

1st Draft Islands of Kilkerian Bay GWB Description August 2005

Kilkerian Bay and Islands GWB: Summary of Initial Characterisation.

Hydrometric Area Local Authority	Associated surface water features	Associated terrestrial ecosystem(s)	Area (km ²)
31 Galway	Lakes: Almost all the lakes and streams occur on Gorumna Island. Ballynakill, Hibbert, Awillia, Loch an Bhalla, Loch an Mhuillean, Nafiddaun, Loughaunanilra, Loch an Feannoige, Loch Ghleann an Uisce.	Coastal lagoons, machairs, salt meadows (O'Riain, 2004).	~47
Topography	There are 71 islands in the GWB, the largest of which is Gorumna (~22 km ²). The majority of the islands are within a kilometre of the mainland. The islands are grouped under a single GWB due to similar geology, geomorphology, proximity to each other, and are grouped together as one SAC, in which there are groundwater dependent terrestrial ecosystems. There are similarities to the Spiddal GWB. The islands are relatively low-lying and occasionally hilly, with elevations in the range of 0-100 mAOD.		
Geology and Aquifers	Aquifer categories	The main aquifer category is: PI: Poor aquifer which is generally unproductive except for local zones.	
	Main aquifer lithologies	This GWB is composed primarily of Igneous rocks.	
	Key structures	There are numerous mapped faults in the GWB, trending N-S and E-W. The fractures do not become in-filled because the granites have a low clay content. Tension joints, which are common in granites, are only found close to the surface. Regional joints become tight and impermeable at depth.	
	Key properties	There are no data available. The rocks are characterised by the absence of an intergranular permeability and the presence of low fissure permeability (Daly, 1985). Transmissivity data available for the granites in the Leinster region is in the order of 20-30 m ² /d. In the vicinity of faults, transmissivity may be higher. Storativity is expected to be low (<0.5%). Resistivity surveys show areas of low resistivity in the vicinity of faults and this was interpreted as due to water in-filled fissures (Daly 1985). The data are inadequate to calculate groundwater gradients, however, are expected to be greater than 0.01.	
	Thickness	Most groundwater flux will be in the uppermost part of the aquifer.	
Overlying Strata	Lithologies	Granitic Till, Blanket Peat and wind blown sands have been mapped on the largest islands, however, outcropping rock is predominant. No data available for the smaller islands.	
	Thickness	No data available.	
	% area aquifer near surface	[Further Information to be added at a later date]	
	Vulnerability	[Further Information to be added at a later date]	
Recharge	Main recharge mechanisms	Diffuse recharge is expected to occur via rainfall percolating through the subsoil and rock outcrops.	
	Est. recharge rates	[Information to be added to and checked]	
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 along the coastline.	
	Hydrochemical Signature	No data available.	
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 streams is likely to be relatively low.		

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Conceptual model	<ul style="list-style-type: none"> • The land surface of the islands is characterised by a low-lying occasionally 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	Figure 1.
Instrumentation	Stream gauges: None EPA Water Level Monitoring boreholes: None EPA Representative Monitoring points: None
Information Sources	Daly, D. (1985) <i>Groundwater in County Galway with particular reference to its Protection from Pollution</i> . Geological Survey of Ireland report for Galway County Council. 98pp. Pracht, M., Lees, A., Leake, B., Feely, M., Long, B., Morris, J., McConnell, B., (2003). <i>A geological description to accompany the Bedrock Geology 1:100,000 Scale Map Series, Sheet 14, Galway Bay</i> . Unpublished Geological Survey of Ireland Map Series Report. 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).
Disclaimer	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. Location and boundaries of GWB

