

*1<sup>st</sup> Draft Dursey Island GWB Description September 2005*

**Dursey Island GWB: Summary of Initial Characterisation.**

Hydrometric Area Local Authority		Associated surface water features	Associated terrestrial ecosystem(s)	Area (km <sup>2</sup> )
21 Cork Co Co		No lakes Several unnamed streams.	Kenmare River (O’Riain, 2004).	~6
<b>Topography</b>	Dursey Island is located just off the Beara Peninsula, approximately 200m off the mainland. It is essentially an extension of the Beara-Sneem GWB. The island is mountainous, elevations range from 0-250mAOD and comprises steep slopes and cliffs down the sea. The island is bordered by a rocky coastline. Figure 1 shows the location and boundaries of the GWB. There are several short small streams.			
<b>Geology and Aquifers</b>	<b>Aquifer categories</b>	The main aquifer category is: <b>PI:</b> Poor aquifer, generally unproductive except for local zones.		
	<b>Main aquifer lithologies</b>	Devonian Old Red Sandstones		
	<b>Key structures</b>	The widespread faulting and folding associated with the Variscan Orogeny in the south of Ireland has given rise to zones of enhanced permeability in the mudstones and sandstones. These can occur in the immediate vicinity of faults and near the axes of folds. The mainly fine-grained nature of the rocks however means that such zones are generally local.		
	<b>Key properties</b>	[TAKEN FROM Beara Sneem GWB] Permeability generally decreases rapidly with depth in all aquifers in this GWB. In general, the ORS and Cork Group aquifer transmissivities will range 2-20 m <sup>2</sup> /d, with median values occurring towards the lower end of the range. However, ‘Excellent’ yielding wells (>400 m <sup>3</sup> /d) are known in some of the ORS units in other locations – these yields are usually associated with boreholes being situated on fault zones. Summer yields are sometimes unsustainable. Transmissivities in the small occurrences of other rock types in this GWB will be similarly low. Aquifer storativity will be low in all rock units. Groundwater gradients are likely to be in the range 0.01 to 0.04.		
	<b>Thickness</b>	Most groundwater flow occurs within the top 15-20 m of the aquifer, in the layer that comprises a weathered zone of a few metres and a connected fractured zone below this. Deeper flows occur along generally isolated faults or significant fractures.		
<b>Overlying Strata</b>	<b>Lithologies</b>	No data but rock is present all around the edge of the island.		
	<b>Thickness</b>	Rock close is expected over much of the island.		
	<b>% area aquifer near surface</b>	<i>[Further Information to be added at a later date]</i>		
	<b>Vulnerability</b>	<i>[Further Information to be added at a later date]</i>		
<b>Recharge</b>	<b>Main recharge mechanisms</b>	Diffuse recharge is expected to occur via rainfall percolating through the subsoil and rock outcrops.		
	<b>Est. recharge rates</b>	<i>[Information to be added to and checked]</i>		
<b>Discharge</b>	<b>Large springs and large known abstractions (m<sup>3</sup>/d)</b>	No data		
	<b>Main discharge mechanisms</b>	Shallow groundwater is likely to discharge mainly to the small lakes, streams or to seeps along the coastline, but the limited bedrock transmissivity means that the baseflow component of the total streamflow will be low.		
	<b>Hydrochemical Signature</b>	The Old Red Sandstone rocks largely contain calcium bicarbonate type water. Groundwater in the Old Red Sandstone rocks ranges from moderately soft to moderately hard water. Conductivities are relatively low, ranging approximately 150-450 µS/cm. High iron (Fe) and manganese (Mn) concentrations can occur, due to the dissolution of Fe and Mn from the sandstone/shale where reducing conditions occur.		
<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 (30-300 m) with groundwater discharging rapidly to the lakes, streams or to seeps along the coastline. Groundwater flow directions are expected to follow topography.		
<b>Groundwater &amp; Surface water interactions</b>		Groundwater will discharge locally to the small lakes, 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 is likely to be relatively low.		

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<b>Conceptual model</b>	<ul style="list-style-type: none"> <li>• Dursey Island is located just off the Beara Peninsula, approximately 200m off the mainland. It is essentially an extension of the Beara-Sneem GWB. The island is mountainous, elevations range from 0-250mAOD and comprises steep slopes and cliffs down the sea.</li> <li>• The GWB is composed of low transmissivity rocks.</li> <li>• Groundwater flow is expected to be concentrated in fractured and weathered zones and in the vicinity of fault zones.</li> <li>• Diffuse recharge is expected to occur via rainfall percolating through the subsoil and rock outcrops.</li> <li>• Flow paths are likely to be short (30-300 m) with groundwater discharging rapidly to the lakes, streams or to seeps along the coastline.</li> <li>• Flow directions are expected to follow topography.</li> <li>• Owing to the poor productivity of the aquifers in this body it is unlikely that any major groundwater - surface water interactions occur.</li> </ul>
<b>Attachments</b>	Figure 1.
<b>Instrumentation</b>	<b>Stream gauges:</b> None <b>EPA Water Level Monitoring boreholes:</b> None <b>EPA Representative Monitoring points:</b> None
<b>Information Sources</b>	<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> <p>Pracht M (1996) <i>Geology of Dingle Bay: A geological description, to accompany bedrock geology 1:100,000 scale map, Sheet 20, Dingle Bay</i>. Geological Survey of Ireland. 58pp.</p> <p>Pracht M (1997) <i>Geology of Kerry-Cork: a geological description, to accompany bedrock geology 1:100,000 scale map, Sheet 21, Kerry - Cork</i>. Geological Survey of Ireland. 70pp</p> <p>Pracht M, Sleeman AG (2002) <i>Geology of West Cork: A geological description, to accompany bedrock geology 1:100,000 scale map, Sheet 24, West Cork</i>. Geological Survey of Ireland. 79pp.</p> <p>Wright GR, Conlon V (1998) <i>County Kerry Aquifer Classification</i>. Unpublished GSI report produced for Kerry County Council. Geological Survey of Ireland.</p>
<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. Dursey Island GWB

