Killavally GWB: Summary of Initial Characterisation.

Hydrometric Area Local Authority	Associated surface water features	Associated terrestrial ecosystem(s)	Area (km^2)
30 Mayo Co. Co.	**Rivers**: Aille, Cloon, Camoge, Claureen. **Streams**: Lough Nacorralea Stream. **Lakes**: Aille, Cloon, Cooley, Derrew, Derryerin, Derrynawillin, Beg, Namuddagh, Brennan, Carra, Kip, Mask, Nacorralea, Nageltia, Loughanadivsha, Loughaunbegs, Rann's, Sraheena, Terilegee.	Lough Carra/Mask Complex (001774), Mweelrea/Sheffry/Erriff Complex (001932) (O'Riain, 2004).	69

Topography	The GWB is located on either side of the northern apex of the Partry Mountains. Killavally is located at the apex. The location and boundaries are shown in Figure 1. The western arm has an upland area toward the western boundary and elevations range from 60-200 mAOD. The eastern arm is low lying with elevations ranging from 20-50 mAOD. The GWB is principally drained by the Aille river. It is bounded to the south by the Maam-Clonbur GWB and L. Mask. It is bounded to the north and east by the Pure Bedded Limestones of the Ballyhean GWB. It is bounded to the west by a topographic and surface water divide.	
Geology and Aquifers	**Aquifer categories**	**Lm:** Locally important aquifer, generally moderately productive (70%). **Ll:** Locally important aquifer, moderately productive only in local zones. **Pl:** Poor aquifer, generally unproductive except for local zones. **Rkc**: Regionally important karstified aquifer (1.3 km^2)
	Main aquifer lithologies	Dinantian Sandstones dominate the GWB. Table 1 presents the rock units in the GWB.
	Key structures	The trend on the western side is NE-SW with the beds dipping 5-30^o to the southeast. A sycncline trending NE-SW runs through the sliver of Pure Bedded Limestones in the southwestern corner of the GWB. The Errif Valley fault, trending NE-SW marks the southern boundary of the western arm of the GWB. On the eastern side of the GWB the trend is almost N-S with the beds dipping 5-7^o to the east. Faults trending NE-SW and E-W cross the GWB.
	Key properties	There are no hydrogeological data available. However, in general, Dinantian Sandstones, given their dominant sandstone lithology, which generally results in a higher fissure permeability, has the potential to be a transmissive aquifer. Transmissivity is estimated in the Dinantian Sandstones to range from 1-150 m^2/d. In the vicinity of faults, transmissivity may be higher. Storativity in the aquifer is expected to be relatively high, in the order of 2%. The data are inadequate to calculate groundwater gradients, but are expected to be greater than 0.001.
	Thickness	Most groundwater flux is likely to be in the upper part of the aquifer, comprising three broad zones: a zone comprising a broken and weathered zone typically less than 3 m thick; a zone of interconnected fissuring up to 30 m thick; and a zone of isolated poorly connected fissuring typically less than 150 m.
Overlying Strata	**Lithologies**	The eastern side of the GWB is dominated by cutover peat, whilst the western side is dominated by blanket peat.
	Thickness	There are no data specific to the GWB, however, data from neighbouring GWB's suggest that the thickness are 3-10 m. Outcrops occur in the western part of the area.
	% 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 occurs via rainfall percolating through the subsoil and rock outcrops. A high proportion of the available recharge will discharge to the streams where there is blanket peat and low permeability till present
	Est. recharge rates	*[Further Information to be added at a later date]*
Discharge	**Large springs and high yielding wells (m^3/d)**	No large springs or wells identified.
	Main discharge mechanisms	The main groundwater discharges are to the streams, rivers and lakes.
	Hydrochemical Signature	There are no data available, however, it is expected to have a $CaHCO_3$ signature.

Groundwater Flow Paths	Groundwater flow is expected to be concentrated in fractured and weathered zones and in the vicinity of fault zones. There is an element of regional groundwater flow. Flow paths can be expected to be relatively long, and are likely to be up to 2000 m. Groundwater flow directions are expected to follow topography, generally to the north on the western side of the GWB and to the south toward L. Mask on the eastern side.
Groundwater & Surface water interactions	Groundwater will contribute baseflow to the streams, rivers and lakes. The L. Carra/Mask complex in which there are marl deposits are dependent on groundwater (Duchas national heritage data).
Conceptual model	• The GWB is located on either side of the northern apex of the Partry Mountains. Elevations range from 20-200 mAOD. The Aille river is the principal river in the area. • It is bounded to the south by the Maam-Clonbur GWB and L. Mask. It is bounded to the north and east by the Pure Bedded Limestones of the Ballyhean GWB. It is bounded to the west by a topographic and surface water divide. • The groundwater body is composed primarily of Dinantian Sandstone which is considered to have the potential for relatively high fissure permeability. Transmissivity is estimated in the Dinantian Sandstones to range from 1-150 m^2/d. In the vicinity of faults, transmissivity may be higher. Storativity in the aquifer is expected to be relatively high, in the order of 2%. • Groundwater flow is expected to be concentrated in fractured and weathered zones and in the vicinity of fault zones.. • Gradients are expected to be greater than 0.001. • Recharge occurs diffusely through the subsoils and via outcrops. • It has a $CaHCO_3$ signature. • Flow paths can be expected to be relatively long, and are likely to be up to 2000 m. Groundwater flow directions are expected to follow topography. • Groundwater will discharge to and contribute baseflow to streams, rivers and lakes.
Attachments	Table 1 and Figure 1.
Instrumentation	**Stream gauges:** 30001, 30041, 30042, 30049. **EPA Water Level Monitoring boreholes:** None **EPA Representative Monitoring points:** None
Information Sources	Mc Connell, B., Mac Dermot, C.V., Long, B. (2002).). *A geological description to accompany the Bedrock Geology 1:100,000 Scale Map Series, Sheet 11, South Mayo.* Geological Survey of Ireland Map Series Report. Geological Survey of Ireland: Dinantian Sandstones Aquifer Chapters. Unpublished. O' Riain, G., (2004). *Water Dependent Ecosystems and Subtypes Draft Report.* 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.

Table 1. List of Rock units in GWB

Rock unit name and code	Description	Rock unit group	Aquifer Classification
Ballyhean Formation (BY)	Volcaniclastic conglomerates, sandstones	Ordovician Metasediments	Pl
Derrylea Formation (DL)	Sandstone, mudrock, conglomerate, tuff	Ordovician Metasediments	Pl
Kilbryan Limestone Formation (KL)	Dark nodular calcarenite & shale	Dinantian Lower Impure Limestones	Ll
Moy Sandstone Formation (MO)	Pale sandstone, siltstone, conglomerate	Dinantian Sandstones	Lm
Sheeffry Formation (SH)	Mudrock, sandstone, tuff	Ordovician Metasediments	Pl
Tonweeroe Formation (TW)	Red & grey sandstone, siltstone, shale	Dinantian Sandstones	Lm
Visean Limestones (undifferentiated) (VIS)	Undifferentiated limestone	Dinantian Pure Bedded Limestones	Rkc

Figure 1 Location and boundaries of GWB