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Generalized Geologic Map for Land-Use Planning: Carter County, Kentucky

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<table>
<thead>
<tr>
<th>LAND USE PLANNING TABLE DEFINITIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Non-Natural Slopes</strong></td>
</tr>
<tr>
<td><strong>Slight to Moderate</strong></td>
</tr>
<tr>
<td><strong>Severe to Moderate</strong></td>
</tr>
<tr>
<td><strong>Severe to Slight</strong></td>
</tr>
<tr>
<td><strong>Virtually No Limitations</strong></td>
</tr>
</tbody>
</table>

**What Are the Factors That Cause Landslides?**

- **Soil:** SLOPE UNSTABILIZED BY SOIL CONDITIONS. Slope instability may be caused by the presence of organic materials, which can reduce soil cohesion and increase the likelihood of landslides.
- **Geologic:** SLOPE UNSTABILIZED BY GEOLN8IC CONDITIONS. Geologic conditions such as weathered rock, fractured rock, or weak rock layers can contribute to slope instability.
- **Hydrologic:** SLOPE UNSTABILIZED BY HYDROLGIC CONDITIONS. Factors such as excessive rainfall, snowmelt, or underground water can increase the load on a slope and contribute to instability.
- **Tectonic:** SLOPE UNSTABILIZED BY TECTONIC CONDITIONS. Tectonic activity, such as earthquakes, can cause movement and instability in slopes.
- **Anthropogenic:** SLOPE UNSTABILIZED BY HUMAN-RELATED CONDITIONS. Human activities such as deforestation, construction, or mining can alter the natural stability of a slope.

**What Are Some Ways to Prevent Landslides?**

1. **Maintain Natural Slopes:** Alter the natural slope of the building site as little as possible during construction. Never remove soil from the toe of the slope during construction.
2. **Construct Retaining Walls:** Use retaining walls to control soil movement and reduce the risk of landslides. This is particularly important for steep or unstable slopes.
3. **Implement Drainage Systems:** Establish effective drainage systems to redirect water flow and prevent saturation. This helps reduce the weight on the slope and minimizes the risk of landslides.
4. **Use Geosynthetic Reinforcement:** Use geosynthetic materials such as geotextiles or geogrids to reinforce the slope and improve stability.
5. **Monitor Slopes Regularly:** Conduct regular monitoring of slopes to detect early signs of instability and take prompt action to address potential problems.
6. **Consult Geologists:** For complex situations, consult geologists or engineering geologists who can provide professional advice and expertise in managing slope stability.

**Planning Guidance by Rock Unit Type**

<table>
<thead>
<tr>
<th>Rock Unit</th>
<th>Description</th>
<th>Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limestone</td>
<td>Thin soils.</td>
<td>Slight to Moderate</td>
</tr>
<tr>
<td>Sandstone</td>
<td>Reservoir may leak.</td>
<td>Severe to Slight</td>
</tr>
<tr>
<td>Shale</td>
<td>Reservoir may leak.</td>
<td>Severe to Slight</td>
</tr>
<tr>
<td>Coal</td>
<td>Reservoir may leak.</td>
<td>Severe to Slight</td>
</tr>
</tbody>
</table>

**Additional Resources**

- How to avoid slope instability at various sites: what are the factors that cause landslides? https://doi.org/10.13023/kgs.mc132.12
- Kentucky Geological Survey: A comprehensive source for geological information and resources.

**Map and Chart 132**

- KYG-2005-6, Kentucky Water Resources Data Center, Digital Vectorized Geologic Quadrangle Data DVGQ-1262. Adapted from Englund, K.J., 1976, Geologic map of the Grahn Quadrangle, Harrison County, Kentucky, scale 1:24,000.