CHAPTER - 7
H Y D R O G E O M O R P H O L O G Y
HYDROGEOEOMORPHOLOGY:

7.0.0. GENERAL:

The term 'Hydrogeomorphology' deals mainly with the groundwater prospects of various geomorphic units. Structure and Lithology are the two prime parameters that control the evolution of land forms. (Thornbury, 1986) In other words, lithology and structure control the groundwater prospects of any region. The Hydrogeomorphological map is given as figure number 7.1.

7.1.0. GROUND WATER CONDITIONS OF THE VARIOUS GEOMORPHIC UNITS:

7.1.1 Cuesta and Escarpment: (Structural Landform)

This landform is reflected by the Gulcheru Quartzite and the dolomite, dolomite - chert and dolomite - chert - shale combination of the Vempalle Formation. The cuesta of the Gulcheru Quartzite has poor prospects, whereas the custas of the Vempalle formation have moderate to good prospects. The picrite and the dolerite of the Tadipatri Formation also exhibit cuesta type of landform. The prospects are poor to limited. The escarpment is reflected by the Gulcheru Quartzite. The prospects are poor as it forms mainly a run-off zone.
7.1.2. Pediment: (Erosional Landform)

(Dolomite and basic flows of Vempalle Formation)

This has restricted distribution and is observed only on the dolomites and on the basic flows of the Vempalle Formation and on the intrusives of the Tadipatri Formation. The prospects are restricted to the lineaments that cut across the geomorphic units. The prospects can be considered as Limited to moderate in all the cases.

7.1.3. Pediplane Shallow (PPS): (Erosional/Depositional Landform)

(Dolomite of Vempalle and shale of Tadipatri Formations)

The Pediplane Shallow can develop partly by erosional process, because of the formation of the pediplane and partly by depositional process, because of the formation of thin (upto 10m) of deposition of weathered material. This can't have an aquifer within the 10m thick weathered material. This is observed on the dolomite of the Vempalle Formation, where the prospects can be considered as moderate to good. On the shale unit of the Tadipatri Formation. The shale, on which the geomorphic unit is noticed, itself is impervious. Hence, the prospects are limited in general and moderate along any lineament. The lineaments again act as secondary porosity and help in the infiltration of water. The aquifer will be in the underlying fractured rock.

The above stated information is presented in the tabular form, (Table 7 - 1) for better appreciation.
Table 7-1
HYDROLOGICAL CONDITION OF THE GEOMORPHOLOGICAL UNITS.

<table>
<thead>
<tr>
<th>Map unit</th>
<th>Formation</th>
<th>Lithology</th>
<th>Geomorphic unit</th>
<th>Ground water prospects</th>
<th>Color index</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS</td>
<td>Tadipatri Formation</td>
<td>Dolerite</td>
<td>Cuesta</td>
<td>Poor to Limited</td>
<td>Light green</td>
</tr>
<tr>
<td>PPS</td>
<td>Tadipatri Formation</td>
<td>Shale</td>
<td>Pediplane Shallow</td>
<td>Limited to moderate</td>
<td>Light green</td>
</tr>
<tr>
<td>PPS</td>
<td>VempalleFormation</td>
<td>Dolomite</td>
<td>Pediplane Shallow</td>
<td>Moderate to Good</td>
<td>Light Green</td>
</tr>
<tr>
<td>PD</td>
<td>VempalleFormation</td>
<td>Dolomite</td>
<td>Pediment</td>
<td>Limited to Moderate</td>
<td>Green</td>
</tr>
<tr>
<td>PD</td>
<td>VempalleFormation</td>
<td>Basic flows</td>
<td>Pediment</td>
<td>Limited to Moderate</td>
<td>Purple</td>
</tr>
<tr>
<td>RH</td>
<td>VempalleFormation</td>
<td>Dolomite</td>
<td>Residual hill</td>
<td>Poor to Limited</td>
<td>Orange</td>
</tr>
<tr>
<td>CS</td>
<td>VempalleFormation</td>
<td>Basic flows</td>
<td>Cuesta</td>
<td>Limited to Moderate</td>
<td>Purple</td>
</tr>
<tr>
<td>CS</td>
<td>VempalleFormation</td>
<td>Dolomite+Chert</td>
<td>Cuesta</td>
<td>Moderate</td>
<td>Greyish green</td>
</tr>
<tr>
<td>CS</td>
<td>VempalleFormation</td>
<td>Dolomite+Chert+Shale</td>
<td>Cuesta</td>
<td>Moderate</td>
<td>Light green</td>
</tr>
<tr>
<td>CS</td>
<td>VempalleFormation</td>
<td>Dolomite</td>
<td>Cuesta</td>
<td>Moderate to good</td>
<td>Green</td>
</tr>
<tr>
<td>CS</td>
<td>Galcheta Quartzite</td>
<td>Quartzite</td>
<td>Cuesta</td>
<td>Poor</td>
<td>Red</td>
</tr>
<tr>
<td>LS</td>
<td>Galcheta Quartzite</td>
<td>Quartzite</td>
<td>Limestone</td>
<td>Poor</td>
<td>Red</td>
</tr>
</tbody>
</table>