

Helvick Head GWB: Summary of Initial Characterisation.

Hydrometric Area Local Authority		Associated surface water bodies	Associated terrestrial ecosystems	Area (km ²)
17 – Coastal Area Waterford Co Co			Dungarvan Harbour	113
Topography		The topography of this groundwater body is dominated by the Drum Hills in the northeast, which rise to elevations of 263m OD and define the boundary between the SERBD and the Southwestern RBD. From these hills the elevation decreases towards the coast and towards the lowlands at Dungarvan Harbour.		
Geology and Aquifers	Aquifer type(s)	LI – Locally Important Aquifer, moderately productive only in local zones PI – Poor Aquifer, generally unproductive except for local zones		
	Main aquifer lithologies	GY - Gyleen Formation - Sandstone with mudstone and siltstone GY bq - Ballyquinn Member - Grey & red sandstone & red mudstone GY am - Ardmore Member - Grey to red sandstone & grey siltstone BS - Ballytrasna Formation - Purple mudstone with some sandstone BS mh - Mine Head Member - Laminated red sandstone & minor mudstone CP - Crows Point Formation - Massive & thick-bedded grey sandstone <u>BA - Ballysteen Formation - Fossiliferous dark-grey muddy limestone</u> <u>WA - Waulsortian Limestones - Massive unbedded lime-mudstone</u>		
	Key structures.	The bedrock layers are folded into synclines and anticlines that dominate the geology of this area of Waterford and Cork.		
	Key properties	The pumping test analysis of the Grange Source in the Ballytrasna formation indicated a transmissivity of 10 m ² /d from the 3 hour recovery test and a specific capacity of 33m ³ /d/m		
	Thickness	Effective thickness is not expected to be large but the bedrock may be permeable to depths of around 25m in some areas.		
Overlying Strata	Lithologies	Sandstone-derived Till		
	Thickness	Mostly 3 to 5m, there are also large areas of rock close to surface and outcrop. The thickness of the subsoil decreases towards the centre of this groundwater body where the elevations are highest and increases towards the lower elevations at the coast.		
	% area aquifer near surface	Nearly half of the area has rock close to surface.		
	Vulnerability	Mostly HIGH with significant areas of EXTREME where there is outcrop and rock close to surface. There is a small area of LOW vulnerability in the very south.		
Recharge	Main recharge mechanisms	Diffuse recharge from rainfall, mostly enters the groundwater at exposed areas of outcrop or rock close to surface. There is a Karst swallow hole identified in the Waulsortian limestone in the south of the groundwater body. This will provide a direct link between the surface water and groundwater, this will increase the recharge in this area but also the possibility of pollution of the aquifer.		
	Est. recharge rates	[Information will be added at a later date]		
Discharge	Springs and large known abstractions	Ballyguiry WS (25), Leagh, Roberts WS(Gortnadiha), Loskeran Old Parish WS (Barranastook – spring -55), Grange WS (11-55), Ardmore (300),		
	Main discharge mechanisms	The overall pattern of groundwater discharge will be towards the coast. There may also be some discharge to local streams although this may only occur at certain times of the year as indicated by the water table levels at Grange.		
	Hydrochemical Signature	There are both siliceous and calcareous bedrock strata in this groundwater body. Hydrochemical analyses at the Grange public water supply indicated ‘hard’ water (241 - 253 mg/l as CaCO ₃) with a moderate alkalinity (120 - 135 mg/l as CaCO ₃). These values are higher than normal for the Ballytrasna Formation. Conductivities were between 574 and 586 µS/cm. In addition chloride concentrations (44 - 47 mg/l) are higher than average, probably due to proximity to the coast.		
Groundwater Flow Paths		Groundwater flow is likely to be dominated by flow from the hills, which act as recharge mounds; this is supported by the available groundwater level data, but it is not possible to obtain accurate groundwater gradients. However, an approximate gradient (between 0.03 and 0.08) is suggested, based on modelling and experience of this formation elsewhere.		
Groundwater & surface water interactions		Due to the proximity of the River Basin District boundary to the coast (~) there is insufficient area for major rivers to form. The only surface drainage features present are small streams flowing down the flanks of the Drum Hills. In the northern area of the groundwater body surface streams flow north off the higher elevations of the Drum Hills onto the Dungarvan Groundwater Body. Elsewhere the surface water bodies discharge to the coast.		

Conceptual model	The extent of this groundwater body is defined to the north by the boundary between the limestones of Dungarvan Harbour and the Devonian sandstones to the south. To the west the Drum Hills define the boundary between the SERBD and the Southwestern RBD. Groundwater flow is influenced by topography and a groundwater mound is present in the hills. Recharge to the groundwater body will be highest in the higher elevations of the Drum hill where there is very thin subsoil and also in the southern area of the groundwater body over the Waulsortian Limestone where there are areas of thin subsoil cover. Groundwater flow will mostly be shallow and will flow down hill towards the coast in the east and south. In the north groundwater flow will be to the Waulsortian limestones of the Dungarvan groundwater body.
Attachments	
Instrumentation	Stream gauge: None Borehole Hydrograph: none EPA Representative Monitoring boreholes: None
Information Sources	Hudson, M. (1996) Grange Public Water Supply, Groundwater Source Protection Zones.
Disclaimer	Note that all calculation and interpretations presented in this report represent estimations based on the information sources described above and established hydrogeological formulae