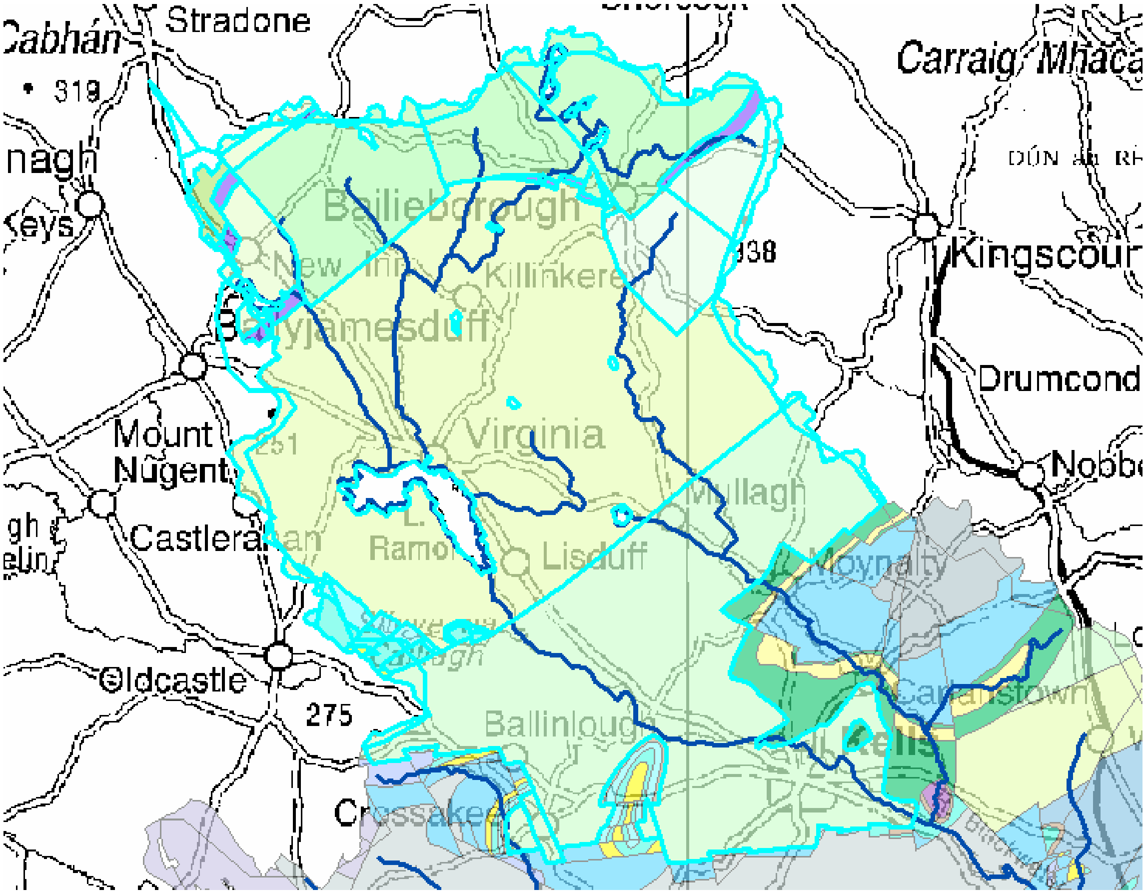
Bailieborough GWB: Summary of Initial Characterisation.

Hydrometric Area Local Authority		Associated surface water bodies	Associated terrestrial ecosystems	Area (km^2)
Meath Co. Co. Cavan Co. Co. Hydrometric Area 07		Rivers: Chapel Lake Stream, Lislea, Nadreegeel Lough Stream, Moynalty, Blackwater, Drumkeery Lough Stream, Athboy Lake: Bailieborough, Blind, Bog, Castle, Chapel, Cloggagh, Cornaslieve, Corratinner, Cuilcagh, Dromlon, Drumeague, Drumkerry, Galbolie, Gallon, Galloncurra, Gartaneane, Kilmore, Lenanavragh, Lisgar, Lisgrea, Acurry, Aush, Dargan, Nakirka, Ramor, Mullagh, Nadreegeal, Parker's, Skeagh	Lough Ramor (008) Killyconny Bog (SAC - 006)	487
Topography		This GWB is located in the northwest of the Boyle catchment. The northern part is extensively drumlinised, the drumlins' long axes orientated NW to SE. Further south there are fewer hills and more extensive areas of flat lowland. Elevations range from over 50 m OD in the southeast to 200 m OD at the peaks of many of the drumlins in the north.		
Geology and Aquifers	Aquifer type(s)	Mostly: **Pl:** Poor aquifer, generally unproductive except for local zones Smaller amounts of: **Lm:** Locally important aquifer, generally moderately productive (0.7%) **Ll:** Locally important aquifer, moderately productive only in local zones (1%)		
	Main aquifer lithologies	Mostly: Silurian Metasediments Smaller amounts of: Ordovician Metasediments (1.2%) Dinantian early Sandstones, Shales and Limestones (1%) Dinantian Pure Bedded Limestones (0.7%)		
	Key structures.	The rocks of this GWB are part of the Longford-Down Inlier.		
	Key properties	There are no detailed analyses of the hydrogeological properties of these rocks. Transmissivity and storativity are considered to be poor as well yields from this aquifer are rarely good. Overlying deposits of gravels, as mapped in Meath, will augment groundwater storage.		
	Thickness	It is typical for such poor aquifers in Ireland to have an upper 3 m of weathered bedrock through which the majority of groundwater flows. Below this groundwater flow may be possible through a network of fractures and faults. These are typically confined to the upper 10 m and rarely extend below the upper 30 m of the bedrock.		
Overlying Strata	Lithologies	The lithology of the subsoils has not been mapped in Cavan at the present date. The mapping in Meath shows the dominant subsoil type to be tills derived from Lower Paleozoic rocks. In addition there are also deposits of Peat and two major areas of sand and gravel deposits (at Moynalty and to the east of Slieve na Calliagh along the River Blackwater)		
	Thickness	Subsoil thickness in this area is highly variable. In general the subsoils are very thin; there is outcrop on the peak of the drumlins and thicker subsoils in between the hills. A number of quarries are located within this GWB (Taghart Quarry near Kingscourt and Greys Quarry near Baileborough), where the aquifer is exposed at surface.		
	% area aquifer near surface	Moderately high		
	Vulnerability	Vulnerability is Extreme on the Drumlins and Moderate in between them. Larger areas of low-lying land generally have Moderate vulnerability		
Recharge	Main recharge mechanisms	Diffuse recharge will occur via rainfall percolating through the subsoil. The proportion of the effective rainfall that recharges the aquifer is largely determined by the thickness and permeability of the soil and subsoil, and by the slope. Due to the generally low permeability of the aquifers within this GWB, a high proportion of the recharge will then discharge rapidly to surface watercourses via the upper layers of the aquifer, effectively reducing further the available groundwater resource in the aquifer.		
	Est. recharge rates	*[Information to be added at a later date]*		
Discharge	Springs and large known abstractions	Bailieborough Co-op Ltd (180), Bailieborough WS (100 - Spring), Ballinamoney Co-op Ltd (91), Killinkere GWS (28), Billis Creamery (10), Pottlereagh GWS (<10)		
	Main discharge mechanisms	Discharge from this groundwater body will be to the overlying rivers and streams. Where the aquifer is in hydraulic connection with the rivers it will be possible for groundwater to enter the river as baseflow. Dry Weather Flow values in this area are quite low suggesting that the aquifer has limited storativity and the aquifer does not support a significant summer flow in the rivers.		

	Hydrochemical Signature	There are no EPA monitoring points located within this GWB. Data from the same rock type to the west shows the groundwater is slightly hard (50-250mg/l CaCO3) and with Electrical Conductivity typically quite low (150-350 µS/cm). A Durov plot for this data shows the main signature to be calcium bicarbonate although some points do indicate a magnesium bicarbonate signature. There is a large range in Alkalinity from 30 to 300 mg/l, most values are between 50 to 100 mg/l. There are no recorded values of pH less than 6, although one third of all recorded values are below 7.
Groundwater Flow Paths		The majority of groundwater flow in this aquifer will take place in the upper 3m of the bedrock. This will be lateral flow to the river and streams. Groundwater flow paths are considered to be quite short and probably in the region of 300 m from recharge point to discharge point.
Groundwater & surface water interactions		There are two Natural Heritage Areas located within this GWB. Lough Ramor has many wet wood species surrounding its banks. Such species are known to be dependent on groundwater and over-abstraction from the lake or from the area could have a detrimental effect on some of these habitats, although closer investigation is required to determine the nature of this dependency.
Conceptual model	This GWB is located in the northwest of the Boyle catchment. The northern part of the GWB is extensively drumlinised. Further to the south there are not as many hills and has more extensive areas of flat lowlands. The extent of the GWB is defined to the south and southeast by the contact with the carboniferous rocks. Elsewhere the GWB extends to the extremities of the Eastern RBD. The GWB is composed primarily of low permeability rocks, although localized zones of enhanced permeability do occur. The majority of groundwater flow occurs in an upper weathered zone of around 3 m below this flow will occur along fractures, joints and major faults. Recharge occurs diffusely through the subsoils and via outcrops. It takes place mainly in the upland areas where subsoils are thinner. The aquifers within the GWB are generally unconfined, but may become locally confined where the subsoil is thicker and/or lower permeability. Groundwater flow paths are considered to be less than 500 m with discharge occurring to the nearest surface water feature or coming to the surface as springs or seepages. The low DWF values and high drainage density suggest the aquifer has a low storativity and transmissivity.	

Attachments	
Instrumentation	Stream gauge:07004, 07011, 07017, 07019, 07020, 07033, 07035, 07043, 07071, 07073, 07081, 07104, 07106, and 07107. Borehole Hydrograph: None EPA Representative Monitoring boreholes: None
Information Sources	McConnell B, Philcox M. & Geraghty M, 2001. *Geology of Meath: A geological description to accompany the bedrock geology 1:100,000 scale map series, Sheet 13, Meath*. Geological Survey of Ireland. 77 p. Geraghty M, Farrelly I, Claringbold K, Jordan C, Meehan R, & Hudson M, 1997. *Geology of Monaghan-Carlingford. A geological description to accompany the Bedrock Geology 1:100,000 Scale Map Series, Sheet 8/9, Monaghan-Carlingford*. Geological Survey of Ireland. 60 p. Woods L, Meehan R & Wright G R, 1998. *County Meath Groundwater Protection Scheme*. Report to Meath County Council. Geological Survey of Ireland. 54 p.
Disclaimer	Note that all calculation and interpretations presented in this report represent estimations based on the information sources described above and established hydrogeological formulae

Formation Name	Code	Description	Rock Unit Group	Aquifer Classification
Carrickatee Formation	CK	Black shale, mafic volcanics & tuff	Ordovician Metasediments	Pl
Clontail Formation	CL	Calcareous red-mica greywacke	Silurian Metasediments and Volcanics	Pl
Kehernaghkilly Formation	KY	Black shale & minor rhyolitic tuff	Ordovician Metasediments	Pl
Lough Avaghon Formation	LA	Massive sandstone & microconglomerate	Silurian Metasediments and Volcanics	Pl
Laragh Formation	LH	Pyritic, graptolitic, black shale	Ordovician Metasediments	Pl
Meath Formation (`Pale Beds)	ME	Pale grainstone	Dinantian (early) Sandstones, Shales and Limestones	Ll
Stackallan Member (`Micrite Unit)	MEst	Micrite, mudstone and dolomite	Dinantian Pure Bedded Limestones	Lm
Moathill Formation (`Shaly Pales)	MH	Mudstone, calcarenite & calc. sandstone	Dinantian (early) Sandstones, Shales and Limestones	Ll
Navan Group (undifferentiated)	NAV	Limestone, mudstone and sandstone	Dinantian (early) Sandstones, Shales and Limestones	Ll
Oghill Formation	OL	Massive sandstone & microconglomerate	Silurian Metasediments and Volcanics	Pl
Castlerahan Formation	RA	Dark quartz greywacke, microconglomerate	Silurian Metasediments and Volcanics	Pl
Shercock Formation	SK	Fine to coarse grained turbidite	Silurian Metasediments and Volcanics	Pl
Taghart Mountain Formation	TM	Greywacke, massive sandstone & siltstone	Silurian Metasediments and Volcanics	Pl



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Drumcondra
Mount Nugent
Virginia
Nobber
Castlerahan
Mullagh
L. Ramor
Lisduff
Moynalty
Oldcastle
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Ballinlough
Carnanstown
Kells
Crossakeel