Recess GWB: Summary of Initial Characterisation.

<table>
<thead>
<tr>
<th>Hydrometric Area</th>
<th>Associated surface water features</th>
<th>Associated terrestrial ecosystem(s)</th>
<th>Area (km²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>31 Galway County Council</td>
<td><strong>Rivers:</strong> Recess, Owentooey, Glencoaghan, Gleninagh, Screeb, Tooreenacooona. <strong>Lakes:</strong> An Loch Ard, Athry, Ballynahinch, Dean's Island, Derryclare, Garroman or Glendolough, Illion, Lehanagh, Lehanaghbeg, Loch na Cuige Rua, Inagh, Nablaecan, Naboiley, Nagasser, Shindilla, Loughaun, Loughaunnagrevagh, Loughbegcanadroma, Oorid.</td>
<td>The Twelve Bens / Garraun Complex (002031), Connemara Bog Complex (002034) (O’Riain, 2004).</td>
<td>~110</td>
</tr>
</tbody>
</table>

**Topography**
The land surface is characterised by steep slopes and mountainous terrain along the northwest and northeastern boundary of the GWB, flattening in a southerly direction toward Recess and toward the centre of the GWB. Elevations range from 10-720 m AOD.

**Geology and Aquifers**
- **Aquifer categories**
  - Pl: Poor aquifer which is generally unproductive except for local zones.
- **Main aquifer lithologies**
  - This GWB is composed primarily (99%) of Precambrian Quartzites, Gneisses & Schists. Table 1 gives a full listing of units and the area occupied within the GWB.
- **Key structures**
  - The rocks have undergone intense deformation, comprising faults and folds. The main fold axes trend E-W and the main fault trend is NW-SE.
- **Key properties**
  - No transmissivity data are available for the Precambrian Quartzites, Gneisses & Schists in the GWB, however in the Clifden GWB, the data indicate low transmissivities – in the range of 0.7-20 m²/d. In the vicinity of faults, transmissivity may be higher. The rocks are characterised by the absence of an intergranular permeability and the presence of low fissure permeability (Daly, 1985). Storativity is expected to be low (~0.5%). The data are inadequate to calculate groundwater gradients, however, these are expected to be greater than 0.01.

**Overlying Strata**
- **Lithologies**
  - A full list of subsoil classification for the GWB is given in Table 2. Blanket Peat covers 41% of the area, rock at the surface 45%.
- **Thickness**
  - The thickness of peat ranges from 0-6 m depending on topography (Daly, 1985). It is expected that subsoil thickness is greater in the valleys.
- **% area aquifer near surface**
  - [Further Information to be added at a later date]
- **Vulnerability**
  - [Further Information to be added at a later date]

**Recharge**
- **Recharge mechanisms**
  - Diffuse recharge occurs via rainfall percolating through the subsoil and rock outcrops. Due to the low permeability of much of the subsoil (blanket peat) and the aquifers, a high proportion of the available recharge will discharge rapidly to the streams. In addition, the steep slopes in the mountainous areas promote surface runoff. Evidence for this is the stream density, which is greater than 1 km/km².
- **Est. recharge rates**
  - [Further Information to be added at a later date]

**Discharge**
- **Large springs and large known abstractions (m³/d)**
  - There are no known large springs or abstractions in the GWB.
  - [Information to be added to and checked]
- **Main discharge mechanisms**
  - Shallow groundwater is likely to discharge to streams and lakes, but the limited bedrock transmissivity means that the baseflow component of the total streamflow will be low. Small springs and seeps are likely to issue at the stream heads and along their course.
- **Hydrochemical Signature**
  - It has a calcium-magnesium bicarbonate signature (Ca-MgHCO₃). Wells north of Clifden have [n=8]:
    - Alkalinity (mg/l as CaCO₃): range = 32-180, median = 88;
    - Total Hardness (mg/l): range 82-336, median 117 (slightly Hard).
- **Groundwater Flow Paths**
  - Groundwater flow is expected to be concentrated in fractured and weathered zones and in the vicinity of fault zones. Flow paths are likely to be up to 100 m, with groundwater discharging rapidly to nearby streams and small springs. Overall, flow directions follow topography, generally to the south. Water levels are generally 0-6 m below ground level.
Groundwater will discharge locally to streams and rivers crossing the aquifer and also to small springs and seeps. Owing to the poor productivity of the aquifers in this body it is unlikely that any major groundwater - surface water interactions occur. Baseflow to rivers and streams is likely to be relatively low. Lakes comprise approximately 9% of the GWB.

**Conceptual model**

- The GWB is bounded to the northeast and northwest surface water catchment divides. The southern boundary is marked by the Precambrian Marbles. The terrain is mountainous along the northwestern and northeastern areas, flattening toward the centre of the GWB and to the southern boundary toward Recess.
- The GWB is composed primarily of low transmissivity rocks. Most of the groundwater flux is in the uppermost part of the aquifer: comprising a broken and weathered zone typically less than 3m thick; a zone of interconnected fissuring typically less than 10m; and a zone of isolated fissuring typically less than 150m.
- Groundwater flow is expected to be concentrated in fractured and weathered zones and in the vicinity of fault zones.
- Recharge occurs diffusely through the subsoils and rock outcrops. Recharge is limited by the peat and the low permeability bedrock, thus most of the available recharge discharges rapidly to nearby streams.
- Flow paths are likely to be short (0-100 m) with groundwater discharging rapidly to nearby streams and small springs and flow directions are expected to follow topography. Overall flow direction is southwards.
- The rock units in GWB are generally of low permeability and baseflow to rivers and streams is likely to be relatively low.

**Attachments**

Table 1, 2 and Figure 1.

**Instrumentation**

Stream gauges: 31001, 31005.
EPA Representative Monitoring points: None

**Information Sources**


**Disclaimer**

Note that all calculation and interpretations presented in this report represent estimations based on the information sources described above and established hydrogeological formulae.

**Table 1. List of Rock units**

<table>
<thead>
<tr>
<th>Rock Unit</th>
<th>% Area GWB</th>
<th>Description</th>
<th>Code</th>
<th>Unit Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Granites &amp; other Igneous Intrusive rocks</td>
<td>0.39%</td>
<td>Medium/coarse non-porphryitic granite</td>
<td>OuGr</td>
<td>Oughterard Granite</td>
</tr>
<tr>
<td>Precambrian Quartzites, Gneisses &amp; Schists</td>
<td>99.55%</td>
<td>Psammitic pelitic &amp; semi-pelitic schists</td>
<td>ST</td>
<td>Streamstown Schist Formation</td>
</tr>
<tr>
<td>Silurian Metasediments and Volcanics</td>
<td>0.05%</td>
<td>Calcareous psammitite, quartzite at top</td>
<td>LN</td>
<td>Lough Nacorra Formation</td>
</tr>
<tr>
<td>Precambrian Marbles</td>
<td>0.00%</td>
<td>Marbles, schists and grits</td>
<td>LM</td>
<td>Lake Marbles Formation</td>
</tr>
</tbody>
</table>

**Table 2. Subsoil types**

<table>
<thead>
<tr>
<th>Parent Material</th>
<th>Code</th>
<th>% Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alluvium</td>
<td>A</td>
<td>0.06%</td>
</tr>
<tr>
<td>Blanket Peat</td>
<td>BktPt</td>
<td>41.40%</td>
</tr>
<tr>
<td>Lakes</td>
<td>Lake</td>
<td>8.65%</td>
</tr>
<tr>
<td>Islands</td>
<td>Lk_isle</td>
<td>0.17%</td>
</tr>
<tr>
<td>Madeground</td>
<td>Made</td>
<td>0.01%</td>
</tr>
<tr>
<td>Rock at surface</td>
<td>Rck</td>
<td>45.34%</td>
</tr>
<tr>
<td>scree</td>
<td>Scree</td>
<td>0.03%</td>
</tr>
<tr>
<td>Metamorphic Till</td>
<td>TMP</td>
<td>4.34%</td>
</tr>
</tbody>
</table>
Figure 1. Boundaries and Location of Recess GWB.