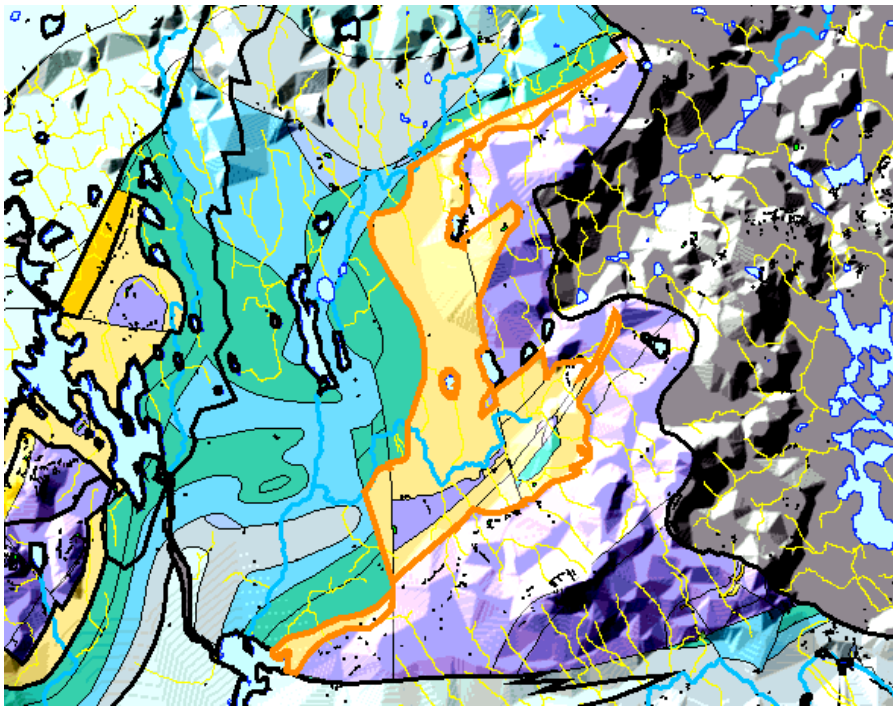
Annaghmore Groundwater Body: Summary of Initial Characterisation.

Hydrometric Area Local Authority	Associated surface water features	Associated terrestrial ecosystem(s)	Area (km^2)
26 – Camlin Rinn Leitrim & Longford Co. Co.'s.	Rivers: Black (South Leitrim); Creelaghta; Cloone Lough: Drumshanbo; Sallagh; Keeldra; Forbes	No NHA's currently recorded.	55

Topography		This groundwater body occupies a low-lying area on the Longford Leitrim border east of Lough Gowna. Ground elevation rises gently to the east, northeast and southeast. The lowest point is 40 mAOD in the extreme southwest of the body near Lough Forbes; the highest point is in the east of the body at 130 mAOD east of Kedrah Lough. There are a number of small low hills which increase in frequency towards the north of the body.
Geology and Aquifers	Aquifer categories	The majority of the area of this groundwater body has an aquifer category of: **Lm:** Locally important aquifer which is generally moderately productive. A number of small areas (3.3 km^2) in the south of the body have an aquifer category of: **Pl:** Poor aquifer which is generally unproductive except for local zones. A small area (0.9km^2) in the south of the body has an aquifer category of: **Ll:** Locally important aquifer which is moderately productive only in local zones
	Main aquifer lithologies	The majority of the area of this groundwater body consists of: Dinantian Sandstones A number of small areas within the south of the groundwater body consist of: Ordovician Metasediments & volcanics (3.3 km^2). There is also a small area of Dinantian (early) Sandstones, Shales and Limestones (0.9 km^2).
	Key structures	There appear to be two main fault orientations within the body, north-south and northeast-southwest. There are a number of small fault-bounded inliers of Orodvician Metasediments within the body. The Dinantian Sandstones rest unconformably on Ordovician Metasediments to the east (Longford/Mohill GWB).
	Key properties	No data on the hydrogeological properties specific to this groundwater body are available. In general, Dinantian Sandstones, given their dominant sandstone lithology, which generally results in a higher fissure permeability, has the potential to be a quite permeable aquifer. and would be expected to have a higher transmissivity than the underlying Ordovician Metasediments of the Longford Ballinalee GWB and the overlying Dinantian (early) Sandstones, Shales and Limestones of the Mohill GWB.
	Thickness	This groundwater body is composed of the Fearnaght Sandstone Formation (Dinanatian Sandstone). Having a dominantly sandstone lithology the permeability of individual fractures and the degree of interconnection is expected to be generally high. Based on experience in other Irish aquifers this aquifer is expected to have a broken and weathered rock zone of a few metres at the top of the rock and below this a zone of more interconnected fissures to a depth of 30 m. Deeper flow can occur in areas of higher structural deformation and faulting. The small areas of Ordovician Metasediments and Dinantian (early) Sandstones, Shales and Limestones that occur within the body are considered less permeable. In the Ordovician Metasediments in particular, the groundwater flow will be concentrated in the upper few metres of bedrock with an effective aquifer thickness generally not extending deeper than 15 m.
Overlying Strata	Lithologies	*[Information to be added at a later date]*
	Thickness	Two data points with depth to bedrock of 19 m and >37 m are recorded indicating presence of thick subsoil deposits. More data are needed to confirm the presence of thick tills over the groundwater body. Very little outcrop is mapped in the body. A small area of outcrop mapped on Ordovician inlier in the south of the body suggesting possible shallower subsoils over that area. *[More information to be added at a later date]*
	% area aquifer near surface	*[Information will be added at a later date]*
	Vulnerability	Lack of outcrop and two data points with >10 m subsoil suggest that areas of extreme vulnerability may be limited, however further data are required and mapping of areas of extreme vulnerability has to be completed. *[Information will be added at a later date]*
Recharge	Main recharge mechanisms	Diffuse recharge will occur over the entire groundwater body via rainfall soaking through the subsoil. More recharge will occur where overlying strata are thinner. If thick low peremeability subsoils occur in the body they may cause potential recharge to be rejected.
	Est. recharge rates	*[Information will to be added at a later date]*
Discharge	Springs and large known abstractions (m^3/d)	*[More information to be added at a later date]*

	Main discharge mechanisms	The main discharges will be to the rivers and streams crossing the groundwater body where the subsoil thickness and permeability permit it.
	Hydrochemical Signature	No relevant hydrochemical data are available in this GWB for assessment. The body is composed of Dinantian Sandstone.
Groundwater Flow Paths		Groundwater flow in the Dinantian Sandstones is expected to be concentrated in fractured and weathered zones and in the vicinity of fault zones. The dominant sandstone lithology and lack of shale will generally result in a higher frequency of more open fractures and, consequently, higher fissure permeability. Where there has been more intense faulting and folding these zones of high permeability will be more common. Because of the nature of the lithology, the degree of interconnection of fissures is expected to be relatively high in Dinantian Sandstones, enabling an element of regional groundwater flow. Flow path lengths in such high permeability rocks can be up to 500-2000 m. Regional flow in this groundwater body is expected to be in a broad west southwesterly direction towards the River Rinn and River Shannon. On a more local scale groundwater flow in the Dinantian Sandstones will be influenced by local topography and flow will be generally to the streams and rivers crossing the body. The western boundary of the body is formed by the contact with the Dinantian (early) Sandstones, Shales and Limestones of the Mohill GWB. While expected to have generally a lower permeability than the Dinantian Sandstones, the Dinantian (early) Sandstones Shales and Limestones do have zones of enhanced permeability and would not be expected to form a significant barrier to flow from the Dinantian Sandstones.
Groundwater & Surface water interactions		Groundwater will contribute baseflow to the streams and the Black River crossing the body if subsoil nature and thickness permit.
Conceptual model		• This groundwater body occupies a low lying area on the Leitrim Longford border east of Lough Gowna. Ground elevation is highest in the east, northeast and southeast falling gently to the west and southwest towards the River Rinn and River Shannon. • The body is bounded to the east and south by contact with the low permeability Ordovician Metatsediments of the Longford/Ballinalee GWB and to the west and north by contact with the Dinantian (early) Sandstones, Shales and Limestones of the Mohill GWB. • The groundwater body is composed primarily of Dinantian Sandstone which is considered to have the potential for relatively high fissure permeability. Dominant sandstone lithology and lack of shale generally results in a higher frequency of more open fractures and consequently a higher fissure permeability. The small areas of Ordovician Metasediments that occur within the south of the body are of a much lower permeability but are considered as part of this groundwater body due to their small size and isolation within the Dinantian Sandstones. • Groundwater flow will occur along fractures, joints and major faults. • Recharge occurs diffusely through the subsoils and via outcrops. Further data are required regarding the thickness and nature of the subsoil in this area as this could influence the recharge to the aquifer. • Groundwater will be unconfined within this GWB except in areas covered by thick low permeability subsoil which could act as a confining layer. Most flow in this aquifer will occur in a zone near the surface. In general the effective thickness of this aquifer is likely to be about 30m, comprising a weathered zone of a few metres and a connected fracture zone below this. However, deep-water strikes in more isolated faults/fractures can be encountered. Regional groundwater flow is expected to be in a broad west southwesterly direction towards the River Rinn and River Shannon but, on a local scale, flow will be generally to the streams and rivers crossing the aquifer depending on the thickness and permeability of the subsoil. In a higher permeability rock such as the Dinantian Sandstones, flow path lengths can be up to 500-2000 m. In the isolated areas of Ordovician Metasediments in the south of the body, flow will be of a local nature, with relatively short flow path lengths and concentrated at the top of the bedrock. • Groundwater will discharge to streams and rivers crossing the body where permitted by depth and permeability of subsoil. There is also likely to be some discharge to the Dinantian (early) Sandstones, Shales and Limestones of the adjoining Mohill GWB which though expected to be generally of a lower permeability than the Dinantian Sandstones, still have sufficient areas of enhanced permeability to accept water from the Dinantian Sandstones. • Groundwater will contribute baseflow to the streams and the Black River crossing the body if subsoil nature and thickness permit.
Attachments		None
Instrumentation		Stream Gauges: 26138 Stream, Corrabaun; 26139 Stream, Ballinamuck. EPA Water Level Monitoring boreholes: None EPA Representative Monitoring boreholes: None
Information Sources		Morris J.H., Somerville I.D. and MacDermot C.V. (2002). *Geology of Longford-Roscommon.* A Geological Description to Accompany the Bedrock Geology 1:100,000 Bedrock Series Sheet 12. With contributions by D.G. Smith, M. Geraghty, B. McConnell, K. Carlingbold, W. Cox, D. Daly. Geological Survey of Ireland, 121pp. (publication pending) Aquifer Chapters: Dinantian 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

GROUNDWATER BODY (For Reference)



List of Rock units in Annaghmore Fearnaght Groundwater Body

Rock unit name and code	Description	Rock unit group
Fearnaght Sandstone Formation (FT)	Pale conglomerate & red sandstone	Dinantian Sandstones
Coronea Formation (CA)	Turbidite, red shale, minor volcanic	Ordovician Metasediment & volcanics
Meath Formation (ME)	Limestone, calcareous sandstone	Dinantian (early) Sandstones, Shales and Limestones