Hydrometric Area		Associated surface features	Associated terrestrial	Area			
Local Authority			ecosystem(s)	(km ²)			
26 – Shannon		Rivers: Eslin, Clogher, Boyle, Killukin, Lung, Breedoge, Kinard,	(001643) Lough Drumharlow;	928			
Upstream Roosky		Owenur, Anaderryboy, Mountain, Owennaforeesha, Scramoge,	(001636) Fin Lough; (000592)				
Roscommon, Leitrim,		Strokestown, Lissaphobble, Rowan, Anagalliagh, Finisclin,	Bellanagare Bog; (000604)				
Slig	o & Mayo Co	Rooskey, Carricknabrahe, Finlough, Mantua, Clooncraff.	Derrinea Bog; (000607) Errit				
	Co's	Streams: Lissydaly	Lough; (001632) Drumalough				
		Loughs: Doolaughan, Derryeen, Black, Naseer, Carrickkevy, Keel,	Bog; (001626) Annaghmore				
		Bran, Costre, Kilmaddaroe, Laundry, Oakport, Coothall, Eidin,	Lough; (000605) Derrycanan				
		Conway, Rowan, Scaradaun, Drumcollop, Agnakilconnell,	Bog; (000587) Lough Gara;				
		Funshinagh, Annaghearly, Ellfinagh, Loughtown, Urlaur,	(001652) Tullagnan Bog;				
		Loucharles, Loucharneman, Dermunser, Core, Fich, Clasher	(000603) Cornaveagn Bog;				
		Corry Covetown Treenemerly Lindely Cortron Lowfold	(000591) Bella Bridge Bog,				
		Pallagh Carbally Joughaun Tully Taomara Padaan Praskan	Lough Pofin: (001222) Ardagh				
		Nahingha Doongon Nahlahy kilalass Laura Loughanduff	Rog: (000614) Cloopshapyill				
		Garrymona Cloonabee Incha Elia Namweelia Cunny O'Donra	Bog: (000608) Kilglass and				
		Drimmon Rathmore O'Morgan Ballyoughter Bellavahan	Grange Loughs: (001627)				
		Cloonculliaan Grange Clooneyn-Blakeney Killeen simon's	Corbally Turlough: (000612)				
		Illanowen O'Donnellan Loughanammer Feeny Duff Drinaun	Mullygollan Turlough: (001617)				
		Ean Annaghmore Aneeg Patrick Gal Nablasharnagh Conny	Ardakillin Lough: (000594)				
		Beg Conny More Nafulla Rogers Lea Cloopsreane Saggart	Brieffield Turlough: (001648)				
		Flasky Beg Caudagh Headford Gortconnellan/Spa Mucklaghan	Shad Lough: (001643)				
		Drumgilra/Gortinty, Bofin, Cloonfree, Fin, Ardakillin,	Drumharlow: (001402)				
		Loughandoughil, Loughanragh, Shad, Coggal, Loughannasool.	Annaghearly Lough: (000587)				
		Loughannatryna.	Lough Gara.				
	This GWB has a	a varied topography. In the east of the body, east of Elphin and Tul	lsk and in the vicinity of the River S	Shannon,			
~	ground elevation	s are 40-50 mAOD. There are a large number of lakes separated by s	small low hills. Within this low-lying	area, an			
hy	elevated area occ	curs north of Stokestown rising to 160 mAOD. Ground elevations are	e higher to the west, north and in the	extreme			
[ra]	north east of the	east of the body (60-170 mAOD). South and southeast of Boyle, the Plains of Boyle (80-110 mAOD) extend southwards to					
30G	Elphin. In the we	n. In the west of the body ground elevations rise to 120-140 mAOD along the boundary with the adjoining GWBs. Dumlins are					
Lol	common in the	body, generally increasing in number and size to the east of the bo	dy. Areas of peat and cut peat are c	common,			
L .	becoming more	common towards the northwest of the body. There are areas within t	the body where surface drainage is li	mited or			
	absent (e.g. south	n of Boyle) reflecting the karstified nature of the underlying bedrock.	-				
	Aquifer	Rk^e: Regionally important karstified aquifer dominated by conduit	flow.				
	categories						
	Main aquifer	This GWB is composed primarily of Dinantian Pure Bedded Limes	stones. Some small isolated areas of D	inantian			
	lithologies	Pure Unbedded Limestone occur within the body.					
	Key structures	Mapping of faults is limited in this area where exposure is poor	and there is little major variation in	the rock			
	·	lithology. Major faults are mapped along the northwestern side of t	he Strokestown Inlier and the Castlere	ea Inlier.			
		The dips over the GWB area are generally less than 10°, except near faults, where steeper dips result from fault					
		drag. The Strokestown Inlier forms part of the south-eastern boundary of this body.					
S	Key properties	s Karstification is widespread in this GWB. Current records of karst features are considered to represent only a					
ife		fraction of existing features. As with most karstic systems, pe	ermeability and transmissivity data	are very			
nb		variable. Transmissivity in karstified aquifers with conduit flow ca	an range up to a few thousand m^2/d . I	Pumping			
ΥI		tests reported by Longworth (1987) and Ibbotson (2000) for wells	s in the Dinantian Pure Bedded Lime	estone in			
anc		this GWB gave transmissivity values of 15-30 m ² /d and 100 m ² /d	(Ballymore Limestone) and $50 \text{ m}^2/\text{d}$ (Oakport			
λ. Δ		Limestone). The aquifer supports high and intermediate springs.	Rapid groundwater flow velocities ha	ave been			
olo		recorded. Iracer tests carried out to Rockingham Spring source	in the north of the body, recorded n	ninimum			
e		velocities of 218 m/hr and 2/9 m/hr (Lee & Kelly, 2003). Tracer	tests carried out in the adjoining Suc	ck South			
Ŭ		GWB recorded groundwater flow velocities ranging from 68 to 11	0 m/hr in the vicinity of Longford ar	nd Silver			
		Island Springs and Killegian Springs. Rapid velocities recorded	101 groundwater in these areas impulated in the visinity of Deskinster	piy flow			
		unough relatively sizeable conduits. Groundwater gradients calc	01 (Oakport Limestone) (Lee & Vall	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$			
		In konstified Pure Poddad Limestone such as that found in this C	WP enlargement of the freeture act	y 2003).			
		solution and the generally well connected and widespread fracture	systems result in a highly normaal	work by			
		with rapid groundwater flow Storativity in this aguifer will be	low Small isolated areas of pure u	nhedded			
		limestones occur within this GWB These nure unbedded lin	nestones are considered less suscer	ntible to			
		karstification due to their massive nature. The nermeability of these	a rocks is generally low but they can	develop			
		local zones of enhanced permeability.	to react is generally low but they call	acterop			
•							

Carrick on ShannonGWB: Summary of Initial Characterisation.

	Thickness	The Dinantian Pure Bedded Limestones are generally well over 100 m thick. Most groundwater flows in an
		epikarstic layer a couple of metres thick and in a zone of interconnected solutionally-enlarged fissures and
		conduits that extends approximately 30 m below this. Deeper inflows can occur in areas associated with faults or
		dolomitisation. Boreholes drilled around Rockingham Spring indicate fracture zones in the first 20 m (Lee &
		Kelly, 2003). These fractures are likely to act as the major conduits for groundwater flow.
	Lithologies	There are large areas cut peat, which include lands reclaimed for grassland, concentrated particularly in the west
		of the body and in the extreme south. Many smaller areas of cut peat occur inroughout the body. Areas of
		outcrop and shallow rock occur throughout the body, often more frequent on higher ground. There are some
		gravel deposits in the west of the body near Errit Lough. These gravel deposits are of high permeability, Large
		areas of fill of various types and origin cover the remainder of the body are also classed as 'low' permeability. The
		low permeability underlying subsail is likely to control the permeability where the peat denosits are thinner
		The till is described as (CLAY) (BS5930). The overall noor drainage is indicated by the bigh frequency of
		rushes and drainage ditches. The soils map records mainly heavy textured gley and peat in this region, which
		also indicate low permeability. The till in the south of the body (extending north as far as Tulsk) is of 'moderate'
		permeability. The till is described as 'SILT' or 'SAND'. The region between Elphin and Tulsk also has subsoil
		of 'moderate' permeability, however the subsoil has a higher degree of mixed sediments.
я		
rat		Subsoil Types identified in body by Teagasc Parent Material Mapping: Altuvium (A), Esker (Bas Esker), Cut
St		Feat (Cut), Gravets (GLS), Rock outcrop and rock close to Surjace (Rck), Rarshiped Limestone outcrop and havetified limestone close to surface (RaRek). Lake sediment (1) Till Lower Palgeozoic Sadetone and Shale
ing		Till (TI PSS) & Limestone Till (TLs) Devolan and Carboniferous Sandstone & Sandstone and Shale Till
erly		(TDSs, TDCSs, TDCSsS) & Namurian Sandstone and Shale Till (TNSsS)
0v6	Thickness	Areas of outcrop and shallow rock occur throughout the body, often more frequent on higher ground. There are
•		large areas with less than 3 m of subsoil cover. Areas of deeper subsoil (5-20 m) are concentrated in the extreme
		west of the body, just west of the centre of the body near the Castlerea Bellanagare GWB, southwest of Carrick
		on Shannon and in the east of the body around Kilglass Lough.
	% area aquifer	[Information to be added at a later date]
	near surface	
	Vulnerability	There are large areas of Extreme vulnerability within this body, including areas south of Boyle, around Eranahardy parthwast of Strakastown and in the couthwast of the body. Areas in the visibility of guallow holes
		and dolines (which allow point recharge) are delineated as extremely vulnerable. Some swallow holes and
		dolines occur in areas of reasonably thick neat cover (6-9 m). The main areas of Moderate and Low vulnerability
		are concentrated in the extreme west of the body, just west of the centre of the body near the Castlerea
		Bellanagare GWB, southwest of Carrick on Shannon and in the east of the body around Kilglass Lough.
		A Groundwater Vulnerability Map has been prepared for County Roscommon as part of a Groundwater Protection Scheme.
	Main recharge	Both point and diffuse recharge occur in this GWB. Swallow holes and collapse features provide the means for
	mechanisms	Where the GWB is covered by 'low' permeability subsoil this can restrict percolation of recharge and increase
		runoff Despite the presence of peat and low permeability till point recharge to the underlying aquifer still
ge		occurs by means of swallow holes and collapse features/dolines. Dolines have been recorded even in area of
arş		thick peat deposits. (Hickey et al, 2002). In areas where point recharge is common and/or subsoils are relatively
ech		thin, groundwater generally shows a rapid response to recharge. Where gravels overlie the karstic aquifer they
R		provide a permeable pathway for recharge to the underlying karstic aquifer. They can also act to augment
		storage in the karstic aquifer.
	Est. recharge	[Information to be added at a later date]
	rates	
	Springs and	Rockingham Spring -Boyle-Ardcarn WS (ROS11) 6000 m ³ /d; Bellanagara WS - Mount Druid (ROS9 – Spring)
	large known	3400 m ³ /d; Cloonmagunaun GWS (ROS19 – Spring) 1100 m ³ /d - From EPA Groundwater Sources List (Larger
	abstractions	Sources – High & Intermediate Yielding Springs)
	(m³/d)	
ge		Spring, Lissian (1429SEW086) 2790 m ³ /d; Cloonmagunnaun Spring, Callow or Runnawillin (1429SEW093)
ıar		2/91 m ² /d; Polimore, Creevy (1429SEW098) /000 m ² /d; Polianabrick Spring, Aghadrestan (1429SEW099) 16290 m ³ /d. Erom CSL Spring Database. Ligh Violding
iscl		Snrings
D		oprings.
		[This information is not complete – further data need to be added and yield data confirmed]
	Main discharge	The main discharges are to the streams and rivers crossing the body and to the large springs found within the
	mechanisms	body. In winter groundwater will discharge to the many turloughs found in the area.

 Signature ions, Hardness can' vary from slightly hard to very' hard (typically ranging between 380–450 mg/). Spring in the set is tend to be solution of micerals into the groundwater Groundwater alkulinity is variable, but can be high. Alkalinity is generally less than hardness indicating that ion exchange (where calcium or magnesisum are replaced by sodium) is not a significant process. These hydrochemical signatures are characteristic of clean limestone and are frequently associated with limescale issues. Like hardness and alkalinity, electrical conductivities are very short. In some springs and borcholes in karst area, high turbidity occurs after heavy minfall. Microbial pollution of groundwater in karstic aquifers in karst area, high turbidity from the surface into the groundwater file karstic aquifers, microbian Dolution can travel very quickly from the surface into the groundwater for anumber of publics supplies within this body is demonstrated in an expanded Duroo plot in Figure 2 below. The hord line store and the set of the process is a solution of surface to the groundwater for an anuber of publics supplies within this body is demonstrated in an expanded Duroo plot in Figure 2 below. The hord line store is a solution of the two publics is role to the sast and faults. Groundwater flow and borizero and a scritten all over often conducting at the store of the properties of the properties of a store of the program billy of the rock. Karstification can be accentuated along structural features such as fold axes and faults. Groundwater flow through karst areas is extremely complex and difficult to predict. As flow publicays are often determined by discrete conduits, actual flow directions with or the south and cast of the body is broadly west to cast, in the north of the body broadly southwater flow velocities are to replot and variable, both spatially and temporally. The rapid groundwater flow the high flow systems. The presence of high yielding springs in this body indicates that		Hvdrochemical	The hydrochemistry of the carbonate rocks, especially pure limestones, is dominated by calcium and bicarbonate
 waters tend to be softer, as throughput is often quicker with less time for the dissolution of minerals into the scale laws and the solution of minerals into the scale laws. Like handbess and alkanity, electrical conductivities (EC) can vary gravity. Typical limestone scale laws. Like handbess and alkanity, electrical conductivities (EC) can vary gravity. Typical limestone groundwater conductivities are of the order 500-700 µS/cm. Lower values suggests that groundwater residence times are very short. In some springs and borcholes in karsti area, ling the surface more times are very short. In some springs and borcholes, this karst area, ling the surface water very quickly from the surface into the groundwater role as surface water in karstic aquifers, microbial pollution can travel very quickly from the surface into the groundwater system. The normal filtering and proteetive action of the subsolis is often bypased in karstic aquifers to for swallow holes, dolines and lays areas of shallow rock. The hydrochemical signature of groundwater from a number of public supplies within this body is demonstrated in a expanded Duroy ploi in Figure 2 below. Groundwater Flow Paths These rocks are generally devoid of integranular permeability. Groundwater flow strongh fissures, faults, sind and faults. Groundwater flow through karst raves is shown by severenal traing studies (Drew and Daly, 1993). Flow velocities can be rapid and variable, conduct as shown by several traing studies (Drew and Daly, 1993). Flow velocities can be rapid and variable, conducter flow through west to east, in the north of the body broadly southwest northeast and in the west of the body broadly south to north. Groundwater flow directions will not necessarily be repredicular to the same duvet of significant quantities of groundwater flow directions will not necessarily be repredicular to the serve of high yielding springs in this body indicate that the prepended to dow velocities: recorded in this body indicate th		Signature	ions Hardness can vary from slightly hard to very hard (typically ranging between 380–450 mg/l) Spring
 Groundwater, Groundwater alkalnity, is variable, but can be high. Alkalnity is generally, less than hardness indicating that ion exchange (where calcium or magnesium are replaced by sodium) is not a significant process. These hydrochemical signatures are characteristic of clean limestone and are frequently associated with lime-scale issues. Like hardness and alkalnity, electrical conductivities (EC) can vay greatly. Typical limestone groundwater conductivities are of the instruct anglifes is also a significant problem. Due to the high level of interaction between groundwater and surface water in karstic aquifers, microbal pollution can travel very quickly from the surface into the groundwater fields is allow rock. The hydrochemical signature of groundwater in mamber of public supplies within this body is demonstrated in an expanded Duroy plot in Figure 2 below. Groundwater Flow Paths Groundwater flow paths and faults. Groundwater flow number of public supplies within this body is demonstrated in an expanded Duroy plot in Figure 2 below. The rocks are generally devid of integranular permeability. Groundwater flow and grinchtraf features such as fold areas and faults. Groundwater flow through karst areas is extremely complex and difficult to preduct. As flow pathways are often determined by discrete conduits, actual flow directions will not necessarily be perpendicular to the assumed water table contours, as shown by several tracing studies (Drew and Daily, 1993). Flow velocities can be rapid and variable, both spatially and temporally. The rapid groundwater flow velocities recorded in this body indicate that a large proprior of groundwater flow with reck on it high product flow traces have in the associated on with soly broady south to conting the body is demonstrated in the event of the body. Isocadly groundwater flow section is high renough to permetability or discrets change direction of the highly variable due to the highly variable due to the highly larabi		Signature	waters tend to be softer as throughout is often quicker with less time for the dissolution of minerals into the
 Groundwater Flow Paths Groundwater Group and a significant process. These hydrochemical signatures are characteristic of clean limestone and are frequently associated with lime-scale issues. Like hardness and alkalinity, electrical conductivities (EC) can vary greatly. Typical limestone groundwater null surges are proven that in some spring and borcholes in karst areas, high turbidity occurs after heavy rainfall. Microbial pollution of groundwater in karstic aquifers in karst actualities, microbial pollution can travel very quickly from the surface into the groundwater from a number of swallow holes, dolines and large areas of shallow rock. The hydrochemical signature of groundwater of swallow holes, dolines and large areas of shallow rock. The hydrochemical signature of groundwater from a number of public supplies within this body is demonstrated in a expanded Duroy plot in Figure 2 below. Groundwater Flow passed in Arastic aquifers the odded limestones these openings are enlarged by karstification which significantly enhances the permeability of the rock. Karstification can be accentuated along structural features such as fold axes and fauls. Groundwater flow through karst reass is shown by several tracing studies (Drew and Dak), 1993). Flow velocities can be rapid and variable, obth spatially and temporally. The rapid groundwater flow velocities recorded in this body indicate that a large proportion of groundwater flow directions will not necessarily be perpendicular to the swall of significant quantities of promodwater flow directions will not necessarily be represented in the west of the body broadly south to onth. Groundwater flow direction is influenced by a disposing of significant process. Low permeability of the rock until sight process and and the sequest structure of the selection of groundwater flow direction is influenced by a dioparaphic high yielding aprings in this body indicate that the program groundwater flow direction is influ			waters that to be short, as anotagiput is variable but can be bick. Alkalinity is generally less than hardness
 These hydrochemical signatures are characteristic of clean limitsome and are frequently associated with limitscale issues. Like hardness and alkalinity, electrical conductivities (EC) can vary greatly. Typical limitsome groundwater conductivities are of the order 500–700 µS/cm. Lower values suggest that groundwater residence times are very short. In some springs and borcholes in karst areas, high turbidity occurs after heavy minfall. Microbial pollution of groundwater in karstic aquifers, microbial pollution can travel very quickly from the surface into the groundwater first is also a significant problem. Due to the high level of interaction between groundwater as the number of swallow holes, dolines and large areas of shallow rock. The hydrochemical signature of groundwater in unmber of public supplies within this body is demonstrated in an expanded Duroy plot in Figure 2 below. Groundwater Flow These rocks are generally devid of intergranular permeability. Groundwater flow strong structural features such as fold areas and faults. Groundwater flow Karsification can be accentuated along structural features such as fold areas and faults. Groundwater flow karsification complex and difficulty planes. In pure bedded limestones these openings are cantaged by karsification which spatient of your planes. In pure bedded limestones these openings are cantaged by karsification which welco: as as fold areas and faults. Groundwater flow through karst areas is extremely complex and difficulty planes. In pure bedded limestones these openings are unaged by karsification which welco: a such as the assumed water table contours, as shown by several tracing studies (Drew and Daily, 1993). Flow velocities can be rapid and variable, both spatially and temporally. The rapid groundwater flow the perpendicular to the assumed water table contours, as shown by several tracing in the care of the hody broady south to north. Groundwater flow the care is high djecture of significant strikes of the body broady south			indicating that ion avalance (where calcium or mean-action by replaced by sodium) is not a significant process
 These hydroclenical signatures are classical extension of and minestone and a minestone and m			indicating that for exchange (where each and in higher stating in the restore of the significant process).
 Sche Exstein Like Hardbrick sind ankanniky electrical conductivities (EC) care value greatly. Typical Inflexione groundwater soft in karstic aquifers is also a significant problem. Due to the high level of interaction between groundwater rand surface water in karstic aquifers is also a significant problem. Due to the high level of interaction between groundwater system. The normal filtering and protective action of the subsoils is often hypassed in karstic aquifers due to the number of swallow holes, dolines and large areas of shallow rock. The hydrochemical signature of groundwater system. The normal filtering and protective action of the subsoils is often hypassed in karstic aquifers due to the number of swallow holes, dolines and large areas of shallow rock. The hydrochemical signature of groundwater from a number of public supplies within this body is demonstrated in an expanded Durov plot in Figure 2 below. Groundwater Flow Partis These rocks are generally devoid of intergranular permeability. Groundwater flow through fissures, faults, is fold axes and faults. Groundwater flow through karst areas is externely complex and difficult to predict. As flow pathways are often determined by discrete conduits, actual flow directions will not necessarily be perpendicular to the assumed water table contours, as shown by secret tracing studies (Orew and Dal), (1993). Flow velocities can be rapid and variable, both spatially and temporally. The rapid groundwater flow velocities recorded in this body indicate that a large proportion of groundwater flow threads in a suggest that we set of the body tis boady used to advert flow direction is influenced by a topographic high in the cent of the body to advalue mound at the output of advalue flow direction is influenced by a topographic high in the cent of the body to advalue soft adjoining GWBs can act as barriers to flow from the karstified pure bedded limestone of this GWB. Groundwater flow direction is influenced by a to			These hydrochemical signatures are characteristic of clean innestone and are nequently associated with inne-
 groundwater conductivities are of the order 300-700 (pixer). Lower values suggest that groundwater residence times are very short. In some springs and boreholes in karst area, high turbidity occurs after heavy entities the interaction between groundwater in karstic aquifers, microbial pollution can travel very quickly from the surface into the groundwater system. The normal filtering and protective action of the subsolis is often bypassed in karstic aquifers due to the number of svallow holes, dolines and large areas of shallow rock. The hydrochemical signature of groundwater from a number of public supplies within this body is demonstrated in an expanded Durve plot in Figure 2 below. Groundwater Flow Paths These rocks are generally devoid of integranular permeability. Groundwater flows through fassures, fulls, joints and bedding planes. In pure bedded limestones these openings are enlarged by karstification which significantly enhances the permeability of the rock. Karstification can be accentuated along structural features such as fold axes and faults. Groundwater flow through karst areas is extremely omplex and difficult to predict. As flow pathways are often determined by discrete conduits, actual flow directions will not necessarily be perpendicular to the assumed water table contours, as shown by several tracing studies (Drew and Daly, 1993). Flow velocities can be rapid and variable, both spatially and temporally. The rapid groundwater flow velocities recorded in this body indicates that a large proportion of groundwater. They are indicative of regional scale hey presended limestone of this GWB. Groundwater flow direction is influent of the body to kow permeability or the rock and the permeability of the rock on thi is high enough to permit the throughput of significant quantities of groundwater flow direction is under sole and they set of the body to dow south to orth of the body bradly southwest north-fithe body bradly southwest north-field in the set of the body			scale issues. Like natiness and arkaninty, electrical conductivities (EC) can vary greatly. Typical minestone
 It thes are very short. In some springs and boreholes in karst areas, ngi lurbindly occurs after leavy rainfail. Microbial pollution of groundwater and surface water in karstic aquifers, and so a significant problem. Due to the high level of interaction between groundwater and surface water in karstic aquifers and so a significant problem. Due to the high level of interaction between groundwater and surface water in karstic aquifers and so the subsolities is often bypassed in karstic aquifers due to the number of swallow holes, dolines and large areas of shallow rock. The hydrochemical signature of groundwater from a number of public supplies within this body is demonstrated in an expanded Durov plot in Figure 2 below. Groundwater Flow Paths These rocks are generally devoid of intergranular permeability. Groundwater flow through karst areas is extremely complex and difficult to predict. As flow pathways are often determined by discrete conduits, actual flow directions will not necessarily be perpendicular to the assumed water table contours, as shown by several tracing studies (Drew and Daly, 1993). Flow velocities can be rapid and variable, both spatially and temporally. The rapid groundwater flow takes place in enlarged conduit systems. The presence of high yielding springs in this body indicates that the permeability of the rock unit is high enough to permit the throughpat of significant quantities of groundwater flow direction is influenced by a topographic high in the centre of the body is broadly west to ast, in the orth of the body broadly south no roth. Groundwater flow takes place in enlarged conduit systems. The presence of high yielding springs in this body indicates that the permeability roth the cost of ady by to the tope the high kastified nature of the body is boradly west to ast, in the orth of the body broadly southwest north as surgersted that groundwater flow takes place in enlarged conduit systems. The presence of high yeldidue splace and ta surfers to			groundwater conductivities are of the order $500-700 \ \mu$ S/cm. Lower values suggest that groundwater residence
 Microbial pollution of groundwater markstic aquifers is also a significant problem. Due to the high level of interaction between groundwater and surface water in karistic aquifers, microbial pollution can travel very quickly from the surface into the groundwater system. The normal filtering and protective action of the subsoils is often bypassed in karstic aquifers due to the number of swallow holes, dolines and large areas of shallow rock. The hydrochemical signature of groundwater from a number of public supplies within this body is demonstrated in an expanded Durov plot in Figure 2 below. Groundwater Flow Paths These rocks are generally devoid of intergranular permeability. Groundwater flows through fissures, faults, joints and bedding planes. In pure bedded limestones these openings are enlarged by karstification which significantly enhances the permeability of the rock. Karstification can be accentuated along structural features such as fold axes and faults. Groundwater flow through karst areas is extremely complex and difficult to predict. As flow pathways are often determined by discrete conduits, actual flow directions will not necessarily be perpendicular to the assumed water table contours, as shown by several tracing studies (Drew and Daly, 1993). Flow velocities can be rapid and variable, both spatially and temporally. The rapid groundwater flow velocities center in the stoy undicate that a large proportion of groundwater flow taces preventil the throughput of significant quantities of groundwater flow tactices of regional scale flow systems. Flow path lengths can be up to a several kilometres in length. Regional groundwater flow direction in the south and east of the body broadly south to east, in the north of the dody broadly south to east, in the north of the dody broadly south to east, any through spring Source (Lee & Kelly 2003) demonstrated that groundwater in the pure beddel dimestone (Oakport Limestone) is forced to move in a southwest to northeas direc			times are very short. In some springs and boreholes in karst areas, high turbidity occurs after heavy rainfall.
Interaction between groundwater and surface water in karstic aquifers, microbial pollution can travel very quickly from the surface into the groundwater from a number of public supplies within this body is demonstrated in an expanded Durov plot in Figure 2 below. The hydrochemical signature of groundwater from a number of public supplies within this body is demonstrated in an expanded Durov plot in Figure 2 below. These rocks are generally devoid of intergranular permeability. Groundwater flow through fissures, faults, joints and bedding planes. In pure bedded limestones these openings are enlarged by karstification which significantly enhances the permeability of the rock. Karstification can be accentuated along structural features such as fold axes and faults. Groundwater flow through karst rareas is extremely complex and difficult to predict. As flow yealtways are often determined by discrete conduits, actual flow directions will not necessarily be perpendicular to the assumed water table contours, as shown by several tracing studies (Drew and Daly. 1993). Flow velocities can be rapid and variable, both spatially and temporally. The rapid groundwater flow velocities recorded in this body indicate that a large proportion of groundwater flow takes place in enlarged conduit systems. The presence of high yielding springs in this body indicates that the permeability of the rock unit is high enough to permit the throughput of significant quantities of groundwater. They are indicative of regional- scale flow systems. Flow path lengths can be up to a several kilometres in length. Regional groundwater flow direction is the subt and east of the body is broadly west to east, in the north of the body broadly southwest northeast and in the west of the body broadly southwest and the doparet link in the contre of the body. Locally groundwater flow direction is influenced by a topographic high in the centre of the body. Locally groundwater flow direction as a bighty variable due to the Rockingham Spring Sour			Microbial pollution of groundwater in karstic aquifers is also a significant problem. Due to the high level of
 quickly from the surface nulo the groundwater system. The normal filtering and protective action of the subsols is often bypassed in karstic aquifers due to the number of swallow holes, dolines and large areas of shallow rock. The hydrochemical signature of groundwater from a number of public supplies within this body is demonstrated in an expanded Durov plot in "Figure 2 below. Groundwater Flow Paths These rocks are generally deviol of intergranular permeability. Groundwater flows through fissures, faults, joints and bedding planes. In pure bedded limestones these openings are enlarged by karstification which significantly enhances the permeability of the rock. Karstification can be accentuated along structural features such as fold axes and faults. Groundwater flow through karst areas is extremely complex and difficult to predict. As flow pathways are often determined by discrete conduits, actual flow directions will not necessarily be perpendicular to the assumed water table contours, as shown by several tracing studies (Drew and Daly, 1993). Flow velocities can be rapid and variable, both spatially and temporally. The rapid groundwater flow velocities can be rapid and variable, both spatially and temporally. The rapid groundwater flow velocities can be an be rapid and variable, both spatially and temporally. The rapid southwest northeast and in the west of the body broadly south to east, in the north of the body broadly southwest northeast and in the west of the body broadly southwet reast in durating the function is influenced by a topographic high in the centre of the body. Droadly groundwater flow direction is influenced by a topographic high rough to the starts of this GWB. Groundwater in the pare bedded limestone (Dakport Limestone) is forced to move in a southwest to northas suggested by the topography. The flow the cost and in the west of the body broadly south west on the assutter and in the west of the body is broadly west to evels in karstified limestone whic			interaction between groundwater and surface water in karstic aquifers, microbial pollution can travel very
 Is often bypassed in karstic aquifers due to the number of swallow holes, dolines and large areas of shallow rock. The hydrochemical signature of groundwater from a number of public supplies supplies within this body is demonstrated in an expanded Duroy plot in Figure 2 below. Groundwater Flow Paths These rocks are generally devoid of intergranular permeability. Groundwater flows through fissures, faults, joints and bedding planes. In pure bedded limestones these openings are enlarged by karstification which significantly enhances the permeability of the rock. Karstification can be accentuated along structural features such as fold axes and faults. Groundwater flow through karst areas is extremely complex and difficult to predict. As flow pathways are often determined by discrete conduits, actual flow directions will not necessarily be perpendicular to the assumed water table contours, as shown by several tracing studies (Drew and Daly, 1993). Flow velocities can be rapid and variable, both spatially and temporally. The rapid groundwater flow velocities recorded in this body indicate that a large proportion of groundwater. They are indicative of regional-scale flow systems. Flow path lengths can be up to a several kilometres in length. Regional groundwater flow direction in the south and east of the body is broadly usout to ent. Groundwater flow direction is influenced by a topographic high in the centre of the body. Locally groundwater flow directions can be highly variable due to the highly karstified nature of the bedrock. Low permeability rocks of adjoining GWBs can act as barriers to flow direction is therefore parallel to the strike of the beds, and the geological contact the thibry and the Oakport Limestone. Groundwater in this GWB is generally unconfined. Water levels in karstified limestone which is dominated by conduit flow, generally show rapid response to rainfall. Water level data from a well with in is dominated by conduit flow, generally show rapid response			quickly from the surface into the groundwater system. The normal filtering and protective action of the subsoils
Groundwater Flow Paths The hydrochemical signature of groundwater from a number of public supplies within this body is demonstrated in a expanded Durro plot in Figure 2 below. Groundwater Flow Paths These rocks are generally devoid of intergranular permeability. Groundwater flows through fissures, faults, joints and bedding planes. In pure bedded limestones these openings are enlarged by karstification which significantly enhances the permeability of the rock. Karstification can be accentuated along structural features such as fold axes and faults. Groundwater flow through karst areas is extremely complex and difficult to predict. As flow pathways are often determined by discrete conduits, actual flow directions will not necessarily be perpendicular to the assumed water table contours, as shown by several tracing studies (Drew and Daly, 1993). Flow velocities can be rapid and variable, both spatially and temporally. The rapid groundwater flow velocities recorded in this body indicate that a large proportion of groundwater flow takes place in enlarged conduit systems. The presence of high yielding springs in this body indicates that the permeability of the rock unit is high enough to permit the throughput of significant quantities of groundwater. They are indicative of regional- scale flow systems. Flow path lengths can be up to a several kilometres in length. Regional groundwater northeast and in the west of the body broadly south to north. Groundwater flow direction is influenced by a topographic high in the centre of the body. Locally groundwater flow direction is influenced by a topographic high in the centre of the body. Locally groundwater flow direction is influenced (Cakport Limestone) is forced to move in a southwest to northeast direction at the contact with the impure limestone (Kilbryan Limestone), rather than from south to north as suggested by the topography. The flow direction is therefore parallel to th			is often bypassed in karstic aquifers due to the number of swallow holes, dolines and large areas of shallow rock.
 in an expanded Duroy plot in Figure 2 below. Groundwater Flow Paths These rocks are generally devoid of intergranular permeability. Groundwater flows through fissures, faults, joints and bedding planes. In pure bedded limestones these openings are enlarged by karstification which significantly enhances the permeability of the rock. Karstification can be accentuated along structural features such as fold axes and faults. Groundwater flow through karst areas is extremely complex and difficult to predict. As flow pathways are often determined by discrete conduits, actual flow directions will not necessarily be perpendicular to the assumed water table contours, as shown by several tracing studies (Drew and Daly, 1993). Flow velocities can be rapid and variable, both spatially and temporally. The rapid groundwater flow velocities recorded in this body indicate that a large proportion of groundwater flow takes place in enlarged conduit systems. The presence of high yielding springs in this body indicates that the permeability of the rock unit is high enough to permit the throughput of significant quantities of groundwater. They are indicative of regional-scale flow systems. Flow path lengths can be up to a several kilometres in length. Regional groundwater flow direction is influenced by a topographic high in the centre of the body. Locally groundwater flow direction is in fluenced by a topographic high in the centre of the body. Locally groundwater flow direction is the cathement of the Rockingham Spring Source (Lee & Kelly 2003) demonstrated that groundwater trains in the cathement of the Rockingham Spring Source (Lee & Kelly 2003) demonstrated that groundwater the kiloryan and the Oakport Limestone. Groundwater in this GWB is generally unconfined. Water levels in karstified limestone which is dominated by conduit flow, generally show rapid response to rainfall. Water level data from a well within this GWB are shown in Figure 1 attached. In the evest of the body near Errit Lou			The hydrochemical signature of groundwater from a number of public supplies within this body is demonstrated
Groundwater Flow These rocks are generally devoid of intergranular permeability. Groundwater flows through fissures, faults, ipints and bedding planes. In pure bedded limestones these openings are enlarged by karstification which significantly enhances the permeability of the rock. Karstification can be accentuated along structural features such as flow aphways are often determined by discrete conduits, actual flow directions will not necessarily be perpendicular to the assumed water table contours, as shown by several tracing studies (Drew and Daly, 1993). Flow velocities can be rapid and variable, both spatially and temporally. The rapid groundwater flow velocities recorded in this body indicate that a large proportion of groundwater flow takes place in enlarged conduit systems. The presence of high yielding springs in this body indicates that the permeability of the rock unit is high enough to permit the throughput of significant quantities of groundwater. They are indicative of regional-scale flow systems. Flow path lengths can be up to a several kilometres in length. Regional groundwater flow direction is influenced by a topographic high in the contre of the body. Locally groundwater flow direction is influenced by a topographic high in the centre of the body. Locally groundwater flow direction is influenced by a topographic high in the centre of the body. 2003) demonstrated that groundwater in the pure bedded limestone (Oakport Limestone) is forced to move in a southwest to northeast direction at the contact with the impure limestone (Kilbryan Limestone), rather than from south to north as suggested by the topography. The flow direction is therefore parallel to the strike of the beds, and the geological contact between the Kilbryan and the Oakport Limestone. Groundwater in this GWB is generally show ray direction a well within this GWB are shown in Figure 1 attached. In the west of the body near Errit Lough the bedrock. Surfac			in an expanded Durov plot in Figure 2 below.
Paths joints and bedding planes. In pure bedded limestones these openings are enlarged by karstification which significantly enhances the permeability of the rock. Karstification can be accentuated along structural features such as fold axes and faults. Groundwater flow through karst areas is extremely complex and difficult to predict. As flow pathways are often determined by discrete conduits, actual flow directions will not necessarily be perpendicular to the assumed water table contours, as shown by several tracing studies (Drew and Daly, 1993). Flow velocities can be rapid and variable, both spatially and temporally. The rapid groundwater flow velocities recorded in this body indicate that a large proportion of groundwater. They are indicative of regional-scale flow systems. Flow path lengths can be up to a several kilometres in length. Regional groundwater flow direction in the south and east of the body broadly south to north. Groundwater flow direction is influenced by a topographic high in the centre of the body. Locally groundwater flow direction is influenced by a topographic high in the centre of the body. Locally groundwater flow direction is influenced by a topographic high in the centre of the body. Locally groundwater flow direction is influenced by a topographic high in the centre of the body. Locally groundwater flow direction is the contact with the impure limestone (Kilbryan Limestone), rather than from south to north as suggested by the topography. The flow direction is therefore parallel to the strike of the beds, and the geological contact between the Kilbryan and the Oakport Limestone. Groundwater in this GWB is operally unconfined. Water level data from a well within this GWB are shown in Figure 1 attached. In the west of the body near Errit Lough the bedrock is overlain by a small area of gravel deposits. Geophysical work in the area no sudgested by the bedrock is overlain by a small area of gravel deposits. Geophysical work in the area has suggested a sand/gravel thickness of	Gro	undwater Flow	These rocks are generally devoid of intergranular permeability. Groundwater flows through fissures, faults,
 significantly enhances the permeability of the rock. Karstification can be accentuated along structural features such as fold acces and faults. Groundwater flow through karst areas is extremely complex and difficult to predict. As flow pathways are often determined by discrete conduits, actual flow directions will not necessarily be perpendicular to the assumed water table contours, as shown by several tracing studies (Drew and Daly, 1993). Flow velocities can be rapid and variable, both spatially and temporally. The rapid groundwater flow velocities recorded in this body indicate that a large proportion of groundwater. They are indicative of regional-scale flow systems. Flow path lengths can be up to a several kilometres in length. Regional groundwater flow direction in the south and east of the body is broadly west to east, in the north of the body broadly southwest northeast and in the west of the body. Locally groundwater flow directions can act as barriers to flow from the karstified nature of the bedrok. Low permeability rocks of adjoining GWBs can act as barriers to flow from the karstified nature of the bedrok. Low permeability rocks of adjoining GWBs can act as barriers to flow from the karstified nut contact with the impure limestone (Kilbryan Limestone). Is forced to move in a southwest to northeast duard the contact with the impure limestone (Kilbryan Limestone). Tather than from south to northa suggested by the topography. The flow direction is therefore parallel to the strike of the bedrok. Suce and the geological contact between the Kilbryan and the Oakport Limestone. Groundwater in this GWB is generally show rapid response to rainfall. Water level data from a well within this GWB are shown in Figure 1 attached. In the west of the body neck area and agravel thickness of greater than 40 m of which 10-30 m may be saturated (Koohane, 1983). There are no borchole data available for the area at present howare row the sing singindicau strafe streams remerge as prings, after flowing as grou		Paths	joints and bedding planes. In pure bedded limestones these openings are enlarged by karstification which
 Such as fold axes and faults. Groundwater flow through karst areas is extremely complex and difficult to predict. As flow pathways are often determined by discrete conduits, actual flow directions will not necessarily be perpendicular to the assumed water table contours, as shown by several tracing studies (Drew and Daly, 1993). Flow velocities can be rapid and variable, both spatially and temporally. The rapid groundwater flow velocities recorded in this body indicate that a large proportion of groundwater flow takes place in enlarged conduit systems. The presence of high yielding springs in this body indicates that the permeability of the rock unit is high enough to permit the throughput of significant quantities of groundwater. They are indicative of regional scale flow systems. Flow path lengths can be up to a several kilometres in length. Regional groundwater flow direction in the south and east of the body broadly south to north. Groundwater flow tincection is influenced by a topographic high in the centre of the body. Locally groundwater flow directions can be highly variable due to the highly karstified nature of the bedrock. Low permeability rocks of adjoining GWBs can act as barriers to flow from the karstified pure bedded limestone of this GWB. Groundwater tracing in the catchment of the Rockingham Spring Source (Lee & Kelly 2003) demonstrated that groundwater rain the impure limestone (Kilbryan Limestone), rather than from south to north as suggested by the topography. The flow direction is therefore parallel to the strike of the beds, and the geological contact between the Kilbryan and the Oakport Limestone. Groundwater in this GWB is generally unconfined. Water level is in kartified limestone which is dominated by conduit flow, generally show rapid response to rainfall. Water level data from a well within this GWB are shown in Figure 1 attached. In the area has suggested a sand/gravel thickness of greater than 40 m of which 10-30 m may be saturated (Keohne, 1983). There are no borehol			significantly enhances the permeability of the rock. Karstification can be accentuated along structural features
 As flow pathways are often determined by discrete conduits, actual flow directions will not necessarily be perpendicular to the assumed water table contours, as shown by several tracing studies (Drew and Daly, 1993). Flow velocities can be rapid and variable, both spatially and temporally. The rapid groundwater flow telocities recorded in this body indicate that a large proportion of groundwater flow takes place in enlarged conduit systems. The presence of high yielding springs in this body indicates that the permeability of the rock unit is high enough to permit the throughput of significant quantities of groundwater. They are indicative of regional-scale flow systems. Flow path lengths can be up to a several kilometres in length. Regional groundwater flow direction is influenced by a topographic high in the centre of the body broadly south to north. Groundwater flow direction is influenced by a topographic high in the centre of the body. Locally groundwater flow direction as a barriers to flow from the karstified pure bedded limestone of this GWB. Groundwater tracing in the catchment of the Rockingham Spring Source (Lee & Kelly 2003) demonstrated that groundwater in the pure bedded limestone (Oakport Limestone). Is forced to move in a southwest to northe as suggested by the topography. The flow direction is therefore parallel to the strike of the beds, and the geological contact between the Kilbryan and the Oakport Limestone. Groundwater in this GWB is generally unconfined. Water levels data from a well within this GWB are shown in Figure 1 attached. In the west of the body encales and/gravel thickness of greater than 40 more winch 10-30 m may be saturated (Kcohane, 1983). There are no borehole data available for the area at present however. Due the limited hydrogeological data these gravels have not been classified as an aquifer. These gravels will however provide a permeability areams, parser or thermiten strates streams, limestone pavements, caves and large springs are evident. Surface streams			such as fold axes and faults. Groundwater flow through karst areas is extremely complex and difficult to predict.
 perpendicular to the assumed water table contours, as shown by several tracing studies (Drew and Daly, 1993). Flow velocities can be rapid and variable, both spatially and temporally. The rapid groundwater flow velocities recorded in this body indicate that a large proportion of groundwater flow takes place in enlarged conduit systems. The presence of high yielding springs in this body indicates that the permeability of the rock unit is high enough to permit the throughput of significant quantities of groundwater. They are indicative of regional-scale flow systems. Flow path lengths can be up to a several kilometres in length. Regional groundwater flow direction in the south and east of the body is broadly south to north. Groundwater flow direction is influenced by a topographic high in the centre of the body. Locally groundwater flow directions can be highly variable due to the highly karstified nature of the body. Locally groundwater flow direction at a barriers to flow from the karstified pure bedded limestone of this GWB. Groundwater rinte pure bedded limestone (Oakport Limestone) is forced to move in a southwest to northeast direction at the contact with the impure limestone (Kilbyan Limestone), rather than from south to north as suggested by the topograph. The flow direction is therefore parallel to the strike of the beds, and the geological contact between the Kilbryan and the Oakport Limestone. Groundwater in this GWB is generally unconfined. Water level data from a well within this GWB are shown in Figure 1 attached. In the west of the body near Errit Lough the bedrock is overlain by a small area of gravel deposits. Geophysical work in the area ne borehole data available for the area at present however. Due the limited hydrogeological data these gravels have not been classified as an aquifer. These gravels will however provide a element of storage for the underlying bedrock. Groundwater & Surface strane surface water in his GWB. Numerous karst features such as turloughs, swall			As flow pathways are often determined by discrete conduits, actual flow directions will not necessarily be
Flow velocities can be rapid and variable, both spatially and temporally. The rapid groundwater flow velocities recorded in this body indicate that a large proportion of groundwater flow takes place in enlarged conduit systems. The presence of high yielding springs in this body indicates that the permeability of the rock unit is high enough to permit the throughput of significant quantities of groundwater. They are indicative of regional-scale flow systems. Flow path lengths can be up to a several kilometres in length. Regional groundwater flow direction in the south and east of the body broadly south to north. Groundwater flow direction is influenced by a topographic high in the centre of the body. Locally groundwater flow direction is ne be highly variable due to the highly karstified nature of the bedrock. Low permeability rocks of adjoining GWBs can act as barriers to flow from the karstified pure bedded limestone of this GWB. Groundwater tracing in the catchment of the Rockingham Spring Source (Lee & Kelly 2003) demonstrated that groundwater tracing in the catchment of the orokingham Spring Source (Lee & Kelly 2003) demonstrated that groundwater tracing in the catchment of the orack provide an southwest to northeast direction at the contact with the impure limestone (Kilbryan Limestone), rather than from south north as suggested by the topography. The flow direction is therefore parallel to the strike of the beds, and the geological contact between the Kilbryan and the Oakport Limestone. Groundwater in this GWB is generally unconfined. Water levels in karstified limestone which is dominated by conduit flow, generally show rapid response to rainfall. Water level data from a well within this GWB are shown in Figure 1 attached. In the west of the body near Errit Lough the bedrock is overlain by a small area of gravel deposits. Geophysical work in the area has suggested a sand/gravel thickness of greater than 40 m of which 10-30 m may be saturated (Keohane, 1983). There are no borehole data available for the a			perpendicular to the assumed water table contours, as shown by several tracing studies (Drew and Daly, 1993).
 recorded in this body indicate that a large proportion of groundwater flow takes place in enlarged conduit systems. The presence of high yielding springs in this body indicates that the permeability of the rock unit is high enough to permit the throughput of significant quantities of groundwater. They are indicative of regional-scale flow systems. Flow path lengths can be up to a several kilometres in length. Regional groundwater flow direction in the south and east of the body is broadly south to north. Groundwater flow direction is influenced by a topographic high in the centre of the body. Locally groundwater flow direction is influenced by a topographic high in the centre of the body. Locally groundwater flow direction is an eat as barriers to flow from the karstified pure bedded limestone of this GWB. Groundwater in the pure bedded limestone (Oakport Limestone) is forced to move in a southwest to northa suggested by the topography. The flow direction is therefore parallel to the strike of the beds, and the geological contact between the Kilbryan and the Oakport Limestone. Groundwater in this GWB is generally unconfined. Water levels in karstified limestone which is dominated by conduit flow, generally show rapid response to rainfall. Water level data from a well within this GWB are shown in Figure 1 attached. In the west of the body rear Errit Lough the bedrock is overlain by a small area of gravel deposits. Geophysical work in the area has suggested a sand/gravel thickness of greater than 40 m of which 10-30 m may be saturated (Keohane, 1983). There are no borehole data available for the area at present however. Due the limited hydrogeological data these gravels have not been classified as an aquifer. These gravels will however provide a permeable pathway for recharge to the karstic aquifer and where saturated, may provide an element of storage for the underlying bedrock. Groundwater & Surface water in this GWB, sumerous karst features such as turloughs, swallow holes, sinking st			Flow velocities can be rapid and variable, both spatially and temporally. The rapid groundwater flow velocities
 systems. The presence of high yielding springs in this body indicates that the permeability of the rock unit is high enough to permit the throughput of significant quantities of groundwater. They are indicative of regional-scale flow systems. Flow path lengths can be up to a several kilometres in length. Regional groundwater flow direction in the south and east of the body is broadly west to east, in the north of the body broadly southwest northeast and in the west of the body. Locally groundwater flow directions can be highly variable due to the highly karstified nature of the bedrock. Low permeability rocks of adjoining GWBs can act as barriers to flow from the karstified pure bedded limestone of this GWB. Groundwater in the pure bedded limestone (Oakport Limestone) is forced to move in a southwest to northeast direction at the contact with the impure limestone (Kilbryan Limestone), rather than from south to north as suggested by the topography. The flow direction is therefore parallel to the strike of the beds, and the geological contact between the Kilbryan and the Oakport Limestone. Groundwater in this GWB is generally unconfined. Water levels and around which is dominated by conduit flow, generally show rapid response to rainfall. Water level data from a well within this GWB are afor gravel deposits. Geophysical work in the area has suggested a sand/gravel thickness of greater than 40 m of which 10-30 m may be saturated (Keohane, 1983). There are no borehole data available for the area at present however. Due the limited hydrogeological data these gravels have not been classified as an aquifer. These gravels will however provide a permeable pathway for recharge to the karsti aquifer and where saturated, may provide an element of storage for the underlying bedrock. Groundwater & and are of gravel deposits. Geophysical work in the area as springs, after flowing as an aquifer. These gravels wilh however provide a permeable pathway for recharge to thee karstic aquifer and where satur			recorded in this body indicate that a large proportion of groundwater flow takes place in enlarged conduit
 high enough to permit the throughput of significant quantities of groundwater. They are indicative of regional-scale flow systems. Flow path lengths can be up to a several kilometres in length. Regional groundwater flow direction in the south and east of the body is broadly west to east, in the north of the body broadly southwest northeast and in the west of the body. Locally groundwater flow direction is influenced by a topographic high in the centre of the body. Locally groundwater flow directions can be highly variable due to the highly karstified nature of the bedrock. Low permeability rocks of adjoining GWBs can act as barriers to flow from the karstified pure bedded limestone of this GWB. Groundwater tracing in the catchment of the Rockingham Spring Source (Lee & Kelly 2003) demonstrated that groundwater in the pure bedded limestone (Oakport Limestone) is forced to move in a southvest to northeast direction at the contact with the impure limestone (Kilbryan Limestone), rather than from south to north as suggested by the topography. The flow direction is therefore parallel to the strike of the beds, and the geological contact between the Kilbryan and the Oakport Limestone. Groundwater in this GWB is generally unconfined. Water levels in karstified limestone which is dominated by conduit flow, generally show rapid response to rainfall. Water level data from a well within this GWB are shown in Figure 1 attached. In the west of the body near Errit Lough the bedrock is overlain by a small area of gravel deposits. Geophysical work in the area has suggested a sand/gravel thickness of greater than 40 m of which 10-30 m may be saturated (Keohane, 1983). There are no borehole data available for the area at present however. Due the limited hydrogeological data these gravels have not been classified as an aquifer. These gravels will however provide a permeable pathway for recharge to the karstic aquifer and where saturated, may provide an element of storage for the underlying bedrock. 			systems. The presence of high yielding springs in this body indicates that the permeability of the rock unit is
 scale flow systems. Flow path lengths can be up to a several kilometres in length. Regional groundwater flow direction in the south and east of the body is broadly west to east, in the north of the body broadly southwest northeast and in the west of the body broadly south to north. Groundwater flow direction is influenced by a topographic high in the centre of the body. Locally groundwater flow direction is influenced by a topographic high in the centre of the body. Locally groundwater flow direction is influenced by a topographic high in the centre of the body. Locally groundwater flow direction is influenced by a topographic high in the centre of the body. Locally groundwater flow direction is influenced by a topographic high in the centre of the body. Locally groundwater flow direction is theratified pure bedded limestone of this GWB. Groundwater in the pure bedded limestone (Oakport Limestone) is forced to move in a southvest to northeast direction at the contact with the impure limestone (Kilbryan Limestone), rather than from south to north as suggested by the topography. The flow direction is therefore parallel to the strike of the body near Errit. Lough the bedrock is overlain by a small area of gravel deposits. Geophysical work in the area has suggested a sand/gravel thickness of greater than 40 m of which 10-30 m may be saturated (Keohane, 1983). There are no borehole data available for the area at present however. Due the limited hydrogeological data these gravels have not been classified as an aquifer. These gravels will however provide a permeable pathway for recharge to the karstic acuifer and where saturated, may provide an element of storage for the underlying bedrock. Groundwater & Surface water is high degree of interconnection between groundwater. Streams I-mesnes, Many turologhs (easonal lakes which are fed by groundwater as the watertable rises in winter) occur in this body. These turloughs support sensitive ecosystems which are highly dependant on groundwater. Stre			high enough to permit the throughput of significant quantities of groundwater. They are indicative of regional-
 direction in the south and east of the body is broadly west to east, in the north of the body broadly southwest northeast and in the west of the body broadly south to north. Groundwater flow direction is influenced by a topographic high in the centre of the body. Locally groundwater flow directions can be highly variable due to the highly karstified nature of the bedrock. Low permeability rocks of adjoining GWBs can act as barriers to flow from the karstified pure bedded limestone of this GWB. Groundwater tracing in the catchment of the Rockingham Spring Source (Lee & Kelly 2003) demonstrated that groundwater in the pure bedded limestone (Oakport Limestone) is forced to move in a southwest to northeast direction at the contact with the impure limestone (Kilbryan Limestone), rather than from south to north as suggested by the topography. The flow direction is therefore parallel to the strike of the beds, and the geological contact between the Kilbryan and the Oakport Limestone. Groundwater in this GWB is generally unconfined. Water levels in karstified limestone which is dominated by conduit flow, generally show rapid response to rainfall. Water level data from a well within this GWB are shown in Figure 1 attached. In the west of the body near Errit Lough the bedrock is overlain by a small area of gravel deposits. Geophysical work in the area has suggested a sand/gravel thickness of greater than 40 m of which 10-30 m may be saturated (Keohane, 1983). There are no borehole data available for the area at present however. Due the limited hydrogeological data these gravels have not been classified as an aquifer. These gravels will however provide a permeable pathway for recharge to the karstic aquifer and where saturated, may provide an element of storage for the underlying bedrock. Groundwater & Surface water in this GWB, sunlow holes, sinking streams, sparse or intermittent streams, limestone pavements, caves and large springs are evident. Surface streams sink frequently, draining through			scale flow systems. Flow path lengths can be up to a several kilometres in length. Regional groundwater flow
 northeast and in the west of the body broadly south to north. Groundwater flow direction is influenced by a topographic high in the centre of the body. Locally groundwater flow directions can be highly variable due to the highly karstified nature of the bedrock. Low permeability rocks of adjoining GWBs can act as barriers to flow from the karstified pure bedded limestone of this GWB. Groundwater tracing in the catchment of the Rockingham Spring Source (Lee & Kelly 2003) demonstrated that groundwater in the pure bedded limestone (Oakport Limestone) is forced to move in a southwest to northeast direction at the contact with the impure limestone (Kilbryan Limestone), rather than from south to north as suggested by the topography. The flow direction is therefore parallel to the strike of the beds, and the geological contact between the Kilbryan and the Oakport Limestone. Groundwater in this GWB is generally unconfined. Water levels in karstified limestone which is dominated by conduit flow, generally show rapid response to rainfall. Water level data from a well within this GWB are shown in Figure 1 attached. In the west of the body near Errit Lough the bedrock is overlain by a small area of gravel deposits. Geophysical work in the area has suggested a sand/gravel thickness of greater than 40 m of which 10-30 m may be saturated (Keohane, 1983). There are no borehole data available for the area at present however. Due the limited hydrogeological data these gravels have not been classified as an aquifer. These gravels will however provide a permeable pathway for recharge to the karstic aquifer and where saturated, may provide an element of storage for the underlying bedrock. Groundwater & Surface water in this ddegree of interconnection between groundwater and surface water in this GWB, nany of which are highly dependant on groundwater. Streams re-emerge as springs, after flowing as groundwater for some distance, to once again form significant surface water in this body. These turloughs suppo			direction in the south and east of the body is broadly west to east, in the north of the body broadly southwest
 topographic high in the centre of the body. Locally groundwater flow directions can be highly variable due to the highly karstified nature of the bedrock. Low permeability rocks of adjoining GWBs can act as barriers to flow from the karstified pure bedded limestone of this GWB. Groundwater tracing in the catchment of the Rockingham Spring Source (Lee & Kelly 2003) demonstrated that groundwater in the pure bedded limestone (Oakport Limestone) is forced to move in a southwest to northeast direction at the contact with the impure limestone (Kilbryan Limestone), rather than from south to north as suggested by the topography. The flow direction is therefore parallel to the strike of the beds, and the geological contact between the Kilbryan and the Oakport Limestone. Groundwater in this GWB is generally unconfined. Water levels in karstified limestone which is dominated by conduit flow, generally show rapid response to rainfall. Water level data from a well within this GWB are shown in Figure 1 attached. In the west of the body near Errit Lough the bedrock is overlain by a small area of gravel deposits. Geophysical work in the area has suggested a sand/gravel thickness of greater than 40 m of which 10-30 m may be saturated (Keohane, 1983). There are no borehole data available for the area at present however. Due the limited hydrogeological data these gravels have not been classified as an aquifer. These gravels will however provide a permeable pathway for recharge to the karstic aquifer an where saturated, may provide an element of storage for the underlying bedrock. There is a high degree of interconnection between groundwater and surface water in this GWB. Numerous karst features such as turloughs, swallow holes, sinking streams, sparse or intermittent streams, limestone pavements, caves and large springs are evident. Surface streams ink frequently, draining through karst features into the groundwater for some distance, to once again form significant surface streams. Many turloughs (season			northeast and in the west of the body broadly south to north. Groundwater flow direction is influenced by a
 highly karstified nature of the bedrock. Low permeability rocks of adjoining GWBs can act as barriers to flow from the karstified pure bedded limestone of this GWB. Groundwater tracing in the catchment of the Rockingham Spring Source (Lee & Kelly 2003) demonstrated that groundwater in the pure bedded limestone (Oakport Limestone) is forced to move in a southwest to northeast direction at the contact with the impure limestone (Kilbryan Limestone), rather than from south to north as suggested by the topography. The flow direction is therefore parallel to the strike of the beds, and the geological contact between the Kilbryan and the Oakport Limestone. Groundwater in this GWB is generally unconfined. Water levels in karstified limestone which is dominated by conduit flow, generally show rapid response to rainfall. Water level data from a well within this GWB are shown in Figure 1 attached. In the west of the body near Errit Lough the bedrock is overlain by a small area of gravel deposits. Geophysical work in the area has suggested a sand/gravel thickness of greater than 40 m of which 10-30 m may be saturated (Keohane, 1983). There are no borehole data available for the area at present however. Due the limited hydrogeological data these gravels have not been classified as an aquifer. These gravels will however provide a permeable pathway for recharge to the karstic aquifer and where saturated, may provide an element of storage for the underlying bedrock. 			topographic high in the centre of the body. Locally groundwater flow directions can be highly variable due to the
 from the karstified pure bedded limestone of this GWB. Groundwater tracing in the catchment of the Rockingham Spring Source (Lee & Kelly 2003) demonstrated that groundwater in the pure bedded limestone (Oakport Limestone) is forced to move in a southwest to northeast direction at the contact with the impure limestone (Kilbryan Limestone), rather than from south to north as suggested by the topography. The flow direction is therefore parallel to the strike of the beds, and the geological contact between the Kilbryan and the Oakport Limestone. Groundwater in this GWB is generally unconfined. Water levels in karstified limestone which is dominated by conduit flow, generally show rapid response to rainfall. Water level data from a well within this GWB are shown in Figure 1 attached. In the west of the body near Errit Lough the bedrock is overlain by a small area of gravel deposits. Geophysical work in the area has suggested a sand/gravel thickness of greater than 40 m of which 10-30 m may be saturated (Keohane, 1983). There are no borehole data available for the area at present however. Due the limited hydrogeological data these gravels have not been classified as an aquifer. These gravels will however provide a permeable pathway for recharge to the karstic aquifer and where saturated, may provide an element of storage for the underlying bedrock. 			highly karstified nature of the bedrock. Low permeability rocks of adjoining GWBs can act as barriers to flow
 Rockingham Spring Source (Lee & Kelly 2003) demonstrated that groundwater in the pure bedded limestone (Oakport Limestone) is forced to move in a southwest to northeast direction at the contact with the impure limestone (Kilbryan Limestone), rather than from south to north as suggested by the topography. The flow direction is therefore parallel to the strike of the beds, and the geological contact between the Kilbryan and the Oakport Limestone. Groundwater in this GWB is generally unconfined. Water levels in karstified limestone which is dominated by conduit flow, generally show rapid response to rainfall. Water level data from a well within this GWB are shown in Figure 1 attached. In the west of the body near Errit Lough the bedrock is overlain by a small area of gravel deposits. Geophysical work in the area has suggested a sand/gravel thickness of greater than 40 m of which 10-30 m may be saturated (Keohane, 1983). There are no borehole data available for the area at present however. Due the limited hydrogeological data these gravels have not been classified as an aquifer. These gravels will however provide a permeable pathway for recharge to the karstic aquifer and where saturated, may provide an element of storage for the underlying bedrock. There is a high degree of interconnection between groundwater and surface water in this GWB. Numerous karst features such as turloughs, swallow holes, sinking streams, sparse or intermittent streams, limestone pavements, caves and large springs are evident. Surface streams sink frequently, draining through karst features into the groundwater for some distance, to once again form significant surface streams. Many turloughs (seasonal lakes which are fed by groundwater, as the watertable rises in winter) occur in this body. These turloughs support sensitive ecosystems which are highly dependant on groundwater. Because of the close interaction between surface water and groundwater in karstified aquifers, surface water and groundwater system, and vi			from the karstified pure bedded limestone of this GWB. Groundwater tracing in the catchment of the
 (Oakport Limestone) is forced to move in a southwest to northeast direction at the contact with the impure limestone (Kilbryan Limestone), rather than from south to north as suggested by the topography. The flow direction is therefore parallel to the strike of the beds, and the geological contact between the Kilbryan and the Oakport Limestone. Groundwater in this GWB is generally unconfined. Water levels in karstified limestone which is dominated by conduit flow, generally show rapid response to rainfall. Water level data from a well within this GWB are shown in Figure 1 attached. In the west of the body near Errit Lough the bedrock is overlain by a small area of gravel deposits. Geophysical work in the area has suggested a sand/gravel thickness of greater than 40 m of which 10-30 m may be saturated (Keohane, 1983). There are no borehole data available for the area at present however. Due the limited hydrogeological data these gravels have not been classified as an aquifer. These gravels will however provide a permeable pathway for recharge to the karstic aquifer and where saturated, may provide an element of storage for the underlying bedrock. Groundwater & Surface water in this GWB, swallow holes, sinking streams, sparse or intermittent streams, limestone pavements, caves and large springs are evident. Surface streams sink frequently, draining through karst features into the groundwater for some distance, to once again form significant surface streams. Many turloughs (seasonal lakes which are field by groundwater as the watertable rises in winter) occur in this body. These turloughs support sensitive ecosystems which are highly dependant on groundwater. Because of the close interaction between surface water and groundwater in karstified aquifers, surface water and groundwater system, and vice versa. There are a large number of associated terrestrial ecosystems within this GWB, many of which are highly dependent on groundwater system, and vice versa. There are a large number of susoci			Rockingham Spring Source (Lee & Kelly 2003) demonstrated that groundwater in the pure bedded limestone
 limestone (Kilbryan Limestone), rather than from south to north as suggested by the topography. The flow direction is therefore parallel to the strike of the beds, and the geological contact between the Kilbryan and the Oakport Limestone. Groundwater in this GWB is generally unconfined. Water levels in karstified limestone which is dominated by conduit flow, generally show rapid response to rainfall. Water level data from a well within this GWB are shown in Figure 1 attached. In the west of the body near Errit Lough the bedrock is overlain by a small area of gravel deposits. Geophysical work in the area has suggested a sand/gravel thickness of greater than 40 m of which 10-30 m may be saturated (Keohane, 1983). There are no borehole data available for the area at present however. Due the limited hydrogeological data these gravels have not been classified as an aquifer. These gravels will however provide a permeable pathway for recharge to the karstic aquifer and where saturated, may provide an element of storage for the underlying bedrock. Groundwater & Surface water in this GWB, swallow holes, sinking streams, sparse or intermittent streams, limestone pavements, caves and large springs are evident. Surface streams sink frequently, draining through karst features into the groundwater for some distance, to once again form significant surface streams. Many turloughs (seasonal lakes which are fed by groundwater as the watertable rises in winter) occur in this body. These turloughs support sensitive ecosystems which are highly dependant on groundwater. Because of the close interaction between surface water and groundwater in karstified aquifers, surface water and groundwater system, and vice versa. There are a large number of associated terrestrial ecosystems within this GWB, many of which are highly dependant on groundwater. 			(Oakport Limestone) is forced to move in a southwest to northeast direction at the contact with the impure
 direction is therefore parallel to the strike of the beds, and the geological contact between the Kilbryan and the Oakport Limestone. Groundwater in this GWB is generally unconfined. Water levels in karstified limestone which is dominated by conduit flow, generally show rapid response to rainfall. Water level data from a well within this GWB are shown in Figure 1 attached. In the west of the body near Errit Lough the bedrock is overlain by a small area of gravel deposits. Geophysical work in the area has suggested a sand/gravel thickness of greater than 40 m of which 10-30 m may be saturated (Keohane, 1983). There are no borehole data available for the area at present however. Due the limited hydrogeological data these gravels have not been classified as an aquifer. These gravels will however provide a permeable pathway for recharge to the karstic aquifer and where saturated, may provide an element of storage for the underlying bedrock. Groundwater & Surface water interactions There is a high degree of interconnection between groundwater and surface water in this GWB. Numerous karst features such as turloughs, swallow holes, sinking streams, sparse or intermittent streams, limestone pavements, caves and large springs are evident. Surface streams sink frequently, draining through karst features into the groundwater for some distance, to once again form significant surface streams. Many turloughs (seasonal lakes which are fed by groundwater in karstified aquifers, surface water and groundwater as the watertable rises in winter) occur in this body. These turloughs support sensitive ecosystems which are highly dependant on groundwater. Because of the close interaction between surface water and groundwater in karstified aquifers, surface water and groundwater system, and vice versa. There are a large number of associated terrestrial ecosystems within this GWB, many of which are highly dependent on groundwater system, which are highly dependent on groundwater system, and vice ve			limestone (Kilbryan Limestone), rather than from south to north as suggested by the topography. The flow
 Oakport Limestone, Groundwater in this GWB is generally unconfined. Water levels in karstified limestone which is dominated by conduit flow, generally show rapid response to rainfall. Water level data from a well within this GWB are shown in Figure 1 attached. In the west of the body near Errit Lough the bedrock is overlain by a small area of gravel deposits. Geophysical work in the area has suggested a sand/gravel thickness of greater than 40 m of which 10-30 m may be saturated (Keohane, 1983). There are no borehole data available for the area at present however. Due the limited hydrogeological data these gravels have not been classified as an aquifer. These gravels will however provide a permeable pathway for recharge to the karstic aquifer and where saturated, may provide an element of storage for the underlying bedrock. Groundwater & Surface water interactions There is a high degree of interconnection between groundwater and surface water in this GWB. Numerous karst features such as turloughs, swallow holes, sinking streams, sparse or intermittent streams, limestone pavements, caves and large springs are evident. Surface streams sink frequently, draining through karst features into the groundwater system, providing rapid recharge to groundwater. Streams re-emerge as springs, after flowing as groundwater fed by groundwater as the watertable rises in winter) occur in this body. These turloughs support sensitive ecosystems which are highly dependant on groundwater. Because of the close interaction between surface water and groundwater in karstified aquifers, surface water and groundwater system, and vice versa. There are a large number of associated terrestrial ecosystems within this GWB, many of which are highly dependent on groundwater. Streams of the close interaction between surface water and groundwater in carsuidiverse. 			direction is therefore parallel to the strike of the beds, and the geological contact between the Kilbryan and the
 which is dominated by conduit flow, generally show rapid response to rainfall. Water level data from a well within this GWB are shown in Figure 1 attached. In the west of the body near Errit Lough the bedrock is overlain by a small area of gravel deposits. Geophysical work in the area has suggested a sand/gravel thickness of greater than 40 m of which 10-30 m may be saturated (Keohane, 1983). There are no borehole data available for the area at present however. Due the limited hydrogeological data these gravels have not been classified as an aquifer. These gravels will however provide a permeable pathway for recharge to the karstic aquifer and where saturated, may provide an element of storage for the underlying bedrock. Groundwater & Surface water interactions There is a high degree of interconnection between groundwater and surface water in this GWB. Numerous karst features such as turloughs, swallow holes, sinking streams, sparse or intermittent streams, limestone pavements, caves and large springs are evident. Surface streams sink frequently, draining through karst features into the groundwater for some distance, to once again form significant surface streams. Many turloughs (seasonal lakes which are fed by groundwater as the watertable rises in winter) occur in this body. These turloughs support sensitive ecosystems which are highly dependant on groundwater. Because of the close interaction between surface water and groundwater quality are also closely linked. Any contamination of surface water is rapidly transported into the groundwater system, and vice versa. There are a large number of associated terrestrial ecosystems within this GWB, many of which are highly dependent on groundwater system, and vice versa. There are a large number of associated terrestrial ecosystems within this GWB, many of which are highly dependent on groundwater system. 			Oakport Limestone. Groundwater in this GWB is generally unconfined. Water levels in karstified limestone
 Within this GWB are shown in Figure 1 attached. In the west of the body near Errit Lough the bedrock is overlain by a small area of gravel deposits. Geophysical work in the area has suggested a sand/gravel thickness of greater than 40 m of which 10-30 m may be saturated (Keohane, 1983). There are no borehole data available for the area at present however. Due the limited hydrogeological data these gravels have not been classified as an aquifer. These gravels will however provide a permeable pathway for recharge to the karstic aquifer and where saturated, may provide an element of storage for the underlying bedrock. Groundwater & Surface water interactions There is a high degree of interconnection between groundwater and surface water in this GWB. Numerous karst features such as turloughs, swallow holes, sinking streams, sparse or intermittent streams, limestone pavements, caves and large springs are evident. Surface streams sink frequently, draining through karst features into the groundwater for some distance, to once again form significant surface streams. Many turloughs (seasonal lakes which are fed by groundwater in karstified aquifers, surface water and groundwater quality are also closely linked. Any contamination of surface water is rapidly transported into the groundwater system, and vice versa. There are a large number of associated terrestrial ecosystems within this GWB, many of which are highly dependent on groundwater system, and vice versa. There are a large number of associated terrestrial ecosystems within this GWB, many of which are highly dependent on groundwater system, and vice versa. There are a large number of associated terrestrial ecosystems within this GWB, many of which are highly dependent on groundwater system, and vice versa. 			which is dominated by conduit flow generally show rapid response to rainfall. Water level data from a well
Groundwater & Surface water interactionsThese gravels will however. Due the limited hydrogeological data these gravels have not been classified as an aquifer. These gravels will however provide a permeable pathway for recharge to the karstic aquifer and where saturated, may provide an element of storage for the underlying bedrock.Groundwater & Surface water interactionsThere is a high degree of interconnection between groundwater and surface water in this GWB. Numerous karst features such as turloughs, swallow holes, sinking streams, sparse or intermittent streams, limestone pavements, caves and large springs are evident. Surface streams sink frequently, draining through karst features into the groundwater for some distance, to once again form significant surface streams. Many turloughs (seasonal lakes which are fed by groundwater as the watertable rises in winter) occur in this body. These turloughs support sensitive ecosystems which are highly dependant on groundwater. Because of the close interaction between surface water and groundwater in karstified aquifers, surface water and groundwater system, and vice versa. There are a large number of associated terrestrial ecosystems within this GWB, many of which are highly dependent on groundwater system, within the body. These turboughs are highly dependent on groundwater and groundwater system, and vice versa. There are a large number of associated terrestrial ecosystems within this GWB, many of which are highly dependent on groundwater and groundwater system, and vice versa. There are a large number of associated terrestrial ecosystems within this GWB, many of which are highly dependent on groundwater and groundwater groundwater dependent on groundwater system, and vice versa.			within this GWB are shown in Figure 1 attached. In the west of the body near Errit Lough the bedrock is
Groundwater & Surface water interactionsThese gravels will however. Due the limited hydrogeological data these gravels have not been classified as an aquifer. These gravels will however provide a permeable pathway for recharge to the karstic aquifer and where saturated, may provide an element of storage for the underlying bedrock.Groundwater & Surface water interactionsThere is a high degree of interconnection between groundwater and surface water in this GWB. Numerous karst features such as turloughs, swallow holes, sinking streams, sparse or intermittent streams, limestone pavements, caves and large springs are evident. Surface streams sink frequently, draining through karst features into the groundwater for some distance, to once again form significant surface streams. Many turloughs (seasonal lakes which are fed by groundwater as the watertable rises in winter) occur in this body. These turloughs support sensitive ecosystems which are highly dependant on groundwater. Because of the close interaction between surface water and groundwater in karstified aquifers, surface water and groundwater system, and vice versa. There are a large number of associated terrestrial ecosystems within this GWB, many of which are highly dependent on groundwater system within this GWB, many of which are highly dependent on groundwater system within this GWB, many of which are highly dependent on groundwater system within this GWB, many of which are highly dependent on groundwater and grou			overlain by a small area of gravel denosits. Geophysical work in the area has suggested a sand/gravel thickness
Or grouter than to inform the first where in the formation of the first set of the transmister of the formation of the first set of the transmister of transmister of the transmister of the transmister of the transmister of transmister of the transmister of the transmister of transmiste			of greater than 40 m of which 10-30 m may be saturated (Kephane 1983). There are no borehole data available
In a quifer. These gravels will however provide a permeable pathway for recharge to the karstic aquifer and where saturated, may provide an element of storage for the underlying bedrock.Groundwater & Surface water interactionsThere is a high degree of interconnection between groundwater and surface water in this GWB. Numerous karst 			for the area at present however. Due the limited hydrogeological data these gravels have not been classified as
Groundwater & Surface water interactions			an aquifer. These gravels will however provide a permeable pathway for recharge to the karstic aquifer and
Groundwater & Surface water interactions There is a high degree of interconnection between groundwater and surface water in this GWB. Numerous karst features such as turloughs, swallow holes, sinking streams, sparse or intermittent streams, limestone pavements, caves and large springs are evident. Surface streams sink frequently, draining through karst features into the groundwater system, providing rapid recharge to groundwater. Streams re-emerge as springs, after flowing as groundwater for some distance, to once again form significant surface streams. Many turloughs (seasonal lakes which are fed by groundwater as the watertable rises in winter) occur in this body. These turloughs support sensitive ecosystems which are highly dependant on groundwater. Because of the close interaction between surface water and groundwater in karstified aquifers, surface water and groundwater system, and vice versa. There are a large number of associated terrestrial ecosystems within this GWB, many of which are highly dependent on groundwater a			where saturated may provide an element of storage for the underlying bedrock
Surface water interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions interactions inte	G	oundwater &	There is a high degree of interconnection between groundwater and surface water in this GWB. Numerous karst
interactions caves and large springs are evident. Surface streams sink frequently, draining through karst features into the groundwater system, providing rapid recharge to groundwater. Streams re-emerge as springs, after flowing as groundwater for some distance, to once again form significant surface streams. Many turloughs (seasonal lakes which are fed by groundwater as the watertable rises in winter) occur in this body. These turloughs support sensitive ecosystems which are highly dependant on groundwater. Because of the close interaction between surface water and groundwater in karstified aquifers, surface water and groundwater system, and vice versa. There are a large number of associated terrestrial ecosystems within this GWB, many of which are highly dependent on groundwater within this GWB.	S	urface water	features such as turloughs, swallow holes, sinking streams, sparse or intermittent streams, limestone navements.
groundwater system, providing rapid recharge to groundwater. Streams re-emerge as springs, after flowing as groundwater for some distance, to once again form significant surface streams. Many turloughs (seasonal lakes which are fed by groundwater as the watertable rises in winter) occur in this body. These turloughs support sensitive ecosystems which are highly dependant on groundwater. Because of the close interaction between surface water and groundwater in karstified aquifers, surface water and groundwater quality are also closely linked. Any contamination of surface water is rapidly transported into the groundwater system, and vice versa. There are a large number of associated terrestrial ecosystems within this GWB, many of which are highly dependent on groundwater within this GWB.	ĩ	interactions	caves and large springs are evident. Surface streams sink frequently, draining through karst features into the
groundwater for some distance, to once again form significant surface streams. Many turloughs (seasonal lakes which are fed by groundwater as the watertable rises in winter) occur in this body. These turloughs support sensitive ecosystems which are highly dependant on groundwater. Because of the close interaction between surface water and groundwater in karstified aquifers, surface water and groundwater quality are also closely linked. Any contamination of surface water is rapidly transported into the groundwater system, and vice versa. There are a large number of associated terrestrial ecosystems within this GWB, many of which are highly dependent on groundwater			groundwater system, providing rapid recharge to groundwater. Streams re-emerge as springs after flowing as
which are fed by groundwater as the watertable rises in winter) occur in this body. These turloughs support sensitive ecosystems which are highly dependant on groundwater. Because of the close interaction between surface water and groundwater in karstified aquifers, surface water and groundwater quality are also closely linked. Any contamination of surface water is rapidly transported into the groundwater system, and vice versa. There are a large number of associated terrestrial ecosystems within this GWB, many of which are highly dependent on groundwater			groundwater for some distance, to once again form significant surface streams. Many turloughs (seasonal lakes
sensitive ecosystems which are highly dependant on groundwater. Because of the close interaction between surface water and groundwater in karstified aquifers, surface water and groundwater quality are also closely linked. Any contamination of surface water is rapidly transported into the groundwater system, and vice versa. There are a large number of associated terrestrial ecosystems within this GWB, many of which are highly dependent on groundwater			which are fed by groundwater as the watertable rises in winter) occur in this body. These turbulots support
surface water and groundwater in karstified aquifers, surface water and groundwater quality are also closely linked. Any contamination of surface water is rapidly transported into the groundwater system, and vice versa. There are a large number of associated terrestrial ecosystems within this GWB, many of which are highly dependent on groundwater			sensitive ecosystems which are highly dependent on groundwater Because of the close interaction between
linked. Any contamination of surface water is rapidly transported into the groundwater system, and vice versa. There are a large number of associated terrestrial ecosystems within this GWB, many of which are highly			surface water and groundwater in karstified aquifers, surface water and groundwater quality are also closely
There are a large number of associated terrestrial ecosystems within this GWB, many of which are highly dependent on groundwater			linked Any contamination of surface water is rapidly transported into the groundwater system and vice versa
dependent on grandwater			There are a large number of associated terrestrial ecosystems within this GWB many of which are highly
ucpendant on groundwater.			dependant on groundwater.

	•	This bo	dy occupies a large area in north County Roscommon south of the Curlew Mountains. It is bounded to the north by the		
		topogra	with the Dinantian Lower impure Linestones of the Curiew Mountains GwB. It is bounded to the west and south by splic highs and groundwater divides that coincide with surface water catchment boundaries. It is bounded to the east in		
		part by	the contact with the Dinantian Sandstones of the Scramoge North GWB and in part by the contact with various low		
		permeat	pility rocks of the Kilglass Dromod and Mohill GWBs.		
	•	The top	ography of the body is varied. Low-lying areas (40-50 mAOD) occur in the east of the body, where a large number of		
		lakes ar	e separated by small low hills. Higher ground occurs on the Plains of Boyle (80-110 mAOD) and on the south western		
		boundar	y of the body (120-140 mAOD). Dumlins are common in the body, generally increasing in number and size to the east		
		of the b	by Areas of peat and cut peat are common, becoming more common towards the northwest of the body. There are		
		underly	within the body where surface drainage is limited or absent (e.g. south of Boyle) reflecting the karstified nature of the lying bedrock and the high permeability or absence/thin occurrence of overlying subsoil		
		The GV	VB is composed primarily of high transmissivity karstified limestone. Groundwater flows through a network of		
_		solution	ally enlarged fissures and conduits. A large number of karst features such as dolines, swallow holes and turlough soccur		
del		within the body. Small areas of pure unbedded limestones are incorporated within this GWB.			
m	•	Ground	indwater flows along interconnected fractures, joints, faults and bedding planes, many of which have been enlarged by		
ual		solution. Much of the groundwater flow is concentrated in conduits. Rapid groundwater flow velocities have been reco			
epti		through	through groundwater tracing.		
nce	•	Recharg	ge to this GWB is both point, though swallow holes and collapse features, and diffuse via rainfall percolating through the		
J		subsoll.	The lack of surface drainage in several parts of this GwB indicates that potential recharge readily percolates into the		
		The gro	undwater in this body is generally unconfined. Most groundwater flow will be concentrated in the upper enikarstic layer		
	-	and in a	zone of interconnected fissures, enlarged by karstification, generally extending to a depth of 30 m. Deep water strikes		
		in more	isolated faults/fractures can be encountered.		
	•	In gener	al in karstic aquifers, the degree of interconnection between fractures zones is high and they support regional scale flow		
		systems	. Flow paths can potentially be several kilometres in length.		
	•	Some a	eas in this GWB are of extreme groundwater vulnerability due to the thin nature of the subsoil, as well as the frequency		
		of karst	features. Groundwater storage in karstified bedrock is low and the potential for contaminant attenuation in such aquifers		
	 Groundwater discharges to the streams and rivers crossing the body and to the large high yielding springs, many of whic used for water supply. 		u. water discharges to the streams and rivers crossing the body and to the large high vielding springs, many of which are		
			water supply.		
	•	There is	s a high degree of interaction between surface water and groundwater in this GWB. Groundwater supports many		
		sensitive	e terrestrial ecosystems, including turloughs, which are highly dependant on groundwater.		
Attac	chmer	nts	Groundwater hydrographs (Figure 1); Hydrochemical Signature (Figure 2)		
Instr	umen	tation	Stream gauges: 25318, 26011, 26017, 26018, 26072, 26086, 26089, 26116, 26118, 26119, 26148, 26223, 26225, 26227, 2		
			20227, 20228, 20229, 20230, 20231, 20232, 20233, 20234, 20307, 20308. EPA Water Level Monitoring boreholes: Lung Bridge (ROS 072), Aghadrestan (ROS 075), Cloopmagunn (ROS 078).		
			Cornaglia (ROS 079).		
			EPA Representative Monitoring points: Boyle (Rockingham) RWSS (ROS011), Cloonmagunaun (ROS019),		
			Strokestown WS (ROS043), Croghan GWS (ROS 055), Hollywell GWS (ROS065)		
Infor	matio	n	Doak, M. (1995) The Vulnerability to Pollution and Hydrochemical Variation of Eleven Springs (Catchments) in the		
Sour	ces		Karst Lowlands of the West of Ireland. Unpublished M.Sc. thesis, Sligo Regional		
			Hickey, C., Lee, M., Drew, D., Meenan, R. and Daly D. (2002) Lowland Karst of North Roscommon and Westmeath. International Association of Hydrogeologists Irish Group, Karst Field Trip October 2002, Unpublished IAH Penert		
			Lee M and Kelly C (2003) Boyle-Ardcarn Water Supply Scheme (Rockingham Spring) Groundwater Source		
			Protection Zones. Geological Survey of Ireland Report to Roscommon Co. Co., 14 pp.		
			Lee, M. & Daly D. (2003) County Roscommon Groundwater Protection Scheme. Main Report. Roscommon County		
			Comment & Constantial Commence of Instantia 5 Ann		
			Council & Geological Survey of Ireland, 54pp.		
			Long, C. B., McConnell and Philcox, M.E. (2003) A Geological Description of South Mayo, to accompany the		
			Long, C. B., McConnell and Philcox, M.E. (2003) A Geological Description of South Mayo, to accompany the bedrock geology 1:100,000 scale map series, Sheet 11, South Mayo. With contributions by W. Cox and U. Leader.		
			Long, C. B., McConnell and Philcox, M.E. (2003) <i>A Geological Description of South Mayo, to accompany the bedrock geology 1:100,000 scale map series, Sheet 11, South Mayo.</i> With contributions by W. Cox and U. Leader. Geological Survey of Ireland. (Publication pending) MacDermot, C. V. Long, C. B. and Harney, S.J (1996) Geology of Sligo-Leitrim: A geological description of Sligo		
			 Counch & Geological Survey of Ireland, 54pp. Long, C. B., McConnell and Philcox, M.E. (2003) A Geological Description of South Mayo, to accompany the bedrock geology 1:100,000 scale map series, Sheet 11, South Mayo. With contributions by W. Cox and U. Leader. Geological Survey of Ireland. (Publication pending) MacDermot, C.V. Long C.B. and Harney S.J (1996) Geology of Sligo-Leitrim: A geological description of Sligo, Leitrim and adjoining parts of Cavan, Fermanagh, Mayo and Roscommon, to accompany bedrock geology 1:100,000 		
			 Council & Geological Survey of Ireland, 54pp. Long, C. B., McConnell and Philcox, M.E. (2003) A Geological Description of South Mayo, to accompany the bedrock geology 1:100,000 scale map series, Sheet 11, South Mayo. With contributions by W. Cox and U. Leader. Geological Survey of Ireland. (Publication pending) MacDermot, C.V. Long C.B. and Harney S.J (1996) Geology of Sligo-Leitrim: A geological description of Sligo, Leitrim and adjoining parts of Cavan, Fermanagh, Mayo and Roscommon, to accompany bedrock geology 1:100,000 scale map, Sheet 7, Sligo - Leitrim. With contributions from K. Carlingbold, G. Stanley, D. Daly and R. Meehan. 		
			 Council & Geological Survey of Ireland, 54pp. Long, C. B., McConnell and Philcox, M.E. (2003) A Geological Description of South Mayo, to accompany the bedrock geology 1:100,000 scale map series, Sheet 11, South Mayo. With contributions by W. Cox and U. Leader. Geological Survey of Ireland. (Publication pending) MacDermot, C.V. Long C.B. and Harney S.J (1996) Geology of Sligo-Leitrim: A geological description of Sligo, Leitrim and adjoining parts of Cavan, Fermanagh, Mayo and Roscommon, to accompany bedrock geology 1:100,000 scale map, Sheet 7, Sligo - Leitrim. With contributions from K. Carlingbold, G. Stanley, D. Daly and R. Meehan. Geological Survey of Ireland, 100pp. 		
			 Council & Geological Survey of Ireland, 54pp. Long, C. B., McConnell and Philcox, M.E. (2003) A Geological Description of South Mayo, to accompany the bedrock geology 1:100,000 scale map series, Sheet 11, South Mayo. With contributions by W. Cox and U. Leader. Geological Survey of Ireland. (Publication pending) MacDermot, C.V. Long C.B. and Harney S.J (1996) Geology of Sligo-Leitrim: A geological description of Sligo, Leitrim and adjoining parts of Cavan, Fermanagh, Mayo and Roscommon, to accompany bedrock geology 1:100,000 scale map, Sheet 7, Sligo - Leitrim. With contributions from K. Carlingbold, G. Stanley, D. Daly and R. Meehan. Geological Survey of Ireland, 100pp. Morris J.H., Somerville I.D. and MacDermot C.V. (2002). Geology of Longford-Roscommon. A Geological Description of Cavan. A Geological Description of Sligo Prince and Prince an		
			 Council & Geological Survey of Ireland, 54pp. Long, C. B., McConnell and Philcox, M.E. (2003) A Geological Description of South Mayo, to accompany the bedrock geology 1:100,000 scale map series, Sheet 11, South Mayo. With contributions by W. Cox and U. Leader. Geological Survey of Ireland. (Publication pending) MacDermot, C.V. Long C.B. and Harney S.J (1996) Geology of Sligo-Leitrim: A geological description of Sligo, Leitrim and adjoining parts of Cavan, Fermanagh, Mayo and Roscommon, to accompany bedrock geology 1:100,000 scale map, Sheet 7, Sligo - Leitrim. With contributions from K. Carlingbold, G. Stanley, D. Daly and R. Meehan. Geological Survey of Ireland, 100pp. 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. Gereghty B. McConnell K. Carlingbold, W. Cor, D. Daly. Cacheries Survey of Ireland, 121an. 		
			 Council & Geological Survey of Ireland, 54pp. Long, C. B., McConnell and Philcox, M.E. (2003) A Geological Description of South Mayo, to accompany the bedrock geology 1:100,000 scale map series, Sheet 11, South Mayo. With contributions by W. Cox and U. Leader. Geological Survey of Ireland. (Publication pending) MacDermot, C.V. Long C.B. and Harney S.J (1996) Geology of Sligo-Leitrim: A geological description of Sligo, Leitrim and adjoining parts of Cavan, Fermanagh, Mayo and Roscommon, to accompany bedrock geology 1:100,000 scale map, Sheet 7, Sligo - Leitrim. With contributions from K. Carlingbold, G. Stanley, D. Daly and R. Meehan. Geological Survey of Ireland, 100pp. 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) 		
Discl	aimer		 Council & Geological Survey of Ireland, 54pp. Long, C. B., McConnell and Philcox, M.E. (2003) A Geological Description of South Mayo, to accompany the bedrock geology 1:100,000 scale map series, Sheet 11, South Mayo. With contributions by W. Cox and U. Leader. Geological Survey of Ireland. (Publication pending) MacDermot, C.V. Long C.B. and Harney S.J (1996) Geology of Sligo-Leitrim: A geological description of Sligo, Leitrim and adjoining parts of Cavan, Fermanagh, Mayo and Roscommon, to accompany bedrock geology 1:100,000 scale map, Sheet 7, Sligo - Leitrim. With contributions from K. Carlingbold, G. Stanley, D. Daly and R. Meehan. Geological Survey of Ireland, 100pp. 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) Note that all calculation and interpretations presented in this report represent estimations based on the information 		



Figure 1: Groundwater hydrographs (EPA Groundwater Level Monitoring)



Figure 2: Hydrochemical signature (EPA Representative Monitoring)

Carrick on Shannon GWB (For Reference)



List of Rock units in Carrick on Shannon GWB

Rock unit name and code	Description	Rock unit group
Visean Limestones (undifferentiated) (VIS)	Undifferentiated limestone	Dinantian Pure Bedded Limestones
Visean Limestones (undiff) & Oolitic limestone (ooVIS)	Undifferentiated limestone	Dinantian Pure Bedded Limestones
Oakport Limestone Formation (OK)	Pale grey massive limestone	Dinantian Pure Bedded Limestones
Ballymore Limestone Formation (BM)	Dark fine-grained limestone & shale	Dinantian Pure Bedded Limestones
Bricklieve Limestone Formation (BK)	Bioclastic cherty limestone	Dinantian Pure Bedded Limestones
Bricklieve Limestone Formation & Mudbank limestone	Bioclastic cherty limestone	Dinantian Pure Unbedded Limestones
Croghan Limestone Formation (CL)	Dark cherty limestone, shale	Dinantian Pure Bedded Limestones
Mudbank Limestones (mk)	Massive grey micritic limestone	Dinantian Pure Unbedded Limestones