

## Water Framework Directive Groundwater Monitoring Programme

### Site Information **Fermoy PWS**



Fermoy PWS is an infiltration gallery and a borehole with an abstraction rate of 4000m<sup>3</sup>/day. A GSI source report has been completed for this site.



Cork

**August 2011**

SITE INFORMATION					
Site Name:	Fermoy PWS		County:	Cork	
RBD:	SWRBD		EU Reporting Code:	IE_SW_G_037_04_015	
Easting:	177757		GWB Name:	Glenville	
Northing:	98386		GWB Code:	IE_SW_G_037	
Site Use:	Drinking Water (PWS)		Drinking Water Code:	0500PUB1207	
Hydrometric Area:	18		Water Level Monitoring Network:	Level	Flow
Townland:	COOLROE			N	N
Ownership:	Cork County Council				
Water Quality Monitoring Network:	Surveillance		Operational (Point)		Operational (Diffuse)
	N		N		Y
Site Comments:	Fermoy PWS is a 30m deep borehole situated in Dinantian Pure Unbedded Limestones and is used as a public water supply. The borehole is included in the operational chemical network.				

SITE DIRECTIONS	
Location and Access Information:	The Fermoy Water Supply is situated in the townland of Coolroe, about 3 km west of Fermoy town. The site is accessed from a laneway off the main road east of the Millquarter Bridge
Additional Comments:	---

WELL INFORMATION					
Monitoring Point Type:	Infiltration gallery/BH	Abstraction Rate (m³/d):	4000	Ground Elevation (m OD):	24
Borehole Log Available:	---	Total Drilled Depth (m bgl):	26	Depth to Bedrock (m bgl):	7.5
Top of Casing (m agl):	27	Upper Casing Diameter (mm):	150	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):	---	Comments on Monitoring Site:	---		
Specific Capacity (m³/d/m):	552				
Static Water Level (m bgl):	4.1				
Scheme Name:	Fermoy	Number of Abstraction Points in the Scheme:	2	Source Report Available	Y
Source Report Info:	Source report prepared by GSI 2000.				
Scheme Summary:	The scheme consists of an infiltration gallery and a borehole. The main supply in the infiltration gallery and the borehole is used only to augment the supply when the gallery cannot supply the schemes needs. The gallery is located in the Blackwater flood plain and shut downs when in flood. The borehole was not used in 2009. The water from both abstraction points collects in a sump before treatment. The water is treated by chlorination and fluorination.				

HYDROGEOLOGY							
GEOLOGY	Soil:	Alluviums (AlluvMIN)				Subsoil Permeability:	Moderate
	Subsoil:	Alluvium (A)					
	Bedrock:	Devonian Old Red Sandstones					
HYDROGEOLOGY	Aquifer Category:	LI	Vulnerability at Monitoring site:	High to Low		Flow Regime:	Poorly productive
ZONE OF CONTRIBUTION	Estimated ZOC Size (km <sup>2</sup> ):	1.18	ZOC Delineated By:	GSI		Recharge Estimate (mm/yr):	460
	ZOC Delineation Comments:	The GSI delineated a ZOC for the two sources based on topography, local aquifer properties and abstraction rate and the probability of the contribution of the Blackwater River to the supply. See the source report for details.					
Groundwater Vulnerability within ZOC (% area):	Extreme (X)	Extreme (E)	High	Moderate	Low	High to Low	Unclassified
	14.39	23.92	0	0	0	61.69	0
HYDROCHEMISTRY							
Hydrochemical Signature:	Ca-HCO <sub>3</sub>		Additional Water Chemistry Information:	During the monitoring period: The average nitrate concentration was 28 mg/l NO <sub>3</sub> and the maximum nitrate concentration was 41 mg/l NO <sub>3</sub> . The average ammonium concentration was 0.02 mg/l N and the maximum ammonium concentration was 0.17 mg/l N. The average molybdate reductive phosphorus (MRP) concentration was 0.009 mg/l P and the maximum MRP concentration was 0.036 mg/l P. The average chloride concentration was 20.3 mg/l Cl and the maximum chloride concentration was 26.6 mg/l Cl.			
Alkalinity (mg/l HCO <sub>3</sub> ):	Average:	Range:					
	201	169-280					
Hardness (mg/l CaCO <sub>3</sub> ):	Average:	Range:					
	241	199-356					
Conductivity (uS/cm):	Average:	Range:					
	485	377-543					
Monitoring Record Period:	From:	To:					
	1995	2010					
RISK ASSESSMENT							
Pressure (e.g., Nitrates, Phosphates, Abstractions):	Diffuse		Typical Contaminants:	Nitrate			
Risk Category:	At risk, high confidence		GWB Status:	Good			
Impact Potential within ZOC (% area):	Extreme:	High:	Moderate:	Low:	Negligible:		
	0.00	65.32	0.00	0.00	34.68		
OTHER INFORMATION							
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Pump House



Access manhole for infiltration gallery



Borehole

## 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 µS/cm) / Drinking Water Test (1,875 µS/cm)

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

### General Downgradient Distances

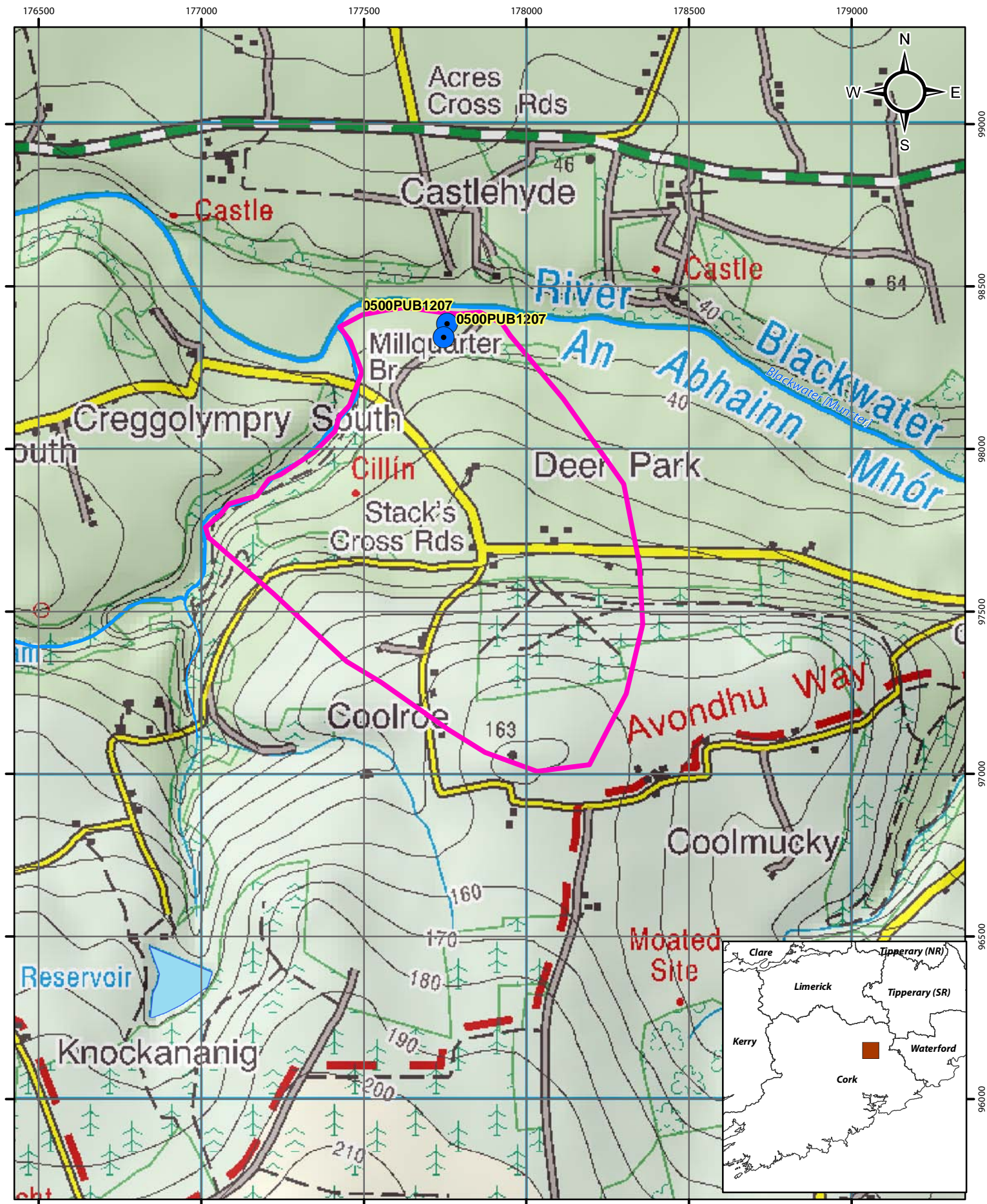
General Downgradient Distances (XL) applied to boreholes sourced in bedrock aquifers are constrained to estimate approximate limits based on data at the GSI. In some cases they may be higher or lower depending on local conditions.

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	OCM (DC)	Date:	Feb 2011
Version 2:	Prepared by		Date:	
Version 3:	Prepared by		Date:	
Version 4:	Prepared by		Date:	

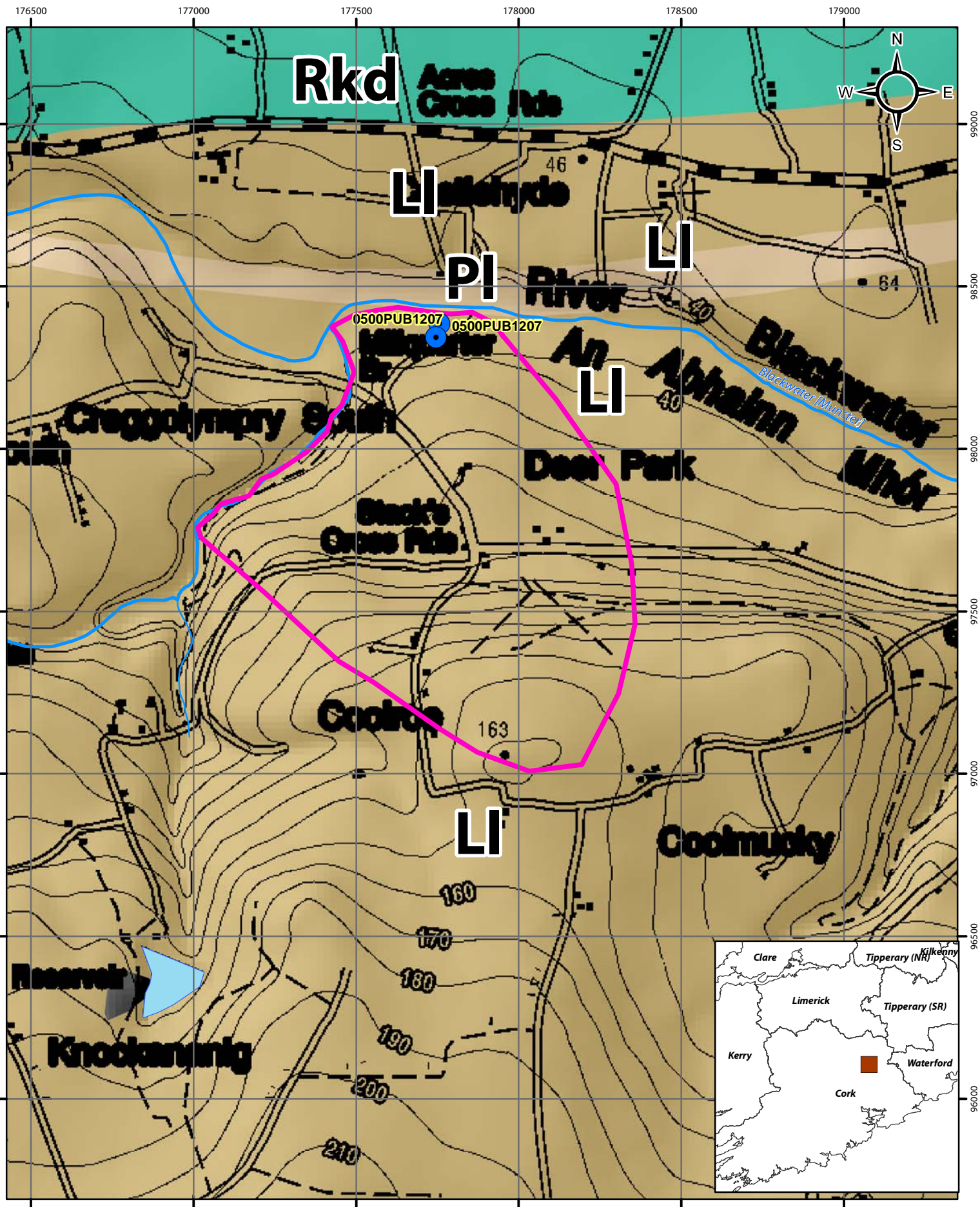




## Location Map for Fermoy

- Abstractions
- Zone of Contribution
- River

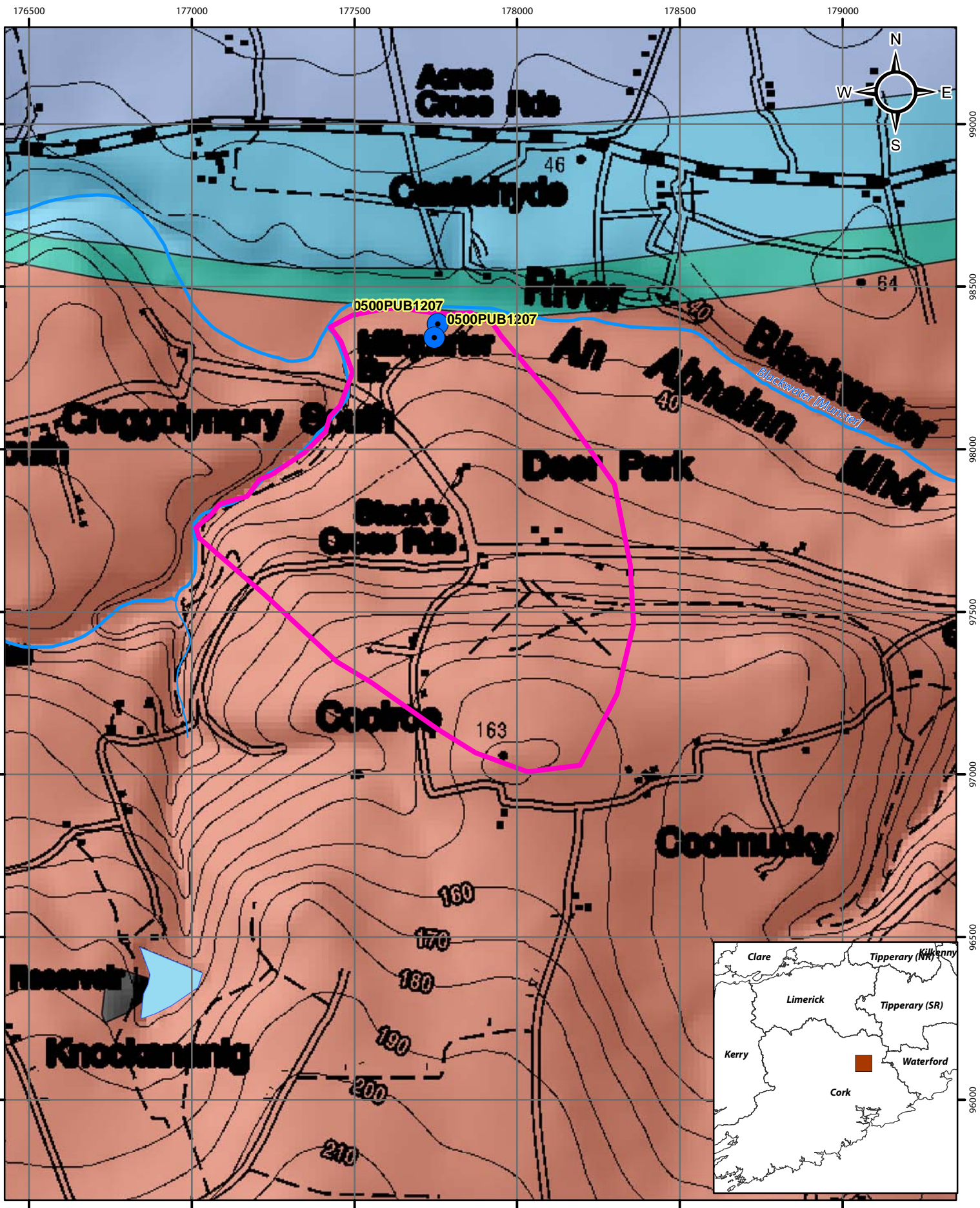










## Aquifer Category Map for Fermoy

- Abstractions
- Zone of Contribution
- River
- LI
- PI
- Rkd
- Fault

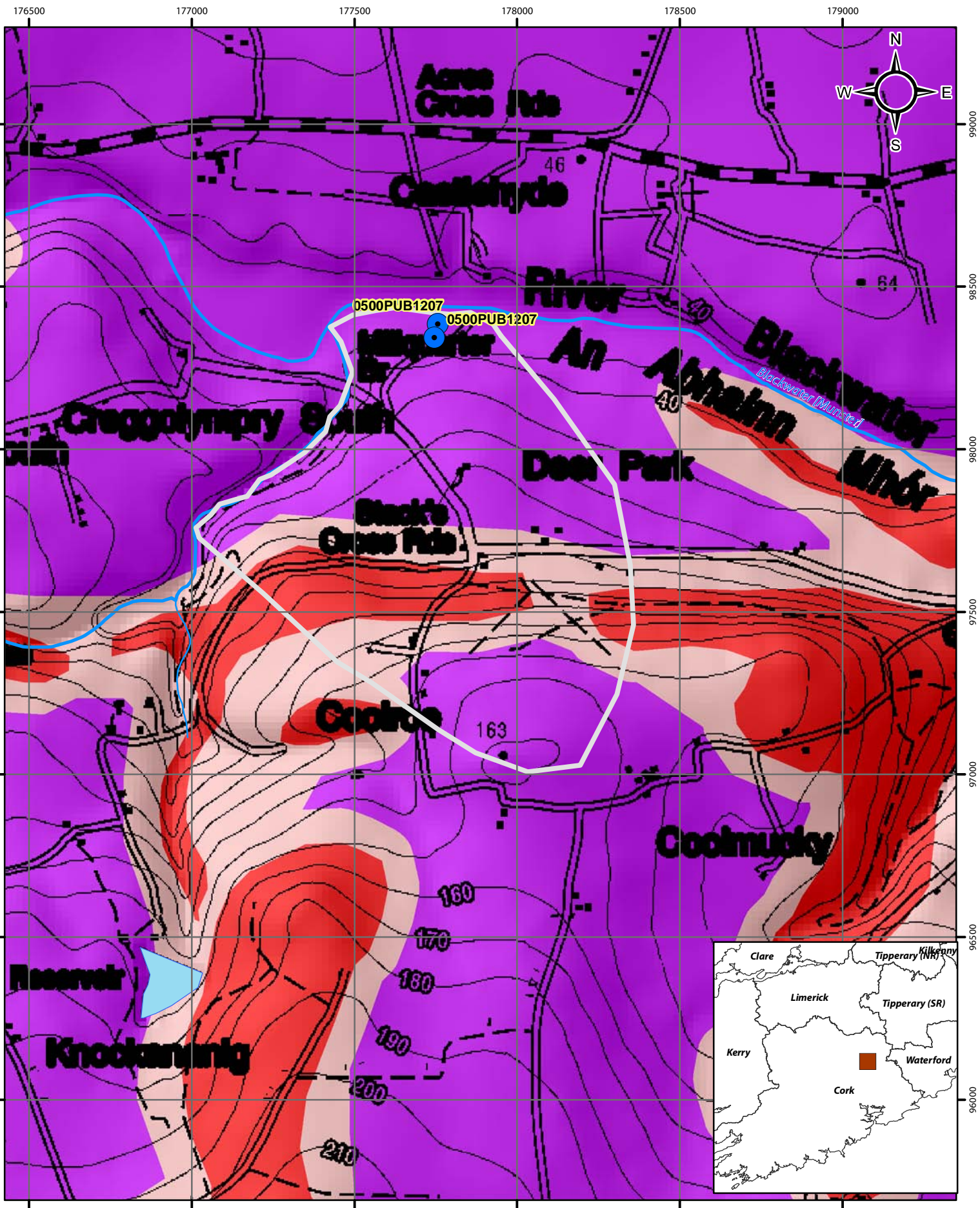




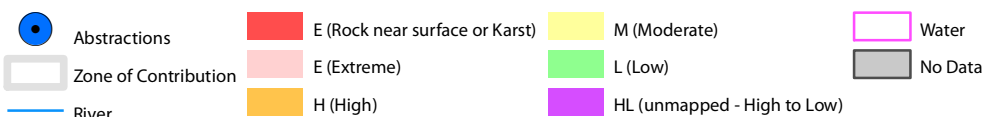
## Bedrock Map for Fermoy

- |  |                      |   |   |
|--|----------------------|---|---|
|  | Abstractions         |  | Devonian Old Red Sandstones                         |
|  | Zone of Contribution |  | Dinantian (early) Sandstones, Shales and Limestones |
|  | River                |  | Dinantian Lower Impure Limestones                   |
|  |                      |  | Dinantian Pure Unbedded Limestones                  |

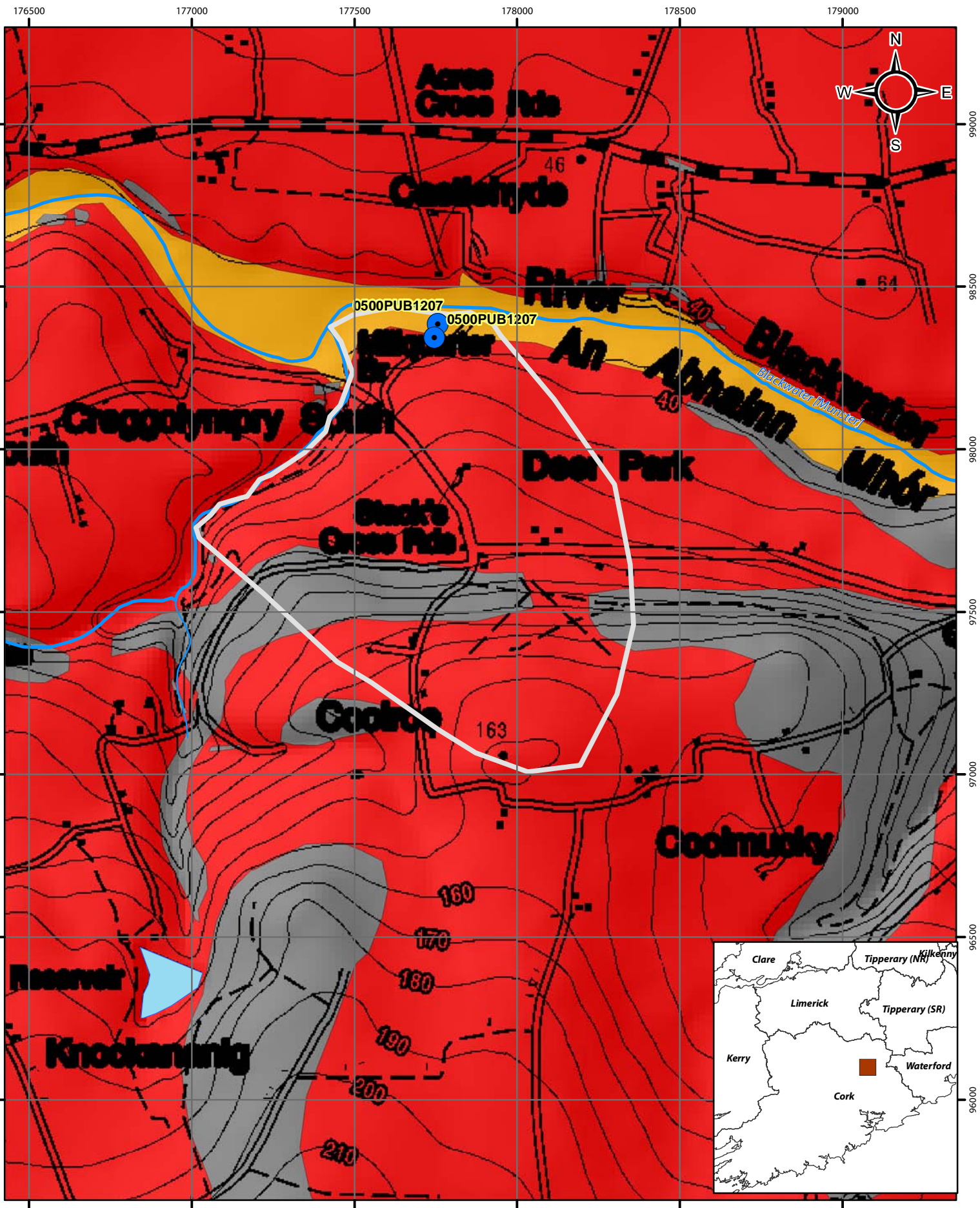




## Groundwater Vulnerability Map for Fermoy



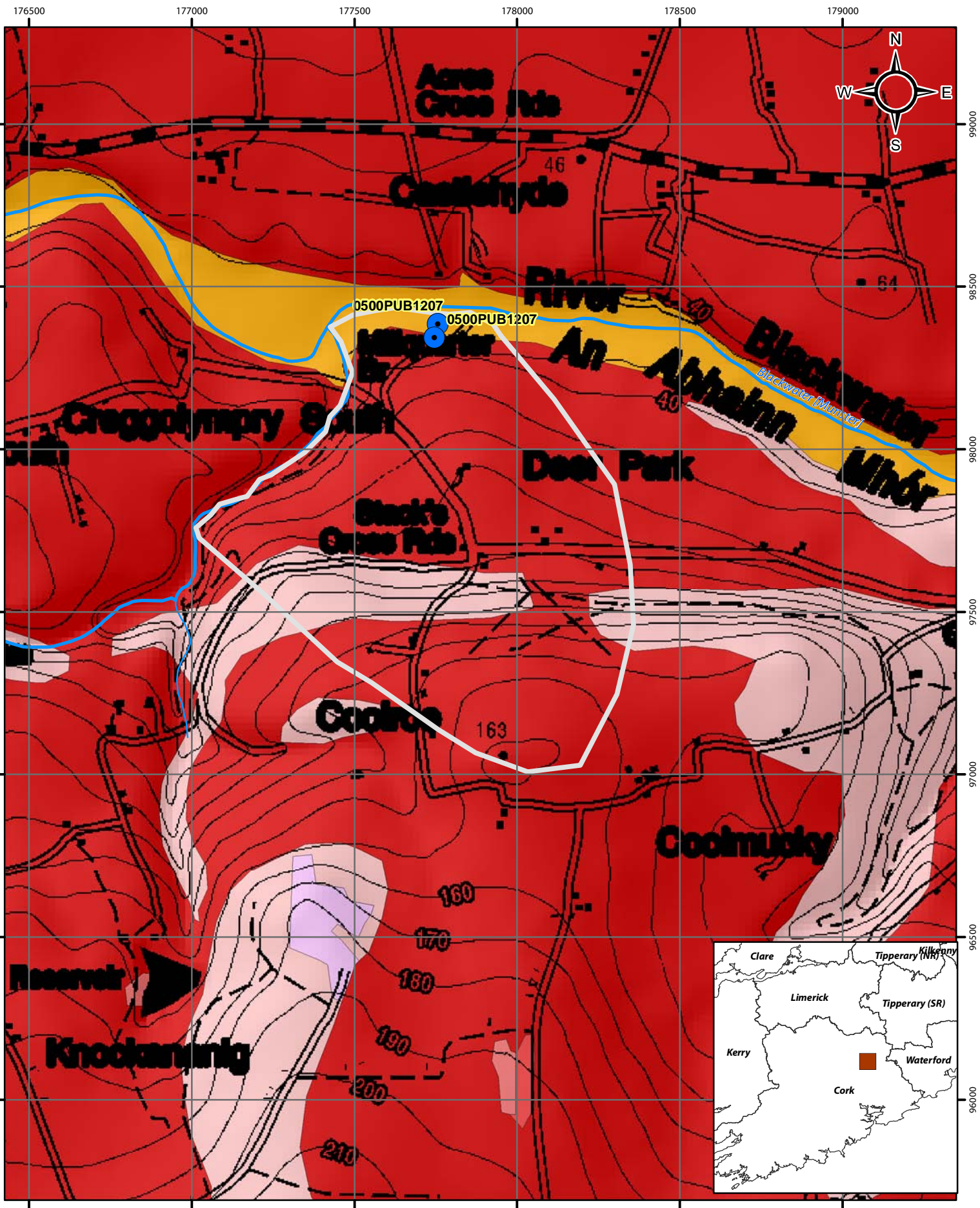




## Subsoils Map for Fermoy

- Abstractions
- Alluvium
- Till derived from Devonian sandstones
- Zone of Contribution
- Bedrock outcrop or subcrop
- River





## Soils Map for Fermoy

