

1st Draft Clare Island GWB Description August 2005

Clare Island GWB: Summary of Initial Characterisation.

Hydrometric Area Local Authority	Associated surface water features	Associated terrestrial ecosystem(s)	Area (km ²)									
32 Mayo Co Co	Lakes: Leinapollbruty, Creggan. Several unnamed streams.	none (O'Riain, 2004).	~ 16									
Topography	The land surface of the island is characterised by several hills mixed with low-lying flat areas. The island is bordered by a rocky coastline interspersed with rare sandy beaches. Elevations range from 10-460 mAOD. There are several streams and lakes.											
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">Aquifer categories</td> <td>The main aquifer category is: Pl: Poor aquifer which is generally unproductive except for local zones. At the eastern end of the island there is a small area of Ll: Locally important aquifer which is moderately productive only in local zones, and Lm: Locally important aquifer which is generally moderately productive.</td> </tr> <tr> <td>Main aquifer lithologies</td> <td>The rocks are composed of Silurian Metasediments and Volcanics and Dinantian Sandstones.</td> </tr> <tr> <td>Key structures</td> <td>The rocks in the GWB have undergone several episodes of deformation, comprising intense folding and faulting. The main structural trend is E-W. Bedrock strata dip moderately steeply (30-70°) both northwards and southwards. An E-W trending syncline is present on the southern end of the island.</td> </tr> <tr> <td>Key properties</td> <td>There are no data available. The aquifer lithologies and structure are similar to the nearby Clifden-Castlebar GWB. Data for that GWB indicate low transmissivities – in the range of 0.7-20 m²/d. In the vicinity of faults, transmissivity may be higher. 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. The eastern parts of the island that are classed as Lm and Ll may have better aquifer properties but the area occupied is small (approximately 2 km²).</td> </tr> <tr> <td>Thickness</td> <td>Most groundwater flux will be in the uppermost part of the aquifer.</td> </tr> </table>			Aquifer categories	The main aquifer category is: Pl: Poor aquifer which is generally unproductive except for local zones. At the eastern end of the island there is a small area of Ll: Locally important aquifer which is moderately productive only in local zones, and Lm: Locally important aquifer which is generally moderately productive.	Main aquifer lithologies	The rocks are composed of Silurian Metasediments and Volcanics and Dinantian Sandstones.	Key structures	The rocks in the GWB have undergone several episodes of deformation, comprising intense folding and faulting. The main structural trend is E-W. Bedrock strata dip moderately steeply (30-70°) both northwards and southwards. An E-W trending syncline is present on the southern end of the island.	Key properties	There are no data available. The aquifer lithologies and structure are similar to the nearby Clifden-Castlebar GWB. Data for that GWB indicate low transmissivities – in the range of 0.7-20 m ² /d. In the vicinity of faults, transmissivity may be higher. 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. The eastern parts of the island that are classed as Lm and Ll may have better aquifer properties but the area occupied is small (approximately 2 km ²).	Thickness
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Thickness	Most groundwater flux will be in the uppermost part of the aquifer.											
Geology and Aquifers	Lithologies No data available.											
	Thickness No data available.											
	% area aquifer near surface <i>[Further Information to be added at a later date]</i>											
	Vulnerability <i>[Further Information to be added at a later date]</i>											
Overlying Strata	Lithologies No data available.											
	Thickness No data available.											
Recharge	Main recharge mechanisms Diffuse recharge is expected to occur via rainfall percolating through the subsoil and rock outcrops. The steep slopes in the mountainous areas promote surface runoff.											
	Est. recharge rates <i>[Information to be added to and checked]</i>											
Discharge	Large springs and large known abstractions (m³/d) There are no known large springs or large abstractions in the GWB.											
	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. Seepages will develop on the coastal cliff faces.											
	Hydrochemical Signature No data available, however, the signature in the Clifden-Castlebar GWB is predominantly Ca-Mg-HCO ₃ .											
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 short (30-300 m) with groundwater discharging rapidly to nearby streams and small springs. Groundwater flow directions are expected to follow topography.										
Groundwater & Surface water interactions		Groundwater will discharge locally to streams and 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.										

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Conceptual model	<ul style="list-style-type: none"> • The land surface is characterised by a relatively hilly terrain. • The GWB is composed primarily of low transmissivity rocks. • Groundwater flow is expected to be concentrated in fractured and weathered zones and in the vicinity of fault zones. • Diffuse recharge is expected to occur via rainfall percolating through the subsoil and rock outcrops. • Flow paths are likely to be short (30-300 m) with groundwater discharging rapidly to nearby streams and small springs. • Flow directions are expected to follow topography. • The rock units are generally of low permeability, thus baseflow to rivers and streams is likely to be relatively low.
Attachments	None
Instrumentation	<p>Stream gauges: None</p> <p>EPA Water Level Monitoring boreholes: None</p> <p>EPA Representative Monitoring points: None</p>
Information Sources	<p>Morris, J.H., Long, B., McConnell, J.B. Archer (1995). <i>Geology of Connemara. An introduction to the physical structure, ancient environments and modern landscapes of parts of northwest Galway and southwest Mayo, to accompany the bedrock geology 1:100,000 scale map series, sheet 10, Connemara.</i> Geological Survey of Ireland Map Series Report.</p> <p>O' Riain, G., (2004). <i>Water Dependent Ecosystems and Subtypes Draft Report.</i> WFD Support Projects. Compass Informatics in association with National Wildlife and Parks Service (DEHLG).</p>
Disclaimer	Note that all calculation and interpretations presented in this report represent estimations based on the information sources described above and established hydrogeological formulae.