

Achill GWB: Summary of Initial Characterisation.

Hydrometric Area Local Authority	Associated surface water features	Associated terrestrial ecosystem(s)	Area (km <sup>2</sup> )
33 Mayo Co Council	<b>Rivers:</b> Dooege, Tenreege, Sraheens, Gallaghers. <b>Lakes:</b> Black, Bunacurry, Bunnafreva East, Bunnafreva West, Dooniver, Keel, Acorymore, Corryntawy, Doo, Gall, Nakeeroge, Nambrack, Loughannascaddy, Mweelin, Sraheens, Scrubhillbeg, Tinney.	Keel Lough, Keel Machair and Menaun Cliffs (O’ Riain, 2004).	148
<b>Topography</b>	The GWB comprises Achill island. The GWB is completely bounded by coastline. The land surface is characterised by steep slopes and mountainous terrain, which dip steeply into the sea. There are low lying flat areas between Keel and Doogort in the northern part of the island. Elevations range from 0 mAOD to 670 mAOD.		
<b>Geology and Aquifers</b>	<b>Aquifer categories</b>	The main aquifer category in this GWB is: <b>PI:</b> Poor aquifer which is generally unproductive except for local zones. It composes 100% of the GWB.	
	<b>Main aquifer lithologies</b>	This GWB is composed almost entirely of Precambrian Quartzites, Gneisses & Schists. There is a thin band of Precambrian Marble at Achill Head and Cloghmore and there is a small area of Cambrian Metasediments at Cloghmore (the southern tip of the island).	
	<b>Key structures</b>	The key structural trend is NE-SW.	
	<b>Key properties</b>	There are no specific hydrogeological data for this GWB. However, the hydrogeology is expected to be similar to the adjacent Belmullet GWB. In the GWB, the data indicate low transmissivities – in the range of 1-5 m <sup>2</sup> /d. In the vicinity of faults, transmissivity may be higher. Storativity is expected to be low (<0.5%). Groundwater gradients are expected to be greater than 0.01.	
	<b>Thickness</b>	Most groundwater flux is likely to be in the uppermost part of the aquifer; comprising a broken and weathered zone typically less than 3 m thick; a zone of interconnected fissuring 10-15 m thick; and a zone of isolated poorly connected fissuring typically less than 150 m.	
<b>Overlying Strata</b>	<b>Lithologies</b>	The subsoils are dominated by Blanket Peat. At Keel there is a deposit of blown sand. There are areas on the eastern side of the GWB classified as Metamorphic Till.	
	<b>Thickness</b>	There are no data on subsoil thickness. The thickness of the blanket peat ranges from 0-6 m, depending on topography (Daly, 1985). It is expected to be thickest in the low lying area between Keel and Doogort.	
	<b>% area aquifer near surface</b>	[Further Information to be added at a later date]	
	<b>Vulnerability</b>	[Further Information to be added at a later date]	
<b>Recharge</b>	<b>Main recharge mechanisms</b>	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 poor productivity of the aquifers, a high proportion of the available recharge will discharge to the streams. In addition, the steep slopes in the mountainous areas promote surface runoff.	
	<b>Est. recharge rates</b>	[Information to be added to and checked]	
<b>Discharge</b>	<b>Large springs and large known abstractions (m<sup>3</sup>/d)</b>	There are no large abstractions or springs identified in the GWB.	
	<b>Main discharge mechanisms</b>	The main groundwater discharges are to the streams, rivers and lake. Small springs and seeps are likely to issue at the stream heads and along their course.	
	<b>Hydrochemical Signature</b>	It is expected to have a Ca-Mg HCO <sub>3</sub> signature. There are no data specific to the GWB.	
<b>Groundwater Flow Paths</b>	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 – up to 150 m, with groundwater discharging rapidly to nearby streams and small springs. Groundwater flow directions are expected to follow topography.		
<b>Groundwater &amp; Surface water interactions</b>	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. Keel Lough and Keel Machair are dependent on groundwater (O’ Riain, 2004).		

*1<sup>st</sup> Draft Achill GWB Description July .2004*

<b>Conceptual model</b>	<ul style="list-style-type: none"> <li>• The GWB is completely bounded by the coastline. The land surface is characterised by steep slopes and mountainous terrain, which slope steeply into the sea. There are low lying flat areas between Keel and Doogort in the northern part of the island. Elevations range from 0 mAOD to 670 mAOD.</li> <li>• 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.</li> <li>• 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.</li> <li>• Flow paths are likely to be short (0-150 m) with groundwater discharging rapidly to nearby streams and small springs and flow directions are expected to follow topography.</li> <li>• Groundwater discharges rapidly to nearby streams, lakes, small springs and seeps.</li> </ul>
<b>Attachments</b>	Figure 1.
<b>Instrumentation</b>	<b>Stream gauges:</b> 33072 <b>EPA Water Level Monitoring boreholes:</b> None <b>EPA Representative Monitoring points:</b> None
<b>Information Sources</b>	Long, B., Mac Dermot, C.V., Morris, J.H., Sleeman, A.G., Tietzsch-Tyler, D., (1992). <i>A geological description to accompany the Bedrock Geology 1:100,000 Scale Map Series, Sheet 6, North Mayo</i> . Geological Survey of Ireland Map Series Report. Geological Survey of Ireland Aquifer Chapters: The Ordovician, Precambrian and Ordovician Aquifers. Unpublished. 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).
<b>Disclaimer</b>	Note that all calculation and interpretations presented in this report represent estimations based on the information sources described above and established hydrogeological formulae.

**Figure 1. GWB [reference only]**

