

Water Framework Directive Groundwater Monitoring Programme

Site Information **Carraignadoura GWS**



Carraignadoura GWS is a borehole with an average abstraction rate of 182m³/day. A source report has been prepared for the source in 2009.



Cork

August 2011

SITE INFORMATION					
Site Name:	Carraignadoura GWS		County:	Cork	
RBD:	SWRBD		EU Reporting Code:	IE_SW_G_005_04_006	
Easting:	114252		GWB Name:	Ballinhassig_2	
Northing:	69996		GWB Code:	IE_SW_G_005	
Site Use:	Drinking Water (GWS)		Drinking Water Code:	---	
Hydrometric Area:	19		Water Level Monitoring Network:	Level	Flow
Townland:	CARRIGNADOURA			N	N
Ownership:	Cork Co. Co.				
Water Quality Monitoring Network:	Surveillance		Operational (Point)		Operational (Diffuse)
	Y		N		N
Site Comments:	The compound is protected by a palisade fence with access by a padlocked gate. The ground surface in the compound comprises granular fill.				
SITE DIRECTIONS					
Location and Access Information:	The site is located in Carrignadoura Townland 3 km north to northwest of Ballygeary.				
Additional Comments:	---				
WELL INFORMATION					
Monitoring Point Type:	BH	Abstraction Rate (m³/d):	182	Ground Elevation (m OD):	190
Borehole Log Available:	---	Total Drilled Depth (m bgl):	90	Depth to Bedrock (m bgl):	unknown
Top of Casing (m agl):	---	Upper Casing Diameter (mm):	200	Lower Casing Diameter (mm):	---
Final Borehole Depth (m):	unknown	Upper Casing Bottom Depth (m bgl) :	unknown	Lower Casing Bottom Depth (m bgl):	unknown
Screen Interval (m bgl):	unknown	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):	unknown
Potential Yield (m³/day):	unknown	Comments on Monitoring Site:	There is a spring discharge in the vicinity overflowing into the downgradient field and then the stream.		
Specific Capacity (m³/d/m):	unknown				
Static Water Level (m bgl):	Artesian				
Scheme Name:	Carrignadoura GWS	Number of Abstraction Points in the Scheme:	1	Source Report Available	Y
Source Report Info:	OCM/CDM/TOBIN 2010				
Scheme Summary:	The single borehole is the main source for Carraignadoura GWS. The water is pumped to a reservoir 1.3 km to the northeast which is located on the site of a spring that was previously used.				

HYDROGEOLOGY								
GEOLOGY	Soil:	Deep well drained mineral (AminDW)					Subsoil Permeability:	n/a
	Subsoil:	Tills (diamictons) (TDSs)						
	Bedrock:	Devonian Old Red Sandstones						
HYDROGEOLOGY	Aquifer Category:	PI	Vulnerability at Monitoring site:	Extreme	Flow Regime:	Poorly productive		
ZONE OF CONTRIBUTION	Estimated ZOC Size (km ²):	0.74	ZOC Delineated By:	OCM (DC)	Recharge Estimate (mm/yr):	100		
	ZOC Delineation Comments:	The Western and Northern boundary are defined by topography. The Eastern boundary is constrained by a NW-SE trending fault between the borehole and the stream. The Southeastern boundary – the Downgradient boundary is the maximum downgradient distance that the borehole can pump water from and is based on the uniform flow equation (Todd, 1980). The ZOC whilst conservative does not include a 50% increase in abstraction as it is considered that such a rate is unsustainable or unachievable.						
Groundwater Vulnerability within ZOC (% area):	Extreme (X)	Extreme (E)	High	Moderate	Low	High to Low	Unclassified	
	83.84	16.08	0.08	0	0	0	0	
HYDROCHEMISTRY								
Hydrochemical Signature:	Ca-HCO ₃		Additional Water Chemistry Information:	During the monitoring period: The average nitrate concentration was 5 mg/l NO ₃ and the maximum nitrate concentration was 15 mg/l NO ₃ . The average ammonium concentration was 0.024 mg/l N and the maximum ammonium concentration was 0.07 mg/l N. The average molybdate reductive phosphorus (MRP) concentration was 0.013 mg/l P and the maximum MRP concentration was 0.046 mg/l P. The average chloride concentration was 14.4 mg/l Cl and the maximum chloride concentration was 45.8 mg/l Cl.				
Alkalinity (mg/l HCO ₃):	Average:	Range:						
	143	85-200						
Hardness (mg/l CaCO ₃):	Average:	Range:						
	127	115-154						
Conductivity (uS/cm):	Average:	Range:						
	277	199-337						
Monitoring Record Period:	From:	To:						
	2007	2010						
RISK ASSESSMENT								
Pressure (e.g., Nitrates, Phosphates, Abstractions):	---		Typical Contaminants:	---				
Risk Category:	At risk, high confidence		GWB Status:	Good				
Impact Potential within ZOC (% area):	Extreme:	High:	Moderate:	Low:	Negligible:			
	0.00	0.00	18.36	0.00	81.64			
OTHER INFORMATION								



Pump House



Borehole



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).

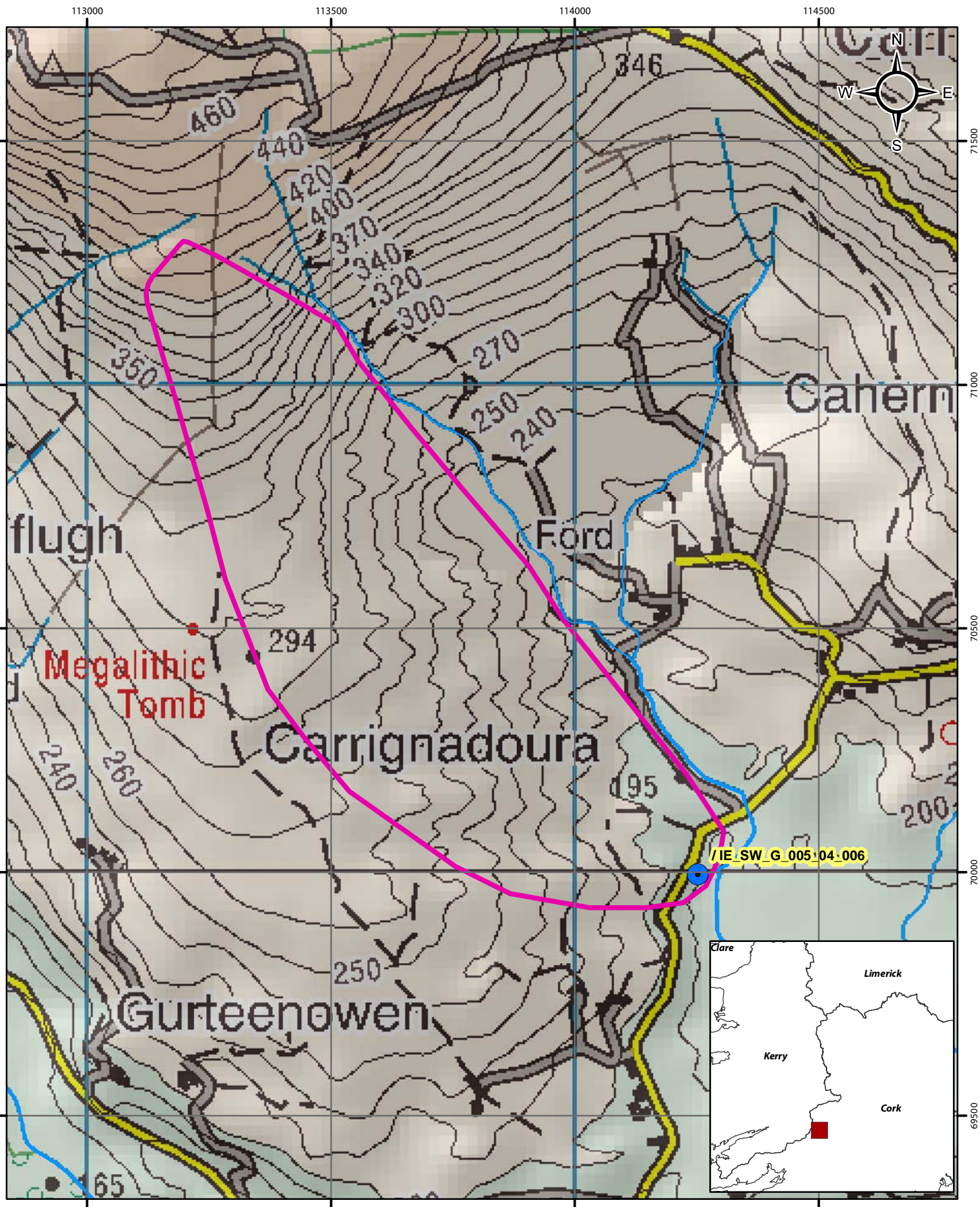
General Downgradient Distances

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		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:	

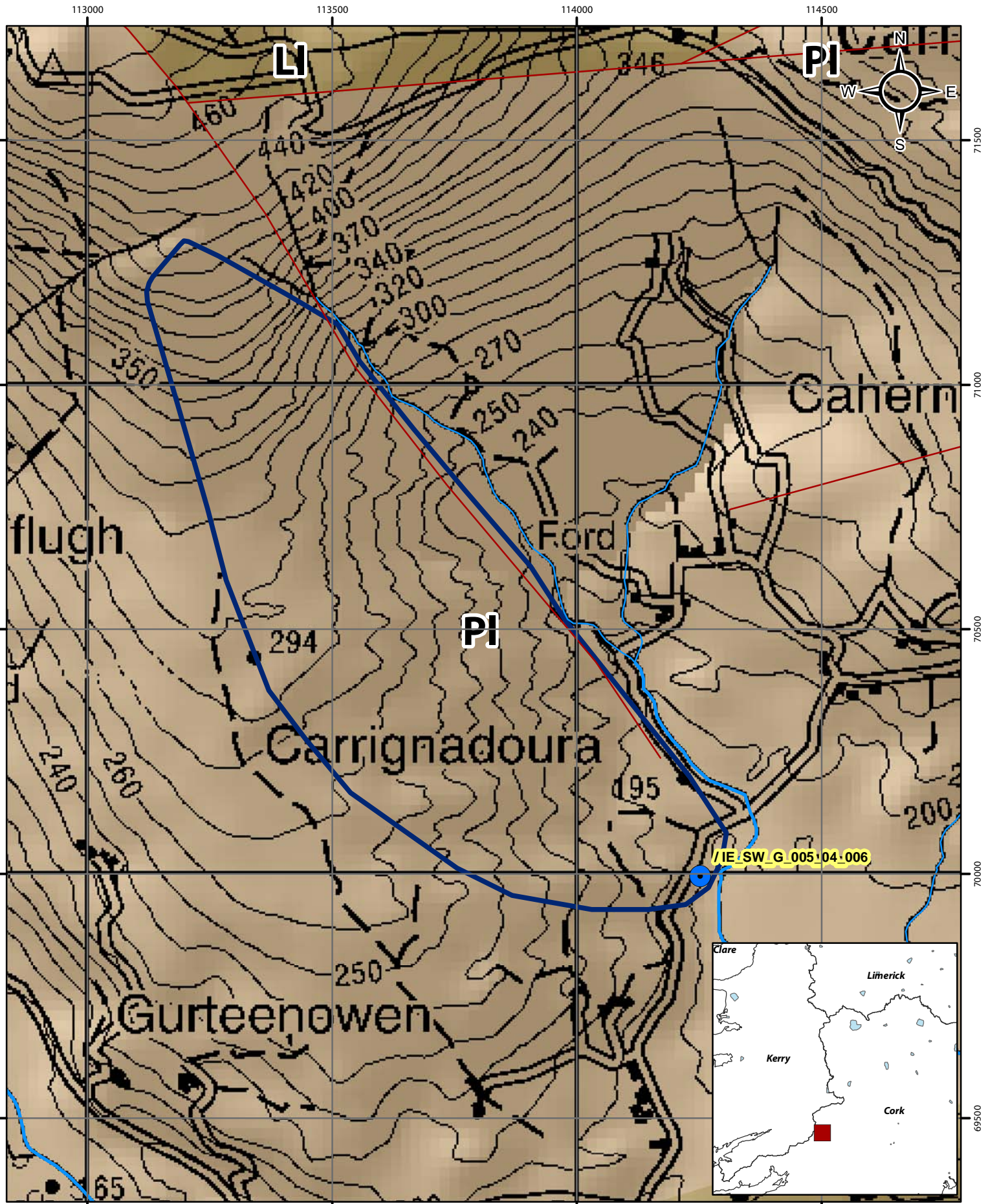


Location Map for Carraignadoura GWS

-  Abstractions
-  River
-  Zone of Contribution

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0 0.25 0.5 1 km

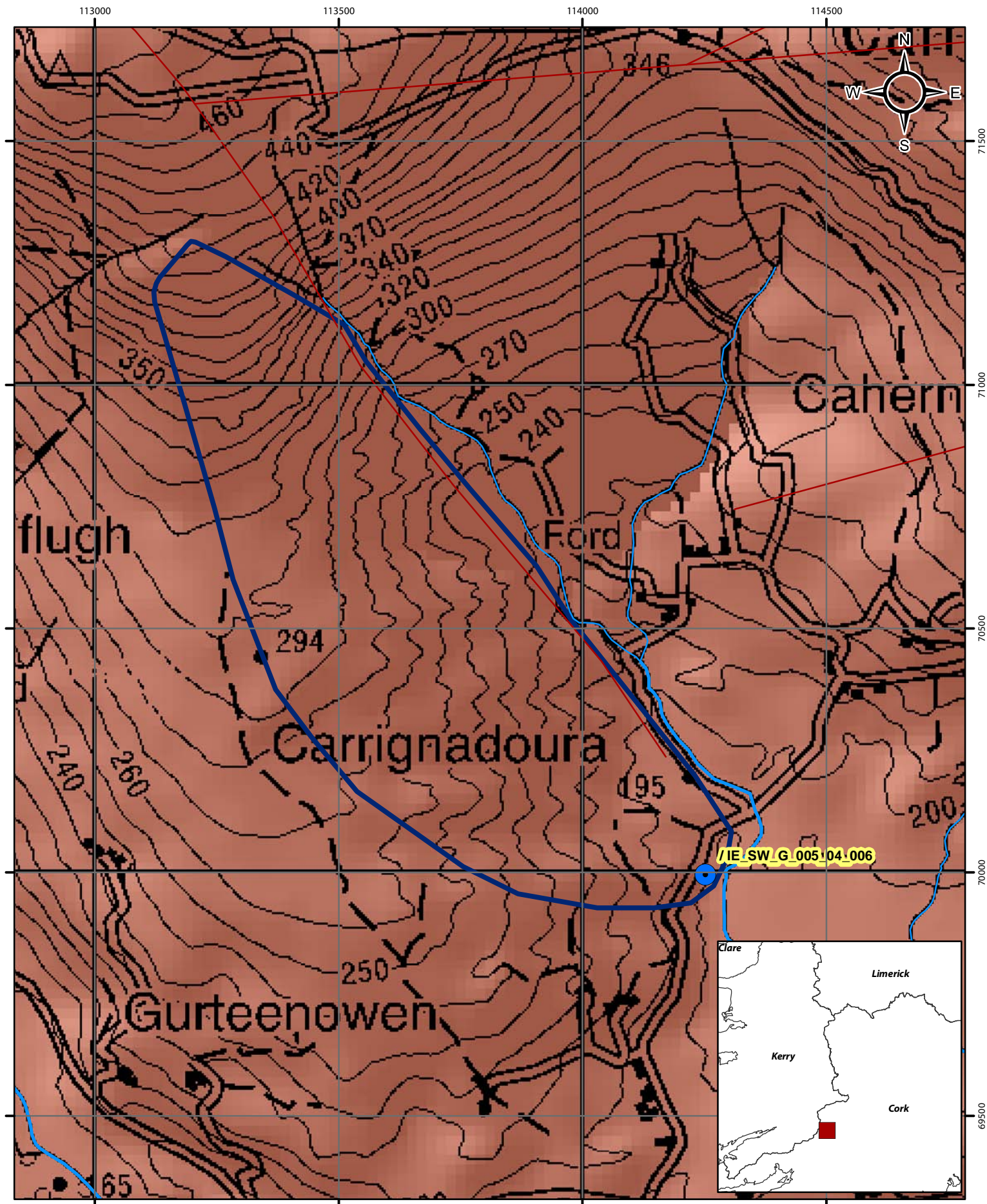


Aquifer Category Map for Carraignadoura GWS






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

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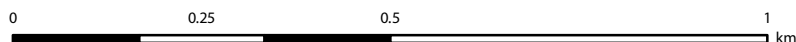
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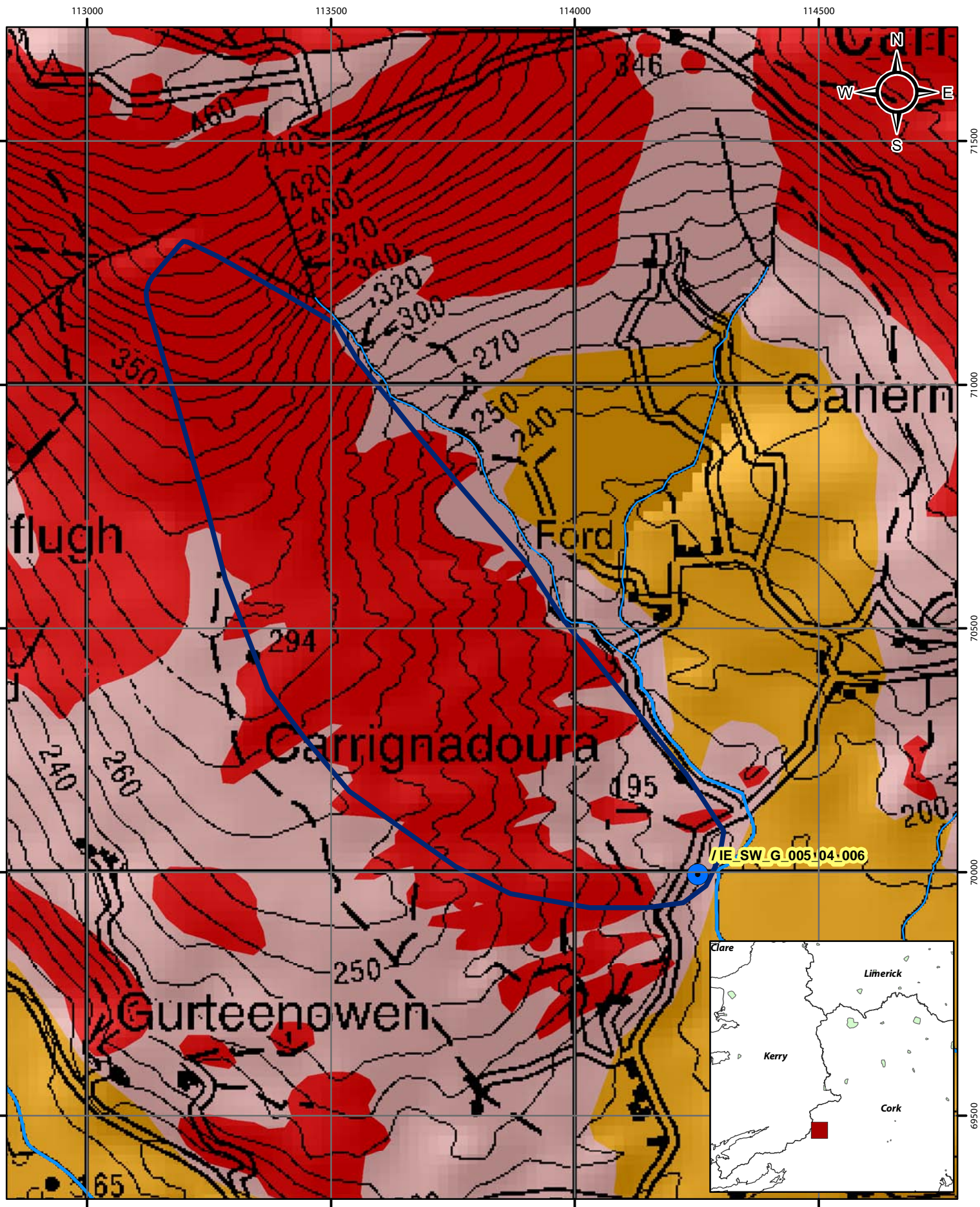


Bedrock Map for Carrignadoura GWS

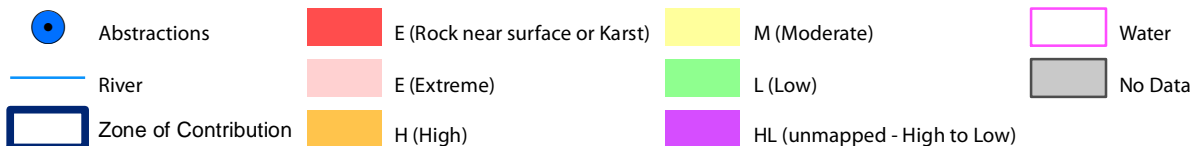
-  Abstractions
-  River
-  Zone of Contribution
-  Devonian Old Red Sandstones
-  Fault

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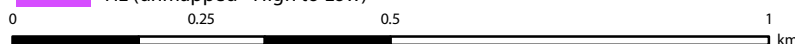


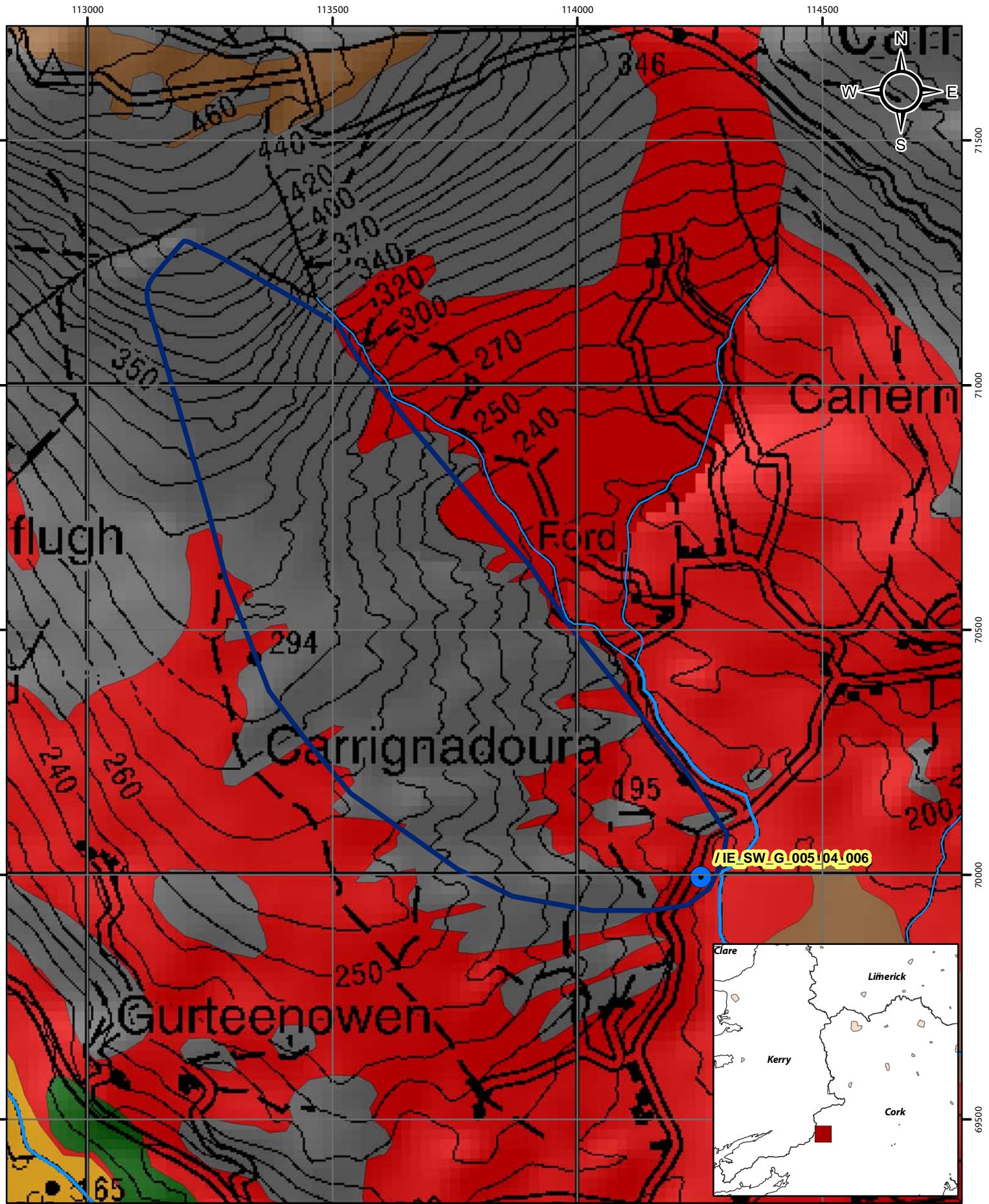


Groundwater Vulnerability Map for Carraignadoura GWS

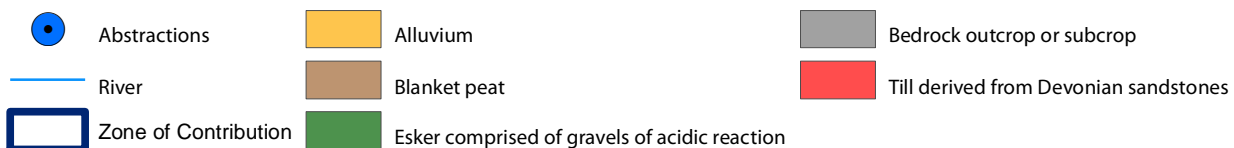


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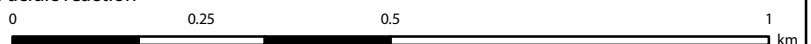


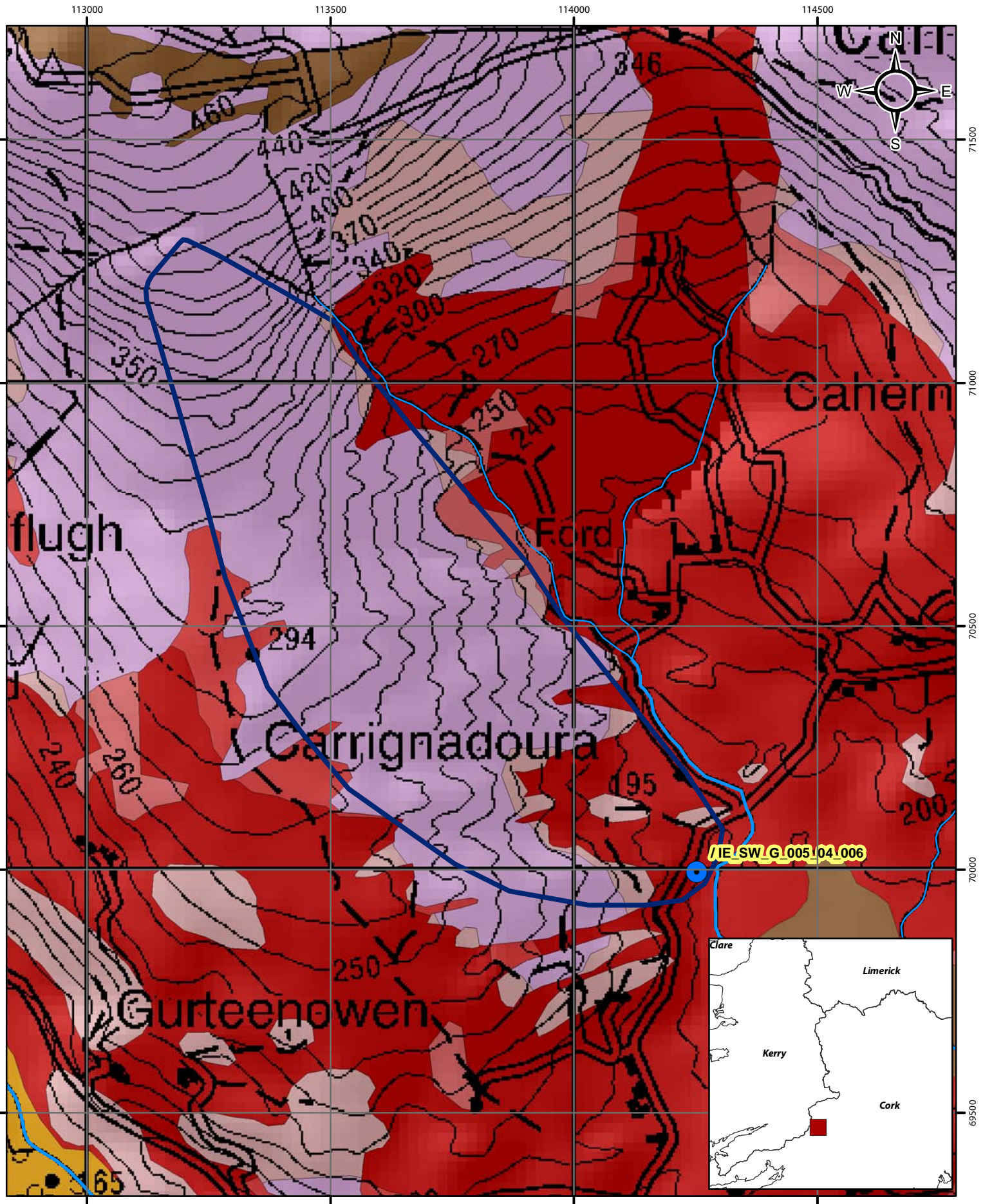


Subsoils Map for Carrignadoura GWS

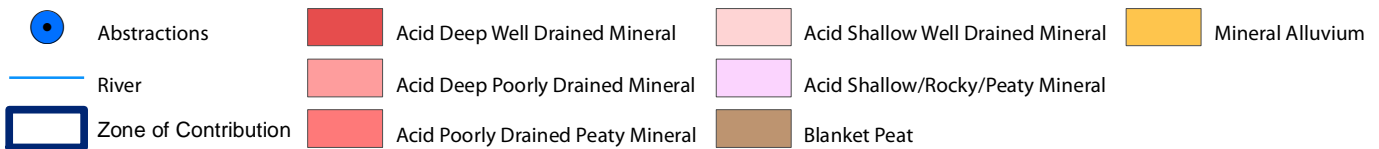


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Soils Map for Carraignadoura GWS



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