

DIRECTORATE OF GEOLOGY ACTIVITES

INTRODUCTION:

The State of Orissa lies along east coast of India and is bound by latitudes 17° 49' – 22°34'N and longitude 81°23" – 87°24'E with an area of 155707 sq. kms. Geological continuity with the bordering states account for occurrence of some of the major rock group of Indian stratigraphy. Pre-cambrians, the oldest tocks occupy about 72.5% of the state's landmass. Rest of the area is composed of younger rocks belonging to the Gondwana. Tertiary, Quaternary and Recent formations.

The varied geological base has been host to many important mineral deposits. Prolonged and consolidated exploration efforts by various Government and semi Government agencies have led to the discoveries of minerals like Iron Ore, Manganese, Chromite, Coal, Bauxite, Limestone, Dolomite, Fire clay, China clay, Nickel, Led Ore, Copper, Quartz etc. besides notable occurrences of Gemstone including Diamond, Gold and Platinum group of elements (PGE) have been located in the state.

EXPLORATION ACTIVITES:

The most important objective of the department is to access the mineral wealth of the state through survey and exploration.

The Directorate possesses expertise in the filed of

- Gemstone and Diamond exploration
- Coal exploration
- Exploration of Chromite and PGE
- Assessment of high Magnesia Igneous (HMI) rocks
- Bauxite exploration
- Mineral sand exploration along Orissa Coast
- Iron Ore exploration
- Limestone exploration
- Graphite assessment
- Proving of Gold concentrate
- Assessment of dimension / decorative stones
- Base metal exploration
- Ground geophysical survey for mineral / groundwater targeting
- Engineering geology and geotechnical studies
- Groundwater and mineral targeting base on High Resolution Aeromagnetic Survey (HRAMS)
- Environment impact assessment study in mining belts
- Urban Environmental studies
- Remote Sensing application for mineral targenting, groundwater, environmental and coastal geomorphological studies.

Over the years, mineral exploration & assessment involving the techniques of geological mapping, sampling and drilling have been practiced backed by modern exploration tools like remote sensing, airborne and ground geophysical survey etc. along with sophisticated laboratory facilities.

EXPLORATION METHODOLOGY:

Directorate of Geology undertakes geological exploration work through the following Programmes:

- i. **GEOLOGICAL MAPPING:** Both large scale and small scales mapping is being taken up and geological maps are prepared by the Directorate in various fields of mineral / ore like Iron Ore, Chromite, Bauxite, Base Metal, Fire clay, Graphite, Limestone, Diamond etc.
- ii. **GEOCHEMICAL PROSPECTING:** Geochemical exploration constituting sampling of in-situ soil, stream sediment and rocks followed by geochemical anomaly interpretation.
- iii. **GROUND GEOPHYSICAL EXPLORATION AND SURVEYING:** Electrical sounding tests for setting up of bore wells are undertaken in the state. The sounding data are interpreted with the help of VES software.

Geophysical logging using E-log (SP, short normal, long normal) and natural gamma ray probes are undertaken in the bore wells to decipher pervious, semi pervious and impervious layers with high precision to detect saline water encroachment fronts.

Geophysical surveys are undertaken to detect hidden ore bodies of Basemetal, Graphite, Limestone, Iron, Manganese, Chromite, Radioactive minerals & subsurface structural deformations.

PROGRAMME FOR 2009-2010:

In order to augment the mineral resource status of the state, following programme has been envisaged for 2009-2010.

1. **Assessment of iron ore resources in northern part of Baliapahar and in Badamgarh Pahad of Sundergarh district.**
2. **Inventory and assessment of small bauxite plateaux in Koraput, Rayagada and Kalahanandi districts.**
3. **Detailed drilling around Kalmidadar in Nuapada district to prove the geometry of olivine lamproite body and to assess the diamond potential.**
4. **Scanning of Arkholi, Kathiwadi, Talakot, Chitorama, Phulchin area of Nuapada district to locate new olivine lamproite bodies for the search of diamond.**
5. **Assessment of thermal grade coal in coal seam I of Padma Block of Talcher Coalfield.**
6. **Assessment of thermal grade coal resources in Madhupur block of Ib-Coalfield.**
7. **Systematic assessment of heavy minerals in Beach Sand in Naba and Manikapatna NE block of Puri district.**

Besides other investigations like geomorphological studies along Dhamra to West Bengal border of the coastal tract of Orissa and bedrock profiling of Puri Coast by geophysical methods will also be taken up.