

MINUTES OF 45TH MEETING OF THE STATE GEOLOGICAL PROGRAMMING BOARD HELD ON 29.06.2010 AT BHUBANESWAR.

45.1 INTRODUCTION:

The 45th meeting of the State Geological Programming Board (SGPB) was held at Hotel New Marrion, Bhubaneswar on 29th June 2010 under the Chairmanship of Sri Manoj Ahuja, IAS, Commissioner-cum-Secretary, Department of Steel & Mines, Government of Orissa. Sri B.C. Patnaik, Director of Geology, Orissa & Member Secretary, SGPB, Sri L.S. Jain, Dy. Director General, GSI (Op: Orissa) were on the dias. Representatives from various Central & State Government Organizations & Public Sector Undertakings like Geological Survey of India, Directorate of Geology, Orissa, Orissa Mining Corporation Ltd., Central Mine Planning & Design Institute Ltd., Atomic Minerals Directorate for Exploration & Research, Indian Bureau of Mines, Central Ground Water Board, Directorate of Ground Water Survey & Investigation, Orissa Industrial Development Corporation of Orissa Ltd., Institute of Minerals & Materials Technology, Mineral Exploration Corporation Ltd., National Aluminium Company, Office of the Chief Engineer, Project Planning & Formulation participated in the meeting. Besides representatives of P.G. Department of Geology, Utkal University & Society of Geo-scientists & Allied Technologists (Non-exploring Organizations) had also attended the meeting (list of participants enclosed).

45.2 WELCOME ADDRESS BY THE MEMBER SECRETARY :

Sri B.C. Patnaik, Director of Geology & Member Secretary, SGPB welcomed Sri Manoj Ahuja, IAS, & Chairman of SGPB, Sri L.S. Jain, Dy. Director General GSI & all the delegates participating in the meeting. He stated that National Mineral Policy, 2008 has laid emphasis on intensification of mineral exploration by strengthening infrastructure, capacity building and updating R&D techniques. He informed that the liberalized economic Policy of the Central Govt. & the existing industrial policy of the state has attracted huge investments from multinational and national companies to set up core sector industries in the field of iron & steel, power, aluminium & cement by signing MoUs with Govt. of Orissa. Keeping it in view a 5 year perspective plan of exploration (2009-10 to 2013-14) has been formulated by the Directorate of

Geology, Orissa covering 10 minerals in co-ordination with GSI. The entire exploration programmes have been chalked out as per UNFC guidelines. He emphasised the need for reassessment of iron ore by framing laws or by amending the existing rules allowing Govt. agencies to conduct exploration in the leaseholds for proving additional resource. Sri Patnaik further reiterated the importance of the SGPB to review the exploration activities and achievements during the preceeding year and to formulate the annual field programme for the ensuing field season. He briefed the house regarding the role of the Directorate of Geology, Orissa in the field of exploration since the 1960s particularly for iron ore, manganese, coal, bauxite, chromite, graphite, limestone and heavy minerals in beach sand. The Directorate is one of the forerunner organizations in the country in the field of aero-geophysical survey, diamond geology and exploration as well as characterization of coloured stones. In addition to this the Directorate has also achieved the drilling of more than 15000m during 2009-10 which is a record.

The member Secretary briefed the delegates that during 2009-10, the Directorate of Geology had undertaken 16 mineral exploration programmes on diamond, coal, iron ore, manganese, bauxite, heavy minerals etc. In a nutshell he highlighted the notable achievements of the Directorate during the period under review in proving OL-lamproite body in Kalmidadar of Nuapada district, proving of Lajkura coal seam in Ib valley, delineation of a sizeable bauxite plateau around Gunupur of Kalahandi district, small bauxite plateaux in Koraput district, findings of iron ore and manganese bodies in Keonjhar and Sundargarh districts and heavy mineral studies in Puri coast. He reiterated that while preparing 19 exploration programmes for 2010-11, thrust areas like coal, bauxite, chromite and limestone have been taken unto account. He also indicated that steps have also been taken for better co-ordination between the state and central Govt. organisations particularly GSI & IBM.

Finally he requested all the participants to deliberate on their achievements and to furnish valuable suggestions during discussion to make the meeting fruitful.

45.3 OPENING REMARKS BY THE CHAIRMAN, SGPB.

Sri Manoj Ahuja, IAS, Commissioner-cum-Secretary, Department of Steel & Mines, Govt. of Orissa & Chairman of SGPB welcomed all the participants and delegates from various organizations for attending the meeting. The chairman laid emphasis on co-ordinated effort for exploration and stressed that exploration in the state should be carried out in a systematic manner to get complete picture of the status of minerals. He insisted upon preparation of a complete map of Orissa covering areas where the exploration has been completed so far. He suggested that a concrete Action Plan should be formulated in this regard. Govt. is keen to enhance additional manpower and upgradation of laboratory facilities. He expected that Director of Geology should improve laboratory & other infrastructural facilities to meet the challenge. He outlined the need for formulation of a strategy to augment the resource. The Chairman further suggested that proper co-ordination and sharing of information among different agencies will be helpful in this regard and he advised the members to formulate specific recommendations based on the discussions in the meeting.

45.4. COFIRMATION OF MINUTES OF THE 44th MEETING OF SGPB HELD ON 14.01.2010.

The member Secretary, SGPB tabled the minutes of the 44th meeting of SGPB held on 14.01.2010 at Bhubaneswar which had been circulated to all the members and with the permission of the house the minutes were unanimously approved.

45.5. DISCUSSION ON ACTION TAKEN ON THE SUGGESTIONS AND RECOMMENDATIONS MADE IN 44th SGPB MEETING.

Initiating the discussion on action taken on the suggestions & recommendations made in 44th SGPB meeting, the Chairman, SGPB requested the Member Secretary and members for a parawise open discussion.

45.5.1: Exploration of sub-grade ore including BHJ/BHQ to augment existing mineral resource of the State.

In this regard Sri P.K. Bose, Sr. Manager, O.M.C. Ltd., intimated that they have been estimating iron ore resource with +58% Fe, manganese ore with +25% Mn as per guidelines of Threshold value issued by I.B.M. He further added that at present there is no immediate market for BHQ/BHJ and the technology is also not

yet confirmed for beneficiation. So exploration of BHQ/BHJ in the present scenario is difficult.

The Director of Geology, Orissa supplemented that a joint venture project has been taken up comprising Directorate of Geology, IMMT & OMC Ltd. to carry out upgradation of BHQ/BHJ and utilization of sub grade ore.

Sri U.K. Behera, GSI reported that they have started exploration and assessment of low grade iron ore with +45% Fe.

Dr. B.K. Mahapatra, Scientist, IMMT apprised that in case of BHQ/BHJ yield is less, but quality is good. He explained that upgradation of BHQ is not a problem but BHJ poses problem. According to him non core drilling can solve the problem by which large areas hosting BHQ/BHJ can be covered.

45.5.2: Private mining lessees should undertake detailed prospecting operation in their leaseholds and govt. has to enforce that all the lessees should declare the reserve within the concerned leaseholds & lessees should not stockpile more ore than their requirement.

In response to above suggestion of IDCOL, Director of Geology replied that more work is necessary by IBM. In this context, Sri S.K. Das, JDG (L-I) clarified that the Govt. cannot take up exploration within the leaseholds. The lessees should themselves take up exploration in their leaseholds so as to arrive at the correct reserve figure.

Sri T.K. Rath, Dy. Controller of Mines, IBM clarified that lessees have been issued guideline for upgradation of their resource regularly. In every 5 years IBM is preparing National Mineral Inventory of the leasehold areas. The work is in progress. Answering to a query from Chairman regarding methodology adopted, Sri Rath informed that the work is in progress by the geologists of IBM. They have been instructed to work basing on 45-50% Fe, 50-58% Fe and >58% Fe. The geologists will visit the sites and examine the mines concerned. Lessees have been instructed to provide their resource data. In response to a query, Sri Rath informed that the process is in action throughout the country.

Sri B.C. Patnaik, Director of Mines, Orissa I/C further stated that the lessees are doing all the activities in the surface right only.

Sri S.K. Das, JDG(L-I) suggested to confine exploration to the non forest area.

In response to the above, Sri Rath replied that there is forest area restriction. The lessees have been asked to complete exploration in time bound programme by outsourcing. For exploration, the entire area is covered by larger grid and subsequently into smaller grid.

Regarding completion of the assignment, Sri Rath informed that initially 2 years time has been fixed.

In this regard the member Secretary opined that 2 years time may not be adequate for completion of the assignment.

Sri Rath further supplemented that besides the earlier data, they have been asked to re-estimate the resource based on the existing drilling data.

The member Secretary emphasised that lessees should know the actual quantity in their leasehold.

Sri G.C. Das, Director (GSI) suggested that it is high time that lessees should update and provide data relating to their leaseholds.

In this context, chairman suggested that DG (O), GSI, IBM should sit together to frame guideline to direct lessees to carry out exploration work.

Sri S.K. Das JDG (L-I) suggested that DG (O) has no additional manpower to carryout exploration in all the leaseholds. Funding should be done by the lessee concerned.

45.5.3: Large areas should be reserved for M/s OMC Ltd.

Sri C.S. Mishra, Head (Mines), IDCOL suggested that lessee should explore the entire area to estimate their resource. In this regard Directorate of Geology, Orissa will be the nodal agency. Large areas should be earmarked for PSUs like OMC Ltd. to take up proper exploration. Private lessees may not take up exploration properly and thereby Govt. will not get the proper resource data.

The Chairman was of the opinion that it may not be possible for pending PL/ML areas. Hence freehold areas can be considered.

In response to the above, Sri B.C. Patnaik, Director of Mines, Orissa I/C replied that no PL/ML is pending at Govt. level. Transparent register indicating actual status of the PL/ML is being maintained.

To meet a query from the Chairman regarding the status of freehold area, Directorate of Mines informed that no freehold area is available for iron ore.

45.5.4: *Govt. notification for investigation of iron and manganese are generally being kept pending for long periods of time.*

Referring to the above Sri S.K. Das, JDG (L-I) briefed the status of notification for iron ore exploration. It is pending so far at Govt. level for which Directorate of Geology, Orissa is also facing problem for execution of detailed exploration since last few years.

In this regard, Sri C.S. Mishra, IDCOL suggested that if the area is not notified, it may be handed over to PSU for exploration.

In response to the above reply Director of Mines assured that the matter will be looked into.

45.5.5: *OMC should establish resource for long tenure.*

In this context, Dr. R.C. Mohanty, President, SGAT apprised that most of the areas have been leased out. Govt. agencies including GSI is also facing problem to carryout exploration. Exploration as well as mineral development work should be free from forest Act. He further added that a lot of coal bearing blocks has not been developed due to forest problem and suggested that forest problem should be solved first otherwise it will be acute in future.

In this context, G.C. Das, Director, GSI stated that now there is provision for putting 25 BHs in a 10 sq. km area against earlier provision of 10 BHs. Regional exploration is quite inadequate. He suggested that forest can not be avoided and optimum requirement to be moved to Forest Deptt.

In response Director of Mines suggested to inform MoEF regarding the constraints of exploration due to forest problem.

45.5.6: Mineral bearing land of the state should be demarcated by DG (O) & all exploring agencies should provide information alongwith exploration data.

In reply Sri S.N. Behera, Geologist (Sr.) GSI (Coal Wing) apprised that GSI is conducting exploration for other organizations for which it is not possible to part the data with other agencies. He suggested that data can be obtained from CMPDI.

Chairman, SGPB informed that as per new Mineral Policy, mine owners should provide the data. He further wanted to know status of mineral maps. In this regard Director of Mines clarified that commodity wise mineral maps have been prepared.

Sri S.K. Das, JDG (L-I) informed the chair that map of mineral bearing area is not available from IBM.

In reply, Sri Rath, IBM clarified that toposheet wise leasehold map would be available from Sale Division Controller General, Nagpur, IBM on payment basis and suggested to refer IBM website in this regard.

The Chairman advised IBM that GSI and Directorate of Geology should be provided with copies of the maps and data.

45.5.7: IBM should provide up-to-date data to GSI for demarcating mineral bearing area.

Chairman, SGPB wanted to know from Director of Mines regarding availability of leasehold map of Orissa. Sri B.C. Patnaik, Director of Mines I/C informed that leasehold maps are available in the Directorate of Mines, Orissa.

G.C. Das, Director, GSI told that status of leasehold plan is essential for exploration of free areas.

Sri L.C. Jain, Dy. DG, GSI further added that commodity wise leasehold areas are to be intimated. To reply a query of the Chairman regarding the issuing authority of the maps, Director of Mines stated that this is being prepared by Directorate of Mines.

Sri Rath, IBM pointed out that they require data from Govt. agencies to prepare the tenement registry.

The Chairman told that all the data will be provided by Director of Mines to IBM & GSI.

In this context Dr. R.C. Mohanty added that raw materials are not adequate to meet the requirements. He put forth the following suggestions for planning explorations to meet challenges from raw materials.

- All exploring agencies and lessees should supply data to the Directorate of Geology who is updating resource. About 80% of the areas are now covered under lease. The resource belongs to the state. Hence resource information should be provided to the state.
- Data base to be prepared by the Directorate of Geology, Orissa.
- Joint collaboration is necessary to assess the resources under supervision of the Directorate of Geology, Orissa.
- Free area is to be marked.
- Govt. is to take initiation for the exploration in forest areas. In this regard a lot of coordination will be required.
- Directorate of Mines should see that lessee is allowing the exploring agency for exploration in their leaseholds.

The Director of Mines assured that we will start with small entrepreneurs.

The Chairman, SGPB appreciated the suggestions given by Dr. R.C. Mohanty

45.5.8: *IMMT requested DG for funding for characterization of vanadiferous Ti rich magnetite ore collected from Betjharan, Ambabeda of Bisoyi area.*

Director of Geology replied that steps are being initiated to place requisite fund for characterization and analysis of vanadiferous Ti bearing magnetite of Bisoyi area during current financial year.

45.5.9: *Selected officials from DG, OMC & GSI will prepare the schemes for an orientation programme cum workshop for lessees to popularize modern exploration and mining techniques.*

Chairman wanted to know the developments regarding holding of workshop. Member Secretary informed that it has not been taken so far.

S.K. Das, JDG(L-I) apprised that necessary action will be taken up by Directorate of Geology during 2010 in coordination with Directorate of Mines. Sri B.C. Patnaik, Director of Mines I/C stated that response from the lessees in this regard is found to be positive.

45.5.10: *Representatives of MoEF or the State Forest Department should be invited to SGPB.*

It was reported by the Director of Geology that Commissioner-cum-Secretary, S&M Deptt. has been moved to allow forest officials to participate in the State Geological Programming Board vide letter No. 5410/DG dtd 21.05.2010. Reply is awaited.

Member Secretary reported that following approval of minutes of 44th SGPB meeting in the 45th SGPB meeting forest officials will be invited to the next meeting.

45.5.11: *Coordination between the State Directorate of Geology and Utkal University for collaborative exploration programme, so that students can get exposure to exploration practices.*

Regarding implementation of training programme for students of Utkal University, it was reported by S.K. Das, JDG(L-I) that one such training has already been executed in the Remote Sensing Cell of the Directorate of Geology. The Chairman emphasized upon encouragement of PhD students in the exploration work.

In this context, Dr. P. Behera, HOD, P.G. Deptt. of Geology, Utkal University putforth following suggestions.

- UGC is not providing funds for collaborative exploration.
- To include students in exploration work to assist geologists and this will help in progress of work in absence of adequate man power. He further informed that this has been implemented by the Govt. of Jharkhand.

The Chairman, advised for more interaction between Directorate of Geology & P.G. Deptt. of Geology, Utkal University to workout the modalities.

45.6 ADDRESS BY THE DEPUTY DIRECTOR GENERAL, GSI (OP: ORISSA)

Addressing the house Sri L.S. Jain, GSI (OP: Orissa) thanked the organizers of 45th SGPB of Orissa for inviting him to share his ideas with them. He briefed the contribution of GSI to the growth and development of the mineral sector of the state. GSI has mounted programmes like environmental and coastal studies, geotechnical, seismological and land slide hazard studies. He informed that GSI has been elevated to an "Attached Deptt." in the Ministry of

Mines and has been able to plan & execute its programmes with its own strategy giving due weightage to the requirement of the state. He informed that GSI has recently adopted 5 missions in the field of geo-scientific sector viz. Baseline Data Generation, National Resource Assessment, Geo-informatics, Fundamental and Multidisciplinary Geo-science and Special Studies and Training and Capacity Building.

He further added that during 2009-10, GSI (OP: Orissa) had taken up 10 items under four Missions in the field of Specialized Thematic Mapping, Reappraisal of structure and stratigraphy of Horse Shoe basin, Geochemical mapping, Exploration of iron and manganese ore in parts of Keonjhar & Sundargarh districts, Searching of chromite in Dhenkanal district. Besides creation of database for 73 D Toposheet (geo-informatics) and study of coastal processes in Kendrapara and Jagatsinghpur district were also taken up.

He apprised briefly the items to be taken up in the ensuing field season 2010-11 for exploration of minerals. GSI has planned to deploy more drill rigs in the field of iron ore, manganese and chromite. Further they have planned for prospecting of PGE and iron ore in the leasehold areas of OMC Ltd.

Sri Jain reiterated that GSI is facing constraint in planning of exploration activities in absence of latest leasehold/freehold status of blocks. He requested the chairman to look into the matter. He assured that GSI is always open to interact with state Directorate of Geology & Directorate of Mines and to provide necessary support for development of the state mineral scenario.

45.7 REVIEW OF WORK DONE FROM 01.11.2009 TO 31.03.2010.

The representatives of various organizations were requested to present review of work done from 01.11.2009 to 31.03.2010 alongwith a brief out line of programme for 2010-11.

45.7.1 GEOLOGICAL SURVEY OF INDIA (OP: ORISSA)

Sri U.K. Behera, Director, GSI presented the synopsis of work done during the review period and briefed the highlights of achievements undertaken in respect of various Projects.

Under project Easternghats, he briefly mentioned Specialized Thematic Mapping conducted in the northern contact region between Eastern Ghat Mobile Belt and Singhbhum Craton in parts of Jajpur and Dhenkanal district. Specialised Thematic Mapping also has been done under Project Noble metals in Badampahar-Gorumahisani belt of Mayurbhanj district for ascertaining the incidence of PGE. He further added that two Geochemical mapping projects has been conducted, one in parts of Keonjhar, Dhenkanal & Jajpur districts and the other in parts of Keonjhar & Jajpur districts on regional scale.

Under project Iron ore, Specialized Thematic Mapping on 1:25,000 scale in Kasia-Thakurani area (T.S. 73 F/8) for litho-structural analysis and for locating iron ore bodies were taken up. Besides, detailed exploration by way of drilling has been continuing in Ghoraburhani-Sagasahi Block in Sundargarh district with achievement of 231.45m drilling. Ore body has been proved for a strike length of 1.95 km and width varying from 40–250m. Iron content varies from 48.64 to 69.16% (Avg. Fe is 61.66%).

Sri Behera apprised that exploration for manganese has been done in Bolani and Damurda South blocks in Keonjhar district. In total 537.75m drilling has been achieved. Manganese ore bodies spread over 300m x 200m. Width of ore zone varies from 0.20 to 11.20m and Mn content ranges from 9.90% to 45.24%. Further in Balagorha-Champuasahi area in Keonjhar district two manganese ore bodies have been delineated by detailed exploration.

Under project Chromite Sri Behera informed the house that search for chromite is being done around Maulabhanj & Tangeria of Dhenkanal district. Thin bands of chromite have been encountered in serpentinites.

Further, creation of theme based database in Degree Sheet 73 G has been undertaken under Geo-data division. So far 37 reports have been completed. Under Environmental Geology project, study of coastal processes in Kendrapara and Jagatsinghpur districts has been undertaken. Geomorphological units and shoreline changes studies were undertaken alongwith beach profiling. It is reported that 71000 m³ of sand has been eroded during monsoon in Penthachinchiri area.

He briefly proposed following items to be undertaken during 2010-11:

Mission – I

- Specialized Thematic Mapping in Mayurbhanj district with special emphasis to PGE.
- Regional geochemical survey in Keonjhar, Mayurbhanj & Jajpur districts.
- Regional geochemical mapping in Nalasahi-Bangur & Betei-Bhalukasuni area of Balasore, Keonjhar & Mayurbhanj districts.

Mission – II

- Exploration of low grade iron ore in Damurda-Champusahi area of Keonjhar district.
- Exploration for Manganese in the identified Damurda South block, Bolani South block and Balani NE block in Keonjhar district.
- Investigation for Manganese in Balagorha-Champusahi area of Keonjhar district.
- Search for Chromite to the south of Raibola-Kanheipal of Dhenkanal district.
- Exploration of Iron Ore in Sagasahi East Block of Sundargarh district.

Mission – III

- Creation of theme based database in Degree Sheet 73 B.

Mission – IV

- Study of coastal processes in Ramachandi-Tundahar Sector, Puri district.

45.7.2 NATURAL ENERGY RESOURCE (COAL WING):

Sri S.N. Behera, Geologist (Sr.) GSI (Coal Wing) Kolkata informed the house that during the review period regional exploration for coal was continued in Talcher and Ib river coalfields of Orissa. He reported that in Talcher coalfield exploration of coal was continued in Simlisahi-Kunjabihari block, Harichandanpur block & Kudanali NE block on promotional scheme. A total of 1041.00 m drilling has been achieved in 5 BHs in Similisahi-Kunjabiharipur block. In total 10 Barakar coal seam zones (II to XI) with cumulative thickness ranging from 2.46 m to 41.70 m have been intersected between 378.20 to 588.00 m depth. In Harichandanpur block 505.40 m drilling has been done. Ten regional Barakar coal seams (II to XI) with cumulative thickness ranging from 1.90m to 71.78 m have been intersected within the depth from 104.36 to 502.40 m. Coal seam-III having 7 split sections is considered to be the thickest.

In Kudanali NE block 10 BHs have been completed and one is in progress. Five regional Barakar seams (II, III, VI to VIII) and one Karharbari seam (I) with thickness from 3.57 to 41.02m have been intersected within 40.50m to 474.61m depth. Coal seam zone III is the thickest having 12 split sections.

Sri Behera briefly highlighted exploration done in Ib River coal field in Piplimal-Khairkuni block under promotional scheme. So far 9 BHs have been completed and two were in progress. In total 641.65m drilling has been achieved in 4 BHs. Five regional Barakar coal seam zones with cumulative thickness from 3.04m (Belpahar) to 35.07 m (Lajkura) have been recorded between 14.34 to 513.88 m depth.

Sri Behera further informed the house that regional exploration of coal in Khariaparha block of Ib River coal field will be taken up during the field season 2010-11.

45.7.3 DIRECTORATE OF GEOLOGY, ORISSA:

The exploration activities of the Directorate of Geology, Orissa was presented by Sri P.K. Ojha, J.D.G. He informed that the Directorate had carried out 16 investigations under Project: Diamond (2), Project: Coal (2), Project: Geophysics (1), Project: Bauxite (3), Project: Beach sand (3), Project: Iron Ore (4) and Project: Dimension Stone (1) during the review period.

Sri Ojha briefly highlighted diamond investigations conducted in Kalmidadar and Arkholi-Kathiwadi areas of Nuapara district. Drilling has been done in 40mX40m & 20mX20m grid in Kalmidadar area. Dimension of the mineralised zone has been established to be 320m X 160m. In total 501.45m drilling has been achieved and thickness of OL bodies varies from 0.80m to 16.05m. Geological scanning for an area of 20 sq. km in 1:50,000 scale supported by trial excavation and bulk sampling have been done in Kathiwadi area to prove incidence of diamond in the area.

Regarding exploration of coal Sri Ojha informed that exploration in Bhubaneswari block of Talcher coalfield is in progress to assess the reserve of Seam-I. In total 1700.90m drilling has been achieved in 7 BHs during the period

of review. Thickness of Seam-I in 3 split sections varies from 1.71 to 8.89m in between 172.97 to 245m depth. Further exploration of coal in Madhupur block of Ib River valley coalfield has been continuing with achievement of 2755.20m drilling. Lajkura seam so far has been found to be workable in the area having 2 split sections i.e. Lajkura Top with thickness from 5.47 to 9.49m and Lajkura Bottom having thickness of 17.08 to 29.78m.

Geophysical investigation was conducted in Kalmidadar area and Supuli valley in Nuapada district in 20mX20m & 40mX40m grids. The survey conducted in Supuli valley indicates a positive anomalous zone.

Sri Ojha gave a brief account of exploration done in respect of bauxite in Kalahandi & Koraput districts. The bauxite plateau around Gunupur of Kalahandi district appears significant having dimension 1.6 km x 0.75 km and thickness of scrap section varies from 4 to 10.26m. Al_2O_3 content of bauxite varies from 35–47%. Further he apprised that geological mapping conducted in Koraput district has brought to light 7 bauxite plateaus around Kadalikhhol, Munda, Murka & Bagbilmali areas of Dasmantpur block. Dimension of the plateaus varies from 1km-3.5 km x 300–800m. Bagblimali plateau contains bauxite of 5m thickness & and average grade of bauxite is 41.4% Al_2O_3 .

In course of investigation around Nariniguda, Pancharha & Baldiagurha of Koraput district, bauxite has been reported in 8 plateaus with dimension 500 m x 300m to 1500m x 250m and having thickness of 4-8m.

Sri Ojha elaborated on the work done in respect of assessment of heavy minerals in beach sand of Puri coast i.e. Nobha NE, NE of Puri & SW of Konark. The investigations comprised geomorphological mapping, land use/land cover mapping, auger drilling & sampling. It was reported that 3328m auger drilling has been achieved in Nobha NE sector while 2013m in NE of Puri and 3045m in SW of Konark Sector. Drilling was done upto maximum 8 m depth and Beach sand is found to contain heavy minerals like ilmenite, rutile, zircon, garnet, sillimanite and monazite.

Regarding investigations in respect of Project: Iron ore, Sri Ojha apprised the house that two iron ore projects were conducted in Keonjhar district and two

in parts of Keonjhar & Sundargarh districts. He highlighted on the investigation of manganese and iron ore in Bamaniajor of Keonjhar district where only float ore zone has been delineated having aerial extent of 500m x 50- 200m on hill top which appeared to be promising. Besides, pockets of manganese have been encountered on the foot hills.

In course of the investigation of iron ore in Baneikela, Kundurpani & Unchhabali-Nayagarh area in Keonjhar district, 5 discontinuous lensoid iron ore bodies with dimension varying from 80 to 200m x 2 to 12m have been delineated with Fe content ranging from 58.98 to 67.80% in Baneikela block. Further 5 lensoid manganese bodies of 50-180m x 2-10m have been encountered with Mn content varying from 11.24 to 45.87% in this block.

Further he reported that iron ore investigations in Sundargarh & Keonjhar districts around Bandhala-Roladihi brought to light 4 iron ore occurrences around Roladihi, Kusumdihi & Bandhala with dimension varying from 100m x 50m x 3m to 500m x 100m x 5m & iron content varies from 55.68 to 66.16% while 3 manganese occurrences are located around Rangua having dimension 50m x 20m x 5m to 150m x 20m x 5m. Besides 2 bauxite occurrences having dimension of 200m x 50 – 75m x 5m have been examined in Kusumdihi with Al_2O_3 content ranging from 55.20 to 56.40%.

Regarding investigation of iron ore around Damaru, Raisuan & Batagaon area of Sundargarh & Keonjhar district, Sri Ojha stated that 4 iron ore occurrences have been encountered with dimension ranging from 100m x 50m x 8m to 300m x 200m x 10m and a resource of 1.586 Mt of iron ore has been estimated.

Sri S.K. Jena, Director, GSI wanted to know the exact nature of iron ore occurring as small isolated ridges in low lying areas along the eastern margin of Horse Shoe Synclinerium. In response, Sri A.K. Mohanty, DDG stated that these are purely sedimentary in nature and confined to the basin.

Sri Ojha added that 250 sq. km was geologically mapped on 1:50,000 scale for searching of dimension stone & HMI rocks in Remuli-Champua-Phagu areas in Keonjhar & Mayurbhanj districts.

Regarding field programme for 20010-11, Sri Ojha gave a brief out line which includes 19 projects such as: Project: Diamond (1), Project: Coal (3), Project: Geophysics (1), Project: Bauxite (2), Project: Chromite (3), Project: Basemetal (1), Project: Iron Ore (1), Project: Limestone (3), Project: Beach sand (2), Project: Coastal Geomorphology (1) & Project: Mineral Potential Survey (1).

Mr. G.C. Das, Director, GSI stated that SW of Sukinda valley is totally covered by laterite which may be explored by geophysical studies. In response Sri S.N. Parida, DDG added that the total area is covered under leases which may pose problem for execution of work.

45.7.4 ORISSA MINING CORPORATION LTD.:

Sri P.K. Bose, Sr. Manager gave a brief account of exploration activities conducted by OMC Ltd. during the field season 2009-10. He apprised that the objective of exploration are:

- To establish additional resources of ore
- Grade wise assessment of reserve
- Quality control
- Proving of barren areas

Sri P.K. Bose apprised that OMC has intensified exploration in iron ore, manganese and chromite in the state by detailed exploration. He briefly discussed in respect of exploration conducted for chromite in South Kaliapani and Bangur areas, iron and manganese in Seremda-Bhadrasahi and Dalki areas, iron ore in Unchabali, Kurmitar and Rantha areas of Sundargarh & Keonjhar districts. Total drilling achieved during the review period is 1703m (non coring) and 3381.55m (coring).

Sri Bose briefly stated the programme of exploration during 2010-11 which include:

- Geological mapping of 3453 Ha in chromite areas in Sukinda and Baula belt
- Core drilling of 72910.30m and DTH drilling of 20,500m in the field of iron ore in Keonjhar and Sundargarh district
- Exploration of manganese in Keonjhar district
- Exploration of gemstone in Hinjilibahal and Jillingdhar belt
- Exploration of coal in Nuagan-Patrapada areas

Sri Bose putforth following suggestions:

- Complete exploration of ML/PL area should be allowed as it is felt essential
- Revision of norm of putting 25 BHs in an area of 10 sq. km which is inadequate for detailed exploration.

45.7.5 INDUSTRIAL DEVELOPMENT CORPORATION OF ORISSA LTD. :

Sri C.S. Mishra, Head (Mines), IDCOL briefly gave out line of their achievement during 2009-10. He informed that IIT, Kharagpur has undertaken integrated geological and geophysical study around Tangarpada area of Dhenkanal district. The area has been geologically mapped to establish lithounits. Geophysical studies involved 346 gravity stations, 312 magnetic stations and resistivity survey along 16 profiles to assess occurrence of chromite/chrome bearing rock in the area. Two anomaly zones has been established. Two pockets of chrome bearing rock have been identified which will be confirmed by drilling.

Sri Mishra apprised that drilling in Tangarpada block will be taken by Directorate of Geology during 2010-11. A target of 1000m core drilling is proposed to be taken up by 15-20 boreholes.

45.7.6 CENTRAL MINING PLANNING & DESIGN INSTITUTE LTD.:

Sri Amitav Das, CMPDI briefly stated that exploration of coal has been undertaken on behalf of MCL in Talcher and Ib River coalfields. CMPDI has achieved 22,972m of drilling in Talcher coalfield and 11,988m in Ib River coal field during 2009-10. He added that coal reserves converted to proved category was 1563.032 MT.

45.7.7 ATOMIC MINERALS DIRECTORATE FOR EXPLORATION & RESEARCH:

The representative from AMD briefly explained about uranium investigation, rare metal & rare earth exploration and heavy mineral investigation conducted during 2009-10. Uranium investigation has been continuing in Balia-Rankia where quartz-pebble conglomerate shows low order radioactivity. During the period 37.90m reconnaitory core drilling has been done for uraniferous QPC. He highlighted on surveys carried out in parts of Jajpur, Angul, Deogarh and Bargarh district for identifying QPC in IOG basins in Orissa.

Regarding Rare Metal & Rare Earth investigations in Pandikimal of Jharsuguda district, he pointed out that zoned pegmatites contain columbite-tantalite and beryl. He informed that 907 kg material has been recovered during the period of review. Reconnaissance survey to locate columbite-Tantalite bearing pegmatite in Bargarh district will be taken up during 2010-11.

Regarding investigation of heavy minerals in beach sand he mentioned that Nunianadi (Nechanpur) and Panchapara Nadi (Bagda) in Balasore district has been surveyed. An area of 60 sq. km has been covered and in total 841.50m drilling has been achieved in 113 boreholes in 200mX100m. About 5% H.M. has been reported.

45.7.8 INDIAN BUREAU OF MINES:

The presentation was given by Mr M.K. Somani, Sr. Mining Geologist, IBM. He conveyed that the work done during 2009-10 includes.

- Inspection of mines
- Approval of mining plan
- Approval of scheme of mining, approval of PMCP/FMCP
- Grant of recognition to persons for preparation of mine plan/scheme of mining
- Mines Environment and Mineral Conservation Week Celebration.

IBM have taken up "Regional Mining Geological Study" covering 86 iron ore mines in Sundargarh and Keonjhar district and approval 34 mine plans. Besides 43 schemes of mining and 77 PMCP and FMCP have been approved.

He informed that the above items are also included in the programme for the year 2010-11.

During discussion, Sri D. Das, IBM suggested that exploration should continue upto base of ore zone. Every one should go upto ultimate limit of mineralization for mine planning. Further +45%Fe should be strictly adhered to.

Reacting to this Mr. Bose, OMC added that in case of chromite drilling 200-300m is not a problem. But in case of iron ore drilling, in deeper levels iron ore poses problem. Phase wise drilling is more suited in this regard.

Mr. G.C. Das, Director, GSI supplemented that behaviour of the footwall part of the ore body must be established. After penetrating through ore zone it may be easy to assess the sub surface geometry of ore zone.

Mr. G.C. Das, Director, GSI asked IBM regarding the role of Al_2O_3 in classification of ore. Whether basing on high Al_2O_3 , the ore can be treated as low grade? Mr. Das, IBM replied that iron ore with 45% Fe has not been practically used. For future use 45% Fe grade is selected.

45.7.9 CENTRAL GROUND WATER BOARD:

The representative of CGWB explained the various activities undertaken during the period under review:

- Ground water management studies for assessing the change of ground water scenario over an area of 10, 100 sq. km. during last 5 years in Orissa.
- Under Ground water exploration, exploratory drilling has been carried out for establishing the aquifer parameter. Ground water explorations have been conducted in 7 districts and in total 46 wells have been drilled during the period.
- Ground water regime monitoring conducted in 30 districts through observation well.
- Geophysical Studies: Surface resistivity surveys & borehole geophysical logging have been carried out. Resistivity surveys comprising 37 VES were conducted to identify potential aquifers and borehole logging has been done in 2 locations.
- Hydro chemical studies conducted in respect of 556 samples.
- Artificial recharge & Rain water harvesting studies.
- Publicity & awareness programme.
- 19 project proposals have been forwarded to Central Ground Water Authority, New Delhi for the issuance of N. O. C. from Nov' 09 to March' 2010.

45.7.10. DIRECTORATE OF GROUND WATER SURVEY & INVESTIGATION

It was reported that following activities were undertaken by the Directorate during 2009-10.

- Ground water table monitoring & water sample collection was completed in 1035 network stations.
- Water quality analysis done in five laboratories.

- Block wise re-estimation of ground water resources. Under this item data has been collected from 314 blocks for assessment.
- Remote Sensing Survey in five blocks.

The above items are also been proposed for 2010-11.

45.7.11 P. G. DEPARTMENT OF GEOLOGY, UTKAL UNIVERSITY

Prof. P. Behera, HOD, P.G. Deptt. of Geology, Utkal University briefly outlined their activities during 2009-10 which comprised research work as sanctioned by U.G.C. Some of the assignments done are :-

- Hydro geological research
- Characterization of BIF.
- Petrographic study of pyrophyllites of Keonjhar district.
- Environmental studies in mining areas.
- Trace element study in coal deposits of Talcher area.
- Hydrodynamics of Puri Beach leading to erosion.

He informed that following three items have been decided to be taken up during 2010 – 11.

- Petrographic study of pyrophyllites of Keonjhar district.
- Hydrodynamics of Puri Beach leading to erosion.
- Petrographic studies of Ib valley coal.

45.7.12 INSTITUTE OF MINERALS & MATERIALS TECHNOLOGY :

Dr. B.K. Mahapatra, Scientist outlined the activities of IMMT:

- Characterisation & up-gradation of BHQ & BHJ from Gandhamardan revealed that recovery in case of BHJ is difficult while for BHQ no difficulty has been faced. 25 – 28% Fe in BHQ can be upgraded upto 60% Fe.
- Recovery of additional iron ore from tailings from TISCO mines - In this context Dr. Mahapatra informed that most of iron ore loss is in the tailings. A column is designed in which 50% Fe can be upgraded to 66% Fe with 30% yield. But for Al_2O_3 no work has been done.
- Beneficiation of low grade iron ore fines supplied by M/s. Bhusan Power & Steel Ltd. for pelletisation shows goethite with 30% Fe can be upgraded to 70% Fe.

- Beneficiation of low grade iron ore fines to prepare concentrates suitable for pelletisation for use in blast furnace.
- Characterisation of vanadiferrous Ti rich magnetite ore around Rairangpur.
- Characterisation & beneficiation of low grade Mn ore from O.M.C leasehold for optimum utilization. Besides characterization of Mn ore from Patmunda mines of O.M.M. has been undertaken.
- In this context, he mentioned that 17% Mn can be upgraded to 40% Mn. Wad (20 – 30% Mn) can be converted to high Manganese Steel.

G.C. Das, Director, G.S.I. suggested that for iron sector BHQ should be beneficiated by selecting a particular area. BMQ is a recent concept. More is the quartz metamorphosed better is the liberation. BHQ of Karnatak is considered better than that of Orissa Sector. In this regard, potential BHQ blocks are required. Non core drilling with sampling at 1m interval is suggested.

To a query made by Sr. Mining Geologist, IBM, Dr. Mahapatra replied that beneficiation is technologically and economically viable and there is zero waste

45.7.13. MINERAL EXPLORATION CORPORATION LIMITED :

Sri R.A. Gupta presented the activities of MECL. He stated that 4164.60m drilling has been achieved in coal.

Sri B.C. Patnaik, Director of Geology opined that MECL should enhance its activities. In response Sri R.A. Gupta expressed his views that MECL can take up exploration if funds will be provided by the lessees or State Government. Director of Geology, Orissa assured to look into the matter.

45.7.14 NATIONAL ALUMINIUM COMPANY :

Sri P.K. Behera, Sr. Manager (Geology) gave a very brief account of their exploration activities confined to Panchpatmali bauxite mine in Koraput district. Average thickness of bauxite is reported to be 14m. He stated that during the review period a total of 4306.56m drilling has been achieved in 200 BHs in North Block in 25m x 25m grid.

He further added that exploration of North block will be undertaken during 2010-11 by way of drilling in 25m x 25m grid with drilling target of 7500m.

45.7.15 CHIEF ENGINEER, PROJECT PLANNING & FORMULATION:

Sri A.K. Raut, Asst. Director gave a brief account of work done during the period from Nov' 09 to Mar' 10. He reported that 94 BHs under 12 Irrigation Projects (under 5 Investigation Divisions of 2 Investigation Circles) have been drilled to determine grade rocks. There are also shallow & exploratory boreholes which are logged in detail for determining foundation grade rock and suggesting SFL (State Foundation Level) at appropriate depths for engineers to start foundation work of the project concerned.

Sri Raut mentioned that 163 Nos. of shallow exploratory BHs involving 15 Irrigation projects under 5 Investigation Divisions & 2 Investigation Circles have been proposed subject to availability of fund & resources during the year 2010-11.

45.8 SUGGESTION VIS-A-VIS ACTION

45.8.1 Chairman, SGPB

Preparation of a complete map of Orissa covering areas where the exploration has been completed so far and a concrete Action Plan should be formulated for coverage of potential unexplored area.

(Action: GSI, DG (O), IBM, AMD)

45.8.2 Chairman suggested that DG (O), GSI, IBM should jointly frame guideline to direct lessees to carry out exploration work within their leaseholds.

(Action: GSI, DG (O) & IBM)

45.8.3 Chairman advised IBM that GSI and Directorate of Geology should be provided with copies of the leasehold maps and data prepared by IBM.

(Action: IBM, GSI, DG (O))

45.8.4 IBM requested for data from Govt. agencies to prepare the tenement registry. In this context Chairman assured that all the data will be provided by Director of Mines to IBM & GSI.

(Action: IBM & DM (O))

45.8.5 Chairman advised more interaction between Directorate of Geology & P.G. Deptt. of Geology, Utkal University to work out the modalities of involving students of P.G. Deptt. of Geology, Utkal University.

(Action: DG (O) & P.G. Deptt. of Geology, U.U.)

45.8.6 There is provision for putting 25 BHs in a 10 sq km area against earlier provision of 10 BHs for exploration in forest area, which is inadequate. Director of Mines suggested pursuing MoEF regarding the constraints of exploration due to forest problem.

(Action: S&M Deptt. & DM (O))

45.8.7 Institute of Minerals & Materials Technology:

Dr. B.K. Mahapatra suggested that for bauxite analysis of Fe, Al₂O₃ & SiO₂ is necessary and suggested that mineralogical studies are to be done to ascertain the nature of bauxite.

(Action: DG (O), IMMT)

45.8.8 Directorate of Mines, Orissa:

The Director of Mines asked OMC to furnish status of Jillingdhar gemstone deposit. Mr. Bose replied that there was poor recovery. Sri S.K. Das, JDG (L-I)

wanted to know whether poor in value or volume. In reply Mr. Bose, DGM, OMC stated that it is poor by both. Director of Mines suggested to go for bulk sampling to arrive at a definite conclusion. **(Action: OMC Ltd.)**

45.8.9 Society of Geo-scientists & Allied Technologists:

Dr. R.C. Mohanty suggested that

- Data Bank to be created & to be updated regularly.
- Data bank to be created in collaboration of GSI, IBM, DG (O) & DM (O).

(Action: GSI, IBM, DG (O) & DM (O))

45.8.10 Mineral Exploration Corporation Ltd:

Sri R.A. Gupta suggested that detailed exploration may be considered in forest areas. MoEF is to be moved for relaxation. **(Action: DM (O), S&M Deptt.)**

45.8.11 Directorate of Geology:

Sri S.N. Parida, DDG stated that collaborative programme for exploration of PGM in Sukinda area was planned by Directorate of Geology and GSI while preparing 5 years perspective plan. This was discussed in CGPB subcommittee Gr.-I (Ferrous) meeting at Jaipur. But there is no progress in this regard so far. Specific proposal in this regard to be submitted to GSI for finalization in the CGPB. **(Action: DG (O))**

45.8.12 S.K. Das, JDG (L-I) sought clarifications regarding notification and reservation of area for geological exploration of minerals in the state. The matter was initiated earlier but requires to be pursued again in the interest of the state.

(Action: DG (O) & S&M Deptt.)

45.8.13 Sri A.K. Mohanty, DDG pointed out that DG(O) had carried out coal exploration in certain blocks and reports have also been submitted. But some of the coal blocks have been allotted to different agencies. The cost of the reports should be borne by the respective allottees?

In response Director of Mines suggested that the Steel & Mines Deptt. Govt. of Orissa will be requested to write to Ministry of Coal in this regard.

(Action: DM (O) & S&M Deptt.)

45.8.14 G.C. Das, Director, GSI summed up the discussions and thanked all members for their active participation in the discussions.

45.8.15 CONCLUDING NOTE BY MEMBER SECRETARY:

In his concluding note the Member Secretary expressed his sincere thanks to all members for fruitful discussion in a cordial atmosphere. He suggested that officials should be exposed to enhance their knowledge and to manage the things properly and opined for intensive interaction. According to him, Government to Government should not be considered as secret. Exchange of ideas will be fruitful to achieve the goal. He assured that pertinent problems will be taken into notice of Govt. for early solution.

The meeting ended with vote of Thanks given by T. Panda, JDG

LIST OF PARTICIPANTS OF 45TH SGPB MEETING HELD ON 29TH JUNE, 2010

Chairman: Sri Manoj Ahuja, IAS, Commissioner-cum-Secretary, Deptt. of S&M,
Govt. of Orissa.

Member Secretary: Sri B.C. Pattnaik, Director of Geology, Orissa.

Sl. No.	Name Designation & Organisation
1	Sri L.S. Jain, Dy. Director General, GSI OP: Orissa
2	Sri G.C. Das, Director, Mission-II, ER. GSI
3	Sri U.K. Behera, Director, GSI, OP: Orissa
4	Sri S.C. Rath, Director, GSI, OP: Orissa
5	Sri P.C. Patra, Director, GSI, OP: Orissa
6	Sri S.K. Jena, Director, GSI, OP : Orissa
7	Dr. S.B. Roy, Director, GSI, OP : Orissa
8	Sri S.N. Behera, Sr. Geologist, GSI (Coal Wing), Kolkata
9	Sri S.K. Das, JDG (L-I), Directorate of Geology, Orissa
10	Smt. M. Patnaik, JDG (L-I), Directorate of Geology, Orissa
11	Sri T. Panda, JDG, Directorate of Geology, Orissa
12	Sri P.K. Ojha, JDG, Directorate of Geology, Orissa
13	Sri A.K. Brahma, JDG, Directorate of Geology, Orissa
14	Sri A.K. Mohanty, DDG, Directorate of Geology, Orissa
15	Sri D.N. Pani, DDG, Directorate of Geology, Orissa
16	Sri S.N. Parida, DDG, Directorate of Geology, Orissa
17	Sri S.K. Padhi, DDG, Directorate of Geology, Orissa
18	Sri M.R. Mishra, DDG, Directorate of Geology, Orissa
19	Sri G.K. Bhuyan, DDG, Directorate of Geology, Orissa
20	Sri M.K. Senapati, DDG, Directorate of Geology, Orissa
21	Sri K.C. Mohapatra, DDG, Directorate of Geology, Orissa
22	Smt. A.B. Mishra, DDG, Directorate of Geology, Orissa
23	Sri P.C. Vajani, Geologist, Directorate of Geology, Orissa
24	Sri P.C. Mishra, Geologist, Directorate of Geology, Orissa
25	Sri C.B. Das, Geologist, Directorate of Geology, Orissa
26	Smt. S. Jena, Geologist, Directorate of Geology, Orissa
27	Sri D. Sharma, Geologist, Directorate of Geology, Orissa

28	Sri P.K. Bose, DGM (Geology), Orissa Mining Corporation Ltd.
29	Sri J.D. Mishra, Sr. Manager (Geology), Orissa Mining Corporation Ltd.
30	Sri S.K. Das, Sr. Manager (Geology), Orissa Mining Corporation Ltd.
31	Sri S.K. Nayak, Manager (Geology), Orissa Mining Corporation Ltd.
32	Smt. T. Basa, Manager (Geology), Orissa Mining Corporation Ltd.
33	Smt. Nirupama Das, Manager (Geology), Orissa Mining Corporation Ltd.
34	Sri A.K. Singh, Manager (Geology), Orissa Mining Corporation Ltd.
35	Sri Subrat Mishra, Dy. Manager (Geology), Orissa Mining Corporation Ltd.
36	Sri P.K. Behera, Dy. Manager (Geology), Orissa Mining Corporation Ltd.
37	Sri D. Manoharan, Dy. Manager (Geology), Orissa Mining Corporation Ltd.
38	Sri P.K. Das, Superintending Hydrologist, CGWB
39	Sri A. Chowdhury, Asst. Hydrologist, CGWB
40	Sri T.K. Rath, Dy. Contoller of Mines, IBM
41	Sri M.K. Somani, Sr. Mining Geologist, IBM
42	Sri D. Das, Jr. Mining Geologist, IBM
43	Prof. P. Behera, HOD, P.G. Deptt. of Geology, Utkal University
44	Dr. B.K. Mohapatra, Scientist, IMMT
45	Sri Amitav Das, CMPDI, Bhubaneswar
46	Sri R.A. Gupta, MECL
47	Dr. R.C. Mohanty, President, SGAT
48	Sri B.K. Sahoo, GWS & Investigation
49	Sri A.K. Raut, Asst. Director (CE,PP&F)
50	Sri Pramod Ku. Behera, Sr. Manager (Geology), NALCO
51	Sri C.S. Mishra, Head (Mines), IDCOL