is fresh with tight and fresh joints except some of the plane with weathered seams of thickness varying from 2 to 10mm. The litho cum structural controlled deep weathering is noticed in the weir foundation. The foundation media in general can be rated as good to very good and acceptable for foundation of these structures. The foundation has been cleared for concreting subject to provision of the following treatment measures.

- Dental treatment and additional grouting along the shear zone at power house.
    - Excavation of the linear litho cum structural controlled weathered rock present in the weir foundation up to fresh rock level and provision of additional grout holes.
    - Chipping of weathered and stained joint surfaces.
    - Removal of loose/detached rock blocks exhibiting blast cracks.

3. ***Adyanpara Small Hydro Electric Project, Malappuram District***

A runoff river scheme envisages to generate 3.50 MW of power by constructing a 5.56 m high and 58.0 m long concrete gravity overflow weir across the river Kanjirappuzha - a tributary of Chaliar near Kurumbalangode Village of Nilambur Taluk in Malappuram District.

Quantum of work done:

1. Large scale geological mapping of the inlet portal area on 1:500 scale
2. 3D Geological mapping of the free flow power tunnel on 1: 100 scale : **967 m**
3. 3D Geological mapping of the pilot tunnel through surge on 1: 100 scale :**10 m**
4. 3D Geological logging of the access tunnel: **19m**

Massive charnockite and hornblende biotite gneiss with intrusive pegmatite, quartz veins and dolerite dykes constitute the tunnelling media. Gneissocity/foliation, intrusive contacts, seven prominent sets of joints and one set of minor shears are the discontinuities deciphered in the rock mass.

Geotechnical assessment of the failure in the inlet portal area

The failure occurred in overburden materials consisting of humus and red lateritic soil at the top followed down by completely weathered sandy soil with core stones and moderately weathered charnockite. The failure is a wedge type initiated along the joint with strike N21° E - S21°W, dip 40° towards N69°W and controlled/ limited by the joint with strike N64° E - S64° W, dip 60° towards S26° E. The intersection of these joints is daylighted on the cut wall made for lead channel.

Unfavourable orientation and inclination of the intersection of two joints, one with strike N21°E - S21°W, dip 40° towards N69°W and other with strike N64° E - S64° W, dips 60° towards S26° E resulted in daylighting on the near vertical cut wall made for the lead channel is the preparatory factor for the slide. Whereas heavy rainfalls leading to pore pressure build up is the triggering factor.

3D Geological logging of Power Tunnel, access tunnel and the pilot tunnel through surge

- Adequate super incumbent and side cover is found to be available along the power tunnel alignment.
- Attempted classification of the tunneling media adapting ǵQ-Systemô of classification advocated by Grimstad and Barton, 1993.
- The rock mass was rated from very poor to good based on Q-value.
- Based on the Q-value the permanent support requirements were worked out and the reach wise support measures have been recommended.
- The rock mass present in the pilot tunnel is fresh, blocky to seamy.
- The super incumbent cover over the surge shaft is worked out to be slightly more than 1 H mainly of rock, which may just be enough.
- Considering the super incumbent cover and presence of smooth planar joint lowly dipping towards the valley spaced at about 0.3m to 1m and its intersection with the other smooth planar joints with strike N50°W - S50°E, dip 70°-85° towards hill, recommended controlled smooth wall blasting and provision of support with systematic rock bolting and plain shotcreting.

Examination and assessment of weir site, power house site and excavation along penstock route

- The weir is abutted against a boulder on the right side whose level is lower than the level of boulder stream bed of the right channel of the channel bar deposit. Hence recommend the guide wall and training wall up to high flood level suitably abutted so that to ensure smooth flow of the flood water.
- The excavations through the penstock route have been made thorough accumulated old slide debris and insitu soil profile consisting of red lateritic soil, lithomarge and highly weathered rock. The excavated walls are steep and the height varies from above 2m (upstream end) to 8-10 m (downstream end). The experience elsewhere shows that steep cut made through slide debris and insitu weathering profile for more than 4-5m height has a tendency to fail. Hence it was recommended to ease the slope with a berm in between wherever the cut exceeds 4m. Alternatively, suggested to convert the penstock as buried structure.

- The left wall of the powerhouse pit exposes red lateritic soil, lithomarge and saprolite of the insitu weathered profile. A berm is provided in between the control room level and the top of the cut. Since the area between the control room structure and cut is intended to be filled, there exists a possibility that water will be accumulated in the filled debris and sometimes leak through the walls which will not only affect the reinforcement of the wall but also will remain in the damp condition. Hence suggestion was given to ease the slope between the control room level and berm with pitching of stone/ turfing with horizontal subsurface drainage arrangements as well as the toe drains all along the cut wall.

4.Barapole Small Hydro Electric Project, Kannur District

The Barapole Small Hydro electric Project is a runoff river scheme envisaged to generate 15MW of power harnessing the flow of Barapole River by constructing 60 m long, 2.5m wide twin trenches, 2892m long power channel, a forebay tank and a surface powerhouse located on the left bank of Barapole River.

Quantum of work done

1. Large scale mapping of the subsidence area: **1950 sq.m.**

The project area forms part of the Southern Granulite Terrain with high grade metamorphic rocks such as charnockite, leptynite, migmatite and amphibolite with acid and basic intrusives. The general foliation trends in NNW-SSE and dipping steeply towards WSW. Dolerite/ gabbro dykes emplaced along the foliation plane are noticed in the area. Very thick capping materials constituted by insitu lateritisation profile comprising soil, laterite, lithomarge, saprolite and weathered rock, slide debris/ hill outwash and river borne materials is present over the bed rock. Pegmatite and quartz veins are found occur as intrusive within the bed rock. Foliation and four sets of prominent joint sets are the discontinuities deciphered in the bed rock.

The power channel is in general excavated through insitu soil profile with or without laterite capping and with perched boulders, which are the result of spheroidal weathering, slide debris, hill wash and weathered/ fresh charnockite / gneiss.

Distress and failures on the left side cut slope have occurred in the reach between ch. 1500 m and ch.1620 m of the power channel damaging the same fully or partly. Multiple subsidence and failures have occurred on the insitu lateritisation profile with core stones. The subsidences are of rotational type exhibiting three arcuate cracks in the crown part and radial cracks.

The failure has been initiated in the form of development of small cracks, which gradually widened and subsided along the cracks leading to small slide on the cut face and bulging and complete shearing of left wall of the channel. The cracks and failures in general are restricted to the invert level of the left wall suggesting that the failures could have been initiated at the base of the cut wall. However presence of two cracks parallel to the limiting cracks at the downstream end of the subsidence indicates the extension of the failure surface below the channel bed level. The scarps of the subsidence vary from about 10cm to 1.5m.

Presence of lithomarge clay and removal of the lateral support by steep cutting are found to be the preparatory factors, whereas increment of pore pressure aided by heterogeneous permeability of the medium and continuous heavy rainfall are assessed to be the triggering factors of slide.

The control and corrective measures recommended are

1. Sealing of the cracks- excavation along the arcuate cracks for about 30cm depth and packing it with impermeable clay.
2. Construction of toe wall at the bottom of the cut wall above the channel berm level.
3. Easing of the slope above the toe wall to 1:1.5.
4. Provision of toe drains and horizontal subsurface drains.
5. Provision of horizontal drains on the left wall of the channel.
6. The channel may be converted to box type with suitably designed left wall.
7. Though the bulge and failures are restricted within the left wall of the channel, presence of cracks oriented parallel to the cracks on the cut slope wall on the channel bed indicate the possibility of extension of the distress below the bed level. Hence it is recommended to provide intercept walls by extending the left wall of the channel for about 1.5 m below the channel bed level.
8. Provision of filter on the back side of the left wall. The horizontal drains may be extended to the filter medium.

5. Thottiyar Hydro Electric Project, Idukki District

The project envisages to generate 40 MW by constructing 222m long and 7.5m high concrete gravity weir across river Thottiyar, 200 m long head race tunnel, 1424m long penstock and a surface power house on the right bank of Periyar River .

Quantum of work done

Geological mapping of the weir foundation: **320 sq.m.**

3D geological logging of the head race tunnel: **199 m.**

Migmatites with bands and patches of amphibolite and occasional intrusive pegmatitic / quartz veins are the rock types exposed in the weir foundation and in the head race tunnel. The thickness of the pegamatitic intrusions varies from 10cm to 30cm. These intrusives are in general disposed perpendicular to the dam axis. Foliation, five predominant sets of joints and one random set of joint are the major discontinuities present in the rock mass.

The foundation media is in general fresh except some mafic bands and patches of amphibolite (?). The deterioration is to the extent that the rock crumbles under thumb. Surficial weathering/ staining is observed along the low dipping sheet joints and controls the excavated profile of the foundation at locations.

The discontinuities in other areas are in general tight, fresh and unfilled except the joint planes of the set with strike $N50^0E$ - $S50^0W$, dip 39^0 towards N 40^0 W. The rock mass in general is fresh and acceptable foundation medium for the proposed structure. The foundation is cleared for concreting after providing following treatment measures.

- Excavation of the weathered and deteriorated amphibolite and pegmatite up to fresh rock level.
- Excavation of the weathered thinly foliated rock mass with considerable amount of mafic minerals up to fresh rock level.
- As the amphibolite and thinly foliated mafic rich rock mass shows the tendency of fast deterioration when exposed to atmosphere or comes in contact with water. Hence these reaches should be covered with concrete immediately after excavating and up to fresh rock level and subsequent cleaning.
- Excavation/ chipping of the weathered/stained surfaces up to fresh rock level
- Excavation of the all rock mass with weathered joints comprising weathered seams of about 2-5 cm up to fresh rock level.
- Removal of loose and detached rock blocks exhibiting blast cracks and small surficially weathered mafic patches.
- Chiseling of surficially weathered small mafic patches and thorough cleaning
- In view of the presence of low dipping/ sheet joints with the spacing varying 10cm to 60cm, the dowel rod are to be provided.

- As most of the discontinuities are disposed near normal or highly askew to the dam axis, it is suggested to provide drainage duct in conjunction with curtain grouting and foundation drain holes.

Based on the 3D geological logging and data collected classified the rock mass adopting updated óQ systemô by Grimstad and Barton, 1993. The rock class arrived at mostly fall in ógoodô category. However, considering the extensive presence of amphibolite bands/patches which has the tendency of time dependent deterioration and resultant stripping failure, it is recommended to plain shotcrete the entire reach of the head race tunnel.

6. Idukki Hydro Electric Project, Idukki District

The post construction stage geotechnical investigation was taken up to assess the movement of abutment rock mass, if any related to time dependent deterioration of the rock and discontinuities, insitu stress and seismo-tectonic regime changes and to assess the alkali aggregate reaction.

Quantum of Work Done

- Large scale geological mapping - **0.105 sq. km**.
- 3D geological logging and assessment of rock mass of drifts - **549m.**
- Examination and assessment of access tunnel, elevator shaft and diversion tunnel.
- Collection of samples for microscopic studies ï **7 Nos.**

Charnockite is the major rock type constitutes the foundation and abutment of the arch dam. The rock mass in general is massive, occasionally gneissic/banded mainly in drainage galleries. The regional strike of foliation of the country rocks is NW-SE to WNW-ESE with a steep dip towards SW. A total of six joint sets belonging to three conjugate pairs are the discontinuities present in the rockmass.

Rock mass deterioration in the form of weathering which could have been fresh at the time of construction is observed in the excavations above the dam and in the drifts at three levels on both the abutments. The depth of weathering in general varies from 10cm to 15cm at places 20cm. Stripping failures and minor openings due to stress induced by weathering/alteration resulting to expansion of mafic minerals are noticed in all the drifts.

The detailed study of the access tunnel and elevator shaft revealed that there is no evidence of stress opening/movement even in the form of hairline cracks observed in the shotcreted surface. Wedge analyses of both the abutment slopes have been carried out for evaluating the presence of critical blocks and their movement. The analyses indicated that the sliding possibility exists on free faces along single plane (planar) and two planes (wedge) in both the abutments. However, the dam is supposed to act as support against sliding.

Based on the studies including insitu stress condition, rock mass characterisation, wedge analysis, alkali aggregate reaction, assessment of crack opening measurement and seismotectonic evaluation carried out so far it is inferred that there is no prima facie evidence of movement of the abutment rock mass.

Petrographic studies of the rocks indicated that the percentage of strained quartz present is much less than 20% which is also supported by the findings of the petrographic analyses carried out in the year 2004. The present as well as studies in 2004 indicate that there is no possibility of alkali-aggregate reaction.

The highest magnitude of earthquake recorded in the project environs is Coimbatore earthquake of 1900 with the magnitude of M6. The dam is provided with seismic coefficient corresponding to the maximum considered earthquake (MCE) of 6.5 magnitude. Based on the MCE and the historical earthquake records it is inferred that the seismic coefficients provided for the structure may be enough.

7. Construction stage geotechnical investigation of Bhoothathenkettu Small Hydroelectric Project, Eranakulam District.

The construction stage geotechnical investigation was taken up to assess the foundation media of a communication bridge across the power channel at the Ch. between 150 m and 162 m. Foundation geological mapping and evaluation of the foundation media of the central and the abutment piers covering an area of about 340 sq.m on 1:100 scale have been completed.

In general, the foundation media is assessed to be fresh, massive and blocky/ tabular with tight and fresh joints. The joint planes at places stained and discolored. Though seepages were noticed on the pit walls, the foundation is dry. The rock mass can be rated as good to very good and acceptable for foundation of the proposed structure. The foundation has been cleared for concreting after carrying out the following treatment measures

- Removal of loosened and detached rock blocks exhibiting blast cracks.
- Chiseling of stained surfaces up to fresh rock level for better bonding between rock and concrete.
- The proposed dowel rod provision may be executed properly by anchoring the bottom end properly.

8. Construction stage geotechnical investigation of Kakkayam Small Hydroelectric Project, Kozhikode District.

The project envisages generating 3MW of power utilizing the additional tail water available from the Kuttiyadi Additional Extension Scheme by constructing a diversion weir across the tail race channel, power channel, fore bay tank and a surface powerhouse. Construction of the diversion weir, power channel and fore bay tank has been completed. While carrying out of excavation for power house, slope failures have occurred mainly on left wall hampering the excavations. Pursuant to the request from the Executive Engineer, carried out geotechnical investigation find out the type and cause of the failure and to recommend control and corrective measures.

The power house has been excavated up to the level varying from ~66m to ~68m from the average ground elevation of +74.0 m above MSL through river borne materials and in situ soil. The power house area is sandwiched between two flowing streams that are tributaries of Kakkayam Thodu. The subsurface exploration data indicates that the river borne material and soil is expected up to a depth of 12.50m and weathered rock from 12.5 m to 15.67 m. The overburden material in general is of clayey/silty sand. Weathered rock exposed at places on the cut wall is found to be rich in sticky clay, which could probably due to the presence of gouge seams.

The studies indicated that the failures are due to infiltration from the streams and water charging of the medium resulting to increment of pore pressure. The following are the control and corrective measures recommended.

- Å Provision of a lined garland drainage connecting all the rivulets system so as to drain the water away from the power house pit and its appurtenant which later on can be connected to tail race channel.
- Å Provision of a berm at the contacts between the top soil and river/gravity fill material and between completely weathered and moderately weathered bed rock with toe drains. The slope may be designed to be at about 30° which is close to the angle of repose/internal friction.
- Å A suitable toe wall may be provided in conjunction with the drain at the contact between completely weathered and moderately weathered bed rock.

9. Pre-construction stage geotechnical investigation of Peruvannamoozhy Small Hydroelectric Project, Kozhikode District.

The project envisages to generate 6 MW of power harnessing the excess inflow in to the already existing Peruvannamoozhy Irrigation dam by constructing an intake structure, 340 m long HRT, 23 m high surge shaft, 240 m long pressure shaft, 43 m long penstock and a surface power house.

The geotechnical investigation carried out includes traverse geological studies of intake, pressure shaft and power house areas and logging and assessment of cores of 5 boreholes. Hornblende biotite gneiss is the country rock exposed in the area.

The borehole data reveals that the thickness of the overburden is ~14 m in the intake, 3.12 m to 8.85 m along the pressure shaft alignment and it varies from 7 m to 11.62 m in power house area. As the overburden is thick in the intake area, the open channel has to be adequately designed providing slope stability measures or the lead channel may be designed as cut and cover reach. Based on the logging and assessment of the borehole cores of the holes drilled along the pressure shaft it is inferred that the enough super incumbent and side cover may be available. The condition of foliation and parallel joints strike sub parallel to the alignment of the pressure shaft may lead to minor tunneling hazard.

As the overburden consisting of loose river borne material and soil is considerably thick in the power house area. The excavation through the overburden should be designed so as to keep the inclination less than the angle of repose that is about 30^0. It is also suggested to provide a 2-3 m wide berm at the middle level of the overburden. In order to avoid infiltration of water and the related stability problem anticipated while negotiating the power house through the overburden, provision of relief wells/pits may be necessary which may be decided during the excavation.

10. Construction stage geotechnical investigation of Poringalkuthu Small Hydroelectric Project, Thrissur District

Poringalkuthu Small Hydro Electric Project (24 MW) is an additional extension scheme proposed to divert 38.83 cumecs of water from the existing Poringalkuthu reservoir through a water conductor system comprises of a 1078m long head race tunnel, a 20m dia. 35.8m deep surge shaft, Low pressure tunnel of 50m length, inclined pressure shaft of 191m length, horizontal pressure shaft of 625m length, surface penstock of 129m, power house and tail race tunnel. An adit of 88m length is also been proposed for facilitating HRT, surge shaft and low pressure tunnel excavations. In view of the tunneling hazard faced due to over break/caving of the head race tunnel (HRT), the Project Manager, Poringalkuthu Small Hydro Electric Project, Thrissur requested to carry out geotechnical assessment of the tunnel. Accordingly the construction stage geotechnical investigation was taken up.

Quantum of work done

1. 3D geological logging and assessment of rock mass of HRT on 1:200 scale: **177 m.**
2. 3D geological logging and assessment of rock mass of horizontal pressure shaft on 1:200 scale: **408 m.**

The head race tunnel and horizontal pressure shaft have been driven through hornblende biotite gneiss and charnockite with intrusive granite/pegmatite. Bands of amphibolite with thickness varying from 10 to 80cm are present in the country rock parallel to foliation. Grey/pink granite intrusive bodies with strike N 60º W - S 60º E are also observed mainly in the mapped reaches. The thickness of the intrusive granite veins varies from less than 20cm to about 3m and in general is weathered at the tunnel grade to the extent that the rock can be crushed under the thumb. The foliation, four sets of joints and one set of sheared/fractured zone and intrusive contacts are the main discontinuities present in the rock mass.

Weathered granite/pegmatite veins with thickness varying from 20cm to 4m are present from Ch.795m to 819m. The main vein present between the from Ch.803m and 808m is responsible for the over break, side break and caving. The granite bodies are weathered to the extent that it can be scooped easily with sharp end of the hammer can easily scooped with the hand in presence of water. The dripping nature existing in this portion also indicates the intensity of water influx and the weathered rock material behaves like a fluid. This resulted in the decrease of holding capacity of the rock and its failure.

In view of the presence of very weak weathered rock mass and over/side breaks the following support measures are recommended

a. Provision of rock bolt, chain link and shotcrete with drain holes from chainage 807m to 818m and 794m to 801m. The length of the bolt may be 3m and spacing about 1.5m. The spacing may be slightly adjusted/modified so that the rock bolts are provided in the hard country rock (Hornblende biotite gneiss). The shotcreting may be done in two layers of 5cm each. The chain link may be placed after first layer of shotcreting. It should be ensured that the entire chain link is embedded in the shotcrete, for which the thickness of the second layer may be increased to 7cm if needed. It is also to be ensured that the chain link hug the tunnel profile by providing hookes between rock bolts.
b. Provision of suitably designed steel ribs spaced at about 0.5m from chainage 801 to 807m. The dimensions of the steel ribs should be designed in such a way that steel ribs can finally been embedded in the concrete lining. It is to be ensured that the load is transmitted to the steel ribs by providing suitable props touching the rock profile. The back filling may be done by providing concrete sleepers between the steel ribs, back packing with rubbles and grouting. Alternatively, blocking concrete can also be resorted.

IRRIGATION PROJECTS

Geotechnical investigation for a small irrigation project at Pattissery was carried out during the period under review.

11. Pattissery Irrigation Project, Idukki District

Envisages to irrigate about 240 Ha of area by constructing of 140 m long and 23 m high composite dam across the river Chengalar near Kanthalloor. The proposed dam is located 5m downstream of the existing weir which is 20m long and 5m high, constructed during 1937.

Quantum of work done

1. Geological studies along and around the dam axis: **2750 sq.m.**
2. Logging and assessment of cores of 7 bore holes to the cumulative depth: **111.8 m.**

The dam alignment area is in general is occupied by overburden material comprising sandy soil and weathered rock. Fairly fresh rock exposures are present only along the stream course. Biotite gneisses and garnetiferous hornblende biotite gneisses with concordant intrusive granite and pegmatite veins. Foliation and three sets of joints are the major discontinuities deciphered in the rock mass exposed at the weir site.

Within the fairly fresh rock sandy weathered seam is observed which could be due to selective weathering of granitic sill. The exposed thickness of the weathered seam on the right flank varies from 20 ï 30 cm. The loss of the core at different depths in the boreholes drilled on the right abutment can be attributed to the weathered seam. Based on the logging and assessment of the bore hole cores worked out the bed rock depth and foundation grade levels. The thickness of the overburden varies from 10 m 12.5 m on the abutments whereas it varies from 0 to 4.1m at the stream bed and adjoining areas. The bed rock profile indicates that the proposal of composite dam with the central concrete spillway is suitable. The cut off for the earthen dam can be kept within the weathered rock, but needs to be grouted up to the fresh bed rock level due to the presence of sandy silt weathered seam.

b) LANDSLIDE INVESTIGATIONS

SU : TAMIL NADU & PUDUCHERRY

1. Macro Scale (1:50,000) National Landslide Susceptibility Mapping (NLSM/SR/TNP/2014/091):

i. During the FS 2014-15, toposheet No 58G/6 is taken under the project NLSM.
ii. The area mainly comprises of ridges, moderate to low dissected mid slope and flat land. The area is drained mainly by two rivers Periyar and Vaigai flowing in direction ENE-WSW and NE-SW directions respectively.
iii. The Varshanad hill sector area is essentially a charnockite terrain. It constitutes the major rock type and is exposed in high hill as well as in the low hummocks and also in low-lying areas. The other rock types exposed in the area include quartzite, calc-granulites/gneiss, and garnet-biotite-sillimanite ± cordierite gneiss; of Khondalite Group, whereas the Charnockite Group is represented by garnetiferous and non-garnetiferous charnockite with bands and lenses of pyroxene granulite. These rocks are intruded by pink granite.
iv. Twenty two numbers of landslide inventories along the roads were recorded mostly constituting cut slope failures.
v. Validation of slope forming material and soil depth maps in the field along with the collection of landslide inventory data from the accessible areas is being carried out
vi. **Total area of 265 km^2 (in total 335 km^2**) has been covered under the preparation of the **slope forming material and soil depth map**. It is observed in the study area that the upslope portion, with steep slope angle is either barren or having a thin soil cover less than 0.5 m in thickness. The area under Tea plantation is having a soil depth ranging from 3-5m, mainly consisting of lithomarge. Colluvial deposit is present mainly in the foot hills where stream/nala carries down the material or brought down due to gravity.
vii. The area is divided into 7 classes based on the Slope Forming Material viz. i) Barren Rock (0-0.5 m), ii) Rock with Thin overburden (1-2 m), iii) Rock with moderate overburden (2-4 m), iv) Alluvial deposit (5-10 m), v) Colluvial deposit (> 10 m) and vii) Lithomarge (3-5 m).
viii. The inaccessible areas of the study area will be interpreted with the help of Remote Sensing data to locate landslide incidences if any.

2. Empirically-Derived Rainfall Threshold Based Early Warning System for Landslide in Part of Coonoor River Basin, Nilgiri and Coimbatore Districts, Tamil Nadu. (EWS/SR/TNP/2014/092):

i. The study area falls in part of toposheet No.58 A/15. For the FS 2014-15, an area of 39.61 km^2 between Kallar and Katteri has been taken up with a focus around Burliar and Katteri Villages as the hill slopes around these areas are susceptible to landslides during the monsoons.
ii. Landslide inventory data was collected along N.H. 67 between Coonoor and Katteri areas and around Kannimariamman Koil Colony area.
iii. Field work along the railway track from Katteri to Kallar and collection of 11 nos. Landslide inventory.

iv. Collection and preparation of database for daily rainfall data from i). Kallar Farm & Horticulture, ii) Burliyar Farm & Horticulture, iii) Kattery Farm & Horticulture, iv) Glendale Tea Estate, v) Adderley Tea Estate, vi) Lower Singara Tea Estate and vii) Moutere Tea Estate.

v. In the head quarters, the rainfall data collected for a 24 year period (from the year 1992 onwards) was synthesised and will be analyzed and the rainfall threshold for the individual rain gauge station with in the study area and rainfall threshold will be calculated.

3. Landslide Inventory in and Around Community areas and along Transportation Corridors an Anaimalai Hills, Coimbatore District- Updation of Data Base of Tamil Nadu State (LS/SR/TNP/2014/093):

i. Collection and collation of geological literature pertaining to the study area proposed for landslide inventory in and around Anaimalai hills, Coimbatore district, Tamil Nadu.

ii. A total of 131 numbers of landslide inventories were recorded during field work till date. Most of the recorded failures are cut slope failures along the road sections. The slope failures observed with in the tea plantations are relict failures. At few places disturbances in the form of slump/ subsidence were also noted.

iii. Collected landslide inventory data related to the study area, from old GSI reports and landslide inventory data of the study area by field mapping in Anaimalai Hills, Coimbatore District & Dindigal district, falling in the Survey of India Toposheet no. 58 B/15 & 16 and 58 F/3, 4 & 7 was entered in Excel data sheet.

iv. Those areas which cannot be accessed, the presence of landslide occurrence will be studied through Remote Sensing.

SU: KERALA

i) Preparation of a 1:50,000 scale landslide susceptibility map for mountainous/ hilly region on GIS Platform, for TS 49M/14 and 58A/3 in Kozhikode, Wayanad and Malappuram districts, Kerala.

Target: 1512 sq.km for two seasons i.e., 2014-15 and 2015-16.

Achievement: 756 sq.km.

Thematic maps prepared- Slope gradient, Slope curvature, Slope aspect, Geomorphology map, Landuse/ land cover map, Slope forming material map, Regolith thickness map, Drainage map and Landslide incidence map. Amongst these, the slope gradient, curvature, aspect and drainage maps are extracted from imageries and finalized with limited field checks. The slope forming material, regolith thickness and geomorphology maps are mainly based on field work. Though the landuse/landcover map was prepared from image processing, it is modified based on adequate field check.

Slope curvature, Slope aspect, Geomorphology map, Landuse/ land cover map, Slope forming material map, Regolith thickness map, Drainage map and Landslide incidence map.

Slope gradient map: The slope gradient map has been prepared for the slope classes of 5º interval up to 45º and from 45º-90º has been taken as single class of T.S. no. 49M/14. 12.4% of the area has 0-5º slope, 22.5% of the area has 5-10º slope, 19.4% of the area has 10-15º slope, 14.7% of the area has 15-20º slope, 11% of the area has 20-25º slope, 8.1% of the area has 25-30º slope, 6% of the area has 30-35º slope, 3.5% of the area has 35-40º slope, 1.5% of the area has 40-45º slope and 0.9% of the area has slope >45º

Slope curvature map: The map has been prepared with five subclasses- Highly concave, concave, flat, convex and highly convex. About 0.4% of the area is in highly concave, 12% in concave, 75.2% in flatter, 12% in convex and 0.4% in highly convex type.

Slope aspect map: The map has been prepared with eight subclasses, viz., N-NE (0-45), NE-E (45-90), E-SE (90-135), SE-S (135-180), S-SW (180-225), SW-W (225-270), W-NW (270-315) and NW-N (315-360).

Drainage map: Kuttiyadi River, Kadiyangod Puzha, Oni Puzha, Niduval Puzha, Karaman todu are the major rivers draining in the study area. Kuttiyadi River flows NW to SE directions and drains southern portion of the study area. Niduvali River and Oni puzha and its tributaries drain the central portion and join the Kuttiyadi River. Kadiyangad Puzha drains the southwestern portion of the area. Karaman Todu and its tributaries drain the northeastern part of the area. Overall the study area has a general dendritic drainage pattern.

Geomorphology- The western most part of the area falls under the undulating plains with elevation ranges from 20-40m, further east the area is characterised by undulating upland topography with the elevation varying from 40m to 100m, middle part of the area forms part of deeply dissected fringe slope. The north eastern part is named as undulating plateau with average elevation of 1000m with a number of isolated peaks and ridges namely Banasuramala, Thariyode mala etc. Pediment, plateau, valley, steep sided slopes, denudational hill ranges forms the topography of this area.

Rock outcrop/soil cover map: The overburden material present in the area has been classified as insitu weathered profile (lateritic profile), scree materials, slide debris, alluvium etc. The insitu soil profile data has collected based on the weathered layers developed in the particular locations like soil and weathered rock, soil and laterite, soil - laterite and lithomarge, soil ï laterite ï lithomarge ï saprolite. Slide debris has been categorised as palaeo, old and recent. The insitu physically weathered sandy silt, silty sand soil with boulders either insitu or transported to short distance are grouped under scree materials. At some locations laterite is being quarried for construction purpose.

Soil /regolith thickness: Contrastingly the undulating mounts in the plains are made up of fresh or weathered bed rock with thin topsoil. The thickness of the overburden varies from 5-15m in the low lying areas of undulating plains and in

undulating uplands mainly insitu lateritic (weathering) profile. The thickness of overburden varies from 3m to 10m in the middle and lower part of the fringe slope comprising mainly insitu soil and scree. The top part of the fringe slope is in general barren or with overburden of about 1 to 2m. the undulating plateau is in general covered with lateritic profile and the thickness varies from 5-20m. In general the bed rock is exposed with thin riverine material along the stream beds irrespective of geomorphic units.

Landuse/Landcover- The landuse/Landcover (LULC) pattern noticed in the area is mixed plantation, tea/coffee plantation and paddy field. The western slopes these mountains facing Kozhikode district are more luxuriant in vegetation in comparison to it eastern slopes facing the Wyanad district.40% of the area is covered with reserved forest and several slides occurred within the forest.

Landslide incidences map- Inventoried total 131 landslides. Cut slope failures, shallow sheet debris slide, debris slide, and debris flows are the type of slides occurred in the area. The landslide incidences are being plotted for finalization of the map.

ii) Post disaster studies in Kerala

Post event studies are carried out for the two incidences occurred at Kozhikode District and one incidence at Ponmudi, Thiruvananthapuram District.

Vaalanpara Rock slide

A rockslide occurred on the cliff face of Vaalanpara in Kattipara panchayat, Thamarassery Taluk at around 02.30 am on 22-06-2014. About 31 mm of rainfall occurred on the preceding day. The failure is of planar type occurred along a prominent weathered joint plane trending N50°W dipping 80° towards southwest.

Poovambayi mala Rock fall

A Rock fall occurred at Poovambayi mala, Kinaloor village, Kozhikode district on 09-06-14. Rock mass measuring 6mX4m detached from the main rock body and rolled over 25 m down slope uprooting coconut trees and shearing of soil on its way

Merchiston debris slide Ponmudi Hills, Thiruvananthapuram District

Many slips, cutslope failures, and one debris Slide have occurred on 22-07-14. The slide occurred in Merchiston estate, 2nd division is the main one and has been inventoried. The thickness of the overburden is around 1.5-2m. The slide is a debris slide along the plane of contact of overburden with bedrock. Heavy rainfall on the 22-07-14 combined with heavy antecedent rainfall for the previous two days resulted in increase in pore pressure and triggering of the landslide.

SU: KARNATAKA & GOA

During the Annual Programme of 2014-15 three items were taken up:

i) **Preparation of a GIS based 1:50,000 scale landslide susceptibility maps for mountainous/hilly region using site-specific rating and weighting system of toposheet no. 48J/11(Jogfalls-Honnawar road section) (LSM/SR/K&G/2014/094):**

- An area of about 160 sq. km. has been covered under NLSM project; recording of landslide data, slope forming material, geomorphology, landuse/landcover and structural data has been carried out.
- A one metre wide pegmatite vein was observed in granitoid in Aghnashini river with network of numerous cross cutting quartz veins. A fibrous, slaty grey material was also observed in quartz vein and fracture fillings in sheared granite. The shear zone is about 800 ï 900m wide, but only a few isolated outcrops could be observed in the area near Heravalli and Hulasigadde villages. A sharp contact between phyllite and metabasalt was also bserved near Medini.
- An 80m wide vulnerable zone was observed along ghat section (Siddapur-Kumta road, SH-48).The rock type observed was weathered argillite, with three sets of joints, J1, J2 and J3; trending N65°E dipping 50°N, N10°W subvertical and E-W dipping 67°NW respectively. It was an old and reactivated slide, widening in nature having three slides compounding to render the zone unstable. There are roads both towards the upper and lower part of the slides. Recent reactivation resulted in the damaging of the stone pitching.

ii) Preparation of a GIS based 1:50,000 scale landslide susceptibility maps for mountainous/hilly region using site-specific rating and weighting system of toposheet no 48E/15 and 48E/16 (parts of Goa) (LSM/SR/K&G/2014/095):

Officer attended to pre field Preparation of LULC, location, road & landslide incidences maps .The area in terms of Land use and Landcover is divisible in to forest, settlements, water body, cultivated land, barren land and scrubs. The major part of the area is sea with scattered settlements and cultivated land within open dense scrubs and forest in toposheet no-48E/15 while in 48E/16 major part is sea & settlements only. Major towns like Madgaon, Vasco Da Gama & Panji are in toposheet no- 48E/15 while in toposheet no 48E/16 there is no major town except small villages. Areas in both the toposheets are well connected by roads. A total of 25 landslides have been recorded in toposheet no-48E/15 while in toposheet no-48E/16 there is no landslide recorded.

The Officer is deputed to NLSM Uttarakhand item field work not initiated yet.

iii). Post disaster studies in Karnataka and Goa. Service Item No. : LHZ/SR/KG/2014/028:

In this quarter no work has been carried out for this item

c) EARTHQUAKE GEOLOGY DIVISION:

The Earthquake Geology Division in Southern Region was formed in 1994 with an aim to carry out pre and post earthquake disaster studies in Southern India, covering Andhra Pradesh, Tamilnadu, Pondicherry, Kerala, Karnataka & Goa. The Earthquake Geology Division carries out investigations concerning macro- and micro- seismicity in selected vulnerable areas with a history of seismicity. Since its inception the division was involved in various earthquake related studies, including distinguished work on Seismic Hazard Microzonation of Visakhapatnam, Pondicherry and Chennai urban agglomeration. The work involves an integrated multidisciplinary approach using inputs from geological, geomorphological, geophysical, geotechnical and geohydrological studies to classify the urban agglomeration into different discrete zones of seismic hazard. The seismic hazard microzonation study has immense societal value as the seismic status of an area provides vital inputs to the geoscientists, civic planners and administrators to adopt necessary preparedness in regards to earthquake disaster safe structures and avoidance of vulnerable areas thus reducing the risk.

Till FS 2013-14, the Earthquake Geology Division has completed Seismic Hazard Microzonation (SHMZ) mapping of Visakhapatnam, Pondicherry, Chennai, Vijayawada & Trichur urban agglomeration. In the SHMZ, the urban areas are classified into three seismic hazard zones, viz., High, Moderate and Low Hazard. The high, moderate and low hazard zones indicate areas having relatively high, moderate and low potential for liquefaction and seismic shaking considering an event of >6 magnitude (VII intensity-MSK scale) earthquake. The seismic hazard maps are of considerable significance for land use and urban planning. In the high seismic hazard areas construction of seismic resistant structures should be made mandatory.

During F.S. 2014-15, a two year programme of Seismic Hazard Microzonation of areas in and around Kochi and Ernakulam urban agglomeration, Kerala has been initiated.

HIGHLIGHTS OF THE WORK:

Item Code No.2014-15/SEI/SR/HQ/2014/098

Title: "*Seismic Hazard Microzonation of areas in and around Kochi and Ernakulam Urban Agglomeration, Kerala"*

An area of 150 sq.km and 14 boreholes for SPT drilling was done upto 31st Marõ2014. Mapping was carried out in Kundanur-Poonithura-Vytila-Elankulam-Kadavantra-Thykoodam-Punnurunni-Chalikavattam in the northeastern portion; and Kumbalam-Aroor-Chantirur-Kandakkadavu-Maruvakkad in the southern and southwestern portions of the study area. The area is thickly populated coastal lowland characterised by a thick cover of loose to semi-consolidated sand, silt and clay, mainly marine to fluvio-marine, Quaternary (possibly Holocene) sediments. The prominent landforms noticed are beaches, palaeo-beach ridges, spits, tidal flats, lagoons, strandline and tidal flats. The strandline occurs as sand flats and comprises white to dirty white sand which are extensively used for settlements. Whereas, the tidal flats are waterlogged comprising black clay and mud and at places mixture of sand and silt were noticed.

The BHK-1 at Kendriya Vidyalaya Playground, Willington Island was started on 09.11.2014 and was closed on 15.11.2014. The depth of borehole is 30.0m. The SPT was conducted at regular interval of 2m which yielded N values viz. 3m to 3.45m (SPT-1) ï 1, 1 & 1; 5m-5.45m (SPT-2) ï 3, 3 & 3; 7m-7.45m (SPT-3) ï 1, 3 & 5; 9m-9.45m (SPT-4) ï 2, 3 & 4; 11m-11.45m (SPT-5) ï 7, 8 & 10; 13m-13.45m (SPT-6) ï 2, 3 & 5; 15m-15.45m (SPT-7) ï 6, 9 & 9; 17m-17.45m (SPT-8) - 4, 6 & 10; 19m-19.45m (SPT-9) ï 3, 3 & 4; 21m-21.45m (SPT-10) ï 4, 6 & 13; 23.00-23.45m (SPT-11): 5, 7 & 9; 25.00m-25.45m (SPT-12): 10, 14 & 29; 27.00m-27.45m (SPT-13): 28, 29 & 30; 29.00m-29.45m (SPT 14): 29, 35 & 40. Fourteen nos. of SPT samples have been collected from this borehole.

The BHK-2 at Sri Subramanyam Temple premise, (near Lighthouse) Puthuvypin was started on 20.11.2014 and was closed on 26.11.2014. The depth of borehole is 30.0m. The SPT was conducted at regular interval of 2m which yielded N values viz. 3m to 3.45m (SPT-1) ï 6, 7 & 18; 5m-5.45m (SPT-2) ï 20, 23 & 37; 7m-7.45m (SPT-3) ï 8, 24 & 29; 9m-9.45m (SPT-4) ï 5, 3 & 3; 11m-11.45m (SPT-5) ï 2, 1 & 2; 13m-13.45m (SPT-6) ï 3, 4 & 4; 15m-15.45m (SPT-7) ï 4, 6 & 6; 17m-17.45m (SPT-8) - 2, 3 & 2; 19m-19.45m (SPT-9) ï 19, 17 & 21; 21m-21.45m (SPT-10) ï 13, 13 & 12; 23.00-23.45m (SPT-11): 2, 2 & 2; 25.00m-25.45m (SPT-12): 2, 3 & 4; 27.00m-27.45m (SPT-13): 9, 9 & 9; 29.00m-29.45m (SPT 14): 17, 25 & 15. Fourteen nos. of SPT samples have been collected from this borehole.

The BHK-3 at Vallarpadam was started on 06.12.2014 and was closed on 09.12.2014. The depth of borehole is 30.30m. The SPT was conducted at regular interval of 2m which yielded N values viz. 3m to 3.45m (SPT-1) ï 1, 1 & 1; 5m-5.45m (SPT-2) ï 1, 1 & 1; 7m-7.45m (SPT-3) ï 1, 1 & 1; 9m-9.45m (SPT-4) ï 2, 2 & 2; 11m-11.45m (SPT-5) ï 6, 7 & 7; 13m-13.45m (SPT-6) ï 5, 5 & 6; 15m-15.45m (SPT-7) ï 6, 7 & 8; 17m-17.45m (SPT-8) - 3, 3 & 4; 19m-19.45m (SPT-9) ï 5, 5 & 6; 21m-21.45m (SPT-10) ï 5, 6 & 8; 23.00-23.45m (SPT-11): 8, 10 & 12; 25.00m-25.45m (SPT-12): 9, 12 & 14; 27.00m-27.45m (SPT-13): 10, 11 & 14; 29.00m-29.45m (SPT 14): 11, 13 & 15. Fourteen nos. of SPT samples have been collected from this borehole.

The BKH-4 at Pallurthy was started on 13.12.2014 and was closed on 27.12.2014. The depth of borehole is 30.0m. The SPT was conducted at regular interval of 2m which yielded N values viz. 3m to 3.45m (SPT-1) ï 6, 9 & 10; 5m-5.45m

(SPT-2) ï 5, 7 & 12; 7m-7.45m (SPT-3) ï 7, 9 & 14; 9m-9.45m (SPT-4) ï 9, 13 & 15; 11m-11.45m (SPT-5) ï 10, 12 & 17; 13m-13.45m (SPT-6) ï 15, 20 & 15; 15m-15.45m (SPT-7) ï 20, 25 & 25; 17m-17.45m (SPT-8) - 15, 15 & 17; 19m-19.45m (SPT-9) ï 20, 20 & 20; 21m-21.45m (SPT-10) ï 15, 16 & 18; 23.00-23.45m (SPT-11): 15, 10 & 12; 25.00m-25.45m (SPT-12): 7, 8 & 8; 27.00m-27.45m (SPT-13): 3, 4 & 4; 29.00m-29.45m (SPT 14): 7, 7 & 8. Two nos. of SPT samples and 12 nos. of Bulk Soil samples due to slipping of SPT samples, have been collected from this borehole.

The BHK-5 at Kumbalangi was started on 02.01.2015 and closed on 10.01.2015. The depth of borehole is 30.0m. The SPT was conducted at regular interval of 2m which yielded N values viz. 3m to 3.45m (SPT-1) ï 4, 3 & 5; 5m-5.45m (SPT-2) ï 4, 5 & 6; 7m-7.45m (SPT-3) ï 4, 5 & 4; 9m-9.45m (SPT-4) ï 7, 7 & 8; 11m-11.45m (SPT-5) ï 3, 4 & 3; 13m-13.45m (SPT-6) ï 10, 12 & 15; 15m-15.45m (SPT-7) ï 15, 20 & 25; 17m-17.45m (SPT-8) - 13, 15 & 15; 19m-19.45m (SPT-9) ï 23, 20 & 25; 21m-21.45m (SPT-10) ï 15, 18 & 20; 23.00-23.45m (SPT-11): 4, 3 & 5; 25.00m-25.45m (SPT-12): 4, 5 & 4; 27.00m-27.45m (SPT-13): 3, 3 & 4; 29.00m-29.45m (SPT 14): 10, 13 & 15. Five nos. of SPT samples and Eight nos. of Bulk soil samples have been collected from this borehole.

The BKH-6 at Marada was started on 15.01.2015 and closed on 19.01.2015. The depth of borehole is 30.0m. The SPT was conducted at regular interval of 2m which yielded N values viz. 3m to 3.45m (SPT-1) ï 8, 15 & 18; 5m-5.45m (SPT-2) ï 4, 4 & 5; 7m-7.45m (SPT-3) ï 5, 5 & 6; 9m-9.45m (SPT-4) ï 6, 6 & 7; 11m-11.45m (SPT-5) ï 3, 3 & 3; 13m-13.45m (SPT-6) ï 6, 8 & 9; 15m-15.45m (SPT-7) ï 3, 9 & 11; 17m-17.45m (SPT-8) - 5, 6 & 10; 19m-19.45m (SPT-9) ï 12, 15 & 17; 21m-21.45m (SPT-10) ï 13, 14 & 14; 23.00-23.45m (SPT-11): 10, 11 & 7; 25.00m-25.45m (SPT-12): 20, 32 & 27; 27.00m-27.45m (SPT-13): 10, 12 & 16; 29.00m-29.45m (SPT 14): 13, 17 & 26. Fourteen nos. of SPT samples have been collected from this borehole.

The BKH-7 at Perumanur was started on 23.01.2015 and closed on 25.01.2015. The depth of borehole is 30.0m. The SPT was conducted at regular interval of 2m which yielded N values viz. 3m to 3.45m (SPT-1) ï 1, 1 & 1; 5m-5.45m (SPT-2) ï 7, 5 & 3; 7m-7.45m (SPT-3) ï 1, 1 & 1; 9m-9.45m (SPT-4) ï 2, 3 & 4; 11m-11.45m (SPT-5) ï 3, 4 & 5; 13m-13.45m (SPT-6) ï 6, 6 & 7; 15m-15.45m (SPT-7) ï 7, 8 & 9; 17m-17.45m (SPT-8) - 10, 8 & 8; 19m-19.45m (SPT-9) ï 8, 8 & 7; 21m-21.45m (SPT-10) ï 9, 10 & 11; 23.00-23.45m (SPT-11): 9, 10 & 12 25.00m-25.45m (SPT-12): 11, 9 & 10; 27.00m-27.45m (SPT-13): 15, 16 & 17; 29.00m-29.45m (SPT 14): NP. Thirteen nos. of SPT samples have been collected from this borehole.

The BKH-8 at Jawaharlal Nehru Stadium, Kaloor was started on 30.01.2015 and is in progress. The depth of borehole drilled is 15.0m. The SPT was conducted at regular interval of 2m which yielded N values viz. 3m to 3.45m (SPT-1) ï 1, 1 & 1; 5m-5.45m (SPT-2) ï 1, 2 & 2; 7m-7.45m (SPT-3) ï 8, 6 & 6; 9m-9.45m (SPT-4) ï 1, 1 & 1; 11m-11.45m (SPT-5) ï 1, 2 & 3; 13m-13.45m (SPT-6) ï 12, 5 & 10; 15m-15.45m (SPT-7) ï 5, 11 & 20. Further it was continued from 15.0m and closed on 07.02.2015. The depth of borehole is 30.0m. The SPT was conducted at regular interval of 2m which yielded N values viz. 17m-17.45m (SPT-8) - 10, 9 & 10; 19m-19.45m (SPT-9) ï 11, 17 & 29; 21m-21.45m (SPT-10) ï 12, 19 & 22; 23.00-23.45m (SPT-11): 8, 12 & 16; 25.00m-25.45m (SPT-12): 10, 13 & 17; 27.00m-27.45m (SPT-13): 7, 8 & 10; 29.00m-29.45m (SPT 14): 2, 7 & 11. Thirteen nos. of SPT samples and one Bulk soil sample have been collected from this borehole.

The BKH-9 at St. Raphael Church, Thykoodam started on 11.02.2015 and closed on 14.02.2015. The depth of borehole is 30.0m. The SPT was conducted at regular interval of 2m which yielded N values viz. 3m to 3.45m (SPT-1) ï 6, 7 & 16; 5m-5.45m (SPT-2) ï 13, 29 & 21; 7m-7.45m (SPT-3) ï 3, 3 & 5; 9m-9.45m (SPT-4) ï 1, 2 & 3; 11m-11.45m (SPT-5) ï 5, 6 & 15; 13m-13.45m (SPT-6) ï 11, 13 & 17; 15m-15.45m (SPT-7) ï 2, 3 & 6; 17m-17.45m (SPT-8) - 2, 2 & 2; 19m-19.45m (SPT-9) ï 8, 7 & 8; 21m-21.45m (SPT-10) ï 20, 18 & 19; 23.00-23.45m (SPT-11): 22, 25 & 27; 25.00m-25.45m (SPT-12): 14, 22 & 25; 27.00m-27.45m (SPT-13): 10, 17 & 22; 29.00m-29.45m (SPT 14): 21, 28 & 31. Fourteen nos. of SPT samples have been collected from this borehole.

The BKH-10 at Maharaja College Ground, Ernakulam was started on 19.02.2015 and closed on 21.02.2015. The depth of borehole is 30.0m. The SPT was conducted at regular interval of 2m which yielded N values viz. 3m to 3.45m (SPT-1) ï 2, 3 & 5; 5m-5.45m (SPT-2) ï 2, 3 & 5; 7m-7.45m (SPT-3) ï 3, 4 & 5; 9m-9.45m (SPT-4) ï 2, 3 & 4; 11m-11.45m (SPT-5) ï 3, 5 & 6; 13m-13.45m (SPT-6) ï 1, 2 & 3; 15m-15.45m (SPT-7) ï 2, 2 & 1; 17m-17.45m (SPT-8) - 1, 1 & 1; 19m-19.45m (SPT-9) ï 3, 5 & 6; 21m-21.45m (SPT-10) ï 11, 11 & 21; 23.00-23.45m (SPT-11): 15, 23 & 25 25.00m-25.45m (SPT-12): 13, 15 & 20; 27.00m-27.45m (SPT-13): 10, 16 & 22; 29.00m-29.45m (SPT 14): 10, 20 & 23. Fourteen nos. of SPT samples have been collected from this borehole.

The BKH-11 at Kuttankavu was started on 25.02.2015 and is in progress. The depth of borehole drilled is 24.0m. The SPT was conducted at regular interval of 2m which yielded N values viz. 3m to 3.45m (SPT-1) ï 6, 17 & 22; 5m-5.45m (SPT-2) ï 2, 2 & 4; 7m-7.45m (SPT-3) ï 4, 5 & 8; 9m-9.45m (SPT-4) ï 14, 14 & 12; 11m-11.45m (SPT-5) ï 4, 4 & 5; 13m-13.45m (SPT-6) ï 5, 5 & 8; 15m-15.45m (SPT-7) ï 13, 12 & 12; 17m-17.45m (SPT-8) - 5, 10 & 14; 19m-19.45m (SPT-9) ï 7, 8 & 12; 21m-21.45m (SPT-10) ï 51, NP & NP; 23.00-23.45m (SPT-11): NP. Ten nos. of SPT samples have been collected from this borehole. Further, it continued from 24.0m and went upto 24.2m. The borehole was closed on 08.03.2015 after encountering bedrock. The depth of borehole is 24.2m.

The BKH-12 at Jnanodayam Public School Ground, Edakochi was started on 11.03.2015 and closed on 19.03.2015. The depth of borehole is 30.0m. The SPT was conducted at regular interval of 2m which yielded N values viz. 3m to 3.45m (SPT-1) ï 13, 16 & 19; 5m-5.45m (SPT-2) ï 8, 10 & 15; 7m-7.45m (SPT-3) ï 13, 10 & 15; 9m-9.45m (SPT-4) ï 15, 13 & 19; 11m-11.45m (SPT-5) ï 2, 3 & 4; 13m-13.45m (SPT-6) ï 2, 4 & 7; 15m-15.45m (SPT-7) ï 6, 12 & 15; 17m-17.45m (SPT-8) - 6, 6 & 6; 19m-19.45m (SPT-9) ï 7, 8 & 8; 21m-21.45m (SPT-10) ï 5, 7 & 8; 23.00-23.45m (SPT-11): 7, 10 & 14; 25.00m-

25.45m (SPT-12): 8, 11 & 17; 27.00m-27.45m (SPT-13): 13, 13 & 16; 29.00m-29.45m (SPT 14): 5, 7 & 9. Thirteen nos. of SPT samples and one bulk soil sample have been collected from this borehole.

The BKH-13 at Kumbalam was started on 23.03.2015 and closed on 26.03.2015. The depth of borehole is 30.0m. The SPT was conducted at regular interval of 2m which yielded N values viz. 3m to 3.45m (SPT-1) ï 7, 11 & 15; 5m-5.45m (SPT-2) ï 1, 2 & 4; 7m-7.45m (SPT-3) ï 5, 8 & 11; 9m-9.45m (SPT-4) ï 4, 7 & 11; 11m-11.45m (SPT-5) ï 4, 4 & 5; 13m-13.45m (SPT-6) ï 5, 7 & 11; 15m-15.45m (SPT-7) ï 11, 13 & 15; 17m-17.45m (SPT-8) - 10, 11 & 12; 19m-19.45m (SPT-9) ï 12, 14 & 15; 21m-21.45m (SPT-10) ï 10, 11 & 15; 23.00-23.45m (SPT-11): 11, 13 & 15; 25.00m-25.45m (SPT-12): 11, 12 & 14; 27.00m-27.45m (SPT-13): 10, 13 & 15; 29.00m-29.45m (SPT 14): 25, 23 & 24. Thirteen nos. of SPT samples and one bulk soil sample have been collected from this borehole.

The BKH-14 at Chandirur was started on 28.03.2015 and closed on 30.03.2015. The depth of borehole drilled is 30.0m. The SPT was conducted at regular interval of 2m which yielded N values viz. 3m to 3.45m (SPT-1) ï 8, 10 & 16; 5m-5.45m (SPT-2) ï 15, 29 & 27; 7m-7.45m (SPT-3) ï 9, 9 & 4; 9m-9.45m (SPT-4) ï 7, 10 & 10; 11m-11.45m (SPT-5) ï 15, 15 & 15; 13m-13.45m (SPT-6) ï 17, 20 & 22; 15m-15.45m (SPT-7) ï 14, 20 & 25; 17m-17.45m (SPT-8) - 5, 6 & 7; 19m-19.45m (SPT-9) ï 3, 4 & 6; 21m-21.45m (SPT-10) ï 16, 17 & 18; 23.00-23.45m (SPT-11): 7, 6 & 10; 25.00m-25.45m (SPT-12): 13, 16 & 17; 27.00m-27.45m (SPT-13): 11, 14 & 15; 29.00m-29.45m (SPT 14): 10, 10 & 12. Thirteen nos. of SPT samples and one bulk soil sample was collected from this borehole.

The work for FS:2014-15 is finished and further work will continue in FS:2015-16.

MISSION – IVB

a) PETROLOGY DIVISION, SR

1) Petro-mineralogical and geochemical evaluation of argillaceous sediments/ultra-potassic rocks for Rare Earth Elements within Cumbum/Pullampet Formations of Nallamalai Fold Belt

(FSP Code:**RP/SR/HQ/2014/100)**: A.Anil Kumar & K.Chandramouleeswara Rao

Highlights: Thin section studies of the tuffaceous rocks of the Cumbum Formation were carried out. They are fine grained and consist of argillaceous material and angular to subangular grains of quartz. Pyramidal phases of quartz are seen, supporting the volcanic origin of the tuffaceous rocks. Needle shaped grains of sericite are commonly found admixed in the matrix. The SiO_2 content of the tuffaceous rocks ranges from 57.67 to 63.07%,, Al_2O_3 content ranges from 14.72 to 15.77, Fe_2O_3 from 7.91% to 13.61%, MgO form 1.90 to 2.33, CaO from 0.17% to 0.99%, Na_2O from 0.66% to 0.18%, K_2O from 2.48% to 2.63% In TAS diagram of SiO_2 Vs $Na_2O + K_2O$ plot after LeBas et al (1986), the samples plot in the andesite to dacite fields, indicating their intermediate to acidic nature. Some of the tuffaceous rocks studied from Pullampet and Tadipatri formations of Naiduvaripalle and Balapauru areas show high K_2O ranging from 3.23% to 4.07%, high K_2O/ Na_2O ratios ranging from 20.16 to 67.83, which confirm their ultra-potassic nature. Near Naiduvaripalle, the ultra-potassic nature in the tuffaceous sequence is observed in a discontinous manner. The rocks are depleted in CaO and MgO, and confirm chemically to some of the Group III and Group IV of Foley et al. (1987). The higher abundance of the Rubidium also supports their ultra-potassic nature. In comparison with the upper continental crust composition (Taylor and McLennan, 1985), the tuffaceous rocks of the study area are depleted in the mobile elements such as MgO, CaO and Na_2O indicating that the source area of the studied rocks underwent a more intense weathering or, alternatively more recycling processes. In Harkerôs variation diagrams of SiO2 versus CaO, Na_2O, Fe_2O_3, TiO_2 of all the analysed samples display negative trend but shows positive correlation with Al_2O_3 and K_2O indicating a dominant role of the clay minerals. The negative correlation of major elements like Fe-Mg oxide with Al_2O_3 point towards a felsic source. K_2O/ Al_2O_3 ratio of the tuffaceous rocks can be used as an indicator of the original composition of ancient sediments. In most of the samples, the K_2O/ Al_2O_3 ratios range from 0.17 to 0.26, falling in the clay limit range of the cox et al. (1995). This also indicates that the rocks underwent more intense weathering processes. The K2O vs Na2O plots of the tuffaceous rocks fall in quartz rich field of Crook (1974) indicating the derivation of the rocks from a felsic source. In TiO2 vs Zr plot (after Hayashi et. al., 1997) all the samples plot in intermediate to felsic igneous fields, supporting the TAS plots of andesite to dacitic compositions.

2) Petrological studies of the surface and subsurface litho-sections of Pullampeta Formation, Mangampeta area, Cuddapah district, Andhra Pradesh (FSP Code: RP/SR/HQ/2014/099) : S.T.Narahari & V.Adinarayana Reddy

Higlights: Bedrock samples for petro-mineralogical studies, at various depths, from the Mangampeta barytes deposit and also from lithounits around the mine area have been collected.Preliminary Sulphides from carbonaceous tuff, from different depths have been collected for sulphur isotopic studies.Carbonaceous tuffs have been characterised.Carbonaceous tuff contain micro- phenocrysts of quartz, albite and microcline set in petrographically unresolved, very fine grained, near isotropic (glassy) matrix.Micro-phenocrysts of quartz with corroded and bi-pyramidal faces indicate volcanic nature. Elemental composition of the matrix is comparable to that of hyalophane by EPMA studies. Microcline at places contains up to 1% of Ba.Carbonaceous tuff at places contains spherulites of barytes (earlier described as rosette barytes) which display radial growth of barites crystals. Barytocalcite partially replaced barite spherule.

c) PALAEONTOLOGY, SR, HYDERABAD

i) Biostratigraphy Of The Quaternary Sediments Along The Kerala Coastal Tract And Midland Rivers (RP/SR/HQ/2013/066): Smt. Nidhi Mishra (PT) & . V.Chakavarti (PT):

i) Consultation of literature on Quaternary Geology and Geomorphology of coastal plains of Kerala. The study area falls under SOI degree sheet 58B and 58C. Carried out field work from 11.03.2015 - 13.03.2015 in different areas located along the coastal and interior part of Ernakulam, district of Kerala. Special attention was paid to section measurement and palaeontological sample collection. Traversed the area around Willingdon Island, Kumbalangi, Marada, Perumanur, Kaloor, Thykoodam, Kuttanlkavu, Edakochi, Vallarpadam, Vypin and Pullaruthy. Geological logging of the borehole core samples. Collection of samples for palaeontological studies. Visited GSI office at Kochi for logging of drilled cores and collection of samples. Palaeoclimatic and biostratigraphic studies are being attempted based on the study of fossil assemblages.

ii) Identification of the invertebrate fauna.

iii) **Laboratory processing of 30 sediment samples** collected during the field work done from 25.12.2014 to 28.12.2014 and from 11.03.2015 - 13.03.2015 their identification and taking their microphotographs using Leica IM 50 software and EPMA. Picking, studying and identifying microfossils under the microscope from the processed samples. Among the microfossils small benthic Foraminifer are the most dominant with predominance of *Ammonia beccarii* (benthic foraminifera) and sporadic occurrences of *Quinquiloculina* sp., *Spiroloculina* sp., *Elphidium* sp. bivalves and gastropods.

ii) **Search and study for dinosaur and vertebrate fossil remains in the Kota Formation and Mesozoic vertebrates from the other Upper Gondwana formations of the Pranhita - Godavari Valley in Southeastern part of Adilabad district, Andhra Pradesh. (RP/SR/HQ/2014/107):** Smt. Nidhi Mishra (PT) & . V.Chakavarti (PT):

Engaged in laboratory studies of Dinosaur fossils and their identification. Dinosaur fossils identified are Rib, Tail vertebrae, Femur part, claw bones. Washing and panning of clay samples yielded micro mammal fossils and vertebrate fossil fragments. Identification and laboratory studies of micro mammal fossils and Dinosaur fossils are under progress.

Consulted literature ñEncyclopedia of Dinosaursò by Philip J.Currie& Kevin Padian.

d) QUATERNARY AND ENVIRONMENTAL GEOLOGY DIVISION, GSI, SR, HYDERABAD

Deciphering sea level changes and climatic vicissitude along the Andhra Coast (183/ENV/SR/RSAS/2014):
Name of the Supervisory officer: B.M.Shah, Supdtg. Geologist
Name of officers: Rimpal Kar, Geologist

Highlights: Geomorphologically the Andhra coastline is broadly divided into northeastern, central and southern segments. The central segment is characterised by a broad (20 - 80 km wide zone) deltaic coast comprising major deltas of the Krishna and Godavari Rivers with conspicuous convexity towards the Bay of Bengal. The area between Bapatla (western fringe of Krishna Delta) and Chinna Ganjam is characterized by a very wide strand plain Chenier ridges, active dune complex, tidal flat etc. The area selected for preent FSP, is located to the south-west of Krishna deltaic plain. The geomorphic expression of the area suggests that the coastal plain is >45 km NE-SW trending curvilinear and low lying (6m msl) strand plain, with width varying between 12km (in NE) to 5 km (in SW), characterised by coast parallel linear ridges covered by sand dunes with low lying swales/tidal flat as inter ridge area.

From the landward margin towards coast, five sets (I-V) of ridges could be recognised. The ridge I, II (palaeo) and V (present day) has prominent relief and remarkable continuity and as a result are easily discernible. However, ridge III and IV are discontinuous and appears to be truncated; only remnant parts, represented by dunes with relief could be observed and recorded in the areas where the strand plain is wide. The dominant lithology is medium to fine sand, with occasional clayey silt in geomorphic depressions. In sections, the upper part of the beach ridge complexes are covered by fine to medium, massive sand, may be deposited by dunal activity. And this horizon is underlain by finely laminated sand with darker hue. At places the laminations are disturbed due to bio-turbation (vertical to subvertical burrows). Each set of beach ridge represents a palaeo shoreline, resulting in progradation of coast. The beach ridges are separated by low-lying swales and at present day both are covered by settelments and cultivated land respectively. OSL samples are collected from both beach-ridge and overlying dune sediments.

The topography of the study area is very subdued. The geomorphic expression of the landscape suggests that the coasts has prograded due to relative changes in the sea level over a period of time by combined action of marine, terrestrial and Aeolian agencies, during the Quaternary period. From the succession of the beach ridges on the wide strand indicates the relative changes in sea level and each beach ridge represent a palaeo shore line. The chronology of the event can be established by the synthesis of data collected for analysis during this field season. According to the verbal communication with the OSL lab Faridabad, NR, GSI, the oldest date obtained may be about 9-10Ka.

Samples, collected from field are submitted for chemical analysis to Chemistry Div., GSI, SR. Heavy minerals are seperated from sand samples for study under EPMA.

The officer assigned to the project was also engaged in preparation of Landuse-landcover and geomorphological map of the Kochi agglomeration, as an additional assignment of Earth quake Geology Division (Code:165/SEI/SR/EQG/2014) in RS Division. The officer has taken traverses for field check of the Landuse-landcover and geomorphological maps of the Kochi area. Overall, the area has very subdued topography with dense population and buildup. The landuse-landcover and

geomorphological map prepared in lab, were checked in field and the changes observed are incorporated in the finalised map. The final maps are submitted to RS Div. for further work.

e) <u>R&D PROJECT: KIMBERLITES</u>
Item Code: 2014-16/ME/SR/AP,KAR/2014
Title: A collobortive R&D project on Kimberlites from Dharwar Craton between GSI and De Beers India Pvt. Ltd.
Name of the Supervisory officer: Dr. S. Ravi, Supdtg. Geologist-Nodal Officer
Name of officers: M. Pradeep Kumar, Ravi Kumar, Senior Geophysicists, Suhel Ahmed, Geologist, SU: AP, Kaushik Shukla, Geologist, SU: K & G
Highlights: A Research Project by the Geological Survey of India and De Beers India pvt. Ltd. for a joint-study of some selected kimberlites of Dharwar craton in A.P and Karnataka states was proposed under R&D Project (Mission-IV) during the period of F.S. 2014-16 in Southern Region, GSI, Hyderabad.

The kimberlites are very complex in composition with lot of variations in the concentration of diamonds and different kimberlitic indicator minerals. A systematic approach is needed to gain all the information for a proper assessment and characterization of all the kimberlitic rock discovered. Delineation of kimberlites using high resolution ground geophysical techniques is essential before assessing the diamondiferous nature of kimberlites. De Beers has the expertise in various geophysical techniques for the delineation of kimberlites. It was proposed to utilize their expertise to generate high resolution geophysical data over selected kimberlites, which will enhance the understanding of these kimberlites. The generation of data, processing and interpretation of data was proposed to taken up jointly by DIPL and GSI. The following kimberlites were covered with high resolution ground geophysics:

1. Gokapasulvadi kimberlite
2. Khajipur kimberlite
3. Undralladoddi kimberlite
4. Mettimalkapur kimberlite
5. Maliabad kimberlite
6. Turkandoni kimberlite
7. Bodisanipalle kimberlite
8. Pennar kimberlite
9. Thummatapalli kimberlite
10. Ramagiri kimberlite

A joint meeting was held in the month of May-2014 between GSI, SR, Hyderabad and DIPL officials involved in the project chaired by Shri. M.S. Jaiaram, Dy. DG SU: Andhra Pradesh, GSI, SR and attended by Shri. P. Ramesh Babu, Dy. DG, RMH-IV and others. The probable outcomes and time frames were discussed on the further work.

Geophysical survey commenced on 12-05-2014 by using ground magnetic, ground EM and ground gravity methods, jointly by DIPL and GSI teams, using DIPLôs in-house technology and equipment. Planning of survey was made in a grid pattern with following specifications:

Method	**Line spacing (in meters)**	**Station spacing (in meters)**
Gravity	50	25
Magnetic	50	Walk mode (Aveg. 2 m)
EM	50	20

Gravity, magnetic and EM data acquisition was made simultaneously by using sophisticated instruments to achieve the target in stipulated time. Two magnetometers (GEM-19T) were deployed; one at field and another one at base. Gravity survey was made by using CG-5 gravimeters and consequently elevation was recorded by using DGPS (M/s Tremble instrument) at each station. M/s Geometrix made EM-34 was instruments used for EM surveys and 20 m coil separation was maintained to measure conductivity of lithological units.

Reduction of Gravity, Magnetic data and preliminary data processing was made in field itself by using Geosoft software. 2D modeling was also attempted over few kimberlite pipes by using PotenteQ software to know the dimensions of kimberlites. Over the all kimberlites, anomalies were recorded with low gravity signature, strong magnetic bipolar anomaly and high conductivity in EM.
Geophysical Survey comprising Gravity, Magnetic and EM over different kimberlites:

Kimberlite	Survey Month	Area Coverage (Sq. km)
Gokapsulvadi	May & June	1.64
Khajipur	May	1.55
Undralladoddi	May & June	2.00
Mettimalkapur	June	2.00
Maliabad	June	1.18
Turukandoni	June	2.00
Bodisanipalli	June and July	1.48
Pennar	June	2.00
Thummatapalli	July	1.45
Ramagiri	July	1.51

xi) TCS Division

1. The Internal Resource Generated during the period is as follows:
   a) Total amount of Internal resource generated Rs. 19,48,870/-

   b) Total Service Tax Generated (Incl. Inst. on S.T.) Rs. 2,09,479/-

   c) Total Education Cess Generated Rs. 629/-

   d) Total Interest on Service Tax Rs. 29,071/-

2. Three nos. of unpublished Progress reports were sold to the outside party.

3. Total Fifty five unpublished progress reports were priced in which, nine coal exploration, 44 mineral investigation (Iron & Manganese) and two environmental reports has been priced and send to CHQ for approval.

4. Raised the Bills of Commercial Projects of Engineering Geology Division, SR, from Oct.2008-09 to 2012-13.

5. Reminders are also sent to the commercial projects taken up by Engineering Geology Division, SR, GSI, Hyderabad for the period from October, 2008 to March 2013 for the recovery of the consultancy charges along with interest on Service Tax.

6. Had discussions with the commercial parties regarding sponsored items and prepared three MoUs with outside parties

   - National Water Development Agency (NWDA), Chennai.
   - M/s Gammon India Ltd, Kalpakkam, Chennai
   - Directorate of Mines and Geology, Telengana State.

xii) QUALITY MANAGEMENT

FSP Implementation: As per the available Quality Management Data Sheets in the RQM Cell for the review period, the field officers are carrying out pre field studies and it is found that the supervisory officers of the concerned projects and Mission Heads expressed satisfaction about the work carried out by the field officers and laboratory officers of SR.
Quality Management: QM data sheets received from the officers of SR are being sent to respective Regional Mission Heads for assessment. Steps are being taken to encourage the officers to realize the importance of the role of GSI in facing the modern challenges and try their best to cope up with the demands. Further, the officers are constantly being advised and

encouraged to excel in their performance to bring about better results in their work output, with an aim to finally attain international standards.

xiii) LIBRARY

a) SR, Hyderabad

In tune with the trend towards modernisation, GSI, SR Library has initiated Automation with the help of two internees of Library Information Science. Since June 2011 journals and books are being systematically rearranged and labelled and the metadata of books are being uploaded into open-source NEWGENLIB software. Already books and journals in 114 bays out of 141 bay containing 7 shelves each have been systematically rearranged and labelled and metadata of 2989 out of 7667 books have been uploaded. The work on softcopy conversion of Pre-2004 unpublished progress reports and uploading on to the GSI Portal has also picked up momentum. Standard purchase methods of the GOOD OFFICES COMMITTEE of The Federation of Publishersô & Booksellersô Associations in India are being implemented for the purchase of books. Publication Division GSI SR has also initiated a dialogue with the National Institute of Science Communication and Information Resources (NISCAIR) a branch of the Council of Scientific and Industrial Research (CSIR), devoted to dissemination and documentation of S&T information, towards connecting us to the worldwide E Library network.

A face lift to the library to promote a library culture is long over due hence the preparation of a Standard Operation practice (SOP) for the GSI SR Library and its implementation.

b) SU: KERALA: The Library has a collection of about 1800 Indian and Foreign Scientific Books and a small collection of general reference books, in addition to various GSI Publications. The back issues of several scientific journals, from the mid sixties onwards are also available for reference. The books and journals in the library are available to students from colleges and scientists from other institutions for reference.

xiv) CORE REPOSITORY:

Item Code: SER/SR/HQ/DCL/2014/052

The drill core generated in Southern Region, GSI from mineral investigations and statigraphic drilling is being preserved in Core Libraries at following three places.

- **i.** Regional Drill Core Library, SR, GSI, Bandalaguda Complex, Hyderabad,
- **ii.** Core Library at Vajrakarur Diamond Project Plant, Ananatpur district, A.P. and
- **iii.** Core Library at Chitradurga Field Training Centre, Chitradurga district, Karnataka.

The details of drill core preserved at these three places and progress of work is as follows:

ı. **The Regional Drill Core Library at GSI Complex, Hyderabad.**

A total of 1973 core boxes for 265 nos. boreholes from 35 investigations carried out in the states of Andhra Pradesh, Karnataka, Kerala and Tamil Nadu by Southern Region and the erstwhile AMSE Wing, GSI since 1975 have been preserved in the Regional Drill Core Library, Hyderabad. The cores preserved belong to investigations carried out for gold, limestone, molybdenum, copper, lead, zinc, platinoid group elements and clay investigations. Details of investigations for which the core is preserved are as follows:

1. Gold Investigations in Andhra Pradesh :

a. Jonnagiri deep drilling, b. Dona North and South, c. Kottapalli blocks

2. Kerala Clay investigation

a. Palai block

3. Kerala Gold investigations

b. Naikerpadi, c. Mundayur, d. Pottupadi, e. Kallakeri, f. Puttumala blocks.

4. Tamil Nadu investigations

a. Molybdenum of Dharampuri sector, b. Limestone of Ariyalur sector, c. Gold of Nilagiri sector
d. Stratigraphic drilling of Kanchipuram sector, e. Limestone of Patti-Vriddhachalam sector.

5. AMSE Wing investigations

a. Varrikunta & Karredukuppa areas, Cuddapah district, A.P.
b. Ghantapuram-Rayavaram(Markapur area), Prakasam district, A.P.
c. Padusalabhavi & Marripadu areas, Nellore district, A.P.
d. Tippireddipalle block, Cuddapah district, A.P.
e. Kadikengaebetta and Ramanahalli areas, Hassan district, Karnataka.
f. Musturu area, Chitradurga district, Karnataka.
g. Turuvanur and Kumabevu areas, Chitradurga district, Karnataka.
h. Papanasi and Doni blocks, Dharwar district, Karnataka.
i. Alladahalli (East block), Hassan district, Karnataka.
j. Karimaranahalli block, Hasan district, Karnataka.
k. Banasandra area, Tumkur district, Karnataka.
l. Bellibetta block, Mandya district, Karnataka.

m. Gaudikatte area, Davangere district, Karnataka.

The Regional Drill core Library of SR, has received skeletonised drill core boxes pertaining to (PGE) investigations in Tamilnadu.
During the period mentioned above drill core boxes from Solavanur block were labelled and arranged in steel racks (**201** no. boxes). Besides this, drill core boxes from Mallanayakanpalaiyam block (**97** boxes) and Karrapadi Block (**92** boxes) were labelled and arrangement into the steel racks of core library is in progress.

xv) GEOLOGICAL MUSEUM / ROCK GARDENS / GEOPARKS:

Geological Museum, SRO:

The Geological Survey of India started its Southern Regional Office at Hyderabad during 1961. In the formative stages, a Geological Museum was established for housing specimens of rocks, minerals and fossils of geological importance, collected by the field officers.

In the year 1990, when GSI shifted to its own premises at Bandlaguda a Geological Museum was set up in the GSI Complex of Southern Region, Hyderabad. The museum was named after Dr. William King, a pioneering worker of GSI in 2004. It is housed in a quite elegant 14m x 23m single, 13m ï high hall.

The museum has two sections, one dedicated to rocks, minerals and ores and other to fossils. The museum houses over 305 rocks and 235 mineral specimens collected from southern parts of the country representing the entire geololgical column. Rocks are displayed genesis-wise. Minerals are displayed separately as per mode of occurrence and industrial use. Approximately 103 specimens of dimensional stones/building stones are displayed as cut and polished slabs/blocks.

The Palaeontology section houses various plant and animal fossils. It contains vertebrate fossils, mainly of dinosaurus, collected from Godavari-Pranhita valley Andhra Pradesh and inveretebrate fossils, most importantly Ammonites, etc. A total of more than 163 vertebrate and invertebrate fossils along with 14 reptile models of different sizes are stored in the museum. Special mention may be made of the full-sized fossilized skeleton of Rhynocosaurus discovered in Gondwana Formations from Karimnagar district, Andhra Pradesh. GSI, SR has reconstructed a full sized dinosaur skeleton in Birla Science Museum, which is located in the Central part of Hyderabad and is visited by many people including tourists. The dinosaur was discovered in Yamanpalli area of Adilabad district, Andhra Pradesh.

The museum exhibits 29 paintings on the important events of the evolution and morphological features of earth and evolution of life, 17 maps and one globe. The major share of exhibits belongs to the characteristic rocks and minerals of the southern states (Andhra Pradesh, Tamil Nadu, Kerala, Karnataka and Goa). Some samples from other states and a few foreign specimens are also housed.

GSI, SR has a ôParks & Museumsô division. As per the HPC recommendations, National level museums have to be established in Chennai, Bengaluru & Hyderabad along with State level museums in Goa, Kerala and Puducherry. In Chennai there is a museum which has a geology gallery. There is a need to enhance / enrich the state galleries with geological samples / exhibits. All the State Units have identified nodal officers to interact with the State Governments to indicate the role of GSI to enrich / establish National level as well as State level museums as per the HPC recommendations.

PARKS & MUSEUM, SR

Item No. SER/SR/HQ/2013/049

1) Looked after the regular maintenance and upkeep of Museum and Rock Garden.
2) A Documentary film ñRock Treasuresò on National Geological Monuments and important Geological features of southern region, Rock garden and museum, SR has been completed.
3) Parliament question on ñdeclaration of Geolheritage sitesò has been submitted to the Director, Curatorial Wing, CHQ, Kolkata.
4) 12 feet Petriefied fossil wood retrived from kothagudem- Palaoncha road is under restoration.
5) 165 Foundation day of GSI has been celebrated on 4th March 2015.

Visit to GSI Museums & Labs:

1) Trainee Officers of Geological Survey, undergoing training at GSITI, Hyderabad visited the rock garden and Museum and the exhibits were explained to the trainees.
2) Students from Various Schools & Colleges along with their techers and lecturers visited the Museum and Rock Garden at GSI,SR, Hyderabad . Parents and children visited Rock garden and Museum, at GSI,SR, Hyderabad. The exhibits were explained to them.

SU: KARNATAKA & GOA:

Personnel:
H.S.M Prakash, Director
Dr. Vinod Kumar, Senior Geologist (PT)
Sri K.N. Nanjundaswamy, Asst. Geologist (PT)

The HPC committee recommends that GSI should advance the cause of the geoscience by documentation, propagation, archiving and education, including by creation and management of museums, geological monuments and parks for use of students, researchers and the public. Maintain and upkeep Museum & Rock Garden located in GSI complexes; organise international/ national/ local exhibitions, providing rock/ mineral and fossil samples to different academic institutions and to guide the visitors from different research/ educational institutions and the common public to impart and enlighten them about geoscience importance.

Geological museum exists in the premises of operations Karnatak and Goa. This museum contains rocks/minerals samples and maps. Around 800 rock/mineral samples are in the Museum and following display such as Columnar structure, St, Marys Island, Malpe, Udipi district, Karnataka, Pillow structure, Maradihalli, Chitradurga District, Karnataka, Peninsular Gneiss, Lalbagh, Bangalore, Geological and Mineral Map of Karnataka and Goa on 1:5,00,000, Political-Physical map of India1:4,600,000(1cm= 46 kms), Map showing gold resources of Karnataka on 1:10,00,000 (1cm = 10kms), Map showing Iron and Manganese ore deposits on 1:10,00,000 (1cm = 10kms) exist in the museum.

SU: KERALA

Proj: Parks & Museum (FSP No. SER/ SR/ HQ/ 2014/049):

Varkala Geoheritage Site

The Director General, GSI declared Varkala cliff as a Geoheritage site on 28.05.2015 and requested the Chief Secretary, Govt. of Kerala to issue a notification in this regard. The follow up actions are detailed below:-

As directed by the DG, GSI, office of SU: Kerala is pursuing the matter with Govt. of Kerala for issuance of notification. Managing Director, Vision Varkala Infrastructure Development Corporation Ltd took initiative and arranged a meeting with the Hon'ble Chief Minister, Kerala. The DDG, SU: Kerala made a presentation on significance of Varkala and follow up action required. In addition to the CM, Minister for Tourism, Minister for Culture, MLA, Municipal Chairman, Municipal Secretary, Vice Chairman, State Planning Board, Secretaries of various departments and several senior officials of Govt. of Kerala were present. GSI was represented by the DDG, Director (TC), Director (Parks & Museum) and Director (EG&LS).

Managing Director, Vision Varkala Infrastructure Development Corporation Ltd took initiative and arranged a meeting with the Hon'ble Chief Minister, Kerala on 23.06.14. The DDG, SU: Kerala made a presentation on significance of Varkala and follow up action required. In addition to the CM, Minister for Tourism, Minister for Culture, MLA, Municipal Chairman, Municipal Secretary, Vice Chairman, State Planning Board, Secretaries of various departments and several senior officials of Govt. of Kerala were present. GSI was represented by the DDG, Director (TC), Director (Parks & Museum) and Director (EG&LS). Director, Parks & Museum visited the Varkala area along with officers and surveyor to identify the sites for litho section measurement on 01.07.14. Deputy Director General, Director, EG & LS division and officers visited Varkala to study the geotechnical aspects for suitable measures for protection of Varkala cliff on 19.07.14

S/Shri Harbans Singh, D.G, GSI, S. Balakrishnan, ADG & HOD, M. Raju, Dy.D.G, NMH-IV, P.A. Ramesh Babu, Dy.D.G, RMH-IV, C. Muraleedharan, Director (G), Kolkata and Dy.D.G, Director (TC), Director (Parks & Museum), Director (EG &LS) and officers of SU: Kerala visited Varkala on 23.08.14 and examined the site proposed for erection of Geological Monument. The DG, GSI had a meeting with Managing Director, Vision Varkala Infrastructure Development Corporation Limited (VIVIDCL); local MLA Shri Varkala Kahar and Chairman, Varkala Municipality at Government Guest

House, Varkala and discussed the matters related to the protection of Varkala Cliff. He advised to expedite the issuance of notification by Government of Kerala.

Shri N. Kutumba Rao, Dy.D.G and Shri M. Suresh Chandran, Director (TC) attended the meeting on 19.12.2014 with Secretary (Planning) Govt. of Kerala to discuss about the notification regarding the Varkala Geoheritage site to be issued by Govt. of Kerala as per the request by the DG, GSI to the Chief Secretary, Govt. of Kerala. The meeting was attended by MD, VIVIDCL and several senior officers of Law Dept, Revenue Dept. etc. It was discussed to explore rules under various departments like municipality, town planning, district administration etc. which can enable bringing out some ordinance to protect the Varkala Cliff from anthropogenic activities.

On 13.01.2015, the Principal Secretary, Local Self Government Department (LSGD) conducted a meeting where in Secretary (Planning and Economic Affairs), District Collector, Thiruvananthapuram, MD, VIVIDCL and various stake holders from Central and State governments participated. GSI was represented by the Dy.D.G, Director (TC) and the Director (Parks & Museum) . Shri P.S.Anil Kumar, Director (Parks & Museum) made a power point presentation on the importance of Varkala cliff as Geoheritage site. A committee was formulated to work out the modalities for framing rules to issue notification for protection of Varkala cliff including various departments of Government of Kerala where in GSI is also a member.

A meeting has been conducted to discuss and take decisions to regulate constructional activities and disposal of waste water and provision of surface drainage. Shri P. S. Anil Kumar, Director represented GSI in the meeting held in the Office of the Chief Town Planner, Thiruvananthapuram on 30.01.2015.

Shri P.S. Anil Kumar, Director, Parks & Museum, Ms. Archana K.G., Geologist and Shri D. Sanil Kumar, Senior Surveyor attended a Meeting on ñVarkala Master Planò organized by RITES on 26.03.15 inaugurated by Minister, Planning and attended by District collector, MLA, Municipal Chairman, Planning board members, Secretary, Tourism, Planning etc.

A poster on óVarkala Cliff: Kerala, A Geoheritage Siteò was prepared and sent for the Brain storming Session on IGC 2020 held at GSI, SR on18.02.2015 and 19.02.2015.

Museum Activities:

Students from schools and colleges have visited the museum of SU: Kerala on many occasions including on GSI Foundation Day.

F. MAJOR ACHIEVEMENTS AND MILESTONES:

- Coverage of 6, 28, 597 sq.km. out of total area of 6,41,707 sq.km of Southern Region by geological mapping on 1:50,000/63,360 scale covering both hard rock and quaternary areas.
- A total area of 1,11,395 sq.km (upto March, 2015) covered in geologically critical areas of Southern Region on large scale (1:25,000) under Specialised Thematic Mapping including structure, stratigraphy, etc.
- Geophysical Mapping (GPM) carried out in 98,136 sq,km(upto March, 2015) on 1:50,000 scale.
- Geochemical Mapping (GCM) carried out in1,29,824 sq.km(upto March, 2015) on 1:50,000 scale
- Publication of Geological Maps (85 MBMôs, 71 GQMôs (2^{nd} edition), 765 RGB print ready 1:50K maps) were compiled.
- Technical Advice rendered to Nuclear Power Corporation for Kaiga Nuclear Power Plant
- Technical advice rendered to Karnataka Power Corporation for Kudigi Plant
- Engineering Geological service to Irrigation Departments Govt. of Andhra Pradesh, Karnataka, Tamil Nadu through sponsored field programmes for building reservoirs, dams, tunnels etc.
- Building repository of Information on Landslides and providing information to the Nodal Agencies at GSI, New Delhi.
- Southern Region Core Library is under revamp on modern lines for consultation and study by interested parties/ professionals.
- A documentary video on the National Geological Monuments, Other important geological features, Rock garden and museum of southern region (i.e. Andhra Pradesh, Karnataka & Gao, Tamilnadu and Kerala) has been completed in all respects by Shri. B.M. Shah and G. Samuel Sukumar and N.J. Sumanth, Suptdg. Geologists.

G. SIGNIFICANT MINERAL RESOURCE ASSESSMENT:

Concerted efforts in the field of mineral exploration have paid positive result in the form of proving additional resources and identifying several promising mineral prospects in recent years by Geological Survey of India, SR. An important location of major mineral deposits/promising prospects; their geological settings and estimated reserves are described below in brief:

1. Gold:

In Andhra Pradesh:

- 9.841 m.t of gold ore with a grade in the range of 1.16 to 31.29 g/t of Au in Dona sector of Jonnagiri area.
- 0.115 m.t with an average grade of 2.65 g/t in Kattapalle block.
- 3.47 m.t. with a grade in the range of 4.00 to 6.22 g/t in Chigaragunta area, South Kolar schist belt.
- 0.65 m.t with an average grade of 4.30 g/t in Mallappakonda

In Karnataka:

Gold deposits explored by G.S.I in different blocks in the schist belts of Karnataka are i) Hutti-Maski Schist belt: Uti, Wandalli, Hira-Buddini, Kadoni, Chinchergi Blocks ii) Gadag Schist Belt: Hosur-Champion, Sangli mine, Mysore mine, Kabuliyatkatti North, Nagavi Blocks iii) Chitradurga Schist Belt: Ajjanahalli Main Ajjanahalli West and G. R. Halli Blocks iv) Nuggihalli Schist Belt: Kempinkote Block v) Shimoga Schist Belt: Chinmulgund Block. A total of 15.915 m.t. of reserve having grade upto 23.20 g/t Au is estimated for these blocks.

Gold resources in some of these blocks are given below:

1.5 m.t of gold ore with an average grade of 3.00 g/t in Chinmalgund area of Shimoga schist belt, Dharwar District, Karnataka.

0.54 m.t of gold ore with a grade of 11.95 to 16.16 g/t in Hira-Buddini block of Hutti ï Maski schist belt.

0.089 m.t of gold ore with an average grade of 3.92 g/t in Tuppadhur block of Hutti-Massi schist belt.

0.60 m.t. of gold ore with an average grade of 4 g/t in G.R. block of Chitradurga Schist Belt, Chitradurga District.

The details of resource assessed in different blocks of Ajjanahalli gold fields are:

Sl. No.	Name of the block	Resource (in million tonnes) (UNFC:333)	Average gold content
1	Ajjanahalli Main Block	1.51	1.76g/t
2	Ajjanahalli West Block	0.76	1.49g/t
3	Ajjanahalli Block-A	0.58	1.84g/t
4	Ajjanahalli Block-B	0.37	1.35g/t
5	Ajjanahalli Block-C	0.26	2.55g/t
6	Ajjanahalli Block-D	1.05	0.94g/t
7	Ajjanahalli Block-E	0.23	1.03g/t

In Kerala:

- Primary gold 0.77 m t is associated with epigenetic quartz veins emplaced into weak planes of the country rock in Malappuram district, Kerala.
- Placer gold 1993 kg (metal) occurs in association with heavy minerals in stream and river channels draining primary gold-bearing terrains in Palakkad district, Kerala.

2. Diamond:

In Andhra Pradesh:

- Surveys carried at in search of Kimberlites has resulted in locating 21 kimberlite bodies in Wajrakarur field of Anatapur district and 36 bodies in the Narayanpet field in the western part of Mahabubnagar district in AP and adjoining Gulbarga district of Karnataka ï the Raichur field in Raichur district and adjoining Mahabubnagar district in AP hold 5 bodies.
- In recent years, processing of bulk samples of 2000 tonnes collected from Anumpalle Dibbasani, Gollapalle at Wajrakarur plant has yielded 81 diamonds weighting 20.74 carats.

In Karnataka:

An area of 5043 sq km in Gulbarga, Raichur and Bellary districts have been surveyed for Kimberlite and 14 Kimberlite bodies (10 in Gulbarga and 4 in Raichur district) have been identified. Out of these, one in Raichur district is proved to be diamondiferous.

3. Iron Ore

In Karnataka:

Major iron ore deposits are spread over Bellary, North Kanara, Chickmagalur, Shimoga, Chitradurga and Tumkur districts. Reserves of 2784 million tonnes of magnetite and 1072 million tonnes of haematite have been estimated. Sizeable Iron ore resources have been estimated in the free hold areas in NMDC Block in Sandur Schist Belt, Bellary district. These resources, estimated for two banded haematite chert bands for a strike length of 1470 and 620 m (total length 2.09 km) with an average width of 25-30 m. include:

- 82, 05, 513 tonnes with a grade of 57.37% of Fe(t) at 45% cut off
- 71,32,299 tonnes with a grade of 59.55% of Fe(t) at 50% cut off and
- 57,17,634 tonnes with a grade of 61.40% of Fe (t) at 55% cut off

Titaniferous Vanadiferous Magnetite occurs around Mulemane and northwest of Kumbarwada in Uttara Kannada district and Masanikere, Davangere district. A total reserve of 3.2 million tonnes and 8.2 million tonnes of ore has been estimated in these two areas, respectively. Besides, small layered to lensoid bodies of gabbro - anorthosite with V-Ti have been recorded around Ubrani, Sakrebyle and Devanarsipura in parts of Shimoga district.

In Goa:

Iron and manganese ore deposits are reported along 95 km long NW-SE trending belt extending from Saliginim to Noibaga. The iron ore deposits consist of essentially haematite and partially magnetite, limonite and goethite. The iron ore bodies are massive, bedded, platy, brecciated, earthy laminated (biscuity) concretionary and powdery (blue dust) in nature. The important deposits in North Goa found around Bicholim, Sanquelim, Velguem and Palle. In situ reserves of 1061 million tonnes of haematite ore with 62.62% Fe and 144 million tonnes of low grade magnetite ore with 35.91% Fe have been established in North Goa and a total of 680 million tonnes of ores of all grades are estimated in South Goa. Large resources of low grade magnetite ore with 25-40% Fe content are available in the Dhave-Sonal area.

In Tamil Nadu:

A resource of over 500 million tonnes with an average grade of 38% Fe is estimated for the major magnetite quartzite bands occurring in Salem, Vellore, Tiruvannamalai, Vilupuram, Dharmapuri, Tiruchirapalli, Namakkal and Perambalur Districts.

In Kerala

100 mt of iron ore occurring as banded magnetite quartzite (quartz-magnetite grunerite) associated with charnockite and peninsular gneissic complex in Kozhikode & Malappuram districts in Kerala.

4. Lignite

In Tamil Nadu:

GSI has established a 130 x 5-150 km. lignite belt between Mannargudi in the south to Bahur (Puducherry) in the north. Neyveli Lignite Corporation Ltd. Currently exploits parts of this belt.

5. Limestone

In Karnataka

Sizeable reserves of cement grade limestone and dolomite are present in parts of Belgaum and Bijapur districts. Besides, crystalline limestone is also found in parts of Tumkur, Chitradurga and Belgaum districts. The total proved limestones of all grades in the state are about 694 million tonnes.

In Goa:

Magnesium rich crystalline limestone containing CaO 33%, MgO 12.8%, with a few cement grades is reported from Ivore khurd in the west to Derodem in the east and in the Surla Ghat. The band extends over a strike length of about 20 km and is about 50 m thick. The estimated reserves of all grades of limestone are about 80 million tonne.

In Tamil Nadu

Geological Survey of India has established about 670 mt. of limestone in the state. A number of cement industries are functioning based on these resources. An additional resource of 96.49 mt. of marginal to cement grade limestone has been established recently in Cuddalore district.

In Kerala

12 mt of crystalline limestone associated with calc-granulites of the Khondalite Group in Palakkad district, Kerala.

6. Bauxite

In Karnataka

Bauxite occurs in Khanapur taluk, Belgaum district, Coondapur and Baindoor in South Kanara district, Kumta, Honavar and Bhatkal in North Kanara district, Guppripare, Nagarkalpare and Dodhara in Bababudangiri hill ranges. A total reserve of 27.42 million tonnes of bauxite has been estimated in the entire region of Karnataka.

In Goa:

Bauxite occurs in the plateau areas of Goa around Mopa, Pernem, Morgim, Ibrampur, Dargalim, Koragaon, Consua, Quelossim, Betul, Palolem and Galgibaga. The estimated recoverable reserve is 28.09 million tonnes.

In Kerala

15.75 mt of bauxite, formed by insitu weathering of Arachaean crystalline rocks and Warkali sedimentary rocks was found as patches within laterite capping. The change is gradational from laterite to aluminous laterite to bauxite in Thiruvananthapuram, Kollam, Kannur &Kasaragod districts in Kerala.

7. Molybdenum

In Tamil Nadu

(FS 2010-12)

Total resource estimate in Harur Uttangarai Mo investigation in Vellakkal Central Block, Dharmapuri district.

Cut-off of 500 ppm average Mo grade	Cut-off of 300 ppm average Mo grade	Cut off of 100 ppm average Mo grade
47,986 tonnes with an average Mo grade of 0.0158%	84,966 tonnes with an average Mo grade on 0.0339%	2,10,032 tonnes with an average Mo grade of 0.0223%

(FS 2012-13)

Total resource estimate in Harur Uttangarai Mo investigation in Vellampatti South Block, Dharmapuri district.

Cut-off of 1000/1200 ppm average Mo grade	Cut-off of 500 ppm average Mo grade	Cut off of 300 ppm average Mo grade
8,143 tonnes with an average Mo grade of 0.2612%	26,366 tonnes with an average Mo grade on 0.1459%	53,967 tonnes with an average Mo grade of 0.962%

8. Chromite

In Karnataka:

Chromite deposits are found around Tagadur, Byrapur, Jambur, Aladahalli and Kadakola in parts of Mysore and Hassan districts. Around 1.5 million tonnes of recoverable reserves of chromite has been established.

In Goa

Chromite bodies of 2.4 km length and an average width of about 400 m with Cr_2O_3 content upto 28% occur towards east and northeast of Bondla.

9. Graphite

In Tamil Nadu

About 0.5 million tonnes of graphite resource with 15% FC has been estimated in the Sivaganga Graphite Belt. GSI has recently established an additional 0.72 mt. graphite with 13% FC in the hitherto unexplored parts. Government and private entrepreneurs currently exploit this deposit.

10. Manganese

In Karnataka:

Karnataka has the second largest recoverable reserve of manganese ores in India and has reserve of 4.10 million tonnes. Sizeable deposits are found in Kanvihalli, Deogiri-Subbrayanahalli in Bellary district, Kumsi and Tarkebail in North Kanara district and Dodaguni and Chikkanayakanahalli in Tumkur district.

In Goa

Manganese ore deposits of Goa are lateritoid type and found at or near the surface, in areas occupied by Fe-Mn phyllites. They occur as irregular lensoid bodies and pockets of varying dimensions. The deposits comprise laterite at the surface with concretions of black coloured iron and manganese ores followed at depth by bouldery manganese ore and then by manganiferous clay called ôWadô. The ore minerals are mainly pyrolusite, psilomelane and partly cryptomelane, biannite and manganite. The grade of ore ranges from metallurgical to black iron ore with Fe+Mn content of 42-45%. The iron content varies inversely with manganese in general. All deposits of economic significance are confined to the southern part of Goa viz., Rivona, Canvorem, Salginim, Verlem, Columba, Netrolim, Muriem, Pirla and Cosmor areas.

11. Magnesite

In Tamil Nadu

The most prominent deposit of magnesite in Tamilnadu is located on Chalk Hills, Salem district. The total reserves in the Chalk Hills are estimated at 44 million tonnes.

In Karnataka:

Magnesite occurrences are known in Mysore, Coorg and Bellary district. Dodkanya working mines near Mysore have a reserve of 12 million tones.

12. Clay:

In Kerala:

- 24 mt of China clay. Primary and sedimentary clay are associated with Tertiary Warkali Formation, underlying Archaean crystalline rocks in Palai Block, Nileswaram, & Kasaragod districts, Kerala
- 3000 mt of China clay. Insitu kaolinisation of upper part of feldspar rich Archaean rocks produced thick deposits of primary clay. Sedimentary clays are bedded deposits associated with the Warkalli Formation in Thiruvananthapuram, Kollam, Kannur, & Kasaragod districts, Kerala.

In Goa:

Small and lenticular deposits of clay are recorded at Camarconda, Concem and Befora in Ponda taluk, Kakora in Quepem taluk and Colvale in Bardez taluk. The Camarconda (south) and Kakora (north) deposits constitute high grade refractory material. Reserves of about 0.164 million tonnes of washed clay have been estimated.

13. Dimension stone

In Andhra Pradesh:

- 13.628 million cubic meters of ôblack graniteô and 182.0226 million cubic meters of varieties of multi-coloured granites in Prakasam, Kurnool, Vizianagaram and Mahabubnagar districts.

In Karnataka:

Karnataka occupies a prominent position in producing variety of quality stones to cater to the external and domestic demands. Ilkal red/ chilly red (granite), Chamarajanagar black (dolerite with clouded felspars), flaggy limestones (marketing name is Shahabad Slabs) are some of the commercial types of dimension/ ornamental stones exploited from different parts of the state. Sizable deposits of dimensional stones have been established which include:

500 million Cu.m of black granite in Hassan, Chickmagalur Districts.
1500 million Cu.m of other varieties in Bangalore rural, Tumkur, Kolar and Gulbarga districts.
500 million Cu.m of black granite in Hassan, Chickmagalur Districts
1500 million Cu.m of other varieties in Bangalore, Tumkur, Kolar and Gulbarga district

In Tamil Nadu:

- 29.398 million cubic meters in Madurai, Dharmapuri, Villupuram, Thiruchirapalli, Virudunagar, Dindugal, Tiruvannamalai, Vellore, Kanya Kumari districts.

In Kerala: 42,571 cubic meters in Kerala.

14. Base Metals (Cu,Pb,Zn):

In Karnataka: Low grade small occurrences of copper mineralisation are recorded in at Ingaldhalu, Chitradurga District and at Tinthini, Raichur District. These were mined few decades back and closed due to their economically unviable nature. A few other occurrences include Kalasapura in Chikmagalur district, Kaiga Mothimakki in Uttara Kannada district, Masanikere - Tavarekere in Davangere district, Aladahalli and Nuggihalli in Hassan district and Kallur - Machanur in Raichur district.

15. Platinoids:

In Karnataka: Incidence of Platinum group of elements has been reported in the intrusive ultramafites occurring around Hanumalapura in Davangere district and its extension areas of Masanikere-Tavarekere-Magyathahalli. It is also reported in the ultramafites of Mothimakki area in Uttara Kannada district.

In Goa

A mafic-ultramafic complex extending over a strike length of 20 km with the maximum width of 4 km is observed near Usgaon. The major constituents include dunite, peridotite, pyroxenite and gabbro. The ultramafic variants, dunite and harzburgite host chromite mineralisation at Usgaon and Bondla. Occurrence of Pt, Pd, Rh, Ir and Ru is detected from the chromite samples of the Bondla area.

16. Tungsten:

In Karnataka: This strategic mineral is commonly associated with gold mineralization at Kolar Gold Fields, Hutti-Maski Schist Belt and Gadag Schist Belt. A reserve of 0.266 million tonnes with 0.18% WO_3 is known to occur in K.G.F and 0.102 million tonnes in Hutti Gold fields.

17. Radioactive minerals:

In Karnataka: Fault controlled epigenetic hydrothermal deposits of radioactive minerals occur near Gogi within the limestone of Bhima basin.

18. Miscellaneous minerals:

In Goa

Silica sand deposits of considerable magnitude are reported along the coast of Goa. The important deposits are: (1) Calanguta, Baga sector extending from Agoada in the south to Baga in the north and (2) Betul, Pali sector extending from Betul in the south to Pali in the north. The chemical analysis shows SiO_2: 93.20-96.48%, Fe_2O_3**:** 0.53-1.67%, Al_2O_3: 0.21-2.08% and TiO_2: 0.11-1.20%. The estimated recoverable reserves are 17.02 million tonnes.

Quartzites suitable for the manufacture of coloured glassware, ferro-silicon and refractory bricks are reported around Concem and Shiroda in Ponda taluk. The quartzite is hard, massive and almost white in colour. A reserve of 14.55 million tonnes, with 96.18 to 97.64% silica and 0.84 to 1.06% iron content, is estimated upto a depth of 10 m.

In Kerala

Glass Sand, 41.6 mt, associated with palaeo-beach ridges in Alappuzha district, Kerala.

Heavy Mineral Sand 163 mt. The concentration of heavy minerals in the beach sands is higher towards south of Kayamkulam in Kerala coast.

In Tamil Nadu

Sizeable concentrations of heavy minerals which include ilmenite, rutile, monazite and garnet occur in the beach sands of Kanyakumari, Tuticorin and Nagapattinam districts. Indian Rare Earths Lt. Currently exploits the occurrence in Kanyakumari district.

In Karnataka: Vermiculite Economically significant deposits are found at Mevanagatta near Holenarsipura in Hassan district and at Dodkanya, Thalur and Varuna in Mysore district. A total reserve of 27,680 tonnes has been established.

Barytes: Economically significant deposits are found at Gadisunkapur Block in Bagalkot district. A total reserve of 50,310 tonnes has been established in Zone-I and IV with BaSO4 values 55.78% and 58.78%. In Zone ï II another 0.139 m.tonnes with BaSO values 4 47.97% was estimated. In all 45% cut off grade was taken for all zones.

H. ASSISTANCE TO STATE GOVERNMENT AND OTHER AGENCIES:

GSI is open for any type of collaboration and assistance to the State Governments, Universities and other agencies including private companies and firms for the advancement and propagation of Geoscience.

GS has been rendering assistance to the State Directorates of Mines and Geology and to the Ministry of Irrigation and Power as and when required. It has also provided necessary information to multi national companies in supplying all available data as desired by them. It has also undertaken several investigations on sponsorship basis for state and central government undertakings of which Project: Jaladhatri is an excellent example.

Project: Jaladhatri is World Bank funded, sponsored item of Ground Water Department, Government of Andhra Pradesh which envisages generation of digital data sets in GIS mode on 12 themes (geology, geomorphology and structure, land use, soil, culture, topographic and administrative themes) for the State of Andhra Pradesh (2,86,000 sq. kms.) spread over nearly 462 toposheets on 1:50,000 scale. This work has been completed by GSI in association with Survey of India.This 12 layer digital thematic data is a powerful tool for earth scientists/ administrators/planners/developers in the development of the State of Andhra Pradesh in ground water, natural resources, forest wealth, disaster mitigation and in sustainable general development of the state.

In the state of Karnataka GSI has undertaken several investigations which include:

- **i.** Construction of dams of Goa and bridge across Mandori River
- **ii.** Foundation studies for LCA aircraft for ADA
- **iii.** Slope stability studies at Cabo Hills, Raj Bhavan, Panaji
- **iv.** Protection of Dattapeetha Cave, Chikmagalur district, Karnataka
- **v.** Stability analysis on the Railway Lines SWR Karnataka
- **vi.** District Authorities requested for technical support and landslide investigations.

XII PLAN WORK ENVISAGED FOR GSI, SR:

Works carried out by Southern Region (pertaining to Mission ï I & II) during the XII Plan period with details on the targets and achievements for the first quarter of the Field Season 2014-15 under XII Plan including the State Units: A.P, Karnataka & Goa, TN & Puducherry and Kerala beside Geophysics Division, SR are given in **Annexure - 2A.**

1. FINANCIAL PERFORMANCE UNDER CURRENT PLAN, GSI, SR

Financial outlay during XII Plan Period is given in **Annexure–3A.** Scheme-wise, quarter-wise distribution of approved plan funds and actual expenditure for the years 2014-15 are given in **Annexures-3B.** Scheme-wise, month-wise distribution of approved plan funds and actual expenditure for 2013-14 are given in **Annexures-3C.**

2. FSP WORK (FS 2014-15):

The current field season programme has been formulated in tune with the departmental priorities as per the XII plan document, taking into consideration the recommendations of the State Geological Programming Boards and the decisions taken by the SRC and Term Review committees with the final approval of the Central Geological Programming board.

Under Mission-I, 12 STM items and 43 GCM items are under execution as against 11 STM items and 31GCM items carried out during FS 2013-14. Four items of GPM, 27 items of Marine and Coastal Surveys and one Geomorphological and lineament mapping item under RS Division are being carried out during the current field season 2014-15.

Under Mission - II, a total of 39 mineral investigations (under Mission-IIA- 32 items & Mission-IIB-7 items) have been taken up during the ongoing field season as against 34 items carried out during FS 2013-14. Out of these; 4 investigations are for PGE, 8 for gold, 5 for diamond, 3 for Basemetal, 4 for Iron ore, 1 each for chromite, Tungsten, Dunite and Graphite besides, 7 for coal/lignite and 4 for REE. One service item of maintenance of Diamond Processing plant at Wajrakarur under Mission ï II is continued during the current Field Season. Among these, 31 are under G-4 stage, 8 are under G-3 stage

State-wise break up of investigations taken up for different mineral commodities are given in Table-11.

Under Mission - III, 34 items (Geodata/Geoinformatics-21 (8 standard & 13 Service Items), 12 MCPI(5 standard & 7 Service items), Publication-1) are taken up during the current field season. It includes Integration of geological, geochemical, geophysical, aero-geophysical and remote sensing data of 57F and 57E degree sheets. Preparation o 1:50K print ready RGB layouts as a link up item with the M&C Division of Southern Region. And one service item on OCBIS link item with Geodata CHQ.

Under Mission - IV, a total of 35 items (under Mission-IVA ï 15 (10 standard & 5 service items, Mission IVB- 20 (19 standad & 1 service item)) encompassing geotechnical evaluation and water resource development projects, earthquake geology and landslide investigations, and research projects under Petrology, Palaeontology, geophysics, M & CSD, PPOD, Bangalore and Quaternary & Environmental Geology have been undertaken during the field season 2014-15. The work of Engineering Geology Division is spaced round the year and largely the programmes are sponsored and taken up on payment basis.

Under Mission ï V, 8 training programmes have been envisaged under Regional Training Institute, SR to be conducted during FS 2014-15.

I. FIELD ITEMS IN TRIBAL AREAS:

Details of investigations taken up in Tribal areas during the field season 2014-15 in Southern Region

i). The list of items proposed to be taken up during the FS 2014 ï 15 falling in Tribal Areas are furnished below:

MISSION – I

SU: Andhra Pradesh & Telangana

1. Specialised Thematic Mapping of the Granite- Greenstone and Gneiss- Granulite Terrain in Palkurti-Torur-Mahabubabad-Panditapuram area ,Parts of Warangal and Khammam districts, Andhra Pradesh (STM/SR/AP/2014/003 TS Nos.56 O/6,10 & 14 , 65C/1,2 & 3)
2. Specialised thematic mapping of the Pakhal sediments in parts of Khammam & Warangal districts, Andhra Pradesh (STM/SR/AP/2014/002 TS Nos. 65 C/1&5)
3. Geochemical mapping in parts of Mahaboobnagar and Ranga Reddy districts, Andhra Pradesh (Toposheet no. 56H/9, Parts of 56L/4) (Code No.:GCM/SR/AP/2014/019)
4. Geochemical mapping in parts of Mahaboobnagar district, Andhra Pradesh (Toposheet no. 56H/10, Parts of 56L/4) (Code No.:GCM/SR/AP/2014/020
5. Geochemical mapping in parts of Mahaboobnagar and Ranga Reddy districts, Andhra Pradesh (Toposheet no. 56H/13, Parts of 56L/4) (Code No.:GCM/SR/AP/2014/021)
6. Geochemical Mapping In Parts Of Mahaboobnagar District, Andhra Pradesh (Toposheet no. 56H/14, Parts of 56L/4) (Code No.:GCM/SR/AP/2014/022)

SU: Karnataka & Goa: Nil

SU: Tamil Nadu & Puducherry : Nil

SU: Kerala:

7. Study on the sanukitoid type rocks and structure in the western extension of Palghat-Cauvery Lineament and its geological implications, Palakkad district, Kerala (STM / SR / KRL / 2014 / 010, TS Nos.58 B/9 & 10)

8. Study of geology of the óPeriyar Lineamentô around Malayattur ï Kotamangalam - Neriyamangalam area, Ernakulam and Idukki districts, Kerala. (STM / SR / KRL / 2013 / 03, TS Nos.58 B/12, 58 C/ 9 & 13)

MISSION – II

SU: Andhra Pradesh & Telangana

9. Search for kimberlite/lamproite in Jadcherla-Yeljal block in Mahabubnagar, Ranga Reddy and Hyderabad districts, Andhra Pradesh (Code No. ME / SR / AP / 2013 / 038, T S Nos. 56 l/1&5)
10. Preliminary investigation for coal in Sirpur-Sitanagar area, eastern part of Sirpur-Kagaznagar exploration block, Godavari valley coalfield, Adilabad district Andhra Pradesh (Code No. ME / SR / NEnr /AP / 2014 /082, T S Nos. 56 M /11)

SU: Karnataka & Goa: Nil

SU: Tamil Nadu & Puducherry : Nil

SU: Kerala: Nil

I. Field Supervision:

The performances of field officers and achievements of field targets are being regularly pursued and guided by the supervisory officers in the field as well as at headquarters. The work progress are evaluated and discussed in OAC and RAC meetings. Number of field visits and stay of supervisory officers ï project wise is given in the table below:

GEOLOGICAL SURVEY OF INDIA

Southern Region

Field days of the Supervisory officers (Director / Suptd. Geologist) MONTH: April to March., 2015 F S 2014-15

S. No.	Name & Designation	Item No.	Mission	First Field departure date	Field Initiation Date	April 13	May 13	June 13	July 13	Aug 13	Sep 13	Oct 13	Nov 13	Dec 13	Jan. 14	Feb.14	March, 2014	Cumulative Field visit days item wise	Total field visit days	Total No. of visits	Remarks
1	Dr. S.K. Mitra, Director	STM/SR/AP/2014/001	M-I			0	Retired on 30-04-2014											0			
		STM/SR/AP/2014/002	M-I			0												0			
		STM/SR/AP/2014/003	M-I			0												0			
		STM/SR/AP/2014/004	M-I			0												0			
2	S.M.K. Kazimi, Director	STM/SR/AP/2014/001	M-I			0	0	0	0	0	0	0	0	0	1	4	0	5	27	2	
		STM/SR/AP/2014/002	M-I			0	0	0	0	0	0	0	0	4	0	3	0	7		2	
		STM/SR/AP/2014/003	M-I			0	0	0	0	0	0	0	0	2	0	2	0	4		2	
		STM/SR/AP/2014/004	M-I			0	0	0	0	0	0	0	0	0	0	0	0	0		0	
		STM/SR/AP/2014/005	M-I			0	0	0	0	0	0	0	3	0	0	0	0	3		1	
		ME/SR/AP/2014/057	M-II			0	0	0	0	0	0	0	3	0	0	0	5	8		2	
3	Surendra Prasad, Director	GCM/SR/AP/2014/011	M-I			0	0	0	0	0	0	0	0	3	2	1	5	11	53	4	
		GCM/SR/AP/2014/012	M-I			0	0	0	0	0	0	0	0	4	2	1	4	11		4	
		GCM/SR/AP/2014/013	M-I			0	0	2	4	0	0	5	0	4	0	0	0	15		4	
		GCM/SR/AP/2014/014	M-I			0	0	1	5	0	0	6	0	0	2	1	0	15		5	
		GCM/SR/AP/2014/016	M-I			0	0	3	0	0	0	0	5	0	0	1	0	9		3	
		GCM/SR/TNG/2014/117													0	1	0	1		1	
5	T.L. Shitiri, Director	GCM/SR/AP/2014/015	M-I			0	0	0	0	0	0	0	6	7	0	0	0	13	69	2	
		GCM/SR/AP/2014/017	M-I			0	0	0	0	0	2	3	7	7	0	0	0	19		4	

		GCM/SR/AP/2014/018	M-I			0	0	0	0	0	4	4	0	5	6	0	0	19		4	
		GCM/SR/AP/2014/019	M-I			0	0	0	0	0	2	0	8	0	0	0	0	10		2	
		GCM/SR/AP/2014/020	M-I			0	0	0	0	0	0	0	1	3	4	0	0	8		3	
6	G. Satyanarayana, Director	GCM/SR/AP/2014/021	M-I			0	0	0	0	0	0	3	0	2	0	0	0	5	31	2	
		GCM/SR/AP/2014/022	M-I			0	0	0	0	0	0	3	0	2	0	0	0	5		2	
		GCM/SR/AP/2014/023	M-I			0	0	0	0	0	0	0	6	1	1	0	0	8		3	
		GCM/SR/AP/2014/024	M-I			0	0	0	0	0	0	0	0	3	4	0	0	7		2	
		GCM/SR/AP/2014/025	M-I			0	0	0	0	0	0	0	3	2	1	0	0	6		3	
7	J.V. Rama Rao, Supdt. Geophysicist	GPM/SR/TN/2014/049	M-I			0	0	0	0	0	0	0	5	0	2	0	0	7	24	3	Joined SR on 15.05.14 on transfer
		GPM/SR/AP/2014/050	M-I			0	0	0	0	0	0	0	0	3	0	0	5	8		3	
		GPM/SR/KAR/2014/051	M-I			0	0	0	0	0	0	2	0	0	0	0	0	2		1	
		GPM/SR/AP,KAR/2014/052	M-I			0	0	0	0	0	0	0	0	0	2	0	5	7		2	
	C.B.K. Sastry, Suptd.Geophysicist	ME/SR/AP/2014/053	M-II				0	0	0	0	0	0	2	0	2	2	3	9	18	4	Joined SR on 15.05.14 on transfer
		ME/SR/AP/2014/056	M-II				0	0	0	0	0	0	2	2	2	1	2	9		5	
		ME/SR/TNP/2014/076	M-II				0	0	0	0	0	0	0	0	0	0	0	0		0	
8	K. Koteswara Rao, Director	ME/SR/AP/2014/053	M-II			0	0	0	0	0	0	4	0	0	0	0	0	4	20	1	
		ME/SR/AP/2013/038	M-II			0	0	0	0	0	0	0	5	0	2	0	0	5		2	
		ME/SR/AP/2014/054	M-II			0	0	0	0	0	0	0	0	3	0	0	0	3		1	
		ME/SR/AP/2012/049	M-II	25.06.2014		0	0	3	0	0	0	0	0	0	0	0	0	3		1	
		ME/SR/AP/2013/039														3	0			1	
		SER/SR/AP/2014/004	M-II			0	0	0	0	0	0	0	0	0	0	0	0	0		0	
9	T. Rajkumar, Director	ME/SR/AP/2013/039	M-II			0	0	0	0	0	0	0	0	2	Transferred			2	10		
		ME/SR/AP/2014/058	M-II	12.07.2014		0	0	0	2	0	0	0	0	3				5		1	
		ME/SR/AP/2014/059	M-II			0	0	0	0	0	0	3	0	0				3			

10	M. Sambi Reddy, Director	ME/SR/AP/2014/055	M-II	23.07.2014		0	0	0	2	0	1	2	2	1	0	0	0	8	33	5	
		ME/SR/AP/2014/056	M-II			0	0	0	0	0	2	3	3	0	0	0	0	8		4	
		ME/SR/AP/2014/060	M-II			0	0	0	0	2	0	3	0	3	0	0	0	8		3	
		ME/SR/AP/2014/061	M-II			0	0	0	0	0	2	0	2	3	2	0	0	9		4	
11	S. Anandamurthy, Director	ME/SR/NEnR/2014/082	M-II			0	0	0	0	0	0	0	0	0	5	0	0	5	20	1	
		ME/SR/NEnR/2014/083	M-II			0	0	0	0	0	0	0	0	0	2	0	0	2		1	
		ME/SR/NEnR/2013/055	M-II			0	0	5	0	0	0	0	0	0	3	0	0	8		3	
		ME/SR/NEnR/2014/084	M-II			0	0	0	0	0	0	0	0	0	5	0	0	5		2	
		ME/SR/NEnR/2014/085	M-II			0	0	0	0	0	0	0	0	0	0	0	0	0		0	
		ME/SR/AP/2014/059	M-II													0	0	0		0	
		ME/SR/AP/2014/058	M-II													0	0	0		0	
12	B.K. Bhandaru, Director	EG/C/SR/HQ/2014/089	M-IV	17.04.2014		3	1	5	4	0	3	2	0	0	0	0	5	23	23	9	
13		SEI/SR/HQ/2014/098	M-IV			0	0	0	0	0	0	0	0	0	0	4	0	4	4	4	
		SER/SR/HQ/EQG/2014/030	M-IV			0	0	0	0	0	0	0	0	0	0	0	0	0		0	
14	J.S. David, Director	RP/SR/HQ/2014/099	M-IV			0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	
		RP/SR/HQ/2014/100	M-IV			0	0	0	0	6	0	0	0	0	0	0	0	0		1	
15	A.R.V.Choudhary, Director	RP/SR/HQ/2013/066	M-IV			0	0	0	Retired on 30-06-2014												
		RP/SR/HQ/2014/0\107	M-IV			0	0	0													
16	P. Ashok Kumar, Director	RP/SR/HQ/2013/066	M-IV						0	0	0	0	4	0	0	0	0	4	8	1	
		RP/SR/HQ/2014/0\107	M-IV						0	0	0	0	0	4	0	0	0	4		1	
16	A. Natarajan, Director	STM/SR/KG/2014/006	M-I	11.4.2014		0	0	0	0	0	0	0	3	0	0	0	2	5	26	2	
		STM/SR/KG/2014/007	M-I	11.4.2014		0	0	0	0	0	0	3	0	0	0	0	2	5		2	
		GCM/SR/KG/2014/026	M-I	11.4.2014		0	0	0	0	0	0	0	1	0	0	0	2	3		2	
		GCM/SR/KG/2014/027	M-I	11.4.2014		0	0	0	0	0	0	0	1	3	0	0	3	7		3	
	A. Natarajan, Director (from 17.06.2014)	GCM/SR/KG/2014/032	M-I	11.4.2014				0	0	0	0	0	1	3	0	0	2	6		3	
17	V.P. Sharma,	GCM/SR/KG/2014/028	M-I	11.4.2014		0	0	0	0	0	0	0	2	0	3	3	0	8	31	3	

	Director	GCM/SR/KG/2014/029	M-I	11.4.2014		0	0	0	0	0	0	0	1	0	0	3	0	4		2	
		GCM/SR/KG/2014/030	M-I	11.4.2014		0	0	0	0	0	0	0	1	2	0	1	0	4		3	
		GCM/SR/KG/2014/031	M-I	11.4.2014		0	0	0	0	0	0	0	1	0	0	2	0	3		2	
	V.P. Sharma, Director (from 17.06.2014)	GCM/SR/KG/2014/033	M-I	11.4.2014				0	0	0	0	0	1	2	2	0	0	5		3	
		GCM/SR/KG/2014/034	M-I	11.4.2014				0	0	0	0	0	2	3	2	0	0	7		3	
18	Shafeeq Ahmed, Director	GCM/SR/KG/2014/032	M-I	11.4.2014		0	0	0	Retired on 30-06-2014									0		0	
		GCM/SR/KG/2014/033	M-I	11.4.2014		0	0	0										0		0	
		GCM/SR/KG/2014/034	M-I	11.4.2014		0	0	0										0		0	
19	K. Basavaraja, Director	GCM/SR/KG/2014/035	M-I	11.04.2014		0	0	0	0	0	0	0	0	3	0	0	0	3	36	1	
		GCM/SR/KG/2014/036	M-I	11.4.2014		0	0	0	0	0	0	0	2	3	3	0	3	11		4	
		ME/SR/KG/2014/067	M-II	11.4.2014		0	0	0	7	0	1	0	2	0	2	0	0	12		4	
		ME/SR/KG/2014/065	M-II	3.12.2014												2	0	2		1	
		ME/SR/KG/2014/066	M-II	3.12.2014												1	0	1		1	
		ME/SR/KG/2014/071	M-II	3.12.2014												3	0	3		1	
		ME/SR/KG/2014/068	M-II	11.04.2014		0	0	0	0	0	1	1	1	0	1	0	0	4		4	
	K. Basavaraja, Director (from 17.06.2014)	ME/SR/KG/2014/074	M-II	11.4.2014				0	0	0	0	0	0	0	0	0	0	0		0	
20	Neeharika Jha, Director	GCM/SR/KG/2014/037	M-I	11.04.2014		0	0	0	0	0	0	2	0	1	2	0	1	6	12	4	
		GCM/SR/KG/2014/038	M-I	11.4.2014		0	0	0	0	0	0	1	2	0	2	0	1	6		4	
21	Dr. S.S.Nayak, Director	ME/SR/KG/2014/063	M-II	11.4.2014		0	0	0	0	0	0	0	1	2	0	0	0	3	8	2	
		ME/SR/KG/2014/064	M-II	11.4.2014		0	0	0	0	0	0	0	1	2	0	2	0	5		3	
22	Subir Das Gupta, Director	ME/SR/KG/2014/065	M-II	11.4.2014		0	4	0	6	1	3	0	1	2	0	0	0	17	24	6	
		ME/SR/KG/2014/066	M-II	11.4.2014		0	0	0	0	2	2	0	1	2	0	0	0	7		2	
		ME/SR/KG/2014/071	M-II	11.4.2014		0	0	0	0	0	0	0	0	0	0	0	0	0		0	
23	Dr.H.S.M. Prakash, Director	ME/SR/KG/2014/069	M-II	11.4.2014		0	0	0	0	0	0	0	2	0	1.5	1	0	4.5	17	3	
		ME/SR/KG/2014/070	M-II	11.4.2014		0	0	0	0	0	0	0	0	0	0.5	3	0	3.5		2	
		ME/SR/KG/2014/072	M-II	11.4.2014		0	0	0	0	0	0	0	2	0	2	1	0	5		3	

		ME/SR/KG/2014/073	M-II	11.4.2014		0	0	0	0	0	0	0	0	0	2	2	0	4		2	
	Dr.H.S.M. Prakash, Director (from 17.06.2014)	ME/SR/KG/2014/075						0	0	0	0	0	0	1	2	0	0	3			
24	C.G.Hemantha Kumar, Director	ME/SR/KG/2014/074	M-II			0	0	0	Promoted to Dy.D.G & transferred to WR												
		ME/SR/KG/2014/075	M-II			0	0	0													
25	K.V. Maruthi, Superintending Geologist	LSM/SR/KG/2014/094	M-IV	11.4.2014		0	0	0	0	0	0	2	1	3	3		3	12	12	5	
		LSM/SR/KG/2014/095	M-IV	11.4.2014		0	0	0	0	0	0	0	0	0	0		0	0		0	
		LHZ/SR/KG/2014/028	M-IV	11.4.2014		0	0	0	0	0	0	0	0	0	0		0	0		0	
	C. Parthsarathi	GCM/SR/KG/2014/112	M-I	3.12.2014										0	5		0	5	5	1	
	K. Raju	GCM/SR/KG/2014/113	M-I	3.12.2014										0	8		0	8	8	1	
26	J.N. Das,Director	RP/SR/HQ/2013/065	M-IV			0	0	0	0	0	0	0	0		Promoted to DDG and transferred			0	5		
		RP/SR/HQ/2014/105	M-IV			0	0	0	0	0	0	0	0					0			
		RP/SR/HQ/2014/106	M-IV			0	0	5	0	0	0	0	0					5		2	
27	R.P. Nagar, Director	RP/SR/HQ/2014/101	M-IV			0	0	0	0	4	0	0	0	0	0	0	0	4	11	1	
		RP/SR/HQ/2013/065	M-IV			0	0	0	0	0	0	0	0		0	0	0	0		0	
		RP/SR/HQ/2014/102	M-IV			0	0	0	0	3	4	0	0		0	0	0	7		2	
28	Subhashish Ghosh, Superintending Geologist	RP/SR/HQ/2014/103	M-IV			0	0	0	0	10	0	0	0		0	0	4	14	37	2	
		RP/SR/HQ/2014/104	M-IV			0	0	0	0	0	0	0	10		0	0	13	23		1	
29	Dr.S. Raju, Director	STM/SR/TNP/2013/002	M-I			0	0	0	0	0	0	0	5	0	0	0	0	5	26	0	
		STM/SR/TNP/2014/008	M-I			0	0	0	0	0	6	1	3	0	0	3	0	13		4	
		STM/SR/TNP/2014/009	M-I			0	0	0	0	0	0	0	0	4	0	4	0	8		2	
	R Baskar, Director	STM/SR/TNP/2013/002	M-I											3	2	2	0	7	7	3	
30	N. Maran, Director	GCM/SR/TNP/2014/039	M-I			0	0	0	0	0	0	0	3	4	0	0	0	7	8	2	
		GCM/SR/TNP/2014/043													1	0	0	1		1	
31	S. Rajakrishnan,	GCM/SR/TNP/2014/040	M-I			0	0	0	0	0	2	0	3	4	0	0	0	9	27	1	

	Supdt. Geologist	GCM/SR/TNP/2014/042	M-I			0	0	0	0	0	2	0	3	3	0	0	0	8		1	
		GCM/SR/TNP/2014/046	M-I			0	0	0	0	0	2	0	4	4	0	0	0	10		1	
32	V. Srinivasan, Director	GCM/SR/TNP/2014/041	M-I			0	0	3	0	0	1	0	3	3	Transferred on promotion			10	17	2	
		GCM/SR/TNP/2014/043	M-I			0	0	0	0	0	0	2	2	0				4			
		GCM/SR/TNP/2014/045	M-I			0	0	0	0	0	0	2	1	0				3			
33	T. Mullaivendhan, Director	GCM/SR/TNP/2014/044	M-I			0	0	0	0	0	0	3	1	3	3	2	0	12	37	5	
		ME/SR/TNP/2014/078	M-II			0	2	1	1	2	3	0	3	2	1	2	3	20		10	
		ME/SR/TNP/2014/079	M-II			0	1	0	0	0	0	1	2	1	0	0	0	5		4	
34	S. Sekhar, Director	ME/SR/TNP/2014/076	M-II			0	0	0	0	0	0	0	0	0	0	0	0	0	15	0	
		ME/SR/TNP/2014/077	M-II			0	0	0	0	0	0	0	0	0	0	0	0	0		0	
		ME/C/SR/NEnR/2010/035	M-IIB						2	0	2	2	3	3	0	3	0	15		6	
35	S. Singanenjam, Director(w.e.f.10.06.2014)	ME/SR/TNP/2014/076	M-II						0	3	0	2	3	3	0	3	0	0	14	5	

		GCM/SR/TNP/2014/045	M-I												1	2	0	2		2	
	R Vijaya Kumar (w.e.f.10.06.2014)	ME/SR/TNP/2014/077	M-II						0	0	0	3	0	4	0	2	2	11	32	4	
		ME/SR/TNP/2014/079	M-II						0	4	6	0	4	0	1	3	1	19		6	
36	R. Srinivasan, Director	ME/SR/TNP/2013/053	M-II			0	0	0	0	2	0	2	5	2	2	0	0	13		1	
37	K. Baskaran, Director (Retd)	ME/C/SR/NEnR/2010/035	M-IIB			0	3	3	0	0	0	2	0	2	0	0	0	10	14	4	
		ME/C/SR/NEnR/2014/086	M-IIB			0	0	0	0	0	0	2	0	2	0	0	0	4		2	
38	K. Jayabalan, Director	EG/C/SR/TNP/2014/090	MIV			0	0	0	Transferred w.e.f 1.7.2014												
		NLSM/SR/TNP/2014/091	MIV			0	0	0													
		EWS/SR/TNP/2014/092	MIV			0	0	0													
		LS/SR/TNP/2014/093	MIV			0	0	0													
		LS/SR/TNP/2014/027	MIV			0	0	0													
	B K. Bhandaru, Director (w.e.f. 01.07.2014)	EG/C/SR/TNP/2014/090	MIV					0	0	0	0	0	0	0	0	0	0	0			
		NLSM/SR/TNP/2014/091	MIV					0	0	0	0	0	0	0	0	0	0	0			
		EWS/SR/TNP/2014/092	MIV					0	0	0	0	0	0	0	0	0	0	0			
		LS/SR/TNP/2014/093	MIV					0	0	0	0	0	0	0	0	0	0	0			
		LS/SR/TNP/2014/027	MIV					0	0	0	0	0	0	0	0	0	0	0			
39	P.C.D. Mony, Superintending Geologist	EG/C/SR/TNP/2014/090	M-IV	01.04.2014		3	2	0	Transferred									5	5	2	
40	R. Srinivasan, Superintending Geologist	NLSM/SR/TNP/2014/091	M-IV			0	0	0	3	0	3	0	4	0	0	0	0	10	22	3	
		EWS/SR/TNP/2014/092	M-IV			0	0	0	0	2	6	0	0	0	0	0	0	8		2	
		LS/SR/TNP/2014/093	M-IV			0	0	0	0	0	0	0	4	0	0	0	0	4		1	
		LS/SR/TNP/2014/027	M-IV			0	1	0	2	0	0	0	0	0	0	0	0	3		2	
41	M. N. Praveen, Superintending Geologist	STM/SR/KRL/2014/010	M-I			0	0	0	0	0	0	0	3	1	0	2	0	6	18	3	on tour to Australia for training
		STM/SR/KRL/2013/03	M-I			0	0	0	0	0	0	0	0	3	0	0	0	3		0	
		ME/SR/KRL/2014/080	M-II			0	0	0	0	0	0	0	2	0	0	2	0	4		2	
		ME/SR/KRL/2014/081	M-II			0	0	0	0	0	0	0	2	3	0	0	0	5		2	

42	M. Suresh Chandran, Director	GCM/SR/KRL/2014/047	M-I			0	0	0	0	0	0	2	0	3	2	1	0	7	15	3	
		GCM/SR/KRL/2014/048	M-I			0	0	0	0	0	0	2	0	2	2	1	0	7		4	
		Parks & Museum and other items				0	0	0	0	1	0	0	0	0	0	0	0	1		1	
43	C. Thanavelu, Director	EG/C/SR/KRL/2014/096	M-IV			0	4	4	2	0	0	2	0	2	0	2	0	16	26	6	
		LSM/SR/KRL/2014/097	M-IV			0	0	0	0	0	0	0	0	3	0	5	0	8		2	
		LHZ/SR/KRL/SER/ 2014/029	M-IV			0	0	0	0	0	0	0	0	0	0	0	0	0		0	
		Parks & Museum and other items	M-IV			0	0	0	1	1	0	0	0	0	0	0	0	2		2	
44	P. S. Anil Kumar, Director	STM/SR/KRL/2013/03	M-I									3	0	0	0	0	0	3	5	1	
		Parks & Museum and other items	M-IV			0	0	0	1	1	0	0	0	0	0	0	0	2		2	
45	K.R. Pillai, Superintending Geologist	RP/SR/MCSD/2014/108	M-IV			0	0	0	0	0		0	0	0	0	0	0	0			

III. RCA Management:

RCA is closely monitored and managed for timely disbursement and recoupment. RCA pendency statement is regularly being forwarded to the Director (Finance-Monitoring), Director Generalós camp office, New Delhi and Dy. Director General (IT), CHQ, Kolkata for uploading on to the portal.The current status of RCA disbursement and recoupment (as on 05.4.2015) are presented in the table given below. The total expenditure along with itemwise calculation of per day expenditure are presented in Annexure-4.

GEOLOGICAL SURVEY OF INDIA												
STATE UNIT : TELANGANA & ANDHRA PRADESH ,SOUTHERN REGION, HYDERABAD.												
STAUS OF RCA & PENDENCY OF RCA BILLS UPTO 31.03.2015												
S.No.	Name & Designation	FSP Item No.	RCA Head	RCA Amount Sanctioned with Date		Bills Submitted & Recouped			Bills for final adjustment			challan no. date
				Amount	Disbursement Date	Recoupment amount	Recoupment date	Bills Submitted to Office date	Amount	advance	balance amount	
1	2	3	4	5		6		7	8	9	10	11
Mission -I												
1	ujjal paul		wages	35000	23.05.2014	15930	9.3.2015	11.3.2015	34515	35000	485	no.29, 31.03.15
			OC	15000	23.05.2014	6163	9.03.2015	12.03.2015	14915	15000	85	30, 31.03.2015
2	Sandhya D Kuthe	NGCM -014	Wages	35000	2.06.2014				35000	35000	nil	nil
			OC	15000	02.06.2014				15000	15000	nil	nil
3	Prathana Das	NGCM -013	Wages	35000	23.05.2014				34810	35000	190	27, 04.03.15
			OC	15000	23.05.2014				14995	15000	5	16, 17.03.15
4	Dinesh Meshram	NGCM -016	Wages	35000	23.05.2014	8850	09.03.2015	12.03.2015	35000	35000		nil
			OC	15000	23.05.2014	1127	16.03.2015	17.03.2015	15000	15000		nil
5	Satya Pal	STM-001	Wages	30000	24.06.2014	3440	09.03.2015	12.03.2015	35000	35000		nil
			POL	10000	24.06.2014	2000	09.03.2015	12.03.2015	10000	10000		nil
			OC	10000	24.06.2014	845	09.03.2015	12.03.2015	10000	10000		nil
6	Sankha Das	STM-005	Wages	30000	14.08.2014				28025	30000	1975	30, 18.03.2015
			POL	10000	14.08.2014	9738	10.03.2015	12.03.2015	4787	10000	5213	20, 17.03.2015

			OC	10000	14.08.2014				10000	10000	nil	
7	Tushar M Meshram	STM-003	Wages	30000	14.08.2014	6575	05.03.2015	06.03.2015	29985	30000	15	15, 24.03.2015
			POL	10000	14.08.2014				9950	10000	50	14, 24.03.2015
			OC	10000	14.08.2014	4202	04.03.2015	05.03.2015	10000	10000	nil	nil
8	Debapriya Adhikari	STM-002	Wages	30000	14.08.2014	4130	10.03.2015	12.03.2015	29205	30000	795	26, 11.03.2015
			OC	10000	14.08.2014	5000	10.03.2015	12.03.2015	9708	10000	292	25, 11.03.2015
						1480	09.02.2015	05.02.2015				
			POL	10000	14.08.2014	4035	10.03.2015	12.03.2015	9181	10000	819	27, 11.03.2015
						5211	10.03.2015	12.03.2015				
9	Rajani G. Dharme	STM-004	Wages	30000	26.08.2014				29950	30000	50	28, 12.3.2015
			OC	10000	26.08.2014				10000	10000	nil	
			POL	10000	26.08.2014				9930	10000	70	29, 12.3.2015
10	Arvind Kumar Singh	NGCM-017	Wages	35000	11.08.2014				34810	35000	190	16, 11.3.2015
			OC	10000	11.08.2014				13343	15000	1657	18, 11.3.2015
11	R.R. Swain	NGCM-023	Wages	35000	11.08.2014	13050	9.3.2015	12.3.2015	31900	35000	3100	17, 12.3.2015
			OC	15000	11.08.2014	5882	9.3.2015	12.3.2015	11555	15000	3445	16, 18.3.2015
12	Madhusmitha Swain	NGCM-018	Wages	35000	11.08.2014	1770	17.3.2015	19.3.2015	34810	35000	190	33, 18.3.2015
			OC	15000	11.08.2014	5000	9.3.2015	12.3.2015	12559	15000	2441	36, 18.3.2015
13	Vaishnavi P Sambre	NGCM-021	Wages	35000	14.08.2014	3540	9.3.2015	12.3.2015	34810	35000	190	32, 18.3.2015
						5015	17.3.2015	19.3.2015				
			OC	15000	14.08.2014				11228	15000	3772	39, 18.3.2015

14	Divya M.P.	NGCM -022	Wages	35000	11.08.2014				34810	35000	190	24, 11.3.2015
			OC	15000	11.08.2014				14932	15000	68	23, 11.3.2015
15	Priya R	NGCM -025	Wages	35000	14.08.2014				34810	35000	190	21, 12.2.2015
			OC	15000	14.08.2014				12562	15000	2438	20, 12.2.2015
16	Parvathi R Krishnan	NGCM -019	Wages	35000	14.08.2014				34810	35000	190	34, 18.3.2015
			OC	15000	14.08.2014				15000	15000	nil	
17	Poornima Sreedhar	NGCM -015	Wages	35000	7.10.2014	8850	9.3.2015	12.3.2015	31565	35000	3435	38, 18.3.2015
			OC	15000	7.10.2014				14445	15000	555	35, 18.3.2015
18	Reena Mishram	NGCM -020	Wages	35000	29.09.2014				35000	35000	nil	
			OC	15000	29.09.2014				15000	15000	nil	
19	Sini Raj	NGCM -011	Wages	35000	11.12.2014				35000	35000	nil	
			OC	15000	11.12.2014				15000	15000	nil	
20	Binod Kumar	NGCM -012	Wages	35000	11.12.2014	8850	4.3.2015	5.3.2015	35000	35000	nil	
						2360	24.3.2015	24.3.2015				
			OC	15000	11.12.2014				15000	15000	nil	
21	Samreen Shaik	NGCM -012	Wages	35000	11.12.2014				35000	35000	nil	
			OC	15000	11.12.2014				15000	15000	nil	
22	Wasim Akram	NGCM -011	Wages	35000	18.11.2014	2655	24.3.2015	24.3.2015	35000	35000	nil	
			oc	15000	18.11.2014				15000	15000	nil	
23	Lakshmi Mehera	NGCM	wages	35000	17.12.2014	2065	24.3.2015	24.3.2015	35000	35000	nil	
			OC	15000	17.12.2014				15000	15000	nil	

24	K.K.Behera		NRCA	30000	7.1.2015				21015	30000	8985+183(PI)	13,15,17,20,21,22 dt.25.3.2015
Mission II												
1	Sujeet Kumar Dwivedi	COAL-083	wages	40000	05-06-2014				40000	40000	nil	
			pol	10000	05-06-2014					10000		18, 12.2.2015
			Oc	10000	05-06-2014				10000	10000	nil	
			ACA	9000	20.2.2015				9000	9000	nil	
2	Praveer Pankaj		wages	40000	05-06-2014	5025	4.3.2015	5.3.2015	39955	40000	45	22, 16.3.2015
			POL	10000	05-06-2014	7900	4.3.2015	5.3.2015	9000	10000	1000	23, 16.3.2015
			Oc	15000	6/5/204	7320	4.3.2015	5.3.2015	15000	15000	nil	
						4137	09.02.2015	29.01.2015				
			ACA	85411	17.12.2014				85411	85411	nil	
3	Praseetha Sugathan		wages	35000	05-06-2014				34810	35000	190	31.3.2015
			Oc	10000	05-06-2014	9030	9.3.2015	11.3.2015	10000	10000	nil	
			pol	10000	05-06-2014	5930	10.3.2015	11.3.2015	10000	10000	nil	
4	Dr. Vikash Tripathy		wages	35000	05-09-2014					35000		16, 12.2.2015
			Oc	10000	05-09-2014					10000		17, 12.2.2015
			pol	10000	05-09-2014	600	2.3.2014	4.3.2015	600	10000	9400	19, 12.2.2015
5	Diganta Barman	COAL-085	Tribal	35000	06-05-2014	4567	4.3.2015	9.3.2015	35000	35000	nil	
6	Bhushan D Kuthe		Tribal	40000	05-09-2014				40000	40000	nil	
7	Amit D Bhimte	COAL-082	Tribal	40000	06-05-2014				40000	40000	nil	

8	Sonali Rath		Tribal	40000	05-09-2014				40000	40000	nil	
9	Shraddha Nannawa re		Tribal	60000	23.5.2014				57496	60000	2504	37, 18.3.2015
10	Rakesh Kumar Gupta	IRON ORE-058	Wages	40000	20-06-2014				38196	40000	1804	18, 17.3.2015
			OC	10000	20-06-2014	8850	9.3.2015	11.3.2015	8233	10000	1767	17, 17.3.2015
			POL	10000	20-06-2014	4000	10.3.2015	11.3.2015	7125	10000	2875	19, 17.3.2015
11	B.J. Barman	IRON ORE-058	Wages	40000	25-06-2014	31585	9.3.2015	11.3.2015	39520	40000	480	18, 25.3.2015
			OC	10000	25-06-2014	6175	18.3.2015	20.3.2015	10000	10000	nil	
						4688	18.3.2015	20.3.2015				
			POL	10000	25-06-2014	4553	18.3.2015	20.3.2015	6635	10000	3365	17, 26.3.2015
12	Suhel Ahmed		ACA	37500	17.12.2014				37500	37500	nil	
13	N.Nandh a Gopal		NRCA	10000	4.2.2015				10000	10000	nil	24, 16.3.2015
14	Md.Zuhai b Siddiqui		NRCA	20000	16.1.2015				20000	20000	nil	
15	M.Thiru murugan		Tribal	60000	07-11-2014	26400	9.3.2015	11.3.2015	59355	60000	645	26, 27.3.2015
						26400	9.3.2015	11.3.2015				
						2800	27.3.2015	27.3.2015				
						2520	31.3.2015	31.3.2015				
16	Bhaskar Jyoti Gogoi		wages	45000	21.08.2014				41440	45000	3560	31, 18.3.2015
			Oc	15000	21.8.2014				13457	15000	1543	29, 11.3.2015
17	Kiran Jyoti Misra	REE-061	Wages	45000	14-08-2014				28560	45000	16440	31, 2.3.2015

			OC	15000	14-08-2014				10229	15000	4771	32, 2.3.2015
18	Rohit V Gajbhiye	GOLD-053	Wages	40000	14-08-2014				39880	40000	120	18, 25.3.2015
			OC	10000	14-08-2014				9933	10000	67	16, 25.3.2015
			POL	10000	14-08-2014				7783	10000	2217	19, 23.3.2015
19	Sufija M V	DIAMOND-054	Wages	40000	01.09.2014	14855	4.3.2015	9.3.2015	39825	40000	175	24, 27.3.2015
			OC	10000	11.08.2014	9342	4.3.2015	9.3.2015	9974	10000	26	23, 27.3.2015
						9756	9.3.2015	11.3.2015				
						9876	30.3.2015	30.3.2015				
			POL	10000	11.08.2014	9570	4.3.2015	9.3.2015	9732	10000	268	28, 27.3.2015
						9871	30.3.2015	30.3.2015				
20	P Hari Krishna		ACA	5000	11.3.2015				5000	5000	nil	

SU:KG, GEOLOGICAL SURVEY OF INDIA

STATUS OF R.C.A. IN R/O KARNATAKA & GOA FOR THE F.S.P. 2014 - 2015

Status of RCA FSP 2014-2015 for the month of MARCH 2015 (period from 1-3-2015 to 31-3-2015)

	Name & Designation of the Officer	FSP item no.	RCA (HEAD)	RCA amount Sanctioned with date	Bills	pending	Submitted	and	for	recoupment
				Rs.	Recoupment Amount	Amount	Recoupment date	Bill Submited to Office date	Balance inhand with officer	Bills pending with PAO date
		2	3	4	5	8	6	7	9	10
	S/Shri/Smt.	**IRCA for FSP 2014-15**								
1	Bijay kumar	Project :Gold - I Block G		-			-			
	Geologist	Tumkur District	M E	**55,000/-**						
		ME/SR/KG/2014/65	WAGES	40000	29,559	10441	4.3.2015.	25.2.2015		
		ME/Mission - II	POL	5000	6,270	-1270	27.3.2015.	17.3.2015.	Amt.drawn, Final Adj.made	
			O.C.	10,000						
2	Ragikrishna R Geologist	Project:Gold - II Block - H	ME	**45,000/-**						
		ME/SR/KG/2014/095.Tumkur Dist.	WAGES	30,000	28,887	1113	4.3.2015.	25.2.2015		
		ME/ Mission - II	POL	5,000	4,000	1000	4.3.2015.	25.2.2016		
			O.C.	10,000						
3	Paradkar Trigun Trivikram	Project: NGCM-IX	S & M	**40,000/-**						
	Geologist	Koppal & Bellary & Gulbarga District	WAGES	30,000	38,688	-8688	24.3.2015.	17.3.2015.	Amt.drawn, Final Adj.made	

			O.C.	10,000	19,383	-9383	24.3.2015.	17.3.2015.	Amt.drawn, Final Adj.made	
4	Manju Anandan, Geologist	Project:STM - I, Tumkur Dist., S&M - I	S & M	**50,000/-**						
			WAGES	25,000	27,767	-2767	24.3.2015.	17.3.2015.	Amt.drawn, Final Adj.made	
			POL	15,000	19,354	-4354	24.3.2015.	17.3.2015.	Amt.drawn, Final Adj.made	
			O.C.	10,000	14,800	-4800	24.3.2015.	17.3.2015.	Amt.drawn, Final Adj.made	
5	P. Mahadevappa Geol.	Project:b Gold - III Mission - II	M.E.	**40000/-**						
			Wages	25,000	26,696	-1696	26.3.2015.	17.3.2015.	Amt.drawn, Final Adj.made	
			POL	8,000						
			O.C.	7,000	7,467	-467	26.3.2015.	17.3.2015.	Amt.drawn, Final Adj.made	
6	K.V. Neena Vaman	Project: STM - II								
	Geologist	Chamrajanagar District	S & M	**50,000/-**						
			WAGES	25,000						
			POL	15,000						
			O.C.	10,000						

7	Rupsa Mukherjee	Project :NGCM XI	S & M	**35,000**						
	Geologist	Karnataka &Anantapur district	WAGES	25,000						
			O.C.	10,000						
8	C.D. Mariyappa	Project : Gold - IV	M . E.	**50000/-**						
	Geologist	Dharwar District	WAGES	40,000						
			O.C.	10,000	10,443	-443	26.3.2015.	17.3.2015.	Amt.drawn, Final Adj.made	
9	Nimmy K.C.									
	Geologist	Project : Gold V	M E	**40000/-**						
		Shimoga District	WAGES	30,000						
			O.C.	10,000	11,419	-1419	26.3.2015.	17.3.2015.	Amt.drawn, Final Adj.made	
10	Nibin G. Tom	Project:PGE	ME	**50000/-**						
	Geologist	Hassan & Tumkur District	WAGES	25,000						
			POL	10,000						
			O.C.	15,000						
11	Athulya R.Somarajan	Proj: REE -I Gulbarga Dist.	ME	**40,000**						
	Geologist		WAGES	25,000	26,100	-1100	26.3.2015.	17.3.2015.	Amt.drawn, Final Adj.made	
			O.C.	15,000	18,210	-3210	26.3.2015.	17.3.2015.	Amt.drawn, Final Adj.made	
12	Ankur Kumar Srivastava	Project : E G Division	Mission - IV	**50,000**						

	Geologist	Shimoga & Uttar Kannada District	WAGES	15,000	15,975	-975	26.3.2015.	17.3.2015.	Amt.drawn, Final Adj.made	
			O.C.	35,000	45,345	-10345	27.3.2015.	17.3.2015.	Amt.drawn, Final Adj.made	
13	Parasuram Behera	Proj:Iron Ore - I Bagalkote Dist.	M E	**45,000/-**						
	Geologist		WAGES	25,000						
			POL	10,000						
			O C	10,000						
14	Jitendra Mahanta	Project:Diamond - I	M E	**40,000/-**						
	Geologist	Bellary & Chitrdurga District	WAGES	30,000						
			O C	10,000	11,017	-1017	24.3.2015.	17.3.2015.	Amt.drawn, Final Adj.made	
15	Laxmi Nandan Deori	Project: REE - II - Raichur District	M E	**50,000/-**						
	Geologist		WAGES	30,000	36,053	-6053	24.3.2015.	17.3.2015.	Amt.drawn, Final Adj.made	
			POL	10,000						
			O C	10,000	14,599	-4599	24.3.2015.	17.3.2015.	Amt.drawn, Final Adj.made	
16	Shashikant Sudhakar Gawade	Project: Diamond - II	M E	**40,000/-**						
	Geologist	Bellary & Chitradurga District	WAGES	30,000	30,005	-5	30.3.2015.	17.3.2015.	Amt.drawn, Final	

									Adj.made	
			O C	10,000	17,566	-7566	30.3.2015.	17.3.2015.	Amt.drawn, Final Adj.made	
17	Jayesh Chourasia	Project:GOLD -VI	ME	**50,000/-**						
	Geologist	Shimoga District	WAGES	30,000						
			POL	10,000						
			O C	10,000	11,316	-1316	30.3.2015.	17.3.2015.	Amt.drawn, Final Adj.made	
18	K.V.Chandran	Project:NGCM - I	S & M	**50,000/-**						
	Geologist	Bagaalkot &Koppal District	WAGES	30,000						
			POL	10,000						
			O C	10,000	10,689	-689	27.3.2015.	17.3.2015.	Amt.drawn, Final Adj.made	
19	Snehasis Bhattacharya	Project:NGCM - III	S & M	**40,000/-**						
	Geologist	Koppal & Raichur District	WAGES	30,000	39,853	-9853	27.3.2015.	17.3.2015.	Amt.drawn, Final Adj.made	
			O C	10,000	15,619	-5619	27.3.2015.	17.3.2015.	Amt.drawn, Final Adj.made	
20	Bapat Mangesh Surendra	Project:NGCM - V	S & M	**40,000/-**						
	Geologist	Koppal & Raichur District	WAGES	30,000	14,779	15221	2.3.2015.	25.2.2015		
			O C	10,000	10,908	-908	27.3.2015.	17.3.2015.	Amt.drawn, Final	

									Adj.made	
21	Hema Shriram Hiwrale	Project:NGCM - VI	S & M	**40,000/-**						
	Geologist	Koppal & Raichur District	WAGES	30,000	30,815	-815	27.3.2015.	17.3.2015.	Amt.drawn, Final Adj.made	
			O C	10,000	16,056	-6056	27.3.2015.	17.3.2015.	Amt.drawn, Final Adj.made	
22	Pawan Baraiud	Project:NGCM -VII	S & M	**40,000/-**						
	Geologist	Raichur & Bellary District	WAGES	30,000						
			O C	10,000	11,352	-1352	27.3.2015.	17.3.2015.	Amt.drawn, Final Adj.made	
23	Aneesh Kumar	Project:NGCM- VIII	S & M	**50,000/-**						
	Geologist	Karnataka & Kurnol District	WAGES	30,000	39,188	-9188	27.3.2015.	17.3.2015.	Amt.drawn, Final Adj.made	
			POL	10,000						
			O C	10,000	11,838	-1838	27.3.2015.	17.3.2015.	Amt.drawn, Final Adj.made	
24	Neethu T.R.	Project: NGCM X	S & M	**40,000/-**						
	Geologist	Karnataka & Andhra Pradesh	WAGES	30,000						
			O C	10,000	11,886	-1886	27.3.2015.	17.3.2015.	Amt.drawn, Final Adj.made	

25	Soumya Das	Project:NGCM - XII	S & M	**50,000/-**						
	Geologist	Karnataka & Ananthpur District	WAGES	30,000						
			POL	10,000						
			O C	10,000						
26	Resya Reghu	Project:NGCM - XIII	S & M	**40,000/-**						
	Geologist	Tumkur &Kolar & Bangalore District	WAGES	30,000	30,815	-815	23.3.2015.	17.3.2015.	Amt.drawn, Final Adj.made	
			O C	10,000	11,967	-1967	23.3.2015.	17.3.2015.	Amt.drawn, Final Adj.made	
27	Thara M	Project:NGCM - II								
	Geologist	Koppal & Gadag District	S & M	**40,000/-**						
			WAGES	30,000						
			O.C.	10,000	12,610	-2610	23.3.2015.	17.3.2015.	Amt.drawn, Final Adj.made	
28	P. Hampaiah	Project:NGCM - IV								
	Geologist	Koppal & Raichur District	S & M	**40,000/-**						
			WAGES	30,000						
			O C	10,000	14,015	-4015	27.3.2015.	17.3.2015.	Amt.drawn, Final Adj.made	
29	Anupama S	Project:Iron Ore - II								
	Geologist	Channagiri Taluk Davangere District	S & M	**40,000/-**						
			WAGES	30,000						
			O C	10,000	11,498	-1498	23.3.2015.	17.3.2015.	Amt.drawn, Final	

									Adj.made	
30	Dsilva Danira Stephen	Project: GCM/SR/KG/2014/XV	S & M	**50,000**						
	Geologist	Kolar District	WAGES	25,000						
			OC	25,000						
31	Dr.Zameer Ahmed Shah	Project: GCM/SR/KG/2014/XIV	S & M	**50,000**						
	Geologist	Kolar District	WAGES	25,000						
			OC	25,000						

GEOLOGICAL SURVEY OF INDIA													
STATUS OF RCA AND PENDENCY OF RCA BILLS OF SU :TN&P, CHENNAI AS ON 31.03.2015													
Sl. No.	**Name & Desgn. S/Shri**	**FSP Item No. (2013-14)**	**Sub-Head**	**Date of Initial RCA sanctioned**	**Initial RCA Adv. Amt**	**Date of RCA Adv. Amt recd (ECS)**	**Recoupment amt**	**Date of Recoupment (ECS)**	**Date of Submission of bill to office**	**AMT**	**Balance amount in hand with officer (6-9)**	**Date of Bills sent to PAO SRO, Hyd.**	**Remarks if any, of the project supervisor and fund status**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
MISSION – I (All items) Survey & Mapping													
1	Siddhartha Karmakar	STM/SR/TNP/2013/02	**Wages**	28.4.14	30000	7.5.14	1140	23.07.14					Officer has submitted the the final adj bill for Rs.30477/- under WAGES AND OC and refunded balane of Rs. 9523/- into Gov. a/c, vide Scroll No. 240780, dt. 13.02.15
	Geologist						7453	04.10.14					
							7710	13.11.14					
							3855	16.10.14					
							4112	27.11.14					
							3855	06.12.14					
							3855	13.01.15					
							15677	20.02.15					
			OC	28.4.14	10000	7.5.14	428	23.07.14					
							2840	13.09.14					
							5100	04.10.14					
							2661	16.10.14					
							6374	13.11.14					
							5073	27.11.14					
							1237	06.12.14					
							4305	13.01.15					
							5440	20.20.15					
2	Hrudananda Naik	STM/SR/TNP/2014/08	**Wages**	28.4.14	30000	7.5.14	1368	22.07.14					Officer has submitted the the
	Geologist						7710	04.10.14					

							29812	25.10.14					final adj bill for Rs.39721/- under WAGES AND OC and refunded balane of Rs. 279/- into Gov. a/c, vide Scroll No. 52264, dt. 06.03.15
							27499	27.11.14					
							29812	19.01.15					
							27756	16.02.15					
							18761	12.03.15					
			OC	28.4.14	10000	7.5.14	1258	04.10.14					
							5662	25.10.14					
							8269	08.12.14					
							7378	19.01.15					
							5630	02.03.15					
							1776	12.03.15					
3	V. Chandramouli	STM/SR/TNP/2014/09	**Wages**	28.4.14	30000	7.5.14	912	23.07.14					Officer has submitted the the final adj bill for Rs.37206/- under WAGES, POL AND OC and refunded balane of Rs. 12794/- into Gov. a/c, vide Scroll No. 52264, dt. 06.03.15
	Sr. Geologist						12336	25.10.14					
							13364	21.11.14					
							12593	27.11.14					
							12079	09.12.14					
							13364	13.01.15					
							10794	23.01.15					
							14392	16.02.15					
							11822	02.03.15					
							15420	12.03.15					
			POL	28.4.14	10000	7.5.14	4340	23.07.14					
							4500	20.10.14					
							5000	21.11.14					
							4940	27.11.14					
							2096	09.12.14					
							5115	13.01.15					
							2000	23.01.15					
							4000	16.2.15					
							2200	02.03.15					
							3000	02.03.15					
			OC	28.4.14	10000	7.5.14	1574	23.07.14					

							3620	20.10.14					
							8344	25.10.14					
							769	21.11.14					
							5888	27.11.14					
							481	09.12.14					
							6072	13.01.15					
							455	23.01.15					
							5800	16.02.15					
							3469	02.03.15					
4	Pawan Kumar	GCM/SR/TNP/2014/039	**Wages**	28.4.14	30000	7.5.14	11308	06.12.14					Officer has submitted the the final adj bill for Rs.40000/- under WAGES AND OC in full and final settlement
	Geologist						14392	09.12.14					
							7196	23.01.15					
							13364	16.02.15					
							16448	26.02.15					
							10280	26.02.15					
							12336	05.03.15					
			OC	28.4.14	10000	7.5.14	5001	06.12.14					
							8460	14.01.15					
							7457	23.01.15					
							5067	16.02.15					
							5023	20.02.15					
							6732	26.02.15					
							594	05.03.15					
5	S. Balakrishnan	GCM/SR/TNP/2014/040	**Wages**	28.4.14	30000	7.5.14	9766	25.10.14					Officer has submitted the the final adj bill for Rs.35332/- under WAGES AND OC and refunded balane of Rs. 4668/- into Gov. a/c, vide Scroll No.
	Geologist						6425	27.11.14					
							9252	05.11.14					
							19275	14.01.15					
							8481	23.01.15					
							14392	16.02.15					
							20046	05.03.15					
			OC	28.4.14	10000	7.5.14	4946	16.10.14					
							3592	05.12.14					
							6111	19.01.15					
							6000	23.01.15					
							4713	20.02.15					
							7216	12.03.15					

													257575, dt. 20.03.15
6	Kalarani	GCM/SR/TNP/2014/041	**Wages**	28.4.14	30000	7.5.14	12079	04.10.14					Officer has submitted the the final adj bill for Rs.38164/- under WAGES AND OC and refunded balane of Rs. 1836/- into Gov. a/c, vide Scroll No. 242611, dt. 03.03.15
	Geologist						25700	25.10.14					
							27499	09.12.14					
							22873	22.01.15					
			OC	28.4.14	10000	7.5.14	5562	13.09.14					
							7646	04.10.14					
							6350	25.10.14					
							4704	09.12.14					
							6632	13.01.15					
							9825	22.01.15					
							8724	12.03.15					
7	R. Geetha Rani	GCM/SR/TNP/2014/042	**Wages**	28.4.14	30000	7.5.14	8224	16.10.14					Officer has submitted the the final adj bill for Rs.39812/- under WAGES AND OC and refunded balane of Rs. 188/- into Gov.
	Geologist						21588	25.10.14					
							15420	05.11.14					
							24415	09.12.14					
							26214	22.01.15					
							15163	23.01.15					
							23130	16.02.15					
							24672	02.03.15					
							23130	12.03.15					
			OC	28.4.14	10000	7.5.14	4393	13.09.14					
							8770	16.10.14					
							7700	09.12.14					

							9962	12.01.15					a/c, vide Scroll No. 257575, dt. 20.03.15
							8649	22.01.15					
							6080	23.01.15					
							4959	04.02.15					
							9593	12.03.15					
							3309	12.03.15					
							5407	12.03.15					
8	Laya M. B. Pillai	GCM/SR/TNP/2014/043	**Wages**	28.4.14	30000	7.5.14	9766	20.10.14					Officer has submitted the the final adj bill for Rs.39804/- under WAGES AND OC and refunded balane of Rs. 296/- into Gov. a/c, vide Scroll No. 257575, dt. 20.03.15
	Geologist						29298	20.10.14					
							28270	05.12.14					
							29298	23.01.15					
							16962	16.02.15					
			OC	28.4.14	10000	7.5.14	3197	13.09.14					
							8400	23.09.14					
							3352	20.10.14					
							5000	27.11.14					
							8950	05.12.14					
							6686	23.01.15					
							9012	20.02.15					
9	Ritam Konar	GCM/SR/TNP/2014/044	**Wages**	28.4.14	30000	7.5.14	29298	20.10.14					Officer has submitted the the final adj bill for Rs.39812/- under WAGES AND OC and refunded balane of
	Geologist						25700	27.11.14					
							29812	13.01.15					
							3598	19.01.15					
							11051	04.02.15					
							27756	16.02.15					
							16191	27.02.15					
							20303	02.03.15					
			OC	28.4.14	10000	7.5.14	9694	20.10.14					
							10000	27.11.14					

							8145	13.01.15					Rs. 188/- into Gov. a/c, vide Scroll No. 52264, dt. 06.03.15
							10000	19.01.15					
							5558	04.02.15					
							5000	16.02.15					
							6980	02.03.15					
10	Dilip Kumar Yadav	GCM/SR/TNP/2014/045	**Wages**	28.4.14	30000	7.5.14	17230	13.09.14					Officer has submitted the the final adj bill for Rs.50000/- under WAGES, POL AND OC in full and final settlement
	Geologist						19584	04.10.14					
							18052	25.10.14					
							18443	13.11.14					
							16068	05.12.14					
							19132	09.12.14					
							20591	13.01.15					
							21640	23.01.15					
							21156	02.03.15					
							19553	02.03.15					
							18874	12.03.15					
							25444	12.03.15					
			POL	28.4.14	10000	7.5.14	3500	07.07.14					
							3500	13.09.14					
							8520	13.09.14					
							5000	04.10.14					
							9000	25.10.14					
							9500	05.12.14					
							7247	09.12.14					
							6740	13.01.15					
							8330	23.01.15					
							9592	16.02.15					
							8400	02.03.15					
							3000	12.03.15					
							8500	12.03.15					
			OC	28.4.14	10000	7.5.14	5680	13.11.14					
							5667	22.11.14					

							9077	05.12.14					
							4236	09.12.14					
							8868	13.01.15					
							6275	23.01.15					
							9482	16.02.15					
							4401	02.03.15					
							7302	02.03.15					
							4543	02.03.15					
							8079	12.03.15					
							4549	12.03.15					
							6232	12.03.15					
							2376	12.03.15					
11	S. Balaji	GCM/SR/TNP/2014/046	**Wages**	28.4.14	30000	7.5.14	7182	04.10.14					Officer has submitted the the final adj bill for Rs.40000/- under WAGES AND OC in full and final settlement
	Geologist						22359	27.11.14					
							7453	09.12.14					
							8738	19.01.15					
							27242	23.01.15					
							28270	16.02.15					
							3084	20.02.15					
							29812	12.03.15					
			OC	28.4.14	10000	7.5.14	8212	09.12.14					
							9800	13.01.15					
							7577	23.01.15					
							9842	12.03.15					
							9384	12.03.15					
12	Pummy Roy	GCM/SR/TNP/2014/227	**Wages**	28.4.14	40000	23.01.15	19750	15.03.15					Officer has submitted the the final adj bill for Rs.49885/- under WAGES AND OC and refunded balane of Rs. 115/-
	Geologist												
			OC	28.4.14	10000	23.01.15	7141	12.03.15					

													into Gov. a/c, vide Scroll No. 314404, dt. 30.03.15

Sl. No.	Name & Desgn. S/Shri	FSP Item No. (2013-14)	Sub-Head	Date of Initial RCA sanctioned	Initial RCA Adv. Amt	Date of RCA Adv. Amt recd (ECS)	Recoupment amt	Date of Recoupment (ECS)	Date of Submission of bill to office	AMT	Balance amount in hand with officer (6-9)	Date of Bills sent to PAO SRO, Hyd.	Remarks if any, of the project supervisor and fund status
1	2	3	4	5	6	7	8	9	10	11	12	13	14
MISSION-II (A) - MINERAL EXPLORATION													
12	S. Dhanendran,	ME/SR/TNP/2014/76	**Wages**	11.4.14	40000	23.4.14	38760	12.06.14					Officer has submitted the the final adj bill for Rs.40000/- under WAGES in full and final settlement
"	Sr.Geologist						24672	09.10.14					
"							38550	20.10.14					
"							36751	25.10.14					
"							15420	13.11.14					
"							39835	29.11.14					
"							37008	19.01.15					
"							37522	12.03.15					
"							32382	16.02.15					
			POL	22.4.14	10000	02.5.14	1877	05.07.14					Unspent RCA amount of Rs.10,000/- + int. Rs.633/- refunded by officer & deposited into govt.account on 12.03.15
							6447	13.09.14					
							9434	27.11.14					
							4359	29.11.14					
			OC	22.4.14	10000	02.5.14	4471	05.07.14					Officer has submitted the the final adj bill for
							1060	13.09.14					

							5400	25.10.14					Rs.10000/- under OC in full and final settlement
							9098	13.11.14					
							3300	21.11.14					
							3933	29.11.14					
							8700	19.01.15					
							6926	16.02.15					
							4371	12.03.15					
13	Nirupa Charchi	ME/SR/TNP/2014/77	**Wages**	28.4.14	35000	07.05.14							The officer has refunded the entire amount of Rs.35000 + 10000/- + 15000 under Wages,POL & OC head in full & final settlement ,as the officer posted to Proj: MCPI
	Geologist		**POL**	28.4.14	10000	07.05.14							
			OC	28.4.14	15000	07.05.14							
14	Abhishek Agnihotri	ME/SR/TNP/2013/53	**Wages**	28.4.14	40000	07.05.14	2736	13.09.14					Officer has submitted the the final adj bill for Rs.60000/- under WAGES, POL AND OC in full and final settlement
	Geologist						13878	14.10.14					
							13621	20.10.14					
							11822	05.11.14					
							10794	27.11.14					
							6168	29.11.14					
							11565	09.12.14					
							14135	19.01.15					
							20817	24.01.15					
							6425	12.03.15					
							16191	12.03.15					
							18504	05.03.15					
			POL	28.4.14	10000	07.05.14	6541	13.09.14					
							3000	13.09.14					
							2877	14.10.14					
							5248	20.10.14					
							4399	05.11.14					

							4180	27.11.14					
							3000	29.11.14					
							5880	09.12.14					
							5000	19.01.15					
							9180	24.01.15					
							7200	12.03.15					
							4000	12.03.15					
							4380	05.03.15					
			OC	28.4.14	10000	07.05.14	6521	13.09.14					
							1843	14.10.14					
							1676	20.10.14					
							9463	05.11.14					
							8729	27.11.14					
							5764	29.11.14					
							3890	09.12.14					
							6585	19.01.15					
							3591	24.01.15					
							9225	12.03.15					
							3332	12.03.15					
							7891	12.03.15					
15	D. Boopathi	ME/SR/TNP/2014/78	**Wages**	28.4.14	35000	07.05.14	4179	02.09.14					
							18761	10.09.14					
							22873	14.10.14					
							34952	25.10.14					
							34438	27.11.14					
							30840	13.01.15					
							23130	24.01.15					
							24672	16.02.15					
							34695	12.03.15					
			POL	28.4.14	15000	07.05.14	7651	02.09.14					
							4000	13.09.14					
							4184	10.09.14					
							5822	14.10.14					
							5947	25.10.14					
							11700	27.11.14					
							4704	13.01.15					
							4755	24.01.15					

Officer has submitted the the final adj bill for Rs.56837/- under WAGES, POL AND OC and refunded balane of Rs. 3163/- into Gov. a/c, vide Scroll No. 257575, dt. 20.03.15

							3270	16.02.15					
							1303	12.03.15					
			OC	28.4.14	10000	07.05.14	5618	02.09.14					
							7927	10.09.14					
							3222	14.10.14					
							8576	25.10.14					
							9131	27.11.14					
							5489	13.01.15					
							4951	16.02.15					
							2674	12.03.15					
16	S. B. Vijay Kumar	ME/SR/TNP/2014/79	**Wages**	28.4.14	35000	07.05.14	15520	14.10.14					Officer has submitted the the final adj bill for Rs.60000/- under WAGES, POL AND OC in full and final settlement
	Sr.Geologist						33410	21.11.14					
							23130	24.01.15					
							21845	16.02.15					
							23901	12.03.15					
			POL	28.4.14	15000	07.05.14	9016	14.10.14					
							8000	21.11.14					
							2500	24.01.15					
							3000	16.02.15					
							4500	12.03.15					
			OC	28.4.14	10000	07.05.14	5561	14.10.14					
							9950	21.11.14					
							9469	08.12.14					
							9992	24.01.15					
							7919	16.02.15					
							5763	12.03.15					
							5547	12.03.15					
							7775	12.03.15					
							3383	12.03.15					
17	S.S.Sahoo,	ME/C/SR/NenR/2010/035	**Wages**	22.4.14	40000	30.4.14	35325	12.06.14					Officer has submitted the the final adj bill for Rs.59718/- under WAGES, POL AND OC and refunded balane of Rs. 282/-
	Geologist						13680	05.07.14					
							25680	23.07.14					

							26640	09.09.14					into Gov. a/c, vide Scroll No. 257575, dt. 20.03.15
							39244	13.09.14					
							29672	22.10.14					
							30258	27.11.14					
							28706	31.12.14					
							28444	16.02.15					
							28154	05.03.15					
			POL	22.4.14	10000	30.4.14	9853	18.06.14					
							9938	23.07.14					
							9930	13.09.14					
							9795	27.11.14					
							9610	05.03.15					
			OC	22.4.14	10000	30.4.14	6638	12.06.14					
							4535	05.07.14					
							7510	23.07.14					
							3951	09.09.14					
							9766	09.09.14					
							8978	13.09.14					
							9999	22.10.14					
							9996	27.11.14					
							9950	31.12.14					
							7067	16.02.15					
							9916	12.03.15					
18	RANJITH.A	ME/SR/TNP/2014/077	**WAGES**	09.09.14	30000	13.09.14	5911	27.11.14					Officer has submitted the the final adj bill for Rs.49356/- under WAGES,POL AND OC and refunded balane of Rs. 644/- into Gov. a/c, vide Scroll No. 257575, dt. 20.03.15
	Geologist						11015	20.01.15					
							22102	16.02.15					
							8995	12.03.15					
			POL	09.09.14	10000	13.09.14	7800	27.11.14					
							4506	29.11.14					
							3500	20.01.15					
							6290	04.02.15					
							3000	12.03.15					
			OC	09.09.14	10000	13.09.14	9007	27.11.14					
							7662	20.01.15					
							3676	04.02.15					

							7015	16.02.15					
							7518	12.03.15					
Sl. No.	**Name & Desgn. S/Shri**	**FSP Item No. (2013 -14)**	**Sub-Head**	**Date of Initial RCA sanctio ned**	**Initial RCA Adv. Amt**	**Date of RCA Adv. Amt recd (ECS)**	**Recoupme nt amt**	**Date of Recoup ment (ECS)**	**Date of Submissi on of bill to office**	**AMT**	**Balance amount in hand with officer (6-9)**	**Date of Bills sent to PAO SRO, Hyd.**	**Remarks if any, of the project supervisor and fund status**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
MISSION-IV (B) - INVESTIGATION													
19	J. Prabhakar	NLS M/SR /TNP/ 2014/ 091	**Wages**	29.4.14	30000	07.05. 14							The officer has refunded the entire amount of Rs.30000 + 10000/- under Wages & OC head in full & final settlement, as the officer posted to Tech.Coord.Divn
	Sr.Geologist		**OC**	29.4.14	10000	07.05. 14							
20	M. Rajkumar	NLS M/SR /TNP/ 2014/ 091	**Wages**	16.06.1 4	30000								Letter sent to PAO,SR,HYD for cancellation of RCA advance, as the officer has to takeup landslide work at Uttarkhand area.
	Geologist		**OC**	16.06.1 4	10000								
21	Abhishek Kumar,	EWS/ SR/T NP/2 014/0 92	**Wages**	18.06.1 4	20000	05.07. 14	12969	25.11.14					Officer has submitted the the final adj bill for Rs.21161/- under WAGES,POL AND OC and refunded balane of Rs. 8839/- into Gov. a/c, vide Scroll No. 257575, dt. 20.03.15
	Geologist	LS/S R/TN P/201 4/093											
			OC	18.06.1	10000	05.07.	9535	27.11.14					

				4		14							
22	P.Srinivasan	NLSM/SR/TNP/2014	**Wages**	19.08.14	30000	25.09.14							Officer has submitted the the final adj bill for Rs.49885/- under WAGES,POL AND OC and refunded balane of Rs. 115/- into Gov. a/c, vide Scroll No. 314404, dt. 30.03.15
	Supdt.Geologist												
			OC	19.08.14	10000	25.09.14							
MISSION - V - FTC													
23	R.Baskaran, Director	DIN DIGUL - FTC	**OAE(T)**	30.4.14	150000	23.05.14			05.12.14(Resubmitted)				The Officer has submitted the final adj bill for Rs. 1,49,771 /- under OAE(T) and refunded balane of Rs.229/- into Gov. a/c, vide Scroll No. 246669, dt. 02.01.2015 . Nill Bill sent to PAO,SR Hyd on 09.01.15.

GEOLOGICAL SURVEY OF INDIA														
STATUS OF RCA BILLS IN RESPECT OF GSI, SU: KERALA, THIRUVANANTHAPURAM AS ON 31-03-2015														
Sl. No.	**Name & Designation of the Officer with FSP Item No.**	**RCA (Head)**	**RCA amount sanctioned with date**	**Disbursement Date**	**RCA Amount new advc.**	**Disbursement Date**	**Bills Submitted & Recouped**		**Bills Pending Recoupment**				**Remarks**	**Remarks of the Project Supervisor & Fund Status**
							Recoupment Amount	**Recoupment Date**	**Bills Submitted to Office-date**	**Amount**	**Balance in hand with Officer**	**Bills pending with PAO-date**		
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**		**14**
MISSION-I (all items)														
1	Dr. Soney Kurien P Geologist SU:Kerala Unit STM/SR/KRL/2014/010 2014-15	Wages	Rs. 35,000/- Bill No. 252/C dated 30.06.2014											Final adjustment Bill sent to PAO, GSI, SR, Hyderabad
							Nil	19.03.15						
								05.02.15						
		POL	Rs.9,000/- Bill No.252/C dated 30.06.2014				Nil	19.03.15						Final adjustment Bill sent to PAO, GSI, SR, Hyderabad
							1500	27.03.15						
		Other Charges	Rs.6000/- Bill No.252/C dated				1459	27.03.15						RCA reimbursement of Rs. 1500 under POL and

			30.06.2014											Rs.1459 under OC
							Nil	19.03.15						
TRIBAL WELFARE														
2	Shri Kausik Kumar Ghosh, Geologist, SU: kerala Unit ME/SR/KRL /2014/081 2014-15	Wages	Rs. 27,000/- Bill No. 250/C dated 30.06.2014											
						-								
		Other Charges	Rs. 20000/- Bill No. 250/C dated 30.06.2014				Nil	12.03.15						Final adjustment Bill sent to PAO, GSI, SR, Hyderabad
3	Smt. Ashamol T.L, Geologist SU:Kerala Unit ME/SR/KRL /2014/080 2014-15													RCA recoupment of Rs. 14473 and RCA reimbursement of Rs.49060, Rs. 49952 and Rs. 49060.
							14473	04.03.15						
		Other Charges					Nil	19.03.15						
							49060	27.03.15						
		Other Charges	Rs.50000/- Bill No. 251/C dated 30.06.2014				49952	27.03.15						
							49060	27.03.15						Final adjustment Bill sent to PAO, GSI, SR, Hyderabad

4	Shri. Pabitra Kumar Behera, Geologist SU:Kerala Unit GCM/SR/KRL/2014/051 2014-15	Wages	Rs. 30,000/- Bill No. 247/C dated 30.06.2014											
		POL	Rs.10,000/- Bill No. 247/C dated 30.06.2014				Nil	16.03.15						RCA recoupment of Rs. 6948, 10218,5000,11082,11082 and RCA reimburesement of Rs. 21759.
							6948	04.03.15						
		Other Charges	Rs.10000/- Bill No.247/C dated 30.06.2014				10218	04.03.15						Final adjustment Bill sent to PAO, GSI, SR, Hyderabad
							5000	04.03.15						
							11082	10.03.15						
							11082	10.03.15						
							21759	27.03.15						
5	Shri.Uday Narayan, Geologist, SU:Kerala Unit GCM/SR/KRL/2013/34 2014-15	Wages	Nil											
		POL	Nil				4216	04.03.15						Rs. 14756 and Rs. 4216 are RCA recoupments and rs. 3214/ as RCA reimbursement
							Nil	12.03.15						
		Other Charges	Rs. 50,000/- Bill No. 248/C dated 30.06.2014				3214	26.03.15						Final adjustment Bill sent to PAO, GSI, SR, Hyderabad
6	Shri.Jiji Kumar. Y,	Wages	Rs. 30,000/-											

	Geologist GCM/SR/KRL/2014 /048 2014-15		Bill No. 249/C dated 30.06.2014											
		POL	Rs. 10,000/- Bill No. 249/C dated 30.06.2014				12000	04.03.15						RCA recoupments of Rs. 12,000 Rs. 19691 and Rs. 18307 and RCA reimbursements of Rs. 18090
							19691	10.03.15						
		Other Charges	Rs. 10,000/- Bill No249/C dated 30.06.2014				18307	10.03.15						
							Nil	12.02.15						Final Bill sent to PAO, GSI, SR, Hyderabad
							18090	27.03.15						
	MISSION IV- B INVESTIGATION													
7	Shri Sachin R, Senior Geologist SU:Kerala Unit LSM/SR/KRL/2014/097 FS 2014-15	Wages	Rs. 10,000/- Bill No. 276/C dated 14.07.2014				Nil	11.02.15						Final adjustment bill sent to PAO, SR, Hyderabad vide Bill No. 887/C dt 10.02.2015
		POL					Nil	11.02.15						
		Other Charges	Rs. 40,000/- Bill No. 276/C dated 14.07.2014				Nil	11.02.15						
8	Smt Rakhi Gopal R, Geologist SU: Kerala Unit	Wages	Rs. 15,000/- Bill No. 616/C dt.10.11.				Nil	19.03.15						Final adjustment Bill sent to PAO, GSI, SR, Hyderabad

	LSM/SR/KRL/2014/097 FS 2014-15		14											
		POL												
		Other Charges	Rs. 35,000/- Bill No. 616/C dt.10.11.14				Nil	19.03.15						
														RCA reimbursement of Rs. 4500/-.
							4500	27.03.15						
9	Shri.Wagh Rajkumar Limbraj, Geologist SU: Kerala Unit GCM/SR/KRL/2014/114 FS 2014-15	Wages	Rs. 35,000/- Bill No. 757/C dt. 05-01-15											
							Nil	19.03.15						
														Final adjustment Bill sent to PAO, GSI, SR, Hyderabad
		Other charges	Rs. 15,000/- Bill No. 757/C dt. 05-01-15											
							Nil	19.03.15						

GEOLOGICAL SURVEY OF INDIA											
STATUS OF RCA AND PENDENCY OF RCA BILLS OF SOUTHERN REGION OFFICE, HEAD QUARTER AS ON 31/03/2015											
Sl. No.	Name & Designation of the Officer with FSP item No.	RCA (Head)	RCA amount sanctioned with date	Disbursement Date	Bills Submitted & Recouped		Bills pending recoupment				Remarks of the project supervisor and fund status
					Recoupment amount	Recoupment date	Bill submitted to office date	Amount	Balance in hand with officer	Bills pending with PAO date	
1	2	3	4	5	6	7	8	9	10	11	12
1	B.M.Shah Supdt. Geologist	POL									
		Wages	30000								RCA Advance bill sent to PAO
			22.4.2014								
		OC	10000		3037	5.8.2014					RCA/REQ/396 bill sent to PAO
			22.4.2014		6892	27.1.2015					RCA/REQ/797 bill sent to PAO
2	A.Anil Kumar Geologist	POL	20000		12308	14-11-2014					RCA/REQ/613 bill sent to PAO
			20.5.2014								
		Wages	15000		3000	14-11-2014					RCA/REQ/613 bill sent to PAO
			20.5.2014								
		OC	5000		1277	14-11-2014					RCA/REQ/613 bill sent to PAO
			20.5.2014								
3	N.J.Sumanth Supdt.	POL									

	Geologist										
		Wages	5000								RCA Advance bill sent to PAO
			06-06-2014								
		OC	20000		17116	29-10-2014					RCA/REQ/547 bill sent to PAO
			06-06-2014								
4	Rimpal Kar Geologist	POL									
		Wages	10000		4500	31.3.2015					RCA Advance bill sent to PAO
			25.6.2014								Adjusted
		OC	5000		2201	17.12.2014					RCA/REQ/700 bill sent to PAO
			25.6.2014		862	27.1.2015					RCA/REQ/796 bill sent to PAO
					4840	31.3.2015					Adjusted
5	V.Chakravarthi Mineralogist (Jr)	POL	20000		13000	14.11.2014					RCA/REQ/612 bill sent to PAO
			16.09.2014	17.09.2014	19780	10.02.2015					RCA/REQ/830 bill sent to PAO
		Wages	10000		10000	14.11.2014					RCA/REQ/612 bill sent to PAO
			16.09.2014	17.09.2014	9900	10.02.2015					RCA/REQ/830 bill sent to PAO
		OC	20000								
			16.09.2014	17.09.2014							RCA Advance bill sent to PAO

6	Nidhi Misra Geologist	POL									RCA Advance bill sent to PAO
		Wages	15000		13572	17.12.2014					RCA/REQ/701 bill sent to PAO
			10-01-2014	7.10.2014	15000	1.04.2015					Adjusted
		OC	10000								
			10-01-2014	7.10.2014	9967	12-02-2015					RCA/REQ/834 bill sent to PAO
					10000	1.04.2015					Adjusted
7	S. T. Nara Hari Geologist (Sr)	POL	20000	18.12.2014							RCA Advance bill sent to PAO
			29.12.2014								
		Wages	10000	18.12.2014							
			29.12.2014								
		OC	5000	18.12.2014							
			29.12.2014								

GEOLOGICAL SURVEY OF INDIA												
STATE UNIT : TELANGANA & ANDHRA PRADESH ,SOUTHERN REGION, HYDERABAD.												
STAUS OF RCA & PENDENCY OF RCA BILLS UPTO 31.03.2015												
S.No.	Name & Designation	FSP Item No.	RCA Head	RCA Amount Sanctioned with Date		Bills Submitted & Recouped			Bills for final adjustment			challan no. date
				Amount	Disbursement Date	Recoupment amount	Recoupment date	Bills Submitted to Office date	Amount	advance	balance amount	
1	2	3	4	5		6		7	8	9	10	11
Mission -I												
1	ujjal paul		wages	35000	23.05.2014	15930	9.3.2015	11.3.2015	34515	35000	485	no.29, 31.03.15
			OC	15000	23.05.2014	6163	9.03.2015	12.03.2015	14915	15000	85	30, 31.03.2015
2	Sandhya D Kuthe	NGCM-014	Wages	35000	2.06.2014				35000	35000	nil	nil
			OC	15000	02.06.2014				15000	15000	nil	nil
3	Prathana Das	NGCM-013	Wages	35000	23.05.2014				34810	35000	190	27, 04.03.15
			OC	15000	23.05.2014				14995	15000	5	16, 17.03.15
4	Dinesh Meshram	NGCM-016	Wages	35000	23.05.2014	8850	09.03.2015	12.03.2015	35000	35000		nil
			OC	15000	23.05.2014	1127	16.03.2015	17.03.2015	15000	15000		nil
5	Satya Pal	STM-001	Wages	30000	24.06.2014	3440	09.03.2015	12.03.2015	35000	35000		nil
			POL	10000	24.06.2014	2000	09.03.2015	12.03.2015	10000	10000		nil
			OC	10000	24.06.2014	845	09.03.2015	12.03.2015	10000	10000		nil
6	Sankha Das	STM-005	Wages	30000	14.08.2014				28025	30000	1975	30, 18.03.2015
			POL	10000	14.08.2014	9738	10.03.2015	12.03.2015	4787	10000	5213	20, 17.03.2015

			OC	10000	14.08.2014				10000	10000	nil	
7	Tushar M Meshram	STM-003	Wages	30000	14.08.2014	6575	05.03.2015	06.03.2015	29985	30000	15	15, 24.03.2015
			POL	10000	14.08.2014				9950	10000	50	14, 24.03.2015
			OC	10000	14.08.2014	4202	04.03.2015	05.03.2015	10000	10000	nil	nil
8	Debapriya Adhikari	STM-002	Wages	30000	14.08.2014	4130	10.03.2015	12.03.2015	29205	30000	795	26, 11.03.2015
			OC	10000	14.08.2014	5000	10.03.2015	12.03.2015	9708	10000	292	25, 11.03.2015
						1480	09.02.2015	05.02.2015				
			POL	10000	14.08.2014	4035	10.03.2015	12.03.2015	9181	10000	819	27, 11.03.2015
						5211	10.03.2015	12.03.2015				
9	Rajani G. Dharme	STM-004	Wages	30000	26.08.2014				29950	30000	50	28, 12.3.2015
			OC	10000	26.08.2014				10000	10000	nil	
			POL	10000	26.08.2014				9930	10000	70	29, 12.3.2015
10	Arvind Kumar Singh	NGCM-017	Wages	35000	11.08.2014				34810	35000	190	16, 11.3.2015
			OC	10000	11.08.2014				13343	15000	1657	18, 11.3.2015
11	R.R. Swain	NGCM-023	Wages	35000	11.08.2014	13050	9.3.2015	12.3.2015	31900	35000	3100	17, 12.3.2015
			OC	15000	11.08.2014	5882	9.3.2015	12.3.2015	11555	15000	3445	16, 18.3.2015
12	Madhusmitha Swain	NGCM-018	Wages	35000	11.08.2014	1770	17.3.2015	19.3.2015	34810	35000	190	33, 18.3.2015
			OC	15000	11.08.2014	5000	9.3.2015	12.3.2015	12559	15000	2441	36, 18.3.2015
13	Vaishnavi P Sambre	NGCM-021	Wages	35000	14.08.2014	3540	9.3.2015	12.3.2015	34810	35000	190	32, 18.3.2015
						5015	17.3.2015	19.3.2015				
			OC	15000	14.08.2014				11228	15000	3772	39, 18.3.2015
14	Divya M.P.	NGCM-022	Wages	35000	11.08.2014				34810	35000	190	24, 11.3.2015

			OC	15000	11.08.2014				14932	15000	68	23, 11.3.2015
15	Priya R	NGCM-025	Wages	35000	14.08.2014				34810	35000	190	21, 12.2.2015
			OC	15000	14.08.2014				12562	15000	2438	20, 12.2.2015
16	Parvathi R Krishnan	NGCM-019	Wages	35000	14.08.2014				34810	35000	190	34, 18.3.2015
			OC	15000	14.08.2014				15000	15000	nil	
17	Poornima Sreedhar	NGCM-015	Wages	35000	7.10.2014	8850	9.3.2015	12.3.2015	31565	35000	3435	38, 18.3.2015
			OC	15000	7.10.2014				14445	15000	555	35, 18.3.2015
18	Reena Mishram	NGCM-020	Wages	35000	29.09.2014				35000	35000	nil	
			OC	15000	29.09.2014				15000	15000	nil	
19	Sini Raj	NGCM-011	Wages	35000	11.12.2014				35000	35000	nil	
			OC	15000	11.12.2014				15000	15000	nil	
20	Binod Kumar	NGCM-012	Wages	35000	11.12.2014	8850	4.3.2015	5.3.2015	35000	35000	nil	
						2360	24.3.2015	24.3.2015				
			OC	15000	11.12.2014				15000	15000	nil	
21	Samreen Shaik	NGCM-012	Wages	35000	11.12.2014				35000	35000	nil	
			OC	15000	11.12.2014				15000	15000	nil	
22	Wasim Akram	NGCM-011	Wages	35000	18.11.2014	2655	24.3.2015	24.3.2015	35000	35000	nil	
			oc	15000	18.11.2014				15000	15000	nil	
23	Lakshmi Mehera	NGCM	wages	35000	17.12.2014	2065	24.3.2015	24.3.2015	35000	35000	nil	
			OC	15000	17.12.2014				15000	15000	nil	
24	K.K.Behera		NRCA	30000	7.1.2015				21015	30000	8985+183(PI)	13,15,17,20,21,22 dt.25.3.2015

Mission II												
1	Sujeet Kumar Dwivedi	COAL-083	wages	40000	05-06-2014				40000	40000	nil	
			pol	10000	05-06-2014					10000		18, 12.2.2015
			Oc	10000	05-06-2014				10000	10000	nil	
			ACA	9000	20.2.2015				9000	9000	nil	
2	Praveer Pankaj		wages	40000	05-06-2014	5025	4.3.2015	5.3.2015	39955	40000	45	22, 16.3.2015
			POL	10000	05-06-2014	7900	4.3.2015	5.3.2015	9000	10000	1000	23, 16.3.2015
			Oc	15000	6/5/204	7320	4.3.2015	5.3.2015	15000	15000	nil	
						4137	09.02.2015	29.01.2015				
			ACA	85411	17.12.2014				85411	85411	nil	
3	Praseetha Sugathan		wages	35000	05-06-2014				34810	35000	190	31.3.2015
			Oc	10000	05-06-2014	9030	9.3.2015	11.3.2015	10000	10000	nil	
			pol	10000	05-06-2014	5930	10.3.2015	11.3.2015	10000	10000	nil	
4	Dr. Vikash Tripathy		wages	35000	05-09-2014					35000		16, 12.2.2015
			Oc	10000	05-09-2014					10000		17, 12.2.2015
			pol	10000	05-09-2014	600	2.3.2014	4.3.2015	600	10000	9400	19, 12.2.2015
5	Diganta Barman	COAL-085	Tribal	35000	06-05-2014	4567	4.3.2015	9.3.2015	35000	35000	nil	
6	Bhushan D Kuthe		Tribal	40000	05-09-2014				40000	40000	nil	
7	Amit D Bhimte	COAL-082	Tribal	40000	06-05-2014				40000	40000	nil	
8	Sonali Rath		Tribal	40000	05-09-2014				40000	40000	nil	
9	Shraddha Nannaware		Tribal	60000	23.5.2014				57496	60000	2504	37, 18.3.2015

10	Rakesh Kumar Gupta	IRON ORE-058	Wages	40000	20-06-2014				38196	40000	1804	18, 17.3.2015
			OC	10000	20-06-2014	8850	9.3.2015	11.3.2015	8233	10000	1767	17, 17.3.2015
			POL	10000	20-06-2014	4000	10.3.2015	11.3.2015	7125	10000	2875	19, 17.3.2015
11	B.J. Barman	IRON ORE-058	Wages	40000	25-06-2014	31585	9.3.2015	11.3.2015	39520	40000	480	18, 25.3.2015
			OC	10000	25-06-2014	6175	18.3.2015	20.3.2015	10000	10000	nil	
						4688	18.3.2015	20.3.2015				
			POL	10000	25-06-2014	4553	18.3.2015	20.3.2015	6635	10000	3365	17, 26.3.2015
12	Suhel Ahmed		ACA	37500	17.12.2014				37500	37500	nil	
13	N.Nandha Gopal		NRCA	10000	4.2.2015				10000	10000	nil	24, 16.3.2015
14	Md.Zuhaib Siddiqui		NRCA	20000	16.1.2015				20000	20000	nil	
15	M.Thirumu rugan		Tribal	60000	07-11-2014	26400	9.3.2015	11.3.2015	59355	60000	645	26, 27.3.2015
						26400	9.3.2015	11.3.2015				
						2800	27.3.2015	27.3.2015				
						2520	31.3.2015	31.3.2015				
16	Bhaskar Jyoti Gogoi		wages	45000	21.08.2014				41440	45000	3560	31, 18.3.2015
			Oc	15000	21.8.2014				13457	15000	1543	29, 11.3.2015
17	Kiran Jyoti Misra	REE-061	Wages	45000	14-08-2014				28560	45000	16440	31, 2.3.2015
			OC	15000	14-08-2014				10229	15000	4771	32, 2.3.2015
18	Rohit V Gajbhiye	GOLD-053	Wages	40000	14-08-2014				39880	40000	120	18, 25.3.2015
			OC	10000	14-08-2014				9933	10000	67	16, 25.3.2015
			POL	10000	14-08-2014				7783	10000	2217	19, 23.3.2015

19	Sufija M V	DIAMOND-054	Wages	40000	01.09.2014	14855	4.3.2015	9.3.2015	39825	40000	175	24, 27.3.2015
			OC	10000	11.08.2014	9342	4.3.2015	9.3.2015	9974	10000	26	23, 27.3.2015
						9756	9.3.2015	11.3.2015				
						9876	30.3.2015	30.3.2015				
			POL	10000	11.08.2014	9570	4.3.2015	9.3.2015	9732	10000	268	28, 27.3.2015
						9871	30.3.2015	30.3.2015				
20	P Hari Krishna		ACA	5000	11.3.2015				5000	5000	nil	

7. LABORATORY INFRASTRUCTURE, ITEMS, OUTPUT- ACTUAL VS NORM, AMC, BUDGET ETC.

NCEGR, Bangalore is equipped with:

1) XRF (X-Ray Sequential Spectrometer-model BRUKER S*Tiger) capable of determination of 10 major elements by fusion bead and 18 trace elements by pressed pellet of common rock types in the felsic to ultramafic compositional range.

2) EPMA (Electron Probe Micro Analysis, model SX-100, CAMECA, France) for determination of mineral chemistry (major, trace and REE), X-ray mapping, BSE imaging monazite (chemical) dating, etc.

3) Ore beneficiation and heavy mineral separation facility like Wilfley table, Mozley mineral separator, Fantz isodynamic separator, Knelson gold concentrator, etc.

4) XRD (X-ray Diffraction, model XðPERT PRO: PANALYTICAL) system equipped with up graded HIGHSCORE PLUS soft ware with PDF-4 and ICSD database for Qualitative and quantitative determination and characterization of the various mineral phases including clay minerals present in all geological samples.

5) Mass spectrometry -Isotope Ratio Mass Spectrometer (GEO 20-20, SERCON, UK) for stable isotopic analysis of C and O in carbonates, S in sulphides, N in nitrates and H/D in water system.

6) Motorized Zoom Fluorescence Stereo Microscope (LEICA Mz16 FA) with image analyzer for identification of mineral grains

7) Trinocular advanced research polarizing microscope for transmitted and reflected light (model- Leica DMRXP) with photomicrography attachment and digital image processing and analysis workstation for study of thin and polished sections

8) Microscope (model-Olympus BX 50) with LINKAM heating and freezing stage (THMSG-600) for determination of the pressure, volume, temperature and composition of the fluids in the inclusions in geological samples.

9) High capacity ball mill, planetary ball mill, polygonal blender, forced air oven, rotary divider, temperature and humidity controlled sample room etc for preparation of Certified Reference Material

10) Pulverizers and Crushers for rock sample powder preparation.

11) Water rock cutting machine, Kerosene rock cutting machine, polishing cum grinding machine, polishing machine, etc for preparation of thin, polished and thin polished sections, wafers and grain mounts.

B) IMPORTANT LABORATORIES LOCATED IN SOUTHERN REGION AND CAPACITY OF EQUIPMENTS:

S.No.	Name/ Type of Equipment available	Type of Analysis	No of samples analysed per month (Optimum Conditions)
	Chemical Laboratory, Hyderabad		
1	ICPMS	REE, PGE, Other Traces & Ultra Trace Elements	500
2	ICPMS (latest model of Agilent make (7700 X) Argon Plasma)	REE, PGE, Other Traces & Ultra Trace Elements	
3	XRF	Major, Minor & Trace elements	300
4	ION ANALYSER	FLUORIDE	200
5	AAS-FLAME	Major, Minor & Trace elements	500
6	AAS-GTA	Au, Ag & Cd	1000
	Petrology Lab, Hyderabad		
1	EPMA	Chemical analysis of silicates and ores.	30 analyses were done as a test case after the installation

2	DMRXP Microscope	Petrographic studies.	80 thin/ polished sections were studied.
3.	Polariscope, Refractometer, specific gravity instrument and microscope	Gem testing	Samples on request
4.	Isodynamic separator	Separation of heavy minerals	Samples on request
5.	Grinding machine and polishing machine	Preparation of thin /polished section	Thin/ polished sections are prepared for Departmental use and also commercially

Laboratory			
	Soil mechanics		
1	Direct shear test apparatus **Geotechnical**	Determination of Cohesion and angle of Internal friction of soil samples	130
2	Cone Panetrometer	Determination of Liquid Limit of soil samples	141
3	Pippet Assembly	Determination of clay size fraction of soil	56
4	Sieve shaker	Determination of grain size analysis of soil	65
5	Pycnometer	Determination of specific gravity of soil	58
	Rock mechanics		
6	Uniaxial compression testing Machine	Determination of Compressive strength and tensile strength of rock/ core	25
7	Point Load testing Machine	Determination of Compressive Point Load strength Index of rock/ core	3
8	Los Angeles Abrasion Testing Machine	Determination of Abrasion Loss of aggregates	3
9	Core cutting Machine	For side c utting of cores	50

	SU: Karnataka & Goa, Chemical Lab, Bangalore		
1	**ICP- AES** (Simultaneous, Ultima-2, (Jobin ï Yvon, France)	Major &trace elements Analysis (Al, Fe, Ti, Ca, Mg, Na & K)	Samples Analysed: 125&139 Total determinations: 1000&834
2	**AAS-Flame** Hydride Generator accessory GBC, Avanta-PM, Australia	Base metals & trace elements Cu, Pb, Zn, Ni, Co, As, Sb, Bi, Mo, Cd, Cr, Ag, Li & Cs	Samples Analysed: 425 Total determinations: 3650
3	**AAS-Flame** Varian SpetrAA-30 Australia **Note: *Already analysed samples taken for the analysis of other elements.**	Cu, Pb, Zn, Ni, Co, Sb,Bi, Cr, Ag, C & Au	Samples Analysed: 139&290 Total determinations: 834&1450
4	**AAS-GTA,** GBC, Avanta- Sigma Spectrometer240 system 3000, Australia	Au(Non-NGCM)	Samples Analysed: 498 Total determinations: 498
5	**Wet classical method**	SiO2 & LOI	Samples Analysed: 125 Total determinations: 250
6	**Pulverizer** **BICO, INC,** b) Vibratory Cup Mill In smart systems, India	Under repair Utilizing for powdering of samples	973 samples

During the above period, 1,312 samples have been analysed for 8,516 determinations. Out of this, 498 Non NGCM samples have been analysed for goldby GTA-AAS instrument, 564 samples for Base metals & trace elements by flame-AAS instrument and 125 samples analysed for major & minor elements by ICP-AES/Wet classical methods for various determinations leaving the backlog of 1408 Non ï NGCM samples for chemical analysis for next quarter

SU: KERALA

The Chemical Division has a well equipped laboratory for classical and instrumental analysis of geological samples. The instruments available include- AAS (Varian Make), UV-VIS Spectrophotometers, Ion Analyser, Water analysis kit and Nephelo-Turbidity meter. During the period from January to March 2015, the lab has **analyzed 1562 samples with 2098 estimations**.

8. TRAINING /CAPACITY BUILDING ACTIVITIES IN THE REGION:

Courses proposed for FS 2014-15 by RTI, SR

MISSION-V (TRAINING & CAPACITY BUILDING)	
1	Exploration strategy for REE & Rare Metals.
2	A Course on Computer Awareness for Group óBô Non-Gazetted and Group óCô Ministerial Staff of SR and CR.
3	Refresher Course for National Geochemical Mapping.
4	Basic training course in Drilling Technology
5	Workshop on United Nation Framework Classification System.
6	Training on Administration, Finance & Vigilance in GSI for Group A & B officers of GSI
7	Workshop on compilation of Second Edition Quadrangle Geological Maps (1:2,50,000)
8	Exploration strategy for Industrial and Fertilizer Minerals

Details of the courses conducted by Regional Training Institute, Southern Region and FTCs:Chitradurga, Salem, Kothagudam and GSI camp Wajrakarur during October to December, 2014 are given in Annexure-10.

TENTATIVE SCHEDULE OF RAC / OAC MEETINGS OF GSI, SR, FOR 2013 – 14 and 2014-15

RAC MEETINGS OF SR

Sl.No.	Name	Date	Venue
1.	XII_SR_RAC_05	28th June, 2013	GSI, SR, Hyderabad
2.	XII_SR_RAC_06	30th September,2013	GSI, SR, Hyderabad
3.	XII_SR_RAC_07	31st December, 2013	GSI, SR, Hyderabad
4.	XII_SR_RAC_08	28th March, 2014	GSI, SR, Hyderabad
5	XII_SR_RAC_09	27th June, 2014	GSI, SR, Hyderabad
6	XII_SR_RAC_10	26th September, 2014	GSI, SR, Hyderabad
7	XII_SR_RAC_11	23rd December, 2014	GSI, SR, Hyderabad
8	XII_SR_RAC_12	27th March, 2015	GSI, SR, Hyderabad

OAC MEETINGS OF SU:AP

Sl.No.	Name	Date	Venue
1.	XII_AP_OAC_05	21st June, 2013	GSI, SU:AP, Hyderabad
2.	XII_AP_OAC_06	25th September, 2013	GSI, SU:AP, Hyderabad
3.	XII_AP_OAC_07	24th December,2013	GSI, SU:AP, Hyderabad
4.	XII_AP_OAC_08	21t March, 2014	GSI, SU:AP, Hyderabad
5	XII_AP_OAC_09	23rd& 24th , June, 2014	GSI, SU:AP, Hyderabad
6	XII_AP_OAC_10	22nd & 23rd Sept., 2014	GSI, SU:AP, Hyderabad
7	XII_AP_OAC_11	19th&20th,December, 2014	GSI, SU:AP, Hyderabad
8	XII_AP_OAC_12	24th & 25th March, 2015	GSI, SU:AP, Hyderabad

OAC MEETINGS OF SU:KG

Sl.No.	Name	Date	Venue
1.	XII_KG_OAC_05	24th June, 2013	GSI, SU:K&G, Bangalore
2.	XII_KG_OAC_06	25th September, 2013	GSI, SU:K&G, Bangalore
3.	XII_KG_OAC_07	19th December, 2013	GSI, SU:K&G, Bangalore
4.	XII_KG_OAC_08	20th March, 2014	GSI, SU:K&G, Bangalore
5	XII_KG_OAC_09	23rd& 24th , June, 2014	GSI, SU:K&G, Bangalore
6	XII_KG_OAC_10	22nd & 23rd Sept., 2014	GSI, SU:K&G, Bangalore
7	XII_KG_OAC_11	19th&20th,December, 2014	GSI, SU:K&G, Bangalore
8	XII_KG_OAC_12	24th & 25th March, 2015	GSI, SU:K&G, Bangalore

OAC MEETINGS OF SU:TNP

Sl.No.	Name	Date	Venue
1.	XII_TNP_OAC_05	21st June, 2013	GSI, SU:TNP, Chennai
2.	XII_TNP_OAC_06	24th September, 2013	GSI, SU:TNP, Chennai
3.	XII_TNP_OAC_07	20th December, 2013	GSI, SU:TNP, Chennai
4.	XII_TNP_OAC_08	25th March, 2014	GSI, SU:TNP, Chennai
5	XII_AP_OAC_09	23rd& 24th , June, 2014	GSI, SU:TNP, Chennai
6	XII_AP_OAC_10	22nd & 23rd Sept., 2014	GSI, SU:TNP, Chennai
7	XII_AP_OAC_11	19th&20th,December, 2014	GSI, SU:TNP, Chennai
8	XII_AP_OAC_12	24th & 25th March, 2015	GSI, SU:TNP, Chennai

OAC MEETINGS OF SU:KERALA

Sl.No.	Name	Date	Venue
1.	XII_KRL_OAC_05	24th June, 2013	GSI, SU:KRL, Thiruvananthapuram
2.	XII_KRL_OAC_06	27th September, 2013	GSI, SU:KRL, Thiruvananthapuram
3.	XII_KRL_OAC_07	20th December, 2013	GSI, SU:KRL, Thiruvananthapuram
4.	XII_KRL_OAC_08	21st March, 2014	GSI, SU:KRL, Thiruvananthapuram
5	XII_KRL_OAC_09	23rd& 24th , June, 2014	GSI, SU:KRL, Thiruvananthapuram
6	XII_AP_OAC_10	22nd & 23rd Sept., 2014	GSI, SU:KRL, Thiruvananthapuram
7	XII_KRL_OAC_11	19th&20th,December, 2014	GSI, SU:KRL, Thiruvananthapuram
8	XII_AP_OAC_12	24th & 25th March, 2015	GSI, SU:KRL, Thiruvananthapuram

SCIENTIFIC /TRAININGSWORKSHOPS /MEETINGS/ SEMINARS/ SYMPOSIUM, EXHIBITIONS ETC. ORGANIZED/PARTICIPATED:

VISITS:

1. Dr. Niranjan Kumar, Joint Secretary, Ministry of Mines, Govt. of India visited Southern Region Office, Hyderabad on 29.03.2015 to review the progress of the carried out on different field season items in different field seasons. He was received by Shri K. Duraisamy, DDG & RMH-I and shri J.S. David, Director PSS, SR. He enquired about man power deployment, Administrative matters, Finance, Organogram across the Southern Region and had lengthy discussions on different power point presentations made by Mission Heads and senior Directors present in the meeting.

2. Shri Harbans Singh, DG, GSI visited the Southern Region Office on 21st and 22nd March, 2015 and reviewed the different field related activities of FS 2014-15. Shri S. Kannan, DDG & HOD, SR, Shri Hemraj Suryavanshi, Director, P&M and TS to DG, GSI, Regional Mission Heads of SR, and Senior Officers were present in the meeting. On this occasion , he released two publications i.e. Miscellaneous Publication Volumes related to the ñ Geology and Mineral Resources of Telangana and Andhra Pradesh compiled by Publication Division, SR.

MEETINGS & MISCELLANEOUS:

CGPB Meeting: 54th CGPB meeting was held on 5th & 6th February, 2015 at Vigyan Bhavan, New Delhi. The main theme of the meeting was on ñ Centres of Excellence of GSI and Mission-V in lieu of the ñ Marine Exploration Capabilities in GSI in view of the recently acquired vessel RV Samudra Ratnakar. The meeting was chaired by Shri Harbans Singh, DG, GSI and was attended by National Mission Heads and Heads of Support Systems as well as officers of PSS and ASS divisions, GSI (CHQ). Shri M.S. Jairam, DDG & HOD, SR, Shri P. Ahok Kumar, Director(F) and Shri J. S. David, Director, PSS, SR attended the meeting.

HOD MEETING: The HoD meeting of the Geological Survey of India was held on 30th January, 2015 , 2015 at Oldham Hall, CHQ, Kolakata to discuss about the agenda points for 54th CGPB meeting, ATR, release of GSI Publications etc. for the CGPB. Shri M.S.Jairam, DDG & HoD, GSI, SR, Shri J.S.David, Director, PSS attended the meeting.

REGIONAL ADVISORY COUNCIL MEETING (RAC): 12th RAC meeting of XII Plan XII_SR_RAC_12 of SR for the quarter January to March, 2015 was held on 17th March, 2015, at Hyderabad. Minutes of the meeting was uploaded in GSI portal.

OPERATIONAL ADVISORY COUNCIL MEETING (OAC):12th OAC meeting under XII Plan of all the State Units of Andhra Pradesh, Karnataka & Goa, Tamilnadu & Puducherry and Kerala were held for the quarter January to March, 2015. Date of the meetings and the status of uploading of minutes are given in Annexure ï 11.

TRAININGS:

M & CSD

- Shri. Jishnu B. K, Shri. Manoj R.V. and Shri. Kshetrimayum Atamajit Singh, Geologists are participated in mandatory safety t

- Training (STCW) at SCI Maritime Training Institute, Powai, Mumbai from 12th January 2015 to 23rd January 2015.

- Training on higher applications of Quantum GIS, a free open source and user friendly software imparted by Shri S.V.Hegde, Director, M&CSD, GSI, Mangalore at G. Gaitan Vaz conference hall of OP:EC-II office from 21.01.2015 to 24.01.2015.

- The OEM Batchï V training on Synthetic Aperture Sonar (SAS) deployment onboard R.V. Samudra Ratnakar by OEM at Off Mangalore from 03rd to 08th February, 2015.

- Familiarization programme on Multichannel Seismic processing software, Promax was conducted from 9 th to 14th February 2015 onboard R.V.Samudra Ratnakar berthed at Mangalore Port.

- Shri M.P.Sahel, Shri Rajanesh P Narayan, Smt. Panikar Nisha Prabhakaran, Smt. Smitha Krishna, Ms. Divya, Ms. S.Krithika and Ms. Shabna Kahar (Op:EC-II) ,Rohit Kumar, Jayamurugan K., Selvasundaram S. and Ashwini Kumar Sahoo(Op:WC-II) , Smt. Beena S, Sr.Geologist, Shri.Prawal Kumar, Geologist, Ms. Priva P.Goswami Geologist, Ms. K. Selva Rathika Geologist, Shri. Viiesh A. Geologist (Op:WC-I) have been undergoing the STCW safety training at MTI, Mumbai since 16th February, 2015.

WORKSHOPS/SEMINARS:

1) Shri S.Kannan,Dy.DG, A.Anil Kumar, Sr.Geologist Satish Kumar, Supdtg. Geologist, Renjith M. L Sr. Geologist, Kum Vidya S. , Geologist Dr.H.S.M Prakash, Director, , Dr. Vinod Kumar, Sr. Geologist, Sethu Rose Joseph, Geologist and K.V. Neena Vaman, Geologists SU: K&G and Smt. Nidhi Misra Geologist, SR attended Regional Brain Storming session on ñ36th IGC: A unique opportunity for advancement in Geosciencesò held at GSITI , GSI , Hyderabad from 18.02.15 to 19.02.15.

2. Shri M. N. Praveen, Supt. Geologist, SU: Kerala has attended the meeting on 02.01.15 at Ministry of Mines chaired by Additional Secretary, MOM regarding the new MMDR policy and need for identification of exploration blocks pertaining to notified minerals for auctioning.

3. Shri C. Thanavelu, Director, SU: Kerala attended the seminar on Landslide Management and Mitigation Strategies on 06.02.15 conducted at DTRL and presented a paper titled óLandslide Perspective Environment Impact Assessment Due to Creation of a Reservoir in the Nilgiris, Tamil Nadu.

4. Dr. P. Soney Kurien, Senior Geologist, SU: Kerala presented a paper entitled óContrasting geological conditions across Palghat-Cauvery Shear Zone, Keralaô on UGC SAP Seminar at University Kerala on 31.03.15.

5. Shri. Jayaprakash C., Supdtg. Geologist delivered a talk on ñClimatic Changesò to the Scientists from DST and GSI from New Delhi at the CPWD Conference Hall of Kedriya Bhavan, Kochi on 6th January, 2015.

11. HUMAN RESOURCE DEVELOPMENT, ESTABLISHMENT, PAY ROLL AND HRMIS, e-SERVICE BOOK, etc:

HRMIS DATA IN RESPECT OF SOUTHERN REGION AS ON 31/3/2015

S.NO	OFFICE	GRôAô	GRôBô(G)	GRôBô(NG)	GRôCô	TOTAL
1	SRO, HYDERABAD	192	14	150	233	589
3	SU:K&G, BANGALORE	83	6	15	24	128
4	SU:TN&P, CHENNAI	79	3	9	33	124
5	SU:KERALA	31	2	11	17	61
6	West Coast-I, Marine Wing, Mangalore	49	3	07	23	82
7	East Coast - II, Marine Wing, Visakhapatnam	38	0	10	23	71
8	West Coast - II, Marine Wing, Cochin	17	0	3	05	25
	TOTAL	489	28	205	358	1080

CONSOLIDATED STATEMENT FOR THE REGION : HYDERABAD									
STATUS OF HRMIS DATA UPDATION FOR AS ON 31st MARCH, 2015									
RHQ / State Unit	Group	No.of Employees as on 1st	No. of Employees (with %) i.r.o. whome the HRMIS data is already updated		No. of Employees (with %) i.r.o. whome the HRMIS data is updated during the current month		No. of Employees (with %) i.r.o. whome the HRMIS data is yet to be updated		Remarks if any
			No.	%	No.	%	No.	%	
RHQ	' A '	192	180	93.75%	0		18	9.38%	2-TR,1-Dep
	' B ' (G)	14	15	107.14%			3	21.43%	
	' B ' (NG)	150	147	98.00%			3	2.00%	
	' C '	233	212	90.99%			31	13.30%	
	Total	**589**	**554**	**94.06%**	**0**	**0.00%**	**55**	9.34%	
SU: Kerala	' A '	31	26	83.87%	0		2	6.45%	
	' B ' (G)	2	5	250.00%			0	0.00%	
	' B ' (NG)	11	10	90.91%			1	9.09%	
	' C '	17	18	105.88%			0	0.00%	
	Total	**61**	**59**	**96.72%**	**0**	**0.00%**	**3**	4.92%	
SU: Tamil Nadu	' A '	79	73	92.41%	0		2	2.53%	1-TR
	' B ' (G)	3	5	166.67%			0	0.00%	
	' B ' (NG)	9	9	100.00%			1	11.11%	
	' C '	33	32	96.97%			0	0.00%	
	Total	**124**	**119**	**95.97%**	**0**	**0.00%**	**3**	**2.42%**	
SU : Karnataka & Goa	' A '	83	72	86.75%	0		0	0.00%	
	' B ' (G)	6	5	83.33%			0	0.00%	
	' B ' (NG)	15	14	93.33%			4	26.67%	
	' C '	24	26	108.33%			0	0.00%	
	Total	**128**	**117**	**91.41%**	**0**	**0.00%**	**4**	**3.13%**	
Un defined if any	' A '				0				
	' B ' (G)								
	' B ' (NG)								
	' C '								
	Total	**0**			**0**	**0.00%**			
Total for Region	***' A '***	385	351	91.17%	0	0.00%	22	5.71%	
	' B ' (G)	25	30	120.00%	0	0.00%	3	12.00%	
	' B ' (NG)	185	180	97.30%	0	0.00%	9	4.86%	
	' C '	307	288	93.81%	0	0.00%	31	10.10%	
	Total	**902**	**849**	**94.12%**	**0**	**0.00%**	**65**	**7.21%**	

Statement of usage of Transactional Application – 'Claims'- GSI Portal (01/01/2015 to 31/03/2015)
Employee Claims :

Serial No.	Claim Description	Submited Claims	Approved & Accepted Claims
1	Joining Report	142	0
2	Leave Application	334	128
3	Leave Cancellation	13	0
4	Station Leaving	22	15
5	Leave Extention	32	14
6	Travel Adjustment	0	0
7	Tour Revision	0	0
8	Travel Approval	59	50

STATUS OF PENDING GRIEVANCE CASES

Annexure - I

STATUS OF GRIEVANCE CASES (PORTAL)

Sl.No.	Registration No. & Date	Name of Complainant	Subject of Grievance	Remarks
01.	DOPPW/P/2014/00732, dt. 28-03-2014	All India Federation of pensioners Association, Chennai.	Fixation of Pay of Sri. Kanaikaraj, Artist (Retd.)	The case is pending with HO,SU :TN&PK, Chennai
02.	MMINE/E/2014//00155 dt. 28.07.2014	ShriK.M. Sivadas, Sr.Geol.(rtd.) Trivandrum	Revision of pension	Pension already revised by PAO,SR as per rules as informed by them. Though the action part from the ends of SR admn and PAO,SR was over the doumentary proof is yet to be received from them and on receipt of the same the grievance will be settled under intimation to NO, Grievance (PG), CHQ.
03.	PG Regn MMINE/E/2014/00081 dt.16-04-2014	Sh K.V.Krishnan, Mineralogist (Rtd.)	Eligibility for family pension	The lr dt 18-07-2014 of NO(PG) was not received. Lr. Dt.18-02-2015 is the first lr received on the subject. Referred to HO, SR on 27-02-2015

Annexure - II

STATUS OF GRIEVANCE CASES (NON PORTAL)

Sl.No.	Registration No. & Date	Name of Complainant	Subject of Grievance	Remarks
01	Lr. Dt. 31-10-2014	Shri D. Ramesh, Duftry, GSI,SR,Hyderabad	Conduct of review DPC for his promotion	The matter was referred to HO, GSI,SR on 07-11-2014
02.	Lr. Dt. 05-11-2014	Shri V. Savarayya, UDC (Retd.), GSI,SR,Hyderabad	Revision of pension	The matter was referred to HO,GSI,SR on 07-11-2014
03.	-	Dr. G.R.M. Rao, Geol (Sr),GSI,SR,Hyd	Incentive for acquiring higher qualification	The grievance is received for the first time in Grievance cell of SRO on 27-01-2015.Referred to DDG(P&A) Kolkata on 28-01-2015 under intimation to HO,SR.
04.	VKK/NFU/ARR/1902 dt.19-02-2015	Sh V.K Khadse, Suptg.Geologist,Nagpur	Fixation of pay on grant of NFSG &NFU& payment of arrears and refixation of pension.	First letter received in Grievance cell of SRO on 23-02-2015 (lr dt.19-02-2015)Referred to the HO,SR on 27-02-2015
05.	Lr. Dt. 09-03-2015	Sh K.Y. Kondarayudu, Assistant, GSI,SR,Hyderabad	Request for internal transfer with appropriate duties and with designation.	Referred to HO, SR on 11-03-2015
06.	Lr. Dt. 03-03-2015	Sh K. Radhakrishnan, Survey Officer, GSI,SR,Chennai	Issuance of revised MACP-III order	Referred to HO,SR on 11-03-2015

STATEMENT OF PENDING OF VIGILANCE CASES (Non-vigilance angle)

(Disciplinary cases pending in SR, Hyderabad upto the end of March, 2015)

Sl.No	Description	No of Cases
1	Total No of cases pending as on 31.3.2015	79
2	Total cases disposed of as on 31.3.2015	-
3	Total No of cases added during the quarter	New case 1+2 *old case=3
4	Total No. of cases disposed during the quarter	5
5	Total No of cases at the end of March, 2015	77

Number of Court/CAT Cases pending upto March, 2015				
(Vide para 114(1)				
less than 6 months	Between 6 months to 1 year	Between 1 to 2 years	Over 2 years	Total
(1)	(2)	(3)	(4)	(5)
33	12	32	77	77

RTI Application / Request Status for the ending March, 2015

Organistion	Number of cases				
Geological Survey of India	Previous pendency	No of RTI request/application received during the period	Disposal	Balance	Information denied under section 8(1),9,11,24 & other RTI acts
1	2	3	4	5	6
SR	20	24	29	15	Nil

12. VEHICLES & TRANSPORT INFRASTRUCTURE INCLUDING OUTSOURCING AND AGE OF VEHICLES

The required informations are given in the attached **Annexure- 13**

13. MODERNISATION

As part of the ongoing modernization and restructuring of the Geological Survey of India NCEGR, Bangalore proposals to procure new instruments like Laser Raman Spectrometer, EDX based SEM automatic mineralogical solution, Particle Size Analyzer, hydroseparation and electric pulse disaggregator for liberation and separation of minerals are being initiated. Tender for the procurement of analytical balance with density measurement kit, Gem Testing Instruments, automatic flotation machine, jig, and shaking table are floated after approval from Sr PAC and ADG, RSAS.

Tenders are floated for two basic and one advance research microscope, heating and freezing stage for fluid inclusion studies and FTIR are under way after vetting and approval by CPMC, CHQ, Kolkata.

Current status on procurement of important capital assets is presented in **Annexure – 14.**

14. DRILLING INFRASTRUCTURE

The informations pertaining to the drilling infrastructure are given in the attached **Annexure- 15A**

15. OUTSOURCING OF ROUTINE SERVICES (HOUSE KEEPING, SECURITY, GARDEN ETC):

As far as practically feasiable, routine services have been outsourced in Southern Region. Out sourcing of routine human services are made through open advertisement / tender invitation followed by short listing the lowest bidding firm and inviting the firm to enter into an agreement for providing the required manpower and / or to accomplish the task assigned for outsourcing jobs. Presently, the entire security as well as house keeping including cleaning and maintenance of office premises are through outsourcing. Vehicle deployment including deployment for field duties (partly) are outsourced. Some of the technical works including uploading of field reports, reorganization of library, as well as some chemical analysis of samples are being undertaken on outsource basis.

ANNEXURES

Annexure – 1A

MAJOR MINERAL RESOURCES ESTIMATED IN SOUTHERN REGION, SHOWING STATE-WISE, FIVE–YEARLY INCREMENT
(Reserve in million tonnes unless otherwise stated)

S.No.	Ore / Mineral		Andhra Pradesh			Karnataka			
		2010	2005	2000	1995	2010	2005	2000	1995
1	Asbestos	0.056531	0.049	0.055	0.051	8.2824	8.282	8.282	0.29
2	Barytes	68.4784	69.896	75.774	0.084	0.01517	0.015	0.015	0.009
3	Bauxite	615.267	615.267	612.756	551.479	55.705	49.503	44.981	27.332
4	China clay	74.176	73.675	72.785	52.504	2.5852	257	255	12.857
5	Chromite	0.187	0.187	0.187	0.116	1.632	1.789	1.87	1.452
6	Copper	8.248	8.248	8.248	5.449	33.535	34.404	34.404	5.669
7	Diamond (M.Carats)	1.822955	1.823	1.182	0.005		--		
8	Dolomite	1.182452	1146	1130	129	662.116	633.509	535.239	346.152
9	Gold	12.098347	12.098	8.553	3.791	66.1724	66.172	24.232	12.863
10	Graphite	0.427199	0.427	0.427	0.219	0.6731	0.267	0.267	0.262
11	Iron ore Hematite(B.T) Magnetite (B.T)	 0.381478 1.463541	 0.163 1.463	 0.140 1.463	 0.051 0.418	 2.15867 7.8017	 1.676 7.811	 1.148 7.883	 1.072 2.784
12	Lead ï Zinc ore	22.689	6.62	6.62	1.954	NA	NA	NA	NA
13	Limestone (B.T)	35.178535	35.18	35.219	15.059	51.8858	51.885	51.210	17.439
14	Magnesite	0.080	0.08	0.08	NA	4.046	3.857	3.754	1.229
15	Manganese	17.598	15.583	18.287	11.905	96.188	82.736	86.568	41.054
16	Mica (M.Kgs)	220.786228	111.3	40.36	44.837		NA	NA	NA
17	Molybdenum	NA	NA	NA	NA	1.3209	1.320	1.32	0.9
18	Sillimanite	9.644500	8.776	8.776	7.898	0.9827	0.983	0.983	0.475
19	Tungsten	14.802300	14.802	14.802	14.395	36.6778	36.68	36.68	NA

S.No	Ore / Mineral	Goa	Tamil Nadu	Kerala									
		2010	**2005**	**2000**	**1995**	**2010**	**2005**	**2000**	**1995**	**2010**	**2005**	**2000**	**1995**
1	Asbestos	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA
2	Barytes	NA	NA	NA	NA	0.2224	0.222	0.222	0.117		NA	NA	NA
3	Bauxite	58.001	50.355	53.072	51.26	24.820	26.845	25.156	22.648	14.096	14.098	14.16	8.426
4	China clay	0.016	0.016	0.016	0.015	56.897	56.897	56.897	44.968	663.83	630.65	468.80	127.48
5	Chromite	NA	NA	NA	NA	0.283	0.282	0.282	0.24		NA	NA	NA
6	Copper	NA	NA	NA	NA	0.790	0.79	0.79	NA		NA	NA	NA
7	Diamond	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA
8	Dolomite	NA	NA	NA	NA	2.145	2.145	2.145	1.627		NA	NA	NA
9	Gold	NA	NA	NA	NA	0.0670	0.067	0.067	NA	0.5585	0.558	0.558	0.558
10	Graphite	NA	NA	NA	NA	8.2388	7.914	1.287	0.423	1.585	1.45	1.45	0.533
11	Iron ore Hematite(B.T) Magnetite (B.T)	 0.9271 0.22267	 0.712 0.214	 0.642 0.215	 0.745 0.164	 NA 0.5070	 NA 0.481	 NA NA	 NA 1	 NA 0.083	 NA 0.083	 NA 0.083	 NA 0.036
12	Lead ï Zinc ore	NA	NA	NA	NA	0.790	0.79	0.79	0.462		NA	NA	NA
13	Limestone (B.T)	NA	NA	NA	NA	1.1824	1.18	1.2	0.805	206.98	0.206	0.210	0.154
14	Magnesite	NA	NA	NA	NA	40..511	45.517	68.044	48.919	0.040	0.04	0.04	0.035
15	Manganese Ore	0.135	19.057	23.271	16.865	NA	NA	NA	NA	NA	NA	NA	NA
16	Mica	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
17	Molybdenum	NA	NA	NA	NA	9.9658	9.965	6.975	0.036	NA	NA	NA	NA
18	Sillimanite	NA	NA	NA	NA	17.9524	17.926	17.926	15.62	7.1500	9.248	9.906	9.607
19	Tungsten	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
20	Ilmenite	NA	NA	NA	NA	NA	NA	NA	NA	114.22	102.00	--	---
21	Rutile	NA	NA	NA	NA	NA	NA	NA	NA	3.7758	6.82	--	----
22	Leucoxene	NA	NA	NA	NA	NA	NA	NA	NA	9.6685	4.87	--	---
23	Zircon	NA	NA	NA	NA	NA	NA	NA	NA	2.7591	5.99	--	----
24	Lignite	NA	NA	NA	NA	32892.92	20350	18377	17354				

(Source ï IBM Yearbook 2001, 2004, 2008, 2010)

B.T. = Billion Tonnes, M.Kgs = Million Kilograms, M. Carats= Million Carats
NA- Data not available

Annexure- 1B

NMI: NO. OF REPORTS CONVERTED AS PER UNFC COMPLIANCE

Nodal Officer: M.B.Beeraiah, Dy.Director General & RMH-II.
Target: Upto June 2011, -- 177 Nos.
Achievements: Upto June 2011, --177 Nos.
Reports remaining for UNFC compliance: Nil.

Sl. No.	Accession No.	Source/Report's Title	Field Season	Author(s)	Stage of Mineral Investigation/ UNFC Code
1.	SRO-12309	Report on the investigation for gold in Volagere-Ambale and adjoining areas, Mysore District, Karnataka.	1996-1997	D.D.Raju	G-4
2.	SRO-12258	A report on gold investigation in contact zones at acid/basic volcanics in Hira-Buddini Western Block of Hutti-Maski Schist Belt, Raichur District, Karnataka.	1996-1997	Venkataswamy and A.N. Susheelendra	G-4
3.	SRO-12316	A report on the evaluation of soil geochemical anomaly zones near the contact of acid-volcanics in Chinchergi South Block, Hutti-Maski Schist Belt, Raichur District, Karnataka.	1997-1998	C.G. Hemantha Kumar, Venkataswamy and A.N. Susheelendra	G-4
4.	SRO-12285	Regional assessment of iron ore in parts of South Goa, Sanguem Taluk, Goa State.	1997-1999	D.Purushothaman and N.D.Ramachandra	334
5.	SRO-13544	Prelimnary assessment of potential of the multi-coloured granites in parts of Prakasam and Guntur Districts, AP.	1998-1999	T.Rajesham and Ch.Jayant Kumar	333
6.	SRO-13318	Geology and resource potential survey of dimension stone granite deposits in parts of Dindigul District, Tamil Nadu	1998-1999	M.Ravikumar and Dr.K.Rajaram	334
7.	SRO-13357	Geology and resource survey of dimension stone deposits in and around Sivakasi, Virudhunagar District, Tamil Nadu.	1998-1999	T.Mullaivendan and K.Rajaram	334
8.	SRO-13169	Report on the detailed exploration to locate primary gold lodes in Nattukal, Kanhirapuzha-Muthikulam Sector, Palakkad District, Kerala.	1998-1999	Mathew Joseph & R.S.Nair.	G-4
9.	SRO-13148	Prelimnary exploration for gold in parts of Attapadi valley (Agali Block), Palakkad District, Kerala.	1998-1999	R.V.G.Nair, K.R.Pillay & A.K.Maji	G-4
10.	SRO-13278	Regional prospecting for molybdenum in the area north of Alangayam, Alangayam-Gudiyattam Belt, Vellore District, TN.	1998-1999	I.K.Khan and K.Jayabalan	G-4
11.	SRO-12406	A report on the evaluation of soil geochemical anomaly zones near the contact of acid-basic volcanics in Hosur East and West Blocks, Hutti-Maski Schist Belt, Raichur District, Karnataka.	1998-1999	Venkataswamy and C.G. Hemanth Kumar	G-4
12.	SRO-12926	Prelimnary exploration for gold in parts of Attapadi valley (Kudapati Block), Palakkad District.	1998-1999	K.R.Pillay and R.V.G.Nair	G-4
13.	SRO-12928	Preliminary investigation for gold in the Karimpuzha-Thalipuzha sector of Nilambur, Malappuram District.	1998-1999	M. Koshy John, C. Muraleedharan and R.S.Nair	G-4
14.	SRO-13274	Report on the investigation for gold in Nagavi North Block, Gadag Schist Belt, Gadag District, Karnataka.	1998-1999	M. Beeraiah	G-4
15.	SRO-12549	Report on the investigation for gold in Doni Tanda Block,	1998-1999	S. Sengupta	G-4

		Gadag Schist Belt, Gadag District, Karnataka.			
16.	SRO-13296	Evaluation of geochemical anomaly No.2 for PGE in Hanumalapura, Channagiri Taluk Davangere District, Karnataka.	1998-1999	S. Ramakrishna Setty & M.N. Ramachandra Rao	G-4
17.	SRO-13309	Investigation for gold in Salagudda Block, Haveri District, Karnataka.	1998-1999	P.G.K. Bhat and A.N.Susheelendra	G-4
18.	SRO-12274	Search for kimberlites in the granitic terrain of Gulbarga and Raichur Districts, Karnataka.	1998-1999	S. Shivanna	G-4
19.	SR0-13294	Report on the evaluation of the geochemical anomalies for gold in Lakkavalli area, Tarikere Taluk, Chikmagagalur District, Karnataka.	1998-1999	S.Ramakrishna Setty	G-4
20.	SR0-13310	Report on the evaluation of stream sediment gold anomalies in different green stone belts of Karnataka (parts of Krishnarajapet, Holenarsipur Schist Belt, Hassan District and Bellara-Anesidri areas of Chitradurga Schist Belt.	1998-1999	S. Balakrishnan & S. Rajakrishnan	G-4
21.	SRO-12286	Evaluation of stream sediment geochemical gold anomaly in Vibhutikatti Tanda area, Huvinahadagali Taluk, Bellary District, Karnataka.	1998-1999	S. Ramakrishna Setty	G-4
22.	SRO-12782	Report on the investigation for gold in Peddapartikunta Block in the Southern Green Stone Belt, Chittoor District, AP.	1998-1999	B.V.R Reddy and K.V. Ramanaidu,	G-4
23.	SRO-12588	Report on geochemical evaluation for gold mineralisation in Atkur Block, Gadwal Schist Belt, Mahabubnagar District, AP.	1998-1999	P.V. Krishna Rao and V.V. Seshasai	G-4
24.	SRO-12287	Report on the investigation for gold in Nabhapura North Block, Gadag Schist Belt, Gadag District, Karnataka.	1998-1999	M.B.Beeraiah and S. Sengupta	G-4
25.	SRO-13322	Assessment of gold resources in Boksampalle North Block, Ramagiri Greenstone Belt, Anantapur District, Andhra Pradesh.	1998-1999	N.Devaraj and M. Purushothaman	333
26.	SRO-13452	A report on the exploration for molybdenum by second level drilling in Marudipatti Central and North Blocks, Harur-Uttangarai Molybdenum Belt, Dharmapuri District, Tamil Nadu	1998-2000	E.Balasubramanian	333
27.	SRO-12965	Detailed exploration to locate primary gold lode zones in kurukkankundu-Kallamala areas of Pothupadi-Kanjirapuzha sector, Palakkad District, Kerala.	1998-2000	M.Koshy John and K.R.Pillay	
28.	SRO-13457	The investigation for gold in Volagere-Ambale Block, Nanjangud Taluk, Mysore District, Karnataka.	1998-2000	D.D. Raju	G-3
29.	SRO-13007	Final report on evaluation of gold mineralisation and characterisation of shears of Dona area, Jonagiri Schist Belt, Kurnool District, Andhra Pradesh.	1998-2000	Santanu Bhattacharjee and D. Roop Kumar	G-4
30.	SRO-13461	Report on search for kimberlites in Hagari River Basin in parts of Anantapur and Kurnool Districts, Andhra Pradesh.	1998-2000	S.S. Nayak, V.Singa Raju and S.A.D.Kudari	G-4
31.	SRO-13348	A report on geochemical evaluation of gold mineralisation in Atkur Block , Gadwal Schist Belt, Mahabubnagar District, AP.	1998-2000	P.A. Ramesh Babu and J.Srihari.	G-4
32.	SRO-13366	Report on the investigation for gold and associated elements in Atkur (South) Block, Gadwal Schist Belt, Mahabubnagar	1998-2000	V.V.Sesha Sai et al	G-4

		District, Andhra Pradesh.			
33.	SRO-13302	Report on investigation of ultramafic rocks to assess their suitability as basic-flux/refractory material.	1998-2000	M. Sridhar	G-4
34.	SRO-13474	Report on regional geochemical surveys in the parts of Shimoga-Dharwar Schist Belt, Dharwar, Haveri and North Kanara Districts, Karnataka.	1998-2001	Rahamathulla Khan & N.Subramanian	G-4
35.	SRO-12927	Prelimnary exploration for gold in parts of Attapadi valley (Vannathura Block), Palakkad District.	1999-2000	R.V.G. Nair and Praveen Kumar	G-4
36.	SRO-13323	Geology and resource survey of dimension stone deposits in Pudukkottai District, Tamil Nadu.	1999-2000	K.Jayabalam and Dr.K.Rajaram	334
37.	SRO-13370	Regional assessment and preparation of inventory of the resources of granitic and dyke rocks for polishing and dimension stone industry in Kurnool District, Andhra Pradesh.	1999-2000	Dr.T.Rajesham , E.S.N Rao and Dr. V.Balachandrudu	334
38.	SRO-13311	Geology and resource survey for dimension stone deposits in parts of Tirunelveli and Kanniyakumari Districts, Tamil Nadu.	1999-2000	T.Mullaivendan and K.Rajaram	334
39.	SRO-13450	Report on resource evaluation of dimension/ornamental stone granites in parts of Lingsugur, Manvi and Deodurg Taluks, Raichur District, Karnataka.	1999-2000	R.Panduranga and Shafeeq Ahmed	334
40.	SRO-13317	Geology and resource survey in and around Chennimalai, Erode District, Tamil Nadu	1999-2000	M.Ravikumar and Dr.K.Rajaram	334
41.	SRO-13363	Investigation for ornamental granite in parts of Koppal District, Karnataka.	1999-2000	Dr.S.Paranthaman and T.Babu Ravindra Kumar	334
42.	SRO-13256	Report on prelimnary investigation for lead and associated other basemetals in the Toppur area, Erode District, Tamilnadu.	1999-2000	V. Krishnan	G-4
43.	SRO-13475	Exploration for gold in Honnamaradi North Block, Chitradurga Schist Belt , Chitradurga District, Karnataka.	1999-2000	Jayaprakash Mohakul	G-3
44.	SR0-13577	Evaluation of geochemical anomalies for gold in Hungund-Kushtagi and Hagari Schist Belts, Bagalkot Koppal, Raichur and Bellary Districts, Karnataka.	1999-2000	P.G.K.Bhat, S.R.K.Setty, B.Venkataramana and K,Babu Rao	G-4
45.	SRO-13315	Preliminary investigation for gold in parts of Shimoga-Dharwar Schist Belt, north of Hanagal and west of Shiggaon, Haveri and North Kanara District, Karnataka.	1999-2000	Dr. Saleem Ahmed Khan & D. Purushothaman	G-4
46.	SRO-13295	Investigation for gold in Kanakuppa (BRGM-GSI anomaly-2), Jagalur Taluk, Davanagere District, Karnataka State.	1999-2000	Balakrishnan	G-4
47.	SRO-13151	Search for kimberlites in the granitic terrain of Gulbarga District, Karnataka.	1999-2000	S. Shivanna	G-4
48.	SRO-13150	Search for kimberlites in parts of Molakalmuru Taluk, Chitradurga District, Karnataka.	1999-2000	H.S.M. Prakash	G-4
49.	SRO-13466	Evaluation of geochemical anomalies for gold in Shimoga-Dharwar Schist Belt, Chikmagalur, Shimoga, Haveri District, Karnataka.	1999-2000	N. Subramani & A.N. Susheelendra	G-4

50.	SRO-13276	Report on the evaluation of geochemical anomalies for gold in the Hutti-Maski Schist Belt, Raichur District, Karnataka.	1999-2000	Venkataswamy and T. Krishnappa	G-4
51.	SRO-13262	Report on the evaluation of geochemical anomalies for gold in the in the Gadag Schist Belt, Gadag District, Karnataka.	1999-2000	M.B.Beeraiah and C.G.Hemantha Kumar	G-4
52.	SRO-13724	Final report on the assessment of gold resources in quartz vein zone of Boksampalle North Block, Anantapur District, Andhra Pradesh.	1999-2001	G. Vidya Sagar, N.Devraj and N.L.Gera	G-3
53.	SRO-13479	Final report on the preliminary exploration for gold in Paramanahalli Block, Chitradurga Schist Belt, Chitradurga District, Karnataka.	1999-2001	R. Dharuman	333
54.	SRO-13571	Evaluation of geochemical anomalies for gold in parts of Chitradurga Schist Belt including Chitradurga, Mayakonda and Kibbanahalli Belts, Chitradurga and Tumkur Districts, Karnataka.	1999-2001	S.Rajakrishnan	G-4
55.	SRO-13583	Report on the investigation for gold in Dona North and Dona South Blocks of Dona Sector, Jonagiri Schist Belt, Kurnool District, Andhra Pradesh.	1999-2001	M.S. Jairam, S. Anandamoorthy, P.V.Krishna Rao & D. Roop Kumar	332
56.	SRO-13308	Report on the search for kimberlites/lamproites in parts of Krishna, Khammam and Nalgonda Districts, Andhra Pradesh.	1999-2001	T. Ajit Kumar Reddy et al.	G-4
57.	SRO-13612	Regional assessment of dimension stones in parts of Koppal Bellary and Raichur Districts, Karnataka.	2000-2001	Dr.S.Parantham and D.K.Sahoo	334
58.	SRO-13344	Report on the detailed investigation for primary gold mineralisation in Addakonda South Sector, Veppanapalli RF, Krishnagiri range, Dharmapuri District, Tamilnadu.	2000-2001	V.Ganesan	G-3
59.	SRO-13253	Report on the prelimnary investigation for molybdenum to the south of Ettipatti (Annamalaipattii bolck) in the extension areas of Velampatti south Block,Dharmapuri District,Tamilnadu.	2000-2001	K.Nagarajan	G-4
60.	SRO-13778	Report on prelimnary investigation for molybdenum in Bisanattam and Avulatippanapalli area, Southern Kolar Greenstone Belt, Chittoor District, Andhra Pradesh.	2000-2001	B.V.R. Reddy, S.N. Mariappan and Y.R.C.S.Narayana	G-4
61.	SRO-13485	Preliminary investigation for gold in Lakkikopa South Block between Hanagal and west of Shiggaon, Dharwar Schist Belt, Haveri District, Karnataka.	2000-2001	Dr. Saleem Ahmed Khan	G-4
62.	SRO-13477	A report on the evaluation of geochemical anomalies for gold in Sargur Schist Belt, Mysore District (Part-A) and in Nuggihalli Schist Belt, Hassan District (Part-B), Karnataka.	2000-2001	S. Ramakrishna Setty and K. Babu Rao	G-4
63.	SRO-13527	Search for Kimberlites in the granitic terrain of Gulbarga and Raichur Districts, Karnataka.	2000-2001	S. Shivanna and J.K.Srivastava	G-4
64.	SRO-13525	Report on the prospecting for gold in volcanics-sediment contact zone between Rangayanadurga and Harpanahalli, Chitradurga Schist Belt, Davanagere District, Karnataka.	2000-2001	T. Krishnappa and R. Madusudanan	G-4
65.	SRO-13375	Report on the evaluation of the geochemical anomalies for gold in Gadag Schist Belt, Gadag District, Karnataka.	2000-2001	M.B.Beeraiah & N.Sampath Rajan	G-4

66.	SRO-13284	Preliminary investigation for gold in Siddarahalli-Bhirapur Block of Shimoga Schist Belt, TarikereTaluk, Chikmagalur District, Karnataka.	2000-2001	B.Venkataramana	G-4
67.	SRO-13361	Report on the evaluation of geochemical anomalies for gold in the Hutti-Maski Schist Belt, Raichur District, Karnataka.	2000-2001	C.G.Hemantha Kumar & N. Devaraj	G-4
68.	SRO-13473	Report on preliminary exploration for gold in Hosahatti Block, Chitradurga Schist Belt, Chitradurga District, Karnataka	2000-2001	Jayaprakash Mohakul	G-3
69.	SRO-13360	Preliminary investigation for gold in parts of Shimoga Dharwar Schist Belt west of Harapanahalli and east of Tungabhadra river, Davangere District, Karnataka.	2000-2001	D.Purushothaman & K. Basavaraja	G-4
70.	SRO-13453	Investigation for gold in Hutti North Block, Hutti-Maski Schist Belt, Raichur District, Karnataka.	2000-2001	N. Devaraj	G-3
71.	SRO-13957	Report on the evaluation of geochemical anomalies for gold in Shimoga-Dharwar Schist Belt, Karnataka.	2000-2001	D.D.Raju and A.N. Susheelendra	G-4
72.	SRO-13767	Investigation for gold in Nabhapura North Block, Gadag Schist Belt, Gadag District, Karnataka.	2000-2001	M.B. Beeraiah	G-3
73.	SR0-13524	Prelimnary investigation to locate gold lodes in the Punnapuzha-Chaliyarpuzha sector of the Nilambur valley, Malappuram District, Kerala.	2000-2002	M.Koshy John and K.R.Pillay .	
74.	SRO-13611	Evaluation of geochemical anomalies for gold in Sandur Schist Belt, Bellary District, Karnataka.	2000-2002	S. Rajakrishnan et al.	G-4
75.	SRO-13523	The detailed exploration for clay and associated minerals in Palai B-Block, Nileswaram, Kasaragod District, Kerala.	2000-2002	T.N.Rajan and K.Koshy John	332
76.	SRO-13439	Report on delineation and assessment of the diamondiferous nature of the pipe P-2, Wajrakarur, Anantapur District, Andhra Pradesh.	2000-2002	S.S. Nayak and M.V.Dhakate	G-4
77.	SRO-13521	Investigation for gold in Bhadrampalle, Venkatampalle and Ramapuram areas of Penakacherla Schist Belt, Anantapur District, Andhra Pradesh	2000-2002	P.A. Ramesh Babu et al.	G-4
78.	SRO-13892	Investigation for gold in Hutti North Block, Hutti-Maski Schist Belt, Raichur District, Karnataka.	2000-2003	N. Devaraj & U.K. Pradhan	333
79.	SRO-13522	Preliminary investigation for quartz and feldspar mineralization in Nellore and Prakasam Districts, Andhra Pradesh.	2001-2002	S.M.J.Basha and M.S.Reddy	334
80.	SRO-13575	Preliminary investigation for gold in Lakkikoppa North Block between Hanagal and west of Shiggaon, Haveri District, Karnataka.	2001-2002	D. Purushothaman and A.N. Susheelendra	G-4
81.	SRO-13744	Report on the concept oriented drilling in Vellakkal Central Block, Harur-Uttangarai Molybdenum Belt (HUB), Dharmapuri District, Tamil Nadu.	2001-2002	E. Balasubramanian	G-3
82.	SRO-13572	Preliminary investigation for Banded Iron Formation hosted gold in the northwestern part of the Dharwar Schist Belt, around northwest of Mungod, Kalghatgi Taluk , Dharwar District, Karnataka.	2001-2002	D.D.Raju	G-4

83.	SRO-13576	Preliminary investigation for gold in Muk-Basrikatti, Singapura, Jakkinkatti, Niralkatti and Shivapura areas, Dharwar Schist Belt, Haveri District, Karnataka.	2001-2002	K.Basavaraja	G-4
84.	SR0-13476	Report on the evaluation of soil geochemical anomaly 6 for gold in Dindur Block , Gadag schistbelt , Gadak District , Karnataka.	2001-2002	Venkataswamy	G-4
85.	SRO-13391	nvestigation for gold in Hutti North Block, Hutti-Maski Schist Belt, Raichur District, Karnataka.	2001-2002	N. Devaraj	G-3
86.	SRO-13469	Investigation for gold in Jalligeri Block, Gadag Schist Belt, Gadag District, Karnataka.	2001-2002	M.B. Beeraiah	G-4
87.	SRO-13467	Report on preliminary investigation for phosporite and associated mineralisation in the western part of the Nallamalai Fold Belt between Lambaditanda and Peddasettipalle, Cuddapah District, Andhra Pradesh.	2001-2002	D.N. Charyulu and M.S.Reddy	G-4
88.	SRO-13603	Regional survey in search of kimberlites in the granitic terrain of Raichur District, Karnataka.	2001-2002	J.K. Srivastava	G-4
89.	SRO-13623	Investigation for gold in kalmukkur area of Attapadii valley, Palakkad district,Kerala.FS: 2001-2003		R.V.G Nair and V.Ambili	
90.	SRO-13671	Search for Kimberlites in parts of Mahabubnagar District, Andhra Pradesh.	2001-2003	M. Sridhar and V. Srinivas Chowdhary	G-4
91.	SRO-13881	Exploration for gold in sulphidic Banded Iron Formation of Lakkikoppa South Block, Haveri District, Karnataka.	2001-2003	S.A. Khan	G-3
92.	SRO-13885	Exploration for gold in Siddarahalli Block, Kadur-Shimoga Schist Belt, Tarikere Taluk, Chikmagalur District, Karnataka.	2001-2003	S.A. Khan	G-3
93.	SRO-13615	Detailed evaluation of clay and associated minerals in selected sub-block-1 of Palai A-block, Nileswaram, Kasaragod District, Kerala.(E-II stage).	2002-2003	M. Koshy John	
94.	SRO-13768	A report on the preliminary P-II stage exploration for molybdenum and gold in the Elavadi area, Dharmapuri District, Tamil Nadu.	2002-2003	E. Balasubramanian	G-4
95.	SRO-13728	Preliminary investigation for gold in western part of Jannagiri Schist Belt and Adjoining granitoids, Kurnool District , Andhra Pradesh.	2002-2003	H.V.Rao & N.V.S.Murthy	G-4
96.	SRO-13409	Regional geochemical evaluation of gold mineralisation in parts of Gulcheru and Vempalli Formations of Cuddapah Supergroup, Kurnool, Cuddapah and Ananatpur Districts , Andhra Pradesh.	2002-2003	Santanu Bhattacharjee, et al.	G-4
97.	SRO-13886	Exploration for gold in Nandi Block, Kadur-Shimoga Schist Belt, Tarikere Taluk, Chikmagalur District, Karnataka.	2002-2003	S A Khan	G-3
98.	SRO-13691	Search for Kimberlites in Veldurthi Block, Kurnool District, Andhra Pradesh.	2003-2004	N.S.Reddy and S.Ravi	G-4
99.	SRO-13707	Preliminary exploration for gold in the Peravali Block of Jonnagiri Schist Belt, Kurnool District, Andhra Pradesh	2003-2004	Sahoo Priyadarshi and M.S.Jairam	G-3

100.	SRO-13670	Report on bulk sampling of hardebank kimberlites and lamproites and associated Coluvium, Anantapur Districtm AP.	2003-2004	S.S.Nayak and K.K.Sinha	G-3
101.	SRO-13735	Delineation and identification of pulses of intrusion and petrological studies of Undraldoddi kimberlires, Raichur District, Karnataka	2003-2004	S.Shivanna	G4
102.	SRO-13882	Report on exploration for gold in Nagavi sector, Gadag Schist Belt, Gadag District, Karnataka	2003-2004	M.B.Beeraiah and C.G.Hemantha Kumar	G-3
103.	SRO-13884	Report on the investigation for gold in Nabhapura South Block, Gadag Schist Belt, Gadag District, Karnataka	2003-2004	M.B.Beeraiah and C.G.Hemantha Kumar	G-3
104.	SRO-13890	Regional targeting for BIF hosted gold in the north-western part of Dharwar Schist Belt from North of Hubli-Haliyal to Deccan Traps in the northwest in Dharwar and North Kanara Districts, Karnataka	2003-2005	K.Besavaraja, N.D.Ramachandra and Dr.Saleem Ahmed Khan	G-4
105.	SRO-13941	Regional targeting for gold in the granitoids bordering Huliyurdurga, Kolar and Parashurampura group of greenstone belts, Karnataka	2003-2005	R.Madhusudanan, J.P.Mohakul and R.Khan	G-4
106.	SU:TN&K-1022	Evaluation of clay and associated minerals in the Klayikode Block, Nileswaram, Kasaragod District, Kerala	2003-2005	C.Muraleedharan	333
107.	SRO-13673	Search for kimberlites in Atamakuru and Penukonda Blocks, Anantapur District, Andhra Pradesh	2003-2005	V.Srinivas Chowdary and K.S.Bhaskar Rao	G-4
108.	SRO-13925	Report on exploration for gold west of G.R.Halli Main Block, Chitradurga Schist Belt, Karnataka	2003-2005	S.Balakrishnan, K.Prabhakara and N.Subramanyan	G-3
109.	SU:K&G-1150	Investigation for gold in the area between Yatkal in the west and Kochapur in the east, Hutti-Muski Schist Belt, Raichur District, Karnataka	2004-2005	N.Devaraj and Uttam Kumar Pradhan	
110.	SRO-13688	Preliminary exploration for gold in the Kallakere West-Vannathura area of Attapadi Valley, Palakkad District, Kerala	2004-2005	M.Koshy John and Mathew Joseph	G-3
111.		Delineation and assessment of the diamondiferous nature of the Thimmasamudram Kimberlite: TK-1, TK-2, TK-3 and TK-4, Anantapur District, Andhra Pradesh	2004-2006	M.Sridhar, K.K.Sinha, and K.S.Bhaskara Rao	333
112.		Investigation for gold mineralization in the northern part of Veligallu Green Stone Belt, Cuddapah, Anantapur and Chittoor Districts, Andhra Pradesh	2004-2006	Priyadarshi Sahoo, K.Subba Rao, and Anasuya Ransingh	G-4
113.	SRO-13716	Search for kimberlites in Emmiganuru Block in Kurnool District, Andhra Pradesh	2004-2006	N.S.Reddy, S.S.Nayak, S.Ravi and K.S.Bhaskar Rao	G-4
114.	SRO-13874	Report on the exploration for gold in Anjanahalli East Block (Block-A), Sira Taluk, Tumkur District, Karnataka	2004-2006	N.D.Ramachandra and K.Prabhakara	333
115.	SRO-13876	Investigation for gold in Beladadi South Block, Gadag Schist Belt, Gadag District, Karnataka	2004-2006	M.B.Beeraiah	G-3
116.	SRO-13858	Report on the exploration for graphite in Arasanur Block, Western Sector, Siva Ganga Graphite Belt, Sivaganga District, Tamil Nadu	2004-2006	K.Duraisamy, P.Sundarrajan and T.Mullaivendhan	334

117.	SRO-13696	Search for kimberlite/lamproite bodies in Mantralayam-Ibrahimpuram area, Kurnool District, Andhra Pradesh	2005-2006	H.V.Rao, M.V.R.Krishna Rao and S.Srinivas	G-4
118.	SRO-13794	Search for kimberlites in Wajrakarur Kimberlite Field, Anantapur District, Andhra Pradesh	2005-2006	P.Balaji	G-4
119.	SRO-13822	Search for kimberlite clan of rocks in granite-greenstone terrain covering the area between Siddampalli, Kurnool & Mahboobnagar Districts, Andhra Pradesh	2005-2006	S.Ravi and V.S.Choudhary	G-4
120.	SU:AP-152	Investigation for gold in Gulcheru quartzite of Gandi and its adjoining areas, Cuddapah District, Andhra Pradesh	2005-2006	G.Vidyasagar and B.S.S.Reddy	G-4
121.	SRO-13960	Investigation for barytes within Pullampet Sub-Basin contiguous with APMDC lease-hold area, Cuddapah District, Andhra Pradesh.	2005-2006	Dr.T.Rajesham	G-4
122.	SRO-13718	Report on geophysical surveys for barytes within Pullampeta Sub-Basin contiguous to APMDC lease-hold area, Cuddapah District, Andhra Pradesh	2005-2006	N.Balakrishna Rao and R.M.C.Prasad	G-4
123.	SRO13883	Prospecting for BIF hosted gold mineralization in Bangargatti Block, Shimoga Schist Belt, Dharwar District, Karnataka	2005-2006	K.Basavaraja and N.D.Ramachandra	G-4
124.	SRO-13952	Report on the investigation for iron ore resources in selected freehold areas, Jibilammagudda Block in parts of Sandur Schist Belt, Bellary District, Karnataka	2005-2006	T.Babu Ravindra Kumar and Raju	334
125.	SRO-13936	Regional targeting for BIF hosted gold mineralization in the northern part of Shimoga - North Kanara Schist Belts in parts of toposheet No. 48I/14, 48J/13, 48J/14 and 48M/2 in Dharwar, Belgaum and North Kanara Districts, Karnataka	2005-2006	N.Devaraj and C.D.Mariappa	G-4
126.	SRO-13799	Orientation survey for investigation of platinum group of elements in Sittampundi Anorthosite Complex of Tamil Nadu	2005-2006	Dr.N.P.Nathan	G-4
127.	SRO-13901	Report on the investigation for iron ore in Tattayyangarpettai Valasiramani and Mahadevi areas, Trichchirapalli and Namakkal Districts, Tamil Nadu	2005-2006	S.N.Mariappan	334
128.	SRO-13875	Investigation of the iron ore resource in selected freehold areas in NMDC Block in parts of Sandur Schist Belt, Bellary District, Karnataka (E-I Stage)	2005-2008	N.Subramanian, D.D.Raju, E.Hanumantha Rao and Mohamed Ahmed	333
129.	SRO-13949	Report on exploration for PGE mineralization in Hanumalapura (Block-A) part of Tavarekere-Masanikere-Magyathahalli areas, Davanagere District, Karnataka	2005-2008	S.Setty Ramakrishna, R.Madhusudanan and C.Parthasarathi	G-3
130.	SRO-13904	Final report on the investigation for limestone in Uchchimedu and Kottatai Prospects, Vriddhachalam Sub Basin, Vriddhachalam and Tittagudi Taluks, Cuddalore District, TN.	2005-2007	K.Raju, M.Ranganathan and V.Chandrasekharan	333
131.	SRO-13736	Search for primary source for the placer diamonds in the terrace gravels along the Munneru River Basin in parts of Krishna and Khammam Districts, Andhra Pradesh	2006-2007	K.V.S.Sharma and G.Lakshminarayana	G-4

132.		Search for kimberlites in Pebberu Block, Mahaboobnagar District, Andhra Pradesh	2006-2007	Dr.S.Ravi	G-4
133.	SRO-13958	Testing the Potential of barytes in the newly discovered Anantarajupeta and Turkapalle area, south-east of Mangampeta Barite Mine, Andhra Pradesh	2006-2007	Dr.T.Rajesham and Dr.V.V.Sesha Sai	G-4
134.	SRO-13845	Preliminary investigation for gold and other associated elements in Aspari area, Kurnool District, Andhra Pradesh	2006-2007	K.Subbarao	G-4
135.	SRO-13734	Report on ground magnetic surveys for location of additional kimberlite bodies in Timmasamudram-Mauktikapuram Block, Anantapur District, Andhra Pradesh	2006-2007	T.Vaideswaran	G-4
136.	SRO-13913	Report on the investigation for PGE mineralization in Tavaregere-Magyathahalli areas (Hanumalapura Block), Davangere District, Karnataka	2006-2007	S.Ramakrishna Setty and R.Madhusudanan	G-4
137.	SRO-13779	A report on regional targeting of iron ore resource in parts of Gadag Schist Belt, Gadag District, Karnataka	2006-2007	Bhupender Singh and A.N.Susheelendra	334
138.	SRO-13915	Report on the investigation for gold in Paramanahalli North Block, Hiriyur Taluk, Chitradurga District, Karnataka	2006-2007	N.Devaraj and Shafeeq Ahmed	G-4
139.	SRO-13951	Report on regional assessment of iron ore resources in Kamatagi Block of Hungund Belt, Bagalkot and Raichur Districts, Karnataka	2006-2007	D.D.Raju and N.Sampath Rajan	G-4
140.	SRO-13791	Exploration for graphite in Arasanur and Kiranur Blocks of Sivaganga Graphite Belt, Sivaganga District and Terku Kallikulam area, Tirunelveli District, Tamil Nadu	2006-2007	K.Duraisamy and T.Mullaivendhan	334
141.	SRO-13863	Report on the investigation of iron ore in Valaiyapatti-Rajampalayam area, Namakkal District, Tamil Nadu	2006-2007	A.P.S.Parihar	334
142.	SRO-13933	Report on preliminary exploration for gold in the Mananthavadi-Talapuzha area of Wayanad Gold Belt, Wayanad District, Kerala	2006-2007	K.R.Pillay	G-4
143.	SRO-13870	Preliminary investigation for molybdenum and REE around Kanigiri and Podili area, Prakasam District, Andhra Pradesh	2006-2008	D.N.Charyulu and B.S.S.Reddy	G-4
144.	SR0-13906	Investigation for gold mineralisation in the southern part of veligallu greenstone belt, Chittoor District, Andhra Pradesh.	2006-2008	Priyadarshi Sahoo and M. Laxma Reddy	G-4
145.	SRO-13879	Investigation for gold in Bangargatti North and South Sectors, Dharwar District, Karnataka	2006-2008	K.Basavaraja and P.Mahadevappa	G-4
146.	SRO-13887	Report on the investigation for gold in Ajjanahalli Block-D, Sira Taluk, Tumkur District, Karnataka	2006-2008	N.D.Ramachandra, Rahamathulla Khan and Shafeeq Ahmed	G-4
147.	SRO-13929	Report on preliminary investigation for gold in Maruthipura - Attigere Block, Dharwar and Haveri Districts, Karnataka	2006-2008	M.B.Beeraiah, Dr.P.Mahadevappa and C.D.Mariyappa	G-4
148.	SRO-13927	Final report on the investigation for gold in Ajjanahalli East Block (Block-B), Sira Taluk, Tumkur District, Karnataka	2006-2008	K.Prabhakara, N.D.Ramachandra	333

149.	SRO-13934	Report on investigation for PGE, gold and multimetal mineralization of the Kaiga-Mothinamakki-Biroligudda-Suryakalyani Gudda areas, Uttara Kannada District, Karnataka	2006-2008	D.K.Sahoo	G-4
150.	SRO-13939	A report on the investigation for gold in Ajjanahalli Block-C (Earlier named as Block-E), Sira Taluk, Tumkur District, Karnataka	2006-2008	M.H.Abbas and K.Prabhakara	G-4
151.	SU:AP-73	Search for kimberlites in Rajouri Block, Mahaboobnagar and Kurnool Districts, Andhra Pradesh	2007-2008	K.V.S.Sarma and N.S.Reddy	G-4
152.	SU:AP-193	Search for kimberlites in Perur Block, Anantapur District, AP	2007-2008	T.Vaideswaran et al	G-4
153.	SRO-13909	Search for kimberlites in Changapuram Sub-Block in Mahaboobnagar District, Andhra Pradesh	2007-2008	Dr.S.Ravi and N.S.Reddy	G-4
154.	SRO-13894	Report on investigation for PGE mineralization in Hanumalapura part of Block-B and Block-C of Tavarekere-Masanikere-Magyathahalli areas, Davanagere District, Karnataka	2007-2008	R.Madhusudanan and C.Parthasarathi	G-4
155.	SRO-13914	A report on regional targeting of iron ore resource in parts of Gadag Belt, Gadag District, Karnataka	2007-2008	N.L.Gera and N.Sampath Rajan	G-4
156.	SU:TN&K-886	Report on investigation of iron ore in Polur-Kelur area, Tiruvannamalai District, Tamil Nadu	2007-2008	A.P.S.Parihar	334
157.	SRO-13959	Testing the diamondiferous nature of the kimberlite pipe, Chagapuram Sub-Block, Mahaboobnagar and Kurnool Districts, Andhra Pradesh	2008-2009	K.S.Bhaskara Rao	G-3
158.	SU:TN&K-1040	Preliminary exploration for gold in Narasimukh Block, Attapadi valley, Palakkad District, Kerala	2008-2009	M.R.Asoka Kumar and Dr.P.Soney Kurien	G-4
159.	SRO-13908	Investigation for gold mineralisation in the northen part of Veligallu greenstone belt,Cuddapah,Anantapur and Chittoor districts,Andhra Pradesh.	2004-06	Priyadarshi Sahoo,K.Subba Rao and Anusuya Ransingh.	G-4
160.	SRO-13949	Report on exploration for PGE mineralisation in Hanumalapura(block-A) part of Tavarekere-Masanikere-Magyathahalli areas,Davanagere district,Karnataka(E-I stage)	2005-2008	R.Madhusudanan and S.Ramakrishna Setty	G-3
161.	SRO-13913	Report on the investigation for PGE mineralisation in Tavaregere-Magyathalli areas(Hanumalapura block),Davanagere district,Karnataka(P-II stage)	2006-07	R.Madhusudanan and S.Ramakrishna Setty	G-4
162.	SRO: 14073	Investigation for gold in Ajjanahalli block-F,Tumkur district, Karnataka(G-4)	2008-2009	K.Basavaraja and N.D.Ramachandra	G-4
163.	SRO:13917	Preliminary investigation for PGE mineralization in Mafic and ultramafic complex in Hanumalapura-Tavargere masanikere areas,Shimoga schist belt,Karnataka(P-II stage)	:2002-03 & 2003-04	S.Ramakrishna Shetty,N.D.Ramachandra and Dr.Saleem Ahmed Khan	G-3
164.	SRO-14072 (I&II)	Investigation for platinum group of elements in Mettupalaiyam ultramafic complex,Solavanur-Karappadi sector, TN(P-II)	2006-09	J.Prabhakar,R.Vijay Kumar and Dr.Chandrasekaran	G-4
165.	SRO-14070	Report on the investigation of iron ore in Polur-Kelur area, Thiruvannamalai District,Tamil Nadu	: 2007-08	: A.P.S.Parihar	G-4

166.	SRO-14032	Report on the exploration for graphite in Arasanur, Arasanur west and Usilampatti west blocks, Western sector, Sivaganga graphite belt, Sivagangai district, Tamilnadu	2007-2008	T.Mullaivendan and K.Raju	333
167.	SRO-13901	Report on the investigation for Iron ore in Tattayyangarpettai, Valasiramani and Mahadevi areas,Tiruchirapalli and Namakkal districts,Tamil nadu	2005-2006	S.N.Mariappan	G-4
168.	SRO-13907	Investigation for gold mineralization along the southern margin of Nellore schist belt,Nellore district,Andhra pradesh(P-1 stage)	2006-2008	K.Koteswar Rao, S.Y.Katti and D.N.Charyulu	G-4
169.	SRO-13952	Report on the investigation for iron ore resources in selected freehold areas,Jibilamma gudda block in parts of sandur schist belt, Bellary district,Karnataka(P-II stage)	2005-06	T.Babu Ravindra kumar and D.D.Raju	G-4
170.	SRO-13925	Report on the exploration for gold west of G.R.Halli main block,Chitradurga schist belt,Karnataka(E-1 stage)	2003-05	S.Balakrishnan, K.Prabhakara and N.Subramanian	G-4
171.	SRO-12376	Geophysical surveys for evaluation of gold mineralisation and characterization of shears of Dona area,Jonnagiri schist belt,Kurnool district,Andhra pradesh.	1998-99	H.V.Rao, B.Sunder Raj and K.V Satyanarayana	G-4
172.	SRO-13258	Geophysical surveys for gold in Atkur area,Gadwal schist belt,Mahboobnagar district,Andhra pradesh	1998-99	G.Jawahar and K. Ramaiah	G-4
173.	SRO-12353	Geophysical surveys for evaluation of bronzite Bearing gabbro(Black galaxy granite) in and around R.L.Puram village, Chimakurti mandal, prakasam district, Andhra Pradesh	1998-1999	N.Venkataramana, M.Balakrishnan and V.Ramamurthy	G-4
174.	SRO-12413	Detailed geophysical surveys over Anumpalle kimberlite pipe(P-10),Anantapur district,Andhra Pradesh.	1998-1999	M.Venkateswarlu and R.M.C.Prasad	G-4
175.	SRO-12414	Report on Regional gravity and magnetic surveys in Veligallu schist belt and adjoining granite terrain, Anantapur, Cuddapah and Chittor districts, Andhra Pradesh.	1998-1999	M.Kesavamani, J.V.Rama Rao and M.V.R.Krishna Rao	G-4
176.	SRO-12634	A report on the investigation for gold in Nagavi north and Malasamudra blocks, Gadag schist belt, Gadag district, Karnataka.	1995-96	Venkatswamy and S.Sengupta	G-4
177.	SRO-13960	Investigation for barytes within Pullampet sub-basin contiguous with APMDC lease-hold area, Cuddapah district, AP.	2005-06	Dr T.Rajesham	G-4

ANNEXURE -2A

ACTIVITY DOMAIN PERTAINING TO MISSION I & II OF THE SOUTHERN REGION AND ACHIEVEMENTS DURING XII PLAN PERIOD

Sl. No.	Major activity area	Programme target FS 2012-13	Achieve-ment of FS 2012-13	Programme target FS 2013-14	Achieve-ment of FS 2013-14	Programme target FS 2014-15	Achieve-ment of FS 2014-15 (upto June, 2014)	Achieve-ment of FS 2014-15 (upto Sept., 2014)	Achieve-ment of FS 2014-15 (upto December, 2014)	Achieve-ment of FS 2014-15 (upto March, 2015)	
I. **Ground survey**											
i)	Special Thematic Mapping (sq.km.)	3295	3296	3675	3687	4,025	18	575	2,862	4039	
ii)	Geochemical Mapping (sq.km.)	21970	20503	24412	24694	31,934	68	2750	18,190	32,701	
iii)	Geophysical Mapping (sq.km.)	7220	7260	10800	7700	11,500(without DGPS) 15,840 (with DGPS)	Nil	400	5,935	12,795	
II. **Mineral Exploration**											
i)	Large scale Mapping (sq.km.)	1590	1575.50	1707.5	1870.75	1928	2.20	182.50	1,257	1,991+1(MoU item of SU: AP & T)	
ii)	Detailed Mapping (sq.km.)	9.0	8.97	16	17.01	14.5	0.06	1.17	6.73	15.3	
iii)	Drilling (metre)	16400	14877.40# + 118.30*	13600	11,128.05+ 1968*	17,000 (includes Auger Drilling)	1521.85	4405.20	8,079.10 + 268.30 (outsource drilling)	12,941.6+ 1863.80*	

iv)	SPT Drilling (in m) (M-IV, EQG studies)	450	232.45	450	320.20	15 boreholes (to a maximum depth of 30m)	Nil	Nil	120 (4 bore holes)	414.20 (14 bore holes)	

***** Outsource Drilling

ACTIVITY DOMAIN PERTAINING TO MISSION I & II OF THE REGION AND ACHIEVEMENTS [FSP RELATED ITEMS] (M&CSD)

S. No	Major Activity area		Programme Target F.S. 2012-13	Achievement of F.S. 2012-13	Programme Target F.S. 2013-14	Achievement of F.S. 2013-14	Programme Target of F.S. 2014-15	Achievement of F.S. 2014-15
b)	Marine Survey							
i)	Seabed Mapping in EEZ (sq. km)		1620 sq km	1620 sq km	430 Sq Km	460 Sq km	**1070 sq km**	**1161 sq km**
ii)	Seabed Mapping in TW (sq. km)		50 sq km	155 sq lm	870 Sq Km	1165 Sq km	630 Sq km	**630 sq km**
ii)	Parametric Survey within EEZ	Bathymetry (lkm) Magnetic (lkm) Swath bathymetry (sq km) Sediment Water Samples (No)	--- --- 22750 90	673 --- 22100 156	3000 3000 18000 10 5	3030 3030 20670 05 6	5030 lkm 5390 lkm 45100 Sq. Km 172 5	3975 lkm 2283 lkm 70341 28 3
iii)	Parametric Survey within TW	Bathymetry (lkm) Swath bathymetry (sq km) Shallow seismic (lkm) Magnetic (lkm) Side scan sonar (lkm) Sed & water Samples (no) Current observ. (No)	2480 305 1830 1180 --- 224 8	3125 232.5 2179 1225 --- 235 8	2372 125 930 1280 --- 286 3	2458 0 887 1241 --- 238 3	1950 420 1542 1707 0 372, 36 & 8	1916 **385sq km** 162, 10, 3 3
iv)	Coastal studies	Beach profiling (Nos) Bathymetry Sediment Samples Water Samples	5 profiles 140 Lkm 110 Station 25 Stations	7 profiles 586 Lkm 126 Nos 22 stations	63profiles 168 lkm 441No 8 No	63 profiles 168lkm 441 samples 8 samples	40 profiles 497 lkm 1146 Nos 5 stations	48 profiles 549 lkm 632 Nos. 84

Annexure – 2B

FSP ROLING PLAN

MISSION – I		
F.S.	Short Title	Personnel
SPECIALISED THEMATIC MAPPING		
SU: Andhra Pradesh & Telangana		
2014-15 & 2015-16	Specialised thematic mapping of granitoids and associated shear zones in parts of Karimnagar and Medak, districts, ne part of eastern Dharwar craton, Telangana with special reference to molybdenite and other associated mineralisation.	2 G
2014-15 & 2015-16	Specialised thematic mapping of the Pakhal sediments in parts of Khammam & Warangal districts, Telangana	2 G
2014-15 & 2015-16	Specialised Thematic Mapping of The Granitic Terrain and associated shears In Palkurti-Torur-Mahabubabad-Panditapuram area ,parts of Warangal And Khammam Districts, Telangana	2 G
2014-15 & 2015-16	Specialised thematic mapping in Amangal- Chintapalli area in parts of Mahbubnagar and Nalgonda districts with special reference to shear zones/faults and associated mineralization in the eastern part of Dharwar craton, Telangana	2 G
2015-16 & 2016-17	Specialized Thematic Mapping of granitoids south of Kalyandurg, Anantapur dt, Andhra Pradesh with an emphasis to locate REE bearing minerals.	2G
2013-16	Specialised thematic mapping of areas of interest in southern part of Karnataka state with emphasis on Petrography, Petrochemistry, Stratigraphy and Structure (T.S. No. 48O/1) **Objective**: to understand crustal evolution in the southern peninsula	1 Diector/ Supdtg. Geologist/2 Sr Geologists/ Geologists
SU: Karnataka & Goa		
2013-16	Specialised thematic mapping of areas of interest in southern part of Karnataka state with emphasis on Petrography, Petrochemistry, Stratigraphy and Structure (T.S. No. 48O/1) **Objective**: to understand crustal evolution in the southern peninsula	1 Director/Suptd. Geologist 2 Sr Geologists/Geologists
SU: Kerala		
2015-16	Study on geology and structure in the western termination of Palghat-Cauvery lineament and its geological implications, Palakkad and Thrissur districts, Kerala **Objective:** 1. To study the structural features in the western termination of Palghat-Cauvery lineament. Search for mineralization in association with alkaline intrusions.Study of geology	2G
2015-16	Study on the tectonostratigraphy and crustal evolution across Aachenkovil lineament, Pathanamthitta district, Kerala **Objective:** 1. To study the tectonic features and the characterization of the Achenkovil lineament. 2. To study the field relationships between khondalites and granitoids. 3. To study the REE geochemistry of significant lithounits.	2G
2016-17	Study of western termination of Bhavani shear zone in the area south of Anamooli, Palakkad district, Kerala. (TS No.58A/12, 58B/5 and B/9) **Objective:** To study the nature of shearing and search for mineralization.	2G

GEOCHEMICAL MAPPING		
SU: Andhra Pradesh & Telangana		
2015-16	Geochemical mapping in parts of Cuddapah and Anantapur districts, Andhra Pradesh and Mahabubnagar district, Telangana (T.S no. 57J/7 & parts of 57I/5)	2 G
2015-16	Geochemical mapping in parts of Anantapur & Cuddapah districts, Andhra Pradesh and Kolar district, Karnataka (toposheet no. 57K/1 & parts of 57J/8)	2 G
2015-16	Geochemical mapping in parts of Anantapur, Chittoor& Cuddapah districts, Andhra Pradesh (toposheet no. 57K/5 & parts of 57J/8)	2 G
2015-16	Geochemical mapping in parts of Chittoor, Anantapur & Cuddapah districts, Andhra Pradesh and Kolar district, Karnataka (toposheet no. 57K/6 & parts of 57J/8)	2 G
2015-16	Geochemical mapping in parts of Chittoor, Anantapur & Cuddapah districts, Andhra Pradesh (toposheet no. 57K/10 & parts of 57J/8)	2 G
2015-16	Geochemical mapping in parts of Mahabubnagar district, Telangana and Kurnool district of Andhra Pradesh(toposheet no. 56L/8, parts of 57J/8)	2 G
2015-16	Geochemical mapping in parts of Mahabubnagar and Nalgonda districts, Telangana (toposheet no. 56L/10, parts of 57J/8)	2 G
2015-16	Geochemical mapping in parts of Mahabubnagar district, Telangana (toposheet no. 56L/5, parts of 57I/5)	2 G
2015-16	Geochemical mapping in parts of Mahabubnagar district, Telangana (toposheet no. 56L/6, parts of 57I/5)	2 G
2015-16	Geochemical mapping in parts of Mahabubnagar district, Telangana (toposheet no. 56L/11, parts of 57J/8)	2 G
2015-16	Geochemical mapping in parts of Nalgonda, Mahabubnagar and Rangareddy districts, Telangana (toposheet no. 56L/14, parts of 57J/8)	2 G
2015-16	Geochemical mapping in parts of Anantapur and Cuddapah districts, Andhra Pradesh and Mahabubnagar district, Telangana (toposheet no. 57J/3, parts of 57I/5)	2 G
2015-16	Geochemical mapping in parts of Cuddapah and Kurnool districts, Andhra Pradesh and Mahabubnagar district, Telangana (toposheet no. 57J/5 & parts of 57I/5)	2 G
2015-16	Geochemical mapping in parts of Chittoor district, Andhra Pradesh (toposheet no. 57K/14 & parts of 57O/2)	2 G
2015-16	Geochemical mapping in parts of Kurnool and Cuddapah districts, Andhra Pradesh and Mahabubnagar district, Telangana (toposheet no. 57I/8, parts of 57I/5)	2 G
2015-16	Geochemical mapping in parts of Mahabubnagar district, Telangana (toposheet no. 56L/1, parts of 57I/5)	2 G

2015-16	Geochemical mapping in parts of Mahabubnagar district, Telangana (toposheet no. 56L/2, parts of 57I/5)	2G
2015-16	Geochemical mapping in parts of Mahabubnagar district, Telangana (toposheet no. 56L/3, parts of 57I/5)	2G
2015-16	Geochemical mapping in parts of Kurnool district, Andhra Pradesh and Mahabubnagar district, Telangana (toposheet no. 57I/6, parts of 57I/5)	2G
2015-16	Geochemical mapping in parts of Kurnool district, Andhra Pradesh and Mahabubnagar district, Telangana (toposheet no. 57I/7, parts of 57I/5)	2G
2015-16	Geochemical mapping in parts of Anantapur and Kurnool districts, Andhra Pradesh and Mahabubnagar district, Telangana (toposheet no. 57J/4 & parts of 57I/5)	2G
2015-16	Geochemical mapping in parts of Cuddapah district, Andhra Pradesh and Mahabubnagar district, Telangana (toposheet no. 57J/6 & parts of 57I/5)	2G
2015-16	Geochemical mapping in parts of Mahabubnagar district, Telangana (toposheet no. 56L/7, parts of 57J/8)	2G
SU: Karnataka & Goa		
2013-16	**Title:** Geochemical mapping in parts of Karnataka state (Degree sheet nos. 57A, 57B) Objective: To generate baseline data and prepare geochemical atlases which may find application in environment, agriculture, public health and other fields of societal concern and in developing natural resources. Objective: To generate baseline data and prepare geochemical atlases which may find application in environment, agriculture, public health and other fields of societal concern and in developing natural resources.	7 Directors/Supdtg. Geologists/ 24 Sr.Geologists/Geologists
MISSION-II		
SU: Andhra Pradesh & Telangana (Mission-IIA)		
	Proj: Gold	
2014-15 & 2015-16	Investigation For Gold And Associated Minerals In Gani And Kalava Area Of Cuddapah Basin, Kurnool District, Andhra Pradesh (G4).	2 G
	Proj: Diamond	
2014-15 & 2015-16	Search For Kimberlite/Lamproite In Kolhapur And Srirangapur Blocks In Mahbubnagar And Kurnool Districts, Andhra Pradesh(G4)	2 G
2015-16	Recconoitery Surveys For Assessment Of Secondary Diamonds In The Penner River Basin Between Jammalamadugu And Chennur In Cuddapah District, Andhra Pradesh District (G-4 Stage)	2 G
2015-16	Recconoitery Sedimentological,Geomophological And Heavy Mineral Studies Of Munneru-Paleru River Basin Area To Constrain The Provenance For Secondary Diamonds Occurring Along Krishna River And In The Upland Areas In The Catchment Of Munneru ï Paleru Rivers, Khammam And Krishna Districts Of Telangana And Andhra Pradesh (G-4 Stage)	2 G
2015-16	Research Project for study of Kimberlites and diamonds from Wajrakarur and Narayanpet area, Mahabubnagar, Kurnool districts, Andhra Pradesh and Gulbarga, Raichur districts, Karnataka,	2G

	Dharwar Craton, India [MoU between GSI and De Beers India Pvt Ltd (DIPL)]	
2015-16	Service Item (Diamond processing plant, Wajrakarur).	1G(PT)
	Proj: REE	
2014-15 &2015-16	Preliminary Investigation For The Possible Occurrence Of REE and Other Rare Metal Mineralization In And Around Chetlamallapuram, Kurnool District, Andhra Pradesh	2 G
	Proj: Base metals	
2014-15 & 2015-16	Preliminary Investigation For Basemetal And Other Associated Mineralisation West Of Karempudi To East Of Khandrika Area Of Agnigundala Mineral Belt, Guntur District, Andhra Pradesh	2G
2015-16 & 2016-17	Reappraisal Of Basemetal Mineralization In Mallapuram Block Of Markapur Basemetal Belt, Prakasham District, Andhra Pradesh (G-3 Stage)	2 G
2015-16	Deep lithostratigraphic-cum-structural drilling to assess the base metal potential at lower stratigraphic level below the bedded Barites deposit of Mangampeta, Cuddapah district, and Andhra Pradesh.(spillover item)	2 G
	Proj: Iron & Manganese	
2015-16	**I**nvestigation For Reassessment Of Iron Ores Of Bayyaram Area, Khammam and Warangal Districts, Telangana, India (MoU Between GSI & DMG-Telangana)	2G
2015-16	Preliminary Investigation For Iron Ore In The Area South Of Manthani Village, Karimnagar District, Telangana (G-4)	2 G
	Proj: Tin, Tungsten & Graphite	
2015-16 & 2016-17	Reappraisal For Graphite And Tungsten Mineralisation At Chinnagalikonda-Potaram In Rampachodavaram Taluk, East Godavari District, Andhra Pradesh	2 G
SU: Andhra Pradesh & Telangana (Mission-IIB)		
2014-15 &2015-16	Regional exploration for coal by drilling in pagaderu (east) sector, southern part of main basin of godavari valley coalfield, khammam district, Telangana (G3).	2 G
2015-16 2016-17	Regional investigation for coal by scout drilling in south of somavaram block, southern godavari basin, godavari valley coalfield, krishna district, Andhra pradesh.	2G
2015-16 & 2016-17	Regional Investiagation For Coal By Scout Drilling In The North Of Medaram, Godavari Valley Coalfield, Khammam District, Telangana	2 G
2015-16 & 2016-17	Regional exploration for coal by scout drilling in eastern extension of Pagaderu (East) sector, southern part of main basin of Godavari Valley coalfield, Khammam district, Telengana.	2 G
2014-15 & 2015-16	Preliminary investigation for coal bearing formations in sandstone body (outlier) Barakars, Mangrude village, Godavari Valley coal field, Adilabad district, Telangana (G-4)	1G
SU: Karnataka & Goa		
	Proj: Gold-IA	
2013-16	**Title:** Exploration for Gold in Ajjanahalli, Sira Taluk, Tumkur district, Karnataka. (G-3) **Objective:** To Evaluate mineral potential of the area by zones of gold mineralisation and	1 Director/Suptd. Geologist/2 Sr Geologists/Geologists

	estimation of available resources.	
SU: Kerala		
	Proj: Gold	
2016-17	Preliminary Investigation For Gold Around Puzhikkunnu, Chullipara And Anamuli Area, Palakkad District, Kerala.	2G
	Proj: PGE	
2016-17	Preliminary investigation for PGE in the ultramafic/ mafic rocks in Karthikulam and Kalavalli areas, Wayanad District, Kerala (G-4) (Toposheet No. 58A/1) Area: 100 sq.km	2G
2015-16	Preliminary exploration for Platinum Group Minerals in Vellamari block, Attapadi valley, Palakkad district, Kerala	2G
	REE	
2016-17	Preliminary investigation for REE in syenite and associated laterite around Angadimogar, Kasargod district, Kerala	1G
	MISSION – III	
SU: Kerala		
	Proj : Geodata	
2016-17	Compilation and Processing of Geochemical Data in GIS platform	2G
	Proj: Geoinormatics	
2015-16	Data repository and management- Geoinformatics (Service Item)	1G (PT)
	Publication	
2015-16	Service Item: Data Repository & Management	1G (PT)

MISSION – IV		
F.S.	Short Title	Personnel
SU: Kerala		
	Landslides	
Continuing Item 2014-15 to2015-16	Macroscale (1:50,000) Landslide Susceptibility Mapping of Kuttiyadi- Kakkayam - Adivaram ï Nilambur areas, T.S.nos. 49 M/14 and 58A/3 Kozhikode, Wayanad and Malappuram Districts, Kerala.	2G (PT)
2015-16	Macroscale (1:50,000) Landslide Susceptibility Mapping of Mananthavady-Kalpetta-Sulthan Bathery-Vazhikkadavu area in parts of Toposheets nos. 58A/1, 58A/2, 58A/5,58A/6,58A/7 and 58A/11 Wayanad and Malappuram Districts, Kerala.	3G
2015-16	Macroscale (1:50,000) Landslide Susceptibility Mapping in parts of Amboori-Ponmudi-Thenmala areas,Toposheets nos. 58D/13, 58H/1, 58H/2, 58H/5 and 58H/6, Kollam and Thiruvananthapuram districts, Kerala.	2G
2015-16	Post Landslide Event Studies Objective: Post disaster landslide study for recommendation of immediate mitigation measures and updating landslide inventory of Kerala	2G (PT)
Earthquake Geology Division		
2014-15 & 2015-16	SHMZ Of Kochi & Ernakulam Urban Agglomeration, Kerala	3G

ANNEXURE-2C

SHELF OF PROJECTS

S.No.	Title / Objective	Personnel Required
MISSION – I		
PROJECT : SPECIALISED THEMATIC MAPPING		
SU: TN&P		
1	Specialised thematic mapping of the sedimentary rocks of Cretaceous cauvery basin objective: Re-look into the stratigraphy of the cauvery basin to bring a unified stratigraphy. Objective: Re-Look Into The Stratigraphy Of The Cauvery Basin To Bring A Unified Stratigraphy	2 G
2	Specialised thematic mapping ofThiruvannamalai area,Tamil nadu, Objective: to delineate different litho assemblages, their tectonomagmatic history and to evaluate the P-T constraints of the terrain.	2 G
3	Title: Study of the granulite and associated rocks ofTirunelveli ï Palayamkottai sector of southern granulite terrain objective:To study the structure and metamorphic evolution of this part of the southern granulite terrain (SGT) (Proposed for FS 2015-16)	2 G
SU:K&G		
1	Specialised thematic mapping of areas of interest with emphasis on Petrography, Petrochemistry, Stratigraphy and Structure to understand crustal evolution in the southern peninsula (in southern part of Karnataka state in parts of Toposheet No. 48 O/1, 5, 6, 9, 10, 13 & 14) (2 items)	1 Director/4 G
SU: Kerala		
1	Study of geology along either side of the ôPeriyar lineamentô (58B/12, B/16, 58C/9, C/13) - 350 sq.km.	2G
PROJECT : GEOCHEMICAL MAPPING		
SU: K&G		
1	Geochemical mapping in parts of Karnataka and Goa state covering the OGP areas (10 Items)	10 Supervisory Officers /20G
SU: TN&P		
1	Geochemical mapping in parts of Vellore, Dharmapuri, Tiruvannamalai, districts, Tamil nadu (toposheet nos. 57L/ 6, 7, 9, 10, 11,13,14, 15).	2G X 8
SU: KERALA		
1	Geochemical mapping in parts of Kasaragod and Kannur districts of Kerala (Toposheets no. 48P/3, 48L/15 and 48P/4) **Objective:** To generate geochemical baseline data for use in managing/developing natural resources and for applications in environmental, agricultural, public health and other societal concerns	2G
2	Geochemical mapping in parts of Kasaragod and Kannur districts of Kerala (Toposheets no. 48P/8 &, parts of 48L/14)	2G
3	Geochemical mapping in toposheets 58A/6, 4, 8, 12, 58B/3, 9, 11, 16, 58C/7, 8, 9, 10 etc (Extended OGP areas)	22G

	Objective: To generate geochemical baseline data for use in managing/developing natural resources and for applications in environmental, agricultural, public health and other societal concerns	
3	Geochemical mapping in parts of degree sheets 58A, 58B, 58C, 58D & 58F Area: About 15000 sq. km. Objective: To generate geochemical baseline data for use in managing/developing natural resources and for applications in environmental, agricultural, public health and other societal concerns	38G
M&CSD		
1	Geotechnical appraisal off Baindur, Karnataka	
2	Parametric (magnetic) survey within TW of Diu, Gujarat coast	
3	Detailed study of the seabed morphology and sub-seabed formations by bathymetry, gravity, magnetic, multi-channel reflection seismic and heat flow measurement off Puducherry, Tamil Nadu coast, Bay of Bengal (SR)	12 geologists, 10 geophysicists 1 chemist and 2 geophy(instr)
4	Geological and Geophysical Surveys in Laxmi Ridge off Saurashtra Coast, India (SR)	12 geologists, 10 geophysicists 1 chemist and 2 geophy(instr)
5	Appraisal of Lime mud in the continental shelf off KakinadaVisakhapatnam coast (SR)	
6	Systematic Seismic, magnetic and gravity surveys in the Bay of Bengal over 85^{o}E Ridge and 90° E Ridge (SR)	
7	Geotechnical appraisal of shallow sea bed off Ponnaiyar and Gadilam River mouths,Tamilnadu coast (ST)	
MISSION – II		
SU:K&G		
	Project: Diamond	
1	Regional Surveys for search of Kimberlites in Koppal, Bellary and Raichur districts, Karnataka (G-4 stage) (2 items)	1 Supervisory officer/4G
	Project: Gold	
2	Exploration for Gold in Ajjanahalli, Sira Taluk, Tumkur district, Karnataka. (G-3)	1 Supervisory officer/ 2G
3	Investigation and Exploration for gold in potential gold bearing blocks in the schist belts. (4 Items)	2 Supervisory officers/ 8 G
4	Deep drilling for Gold in Hutti North Block, Hutti-Maski Schist Belt, Dharwar district, Karnataka (G-3) -1 item	1 Supervisory officer /2 G
5	Deep drilling for Gold in Mysore mine block and Sangli mine block in Gadag Schist Belt, Gadag district, Karnataka (G-3).-1 item	1 Supervisory officer /1 G
	Project: Platinum Group of Elements	
6	Investigation of PGE in ultramafics complexes of Karnataka and Goa for possible mineralization (2 items)	1 Supervisory officer /4 G
	Project: Iron Ore	
7	Investigation of low grade Iron Ore in the freehold areas-2 items	1 Supervisory officer /4 G
8	Deep drilling for finding out depth continuity of Iron resources as suggested by Karnataka DGM in	1 Supervisory

	SGPB meetings.-1 item	officer /2 G
SU: TN&P		
1	Title: Re-assessment of clay deposits in Kanchipuram and Tiruvallur districts, Tamil nadu. objective: To re-assess the clay deposits and to study the sedimentological history of Sri perumpudur - Avadi Upper Gondwana basin.	2G
2	Title: Preliminary investigation for clay deposits in Kallamedu area, Ariyalur taluk, Perambalur district,Tamil nadu. objective: To estimate the resource potential of olive green swelling clay for its industrial utility and to study their sedimentological characteristics	2G
3	Title: Re-assessment of clay deposits of upper gondwana sediments of Tiruchirapalli cretaceous basin, Perambalur district, Tamil nadu. objective: To re-assess the resource potential of clay deposits of upper gondwana sediments and to bring out their sedimentological characteristics.	2G
4	Title: Study of major pegmatites of central and southern Tamil nadu for rare metals and rare earth elements mineralisation, Karur, Dindigul, Tiruchirapalli, Kanyakumari, Tirunelveli districts (degree sheets 58E, F, J & H) objective : To assess the economic potential of the major pegmatites and radioactive granitoids for rare metals and ree mineralisation in central and southern Tamil nadu.	2G
5	Title : Environmental impact assessment of placer mineral exploitation along Tamil nadu coast objective : To study the impact of tsunami on placer mineral deposits along the coast to make an idea on the exploitation of placer beach placers.	2G
6.	Investigation For Platinum Group Of Elements In Torappadi Ultramafic Complex, Tiruvannamalai District, Tamil Nadu (G4). (Proposed For The Fs 2014-15 ï Shelved Due To Law And Order Problem Prevailing In Tiruvannamalai District)	

SU: KERALA		
	Project: PGE	
1	Preliminary investigation for PGE in the ultramafic/ mafic rocks around Kalpetta, Wayanad District, Kerala (G-4) (Toposheet No. 58A/2). Area: 100 sq.km	2G
2	Preliminary investigation for PGE in the ultramafic/ mafic rocks around Adakkathodu, Kannur District, Kerala (G-4) (Toposheet No. 49M/13) Area: 50 sq.km	1G
	Proj: Gold	
3	Investigation for Gold in the area north of Chulliyamkulam (Karimala area), Palakkad district, Kerala (Toposheet No 58C/6)	2G

MISSION – IIC		
SU:K&G		
1	To locate deep seated aquifers in the drought prone areas of Northern Karnataka and to delineate and characterize different hydro geological and hydrological properties of the aquifer system-1 item	1Supervisory officer/2 G

Landslide		
SU: Kerala		
1	Landslide susceptibility mapping on macro scale in toposheets pertaining to Kerala	30G
2	Site specific study of Kuttipuzha slump, Vilamina Village, Thalassery Taluk, Kannur District.(Lat.$12^0$04ô10.2òN& Long.$75^0$43ô7.2ò E. TS. No. 48P/12) **Objective:** To identify causative factors for the landslide and to suggest site specific mitigative measures	2G (PT)
3	Detailed site specific study of Thekkummoodu hill debris slide, Chittar-Seethathode Village, Ranni Taluk, Pathanamthitta district. (Lat. 9^0 18ô51òN & Long. 76^0 57ô59òE, TS.No. 58C/15)	2G (PT)
4	Site specific study of Kattunaicken Colony debris flow, Kottapadi Village, Vythiri Taluk, Wayanad District. (Lat. 11°32'43.14"N & Long. 76° 07' 2.28"E. TS. No. 58A/2)	2G (PT)
5	Site specific study of Manjapara debris flow, Mundakkayam Village, Kanjirappally Taluk, Kottayam district. (Lat. 9^0 34ô12.2òN & Long. 76^0 51ô37.5òE. TS.No. 58C/14)	2G (PT)
6	Site specific study of Narikolli debris flow, Padinjarethara Village, Vythiri Taluk, Wayanad District. (Lat. 11°41'17"N & Long. 75°56'24"E TS. No. 49M/14)	2G (PT)
7	Site specific study of Alappara debris flows, VettilaparaVillage, Eranadu Taluk, Malappuram District. (Lat. $11^0$16ô33.1òN & Long. 76^0 05ô18.1òE. TS.No. 58A/3)	2G (PT)
8	Site specific study of coastal landslide at Chowara- Pulinkudi- Adimalathura of Kottukal- Vizhinjam villages, Neyyattinkara Taluk, Thiruvananthapuram district. (Lat. 08^0 21ô25.9òN & Long. 77^0 00ô59ò E. TS.No. 58 H/3)	2G (PT)
9	Site specific study of Santhigiri slump, Kelakam Village, Thalassery Taluk, Kannur District, (Lat. $11^0$54ô38.2òN & Long. $75^0$51ô39.7ò E. TS.No. 49M/13)	2G (PT)
10	Site specific study of Thachankolli colony slump, ThrissilleriVillage, Mananthody Taluk, Wayanad District. (Lat. 11°43'54"N & Long. 75°45'53"E. TS. No. 49M/14)	2G (PT)
11	Detailed site specific landslide study of Chelikuzhi slide, Aruvapulam Village, Kozhenchery Taluk, Pathanamthitta district.(Lat. 9^0 11ô01.5òN & Long.76^0 53ô18.9òE . TS.No. 58C/16)	2G (PT)

MISSION – IVA		
Earthquake Geology Division, SR		
	SHMZ of Ongole, Andhra Pradesh	3G
SU:K&G		
	Project: Engineering Geology	
1.	Landslide inventory along NH& SH of Karnataka and Goa-1 item	1 Supervisory officer/1 G
2.	Geotehcnical evaluation of water resources- 1 item	1 Supervisory officer/1 G
3.	Seismic hazard microzonation of sensitive areas/ townsdevelopment and communication projects- 1 item	1 Supervisory officer/1 G
	Environmental Geology	
1.	Environmental impact assessment for mining/engineering projects and industries in Goa.-1 item	2G
SU:TN&P		
	LANDSLIDES	
1	Title: Site specific studies and slope stability analysis of Nondi ï Medu slope on Ootacamund-Coonoor road, Nilgiri district, Tamil nadu objective: detailed studies and stability analysis of landslides and landslide prone slopes for identifying the causative factors/factor of safety and suggesting appropriate corrective/ preventive measures.	2G
2	Title: Slope stability analysis of community area slopes in Ooty township and its environs ï Nilgiri district. objective: Detailed study of distressed slopes in community areas for evaluating the instability status and suggesting appropriate improvement measures.	2G
3	Title: Site specific studies and slope stability analysis of Gandhi Pettai slide on Ootacamund-Kundah road, Nilgiri district, Tamil nadu objective: detailed studies and stability analysis of landslides and landslide prone slopes for identifying the causative factors/factor of safety and suggesting appropriate corrective/ preventive measures.	2G
4	Preparation Of A 1:50,000 Scale Landslide Susceptibility Map For Varshanad Hills On Gis Platform. (Proposed for FS 2015-16)	
5	Preparation Of A 1:50,000 Scale Landslide Susceptibility Map For Nilgiri Hills On Gis Platform. (Proposed For Fs 2015-16)	
EG		
	Following Are The Major Sponsored Engineering Geology Projects-Expected/Awaited. 1. Underground Laboratory Cavern For India Based Neutrino Observatory, Tamil Nadu 2. Geological Documentation For 25 Pwd Dams, Tamil Nadu 3. Periodical Dam Safety Inspections Of Pwd And Tneb Dams, Tamil Nadu **4.** Bhavani Barrage IV, V, VI & VII HEPS, Tamil Nadu 5. PFBR ï Nuclear Power Plant Kalpakkam	3G

MISSION – IVB		
SU:K&G		
	Petrology Division	
1.	Petrographic studies of Chamundi Granite, Mysore district.	1G(PT)
2.	Petrographic studies of acidic rocks in G.R.Halli-Yerahalli sector, Chitradurga district	1G(PT)
3.	Comparative petrographic studies of variants of metamorphics of Ingaldhal Formation and Hiriyur Formation to understand the evolution of the Chitradurga schist belt.	1G(PT)
4.	Petrographic study and trace element geochemical study of mafic-ultramafic rocks of Yennehole-Ranganabetta area in parts of Holenarsipura schist belt, Hassan district.	1G(PT)
5.	Petrography, petrochemistry and genetic studies related to orbicular granite in Raichur and Ilkal area (Closepet granite), Raichur and Bijapur districts.	1G(PT)
SU: Kerala		
Medical Geology		
1.	Extent of fluorosis and its geological linkages in Perintalmanna, Malappuram district, Kerala. (TS No. 58B/1) **Objective:** Detailed study to evaluate the extent of fluorosis and to identify the possible source rock.	1G (PT)& 1C (PT)
R & D		
1	Study of the possible dismembered Precambrian ophiolitic sequence of Kalkandi, Narasimukk and Mulli areas in the Bhavani shear zone, Attapadi valley, Palakkad district, Kerala, by detailed mapping, geochemistry and mineral chemistry. (TS 58A/12) Objective: To generate detailed maps on 1:1,000 scale of the ultramafic-supracrustal rocks around Kalkandi, Narasimukk and Mulli and their geochemical and mineralogical characterization for establishing a possible dismembered Precambrian ophiolitic sequence.	1G

Annexure-3 A

FINANCIAL OUTLAY AND EXPENDITURE DURING XII PLAN PERIOD
FOR THE MONTHS OF JANUARY, 2015 TO MARCH, 2015.

Year	Survey & Mapping	Mineral Exploration	Specialized Investigation	Research & Development and Other Exploration	Information Dissemination	HRD	Modernization & Replacement + MV	Plan Outlay without construction Budget	Construction	Total Plan Outlay
	Outlay / Expenditure	Outlay / Expenditure	Outlay / Expenditure	Outlay / Expenditure	Outlay / Expenditure	Outlay / Expenditure	Outlay / Expenditure	Outlay / Expenditure	Outlay / Expenditure	Outlay/ Expenditure
2012-13	889.33/ 833.11	313.00/310.81	26.00/23.25	180.41/174.71	131.79/105.11	48.09/48.42	401.56/400.60	1990.18/1946.01	0.00/0.00	1990.18/1946.01
2013-14	832.10/ 447.83	252.00/240.88	37.50/17.69	138.60/100.29	30.00/22.32	64.60/58.85	380.00/432.08	1734.80/1319.94	127.41/61.69	1862.21/1381.63
2014-15	1057.96/ 893.00	418.28/268.00	43.45/39.55	341.00/206.75	228.76/300.00	129.05/20.60	1391.90/25.00	352.94/258.25	0.00/0.00	3963.34/2011.15
2015-16										
2016-17										

SCHEME-WISE, QUARTER-WISE DISTRIBUTION OF APPROVED PLAN FUNDS AND ACTUAL EXPENDITURE FOR THE FINANCIAL YEAR 2014-15

Annexure-3B

2014-15 SCHEME	Q 1		Q 2		Q 3		Q 4		Total	
	Approved Outlay [RE]	Actual Exp	Approved Outlay [RE]	Actual Expenditure	Approved Outlay [RE]	Actual Expenditure	Approved Outlay [RE]	Actual Expenditure	Total Outlay (RE)	Total Expenditure
Survey & Mapping	385.00	300.85	508.00	360.66	**64.00**	**62.43**	**100.96**	**135.88**	**1057.96**	**893.00**
Mineral Exploration	94.00	64.10	174.00	117.57	**50.28**	**77.30**	**100.00**	**113.11**	**418.28**	**372.08**
Specialized Investigation	12.05	3.30	19.00	6.92	**6.40**	**6.85**	**6.00**	**9.20**	**43.45**	**26.27**
R&D and Other Exploration	59.00	28.74	100.75	70.96	**45.60**	**31.65**	**135.65**	**66.56**	**341.00**	**197.91**
Information Dissemination	100.00	7.32	16.00	13.69	**48.50**	**33.08**	**64.26**	**75.71**	**228.76**	**129.80**
Human Research Development	9.00	6.63	6.00	14.53	**14.65**	**10.85**	**99.40**	**9.12**	**129.05**	**41.13**
Modernization &Replacement	100.00	58.67	500.00	101.57	**56.00**	**29.46**	**735.90**	**60.47**	**1356.00**	**250.17**
Motor Vehicle	15.00	3.69	10.00	9.93	**5.65**	**4.74**	**5.25**	**2.11**	**35.90**	**20.47**
Construction	10.00	0.20	65.25	53.16	**120.00**	**99.33**	**157.69**	**10.72**	**352.94**	**163.41**
TOTAL	1067.05	473.50	1483.00	1049.84	**411.08**	**355.69**	**1405.11**	**482.88**	**3963.34**	**2094.24**

Annexure-3C

SCHEME-WISE, MONTH-WISE DISTRIBUTION OF APPROVED PLAN FUNDS AND ACTUAL EXPENDITURE FOR FY 2014-15

2014-15 SCHEME		TARGET VIS-À-VIS ACTUAL EXPND. FROM JULY'2014 TO SEPTEMBER'2014.																	
	OUT LAY	April,14		May,14		June,14		July,14		August,14		Sept,14		Oct,14		Nov,14		Dec,14	
		TAR	EXP	TAR	EXP	TAR	EXP	TAR	EXP	TAR	EXP	TAR	EXP	TAR	EXP	TAR	EXP	TAR	EXP
SURVEY & MAPPING	1057.96	225.00	86.47	25.00.00	13.98	385.00	200.40	60.35	56.70	120.65	100.15	204.00	203.81	12.50	10.74	28.50	28.14	23.00	23.55
MINERAL INVESTIGATION	418.28	85.00	28.17	25.00	21.24	94.00	14.69	58.00	11.25	58.00	19.24	58.00	22.98	21.50	20.30	16.93	22.93	11.85	34.07
SPECIALISED INVESTIGATION	43.45	9.05	0.00	3.50	2.26	12.05	1.04	6.30	1.05	6.30	0.81	6.40	1.76	1.50	1.30	3.65	3.14	1.25	2.41
RESEARCH & DEVELOPMENT & OTHER EXPLORATION	341.00	49.00	4.24	15.00	11.65	59.00	12.85	33.60	3.82	33.50	21.98	33.50	16.42	19.00	17.05	4.50	-8.95	22.10	23.55
INFORMATION DISSEMINATION	228.76	200.00	2.05	5.00	2.24	200.00	3.03	33.30	2.78	33.30	1.65	33.40	2.21	25.60	21.31	4.50	2.35	18.40	9.42
HUMAN RESOURCE DEVELOPMENT (PLA)	129.05	6.00	0.00	9.00	5.02	9.00	1.61	1.00	3.70	1.00	1.98	1.00	2.22	4.25	3.87	6.25	4.68	4.15	2.30
MODERNISATION & REPLACEMENT	1356.00	100.00	4.57	100.00	24.54	100.00	29.56	200.00	8.69	200.00	23.06	100.00	11.15	36.25	40.16	15.65	-13.53	4.10	2.83
MOTOR VEHICLE	35.90	5.00	0.00	2.00	2.08	15.00	1.61	1.00	0.22	3.00	2.38	6.00	3.64	3.20	2.81	1.86	1.56	0.59	0.37
CONSTRUCTION	352.94	0.00	0.00	193.00	0.00	193.00	0.20	4.50	3.38	50.25	49.31	7.50	0.27	93.00	92.00	7.00	7.33	00.00	0.00
TOTAL (PLAN)	**3963.34**	**679.05**	**125.50**	**872.05**	**83.01**	**1067.05**	**264.99**	**398.05**	**91.59**	**506.00**	**220.56**	**449.80**	**264.46**	**216.80**	**209.54**	**88.84**	**74.71**	**85.44**	**98.50**

Annexure-3C (Contd.)

2014-15 SCHEME		TARGET VIS-À-VIS ACTUAL EXPND. FROM JAN. TO MARCH, 2015					
	OUT LAY	Jan,15		Feb,15		Mar,15	
		TAR	EXP	TAR	EXP	TAR	EXP
SURVEY & MAPPING		50.64	34.86	67.72	35.21	85.64	65.81
MINERAL INVESTIGATION		10.80	32.64	30.86	48.29	18.34	32.18
SPECIALISED INVESTIGATION		2.00	2.24	1.56	2.64	1.99	4.32
RESEARCH & DEVELOPMENT AND OTHER EXPLORATION		0.00	2.27	34.00	54.42	0.00	9.87
INFORMATION DISSEMINATION		35.00	2.56	56.00	8.41	104.00	64.74
HUMAN RESOURCE DEVELOPMENT (PLAN)		25.00	1.02	10.00	-0.06	52.40	8.16
MODERNISATION & REPLACEMENT		200.00	141.35	100.00	-86.97	200.00	6.09
MOTOR VEHICLE		0.65	0.14	0.95	1.00	1.00	0.93
CONSTRUCTION		15.00	0.00	12.00	10.72	12.00	10.72
TOTAL (PLAN)		**339.09**	**217.08**	**313.09**	**73.66**	**475.37**	**202.82**

ANNEXURE – 4

MISSION WISE PRO-RATA RCA EXPENDITURE IN DIFFERENT PROJECTS VIS-À-VIS TARGETS AND ACHIEVEMENTS

Sl. No	FSP Item no.	Name of the field officer	Nature of work	Target	Achievement	Field Days	Total Expenditure	Per day expenditure	Remark
MISSION-I									
1	STM/SR/AP/2014/001	Satyapal Kunal Kumar Singh	STM (sq.km): Samples(Nos.) PS PCS BRS/SSS EPMA Geochronology	350 50 15 75 5 --	350 62 16 75 5 -	125 124	Rs.232397 /-	Rs.933/-	
2	STM/SR/AP/2014/002	D.Adhikary Samarendra Sahoo K.K.Behera, Suptdg.Geologist	STM (sq.km) Samples(Nos.) PS PCS BRS/SSS Geochronological studies	350 50 20 50 --	352 62 27 54 -	120 124 35	Rs. 270664/-	Rs. 970/-	
3	STM/SR/AP/2014/003	Tushar Meshram D.Shukla	STM (sq.km) Samples(Nos.) PS PCS BRS/SS EPMA Geochronological studies	350 50 15 75 5 --	350 55 15 70 5 2	124 125	Rs. 285567/-	Rs. 1146/-	
4	STM/SR/AP/2014/004	D.Rajani Gangadhar Nibedita Sahoo	STM (sq.km) Samples(Nos.) PS PCS BRS/SS EPMA Geochronological	350 50 15 75 10 --	350 50 15 75 - -	121 121	Rs. 247452/-	Rs. 1023/-	

			studies						
5	STM/SR/AP/2014/005	Sankha Das Munmun Chakraborty	STM (sq.km) Samples(Nos.) PS PCS BRS/SS EPMA Geochronological studies	350 50 20 50 10 --	350 50 23 50 - -	126 122	Rs. 198805/-	Rs.1343/-	
6	STM/SR/KG/2014/006	Manju Anandan Dr. Sreepriya.S	STM (sq.km) 1:25,000 scale Sample (Nos.) PS PCS (Major and trace) PGE SEM-EDX@ EPMA U-Pb/Pb-Pb dating Channel Sampling	350 50 25 50 10 10 05 As required	350 50 25 50 10 10 05 Nil	133 130	Rs.201610./-	Rs. 767./-	
7	STM/SR/KG/2014/007	K.V. Neena Vaman Arsha T.L	STM (in sq.km) (1:25000) Samples PS PCS PGE & REE SEM-EDS EPMA U-Pb/Pb-Pb dating	350 50 25 25 10 15 05	350 60 34 18 Nil Nil Nil	133 135	Rs. 203255/-	Rs. 758/-	
8	STM/SR/TNP/2013/02	Siddhartha Karmakar Sunita Kumari Patnaik	1) STM (1:25,000) sq km 2) SMPL (Nos.) a) PS b) PCS c) BRS d) EPMA	350 25 20 20 10	365 57 25 20 10	132 126	Rs. 352122/-	Rs. 1364.81/-	

9	STM/SR/TNP/2014 /008	Hrudananda Naik Avijit Mukherjee	1) STM (1:25,000) sq km 2) SMPL (Nos.) a) PS b) PCS c) BRS d) EPMA	350 25 20 50 10	365 57 25 20 10	139 122	Rs. 482154/- -	Rs. 1847.33/-	
10	STM/SR/TNP/2014/00 9	V Chandramouli Biswaranjan Mohanty	1) STM (1:25,000) sq km 2) SMPL (Nos.) a) PS b) PCS c) BRS d) EPMA e)OM f)Geochronological Study	350 25 20 50 10 15 AN	350 45 17 50 12 15	131 126	Rs. 229628/-	Rs.893/-	
11.	STM/SR/KRL/2014/01 0	Dr.P. Soney Kurien	1. STM 1: 25,000(sq km) 2. SMPL (Nos.) (a) GCS (b) PCS (c) PS (d) EPMA (e) Geochronological studies	175 25 20 25 10 2	175 25 20 25 10 2	124	Rs. 210922/- NRCA: Rs. 19900/-	RS. 1701/-	
12	STM/SR/KRL/2013/00 3	Uday Narayan Deepanjan Ghose	1. Remote Sensing input(sq.km) 2.STM 1: 25,000(sq km) 3. SMPL (Nos.) (a) PCS (b) PS (c) EPMA (d) REE (e) Geochronology	700 350 25 60 10 10 04	700 350 25 80 10 10 8* (4 of Each field season)	122 127	Rs. 304158/- Rs. 25,000/- NRCA)	Rs. 1322/-	
13.	GCM/SR/AP/2014/011	Sini Raj Wasim Akram	GCM (sq.km) GCM Samples (Nos.) Stream sediment/slope wash Composite samples Soil C-Horizon	800# 800 207 09	800 819(212*) 212 10	97 103	Rs. 587047/-		

			Regolith Water	09 09	10 10				
		B. Shradhha Sharad	Humus Flood plain sediments Duplicate Chemical Analysis Pt-Pd analysis (I package) HMS PS XRD	A.N AN 40(10) 254 5 9 10 5	- - 40(10) - 5 9 10 5	14		Rs. 2743/-	
14.	GCM/SR/AP/2014/012	B.K. Parida	GCM (sq.km)	800#	818	102	Rs.434578/-	Rs. 2040/-	
		Samreen Shaik	GCM Samples (Nos.) Stream sediment/slope wash Composite samples Soil C-Horizon Regolith Water	800 207 09 09 09	265(212*) 212 10 10 10	100			
		Lakshmi Mehera	Humus Flood plain sediments Duplicate Chemical Analysis Pt-Pd analysis (I package) HMS PS XRD	A.N AN 40(10) 254 1 9 10 5	- - 10 - 1 9 10 5	11			

15.	GCM/SR/AP/2014/013	Prathana Das Binitha SS	GCM (sq.km) GCM Samples (Nos.) Stream sediment/slope wash Composite samples Soil C-Horizon Regolith Water Humus Flood plain sediments Duplicate Chemical Analysis Pt-Pd analysis (I package) HMS PS XRD	800# 800 207 10 10 10 A.N AN 36(9*) 254 43 9 10 5.	808 808 211 10 10 09 - - 36(9) 249 43 9 10 5	124 127	Rs. 413352/-	Rs. 1647/-	
16.	GCM/SR/AP/2014/014	Sandhya D. Kuthe Mrunalii V. Khond	GCM (sq.km) GCM Samples (Nos.) Stream sediment/slope wash Composite samples Soil C-Horizon Regolith Water Humus Flood plain sediments Duplicate Chemical Analysis Pt-Pd analysis (I package) HMS PS XRD	800# 800 207 10 10 10 A.N AN 36(9*) 250 80 9 10 5	820 820 212 10 10 10 - - 40(10) - 80 9 10 5 -	125 74	Rs. 396490/-	Rs. 1992/-	

17.	GCM/SR/AP/2014/015	Poornima Sreedhar Sari. S 1G	GCM (sq.km) GCM Samples (Nos.) Stream sediment/slope wash Composite samples Soil C-Horizon Regolith Water Humus Flood plain sediments Duplicate Chemical Analysis Pt-Pd analysis (I package) HMS PS XRD	800# 800 207 10 10 10 A.N AN 36(9*) 250 7 9 10 5	820 815 212 10 10 10 - - 36(9) 250 7 9 10 5	122 91	Rs. 370416/-	Rs. 1739/-	
18	GCM/SR/AP/2014/016	Dinesh Meshram Snigdha Rani Mishra	GCM (sq.km) GCM Samples (Nos.) Stream sediment/slope wash Composite samples Soil C-Horizon Regolith Water Humus Flood plain sediments Duplicate Chemical Analysis Pt-Pd analysis (I package) HMS PS XRD	800# 800 207 10 10 10 A.N AN 36(9*) 250 48 9 10 5	804 804 212 09 09 09 - - 36(9)* - 48 9 10 05	128 74	Rs. 399973/-	Rs. 1980/-	
19	GCM/SR/AP/2014/017	Arvind Kumar .	GCM (sq.km) GCM Samples (Nos.)	800# 800	820 737	125 125			

		Anicia K.S	Stream sediment/slope wash Composite samples Soil C-Horizon Regolith Water Humus Flood plain sediments Duplicate Chemical Analysis Pt-Pd analysis (I package) HMS PS XRD	207 10 10 10 A.N AN 36(9*) 250 42 9 10 5	209 02 02 9 - - 36(9) 245 42 9 10 5		Rs. 373210/-	Rs.1493/-	
20	GCM/SR/AP/2014/018	Madhusmita Swain Debasmita Das Athira V Nair	GCM (sq.km) GCM Samples (Nos.) Stream sediment/slope wash Composite samples Soil C-Horizon Regolith Water Humus Flood plain sediments Duplicate Chemical Analysis Pt-Pd analysis (I package) HMS PS XRD	800# 800 207 10 10 10 A.N AN 36(9*) 250 21 9 10 5	816 816(214) 214 10 10 10 - - 36(9) 253 21 9 10 5	105 91 Nil	Rs. 394053/-	Rs. 2010/-	
21	GCM/SR/AP/2014/019	Parvathy R Krishnan Sweta Rath	GCM Samples (Nos.) Stream sediment/slope wash Composite samples Soil C-Horizon Regolith Water	800# 800 207 10 10 10 A.N	828 828 188 02 02 09 -	121 121	Rs 368610/-	Rs.1523/-	.

			Humus	AN	-				
			Flood plain sediments	36(9*) 250	39(9)* -				
			Duplicate Chemical Analysis	11	11				
			Pt-Pd analysis (I package)	9 10	9 10				
			HMS	5	5				
			PS						
			XRD						
22	GCM/SR/AP/2014/020	Reena Meshram	GCM (sq.km)	800#	828	124	Rs. 386157/-	Rs. 2022/-	
			GCM Samples (Nos.)	800	828				
			Stream sediment/slope wash	207	214				
			Composite samples	10	09				
			Soil C-Horizon	10	09				
		Pranamee Neog	Regolith	10	09	67			
			Water	A.N	-				
			Humus	AN	-				
			Flood plain sediments	36(9*) 250	40(10) -				
			Duplicate	33	34				
			Chemical Analysis	9	9				
			Pt-Pd analysis	10	11				
			(I package)	5	5				
			HMS						
			PS						
			XRD						
23	GCM/SR/AP/2014/021	Vaishnavi Sambre	GCM (sq.km)	800#	816	125	Rs. 402216/-	Rs.1915/-	
			GCM Samples (Nos.)	800	814				
			Stream sediment/slope wash	207	211	85			
		Swati Subhadarshini,	Composite samples	10	9				
			Soil C-Horizon	10	9				
			Regolith	10	9				
			Water	A.N	-				
			Humus	AN	-				
			Flood plain sediments	36(9*) 250	36(9) 262				
			Duplicate	9	9				
			Chemical Analysis	9	9				
			Pt-Pd analysis	10	10				

			(I package) HMS PS XRD	5	5				
24	GCM/SR/AP/2014/022	Divya MP Lishi Thottungal	GCM (sq.km) GCM Samples (Nos.) Stream sediment/slope wash Composite samples Soil C-Horizon Regolith Water Humus Flood plain sediments Duplicate Chemical Analysis Pt-Pd analysis (I package) HMS PS XRD	800# 800 207 10 10 10 A.N AN 36(9*) 250 Nil 9 10 5	816 808 210 10 10 10 - - 36(9) 244+10(W) - 9 10 5	121 121	Rs. 554597/-	Rs.2282/-	
25	GCM/SR/AP/2014/023	R.R. Swain Sambuddha Mukherjee	GCM (sq.km) GCM Samples (Nos.) Stream sediment/slope wash Composite samples Soil C-Horizon Regolith Water Humus Flood plain sediments Duplicate Chemical Analysis Pt-Pd analysis (I package) HMS PS XRD	800# 800 207 10 10 10 A.N AN 36(9*) 250 Nil 9 10 5	820 820 212 10 10 10 - - 40(10*) 252 - Nil 10 5	127 81	Rs. 372853/-	Rs.1793/-	
26	GCM/SR/AP/2014/024	Ujjal Paul	GCM (sq.km) GCM Samples	800#	816	119	Rs. 345281/-	Rs.1476/-	

			(Nos.)	800	816	115			
		S.Chakraborthy	Stream sediment/slope wash	207	212				
			Composite samples	10	10				
			Soil C-Horizon	10	10				
			Regolith	10	10				
			Water	A.N	-				
			Humus	AN	-				
			Flood plain sediments	36(9*)	09				
			Duplicate	250	250				
			Chemical Analysis	Nil	-				
			Pt-Pd analysis	9	8				
			(I package)	10	10				
			HMS	5	05				
			PS						
			XRD						
27	GCM/SR/AP/2014/025	S.B. Chavan	GCM (sq.km)	800[#]	820	2			
			GCM Samples (Nos.)	800	804(208)				
		R. Priya	Stream sediment/slope wash	207	208				
			Composite samples	10	10		Rs. 418162/-	Rs.1679/-	
			Soil C-Horizon	10	10	121			
			Regolith	10	10				
			Water	A.N	-	126			
		J.K.Aravind	Humus	AN	-				
			Flood plain sediments	36(9*)	36(9)				
			Duplicate	250	247				
			Chemical Analysis	Nil	-				
			Pt-Pd analysis	9	9				
			(I package)	10	10				
			HMS	5	08				
			PS						
			XRD						
28	GCM/SR/AP/2014/117	R.Balaji Suptdg Geol	GCM (sq.km)	320[#]	260	24	170446./-	1282/-	
			GCM Samples (Nos.)						
		Lakshmi Mehera, Geol.	Stream sediment/slope wash	320(80)	260(55)	53			
			Composite samples	80	55	56			
		Borkar Shradhha Sharad, Geol.	Soil C-Horizon	03	03				
			Regolith	03	03				

			Water Humus Flood plain sediments Duplicate Chemical Analysis Pt-Pd analysis (I package) HMS PS XRD	A.N AN 12(3*) - AN AN AN AN	- - 8(2*) - - - 3 2				
29	GCM/SR/KG/2014/026	K.V. Chandran M.Anbu (transferred to NER) Kapil singh	1. GCM (sq km) 1:50,000 scale 2. SMPL (Nos.) i) SSS ii) Composite ii) Regolith iii) Soil C-Horizon iv) Water v) Humus vi) Floodplainsediment vii) Stream Sediments duplicates 3.Land use/soil maps (PGRS Div) 4. Chemical analysis 5. Samples for Pt-Pd analysis 6. Geodata: Data storing / processing H M S PS XRD	800 840 214 10 10 10 AN AN 40 (10*) Nil 254 4 As per the requirement 9 10 5	800 840 214 10 10 10 Nil Nil 40 Nil 254 4 Nil Nil Nil Nil	133 0 92	Rs. 125170/-	556/-	
30	GCM/SR/KG/2014/027	Thara M Tanvi Gupta	1. Geochemical mapping (sq km) (1:50000 scale) 2. SMPL (nos.) i) Stream Sediment/ Slope wash ii) Regolith iii) Soil C-horizon iv) Water	800 840 (214*) 10 10 10	829 829 10 10 0	110 97	Rs. 165403/-	Rs. 799/-	

			v) Humus vi) Floodplainsediment vii) Stream sediment duplicates 3. Land use/soil maps (PGRS Division)sq km 4. Chemical Analysis 5. Geodata: Data storing/processing HMS PS XRD	AN AN 40 (10*) -- 254 As per the requirement 9 10 5	NIL NIL 40 -- 247 Nil 9 10 5				
31	GCM/SR/KG/2014/028	Snehasis Bhattacharya Reshma K	1. GCM (sq km) 1:50,000 scale 2. SMPL (Nos.) i) SSS ii) Composite ii) Regolith iii) Soil C-Horizon iv) Water v) Humus vi) Flood plain sediment vii)Stream Sediments duplicates Composite Samples Duplicate 3.Land use/soil maps (PGRS Div) 4. Chemical analysis 5. Samples for Pt-Pd analysis 6.Geodata:Data storing/processing H M S PS XRD	800 840 214 10 10 10 AN AN 40 10 As per the requirement 254 2 As per the requirement 9 10 5	840 840 214 10 10 10 Nil Nil 40 10 Nil 254 2 Nil 9 10 5	124 140	Rs. 122330/-	Rs. 463/-	
32	GCM/SR/KG/2014/029	P. Hampaiah	1. GCM (sq km) 1:50,000 scale 2. SMPL (Nos.)	800	827	125	Rs. 137000/-	Rs. 646/-	

			i) SSS	840	827				
		Sunandan Basu	ii) Composite	214	212	87			
			ii) Regolith	10	10				
			iii) Soil C-Horizon	10	10				
			iv) Water	10	10				
			v) Humus	AN	Nil				
			vi) Flood plain sediment	AN	Nil				
			vii) Stream Sediments	40	40				
			duplicates	10	10				
			Composite Samples		Nil				
			Duplicate	As per the					
			3. Land use/soil	requirement	130				
			maps (PGRS Div)	254	1				
			4. Chemical analysis	2	Nil				
			5. Samples for Pt-Pd analysis	As per the	Nil				
			6.Geodata:Data	requirement					
			storing/processing	9	Nil				
			H M S	10	Nil				
			PS	5	Nil				
			XRD						
33	GCM/SR/KG/2014/030	B. Mangesh Surendra	1. GCM (sq km) 1:50,000 scale	800	837		Rs.177638/-	Rs. 728/-	
			2. SMPL (Nos.)			142			
			i) SSS	840	837				
			ii) Composite	214	221				
			ii) Regolith	10	10				
			iii) Soil C-Horizon	10	10				
		Abhishek Shukla	iv) Water	10	10	102			
			v) Humus	AN	Nil				
			vi) Flood plain sediment	AN	Nil				
			vii) Stream Sediments	40	40				
			duplicates	10	10				
			Composite Samples						
			Duplicate	--	Nil				
			3.Land use/soil	254	256				
			maps (PGRS Div)	As per the	--				
			4. Chemical analysis	requirement					
			5.Geodata:Data						
			storing/processing	9	13				

			H M S PS XRD	10 5	11 5				
34	GCM/SR/KG/2014/031	Hema Shriram Hiwrale Prashant D. Wagh	1. GCM (sq km) 1:50,000 scale 2. SMPL (Nos.) i) SSS ii) Composite ii) Regolith iii) Soil C-Horizon iv) Water v) Humus vi) Flood plain sediment vii) Stream Sediments duplicates Composite Samples Duplicate 3. Land use/soil maps (PGRS Div) 4. Chemical analysis 5. Samples for Pt-Pd analysis 6.Geodata: Data storing/processing H M S PS XRD	800 840 214 10 10 10 AN AN 40 10 254 20 As per the requirement 9 10 5	846 846 221 10 10 -- -- 04 40 10 Nil 265 36 Nil 10 11 5	142 141	Rs. 200190/-	Rs. 707/-	
35	GCM/SR/KG/2014/032	Pawan Baraiud Neha Kumari	1. GCM (sq km) 1:50,000 scale 2. SMPL (Nos.) i) SSS ii) Composite ii) Regolith iii) Soil C-Horizon iv) Water v) Humus vi) Flood plain sediment vii) Stream Sediments duplicates Composite Samples	800 840 214 10 10 10 AN AN 40 10 --	837 837 0 10 10 10 Nil 1 40 10	134 99	Rs.167188/-	Rs 718/-	

			Duplicate 3. Land use/soil maps (PGRS Div) 4. Chemical analysis 5. Samples for Pt-Pd analysis 6.Geodata: Data storing/processing H M S PS XRD	 254 As per the requirement 9 10 5	-- 262 Nil Nil Nil Nil				
36	GCM/SR/KG/2014/033	Aneesh Kumar S Anju P.S	1. GCM (sq km) 1:50,000 scale 2. SMPL (Nos.) i) SSS ii) Composite ii) Regolith iii) Soil C-Horizon iv) Water v) Humus vi) Flood plain sediment vii) Stream Sediments duplicates Composite Samples Duplicate 3. Land use/soil maps (PGRS Div) 4. Chemical analysis 5. Samples for Pt-Pd analysis 6.Geodata:Data storing/processing H M S PS XRD	800 840 214 10 10 10 AN AN 40 10 --- 254 9 As per the requirement 9 10 5	837 837 216 10 10 10 Nil Nil 40 10 -- 256 9 -- 9 10 5	133 67	Rs. 137224/-	Rs. 686/-	
37	GCM/SR/KG/2014/034	Paradkar Trigun	1. GCM (sq km) 1:50,000 scale 2. SMPL (Nos.) i) SSS ii) Composite ii) Regolith iii) Soil C-Horizon	800 840 214 10 10	840 840 218 10 10	131	Rs. 163033/-	Rs. 703/-	

		Borkar Nandeshwar	iv) Water v) Humus vi) Flood plain sediment vii) Stream Sediments duplicates Composite Samples Duplicate 3. Land use/soil maps (PGRS Div) 4. Chemical analysis 5.Geodata:Data storing/processing H M S PS XRD	10 AN AN 40 10 -- 254 As per the requirement 9 10 5	10 Nil Nil 40 10 -- 258 Nil 9 10 5	101			
38	GCM/SR/KG/2014/035	Neethu T.R	1. GCM (sq km) 1:50,000 scale 2. SMPL (Nos.) i) SSS ii)Composite	800 840	812 812	144	Rs. 172678/-	Rs. 708/-	
		Kamal Kumar	ii) Regolith iii) Soil C-Horizon iv) Water v) Humus vi) Flood plain sediment vii) Stream Sediments duplicates Composite Samples Duplicate 3.Land use/soil maps (PGRS Div) 4. Chemical analysis 5.Geodata:Data storing/processing H M S PS XRD	10 10 10 AN AN 40 10 -- 254 As per the requirement 9 10 5	10 10 10 Nil Nil 40 10 -- 244 Nil 9 8 Nil	100			

39	GCM/SR/KG/2014/036	Rupsa Mukherjee Arpita Roy Choudhury	1. GCM (sq km) 1:50,000 scale 2. SMPL (Nos.) i) SSS ii)Composite ii) Regolith iii) Soil C-Horizon iv) Water v) Humus vi) Flood plain sediment vii) Stream Sediments duplicates Composite Samples Duplicate 3.Land use/soil maps (PGRS Div) 4. Chemical analysis 5.Geodata:Data storing/processing H M S PS XRD	800 840 214 10 10 10 AN AN 40 10 -- 254 As per the requirement 9 10 5	833 846 221 10 10 4 Nil Nil 40 10 Nil 255 Nil 9 10 5	127 83	Rs 160812/-	Rs. 766/-	
40	GCM/SR/KG/2014/037	Soumya Das Bikash Kumar Acharya	1. GCM (sq km) 1:50,000 scale 2. SMPL (Nos.) i) SSS ii)Composite ii) Regolith iii) Soil C-Horizon iv) Water v) Humus vi) Flood plain sediment vii) Stream Sediments duplicates Composite Samples Duplicate 3.Land use/soil maps (PGRS Div)	800 840 214 10 10 10 AN AN 40 10 --	846 846 221 10 10 1 Nil Nil 40 10 Nil	135 98	Rs. 115395/-	Rs 495/-	

			4. Chemical analysis 5.Samples for Pt-Pd analysis 6.Geodata:Data storing/processing H M S PS XRD	254 2 As per the requirement 9 10 5	252 Nil Nil Nil 3 Nil				
41	GCM/SR/KG/2014/038	Resya Reghu	1. GCM (sq km) 1:50,000 scale 2. SMPL (Nos.) i) SSS	800 840	800 844	147	Rs. 128675/-	Rs.564 /-	
		Arunima.M.Lal	ii)Composite ii) Regolith iii) Soil C-Horizon	214 10 10	220 10 10	28			
		Parusharma G.	iv) Water v) Humus vi) Flood plain sediment vii) Stream Sedimentsduplicates Composite Samples Duplicate 3.Land use/soil maps (PGRS Div) 4. Chemical analysis 5. Pt-Pd analysis 5.Geodata:Data storing/processing H M S PS XRD	10 AN AN 40 10 -- 254 23 As per the requirement 9 10 5	7 Nil Nil 40 10 Nil 257 24 Nil Nil 10 5	53			
42	GCM/SR/KG/2014/114 (New item)	Dr Zammer Ahmad Shah	1. GCM (sq km) 1:50,000 scale 2. SMPL (Nos.) i) SSS	320 320	324 324	56	₹ 43543/-	Rs. 392/-	Field work started in the last week of December, 2014
		Mr. Mukut Singha Konwar	ii)Composite ii) Regolith iii) Soil C-Horizon iv) Water v) Humus vi) Flood plain	80 4 4 4 AN AN	81 4 4 NIL Nil Nil	55			

			sediment vii) Stream Sediments duplicates Composite Samples Duplicate 3.Land use/soil maps (PGRS Div) 4. Chemical analysis 5.Geodata:Data storing/processing Pt-Pd H M S PS XRD	16 4 - As per package As per the requirement 5 Nos. 4 Nos 5 4 Nos.	16 4 -- 93 2 2 3 3				
43	GCM/SR/KG/2014/113 (New item)	Ms Dsilva Danira Stephen R. K. Chaurasia	1. GCM (sq km) 1:50,000 scale 2. SMPL (Nos.) i) SSS ii)Composite ii) Regolith iii) Soil C-Horizon iv) Water v) Humus vi) Flood plain sediment vii) Stream Sediments duplicates Composite Samples Duplicate 3.Land use/soil maps (PGRS Div) 4. Chemical analysis 5. Samples for Pt-Pd analysis 6.Geodata:Data storing/processing H M S PS XRD	320 320 80 4 4 4 AN AN 16 4 - 104 Nil As per the requirement Nil Nil. Nil	342 342 90 4 4 Nil Nil Nil 16 4 Nil 102 Nil Nil Nil Nil Nil	69 71	70667/-	Rs. 505/-	Field work started in the month of January, 2015
44	GCM/SR/KRL/2014/114		1. Geochemical mapping (sqkm,	480	486	61	Rs. 208914	1160/-	Field work started in

	(New item)	Wagh Rajkumar Limbraj Ranjeet Kumar Das Amrapalli Kamble	1:50,000 scale) 2. SMPL (nos.) i) Stream Sediment/ Slope wash ii) Composite samples ii) Regolith (A horizon) iii) Soil (C-horizon) iv) Water v) Humus vi) Flood plain sediment vii) Stream sediment duplicates viii) Composite sample duplicates 3. Landuse/soil maps (PGRS Division) 4. Chemical Analysis 5. Samples for Pt+Pd analysis 6. Geodata: Data storing/processing	 480 126 6 6 6 AN AN 24 6 144 . AN As per the Requirement	 486 126 6 6 Nil Nil Nil 24 6 144	 59 60			the month of January, 2015
44	GCM/SR/TNP/2014/039	Pawan Kumar	1.Geochemical Mapping 1:50,000 sq km 2. Samples (nos.) i) Stream sediments/ slopewash ii) Soil C-horizon iii) Regolith iv) Water v) Humus vi) Flood Plain sediment vii) Duplicate 3. Chemical analysis	400 404 (101) 9 9 9 AN AN 36(9) 137 nos.	400 404 (101) 9 9 Nil Nil Nil 36(9) 138	133	Rs 400474. /-	Rs. 3011/-	
45			1. Geochemical Mapping 1:50,000 sq km 2. Samples (nos.)	800	817	202	Rs. 367384/-	Rs. 1819/-	

	GCM/SR/TNP/2014/040	S.Balakrishnan Yogendra Bhogta	i) Stream sediments/ slopewash ii) Soil C-horizon iii) Regolith iv) Water v) Humus vi) Flood Plain sediment vii) Duplicate 3. Chemical analysis Pt-Pd Analysis HMS PS X R D	800 (210) 9 9 9 AN AN 36(9)* 246nos 10 nos 9 nos 10 nos 05 nos	832(210) 9 9 Nil Nil 1 36 (9) 237 Nil 09 12 05				
46	GCM/SR/TNP/2014/041	Kalarani Roshni SL	1. Geochemical Mapping 1:50,000 sq km 2. Samples (nos.) i) Stream sediments /slopewash ii) Soil C-horizon iii) Regolith iv) Water v) Humus vi) Flood Plain sediment vii) Duplicate 3. Chemical analysis Pt-Pd analysis HMS PS XRD	800 800 (210) 9 9 9 AN AN 36(9) 246 nos. 10 09 10 05	810 810 (210) 09 09 Nil Nil Nil 36(9) 237 10 9 10 **5**	136 129	Rs.477245/-	Rs. 1801/-	
47	GCM/SR/TNP/2014/042	R. Geetha Rani	1. Geochemical Mapping 1:50,000 (sq km) 2. Samples (nos) i) Stream sediments/ slopewash	800 800(210)	810 810(210)	148	Rs. 585133/-	Rs. 1983/-	

		Anu Johnson	ii) Soil C-horizon iii) Regolith iv) Water v) Humus vi) Flood Plain sediment vii) Duplicate 3. Chemical analysis Pt-Pd Analysis HMS PS X R D	9 9 9 AN AN 36 246 10 nos 9 nos 10 nos 05 nos	09 09 Nil Nil Nil 36 237 10 09 10 05	147			
48	GCM/SR/TNP/2014/043	Laya.M.B.Pillai Soumya Vijayan	1. Geochemical Mapping 1:50,000 (sq km) 2. Samples (nos) i) Stream sediments/slopewash ii) Soil C-horizon iii) Regolith iv) Water v) Humus vi) Flood Plain sediment vii) Duplicate 3. Chemical analysis Pt-Pd Analysis HMS PS X R D	800 744(186) 9 9 9 AN AN 36(9) 222 95 9 10 5	800 693 9 8 8 4 Nil - 9 95 9 10 5	136 143	Rs. 473124/-	1696	
49	GCM/SR/TNP/2014/044	Ritam Konar Swati Mondal	1. Geochemical Mapping 1:50,000 (sq km) 2. Samples (nos) i) Stream sediments/slopewash ii) Soil C-horizon iii) Regolith iv) Water v) Humus vi) Flood Plain sediment vii) Duplicate 3. Chemical analysis	800 800(210) 9 9 9 AN AN 36(9) 246	810 810 9 9 5 - 9 36 (9) Nil	149 149	Rs.559658/-	Rs. 1878/-	

			Pt-Pd Analysis HMS Ps X R D	28 9 10 5	Nil Nil Nil Nil				
50	GCM/SR/TNP/2014/045	Dilip Kumar Yadav Vinod Kumar K. B	1. Geochemical Mapping 1:50,000 (sq km) 2. Samples (nos) i) Stream sediments/slopewash ii) Soil C-horizon iii) Regolith iv) Water v) Humus vi) Flood Plain sediment vii) Duplicate 3. Chemical analysis Pt-Pd Analysis HMS Ps X R D	800 800(210) 9 9 9 AN AN 36(9) 246 33 9 10 5	800 796 (209) 09 09 16 Nil Nil 09 223 33 9 10 5	174 174	Rs. 463363/-	Rs. 1332/-	
51	GCM/SR/TNP/2014/046	Balaji. B Asaad Ahsan Raza	1. Geochemical Mapping 1:50,000 (sq km) 2. Samples (nos) i) Stream sediments/slopewash ii) Soil C-horizon iii) Regolith iv) Water v) Humus vi) Flood Plain sediment vii) Duplicate 3. Chemical analysis Pt-Pd Analysis HMS PS X R D	800 800(210) 9 9 9 AN AN 36(9) 243 10 9 10 5	800 800 (207) 9 9 Nil Nil Nil 225 10 9 11 5	129 127	Rs. 526102/-	Rs. 2055/-	
52	GCM/SR/KRL/2014/047	P.K. Behera	1. GCM on scale			132	Rs. 428322/-	Rs. 2120/-	

			1:50,000 (sq km) 2. Samples (nos) i) Stream sediments / slope wash ii) Soil C-horizon iii) Regolith iv) Water v) Humus vi) Flood Plain sediment vii) Duplicate viii) Composite ix) Pt-Pd analysis 3. Chemical analysis HMS PS XRD	800 800 10 10 10 AN AN 40(10*) 210 45 250 as per package 9 10 5	800 772 10 10 10 Nil Nil 40(10) 210 Nil 210 9 10 Nil				
		Shakti Dhage				70			
53	GCM/SR/KRL/2014/048	Jiji Kumar.S	1. GCM on scale 1:50,000 (sq km) 2. Samples (nos) i) Stream sediments / slope wash ii) Soil C-horizon iii) Regolith iv) Water v) Humus vi) Flood Plain sediment vii) Duplicate viii) Composite 3. Chemical analysis HMS PS XRD	814 814 10 10 10 AN AN 40(10) 213 253 9 10 5	814 814 10 10 10 Nil Nil 40 212 252 9 10 Nil	128	Rs. **304939**/-	Rs. 1763/-	
		Suchismita Swain				45			
54	GCM/SR/TNP/2014/116	Pummy Roy	1. GCM on scale 1:50,000 (sq km) 2. Samples (nos) i) Stream sediments / slope wash	480 sq.km 120	500 sqkm 125	41	154241	Rs 1296/-	
		Sudeshna Dey				41			

		Nishant Kumar	ii) Soil C-horizon iii) Regolith iv) Water v) Humus vi) Flood Plain sediment vii) Duplicate viii)HMS PS	6 6 AN AN AN 6 4 5	6 6 - - - 6 4 5	37			
55	GPM/SR/TN/2014/049	K.V. Satyanarayana Sandeep Laxman P. Mani Maren	Regional gravity & magnetic (TF) surveys. Area: Samples for Physical Property measurements: Radiometric Survey	2,160 sq.km 100 AN	2535 sq km 125 NIL.	102 Days 104 Days 47 Days	Rs.4,28,683/-	Rs.4,122/-	
56	GPM/SR/AP/2014/050	B. Sunderaj S. S. Ganguly K. Sreeja Debdoot Mitra	Regional gravity & magnetic (TF) surveys. Area: Samples for Physical Property measurements: Radiometric Survey	2160sqkm 100 AN	2,880sqkm 86 NIL.	103 Days 99 Days 91 Days 60 Days	Rs. 4,18,772/-	Rs. 4,065/-	
57	GPM/SR/AP,KAR/2014/051	M S Kumar B Ravi Kumar D. Purushottam	Regional gravity & magnetic (TF) surveys. Area: Samples for Physical Property measurements: Radiometric Survey	2160 sqkm 100 AN	2160sqkm 64 NIL	115 Days 112 Days 49 Days	Rs. 3,39,334/-	Rs. 2,950/-	

58	PM/SR/AP,KAR/2014/052	N.V.S.Murthy K. Sundara Linga	Regional gravity & magnetic (TF) surveys. Area: Samples for Physical Property measurements:	5000 sq km 100	5220 sq km 197	105 108	Rs. 1,24,560/-	Rs. 1,153/-	

M&CSD							
Sl. No.	**Item**	**Name of Officers**	**Targets**	**Achievements**	**Field Days**	**Total Exp. Rs**	**Per day Exp.**
59	2014-15/080	Shri KG Mohan Shri Subradeep Das Smt Ashalatha CP Smt Reshma A	Beach Profiling Beach profiling samples Grid samples (1 x 1 km interval)	5 locations (L1 to L5) 21 23	3 days	Rs. 8,933/-	
60	**SD 251**	Satish Kumar Rekha P.R. Harsha S.E. Vidya S Devarajan P.	Area : 108 sq km Bathymetry : 72 lkm Sediment Samples : 40 vibrocores	48 sq. km. 38 line km. 24 vibro cores Targets could not be completed as vibrocorer fell in to sea during sampling operation and part of the cruise time was utilized to recover the corer and repair it.	17 days	**Rs. 4000/-**	
61	**SD 255**	V. Ambili Rekha P.R. Prashant I Naranje Harsha S Eathakota G Srikant Achary P. Devarajan	Area : 180 sq km Bathymetry : 180 L km Sediment sample : Grab - Nil Cores 60 Water Sample stations: 05	246 sq km 287 L km 7 grab samples 65 cores 05 Stations.	22 days	15032	
62	2014-15/MIP/SR/**ST**/2014/**238**	Kalyan Krishna Sandip.B.Kheole Satish Gunasekaran Vairavan R.V. Gobi .R Garvesh Raj Ragnadh babu	Area : 50 sq km Bathymetry: 40 lkm Sea bed samples : 66 Water samples: 3 Environmental parameters: 3	Area : 58 sq km Bathymetry: 70 lkm Sea bed samples : 69 Water samples: 3 Environmental parameters: 3	23 days	**Rs.23,000-**	

63	2014-15/OPWCI/ SR-004	Shri KR Pillai Smt. Saritha VK Shri Durgaprasad P Shri Mohan KG Shri Ramesh PJ Shri Raja Mukhopadhyay Shri Gopakumar B Shri Subhradeep Das Smt Mamatha PK Shri Dhananjay Verma Shri Piyush Kumar Shri Gajanan Dumne Ratnakar Shri Kailash L Vhatkar	Swath Bathymetry ï 3600 sq.km SBP ï 360 lkm Gravimetric profile ï 360 lkm Magnetic profile ï 360 lkm Sediment samples (i) Grab ï 9 (ii) Piston cores - 2	Swath Bathymetry ï 1655 sq.km SBP - 350 lkm Gravimetric profile - 350 Magnetic profile ï 325 lkm Sediment samples **(i)** Grab ï 9 **(ii)** Piston cores - 2	19 days	Rs. 40,000/-	
64	2014-15/MME/SR/008	Smt VV Sugatha Shri Sivasamy A Shri Vijayarajulu H Shri CV Gopalan Smt Samgna S Shri Sarath LG Smt Bhadra Kumary SR Smt Anju PV Shri Katari Murali Dr. P Devarajan Shri Vijedurga Raju	Area-16000 sq.km Sediment samples ï 16G/PC SBP ï 1800 lkm Gravity Survey ï 1800 lkm MBES Survey ï Nil Surface water sample ï Nil Onboard core analysis by core scanner - Nil	Area-16,000 sq.km Sediment samples: (i) Spade core ï 9 Nos. (ii) Grab ï 7 Nos. SBP ï 2214 lkm Gravity Survey ï 2214 lkm MBES survey ï 850 sq.km Surface water sample ï 3 Nos. Onboard core analysis by core scanner ï 8 SC	30 days	Rs. 40,000/-	
65	2014-15/ENV/SR/OPEC-II MCSD/2013/108	Dr.V.Balachandrudu Shri Satish Gunasekaran Shri. M. R. Arivarasan Shri V.Jagannadhan Shri PVVR Sarma	Sea bed samples: 160 Water samples: 32 Beach Profiling: 32 stations Littoral drift: 16 stations	Sea bed samples: 40 Water samples: 9 Beach Profiling: 9 stations Littoral drift: 4 stations	4 days	**Rs. 30,000/-**	

66	2014-15/MGS/SR/M&CSD OpWC-1/SR/2014/005 (Item no. 059)	Dr. Renjith, ML Shri. Arun, SK Shri. Kailash Singh Smt. Rekha, PR Kum. Vidya, S Shri. Suhbradeep Das Smt. Reshma A Shri. Rajasekar R. Shri. Kishore K Shri. Jayamurugan K. Shri. Vijesh, A	Swath bathymetry-16000 sq.km Bathymetry ï 2000 lkm Sub bottom profiling ï 2000 lkm Gravimetric profile ï 2000 lkm	Swath bathymetry - 30852 sq.km Bathymetry - 3975 lkm Sub bottom profiling ï 3975 lkm Gravimetric profile ï 4100 lkm	30 days	Nil	
67	2014-15/MGR/SR/SD/2014/256	Shri. Manoj Kumar Singh Shri. Debanshu Banerjee Dr. JM Neelakantarama Shri. TK Ghose Smt. Rachana Pillai Smt. Anju PV Shri. Kailash L Vhatkar	Area ï 300 sq. km Shallow seismic ï 650 lkm Magnetic ï 215 lkm / 60 sq.km Bathymetry ï 865 lkm Sediment samples (VC) ï 30 location	Area ï 385 sq.km Shallow seismic ï 701 lkm Magnetic ï 225 lkm / 135 sq. km Bathymetry ï 926 lkm Sediment samples (VC) ï 33 location	24 days	16538/-	
68	Item No. 080 (2014-15/MGR/SR/M&CSD/2014/080)	Shri. KG Mohan Shri. Suhbradeep Das Smt. Ashalatha CP Smt. Reshma A	Beach profiling ï 5 Beach Samples - 22	Beach profiling ï 5 Beach Samples - 22	4 days	20,000/-	
69	2014-15/ENV/SR/OPEC-II MCSD/2013/108	Dr.V.Balachandrudu Shri Satish Gunasekaran Shri. M. R. Arivarasan Shri V.Jagannadhan Shri PVVR Sarma	Sea bed samples: 160 Water samples: 32 Beach Profiling: 32 stations Littoral drift: 16 stations	Sea bed samples: 123 + 24* Water samples: 27 + 5* Beach Profiling: 25 +5* Littoral drift: 14 stations *ôat visakhapatnam	9 days	Rs. 29458/-	

70	2014-15/MGR /SR/M&CSD/Op WC-1/SR /2014 /007	Sri Subhankar Dutta Sri P. Ramachandra Rao Dr.Ramesh Singh Dr.V.Balachandradu Sri Anupam Bara Sri Satish Gunasekharan Smt Titir Mukherjee Kum Chinmayee Satpathy Sri Gobi R. Sri V.Jeganathan Sri M.R.Arivarasan Sri S.K.Panda Sri P.Raghunadh babu	Area: 25,500 Sq km Swath Bathymetry: 25500 Sqkm Gravity Survey: 1800 lkm Sub bottom profiling: nil	Area:32834 Sq.Km Swath Bathymetry 32834 Sq.km Gravity Survey: 4170 lkm Sub bottom profiling :4170 lkm	30 days	38025/-	
71	**Item No. 083**	Harsha Sundar E Nisha. N. V P. Devarajan Rohit Kumar Selvasundaram S. Ashwini Kumar Sahoo	Area : 16 sq km Bathymetry : 80 lkm Sediment Samples : 36 Grab samples	18 sq. km. 105 line km. 36Grab samples+ 15beach samples	15 days	25078	
72	SR-005 *(*2014-15/MGS/SR/M&CSD/OpWC-1/SR/2014/005	Dr. Renjith M.L. Shri. Arun S.K. Shri. Kailash Singh Smt. Rekha P.R. Kum. Vidya S. Shri. Suhbradeep Das Smt. Reshma A. Shri. Rajasekar R. Shri. Kishore K Shri. Jayamurugan K. Shri. Vijesh A.	Swath bathymetry -16000 sq.km Sub bottom profiling -2000 line km Gravimetric profile -2000 line km Magnetic profile -2000 line km Seabed sampling -66G/PC Water sample/CTD -5 stations Deployment of ROV-At suitable places	Swath bathymetry - 30852sq.km Sub bottom profiling -3975 line km Gravimetric profile -~4100 line km Magnetic profile - Not recorded Seabed sampling - Not collected Water sample/CTD - Not collected Deployment of ROV-Notdeployed	26 days		

73	SD-256(2014-2015/MGR/SR/SD/2014/256)	Shri. Manoj Kumar Singh Shri. Debanshu Banerjee Dr. JM Neelakantarama Shri. TK Ghosh Smt. Rachna Pillai Smt. Anju PV Shri. Kailash L Vhatkar	Area ï 300 sq. km Shallow seismic ï 650 lkm Magnetic ï 215 lkm / 60 sq.km Bathymetry ï 865 lkm Sediment samples (VC) ï 30 location	Area ï 385 sq.km Shallow seismic ï 701 lkm Magnetic ï 225 lkm / 135 sq. km Bathymetry ï 926 lkm Sediment samples (VC) ï 33 location	24 days	16538/-	
74	SD-257 (2014-2015/MGS/SR/SD/2014/257)	Shri.P. C. Das Shri.D. Banerjee Shri.P. Durga Prasad Shri.Piyush Kumar Shri.Gajanan D. Shri.Ratnakar K. Ganesh Shri.P. Prem Kumar	Area coverage -700 sq. km Shallow seismic -230 lkm Bathymetric -230 lkm Magnetic -230 lkm Grab & Gravity corer samples ï 39G & 16 GC Water sample -12nos from 6 stns Samples for gas ï 10 nos. chromatography	Area coverage -774 sq. km Shallow seismic -246 lkm Bathymetric -246 lkm Magnetic -236 lkm Grab & Gravity corer samples ï 40 G &17 GC Water sample -12nos from 6 stns Samples for gas ï 11 nos. chromatography	24 days	15000/-	
75	SD-261 (2014-15/MME/SR/M&CSD/SD/2014/261	Dr. A. Anil Kumar Shri. R.K. Mishra Smt. S. Beena Shri. Srikant Achary G Shri. Jayamurugan K Shri. Prawal Kumar. Ms. Priya P.Goswami Ms. Selva Rathika K Shri. Rohit Kumar Shri. Selvasundaram S Shri. Ashwini Kumar Sahoo	Area-225 Sq. km. Bathymetry-180 lkm Sediment samples-40 VC & 40 grab	Area-225 Sq. km. Bathymetry-207lkm Sediment samples- Grab - 78 Samples Vibro Core - 10 Samples	23 days	15,000/-	
76	Item No 074 (2014-15/ ENV/SR/Op:WC-I M&CSD/2014 /074	Shri.C.V.Gopalan Shri.K.G.Mohan Shri Vijesh A	20 offshore samples 60 onshore samples	20 offshore samples 60 onshore samples 05 water samples	4days	Rs. 20,000/-	

77	Item No. 080 (2014-15/MGR/SR/Op:WC-I M&CSD/2014 /080:	Shri.K.G.Mohan. , Shri.Subhradeep Das, Shri. S. Ravisekhar, Shri.U.Rohitaksha.,	5 locations (L1-L5) 40 offshore samples 50 lkm	5 locations (L1-L5) 41 offshore samples 60 lkm 21 onshore samples	6days	Rs. 70,000/-	
78	Item No. 082 (2014-15/RP/SR/ Op:WC-I/ M&CSD/2014/082)	Dr.A.Anil Kumar Shri S Ravishekhar Shri U.Rohitaksha	40 collection of samples from coastal sedimentary units/ estuaries	42 sediment samples and 13 water samples from 11 estuaries 10 geologic sections with country rock, laterite and lithomarge	7 days	Rs. 5000/-	
79	Item No. 089 (2013-15/ RP/SR/ Op:WC-I M&CSD/2015 /089):	Shri. Kailash L Vhatkar Shri Kishore K Shri S Ravisekhar Shri U.Rohitaksha	24 lkm (32 sq.km) 24 offshore samples 14 onshore samples	24 lkm (32 sq.km) 24 offshore samples 14 onshore samples	04days	Rs. 20434/-	
80	Item No 090 (2013-15/RP/ SR/Op:WC-I M&CSD/2015 /090)	Shri.Sarath L.G. Smt.Anupama L.C. Shri.Kishore K	24 lkm (32 sq.km) 24 offshore samples 14 onshore samples	24 lkm (32 sq.km) 20 offshore samples 21 onshore samples	05 days	Rs. 44,868/-	
81	2013-14/ MGS / SR / ST / 2012 / 230	Shri A.Katari Kalyan Krishna Sandip.B.Kheole Satish Gunasekaran S Kr Panda Gobi R A S Rawat T Bhattacharjee	Area: 50 Sq Km Seabed samples: 66 Nos Water samples: 03 Stations Current: 03 Stations	Area: 50 Sq Km Seabed samples: 66 Nos Water samples: 03 Stations Current: 03 Stations	23 days	Rs.6000/-	
82	2014 -15 / MGR / SR / ST / 2014 / 242	D. Chakravarthi Dr.Ramesh Singh Shri.P.V.V.R Sarma Shri N.C.Sahoo Shri.R.V Vairavan Shri.Sandip Kheole Shri.Garvesh Raj Sahel.M.P Rajaneesh Narayan P.R	Bathymetry: 492 lkm Magnetic: 492 lkm Shallow seismic : 492 lkm Seabed samples: 10 Marine sediment: 200 kg	Bathymetry : 426 lkm Magnetic : 426 lkm Shallow seismic : 387 lkm Seabed samples : 10 Marine sediment : 250 kg	23 days	Rs.23,700 /-	

83	2014-2015 / MGS / SR / ST / 2014 / 237	Shri G. Nagendran Shri Md. Sabir Pathan Shri. Anupam Bara Shri. Ghosh T. K. Ms. Shaikh Nilofer Husain Basha Ms. N. Madhupriya Shri Murali Katari Shri Vijedurga Raju Ms. S. Krithika Shri P. V. Raghunadh Babu	Area: 1000 sq. km Bathymetry: 300 lkm Magnetic Survey:300 lkm Shallow seismic survey: 300 lkm Seabed sample: 100 VC/GC/Grab Water sample 5 stns.: At 2 levels each	Area: 1017 sq. km Bathymetry: 708 lkm Magnetic Survey:104 lkm Shallow seismic survey: 302 lkm Seabed sample: 133 which includes 8 VC; 70 Grabs & 55 GC Water sample: 5 stns. At 2 levels each	28 days	Rs.29,000 /-	

MISSION - II									
Sl. No.	**FSP Item no.**	**Name of the field officer**	**Nature of work**	**Target**	**Achievement**	**Field Days**	**Total Expenditure**	**Per day expenditure**	**Remarks**
84	ME/SR/AP/2014/053	Rohit V,.Gajbhiye	Aerial Rec & PGRS	300	400	126	Rs. 222145/-	Rs. 896/-	
			LSM	100	100				
			DM	1.0	1.0				
		Madhusudan D G	Pitting&Trenching	50	55	122			
			PTS	50	57				
			Geophysical Survey		-				
			(IP & SP) (L.Km)	40	41				
			SSS	30	30				
			BRS/SS	150	144				
			PS	20	20				
			PCS	15	15				
			Ore microscopy	10	10				
			SEM-EDX	10	-				
			EPMA	05	-				
			FI	3	3				
			Chemical Anal.	230	125				
85	ME/SR/AP/2013/038	Praveek Pankaj	Aerial Rec & PGRS	720	720	113	Rs. 268839/-	Rs.1111/-	
			REC	720	515				
			DM	0.5	0.5				
			SSS	150	151				
			HMS	150	151				
			PS	5	8				
			PCS	5	7				
		Alok Kumar	SEM	10	-	129			
			XRD	10	13				
			EPMA	A.N	71, 5 thin sec.				
			Chemical Analysis	A.N	7				
86	ME/SR/AP/2014/054	Suhel Ahmed	Aerial Rec & PGRS	720	720	112	Rs. 256164/-	Rs.1021/-	
			REC	720	720				
		Sufija MV	SSS	150	150	112			
			HMS	150	150				
			PS	5	37				
			PCS	5	16				
		S.Ravi,Suptdg Geologist	SEM	5	-	27			
			XRD	5	-				
			EPMA	A.N	148				
			Chemical Analysis	A.N	-				

87	ME/SR/AP/2012/049 **{Extended item of FS 2013-14}**	Suhel Ahmed (PT) Sufija MV (PT) S.Ravi,Suptdg Geologist	Aerial Rec & PGRS REC Auger Drilling SSS HMS Petrographic Samples PCS SEM XRD EPMA Chemical Analysis	- 90 200 150 150 AN AN AN AN A.N A.N	90 90 200 152 152 34 15 - 01 166 -	49 48 5	Rs. 96561	Rs.947/-	
88	ME/SR/AP/2013/039	Shraddha Nannaware Subhangi Bhilkar	Aerial Rec & PGRS LSM D.M. PT PTS BRS SSS Petrographic Samples PCS OM EPMA Chemical Analysis	-- 100 0.5 50 50 150 50 25 20 20 20 250	- 100 0.5 70 70 165 50 25 20 20 20 -	121 125	Rs. 409335/-	Rs.1664/-	
89	ME/SR/AP/2014/55	Dr Vikash Tripathy Deepak kumar Rai	Aerial Rec & PGRS DM (sq.km) PT (cu.m.) PTS (Nos.) Drilling (m) (Unit 449) CS (nos.) GP :BHLOG BRS PS PCS ORM XRD EPMA Chemical analysis	AN 1.0 50 50 1000 200 1000 100 15 15 15 15 5 30	50 Sq km 1.0 52 61 - - - 100 15 15 15 15 05 -	95 99	Rs. 190845/-	Rs. 984/-	
90	ME/SR/AP/2014/56	Bhaskar jyoti Gogoi S.B Chavan	Aerial Rec & PGRS LSM PT (cu.m.) PTS (Nos.) BRS Geophysical Surveys (lkm) IP, SP & Resistivity PS PCS Chemical Analysis	400 100 50 50 150 40 10 10 200	400 110 23 30 150 40.4+40.4 12 14 215	123 83	Rs. 233999/-	Rs. 1136/-	

91	ME/SR/AP/2014/057	Nilmadhob Sinha Praseetha S	LSM DRILLING (m) CS(m) GP : BHLOG (m) PS PCS ORM SEM-EDX EPMA Sulphur Isotope Studies FI Chemical Analysis	50 1600 160 1600 25 25 25 25 25 5 10 160	52 864.60 28 - 17 13 3 5 5 - - 20	132 124	Rs. 189601/-	Rs. 741/-	
92	ME/SR/AP/2014/058	N.Nandhagopal (PT) R.K.Gupta	Aerial Rec & PGRS LSM PT (cu.m.) PTS (Nos.) BRS PS PCS ORM Ore beneficiation Chemical Analysis	100 100 50 50 150 20 20 20 5 200	100 100 50 50 150 20 20 20 05 200	44 121	Rs. 309447/-	Rs.1875/-	
93	ME/SR/AP/2014/059	B.J.Barman G.Ramachandran	Aerial Rec & PGRS LSM PT (cu.m.) PTS (Nos.) BRS PS PCS Ore Beneficiation Study ORM Chemical Analysis	500 100 50 50 150 20 20 5 10 200	500 100 50 50 150 20 20 5 10 200	107 115	Rs. 235419/-	Rs.1060/-	

94	ME/SR/AP/2014/060	M.Thirumurugan Md.Zuhaib Siddiqui	DM (sq.km) PT (cu.m.) PTS (Nos.) Drilling (m) (Unit 449) CS (nos.) BRS PS PCS ORM Chemical analysis	1.0 50 50 1000 200 150 10 20 10 400	1.10 70 65 1107.25 201 150 10 20 12 386	135 147	Rs. 449726/-	Rs.1595/-	
95	ME/SR/AP/2014/061	S.Bhattacharjee. Suptdg.Geologist (PT) K.J.Mishra	Aerial Rec & PGRS LSM PT (cu.m.) PTS (Nos.) BRS SS PS PCS EPMA Chemical analysis	720 100 50 50 100 50 15 15 10 200	720 110 50 50 101 50 20 20 10 221	25 141	Rs 270952/-	Rs. 1632/-	
96	SER/SR/AP/2014/004	Praveer Panjak(PT)				12	Rs. 7940/-		*wages and electricity bill is being paid by FTC, Vajrajarur from Apr, 2014
97	ME/SR/NEnR/2014/082	S.Sarkar (PT) Amit Devidas Bhimte	Reconn. Survey LSM PS CPS One scout borehole GBL CS RA Updating of Coalfield Maps	300 25 20 If available 800 800 1 1 scout Borehole AN	300 25 25 2 799 799 2(0.70meach) - -	13 128	Rs 178622/-	Rs. 1267/-	
98	ME/SR/NEnR/2014/083	Sujeet Kumar Dwivedi Priyanka Tripathi	Reconn. Survey LSM PS CPS	300 25 20 4	300 25 33 -	123 113	Rs. 191801/-	Rs 813/-	

99	ME/SR/NEnR/2013/055	S.Rajesh (PT) Sonali Rath	Drilling (m) GBL (m) CS (sq.km) LSM(sq.km) GP:BHLOG(m) CPS Updating of Coalfield Map(sq.km) RA	2600 2600 40 3 2600 3 3 AN	2125.15 2125.15 111.60 6 1716 5 6.5 5.5 -	57 112	Rs. 192480/-	Rs. 1153/-	
100	ME/SR/NEnR/2014/084	Rajesh S (PT) Bhushan Kuthe Dadaji	Reconn.Mapping LSM PS Drilling GBL GP:BHLOG CS CPS RA	300 25 20 1300 2 1200 20 4 2	300 25 20 646.00 646.00 - 19.124 4 -	24 115	Rs. 172794/-	Rs. 1243/-	
101	ME/SR/NEnR/2014/085	S.Sarkar (PT) D.Barman	LSM CPS PS	100 10 5	100 - 13	7 123	Rs. 171704/-	Rs. 1320/-	
102	ME/SR/AP/2014/053.	M. Mohan Babu, V G Rajesh D. Vijayakumar	40 L.Km Magnetic IP Resistivity	41.0 L.km 40	Line Km covered by detailed Geophysical Surveys: 41.0 L.km Samples: 40 nos	123 122 131	Rs. 4,24,795/-	Rs. 3242/-	
103	ME/SR/AP/2014/056.	P. Diwakar Reddy B. Ashish Giridhar S. Mahinder	40 L.km M agnetic IP Resistivity	40.4Lkm	Line Km covered by detailed Geophysical Surveys: SP 40.4L.km IP & Res: Samples: 76 nos	144 124 51	Rs. 5,29,747/-	Rs.3,678/-	

104	ME/SR/TNP/2014/076.	R. Ananda Reddy (Pt) M. Mohan Babu,(PT) B. Asish Giridhar(PT)	Gravity, Magnetic IP Resistivity (Multi Electrode Dipole Dipole)	08 L.km	Survey Line: 11.45 L.km Gravity obs: 746 Magnetic obs: 1540 IP obs: 520 Resistivity obs: 520 Samples 40	23 18 18	Rs. 85,681/-	Rs. 3725/-	
105	ME/SR/KG/2014/063	Jitendra Mahanta Anu J Ponnar	Aerial Reconnaissance PGRS (1:50,000) (Sq.km) Geological Survey REC (1:50,000) (Sq.km) Geochemical Survey (nos.) (i)SSS (ii)HMS Petrographic and Mineragraphic studies (nos.) PS PCS EPMA	750 720 150 150 5 5 As necessary	750 720 168 168 5 Nil 10	115 132	Rs. 131396/-	Rs. 492/-	
106	ME/SR/KG/2014/064	S.S Gawade Sibi P.B	Aerial Reconnaissance PGRS (1:50,000) (Sq.km) Geological Survey REC (1:50,000) (Sq.km) Geochemical Survey SSS(nos.) HMS(nos.) Petrographic and Mineragraphic studies (nos.) PS PCS	750 720 150 150 Nil 5	750 720 171 171 5 5	147 143	Rs.144765/-	Rs. 499/-	

			EPMA	5	11				
107	ME/SR/KG/2014/065	Bijay Kumar	1. Geo. Survey LSM (sq km) 1:12,500 scale A. Sub surface exploration Block G i) Drilling m RD (433) ii) CS nos. i) PT (Cu. m.) ii) PTS (Nos.) BRS/ SS 2. Petrographic and Minerographic studies A. Block G PS ORM Chemical Analysis	50 1000 400 150 100 100 15 20 500	50 1094.25 440 162 103 116 15 20 389	173	Rs. 239691-	Rs. 1385/-	
108	ME/SR/KG/2014/066	Ragi Krishna	1 Geological survey DM (sq km)(1:1,000) 2. Technological i) PT (Cu. m.) ii) PTS (Nos.) BRS/ SS 4. Petrographic and mineragraphic studies (nos) ORM Chemical analysis	1.5 100 75 75 10 10 300	1.5 124 111 116 10 7 227	174	Rs. 204022/-	Rs.1173/-	
109	ME/SR/KG/2014/067	Dr. P. Mahadevappa	Geo. Survey DM (sq km)(1:5,000) Technological (RD 429) CS i) PS ii)PT iii)PTS BRS iv)ORM Chemical analysis	1 1000 250 10 100 75 50 20 250	1 1012.30 129 16 135 86 73 20 250	144	Rs. 226741/-	Rs. 1575/-	

110	ME/SR/KG/2014/068	C.D. Mariappa	Geological Survey A: Detailed Mapping (1:1,000)(sq km) B. Technological a) surface exploration i) PT (Cu. m.) ii) PTS 3. Geoche. Survey BRS PS PCS ORM Chemical analysis	1.5 100 100 150 15 10 20 250	1.5 103 100 150 15 10 20 Nil	153	Rs. 251429/-	Rs. 1643/-	
111	ME/SR/KG/2014/069	Nimmy K. C Smitha Joseph	1 Geo. Survey LSM (1:12,500) (sq km) DM (1:1000)(sq km) 2 Technological i) PT (Cu. m.) ii)PTS BRS 3 Petrographic and minerographic studies PS ORM Chemical lysis	50 2 200 150 100 10 20 250	81 2 220 150 106 10 20 256	135 134	Rs. 198309/-	Rs. 737/-	
112	ME/SR/KG/2014/070	Jayesh Chourasia Lekhram Deshmukh	1 Geo. Survey LSM (1:12,500) (sq km) DM (1:1000)(sq km) 2 Technological i) PT (Cu. m.) ii)PTS Geochemical Surveys i) BRS ii)SSS 3. Petrographic and minerographic studies PS PCS OM Chemical Analysis	100 0.5 100 75 75 25 20 20 20 175	100 0.5 101 101 81 25 20 20 20 207	146 146	Rs. 182117/-	Rs. 657/-	

113	ME/SR/KG/2014/071	N.G.Tom Jitendra kumar	1 Geological survey B.DM (sq km)(1:2,000) 2. Technological i) PT (Cu. m.) ii) PTS (Nos.) 3.Geochemical Survey BRS SSS 4. Petrographic and mineragraphic studies(nos) Ore microscopy EPMA Chemical analysis	100 0.5 50 50 50 50 25 10 10 150	100 0.5 76 61 60 50 26 20 10 160	131 113	Rs. 214534/-	Rs. 879/-	
114	ME/SR/KG/2014/072	Athulya Rajan Nijambika M	1. A. Geological Survey LSM (sq km) 1:12,500 scale B.DM (sq km)(1:2,000) 2.Technological (a)Surface exploration i)PT ii)PTS 3. Geochemical survey BRS SSS 4.Petrographic and minerogaraphic studies PS PCS O M	100 0.5 50 50 50 50 20 10 AN	100 0.5 52 42 50 50 22 11 Nil	112 125	Rs. 112235/-	Rs. 474/-	

			Chemical analysis	150	150				
115	ME/SR/KG/2014/073	Laxmi Nandan Deori	1. A. Geological Survey LSM (sq km) 1:12,500 scale B. DM (sq km) (1:2,000) 2.Technological (a) Surface exploration i)PT ii)PTS 3. Geochemical survey BRS SSS 4. Petrographic and minerogaraphic studies PS PCS O M Chemical analysis	100 0.5 50 50 50 20 10 AN 150	100 0.5 50 44 53 20 10 Nil 147	114	Rs. 152412/-	Rs. 617/-	
		Immomeran A.O				133			
116	ME/SR/KG/2014/074	Parsuram Behera	1. A. Geological Survey LSM (sq km) 1:12,500 scale 2. Technological (a) Surface exploration i)PT ii)PTS 3. Geochemical survey BRS SSS 4.Petrographic and minerogaraphic studies PS PCS O M Chemical analysis	50 75 50 50 25 10 5 5 100	50 75 57 65 25 10 7 5 05	122	Rs. 150760	Rs. 1236/-	

117	ME/SR/KG/2014/075	Anupama Hima K Raghunath	1. A. Geological SurveyLSM (sq km) 1:12,500 scale 2. Technological (a)Surface exploration i)PT ii)PTS 3. Geochemical survey BRS 4.Petrographic and minerogaraphic studies PS PCS O M Chemical analysis	100 150 100 100 20 10 10 200	100 178 105 112 20 10 10 217	149 145	Rs. 236942/-	Rs. 806/-	
118	ME/SR/TNP/2012/076	S. Dhanendran Debakant Misra Nishant Kumar	1. Aerial Reconnaissance and PGRS (1:50,000) 2. Technological (a)Surface Exploration (i)LSM (1:12,500) (ii) Trenching/ pitting (cu m) (iii) PTS (nos) (b) Sub surface Exploration (i) Drilling(m) (U-456) (ii) CS (nos) 3. Geophysical survey (i) Gravity, Magnetic, IP)(l km) (ii) B H Logging(m) 4. Petrographic and mineragraphic Studies (nos) a. Petrographic samples b. Petrochemical Samples c. Ore microscopy d. SEM-EDX studies e. EPMA f. Chemical Analysis	As necessary 50 150 25 1000 400 8 1000 25 15 25 25 25 425	- 50 300 55 1009.95 210 8 812.30 25 15 15 25 25 235	91 208 22	Rs. 649278 /-	Rs. 2023/-	

119	ME/SR/TNP/2014/077 (Proposed in lieu of Item No ME/SR/TNP/2014/077)	Shri A. Ranjith	1.Aerial Reconnaissance PGRS (1:50,000) (sq km) 2.Technological Surface Exploration LSM (1: 12, 500) sq km PT (cu m) 3. SMPL (nos.) a) PTS/ BRS (Groove/ chip) 4. Petrographic and mineragraphic studies (nos) PS PCS OM EPMA CHEM-STUDY	100 50 100 200 25 15 15 10 215	100 50 104.24 250 25 15 15 10 215	127	Rs. 201202/-	Rs. 1584/-	
120	ME/REE/SR/TNP/2013/053	Abhishek Agnihotri Vidhya Sivadas	1. Geological Survey (i) LSM (1:12,500) (sq. km) (ii) DM (1:2000) (sq.km) 2. Geochemical survey (i) Groove/bed samples (nos.) 3. Petrographic and mineragraphic studies: (nos.) a. Petrographic samples b. Ore microscopy c. EPMA d. XRD 4. Chemical Analysis (REEs, Th, U, Nb-Ta, Zr, Sn, W, Ni and Cr)	100 0.5 100 20 10 10 10 100	100 0.55 175 51 25 25 13 175	165 151	Rs.359029/-	Rs. 1136/-	
121	ME/SR/TNP/2014/078	D.Boopathi	1. Technological (a)Surface Exploration (i) Trenching/ pitting (cu m) (ii) PTS (nos) (b) Sub surface Exploration	100 40	100 33	154	Rs. 409246/-	Rs.2574/-	

		Pummy Roy	(i) Drilling(m) (U-432) (ii) CS (nos) 2. Geophysical survey (i) B H Logging(m) 3. Petrographic and mineragraphic Studies (nos) a. Petrological samples b. CHEM-STUDY	1000 400 900 20 440	937.55 583 721.55 - 25 525	5			
122	ME/SR/TNP/2014/079	S.B. Viaykumar	Aerial Reconnaissance and PGRS (1:50,000) sq.km a. Surface Exploration 6 LSM (1:12500) sq.km 7 DM (1:100) sq.km b. Subsurface Exploration D(m) (Scout drilling) c. Core SampleSMPL (nos.) a. BRS	150 100 0.5 600 300 25	150 100 0.65 614.85 326 25	166	Rs. 349423/-	Rs. 1344/-	
		Himanshu Ranjan Patra	Petrographic and Mineragraphic Studies* a. PS b. PCS c. ORM d. EPMA f. Chem Study	 15 30 30 30 300	 16 17 30 30 368	94			
123	ME/C/SR/NEnR/2010/035	S.S. Sahoo	Drilling (m) LS (m) GP: BHLOG LPS Trace Element	2000 30 2000 - 2	1936.15 17.15m 1980 4 2	198	Rs. 503411/-	Rs. 2207/-	
124	ME/C/SR/NEnR/2014/086	Sudeshna dey	Drilling (m) LS (m) GP: BHLOG LPS Trace Element	1900 30 1900 2 4	1900.90 30.25 869.00 2 4	30			
125	ME/SR/KRL/2014/080	Ashamol T.L.,	1. 1. PGRS (sq.km) 2. Geological Survey LSM: (1:12,500 scale) (sq.km) 3.Sampling (Nos) a) BRS/Groove	100 100 100	100 100 100	141	Rs. 452643 /-	Rs. 1622/-	
		Dr. Anilkumar Y				138			

			b) SS 4. Technological **(i)** PT **(ii)**SSS 5. Petrographic and mineragraphic studies (nos.) (nos.) (i) PS (ii) PCS (iii)REE (iv) ORM v) EPMA vi)XRD Chemical Analysis (Au by fire assay, Cu, Zn, Pb, Ag, Mo, As)	400 50 25 30 20 20 20 20 10 500	400 50 130 30 20 20 20 20 10 550				
126	ME/SR/KRL/2014/081	Kaushik K Ghosh Abhiram Behera	1. Geological Survey a) LSM: (1:12,500 scale) (sq km) b)DM (1:2000) (sq km) 2. Technological (nos.) (i) PT (cu.m) ii) PTS (nos.) 3.Geochemical Survey (nos.) (i) BRS 4.Petrographic and mineragraphic studies(nos) (a) PS (b) PCS c) REE samples d) ORM e)EPMA f)XRD Chemical analysis	50 1.5 25 25 200 15 15 10 15 10 5 200	32 1.5 41.5 36 201 15 15 12 15 10 5 237	128 125	Rs. 364692 /-	Rs. 1441/-	
127	SER/SR/GP/ /HQ/2014/040	M. Pradeep Kumar V. Vidyasagar (PT)	Borehole logging	AN Carried out GP Logging for PGE, Coal, Lignite, Graphite, Tungsten in SR	No.of Bore Holes Logged: 42 Nos.	103 48	Rs. 2,91,445/-	Rs.2,829/-	

		D. Vijay Kumar, STA (Gp)				23			
Mission : M-IV									
Sl.No.	**FSP Item no.**	**Name of the field officer**	**Nature of work**	**Target**	**Achievement**	**Field days**	**Total Expenditure**	**Per day expenditure**	**Remarks**
128	EG /C / SR / HQ / 2014 / 089	B.Ajaya Kumar (PT) GJS Prasad T Naga Raj	The targets o engineering projects are as per the requirement of the sponsoring projects	nil	Nil	61 57 53	NA	NA	
129	LSM/SR/K&G/2014/094	Ankur Kumar Srivastava (PT)	**1.Pre-field studies** a)Preparation & updating and collation of thematic maps in GIS (1:50000) b)01:50K Geological Map (Source: GSI) c)1:50K Geomorphological map including thrust and lineament maps (Source: GSI) d)DEM, Dem-derived derivatives such as Elevation, Slope, aspect and slope shape maps (Source: SRTM; USGS freely-downloadable 3-Arc data) e)Historic landslide inventory maps as point data with attributes as much as retrievable (Source: Old reports, maps, high-resolution satellite imagery such as IRS P6 LISS IV, large scale aerial photos etc. f)Land use/cover map (Source: Toposheet, IRS P6 LISS IV imagery etc.) g)Drainage maps (Source: Toposheet) h)Collection of data on roads, important locations etc. (Source: Toposheets, IRS P6 LISS IV imagery etc.)	~700 km2 or area of Two (2) SOIôs Topographical map Sheets(48E/15&48E/16) (As the most of the area in these two toposheets are occupied by Arabian Sea,the total land area to be Covered is 700 sq.km.)	100%	91			
			2. Field-based studies a) Rec. Survey (Sq. Km):For field-checking and updating of Thematic geofactors at accessible locations on 1:50,000	350 sq.km	360				

			b) Collection of recent landslide inventory and damage data (Annexure-I)	350 sq. km	360				
			3.Post-field studies & modeling a) GIS- based analysis for determining and fixing site-specific weights and ratings as proposed in revised GSI-SOP 2014 (will be finalised by March 2014). b) Knowledge-based integration using Multi-class Index Overlay method following GSIôs revised SOP 2014 (will be finalised by March 2014) and preparation of GIS-based landslide susceptibility score maps. c) Quantitative validation of landslide susceptibility score maps and classification into qualitative final maps for the stakeholders/ end-users.	~700 km2 or area of Two (2) SOIôs Topographical Map Sheets(48E/15 & 48E/16) (As the most of the area in these two toposheets are occupied by Arabian Sea,the total land area to becovered is 700 sq.km.)	100%				
130	LSM/SR/K&G/2014/095	Sh. Koushik Shukla (PT)	**1.Pre-field studies** a)Preparation & updating and collation of thematic maps in GIS (1:50000) b)01:50K Geological Map (Source: GSI) c)1:50K Geomorphological map including thrust and lineament maps (Source: GSI) d)DEM, Dem-derived derivatives such as Elevation, Slope, aspect and slope shape maps (Source: SRTM; USGS freelydownloadable 3-Arc data) e)Historic landslide inventory maps as point data with attributes as much as retrievable (Source: Old reports, maps, high-resolution satellite imagery such as IRS P6 LISS IV, large scale aerial photos etc., f)Land use/cover map (Source: Toposheet, IRS P6 LISS IV imagery etc.) g)Drainage maps (Source: Toposheet) h)Collection of data on roads, important locations etc. (Source: Toposheets, IRS P6 LISS IV imagery etc.)	~700 km2 or area of Two (2) SOIôs Topographical map Sheets(48E/15&48E/16) (As the most of the area in these two toposheets are occupied by Arabian Sea,the total land area to be Covered is 700 sq.km.)	100%	100%	Officer is deputed to NLSM Uttarakhand item field work not initiated yet	-	-

			2. Field-based studies a) Rec. Survey (Sq. Km):For fieldchecking and updating of Thematic geofactors at accessible locations on 1:50,000	350 sq.km					
			b) Collection of recent landslide inventory and damage data (Annexure-I)	350 sq. km					
			3.Post-field studies & modeling a) GIS- based analysis for determining and fixing site-specific weights and ratings as proposed in revised GSI-SOP 2014 (will be finalised by March 2014). b) Knowledge-based integration using Multi-class Index Overlay method following GSIôs revised SOP 2014 (will be finalised by March 2014) and preparation of GIS-based landslide susceptibility score maps. c) Quantitative validation of landslide susceptibility score maps and classification into qualitative final maps for the stakeholders/ end-users.	~700 km2 or area of Two (2) SOIôs Topographical Map Sheets(48E/15 & 48E/16) (As the most of the area in these two toposheets are occupied by Arabian Sea,the total land area to becovered is 700 sq.km.)					
131	LHZ/SR/KG/2014/028 (Service Item)	Ankur Kumar Srivastava(PT) Kaushik Shukla(PT)	Post disaster studies in Karnataka and Goa.	-	-	-	-		
132	EG/C/SRP/SR/HQ/2014/107R/TNP/2014/090	P.C.D. Mony(Transferred)	-	-	-	5			
		K.Arvind	-	-	-	34			
		S.Chandrasekaran	-	-	-	15			
133	NLSM/SR/TNP/2014/091	P. Srinivasan	1. Preparation & updating and collation of thematic maps in GIS (1:50000) a. 1:50K Geological Map b. 1:50K Geomorphological map including thrust and lineament maps c. DEM, Dem-derived derivatives such as Elevation, Slope, aspect and slope shape Maps. d. Historic landslide inventory maps as point data with attributes as much as retrievable. e. Land use/cover map	350 sq km.	350 350	10	Rs. 149066/-	Rs. 1129/-	-
		Abhishek Kumar (PT)			350	55			
		Rajkumar (PT)			6 nos 350 350	27			

		Souvik Acharya	f. Drainage maps g. Collection of data on roads,important location etc.		50	40			
134	EWS/SR/TNP/2014/092	P. Srinivasan	1. Compilation of existing landslide data on GIS platform. 2 Generation of a database for daily rainfall from different rain gauge stations (at least for last 15 years) 3.Rainfall threshold modeling at different locations 4.Development of threshold based early warning model and operating procedure 5.Implementation of early warning system at different locations 6.Public awareness through CBDMP at different locations 7.Collection of UDS soil samples	As nec. 5 rain gauge stations 2 locations 1 no. As nec. As nec. As nec	7raingauge stations 7	12	Rs. 130755 /-	Rs. 1436/-	
		Abhishek Kumar (PT)				18			
		Rajkumar (PT)				3			
		Souvik Acharya				7			
135	LS/SR/TNP/2014/093	P. Srinivasan	1. Preparation of landslide inventory in GIS by perusal of historical records and field mapping. 2. Preparation of spatial distribution map of landslides on scale 1:50,000/25,000	As necessary. 900 sq.km*	703 l.km & 40 Km^2 131 landslide events inventoried	4			
		Abhishek Kumar (PT)				28			
		Rajkumar (PT)	Within the 900 sq.km area, all the community settlements and road corridors will be covered (in L.Km)			19			
		Souvik Acharya				0			
136	EG/C/SR/KRL/2014/096	Praveen K.R.	1. Vellatooval Small Hydro Electric Project, Idukki District 2. Post construction stage geotechnical investigation of Idukki Arch Dam, Idukki District 3. Preliminary stage geotechnical investigation of Peechad Small Hydro Electric Project, Idukki District			31	Rs. 14498/-	Rs. 207/-	
		Vishnu C.S				33			
		Rakhi Gopal, R				3			
		Sulal N.L				2			
		Jijikumar S				1			
137	LSM/SR/KRL/2014/097	Sachin R.(PT) (Drawn for	1. Compilation of Geological Map (Source: GSI)	1512 sq.km	756sq.km		Rs. 20,2637 /-	-Rs. 1365/-	

		NLSM :Utharakhand)	2. Preparation/Compilation of Geomorphology and lineament map (Source: GSI)	1512sq.km	756 sq.km				
			3. Preparation of Soil Cover Rock outcrop map	1512 sq.km	756 sq.km				
			4. Preparation Soil/Regolith Thickness Map	1512 sq.km	756 sq.km				
			5 Preparation of Slope gradient map	1512 sq.km	756 sq.km				
			6. Preparation of slope aspect map	1512 sq.km	756 sq.km				
			7.Preparation of slope curvature map	1512 sq.km	756 sq.km				
			8.Compilation of Historic landslide data	AN	42 nos.	2			
			9.Collection of recent landslide inventory data	AN	89 nos				
		Rakhi Gopal R.(PT)	10.Preparation of Landslide Incidence map	756 sq.km	756 sq km	73			
		Sulal N.L (PT)	11.Preparation of Land use/cover map			70			
			12.Preparation of Drainage map	1512 sq.km	756 sq.km				
		Amrapali (PT)	13.Preparation of Landslide Susceptibility map	1512 sq.km	756 sq.km	3			
			14.Collection of rain fall data from available rain gauge stations	756sq.km	756 sq. km				
				AN	Nil				
138	LHZ/SR/KRL/SER/2014/029 (Service item)	Sachin R.(PT)	Post disaster studies at Kozhikode District				2	Nil	
		Rakhi Gopal R.(PT)					Nil		
		Sulal N.					2		
139	SEI/SR/HQ/2014/098)	B. M. Shah	1.Compilation of geological, geomorphological, lineament, depth of groundwater maps with required field checks on 1:25,000 scale, including PGRS Division (@**1**) inputs from the study of high resolution satellite data.	150 sq. Km	150sq.km	48	Rs. 201017/-	Rs. 1436/-	
		.B. Lakshminarayanan	2. Drilling 15 boreholes for SPT to determine ôNô values **@3** Mini Drill 424	15 boreholes	15 boreholes completed	92			
			3. Geotechnical analysis of soil samples **@4**	AN	165 SPT Smpl and 23 Bulk soil Smpl				
140	SEI/SR/HQ/2014/098 (Geophysics)	M. Lakshmana,	i) Seismic Site Response Studies ii) Resistivity Soundings (VES):	100	i) Seismic Site Res Studies:	104	Rs. 4,55,519/-	Rs. 4,380/-	
		P. Rajeswar	iii). Seismic Profiles : As		54 Sites	27			

		Reddy V. Periyasamy	necessary	20 20	ii) Resistivity Soundings: - -- iii). Seismic Profiles:--	 89			
141	ME/SR/AP,KAR/2014 (Geophysics)	M. Pradeep Kumar, (PT) B. Ravi Kumar, (PT)	High resolution Gravity,Electro-Magnetic and Magnetic surveys over kimberlite pipes in Narayanpet area and Wajrakarur area, parts of AP and Karnataka in collaboration with DE Beers India Pvt. Ltd,.	High resolution Gravity, EM and Magnetic surveys over 10 Kimberlite pipes in Telangana, AP and Karnataka.		10 18	-	-	
142	183/ENV/SR/RSAS/2014	B.M. Shah (PT) Rimpal Kar (PT)	1. Compilation of geological and geomorphological map of the area. 2. Section measurements and field studies 3. Collection of samples for OSL dating, EPMA, XRF studies and heavy mineral studies. 3a. OSL Dating 3b. Heavy mineral & EPMA Analysis 3c. XRF analysis	50 10 20 20 10 20	50 14 20 20 10 20	7 15	Rs. 51803 /-	Rs. 2115/--	

ANNEXURE-5

PROGRESS & PENDENCY REPORT OF CHEMICAL ANALYSIS OF NGCM SAMPLES

Item	Pak A	Pak B	Pak C	Pak D	Pak E	Pak F	Pak G	Pak H
Machine capacity in the region (nos of samples) per month	400	200	800	300	250	200	500	600
Capacity to analyse in the region (nos of samples) per month	Pak A	Pak B	Pak C	Pak D	Pak E	Pak F	Pak G	Pak H
	400	200	3200	300	250	200	500	600

	Month	Apr 14	May 14	June 14	July 14	Aug 14	Sep 14	Oct 14	Nov 14	Dec 14	Jan 15	Feb 15	Mar 15
Total nos of samples collected/ analysed during the FS 2013-14 & 14-15	Target												
	Collected												
	Submitted to Lab	1094	429+ 311(+)	95 + 28 U	770+12 U	0	440	302	283	1274	1860	1837	2504
	Analyse reported, during the month of-												
	Pak A	638	648	932	643	964	855	131	212	81	161	326	277
	Pak B	376	487	485	581	618	773	800	710	760	672	468	351
	Pak C	0	245	900	948	802	1385	97	0	48	255	428	624
	Pak D	594	0	0	0	0	0	0	0	0	373	25	0
	Pak E	634	669	886	739	774	605	0	0	0	751	524	922
	Pak F	508	404	402	461	414	757	525	672	713	739	744	563
	Pak G	571	512	663	607	504	528	510	437	583	475	553	585
	Pak H	899	441	917	841	1018	818	214	173	240	176	385	271
	Pak I	0	0	0	0	0	0	0	0	0	0	0	0
	Pak J	0	0	57	193	343	151	364	351	447	661	590	332
	Pendency [Up to the end of the month:-]												
	Pak A	3788	3341 + 224(D)	2504	1938	974	163	292	363	1556	3255	4766	6543 + 450(D)
	Pak B	6058	5992	5602	5098	4480	3751	3253	2826	3340	4528	5897	8050
	Pak C	6790	5541 + 1670(D)	4526 + (1005)	3454+ 1043(D)	2396 + 986(D)	467 + 1822(D)	781	1064	1785+ 505(D)	3234+ 274(D)	5071	6916
	Pak D	6790	7211	7306	7383	7383	6930+ 497(D)	6727+ 1002(D)	7010	8284	10144	11981	14485
	Pak E	5358 + S92(D)	5173 + 521(D)	4112 + 1005(D)	3024 + 1043(D)	2520+ 504(D)	742 + 1822(D)	1080	1363	1986+ 651(D)	3572	5409	7254 + 659(D)
	Pak F	5880	5895	5588	5204	4790	4077	3854	3465	4026	5147	6240	8181
	Pak G	4704	4511	3943	3413	2909	2425	2217	2063	2754	4139	5423	7342
	Pak H	3513	3491	2697	1965	927	153	209	319	1353	3037	4489	6722
	Pak I	16373	16799	16894	16971	16971	17015	17317	17600	18874	20734	22571	25075
	Pak J	6790	7211	7249	7133	6790	6683	6621	6553	7380	8579	9826	11998

Dô These samples are diverted to other regions/unit labs of SR and CHQ , Faridabad for Package-D. U Unit cell samples

HIGHLIGHTS: 1. ICPMS is also utilized for the analysis of project samples for REE , trace elements in NGCM water samples & PGE in project samples

FSP WISE ANALYSED AND PENDING STATUS OF NGCM SAMPLES AS ON 31-03-2015

FSP- 2001-2010	**All the samples i.e, 11315 analysed for all the NGCM packages A to I.**

FSP- 2010-12	**All the samples i.e, .3566 analysed for all the NGCM packages A to H, pending samples for package -I is 3460 .**

FSP- 2012-13	**All the samples i.e, .6128 analysed for all the NGCM packages A to H, pending samples for package -I is 6128 .**

FSP- 2013-14	**A XRF**	**B GF-AAS (Au)**	**C F-AAS (Li,Cs)**	**D HG-AAS (As,Sb,Bi)**	**E ISE (F)**	**F GF-AAS (Cd,Ag)**	**G CV-AAS (Hg)**	**H ICPMS**	**I FA-GF-AAS (Pt,Pd)**	**J ICPMS**
Samples Received/generated in the Region	7306	7306	7306	7306	7306	7306	7306	7306	7306	7306
Analysed samples	7306	7306	7306	398	7306	7306	7306	7306	0	3489
Name of lab. Where samples have been Diverted & Results awaited				604 (604-Faridabad)						
Pending Samples	0	0	0	* 6908	0	0	0	0	7306	3817

* INCLUDING DIVERTED SAMPLES

FSP- 2014-15	**A XRF**	**B GF-AAS (Au)**	**C F-AAS (Li,Cs)**	**D HG-AAS (As,Sb,Bi)**	**E ISE (F)**	**F GF-AAS (Cd,Ag)**	**G CV-AAS (Hg)**	**H ICPMS**	**I FA-GF-AAS (Pt,Pd)**	**J ICPMS**
Samples Received/generated in the Region	8181	8181	8181	8181	8181	8181	8181	8181	8181	8181
Analysed samples	1188	131	624	0	193	0	839	1459	0	0
Name of lab. Where samples have been Diverted & Results awaited	450 450-ChQ kolkata		641 (325-Chennai , 316 - Kerala)		734 (325- chennai + 409-Kerala)					
Pending Samples	* 6993	8050	* 7557	8181	* 7988	8181	7342	6722	8181	8181

* INCLUDING DIVERTED SAMPLES

Annexure -6

UNIVERSE ON REGION WISE – MISSION WISE STATUS OF PENDING PROGRESS REPORTS for 2013-14 as on 31.03.2015

REGION	**MISSION-I**						**MISSION-II**	**MISSION-III**	**MISSION-IV**		**TOTAL NO. OF PROGRESS REPORTS PENDING**
Southern Region	**GM**	**STM**	**GCM**	**GPM**	**RSAS**	**MCS**	(including Coal-Lignite)	**Data Integration**	**MULTI-DISP**	**FUNDA-MENTAL (R&D)**	
SRO	-	-	-	-	-	-	-	-	-		-
AP	-	-	-	-		-	-	-	-		-
K & G	-	-	-	-	-	-	-	-	-		-
TN P	-	-	-	-	-	-	2	-	-		2
KERALA	-	-	-	-	-	-	-		-		-
Pendency							**MII: 2**	**MIII: -**	**MIV: -**		**2**

Southern Region – Year wise Status of Pending Progress Reports (all reports as well as mineral investigation & GCM)

Region	Total no. of Progress Reports Pending up to 31.12.2014		1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-12	2012-13	2013-14	Total
SR		All Reports											nil	nil	nil	nil	-
		Only MI											nil	nil	nil	2	2
		Only GCM											nil	nil	nil	nil	-

ANNEXURE – 7

Status of uploading in GSI portal up to 31.03.2015

S. No	Components	Data universe (total vol. of data) in SR Library	Achievement During F.S 2008-09 & 2009-10	Target FS 10/11	Achievement during April 2010-Sept 2010	Achievement during Oct 2010-Dec 2010	Achievement during January 2011-March 2011	Achievement during April 2011 - June2011	Achievement during July 2011 ï Sept 2011	Achievement during Oct 2011 ï Dec 2011	Achievement during Jan 2012 ï Mar 2012	Achievement during April, 2012 ï June, 2012	Achievement during July, 2012 ï Sept, 2012	Achievement during Oct, ô12-Dec, 2012	Achievement during January, 2013 ï March, 2013	Achievement during April to June 2013	Total (Cumulative Achievement) up to June, 2013	Remarks
1	Uploading of legacy FSP and extended abstract (EA)																	
	FSP																	
	Extended Abstract (EA)	25 Years EA (1987-2012)														GSI Rec.vol 148,Pt-5 (Ext-Abst-FS 2013-14) Released 5th &6th February,2015		25Years of EA uploaded (1987-2012)
2	Metadata of unpublished reports	8178	Target Not Quantified 6410			8	8	17	64	40	19	12	Nil	17	-	-	6593	6593 with duplicates in portal
3	Actual unpublished reports post 2004	288	Target Not Quantified Achievement: 83+21=104			8	8	17	29	37	4	0	Nil	33	26	-	266*	Lack of Personnel & infrastructure *4 duplicate reports deleted Net Fig. 203
4	Actual unpublished reports pre 2004	1834*	100	NIL	100	NIL	NIL	NIL	295	403	354	113	154	Nil	Nil	Nil	1519	Keying & uploading of 1634 Reports outsourced in March 2011 *20 duplicate reports deleted

*The figure 1834 is as per records obtained in outsource file: 1 Report/48/PD/SR/2009 of Publication Division, SR.

Annexure-8

Case study from Geological Survey of India, Southern Region Uploaded in GSI Portal

Sl. No.	Mission	Title	Authors
		Mission-1	
1	M-I	Kannegiri Horst, Khammam district, Andhra Pradesh	
2	M-I	Marginal zone along the contact of Eastern Dharwar Craton and Eastern Ghats Granulite Belt	
3	M-I	The Monolith of Lord Buddha : A Type Sample of Granite (S.S.)	
4	M-I	Identification of Geohazard ï prone area by Remote sensing: Shaklespur in Hemavati River Meander, Karnataka	
5	M-I	Occurrence of Anhydrite in Charnockite rocks of Southern Granulite Terrane (SGT) , near Thissur, Kerala	V. Ambli & M.N.Parveen
6	M-I	Quarternary Geological Studies with Special Emphasis on Vocanic Ash and Neotectonism in Gundalakamma River Basin, Guntur and Prakasam Districts, Andhra Pradesh	
7	M-I	A note on the reported occurrence of lava in agriculture fields of Bugga area of Maddikere Mandal of Kurnool district, Andhra Pradesh.	P.Ashok Kumar, Ch. Venkataswara Rao, A. Ramakrishnaiah.
8	M-I	Komatites in Wynad Group in Sultan ï Batheri area of Wynad district, Kerala	K.R.Pillai
9	M-I	Tectonic contact between the granulite and granite ï green stone belt, North eastern part of Tamil Nadu.	P. Rajesh Durai , G. Senthil Kumaran & N. Singaram
11	M-I	Identification of high fluoride zone near Chimmony Dam, Thrissur district of Kerala through geochemical mapping.	R.Sajeev
12	M-I	Identification of high fluoride zone near Perintalmanna, Malappuram district of Kerala through Geochemical Mapping.	R.Sajeev
13	M-I	Oceli from Cretaceous mafic dyke of Attapadi valley, Palakal district, Kerala	Dr. P. Mathew Joseph
14	M-I	First Report of an Archaean Conglomerate Unit from the Attapadi Valley, Palakkad District, Kerala	Dr. P. Mathew Joseph
15	M-IB	Borehole logging and Mise-A-La-Masse surveys in borehole AKT-3, Veligallu greenstone schist belt, Telakonda area, Cuddapah district A.P.	S.L.Singh, M.S.Kumar and Dr.Dinesh Gupta.
		Case studies uploaded from M&CSD.	
16	M- I	Depletion of Heavy Mineral content on Chavara Beach, Kerala	S/Shri U K Ray, SBhattacharyya and G G Vaz
17	M-I	The Changing shoreline during the last 100 years around Periyar River mouth, North of Kochi, Kerala	S/Shir P Praveen Kumar, Satish Kumar, K N Rajarama, Dr L P Singh and Shri V Singaraju
18	M-I	Late Quarternary Century to Millenium Scale Global Climatic Events in the Bay of Bengal	Shri Sanjeev Raghav
19	M-I	Interpretation of Palaeoechological Scenario and Sea level changes with the help of Taphonomy of Benthic Foraminifera	Dr Amitava Lahiri

		Mission-1I	
17	M-II	New find of two Kimberlite Bodies at Turkandoni, Raichur district, Karnataka	
18	M-II	A note on occurrence of magnesite in Moyar Valley , Nilgiri district, Tamil Nadu	S.N.Mariappan, Geologist
19	M-II	A case study on limestone deposit find in Ariyalur and Perambalur districts, Tamil Nadu	E. Ramalingam
20	M-II	Gold anaomaly in Precambrian rocks brought out by NGCM in and around Viyyur area, Thrissur district, Kerala	V.Ambli
21	M-II	Limestone exploration in Vriddhachalam area , Tamil Nadu	K. Raju & V. Chandrasekaran
22	M-II	Lithological associations hosting gold mineralisation in Chitradurga schist belt, Karnataka	Dr. S.P. Venkata Dasu
23	M-II	A concept orientaed approach in establishing the shear zone / load geometry in Harur molybdenum belt.	K. Raju & K. Nagarajan
24	M-II	NW-SE trending anomalous zone of REE in Degree sheet 57E, Andhra Pradesh	S.K.Dash
25	M-II	First report of PGM and gold from chromitites of Hallikereundi, Sindhuhalli-Thaluru belt, Mysore District, Karnataka	M.Mohanty, Setu Rose oseph, K.V.Neena Vaman and M.M. Korakappa
		Mission-1II	
26	M-III	Creation of the Seamless Geological Map of the State Unit of Karnataka and Goa	
		Mission-1V	
28	M-IV	Modification in Layout of Tunnels to suit the Geological Settings in Parsons Valley Powerhouse Project, Nilgiris, Tamil Nadu	
29	M-IV	Failure in Pressure Shaft of Pykara Ultimate Stage H.E. Project, Nilgiris, Tamil Nadu and its remedy.	
30	M-IV	Reactivation of Kallala, 102/800 Slump, Vazhikkadavu Area, Nilambur Taluk, Malappuram District, Kerala	C. Muraleedharan & Dr. P. Soney Kurien
31	M-IV	August 2000 Flood in Hyderabad City ï Causative Factors and Suggestions to avoid Recurrence	
32	M-IV	A note on the recently reported dinosaur nests and eggs from the cretaceous sediments of Sendurai area, Tamil Nadu	
33	M-IV	Vehicular tunnel project of Aizawl city, Mizoram : A Geotechnical Evaluation	R.Pitchai Muthu, Director
34	M-IV	Pykara ultimate stage H.E. project, Nilgiris, Tamilnadu	SU: TNP
35	M-IV	Parsons Valley Powerhouse Project	SU: TNP
36	M-I	Identification of high fluoride zone near Perintalmanna, Malappuram district of Kerala through Geochemical Mapping	R. Sajeev
37	M-IV	Land slide occurrence in Nadukanni ghat section (SH-24) Kerala: GSIôs predictions come true.	P.Sundar Rajan & Dr. K.S.Sajin Kumar.
38	M-IV	The first ever tsunami along the coast Kerala, India, cause and effect.	Dr. P. Mathew Joseph
39	M-IV	The Changing Shoreline During The Last Hundred Years Around Periyar River Mouth, North Of Kochi, Kerala.	
40	M-IV	First report of Quaternary Tephra in the alluvial sediments of Penner River basin in Karnataka	Vinod Kumar and M. Keshava Rao
41	M-IV	Awareness workshop on Landslide and Climatic change	SU: Kerala

Misscellaneous			
40		A note on DGôs visit to proposed Geopark at Varkala, Thiruvananthapuram	SU: Kerala
41		Visit of Shri Harbans Singh, Director General, GSI to Varkala Cliff, Kerala	SU: Kerala
42		Inauguration of Engineering Geology and Landslide Division at SU: Kerala, GSI, Thiruvananthapuram	SU: Kerala
43		Vigilance Awareness Week, 2014 ñCombating corruption - Technology as an enablerò	SU: Kerala
44		Celebration of Hindi Pakhwada	SU: Kerala
45		Swacch Bharat Abhiyan	SU: Kerala

Annexure-9

LIST OF PUBLICATIONS BROUGHT OUT IN LAST FIVE YEARS

Sl. No.	Title of Publication	Periodicity of Publication	When last Published (Date)	Whether Available	
				Soft Copy	Hard Copy
1.	G.S.I., S.R. News, Vol.24 (No. 1 & 2)	Annual	June, 2007	No	Yes
2.	Quaternary Geology and Geomarphology of Coastal Plain of Kerala (Spl.Pub.No.88)	Not Specified	2007	No	Yes
3.	Records Vol.140, Pt.5 (Ext.Abst. for F.S. 2005-06)	Annual	2008	No	Yes
4.	Misc Publication No. 30, Pt.VIII (A.P.) in (Telugu)	Not Specified	2008	No	Yes
5.	Records Vol.141, Pt.5 (Ext.Abst. for F.S. 2006-07)	Annual	2009	No	Yes
6.	G.S.I., S.R. News, Vol.25 & 26	Annual	November, 2009	Yes	Yes
7.	Records vol.142, Pt.5 (Ext.Abst. for F.S.2007-08)	Annual	July, 2010	Yes	Yes
8.	Misc.Publication No.30, Pt.VI (TNP) (Tamil)	Not Specified	26.11.2010	No	Yes
9.	Quaternary Geology and Geomorphology of the Interior valleys and coastal tracts of Andhra Pradesh (Memoir G.S.I., Vol.133)	Not Specified	31.08.2010	Yes	Yes
10.	G.S.I., S.R. News, Vol.27 (No.1 & 2)	Annual	December, 2010	Yes	Yes
11	Records Vol.143, Pt.5 (Ext.Abst. for F.S.2008-09)	Annual	18.10.2011	Yes	Yes
12	**G.S.I., S.R. News, Vol.28 (No.1 & 2)**	Annual	02.02.2012	Yes	Yes
13	Records Vol.144, Pt.5 (Ext.Abst. for F.S.2009-10)	Annual	31.07.2012	Yes	Yes
14	Records Vol.145 & 146, Pt.5 (Ext.Abstracts for progress reports for F.S.2010-12 of SR)	Annual	28.03.2013	Yes	Yes
15.	Misc. Pub.No.30 Part VII(3rd revised edition) ï Geology and Mineral Resources of Karnataka & Goa	Periodical	05-02-2014	Yes	Yes
16.	Misc.Pub.No.30, Part ï XI(3rd revised edition) ï Geology and Mineral Resources of Kerala	Periodical	05-2-2014	Yes	Yes
17.	Records Vol.147, Pt.5 (Ext.Abst. for F.S.2012-13)	Annual	29-03-2014	Yes	Yes
18.	Misc.Pub.No.30, Part ï VI (3rd revised edition) ï Geology and Mineral Resources of Tamil Nadu & Puducherry.	Periodical	27-06-2014	Yes	Yes
19	G.S.I., S.R. News, Vol.30 (No.1 & 2)	Annual	December, 2014	Yes	Yes
20	Records Vol.147, Pt.5 (Ext.Abst. for F.S.2013-14)	Annual	05-02-2015	Yes	Yes
21	Misc.Pub.No.30, Part ï VIIIA (First edition) ï Geology and Mineral Resources of Tamil Nadu & Puducherry.	Periodical	20-03-2015	yes	Yes
22	Misc.Pub.No.30, Part ï VIIIB (First edition) ï Geology and Mineral Resources of Andhra Pradesh	Periodical	20-03-2015	yes	Yes

Annexure 10

TRAINING PROGRAMS ORGANIZED BY GSI, RTI, SR, HYDERABAD

A. COURSES CONDUCTED BY REGIONAL TRAINING INSTITUTE, GSI TI, Hyderabad:

a) COURSES CONDUCTED: APPROVED FSP 2014-15: 1. 37the OCG course for batch B,E,F 2. Training on Administration, Finance& Vigiliance in GSI for Group A&B officers 3. Refresher course for National Geochemical Mapping 4. Exploration strategy for REE and Rare metals 5. Basic training in Drilling Technology For SCCL 6. A Course on computer Awareness for Groupô Bô ôNon-gazetted and Group ócôMinisterial staff of Southern Region 7. Workshop on UNFC systems 8. Workshop on compiliation of second edition QGM(1:250,000)

b)PROGRAMMES CONDUCTED FOR OTHERS & OUTSIDERS: 1.Guided traverse geological mapping for M.Sc Geology students of Indian school of Mines (ISM), Dhanbad (Wajrakarur& Kothagudem centers) 2. Basic training in Drilling Technology for SCCL 3. Administrative training programme in association with ISTM 4. Workshop on ñ Synergising /Sensitizing Administrative and other support system personnel to newer initiatives/ challenges in GSIò in association with ASCI

A. FTC CHITRADURGA:

Sl.No	Course	Duration	Course conducted / not conducted	Core Faculty (No. and topics of lectures delivered)	Guest Faculty (No. and topics of lectures delivered)
1.	38th Orientation Course for Geologists, Batch ñDò. (23 Nos)	27.12.2014 to 25.01.2015	Completed	**Dr. M.Mohanty, Director.** 1. Dharwar Craton- Geological Setting and Tectonic Evolution. 2. Evolution of Greenstone Belts and their Mineral Potential in Dharwar Craton. 3. Shear Zone Characteristics **K. Raju, Supdt. Geologist.** 1. Planar & Linear Structures **C. Parthasarathi, Supdt. Geologist.** **1.** Geology of Karnataka and Chitradurga Schist Belt in Particular. **2.** Folds- anatomy, geometric classifications and superposition..	**NIL**
2.	Osmania University, Hyderabad. (43 students and 03 teaching staffs).	16.2.2015 to 21.2.2015	Conducted	**Dr. M.Mohanty, Director.** 1. Dharwar Craton- Geological Setting, Tectonic Evolution and their Mineral Potential. 2. Shear Zone Characteristics **K. Raju, Supdt. Geologist.** 1. Planar & Linear Structures **C. Parthasarathi, Supdt. Geologist.** 1. Geology of Chitradurga Schist Belt. 2. Folds- anatomy, classifications & outcrop pattern.	**NIL**
3.	Mysore University, Mysore, (22students and 04 teaching staffs)	01.3.2015 to 07.3.2015	Completed	**Dr. M.Mohanty, Director.** 1. Dharwar Craton- Geological Setting, Tectonic Evolution and their Mineral Potential. 2. Shear Zone Characteristics **C. Parthasarathi, Supdt. Geologist.** 1. Geology of Chitradurga Schist Belt. 2. Folds- anatomy, classifications & outcrop pattern.	**N I L**

B. FTC, Dindigul

Sl. No.	GSITI FSP Item No.	Course	Tentative Schedule (Duration)	Core Faculty (No. of lecture/ session)	Guest Faculty
Courses envisaged for F.S. 2013-14 FTC, Dindigul					
1	36th OCG	Batch C	24.06.2013 to 23.07.2013	2	4
		Batch A	27.08.2013 to 25.09.2013	2	2
	37th OCG	Batch H	24.12.2013 to 22.01.2014	2	
Courses envisaged for F.S. 2014-15 FTC, Dindigul					
1	37th OCG	Batch E	19.06.2014 to 18.07.2014	2	4
		Batch D	24.08.2014 to 22.09.2014	2	4
	38th OCG	Batch D	22.10.2014 to 20.11.2014	2	5

Annexure-11

LIST OF RAC /OAC/STAGE REVIEW/SGPB MEETINGS WITH DATE AND STATUS OF UPLOADING OF MINUTES

REGION/STATE	RAC/OAC/SGPB / STAGE REVIEW	PLACE	DATE OF MEETING	MINUTES STATUS
Southern Region	XII_SR_RAC_12	Hyderabad	17.03.2015	Minutes uploaded
Andhra Pradesh	XII_AP_OAC_12	Hyderabad	16.03.2015	Minutes uploaded
Karnataka & Goa	XII_KG_OAC_12	Bengaluru	13.3.2015	Minutes uploaded
Tamil Nadu & Puducherry	XII_TNP_OAC_12	Chennai	11.3.2015	Minutes uploaded
Kerala	XII_KRL_OAC_12	Thiruvananthapuram	13.3.2015	Minutes uploaded
SU: Andhra Pradesh & HQ Divisions, SR	Stage Review (FS2013-14)	Hyderabad	03.10.2013 & 04.10.2013	Minutes uploaded
SU:Karnataka & Goa	Stage Review (FS2013-14)	Bengaluru	7.10.2013 & 8.10.2013	Minutes uploaded
SU: Tamilnadu & Puducherry	Stage Review (FS2013-14)	Chennai	9.10.2013 & 10.10.2013	Minutes uploaded
SU: Kerala	Stage Review (FS2013-14)	Thiruvananthapuram	11.10.2013	Minutes uploaded
Term Review Meeting of Southern Region(FS 2014-15)	Term Review (FS 2014-15)	Hyderabad	9th & 10th January, 2015	Minutes uploaded
Andhra Pradesh	47th SGPB meeting	Hyderabad	12.12.2013	Minutes received
Karnataka & Goa	48th SGPB meeting	Bengaluru	3.11.2014	Minutes received
Tamil Nadu & Puducherry	56th SGPB meeting	Neyveli	16.2.2012	Minutes received
Kerala	51st SGPB meeting	Thiruvananthapuram	20.09.2014	Minutes received

Annexure-12

EMPLOYMENT POSITION IN THE SOUTHERN REGION AS ON 31st MARCH, 2015

Sanctioned*					**Filled - up in position**					
Grade	**Geology**	**Geophysics**	**Chemistry**	**Engineering**	**Geology**	**Geophysics**	**Chemistry**	**Engineering**	**Mineralogy**	**Administration**
JTS					192	3	4	7	6	3
STS					61	12	12	2	1	3
JAG					26	0	0	0	0	0
SG					33	3	2	4	0	0
SAG					7	0	0	0	0	-
HG					0	0	0	0	0	-
TOTAL					**319**	**18**	**18**	**13**	**7**	**6**
GRAND TOTAL					**381**					

* For Gazzetted officers the sanctioned strength of the Region is available with DDG(Personnel), CHQ, Kolkata.

TOTAL NUMBER OF EMPLOYEES IN GROUP - B,B(NON-GAZETTED), C&D IN GSI, SR

GROUP	**TOTAL NO OF EMPLYOEES (SANCTIONED)**	TOTAL EMPLOYEES IN (FILLED UP POSITION)
Group -B		15
Group-B(NG)	325	180
Gropup-C	412	187
MTS (Erstwhile Group D)	158	119
TOTAL	**895**	**501**

Group B Non-Gaz from the Grade pay 4200 on wards.

Annexure-13

STATEMENT OF RUNNING VEHICLES & Drivers in SRO, GSI as on 31.03.2015							
INCLUDING VEHICLES HANDEDOVER BY RSAS & COAL WING (DRILLING CAMPS & HQ, HYDERABAD)							
Type of Vehicle	**< 25000 km**	**25000 - 50000 km**	**50000 - 1,50,000 km**	**> 1.5 Lakh Km**	**Total**	**Sanctioned strength of Drivers**	**Drivers in position**
Field Vehicles							
Jeeps/ Invader			**20**	**53**	**73**		
Trucks (LCVs/ HCVs)				**16 @**	**16**		
Spl. Vehicles				**1**	**1**		
Head Quarter Vehicles							
Cars/ MUVs			**6**	**6**	**12**		
TOTAL	**0**	**0**	**26**	**59**	**102**	**107 ***	**56****

@ - Out of these 16, 12 are HCVs and of more than 30 years old, but are running due to operational constraints with minimum repairs in Drilling Camps

* - Strength as per the redistribution of Transport Stream based on HPC recommendations
** - Drivers of RSAS, MARINE & COAL WING are not taken into account as per policy

STATEMENT OF RUNNING VEHICLES in SRO, GSI as on 31.03.2015
INCLUDING VEHICLES HANDEDOVER BY RSAS & COAL WING (DRILLING CAMPS & HQ, HYDERABAD)

Type of Vehicle	**< 6 Years**	**6 - 10 Years**	**10 - 15 Years**	**15 - 20 Years**	**> 20 Years**	**Total**	**Remarks**
	Field Vehicles						
Jeeps/ Invader		**8**	**32**	**28**	**5**	**73**	
Trucks (LCVs/ HCVs)			**3**	**1**	**12**	**16**	
Spl Vehicles				**1**		**1**	
	Head Quarter Vehicles						
Cars/ MUVs		**9**	**3**			**12**	
TOTAL	**0**	**17**	**38**	**30**	**17**	**102**	

Annexure-14-I

Previous Year- Under ME Head Pending POs of 2013 – 2014 Carried forwarded to 2014-15

Sl No	PO No Dt	Description of the stores	Firm Name	Amount in Rs.	Present Status
1	59/13 dt. 03.12.2013	Fume Hood- Vizag	M/s Labmate, Chennai	1,03,050-00	Payment Made to the Party
2	40/13 Dt.02-12-2013	Brunton Compass- 70 Nos for SRO	M/s. Brunton Outdoor Group, USA	1,22,634-00	Payment Made to the Party
3	65/13 Dt. 11-03-2014	Exploration of Core Drilling for Coal at Khammam	M/.s APC Drilling Constructions,	34,38,216-00	Payment Made to the Party
4	23/13 Dt.03-10-2013	NW Upset End Drill Rods	M/s. Amco Mining, Mumbai	65,48,850-00	Payment Made to the Party

Annexure-14-II

Purchase orders / Contracts placed by APMD, GSI, SR, HYD for the month of Januaray, February and March 2015

Sl.No	Po. No.	Description of item	Amount	Firm Name	Remarks
1	65/2014 dt 02.01.2015	Outsourcing of DTH Drilling 25 holes	Rs. 98000-00	M/s Siddhi Vinayak Enterprises	Payment Made to he Party
2	66/2014 dt 05.01.2015.	Laboratory hot plates	Rs. 1,41,353-00	M/s Thermal Instruments & Equipments	Payment Made to he party
3	67/2014 dt 06.01.2015.	Pant cloth	Rs. 7865-00	M/s UPICA	Payment Made to he party
4	68/2014 dt 06.01.2015.	Pant and shirt cloth	Rs. 40,154-00	M/s UPICA	Payment Made to he party
5	69/2014 dt 06.01.2015.	Outsourcing of exploratory deep statigraphic	Rs. 99,77,568-00	M/s Central Drilling Associates	Work completed, Bill with Party Bill section.
6	70/2014 dt 27.01.2015.	Table top and cloth	Rs. 9980-00	M/s NCCF	Payment Made to he party
7	71/2014 dt 13.03.2015.	AMC for 20 KVA UPS	Rs. 1,63,659-00	M/s Emerson Network Power (India0 Pvt Ltd	
8	72/2014 dt 17.03.2015.	Drilling of 60m shallow drill holes in Mehaboobnagar Dist,Telangana	Rs. 42,000-00	M/s Siddhi Vinayak Enterprises	Payment made to he party
9	73/2014 dt 25.03.2015.	Water dispenser	Rs. 9,900-00	M/s Shekhar Enterprises	Payment made to he party
10	74/2014 dt 27.03.2015.	HP Colour printer ï 02 Nos	Rs. 63,100-00	M/s Image computers	

Annexure-14-III

M. E - Major Indents & Procurement Status of 2014-15 of all <u>heads as on 31.03.2015. of APMD, GSI, SR, HYD</u>

Sl. No.	Item	Qty	Value	PO/Tender No.	Remarks
1	DGPS with RTK with radio Equipment	1 Unit	1900000		Consolidated by CHQ for purchase
2	20 KVA UPS ï SU: Kerala	1 No	400000		Clarification sought
3	Steel Racks with doors for samples	30 No	700000		File under Sr.TAC
4	AMC for 20KVA UPS Chemical	1 Unit	163659		PO released, AMC from

	Div				March ó2015 to Marõ2016.
5	SEM- Spectro Electron Microscope	1 Unit	12000000		PO Placed, L/C to be Opened
6	EDS ï SEM ï PPOD, Bangalore	1unit	88000000		File transferred to RSAS, Bangalore for Sr. TAC
7	Raman Spectrophotometer- PPOD, Bangalore	1unit	15000000		File transferred to RSAS, Bangalore for Re-tendering
8	UV Spectrometer SU: K &G	1unit	250000		Sr. TAC
9	Out Sourcing Drilling, Deep Lithoraph	1600 Mtr.	15000000		PO placed
10	101mm DT Core Barrels, Accessories	60 Nos.	1505000		Price Bid Opened
12	Magnetometer for Geophysics	02 Nos.	15,00,000		Demonstration stage
13	Online UPS-5KVA with Batteries-12 Nos.-SU:AP	01 No.	1,39,000		PO placed
14	AO Colour Plotter- SU:AP	01 Nos.	4,12,000		Sr. PAC
15	Trinacular Microscope + 4	02 Nos.	25,00,000		Proposal Stage
16	Structural Telescope	06 Sets	9,00,000		Proposal Stage
17	PX Flush Coupled casing	100 Nos.	7,50,000		Price Bid Opened
18	Craelius Flush Joint Casing	300 Nos.	10,50,000		Tender Extened
19	Brunton Compass	30 Nos.	6,00,000		Proposal Stage
20	Steel Almirahs	65 Nos.	4,70,000		Proposal Stage
21	20KVA UPS - Paleontology Div	01 Nos.	7,75000		Sr. TAC Stage
22	15 KVA UPS-MPD	2 Nos.	15,00,000		Under PAC
23	SMF Batteries-M&C	16 Nos.	1,50,000		Sr. TAC
24	Slotted angle racks	23 Nos	1,36,942		Material Recd.
25	Procurement of ICPMS spares	02 Nos	98,825		Funds Awaited
26	Procurement of consumables for petrology division	06 Nos	3,00,000		LPC
27	Procurement of fume hood	03 Nos	5,25,000		Material Recd.
28	Procurement of Magnetic barrier separator	01 No	32,00,000		Quotation Recd., Sr. TAC Stage
29	Procurement of ACs for various division	09 Nos	3,00,000		PAC stage
30	Procurement of hand held UV lamps for petrology division	04 Nos			LPC stage

ANNEXURE – 15A

Pro. Target/Achievement

SL.NO	PROJECT	UNIT NO.	DRILLING (m). ANNUAL TAR /ACHEIVMENT (Apr'13 to Mar'14)	FSP CODE
1	Gold	429	**2000/1882.65 (Assignment completed)**	ME/SR/KG/2013/044
2	Gold	433		ME/SR/KG/2013/044
3	Limestone	431	300/**352.95** (Spillover Drilling 114.90m)	ME/SR/AP/2013/042
4	PGE	432	1000/**1015.05**	MIE/SR/TNP/2012/066
5	PGE	456	1600/**1617.60 + (U-449 Spillover Drilling 53.70m)**	ME/SR/TNP/2012/065
6	PGE	449		ME/SR/TNP/2013/065
7	Lignite	453	1300/**1347.05**	ME/SR/NEnR/2010/035
8	Lignite	470	1300/1110.60	ME/SR/NEnR/2010/035
9	Lignite	471	1300/**1359.90**	ME/SR/NEnR/2010/035
10	Coal	389/494 (495)	1300/**1371.05**	MIE/CW/CW/2010/034
11	Coal	483	1300/906.30	MIE/SR/NEnR/2012/072
12	SPT	424	15BH/**17BH**	SEI/SR/HQ/2012/128

Target / Achievement

Outsourcing DTH drilling (limestone) - 1700/ 1650mtrs

Outsourcing Coal drilling (600mtrs) ï 600/291 mtrs

DETAILS OF DRILLING RIGS AVAILABLE (WITH DEPLOYMENT DURING F.S.2014-15)
Pro. Target/Achievement.

SL.NO	PROJECT	UNIT NO.	DRILLING (m). PRO.TARGET/ACHEIVMENT Q-4 (Jan'15 to Mar'15)	FSP CODE
1	Gold	429	**240/541.20 (1000/1012.30)**	ME/SR/KG/2014/67
2	Gold	433	**240/401.85 (1000/1094.25)**	ME/SR/KG/2014/65
3	Dunite	431	**360/447.65 (600/615.80)**	ME/SR/TNP/2014/079
4	Graphite	432	**240/375.90 (1000/933.75)**	MIE/SR/TNP/2014/078
5	Platinum	456	**240/488.80 (1000/1009.95)**	ME/SR/TNP/2014/076
6	Graphite/Tungsten	449	**240/423.50 (1000/1107.25)**	ME/SR/AP/2014/060
7	Lignite	453	**312/427.65 (1300/1511.95)**	ME/CSR/NEnR/2014/086
8	Lignite	470	**312/516.00 (1300/1537.00)**	ME/CSR/NEnR/2014/086
9	Lignite	471	**312/419.60 (1300/1341.70)**	ME/CSR/NEnR/2014/086
10	Coal	494	**312/390.50 (1300/1179.00)**	ME/SR/NEnR/2013/055
11	Coal	495	**312/242.70 (1300/982.30)**	ME/SR/NEnR/2014/084
12	Coal	483	**312/187.15 (1300/768.35)**	ME/SR/NEnR/2013/055
13	SPT	424	**4BH/10BH (15BH/14BH)**	SEI/SR/HQ/2014/098

ANNEXURE 15B

STATUS OF EXISTING DRILLING AND OTHER HIGH-END (RS. >1 CORE) EQUIPMENTS TO BE PROCURED DURING FY 2014-15

Type of instrument	Indenting Region	Qty	Cost	Lead Time	PAC/ Sr. PAC	DGôs approval & CPMC recommendation	Tendering/ Re-tendering	TEC	TAC	PO Placed	LC opened	Delivery to be or Received	Utility of the Instrument [Mission-wise]
Geophysical [STSS-MI, MII & MIV]													
TOTAL													
Geology [STSS- MI, MII & MIV]													
TOTAL													
FIELD/ SURVEY [STSS ï MI, MII & MIV]													
Drilling	--	--	--										
TOTAL													
GRAND TOTAL						No drilling & other high end (Rs.>1 Crore) equipment proposed to be procured during F.Y. 2013-14.							

ANNEXURE-16

STATUS OF PENDING COURT CASES IN RESPECT OF SOUTHERN REGION OFFICE OF GSI as on 31st MARCH, 2015

Sl. No.	Case ID /Case No.	OA/WP No. & Brief Subject of the case	Region	File/ Reference No. with date	Date of filing	Date of filing reply/ CA	Court at which case to be heard	Petitioner	Party involved	Name of Govt. Counsel	Last date of hearing	Next date of hearing	Current status pending with RO/CHQ	Current status pending with MoM / DoPT if any
1		W.P.No.28603 of 2011, for grant of two ACPs	SRO Hyderabad		17.10.2011	No counter affidavit filed by the party	H.C of AP	UOI & others	K.S.Subba Rao and others	B. Narayana Reddy,ASG	28.08.2013	--	Stay granted in favour of the Department	
2		O.A.No.1177 of 2012, MACP	SRO Hyderabad		23.08.2012	Reply filed	CAT Hyd.	V. Savaraiah & others	Department	G. Jayaprakash Babu, Sr.CGSC	23.08.2013		Reply statement filed, which is under trial	
3		O.A.No.3 of 2012. Grant of temporary status as a casual labour and appointment to the post of MTS	SRO Hyderabad		05.10.2011	24.02.2012	CAT,Hyd.	J. Vishwanatham & others	UOI and 2 others (R)	Shri D. Madhava Reddy, ACGSC	11.09.2013 O.A allowed	----	WP filed before the Hon'ble High Court of AP and awaiting for the grant of stay orders and pursuing the matter vigorously.	
4		W.P.No.21260 of 2014. Temporary Status	SRO Hyderabad		09.07.2014	No counter affidavit filed by the party	H.C Hyd.	UOI & others	J. Vishwanatham and 5 others	B. Narayana Reddy, ASG	10.09.2014	Not yet listed	WP filed by the Dept. before the Hon'ble High Court of AP challenging the CAT order in OA.No.03 of 2012, after admission of the case, till date not listed.	
5		O.A.No.606 of 2013. Grade pay recovery	SRO Hyderabad		20.05.2013	25.04.2014	CAT,Hyd.	M. Ashok, Sr. Hindi Translator	UOI & others	Smt. K. Rajitha, ACGSC	28.10.2014 O.A was disposed. Again the applicant filed the CP No. Of 2015	----	As per the directions of the Hon'ble CAT a reasoned speaking order issued by the DDG,GSI,SR on 21-01-2015 in compliance of the order.	
6		O.A.No.611 of 2012. Promotion to the post of SAO&RAO with retrospective date	SRO Hyderabad		04.06.2012	14.11.2012	CAT,Hyd.	A.S.S.Vadivel Joint Director	UOI & others	Shri G. Jayaprakash Babu, Sr.CGSC	04.06.2012	__	Under trial	
7		O.A.No.1204 of 2012. Compassionate Appointment	SRO Hyderabad		Feb.,11	09.06.2011	CAT,Hyd.	T. Nitesh Singh	UOI & others	Shri K. Siva Reddy, Addl. CGSC	08.08.2014 O.A. allowed	----	WP filed by the Department before the Hon'ble High Court, Hyderabad challenging the CAT order.	

8		O.A.No.1196 of 2012. Retirement Benefits and also for Temporary Status	SRO Hyderabad		July,2012	14.03.2013	CAT,Hyd.	Francis Hazoari MTS(Retd.)	UOI & others	Shri G. Jayaprakash Babu	11.11.2013 O.A. allowed		Implementation of the Hon'ble CAT order was made partially. As far as pensionery benefits concerned, it is linked with SLP.	
9		O.A.No.741 of 2013.Promotion to the post of DDG	SRO Hyderabad		20.06.2013	29.08.2013	CAT,Hyd.	P. Vijay Kumar, Director	UOI & others	Shri G. Jayaprakash Babu, Sr.CGSC	02.12.2013	----	The O.A. order was challenged by office before the Hon'ble High Court of AP and granted stay in favour of the Department.	
10		W.P.No.34101 of 2013. Promotion to the post of DDG	SRO Hyderabad		26.11.2013	----	H.C, A.P,Hyd.	UOI & others	P.Vijaykumar	B. Narayana Reddy, ASG	10.02.2014	----	The Hon'ble High Court of AP granted stay by suspending the operation of Hon'ble CAT order. Stay continued till date.	
11		O.A.No.144 of 2009. Compassionate Appointment	SRO Hyderabad		Jan.,2009	06.05.2009	CAT,Hyd.	C. Prabhakar	UOI & others	Shri G. Jayaprakash Babu, Sr.CGSC	02.07.2014	Not listed	CAC submitted report & speaking order submitted to Tribunal. Awaiting for closure of case.	
12		O.A.No816 of 2013. MACP	SRO Hyderabad		18.04.2013	14.12.2013	CAT,Hyd.	D. Rajeswar Rao, Assistant (Retd.)	UOI & others	Shri G. Jayaprakash Babu, Sr. CGSC	27.08.2013	Not listed	Under Trial	
13		O.A.No.481 of 2014. Extension of suspension period	SRO Hyderabad		Jun.,2014	Reply filed.	CAT,Hyd.	B. Pitchaiah, SK(T)	UOI & others	Dr. K.M.J.D. Syamasundari,ACGSC	01.07.2014	Not yet listed	Under trial.	
14		O.A.No.1255 of 2013. Down grading Superintendent post	SRO Hyderabad		17.10.2013	10.12.2013	CAT,Hyd.	Syed Taquiddin, Assistant and 9 others	UOI & others	Shri D. Madhava Reddy, ACGSC	22-12-2014		Meanwhile, the applicants filed Rejoinder which was received by this office on 27-03-2015, a copy of Rejoinder forwarded to CHQ for parawise comments.	
15		O.A.No.87 of 2014. Down grading Superintendent post	SRO Hyderabad		05.01.2014	24.03.2014	CAT,Hyd.	Smt. Y. Surya Kumari, Assistant	UOI & others	Shri G. Jayaprakash Babu, Sr.CGSC	22-12-2014		Under trial	
16		W.P.No.19422 of 2004. Challenging orders of CAT in O.A.No.980 of 2003	SRO Hyderabad		14.10.2004	No counter affidavit filed by the party	H.C of AP	UOI & others	T.S.Sharma (R) (Director)	B. Narayana Reddy, ASG	Till date not listed	Not listed	Under trial.	
17		W.P.No.19502 of 2004. Challenging orders of CAT in O.A. No.1361 of 2003	SRO Hyderabad		14.10.2004	No counter affidavit filed by the party	H.C of AP	UOI & others	T.S.Sharma (R)	B. Narayana Reddy, ASG	Till date not listed	Not listed	Under Trial	

18		W.P.No.15783 of 2008 in O.A..No.591 of 2005. Up gradation of Pay Scale	SRO Hyderabad		13.07.2008	04.05.2009	H.C of AP	K. Gopal Krishna, STA(Mining) Retd. and others(P)	UOI & others	B. Narayana Reddy, ASG	30.07.2008			
19		W.P.No.17369 of 2008. Promotion	SRO Hyderabad		sep., 08	No counter affidavit filed by the party	H.C of AP	UOI & others	G.R.N.Tagore (R)	B. Narayana Reddy, ASG	14.10.2008			
20		W.P.No.13747 of 2006 Payment of Gratuity	SRO Hyderabad		27.06.2006	No counter affidavit filed by the party	H.C of AP	UOI & others	Raju Varghese (R)	B. Narayana Reddy, ASG	23.07.2007			
21		W.P.No.20329 of 2006. Pay Fixation	SRO Hyderabad		19.09.2006	Jan.,2007	H.C of AP	S.N.Puri, Ex-DDG	UOI & others	B. Narayana Reddy, ASG	09.10.2006			
22		W.P.No.7984 of 2012. Compassionate Appointment	SRO Hyderabad		19.03.2012	24.07.2012	H.C of AP	Smt. M. Shankaramma	UOI & others	B. Narayana Reddy, ASG	22.03.2012			
23		MACMAMP No.6074 of 2009 in MACMA No.3919 of 2009 in OPNo.414 of 2007, Accident Claim	SRO Hyderabad		09.11.2009	No counter affidavit filed by the party	H.C of AP	UOI & others	Smt. Eleti Rajavva	S.S. Varma Sagi, Sr. CGSC	Not yet listed			
24		W.P.No.1022 of 2011. Payment of Gratuity under PG Act 1972	SRO Hyderabad		24.01.2011	April,2011	H.C of AP	Md. Khalid	UOI & others	B. Narayana Reddy, ASG	25.01.2011			
25		W.P.No.29156 of 2012. Compassionate Appointment	SRO Hyderabad		Sep.,12	16.01.2013	H.C of AP	UOI	Syed Ashfaq Ahmed	B. Narayana Reddy, ASG	17.09.2012	----	WP filed against the Hon'ble CAT orders and stay granted in favour of Department	
26		A.S.No.675 of 2012. Land dispute of GSI Land	SRO Hyderabad		13.04.2012	14.07.2014	H.C of AP	Ayesha bee(expired)	UOI & others	B. Narayana Reddy, ASG	Not yet listed	Not listed	Counter affidavit filed, under trial.	
27		O.A.No.649 of 2010. Promotion	SRO Hyderabad		07.08.2009	28.07.2010	CAT	Ala Ramesh	UOI & others	Shri G. Jayaprakash Babu, Sr.CGSC	23.11.2012 O.A allowed	----	The order of the Hon'ble CAT stayed by the High Court of AP	

28		W.P.No.13662 of 2013. UDC Promotion	SRO Hyderabad		26.04.2013	No counter affidavit filed by the party	H.C of AP	UOI & others	Ala Ramesh	B. Narayana Reddy, ASG	30.04.2013	---- -	The WP filed and stay granted in favour of the Department against the orders of O.A.No.649 of 2010. Stay continued.	
29		O.A.No.1452 of 2013. Promotion to the post Assistant	SRO Hyderabad		03.12.2013	04.03.2014	CAT Hyd.	Ala Ramesh	UOI & others	Shri G. Jayaprakash Babu, Sr.CGSC	04.06.2014	Not listed	The Addl. Reply Statement to the Addl. Rejoinder has been filed by the Department. Under trial.	
30		O.A.No.55 of 2010. Promotion to the post of Supdt.	SRO Hyderabad			02.07.2010	CAT Hyd.	D. Raj Kumar	UOI	Shri G. Jayaprakash Babu, Sr.CGSC	Not available		The O.A. challenged by the Department vide WP NO. 21649 of 2011 before the Hon'ble High Court of AP and Stay granted.	
31		W.P.No.21649 of 2011. Promotion to the post of Superintendent	SRO Hyderabad				H.C of AP	UOI	D. Raj Kumar	B. Narayana Reddy, ASG	Not available		The Hon'ble High Court granted Stay on the CAT order in O.A.No.55 of 2010	
32		W.P.No.10904 of 2013. Stoppage of ROC meeting, subscription towards GSIEA	SRO Hyderabad		08.04.2013	30.12.2013	H.C of AP	GSIEA(822) Md. Ghouse and D.Rajkumar	UOI & others	B. Narayana Reddy, ASG	Not yet listed			
33		W.P.No. 30205 of 2014, Compassionate Appointment	SRO Hyderabad		26.09.2014	16.10.2014	H.C of TS & AP	UOI & others	T. Nitesh Singh	B. Narayana Reddy, ASG	15.12.2014			
34		WP No.26936 of 2014, Deposit of salary and family disputes case.	SRO Hyderabad		26.08.2014		H.C of TS & AP	Md. Issaq	UOI & others	B. Narayana Reddy, ASG	12.09.2014			
35		O.A.No.477 of 2014. Grant of MACP for ad-hoc service	SRO Hyderabad		23.04.2014	24.09.2014	CAT	B. Radhakumari	UOI & others	Shri G. Jayaprakash Babu, Sr.CGSC	26-02-2015			
36		O.A.No.1245 of 2014 Transfer Case	SRO Hyderabad		30.10.2014		CAT Hyd.	P. Ajay Kumar, Geophysicist(Sr.)	UOI & others	Shri G. Jayaprakash Babu, Sr. CGSC	30.10.2014 Disposed			
37		O.A.No.662 of 2014. Arrears of family pension	SRO Hyderabad		24.06.2014	10.09.2014	CAT	Smt. Pathuru Penchalamma	UOI & others	Shri G. Jayaprakash Babu, Sr. CGSC	24.06.2014			

38		O.A.No.675 of 2014. Retirement benefits	SRO Hyderabad		08.06.2014	Reply filed	CAT	Shri Jeevan Raj	UOI & others	Shri G. Jayaprakash Babu, Sr.CGSC	26.06.2014			
39		O.A.No. 727 of 2014. Promotion	SRO Hyderabad		17.07.2014	05.09.2014	CAT Hyd.	M.P.Narendra Kumar	UOI & others	Shri D. Madhava Reddy, ACGSC	----	Not yet listed	Reply Statement filed, meanwhile the applicant filed rejoinder, which was received by this office on 26-03-2015, filing of addl. Reply is under process.	
40		O.A.No.778 of 2014(RSAS). Compassionate Appointment.	SRO Hyderabad		10.07.2014	The O.A. disposed of at the admission stage order dt.16-7-14	CAT Hyd.	E. Suresh Kumar	UOI & others	Shri G. Jayaprakash Babu, Sr. CGSC	16.07.2014 Disposed	----	The case was disposed on 16-07-2014. The Department filed M.A. for extension of six months time for implementing the order for considering in CAC.	
41		O.A.No.899 of 2014. Stoppage of reduction of grade pay	SRO Hyderabad		02.08.2014	Reply Statement filed	CAT Hyd.	P. Anil Kumar	UOI & others	Shri Y. Vivekanananda Swamy, ACGSC	07.08.2014Stay granted	----	Reply Statement filed, under trial.	
42		O.A.No.892 of 2014. Promotion and Seniority	SRO Hyderabad		25.07.2014	Reply Statement filed	CAT Hyd.	Vishwanath Debnath	UOI & others	Shri B. Sri Hari, ACGSC	06.08.2014 Status quo	----	Reply Statement filed, under trial.	
43		O.A.No.866 of 2014. Attributing bias in the disciplinary proceedings	RSAS case filed at Hyderabad		July,2014	27.10.2014	CAT Hyd.	D. Raj Kumar, Assistant	UOI & others	Shri P. Laxman Rao, ACGSC	22-01-2015	Stay granted	Reply to the Rejoinder filed.The case came up for hearing on 27-03-2015 and posted to 06-04-2015 for final orders.	
44		O.A.No.912 of 2014. Seniority	SRO Hyderabad		21.06.2014	Reply filed.	CAT Hyd.	G. Vijay Babu	UOI & others	Miss. N.Shakti, ACGSC	11.08.2014	Not listed	Reply Statement filed, under trial.	
45		O.A.No.1012 of 2014, Promotion to the post of Assistant	SRO Hyderabad		03.09.2014	20.09.2014	CAT Hyd.	K. Vijay Bhaskar Reddy	UOI & others	Shri G. Jayaprakash Babu, Sr. CGSC	21-01-2015	Not yet listed	Addl. Rejoinder filed by the applicant. Preparation of Addl. Reply Statement is under process.	
46		O.A.No.1091 of 2014, Disciplinary proceedings	SRO Hyderabad		19.09.2014	Reply filed	CAT, Hyd.	P. Vijaya Kumari	UOI & others	Shri G. Jayaprakash Babu,Sr.CGSC	19.09.2014	Not listed	The reply statement has been filed and not listed till date. Under trial.	
47		O.A.No:1282 of 2014, MACP	SRO Hyderabad		03.11.2014	Filed	CAT, Hyd.	S.K.Jaiswal Assistant	UOI & others	Shri G. Jayaprakash Babu,Sr.CGSC	New Case	-	Reply statement filed, which is under trial	

48		O.A.No:1283 of 2014, MACP	SRO Hyderabad		03.11.2014	Filed	CAT, Hyd.	S.Sukanya Assistant	UOI & others	Shri G. Jayaprakash Babu,Sr.CGSC	New Case	-	Reply statement filed, which is under trial	
50		O.A.No:1285 of 2014, MACP	SRO Hyderabad		03.11.2014	Reply Statement filed	CAT, Hyd.	Ramesh Assistant	UOI & others	ShriNisar Ahmed, Addl.CGSC	New Case	-	Reply Statement filed,which is under trial.	
51		O.A.No:1286 of 2014, MACP	SRO Hyderabad		03.11.2014	Reply Statement filed	CAT, Hyd.	Md.Jaffar Assistant	UOI & others	Shri B. Srihari, Addl.CGSC.,	New Case	-	Reply Statement filed,which is under trial.	
52		O.A.No:1287 of 2014, MACP	SRO Hyderabad		03.11.2014	Reply Statement filed	CAT, Hyd.	K.Girija UDC	UOI & others	Shri P. Lakshmana Rao, Addl.CGSC.,	New Case	-	Reply Statement filed,which is under trial.	
53		O.A.No:1288 of 2014, MACP	SRO Hyderabad		03.11.2014	Reply filed	CAT, Hyd.	M.Satyan arayana Assistant	UOI & others	Dr. K.M.J.D. Syama Sundari, Addl. CGSC.,	New Case	-	Reply Statement filed,which is under trial.	
54		O.A.No:1289 of 2014, MACP	SRO Hyderabad		03.11.2014	Reply Statement filed	CAT, Hyd	G.Victoria Rani Assistant	UOI & others	ShriNisar Ahmed, Addl.CGSC	New Case	-	Reply statement filed, which is under trial	
55		Crl.P No.37 of 2015, Complaint	SRO Hyderabad (RSAS)		20-01-2015	Reply to be filed	High Court, Telangana & Andhra pradesh	D. Rajkumar, Assistant	Shri Rajendra Sharma, DDG(Retd.), RSAS & Domma Prasad	B. Narayana Reddy, ASG	New Case	__	challenging the order dated 15-05-2014 in CCSR No.4247 of 2013 passed by the Hon'ble IInd Metropolitan Magistrate, Cybarabad, L.B.Nagar, Hyderabad on the complaint given by the petitioner. Draft Reply Counter handed over to the ASG for vetting.	
56		O.A.No.230 of 2015. Death Benefits	SRO		17-02-2015	Reply filed	CAT, Hyd.	Smt. Anwari	UOI & others	G. Jayaprakash Babu, Sr.CGSC	17-02-2015		Reply statement filed, meanwhile the applicant filed rejoinder, which was received by this office on 23-03-2015, filing of addl. Reply is under process.	
57		O.A.N o:1121 of 2014, for appointment	SRO Hyderabad		19.09.2014	-	CAT, Hyd	G.Satyana rayana Reddy Contingent worker	UOI & others	Shri G. Jayaprakash Babu,Sr.CGSC	New Case	25.09.14. the O.A. was dispos	The O.A. was disposed at the admission stage. The Department (coal wing) issued speaking order in compliance of the order dated 25-09-2014. The case will be closed shortly.	

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58		O.A.No.307 of 2015, Transfer	SRO Hyderabad		3.3.15	The O.A. copy was received from the Sr.CGSC on 05-03-2015. The Reply Statement to be filed	CAT,Hyd.	Shri P. Ajay Kumar, Geophysicist(Sr.)	UOI & others	Shri G. Jayaprakash Babu, Sr.CGSC	New Case			
CASES PERTAINS TO VISAKHAPATNAM														
59		O.A.No.120 of 2013. To quash the orders of disciplinary actions issued by DDG, Marine Wing	SRO Hyderabad		06.01.2013	13.06.2013	CAT Hyd.	K.S.Jogi Dora Driver Gr.I	UOI & others	Smt. K.Rajitha, ACGSC	23-02-2015			
60		The Labour Enforcement Officer, Vizag. Appln. No.19/A/2014. Minimum wages Act.(M.Thaudamma & K.Mani)	SRO Hyderabad				RLC Hyd.	M.Thaudamma & K.Mani	UOI		Dec.,2014			
CASES PERTAINS TO TAMILNADU														
61		MCOP No.210 of 2003. Accident Compensation	SU: TN & P, Chennai				Sub-court, Kumbakonam	Smt. Kamala & others	UOI				under trial	
62		M.C.OP. No. 686 of 2003. Accident Claim	SU: TN & P, Chennai				District Judge Court, Krishnagiri	Minor Vivekanandan	UOI			01/05/2015	The case presently monitoring by SU:TNP, Chennai, which is under trial.	
63		REP No.38 of 2015 in MCOP No.497 of 2009, Accident Claim	SU:TN &P, Chennai		20-10-2009	Jan.,2010	Motor Accident Tribunal, Sankari, Tamilnadu	Vijay, Baby and Selvaraju	DDG,GSI,SR		Jan.,2014	10.04.2015	The petitioners filed REP No.38 of 2015 in MCOP No.497 of 2009, the case posted to 10-04-2015. A letter along with notice of appearance sent to Shri Arul prakash, Advocate to attend /defend the case on 10-04-2015	
64		O.A.NO.1277 of 2013, Retirement benefits	SU:TN &P, Chennai		July,2013	24-02-2015	CAT, Chenni	Mohd. Khalid Iqbal	UOI & others	S.M.Deenadayalan, ACGSC	20-03-2015		under trial	

CASES PERTAINS TO KARNATAKA													
65		O.A.No.404 of 2009. For NFSG benefits	SU: K&G Bangalore				CAT Bangalore	M.N.Ramachandra Rao	UOI		30-03-2015		The case heard on 30-03-2015 and granted time upto 13-04-2015 for compliance of order.	
66		O.A.No.325 of 2013, Compassionate Appointment	SU:K&G		19-04-2013	19-07-2013	CAT, Bangalore	B.D.Ranatur	UOI & others				The case referred to CAC for its next meeting. It is under process.	
67		O.A.No.289 of 2014, grant of NFSG w.e.f. 01-01-2006	SU:K&G		29-01-2014	—	CAT, Bangalore	R.N.Patra	UOI & others			02/12/2015	Reply to the Rejoinder filed.Under Trial.	
68		O.A.No.238 of 2014, compassionate appointment	SU:K&G		23-01-2014	——	CAT, Bangalore	Smt. K. Pramila	UOI & others				The case referred to CAC for its next meeting. It is under process.	
69		W.P.NO.21130 of 2011, challenging the pension attachment notice issued by SBI, Shillong	SU:K&G		06/10/2011	03/08/2012	High Court, Bangalore	Smt. Nalini Raju	UOI & others				Statement of objection filed by the respondents(GSI). Under trial	
70		MFA No.6340 of 2014, appeal against MACT order.	SU:K&G				High Court of Bangalore	Smt. Amana Bivi	UOI & others				Counter Affidavit filed at Bangalore. Under trial.	
71		O.A.No.923 of 2014, grant of NFSG	SU:K&G		01-01-2006	18-12-2014	CAT, Bangalore	R.N.Patra	UOI & others				Reply statement filed , under trial.	
CASES PERTAINS TO KERALA														
72		O.A.No.283 of 2013. Non Functional Upgradation.	SU: Kerala				CAT Ernakulam	R.Sadasivam Nair & Officers Association	UOI				Under trial	
73		Payment of Gratuity Case No.11 of 2003	SU: Kerala		Filed in 2004	No counter affidavit filed by the party	Asst. Labour Commissioner ©	K.Sadasivan Nair (R)	UOI & others				The case is pending with ALC ©, Thiruvananthapuram	
74		Payment of Gratuity Case No.12 of 2003	SU:Kerala		Filed in 2004	No counter affidavit filed by the party	Asst. Labour Commissioner ©	K.M Gopi (R)	UOI & others				The case is pending with ALC ©, Thiruvananthapuram (* the applicant expired)	

75		A.S.No.111 of 2011 in O.S.No.1537 of 2007. Land dispute on the office premises.	SU:Kerala				District Court, Thiruvananthapuram	Antony	UOI				under trial	
76		O.A.No.351 of 2014. Recruitment to the post of Geologist	SU:Kerala				CAT Ernakulam	Miss. Aparna Sagar	UOI				Offer of appointment order issued and the case will be closed shortly.	
77		W.P.No.(C) No. Of 2014, Tourism Plaza Project	SU:Kerala		08/08/2014	Reply filed	High Court of Ernakulam	Shylan & 5 others	State of Kerala & 7 others		New Case		Reply Statement filed	

CASES PERTAINS TO MANGALORE

Sl.No	Applicants Name and Case Number	Designation of the applicant	Name of Court/ Bench	Brief Details of the cases	Department action (C.A. Filed or not)	Present status of the case/ next date of hearing	Remarks
78	W.P. No. 48656/2013 (GM) GSI	GSI	High Court Bangalore	Two writ petitions have been filed and stay has been obtained from High Court to stop the proceedings of the III Addl. Civil Judge and JFMC, Mangalore DK, Karnataka in execution case No. 45/2000 and order dated 28.6.13 in Misc. No. 52/2010	N.A.	W.P. No. 48656/2013 (GM) filed at the Honôble High Court of Karnataka on 25.10.13. The High Court was pleased to stay further proceedings of the Ex. P 45/2000(W.P. No. 48656/2013 (GM) for a period of 4 weeks effective from 29.10.13 when it came up for hearing and further extended upto 1st week of Januaryô 14. Further hearings are not come up.	Two writ petitions were filed at the Honôble High Court of Karnataka on 25.10.13 and 26.10.13 Pending for admission Next date awaited
79	W.P. 48912/2013 (KLR)	GSI	High Court Bangalore		N.A.	The W.P No. 48912/2013 (KLR filed on 26.10.13) on hearing adjournment to 12.12.13. It is informed that the case didnôt come up for hearing on 12.12.13 in view of a memo submitted by the Sr. Panel Counsel requesting the Honôble High Court for a combined hearing of the both the W.P. No. 48656/2013 (GM) and W.P. No. 48912/2013 (KLR) 7/24/2014 Last hearing	Case pending Next date awaited

80	Christine DôSouza and others Vs LAO and the Assistant Commissioner vide calculation memo in Ex. Case 45/2000	Land owner	In the Addl. Court III Principal Civil Judge, Mangalore.	Department (GSI) paid additional compensation for the land as per the High Court order but the Applicant appealed against the compensation amount paid by the department.	Department has filed MA before Addl. Court III Principal Civil Judge, Mangalore against the calculation memo filed by one of the Land lords and an attachment order issued by the LAO & Assistant Commissioner, D.K.	The case was dismissed on 28.06.2013 and GSI approached Law Ministry, Bangalore for legal opinion and they advised to challenge the lower court order in high court and recommended one Sr.Panel Counsel and one Central Govt.Counsel to file appeal in high court. Awaited verdict of the high court, Bangalore for WP48656/ 2013	Two writ petitions have been filed and stay has been obtained from High Court to stop the proceedings of lower court. Two writ petitions were filed at the Honôble High Court of Karnataka on 25.10.13 and 26.10.13 1.The High Court was pleased to stay further proceedings of the Ex. P 45/2000(W.P. No. 48656/2013 (GM) for a period of 4 weeks effective from 29.10.13 when it came up for hearing and further extended upto 1st week of Januaryô14 2.The W.P No. 48912/2013 (KIR) on hearing adjournment to 12.12.13. It is informed that the case didnôt come up for hearing on 12.12.13 in view of a memo submitted by the Sr. Panel Counsel requesting the Honôble High Court for a combined hearing of the both the W.P. No. 48656/2013 (GM) and W.P. No. 48912/2013 (KLR)
81	Christine DôSouza and others Vs LAO and the Assistant Commissioner vide calculation memo in Ex. Case 52/2000	Land owner	In the Addl. Court III Principal Civil Judge, Mangalore.	Department paid additional compensation as per the final decree but the Applicant appealed against the compensation amount paid by the department.	Department has filed MA before Addl. Court III Principal Civil Judge, Mangalore against the calculation memo filed by one of the Land lords and an attachment order issued by the LAO & Assistant Commissioner, D.K.	The case was dismissed on 28.06.2013.	Two writ petitions have been filed and a stay has been obtained.
82	Land acquisition Officer & Fredrick Noronha & LRS and others. LAC-53/87.	Land owner	In the Principal Civil Judge, Mangalore	Department paid additional compensation as per the final decree but the Applicant appealed against the compensation amount paid by	Department has filed MA before Addl. Court III Principal Civil Judge, Mangalore against the calculation	The next date of hiring is posted on 28th June 2013. Respondents have filed objections against the MA before Honôble Civil Court, Mangalore	The Ldô Advocate has conducted conference with Dy. DG, M&CS, GSI, Mangalore and Nodal officer (Legal) at

				the department.	memo filed by one of the Land lords and an attachment order issued by the LAO & Assistant Commissioner, D.K.		different occasions. He has been asked to defend the departmentôs stand firmly.
83	Tahasildar Assistant Commissioner & LAO and Deputy Commissioner, Mangalore	LAO & State Government	Civil Judge & JMFC Mangalore	Action Notice against Tahasildar, Mangalore	Department has filed suit at Civil Judge & JMFC Mangalore. For Permanent Prohibitory Injuction.	An Interim Injunction order in favour of GSI. The next date of hearing is posted on 2nd July 2013.	Two writ petitions have been filed and a stay has been obtained.
84	Shri C. Jayaprakash Senior Geologist Vs UOI and Others. In Bangalore CAT. (OA-75/2006)	Senior Geologist	CAT, Bangalore	In context to the selection for the post of Geologist by UPSC the appeal was filed in the reference court but the matter become subjudice. The applicant was issued appointment order to the post of Asst Geologist on the directives of High Court Ernakulam. The applicant has challenged the department as there were vacancies available on the day of canceling his appointment to the post of Geologist.	Department had filed C.A and issued speaking orders. He had challenged the speaking orders.	A verdict has been passed in favour of the applicant stating that the applicantôs seniority may be restored above Shri S. Raju of the pertinent batch.	As informed by CHQ, department has filed a challenge petition before the Honôble High Court of Karnataka challenging the verdict passed by Honôble CAT, Bangalore. Case No. is 456/2008.
85	Mr.K.A.Ebrahim Kunju A.O. Vs UOI & Others. In Ernakulam CAT (CP No.95/10 out of OA-766/2007)	Senior Administrative officer	CAT Ernakulam	The officer withdrew his request for Voluntary Retirement well before the effective date of his voluntary retirement. He had been asked by the department to handover charges as competent authority had not accepted his request. He challenged the action of the department and court has asked the department to reinstate the officer with all the consequential benefits as if he was in service and directed the department that his seniority as AO should be intact and he should be considered for promotion in the next DPC and his juniors who were promoted earlier not to be seniority him.	Department complied with the verdict passed by the Honôble Judge, CAT Ernakulam and conferred on all the consequential benefits till the post of SAO. He was not considered promotion to the post of RAO.	DOPT had cleared the residential period for promotion. DPC has been taken up but the applicant he was not considered for promotion to the post of RAO.	The applicant further filed a MA before Honôble CAT Ernakulam and same has been dismissed.
86	Mr.K.A.Ebrahim Kunju A.O. Vs UOI & 5 Others at	Senior Administrative	CAT Bangalore	____,____	DDG GSI State unit Karnataka & gova legal	Next date of hearing on 09/07/2013	Para wise comments sent to MoM for

	CAT Bangalore (O.A. No: 359/2013)	officer			requested to the Deputy Legal Adviser for nomination of CGSC to defend case		approval.
87	Shri.K.V. Sathyanathan Store Superintendent Vs. DG and others. In Bangalore CAT (OA-68/2010)	Store Superintendent	CAT Bangalore	He is contenting that there were vacancies earlier for his promotion and he was not considered.	C.A. was filed and the reference court passed a verdict in favour of the applicant.	As informed by CHQ prayer for extension of three month time has been forwarded to the reference court.	Action initiated and it is under process at CHQ, Kolkata.
88	Shri. K.V. Ramachandran Director Vs UOI and others. In Bangalore CAT (OA-184/2010)	Director	CAT Bangalore	He contested that in the earlier DPC he was not included even though clear vacancies were available and he was eligible for promotion.	CAT asked the department to issue a considered speaking order and the department had issued the same justifying the stand of department for not considering him in the earlier DPC.	The applicant filed an O.A before the Hon'ble CAT, Bangalore and the same was allowed by the reference court. The verdict has been passed in the favour of the applicant stating that promotion of the applicant to the post of Director to be conferred w.e.f. 2008. The matter is being handled by CHQ.	Action initiated to file MA in respect of C.P. No. 35/2013
89	Shri K C Gowda, Driver Vs DDG&HOD, M-I and others in Ernakulam CAT (OA No. 1053 of 2011)	Driver	CAT Ernakulam	Regarding Transfer to Kochi	Reply affidavit filed	Operative part of the Honorable court order on 12/4 2012 states that ñNo legal flaw could be found in the transferò of Mr. Gowda from Mangalore Cochin.	As per court judgement / departmental inquiry report and Mr. Gowda request , He is tranfered to Manglore
90	Sri K.Govinda Rao Vs Geological Survey Of India, Visakhapatnam & Greater Visakhapatnam Municipal Corporation, Visakhapatnam. (O.S.No: 691/2012)	-	VI -Additional Junior Civil Court, Visakhapat-anam.	Petition to direct the GSI (R1) and GVMC (R2) to restrain from evection of the petitioners. The petitioner along with encroached the space abutting the western boundary wall of GSI Office, Visakhapatnam	Department has filed C.A	Court refused to grant injunction order to petitioner. Petition dismissal & applied for certified copies of judgment.	-
91	UOI and others Vs state of Karnataka and others	WP No. 33252/2012 (LB, RES)	Hon'ble High Court, Karnataka	Govt. of Karnataka in consultation with Mangalore municipal corporation impost property tax on GSI residential quarters, Mangalore.	WP was filed before Hon'ble High Court, Karnataka to challenge the demand of property tax in respect of GSI residential quarters, Mangalore	An interim order of stay as been granted by Hon'ble High Court, Karnataka	The instant case is being dealt by Nodal Officer SU: Karnataka & Goa.
92	Aparna Sagar (OA No:1A/2012)	Candidate 2011 UPSC batch	CAT Ernakulam	Medically unfit and hence not appointed.	Reply affidavit filed	Pending	
93	Praveen S. (OA No:122/2013)	Candidate 2011 UPSC batch	CAT Ernakulam	Medically unfit and hence not appointed	Reply affidavit filed	Pending	
94	Aparna Sagar O.A. No: 1195/2012	Candidate 2011 UPSC batch	CAT, Ernakulam	Medically unfit and hence not appointed.	Re-medical examination conducted on 3-3-2014 and report submitted to the CAT, Ernakulam.	Pending with Court	
95	Praveen S. O.A. No: 122/2013	Candidate 2011 UPSC batch	CAT Ernakulam	Medically unfit and hence not appointed. Undergone Lasic surgery	Based on DoPT clarification and court order appointment order issued	Affidavit explaining the delay in implementing the court order and miscellaneous application for exception of personal appearance of	

						DG GSI is submitted to CAT, Ernakulam. Case not yet posted and waiting for the reply.	
96	Aparna Sagar O.A. 351/2014	Candidate 2011 UPSC batch	CAT Ernakulam	Medically unfit and hence not appointed.	Based on DoPT clarification CHQ, GSI has sent the parawise comments to the Ministry for approval prior to submission to CAT, Ernakulam.	Awaiting the reply from Ministry. Advice from SGSC is also awaited in this regard.	
97	(O.S. 439/2013) dt 14/6/2013	M&CSD Mangalore	Civil Judge & JMFC Mangalore	Auction Notice against, GSI, Property, Mangalore. Department has filed suit at Civil Judge & JMFC Mangalore for Permanent Prohibitory Injunction		Interim injunction order in favour of GSI. The last date of hearing was on 26/2/15 Judgement is passed in favour of defendant on 3rd Mar 2015	
98	W.P. No. 33252/ 2012	M&CSD, SRO	Civil Judge & JMFC Mangalore	Payment of Property Tax		Stay Order obtained on 19/10/2013 Next date awaited	
99	W.P. No. 51171/ 2012, C.Jaya Prakash, Geol(Sr), GSI, Mangalore	M&CSD,	High Court, Bangalore	Initial appointment to the post of Geologist Junior		21-04-2014 Stay Order obtained on 27/05/2013 The case is liste on 30.10.2014	
100	W.P. No. 48656/ 2013,		High Court, Bangalore	GSI Land Case at Mangalore		Stay Order obtained on 19/10/2013 Next date awaited	
101	W.P. No. 48912/ 2013, M&CSD, SRO	M&CSD, SRO		GSI Land Case at Mangalore		7/24/2014 Next date awaited	
102	W.P. No. 27151/ 2014	M&CS, Kolkata		post of SS (T) & Stores Officer		Dismissed CHQ	