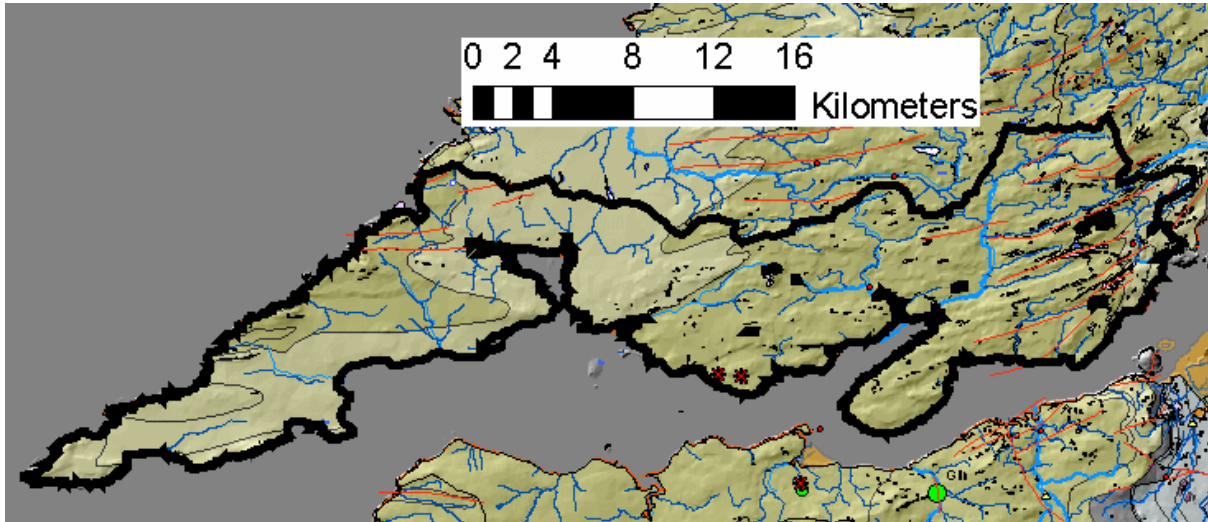


Kilrush GWB: Summary of Initial Characterisation.

| Hydrometric Area Local Authority | Associated surface water features | Associated terrestrial ecosystems | Area (km ²) |
|---|--|---|-------------------------|
| 27 - South Clare/ Shannon Estuary Clare Co. Co. | Rivers: Cloon, Crompaun, Wood, Doonaha, Moyarta; Loughs: Lomaun, Cloughaun, Knockerra, Tarmon, Gortglass, Cloonsnaghta, Athoga, Efferan. | <i>Information to be added at a later date</i> | 400 |
| Topography | The groundwater body is situated in the south of Co. Clare, and the Shannon Estuary forms the southern boundary. In the west, the coast bounds the GWB. The northern and eastern boundaries are surface water catchment divides. The GWB is elongated east-west. The majority of the GWB is between 20-60 mAOD, although ground elevations range from sea level to 167 mAOD. The higher elevations (100+ mAOD) are concentrated along the eastern boundary, although there are two local high points near to the sea at Moveen Hill (136 mAOD) and at Knocknagarhoon (127 mAOD). In the east, the east-west drainage pattern is controlled by the folding of the rocks. In the west, streams cross geological boundaries and incise the substrate. Drainage, relative to other areas in Co. Clare over similar rock types, appears to be relatively good. | | |
| Geology and Aquifers | Aquifer category(ies) | LI : Locally important aquifer which is moderately productive only in local zones. | |
| | Main aquifer lithologies | Namurian Sandstones and Namurian Undifferentiated. | |
| | Key structures | The rocks are folded into relatively small folds with wavelengths of about 3 km. The fold axes trend WSW-ENE; strata dip at right angles to the fold axes at angles from 10-50°. No major faults are mapped the area. Fractures and jointing may be more open on the fold axes. | |
| | Key properties | Transmissivity is in the range 2–20 m ² /d although higher values may be achieved in faulted zones. South of the Shannon Estuary at Glin WS, a pumping test gave a transmissivity of 14 m ² /d [estimate range 7-27 m ² /d]. Aquifer storativity is low. At Glin WS, estimated groundwater gradients are 0.04 - 0.05. Over the GWB, they are likely to be in the range 0.02 – 0.05. | |
| | Thickness | In general, the effective thickness of the upper part of the aquifer is likely to be about 10 m, comprising a weathered zone of a few metres and a connected fractured zone below this. However, deep water strikes (30-90 m) are noted in this aquifer, and are associated with better yields and productivities, and wells are often overflowing. Permeable zones are met at deeper levels than in other rocks. In a 3 km deep exploration borehole drilled by Ambassador Oil near Doonbeg, for example, water was struck at 107 m and then intermittently until a depth of 610 m. | |
| Overlying Strata | Lithologies | <i>[Information to be added at a later date]</i> | |
| | Thickness | Subsoil thicknesses range from 1 m to over 20 m, and generally decrease eastwards. Subsoils are thickest around Poulmasherry Bay and in the area to the southwest of the Bay. Outcrop is mainly confined to coastal areas and the uplands in the east. | |
| | % area aquifer near surface | <i>[Information to be added at a later date]</i> | |
| | Vulnerability | Groundwater vulnerability is Extreme to High in the eastern part of the GWB, east of Kilrush. Groundwater vulnerability is predominantly Low around Poulmasherry Bay and westwards towards Loop Head, although small areas of Extreme and High Vulnerability occur. Extreme and High vulnerabilities are mapped along the coast on both sides of the promontory leading to Loop Head. | |
| Recharge | Main recharge mechanisms | Diffuse recharge will occur over the entire groundwater body via rainfall soaking through the subsoil. A percentage of rainfall will not recharge the aquifer, but will runoff. Most recharge will occur where overlying subsoils are thinner. | |
| | Est. recharge rates | <i>[Information to be added at a later date]</i> | |
| Discharge | Springs and large known abstractions (m ³ /d) | Roadstone Readymix plant [110 m ³ /d]; Kilrush WS (backup) [545 m ³ /d] – not in use in 2000 due to high ammonium levels; ESB Moneypoint [180 m ³ /d]. <i>[More Information to be added at a later date]</i> | |
| | Main discharge mechanisms | The main discharges are to the streams crossing and incising into the sandstone and shale rock units. 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 are currently available for this GWB. Groundwaters in the Ballylongford GWB (on the opposite side of the Shannon Estuary) are moderately hard (120-270 mg/l CaCO ₃) and have moderate alkalinities (170-240 mg/l CaCO ₃). Measured electrical conductivity ranges from ~440-560 µS/cm. Spring waters (Tarbert WS) have a calcium bicarbonate signature. Groundwater sampled from a borehole (Glin WS) has a signature varying from Ca-HCO ₃ to Na/K-HCO ₃ and alkalinities greater than total hardness. This is typical of confined waters where ion exchange has occurred. Reducing conditions may also occur. Both iron and manganese can exceed allowable concentrations, these components coming from the shales. Background chloride concentrations will be higher than in the Midlands, due to proximity to the sea. The Namurian bedrock strata of this aquifer are siliceous . | |

| | |
|---|--|
| Groundwater Flow Paths | These rocks are devoid of intergranular permeability; groundwater flow occurs in fractures, joints and faults. Generally, groundwater levels are 0-9 m below ground level (median 4 mbgl), and follow the topography. Deeper water levels, up to 18 mbgl are observed, however, which indicate that there may be zones that are hydraulically isolated from the rest of the aquifer. Unconfined groundwater flow paths are short (30-300 m), with groundwater discharging to seeps, small springs and streams. Groundwater perched in the subsoil is shallow (median 2 mbgl). Artesian conditions and deep inflow levels indicate that the lower part of the aquifer is confined by shales in the succession. Groundwater travel times in this zone are relatively slow. |
| Groundwater & Surface water interactions | The streams crossing the aquifer are gaining. Dry weather flows in Abbeyfeale GWB on the south of the Shannon are low (0.1 to 0.5 l/s/km ² at 5 stations), indicating that the aquifer has low storage. Small springs and seeps contribute to river flows. |
| Conceptual model | <ul style="list-style-type: none"> • The groundwater body is bounded to the south by the Shannon Estuary. In the west, the coast bounds the GWB. The northern and eastern boundaries are surface water catchment divides. The GWB is elongated east-west. The terrain is low-lying except in the very east, where it is hilly. • The groundwater body is composed primarily of low permeability rocks, although localized zones of enhanced permeability do occur along faults and in coarser layers. Groundwater flows along fractures, joints and major faults. • Recharge occurs diffusely through the subsoils and via outcrops. It occurs especially in areas where the subsoil is thinner. • The aquifers within this GWB are both unconfined and confined. Most flow in this aquifer will occur near the surface; the effective thickness of the unconfined part of aquifer is likely to be about 10 m, comprising a weathered zone of a few metres and a connected fractured zone below this. The water table is from 0-9 m below ground level and follows topography. Deep inflow levels and artesian wells indicate confined conditions in higher permeability strata from which better yields can be obtained. Unconfined flow path lengths are relatively short, and in general are between 30 and 300 m. Confined flow paths may be significantly longer. • Groundwater discharges to the numerous small streams crossing the aquifer, and to the springs and seeps. Local unconfined flow directions are oblique to the surface channels. Overall, east of Poulmasherry Bay, the flow direction is to the west and south. West of the Bay, flow is to the north and south of the promontory leading to Loop Head. |
| Attachments | N/A |
| Instrumentation | Stream gauges: 27006, 27007 |
| Information Sources | Deakin, J. and Daly, D. (2000) County Clare Groundwater Protection Scheme. Geological Survey of Ireland Report to Clare Co. Co., 67 pp. Hudson, M. (1995) Glin WS: Groundwater Source Protection Zones. Geological Survey of Ireland Report to Limerick Co. Co., 8 pp. Aquifer Chapter: Namurian Undifferentiated, Shales, Sandstones |
| Disclaimer | Note that all calculations and interpretations presented in this report represent estimations based on the information sources described above and established hydrogeological formulae |



Rock units in GWB

| Rock unit name and code | Description | Rock unit group |
|--------------------------------|--------------------|---------------------------|
| Ross Sandstone Formation (RS) | | Namurian Sandstones |
| Gull Island Formation (GI) | | Namurian Sandstones |
| Tullig Sandstone (TS) | | Namurian Sandstones |
| Central Clare Group (CCG) | | Namurian Undifferentiated |