

Water Framework Directive Groundwater Monitoring Programme

Site Information **Dungarvan PWS (Ballinamuck)**



Dungarvan PWS (Balinamuck) is comprised of four boreholes used as a public water supply. Usually only one borehole is pumped at a time with an abstraction rate of 5928m³/day. The GSI has completed a source report for the scheme.

SITE INFORMATION					
Site Name:	Dungarvan PWS (Ballinamuck)		County:	Waterford	
RBD:	SERBD		EU Reporting Code:	IE_SE_G_052_24_007	
Easting:	223631		GWB Name:	Dungarvan	
Northing:	94710		GWB Code:	IE_SE_G_052	
Site Use:	Drinking Water (PWS)		Drinking Water Code:	3100PUB1039	
Hydrometric Area:	17		Water Level Monitoring Network:	Level	Flow
Townland:	BALLYNAMUCK WEST			N	N
Ownership:	Waterford County Council				
Water Quality Monitoring Network:	Surveillance		Operational (Point)		Operational (Diffuse)
	N		N		Y
Site Comments:	---				
SITE DIRECTIONS					
Location and Access Information:	Take R672 out of Dungarvan heading Northwest. After approximately 1km there is a major junction; turn right down a small road. Powersfield Guesthouse is at the junction. Follow the small road passed an industrial unit located on the right hand side. Boreholes are down by river.				
Additional Comments:	---				
WELL INFORMATION					
Monitoring Point Type:	BH	Abstraction Rate (m³/d):	5928	Ground Elevation (m OD):	5.9
Borehole Log Available:	---	Total Drilled Depth (m bgl):	27.5	Depth to Bedrock (m bgl):	12
Top of Casing (m agl):	---	Upper Casing Diameter (mm):	---	Lower Casing Diameter (mm):	---
Final Borehole Depth (m):	---	Upper Casing Bottom Depth (m bgl) :	---	Lower Casing Bottom Depth (m bgl):	---
Screen Interval (m bgl):	---	Screen Type (PVC,Steel,other):	---	Screen Slot Size (mm):	---
Grout Type (cement,bentonite):	---	Grouted above (m bgl):	---	Grout Volume Injected (m³):	---
Gravel Pack Interval (m bgl):	---	Gravel Pack Volume (m³):	---	Open Hole Interval (m bgl):	---
Potential Yield (m³/day):	9800	Comments on Monitoring Site:	---		
Specific Capacity (m³/d/m):	---				
Static Water Level (m bgl):	0.52-4.57				
Scheme Name:	Dungarvin (Ballinamuck)	Number of Abstraction Points in the Scheme:	4	Source Report Available	Y
Source Report Info:	Source report prepared by GSI in 1998.				
Scheme Summary:	The scheme comprises 4 boreholes with usually one pumping at a time. The pumping system is connected via a rising main to a water tower reservoir. The Springmount Scheme, located to the east of Dungarvan is meant to augment Ballinamuck but it has not been used for over five years. Both schemes are in the EPA GW Monitoring Network. The ZOC for the Ballyduff/Ballylemon WS springs is located in the northern part of the Ballinamuck SPA.				

HYDROGEOLOGY							
GEOLOGY	Soil:	Alluviums (AlluvMIN)				Subsoil Permeability:	Moderate
	Subsoil:	Alluvium (A)					
	Bedrock:	Dinantian Pure Unbedded Limestones					
HYDROGEOLOGY	Aquifer Category:	Rkd	Vulnerability at Monitoring site:	High to Low	Flow Regime:	Karstified	
ZONE OF CONTRIBUTION	Estimated ZOC Size (km ²):	13.09	ZOC Delineated By:	GSI	Recharge Estimate (mm/yr):	396	
	ZOC Delineation Comments:	The GSI delineated a ZOC of 13.08 km ² based on hydrogeological modelling based on the maximum estimated abstraction rate of the source of 9800 m ³ /d. See the source report for details.					
Groundwater Vulnerability within ZOC (% area):	Extreme (X)	Extreme (E)	High	Moderate	Low	High to Low	Unclassified
	17.39	26.46	0	0	0	56.06	0.09
HYDROCHEMISTRY							
Hydrochemical Signature:	Ca-HCO ₃		Additional Water Chemistry Information:	During the monitoring period: The average nitrate concentration was 23 mg/l NO ₃ and the maximum nitrate concentration was 30 mg/l NO ₃ . The average ammonium concentration was 0.017 mg/l N and the maximum ammonium concentration was 0.121 mg/l N. The average molybdate reductive phosphorus (MRP) concentration was 0.01 mg/l P and the maximum MRP concentration was 0.039 mg/l P. The average chloride concentration was 20.5 mg/l Cl and the maximum chloride concentration was 26 mg/l Cl.			
Alkalinity (mg/l HCO ₃):	Average:	Range:					
	187	41-280					
Hardness (mg/l CaCO ₃):	Average:	Range:					
	222	102-310					
Conductivity (uS/cm):	Average:	Range:					
	460	350-568					
Monitoring Record Period:	From:	To:					
	1993	2010					
RISK ASSESSMENT							
Pressure (e.g., Nitrates, Phosphates, Abstractions):	Diffuse		Typical Contaminants:	Nitrates			
Risk Category:	At risk, high confidence		GWB Status:	Good			
Impact Potential within ZOC (% area):	Extreme:	High:	Moderate:	Low:	Negligible:		
	9.65	57.45	10.72	0.00	22.18		
OTHER INFORMATION							



Borehole Housing



Borehole Housing



Sampling Point

Data Summary Sheet - July 2011

Disclaimer: The data in this document are based on the best available information and understanding at time of writing. Neither the Environmental Protection Agency, nor the individual bodies supplying data for this document and accompanying maps will be responsible for any loss or damage from the use or interpretation of these data.

Rock Unit Geology Map: GSI, 2009

Aquifer Type Map: GSI, 2009

Groundwater Vulnerability Map: GSI, 2009

Soils & Subsoils Type: Teagasc, 2007

Recharge Map: GSI, 2009

Impact Potential Map: EPA, 2009

Risk Assessment Map: EPA WFD Risk Assessment, 2006

Groundwater Body Status: EPA WFD Status Assessment, 2008

Water Quality Data: EPA WFD Monitoring, 2008

Groundwater Threshold Values

Groundwater threshold values for selected parameters:

Nitrate - General Chemical Test/ Drinking Water Test (37.5 mg/l N03)

Ammonium - Drinking Water Test (0.175 mg/l N) / Surface Water Test (0.065 mg/l N)

Molybdate Reactive Phosphorus (MRP) - Surface Water Test (0.035 mg/l P)

Chloride -Saline/Intrusive Test (24 mg/l) / Drinking Water Test (175 mg/l Cl)

Electrical Conductivity -Saline/Intrusive Test (800 μ S/cm) / Drinking Water Test (1,875 μ S/cm)

Further information on groundwater threshold values is contained in the Groundwater Regulations (S.I. No.9 of 2010).

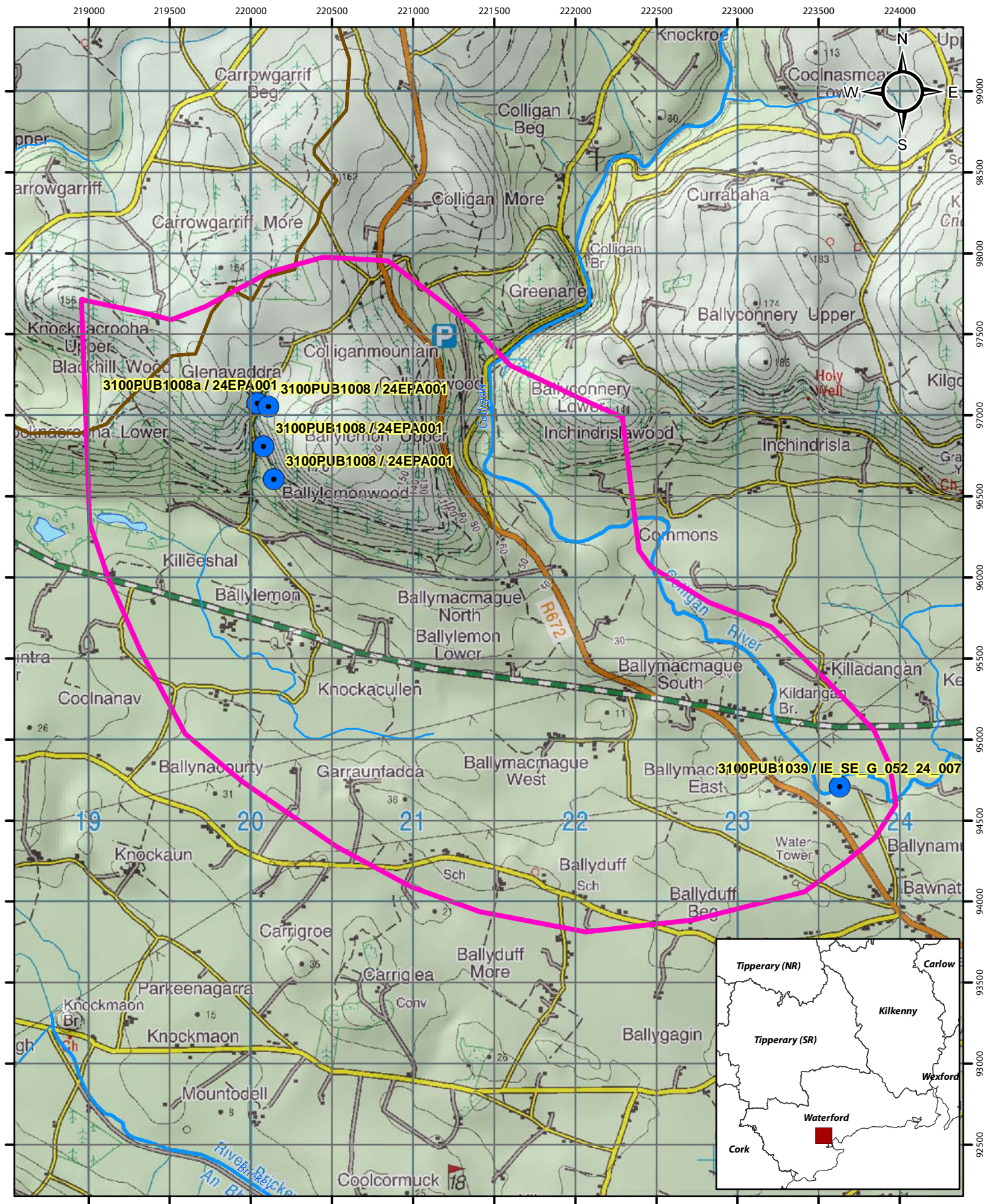
General Downgradient Distances

General Downgradient Distances (XL) applied to boreholes sourced in bedrock aquifers are constrained to estimate approximate limits based on data at the GSI. In some cases they may be higher or lower depending on local conditions.

Rk, Rkd, Lk	225 m
Lm	150 m
LI, PI	60 m

It is assumed that groundwater downgradient of a spring cannot flow back up to the spring, however a precautionary 30m buffer is generally applied which allows for instances where pumping under dry weather periods may induce a drawdown or where the ground may be sloping toward the spring from the downgradient side.

Version 0:	Prepared by	GSI	Date:	
Version 1:	Prepared by	TOBIN (CK)	Date:	Feb 2011
Version 2:	Prepared by		Date:	
Version 3:	Prepared by		Date:	
Version 4:	Prepared by		Date:	

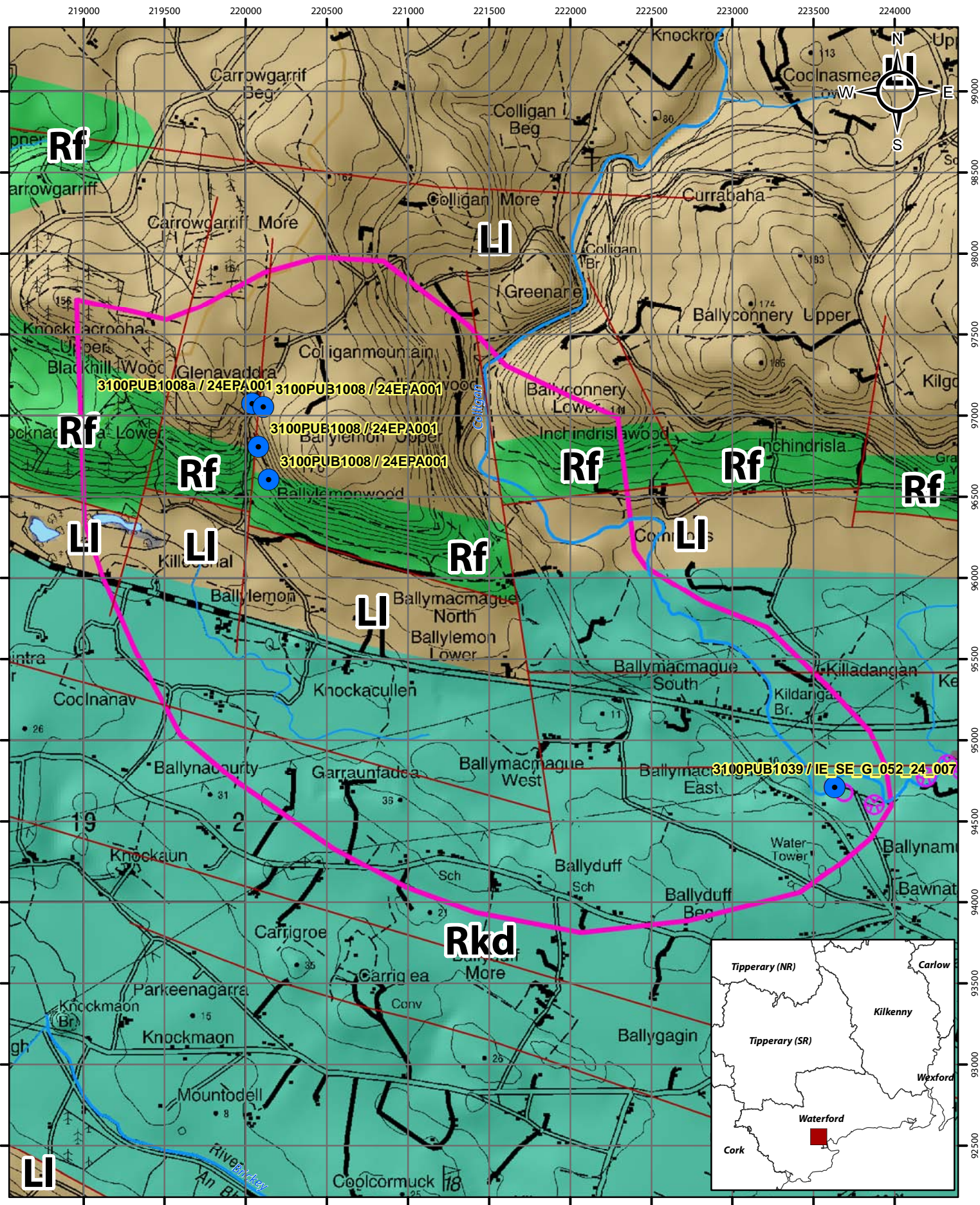


Location Map for Dungarvan (Ballinamuck) PWS

- Zone of Contribution
- Lake
- Abstractions
- River

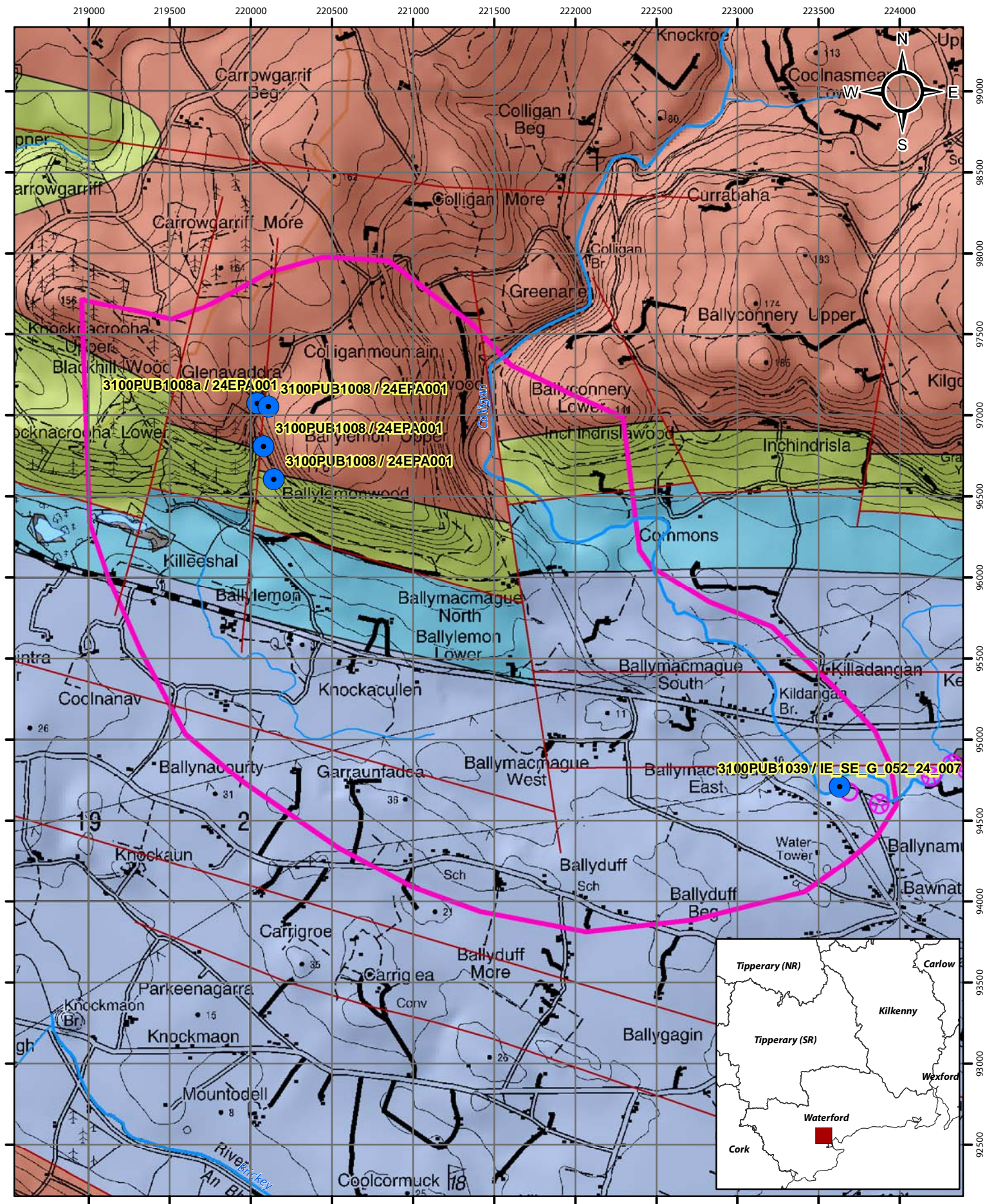
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0 0.25 0.5 1
km

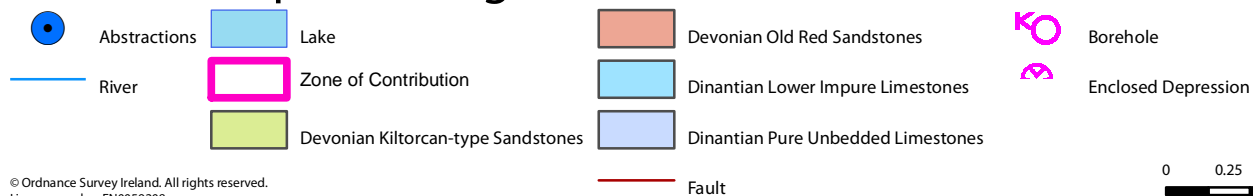


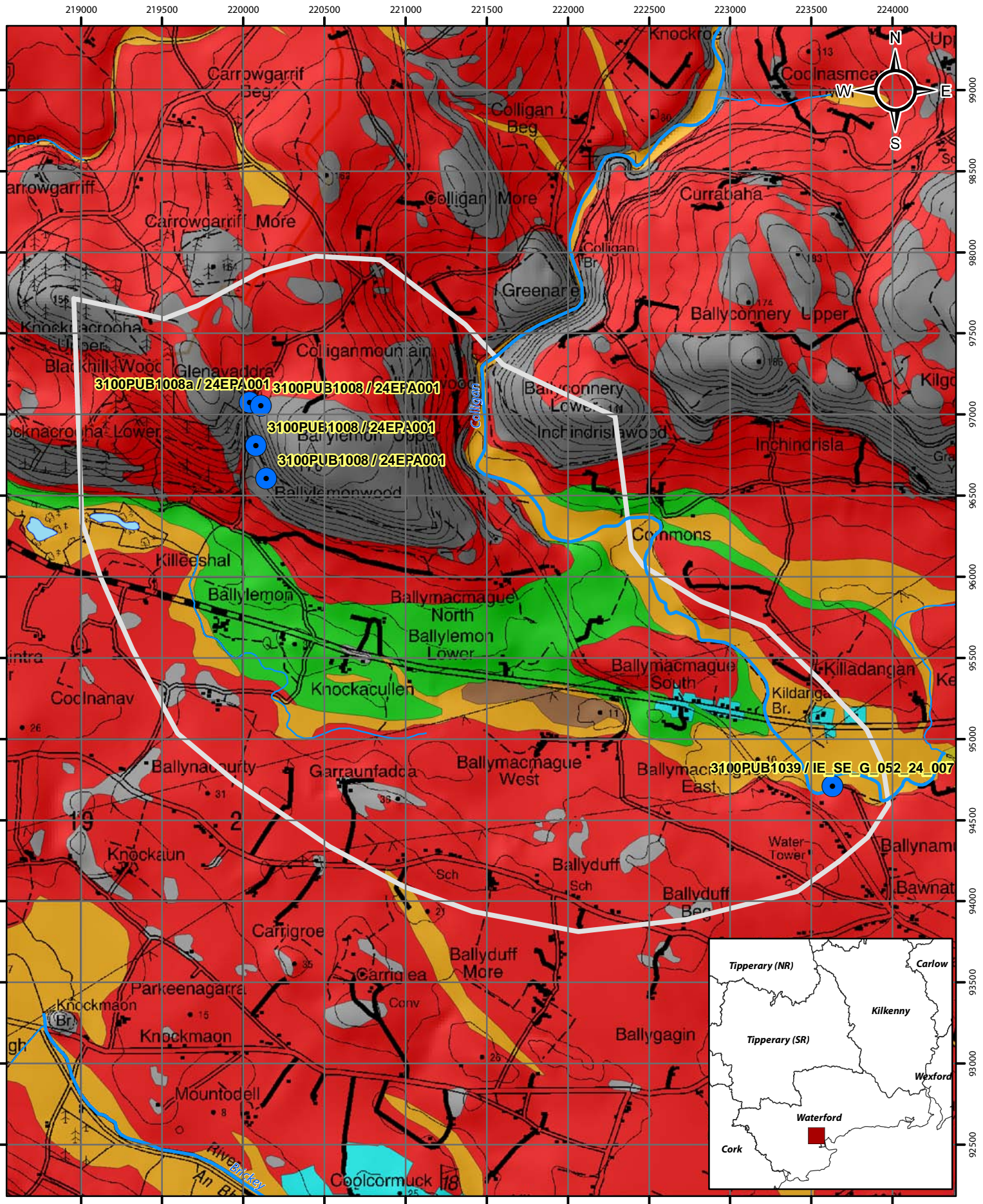
Aquifer Category Map for Dungarvan (Ballinamuck) PWS





Bedrock Map for Dungarvan (Ballinamuck) PWS





Subsoils Map for Dungarvan PWS



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