Rathnacally GWB: Summary of Initial Characterisation.

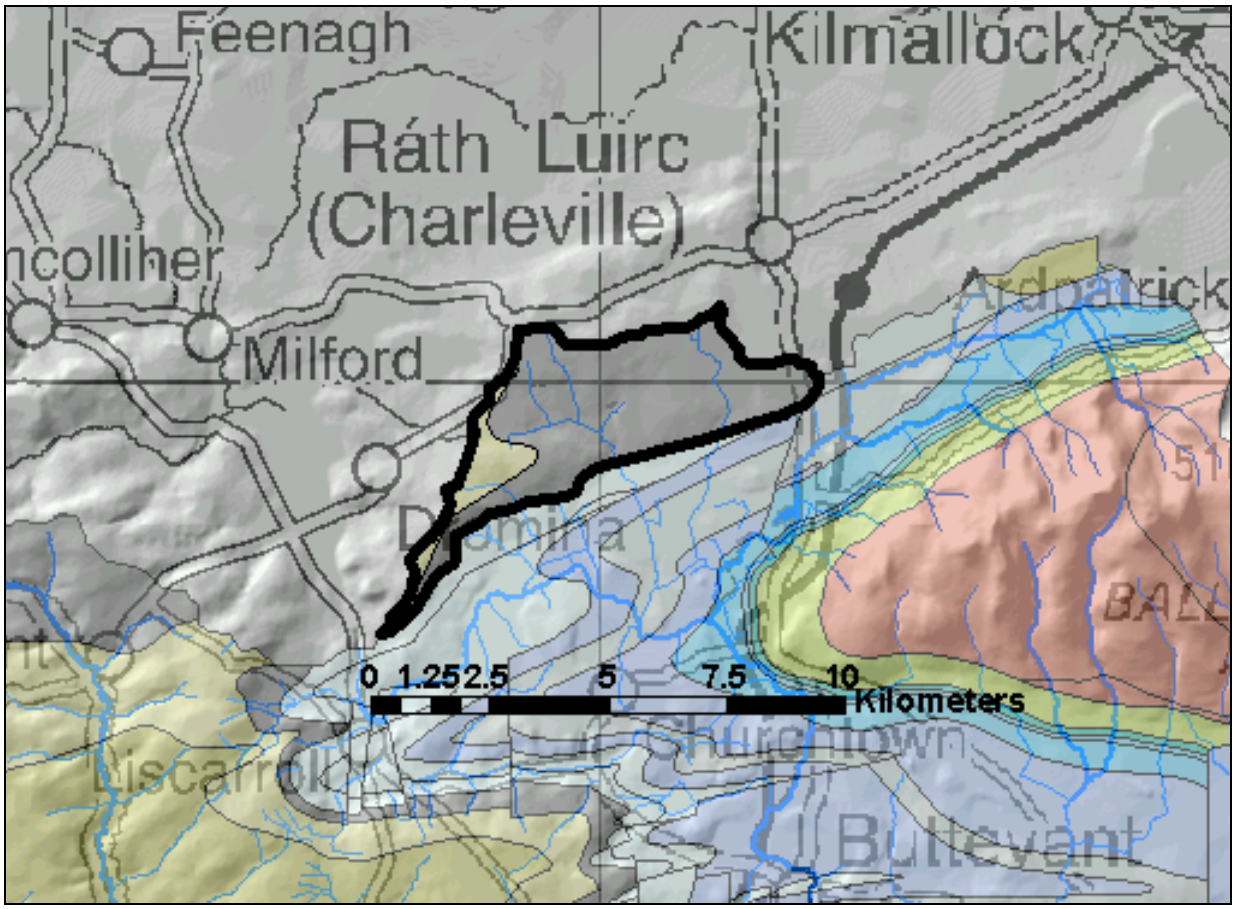
Hydrometric Area Local Authority	Associated surface water features	Associated terrestrial ecosystem(s)	Area (km^2)
18 Cork Co. Co.	None	None currently recorded	19

Topography	This small GWB at the northern edge of the SWRBD is bounded to the south by the Mitchelstown GWB, and has the Newtown-Ballyhea GWB adjacent to the east. The area is a dissected upland with elevations ranging from approximately 100 to 190 metres OD. Drainage is to the south and southeast.	
Geology and Aquifers	**Aquifer categories**	**Pu:** Poor aquifer which is generally unproductive (88%) **Ll:** Locally important aquifer which is moderately productive only in local zones (12%)
	Main aquifer lithologies	Namurian Shales (88%), Namurian Sandstones (12%).
	Key structures	The Namurian and Dinantian rocks have been folded by the Variscan Orogeny into a series of east-west trending anticlines and synclines, with associated systems of faults and joints which created some pathways for groundwater movement.
	Key properties	The Namurian rocks are composed of a variety of thin sandstones, siltstones, flagstones, mudstones and shales. Hydrogeological data are poor for all formations except the Upper Namurian Beds. The sandstone beds within the rock groups have a slightly higher permeability than the shales due to their greater ability to fracture. Water levels have been recorded at depths of more than 20 m but in general the water table is close to the surface reflecting the low permeability of the rock. There are a number of artesian supplies where the sandstone beds are confined by the shales and mudstones. Wells are generally low yielding although some have recorded yields of more than 100 m^3/d. Specific capacities are usually low being less than 5 m^3/d/m.
	Thickness	The rock units themselves are extremely thick, but the depth of groundwater circulation is probably limited to about 120 metres, and most active circulation is much less deep.
Overlying Strata	**Lithologies**	*Subsoil Types identified in Rathnacally GWB by Teagasc Parent Material Mapping (Draft): Limestone sands and gravels (Carboniferous) (GLs); Made Ground (Made); Rock outcrop and rock close to surface (Rck); Till – Namurian Sandstone and Shale Till (TDSs).*
	Thickness	Depth to bedrock has not been mapped in this GWB.
	% area aquifer near surface	
	Vulnerability	Groundwater vulnerability has not been mapped in this GWB.
Recharge	**Main recharge mechanisms**	Recharge will be diffuse, from rainfall percolating through the subsoil or areas of outcropping rock.
	Est. recharge rates	*To be assessed*
Discharge	**Large springs and high yielding wells (m^3/d)**	*Note: The following data need to be checked and updated by RBD Project Consultants.* Data from GSI Well Database: Additional data from EPA Groundwater Sources List:
	Main discharge mechanisms	Due to the generally low permeability of the aquifers within this GWB and the high slopes, a high proportion of the recharge will discharge rapidly to surface watercourses via the upper layers of the aquifer, effectively reducing the available groundwater resource in the aquifer.
	Hydrochemical Signature	No data are known from this GWB. By analogy with similar areas, the hydrochemical signature is probablyCalcium Bicarbonate, the water generally soft to slightly hard (<150 mg/l as $CaCO_3$), pH between 5.5 and 8; with low pH (<6.5) a common problem. The main groundwater quality problems due to the natural chemistry of groundwater are probably caused by iron (Fe). A high proportion of wells in Namurian rocks have high iron concentrations and to a lesser extent manganese (Mn).

Groundwater Flow Paths	These rocks have no intergranular permeability; groundwater flow occurs in fractures and faults. Permeability is highest in the upper few metres but generally decreases rapidly with depth. In general, groundwater flow is concentrated in the upper 15 m of the aquifer, although deeper inflows from along fault zones or connected fractures can be encountered. Significant yields can be obtained where boreholes are drilled into known fault zones. However, yields are not necessarily sustainable, as the fracture networks are generally not extensive or well connected but primarily concentrated in the vicinity of the fault zones. Springs occur in some instances on fault zones. Groundwater levels are about 1.5-15 m below ground level, and will generally follow the topography. Close to the rivers and streams, water levels will be near ground level. Surface water features are considered to be in hydraulic continuity with the water table. Groundwater flow will be local. Groundwater flow paths are generally short, typically 30-300 m, with groundwater discharging to small springs, or to the streams and rivers that traverse the aquifer. Flow directions are expected to approximately follow the local surface water catchments. Groundwater is generally unconfined.
Groundwater & Surface water interactions	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.

Conceptual model	• The groundwater body is bounded to the north by the topographic high and surface water divide which forms the boundary of the SWRBD. • The topography of this body is a dissected upland, with ground level rising from about 100 metres OD to elevations of 190 metres OD at the southwestern end. • The groundwater body is comprised of rocks with low transmissivity and storativity, although localised zones of enhanced permeability may occur along fault zones. • Flow occurs along fractures, joints and major faults. Flows in the aquifer are generally concentrated in a thin zone at the top of the rock, although deeper groundwater flows along faults and major fractures. • Diffuse recharge occurs across the GWB through the subsoils and rock outcrops. Due to the generally low permeability of the aquifers within this GWB and the high slopes, a high proportion of effective rainfall will runoff, or discharge rapidly to surface water courses via interflow and shallow flow. Where water levels within the unconfined aquifer are high, potential recharge will also be rejected. • The water table can vary between a few metres up to more than 10 m below ground surface, depending upon topography. Groundwater is generally unconfined. Flow path lengths are generally short, ranging 30-300 m. Local groundwater flow directions are controlled by local topography. Overall, groundwater flows to south and east from the topographic highs.
Attachments	None
Instrumentation	**Stream gauges:** None **EPA Water Level Monitoring boreholes:** None **EPA Representative Monitoring points:** None
Information Sources	Pracht M (1997) *Geology of Kerry-Cork: a geological description, to accompany bedrock geology 1:100,000 scale map, Sheet 21, Kerry - Cork.* Geological Survey of Ireland. 70pp
Disclaimer	Note that all calculation and interpretations presented in this report represent estimations based on the information sources described above and established hydrogeological formulae

Rathnacally GWB (For reference only)



List of Rock units in Rathnacally GWB

Rock unit name and code	Description	Rock unit group	Aquifer Classification
Cloone Flagstone Formation (CF)	Greywacke, siltstone & silty shale	Namurian Sandstones	Ll
Clare Shale Formation (CS)	Mudstone, cherty at base	Namurian Shales	Pu