CHAPTER - 3
LOCAL GEOLOGY
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3.0.0. GENERAL:

The glauconite is observed at a few places in the basin. It is mostly the ferruginous quartzites that host the mineral glauconite. It is occurring in different stratigraphic horizons, but the environment appears to be the same. The glauconite bearing quartzites in the Cuddapah basin are recorded from,

1. The Gandikota Quartzite of the Chitravati Group,
2. The intercalated shale-quartzite sequence of the Gandikota Quartzite,
3. The Nagari Quartzite of the Nallamalai Group,
4. The Banaganapalle Quartzite of the Kurnool Group,
5. The intercalated quartzite sequence of the Narji Limestone of the Kurnool Group.

Each of the above occurrence is detailed in the following pages. The said locations are also indicated on the image to get a regional picture and the distribution of glauconite in the basin. (Fig. 3-1)

3.1.0. The Gandikota Quartzite of the Chitravati Group:

Gandikota Quartzite:

Glauconite has been recorded from the ferruginous quartzite of the Gandikota quartzite: This occurs as green color grain scattered in the rock unit. Occasionally glauconite is seen as thin beds as observed on the consequent slope of the Gandikota Quartzite located in the SOI topo map of 57J/5. The Gandikota Quartzite has orthoquartzite, quartz-iron oxide quartzite, quartz-glauconite quartzite. The top units are glauconite bearing. The concentration of glauconite is observed, north of Malliyambavi and the road cuttings further down also expose the glauconite. The location of the glauconite bearing quartzite is shown in the figure number (Fig. 3-2).
3.1.1. The intercalated shale-quartzite sequence of the Gandikota Quartzite:

Further north, the Gandikota Quartzite (topographical map of 57J/5) has intercalated sequence of major shale unit. The shale exhibits all the physical characters of the Tadpatri Formation. The concentration of glauconite is also noticed in the shale unit that has thin intercalated ferruginous quartzite bands of the order of 1cm to 6cm thick. (Fig. 3-3). Infact towards west, where the area is under Mailavaram Reservoir glauconite is occurring in the form of 3mm thick beds.
Fig. 3-2 Geology on Satellite image background

Fig. 3-3 Geological map of the Gandikota Quartzite
3.1.2. The Nagari Quartzite of the Nallamalai Group:

In the area under study the Nagari Quartzite overlies the Gulcheru Quartzite with an angular unconformity. The Gulcheru Quartzite strikes E – W and dips northerly at shallow angle of 15°. The Nagari Quartzite strikes NNW – SSE and dips easterly at 10°. This unconformity is also marked by an oligomictic quartzite dominant conglomerate. From Guvalacheruvu village, (57J/15) the road leading to Kadapa has a diversion towards east that is a forest road that leads into the jungle area. This road is on Guvalacheruvu Quartzite for some distance and it touches the Nagari Quartzite slightly inside the jungle area where glauconite is observed, (Fig. 3-4). The concentration glauconite in this is more compared to other locations. It is also in the form of disseminations. It is also shown as figure (3-5).

Fig. 3-4 Geology on Satellite image background

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3.1.3. The Banaganapalle Quartzite of the Kurnool Group:

Nallalingayapalle Quartzite:

This is located ENE of Peddanapadu situated in the Survey of India topographical map bearing the number 573/10. The glauconite bearing unit is the Banaganapalle Quartzite of the Kurnool Group. This overlies the Tadpatri Formation of Chitravati Group unconformably. The relationship between the Tadpatri Formation and the Banaganapalle Quartzite is marked by an angular unconformity, (Fig. 3-6). In the Tadpatri Formation terrigenous shale, ignimbrite, ash fall tuff are observed. These units are traversed by quartz dolerite sills. The general trend of the formation is NE - SW with northwesterly dip of 40° to 45° (Fig 3-7). The trend of the Banaganapalle Quartzite is WNW – ESE, with NNE dips of < 10°. The quartzite is ferruginous in nature and it has glauconite grains scattered. The Narji Limestone overlies the quartzite conformably.

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Fig. 3 - 6 Geology on Satellite image background

Fig. 3 - 7 Geological map of the area south of Rageru river
3. 1. 4. The intercalated quartzite sequence of the Narji Limestone of the Kurnool Group:

Narji Limestone is basically a carbonate sequence. The limestone of this unit is generally used for manufacture of cement. It is dark to medium grey in color and has pyrite encrustations and disseminations. This setup indicates the reducing environment of deposition. However, in the Kalva area, located in the Survey of India topographical map of 57I/3, the limestone has intercalations of ferruginous quartzite. The thickness of intercalated sequence is about half a meter. Glauconite is observed as thin beds of a few millimeters and also as disseminations in the ferruginous quartzite. The geology of the area is given on the satellite data, (Fig. 3 -9) and also as the map prepared from the satellite data. (Fig. 3 -10).
Fig. 3-9 Geology on Satellite image background

Fig. 3-10 The Geological map of the Karva area
Within the Narji Limestone below purple or pink limestone, ferruginous shale and ferruginous quartzite occur as intercalations. The ferruginous quartzite is about 0.5m thick and is of lensoid nature. Glauconite occurs as scattered individual grains and also occurs as very thin bed of a few millimeter thick. In the field, it can be identified by the green color. Associated with the ferruginous quartzite, is the grey siliceous shale. It reflects two sets of prominent joints that are at right angle to each other, (Fig. 3-13). One set has almost N-S strike other has E-W strike and both are vertical joints.

Fig. 3-13 Two sets of prominent joints at right angle to each other
Glauconite Bearing Quartzite in Narji Limestone:

The Kalva area is very famous for the location of a major fault known as "Gani-Kalva" fault. In this area, the Kurnool rocks, mainly the Narji Limestone and the Paniam Quartzite show very steep dips of nearly 50° - 60°. Otherwise, these rocks are sub-horizontal. In fact the Narji Limestone exhibits a tight synformal structure. The Paniam Quartzite is resistant and stands like a wall, popularly known as the 'Kalva Wall'.

(Fig. 3-11)

**Fig. 3-11 The Kalva Wall of the Paniam Quartzite.**

The limestone also exhibits very steep dips. (Fig. 3-12)

**Fig. 3-12 Steep dips in the Narji Limestone – 75° south.**