

<b>Location: Nenagh, Co. Tipperary</b>		<b>Unique ID: 250432</b> (from PFRA database)	
<b>Initial OPW Designation</b>	<b>APSR</b> <input checked="" type="checkbox"/>	<b>AFRR</b> <input type="checkbox"/>	<b>IRR</b> <input type="checkbox"/>
<b>Co-ordinates</b>	<b>Easting: 186604</b>	<b>Northing: 178781</b>	
<b>River / Catchment / Sub-catchment</b>	<b>Nenagh River / Nenagh / Shannon</b>		
<b>Type of Flooding / Flood Risk</b> (identify all that apply)	<b>Fluvial non-tidal</b> <input checked="" type="checkbox"/>	<b>Fluvial tidal</b> <input type="checkbox"/>	<b>Coastal</b> <input type="checkbox"/>

<b>Stage 1: Desktop Review</b>	
<b>1.1 Flood History (include review of Floodmaps.ie)</b>	<p><b>River Flow Path</b></p> <p>The Nenagh River flows past the town of Nenagh on the eastern boundary and meanders towards Lough Derg. Minor tributaries to the Nenagh River are located within the town boundary.</p> <p>The Nenagh River is crossed by Bulfin Road and the N7 (Dublin Road) as well as a railway line to the east.</p> <p><b>Flood Event Records</b></p> <p>Nine flood records are listed in floodmaps.ie. The most significant event occurred in an industrial estate off the Dublin Road east of the town centre.</p>
<b>1.2 Relevant information on flooding issues from OPW and LA staff</b>	<p><b>PFRA database comments (<i>in italics</i>):</b></p> <p><b>OPW comments</b> <i>Designated APSR on the basis of predictive analysis and historical extents. V. High score - possible wedges, but also historic score of 4 - LA FRS?</i></p> <p><b>LA comments</b> <i>No problem in the last 10 years Large scheme in place Swimming pool at risk/flooded? Outside Coolahoggia? Ground water issue, one property at risk, west of Nenagh. [Clare: map shows townland called Coolaholloga, north west of Nenagh, this may be the are</i></p> <p><b>Meeting / discussion summary comments:</b></p> <p><b>LA comments</b></p> <ul style="list-style-type: none"> <li>• Clanna / swimming pool area used to flood, including the hotel. However, there has been works carried out and the area is not at significant risk anymore,</li> <li>• Potential risk to new housing estate, constructed on an area which is generally marshland, but the properties are generally built on a high ridge.</li> </ul>

<b>1.4 PFRA Data</b>			
<b>1.4.1 PFRA hazard mapping</b>	<b>PFRA mapping available in GIS layer:</b>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
	<b>PFRA mapping included on FRR map:</b>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
<b>1.4.2 Summary of Principal Receptors</b>	<b>Type</b>	<b>FRI score (if available)</b>	
	Nursing_H	2500	
	ESB_HV_Sub	2500	
	UWWTP	5	
	Arch_Local	10	
	Arch_Regional	81.1	
	Monument_LV	71	
	<b>Total</b>	<b>7449.5</b>	
<b>1.7 Stage 1 Evaluation</b>	<b>Aspect</b>	<b>Clearly APSR</b>	<b>Uncertain</b>
	<b>Flood History (1.1)</b>	<b>X</b>	
	<b>OPW / LA Information (1.2)</b>		<b>X</b>
	<b>PFRA Evaluation (1.4)</b>	<b>X</b>	
	<b>Overall Desktop Evaluation</b> (if any above aspect is uncertain then overall designation is uncertain)		<b>X</b>
<b>1.8 Proposed level of assessment for Stage 2 site visits</b>	<b>Level A Site Visit</b>	<b>X</b>	
	<b>Level B Site Visit</b>		

<b>Stage 2: Site Inspection</b>		<b>Level A Assessment</b>		
<b>Date and Time of Inspection</b>		<b>Date: 03/06/11</b>		
		<b>Time: 08:00</b>		
<b>Names of inspection team (including OPW/LA staff if present)</b>		<b>Mathieu Valois</b>		
		<b>James Murray</b>		
<b>2.1 Ground-truthing of Hazard Mapping</b>	<b>Fluvial non-tidal <input checked="" type="checkbox"/> Fluvial tidal <input type="checkbox"/> Coastal <input type="checkbox"/> Not available <input type="checkbox"/></b>			
	PFRA hazard mapping is good in places, however there are some locations where it seems to overestimate flood risk. One particular location is the residential area north of town on the left bank of the Nenagh. From investigating the flood risk on-site it is clear that the properties are not at significant risk.			
<b>2.2 Spot check ground-truthing of selected receptor vulnerability  (also note any key receptors noted during visit that are not identified by PFRA)</b>	<b>Receptor Type</b>	<b>Location description (if not obvious)</b>	<b>Exists?</b>	<b>Overall Vulnerability / Risk (L / M / H)</b>
	Crèche – critical infrastructure	West most tributary	Yes	Medium
	Nursing home – critical infrastructure	East tributary to the Nenagh river	Yes	Medium
	Sub station	Between east tributary and Nenagh River	Yes	Medium
	STW	On left bank of Nenagh River	Yes	Medium
	Industrial Estate Small and Large retail	On the Right bank of the Nenagh off the R445	Yes	Medium
<b>2.3 Local knowledge - on-site comments  (OPW, LA and any info volunteered by local residents during visit)</b>	No on-site comments.			
<b>2.4 Comments on hydraulic constrictions (bridges, etc.) and conveyance routes</b>	Most bridges have good capacity. Culvert at crèche has a very low soffit, however channel capacity upstream is significant.			

2.5 SVRS Assessment Matrix												
<b>Weightings:</b> <b>A - x1 - reasonable expectation of flooding</b> <b>B - x2 - high expectation of flooding</b> <b>C - x5 - risk to life</b>												
Approx. Number	1 to 4			5 to 20				>20				
Weighting		A	B	C		A	B	C		A	B	C
Property (domestic)	10				100				200			
Property (small retail or business)	20		X		200				400			
Property (large retail or business)	50		X		500				1000			
Road or Rail Infrastructure	30				300				600			
Critical Infrastructure (local) [hospital, school, police/fire/ambulance station, substation, WTW/WWTW, gov bldg, other (specify)]	50	X			500				1000			
Critical Infrastructure (national importance)	250				1000				2000			
Cultural Heritage Site	20				200				400			
Environmental Designated Site	20				200				400			
Hazardous Substances Site	50				500				1000			
<b>Total SVRS</b>									<b>190</b>			
2.6 Defence Assets												
<b>Formal and Informal Flood Defence Assets</b> <i>(include effective and ineffective assets to inform asset survey and potential mitigation measures)</i>	<b>Open Channel Watercourses</b> Man-made river channel <input type="checkbox"/> Flood relief channel <input type="checkbox"/> Canal <input type="checkbox"/> Mill leat <input type="checkbox"/> Drainage channels / back drains <input checked="" type="checkbox"/>											
	<b>Bridges and Culvert crossings</b> Single Arch bridge <input checked="" type="checkbox"/> Multi-Arch bridge <input checked="" type="checkbox"/> Single Span bridge <input type="checkbox"/> Multi-Span bridge <input type="checkbox"/> Box culvert(s) <input checked="" type="checkbox"/> Pipe culvert(s) <input type="checkbox"/> Arch Culvert(s) <input type="checkbox"/>											
	<b>Culverted Watercourses</b> (culvert length is greater than just a crossing) Box culvert(s) <input type="checkbox"/> Pipe culvert(s) <input type="checkbox"/> Arch Culvert(s) <input type="checkbox"/> Irregular Culvert(s) <input type="checkbox"/>											
	<b>Walls and Embankments</b> Embankment(s) <input checked="" type="checkbox"/> Raised wall(s) <input type="checkbox"/> Retaining wall(s) <input type="checkbox"/>											
	<b>Control Structures – weirs, gates, dams</b> Fixed crest weir <input type="checkbox"/> Adjustable weir <input type="checkbox"/> Dam / Barrage <input type="checkbox"/> Sluice gates <input type="checkbox"/> Lock gates <input type="checkbox"/> Radial gates <input type="checkbox"/>											
	<b>Storage</b> On-line storage (natural) <input type="checkbox"/> On-line storage (artificial) <input type="checkbox"/> Off-line storage <input type="checkbox"/>											
	<b>Outfalls</b> Flapped outfall(s) into watercourse <input type="checkbox"/> Unflapped outfall(s) into watercourse <input checked="" type="checkbox"/> <i>i.e. from smaller watercourses, drains etc. into river / estuary / sea</i> Tidal flap(s) <input type="checkbox"/> Tidal sluice(s) <input type="checkbox"/> <i>i.e. from main watercourse into estuary / sea</i>											

	<p><b>Other</b>  Pumping Station <input type="checkbox"/> Erosion Protection <input type="checkbox"/> Sand Dunes <input type="checkbox"/></p> <p><b>Additional notes (if required):</b>  Informal embankment on the right bank of the Nenagh River near the industrial estate that previously flooded has been compromised where a access road has been cut through the embankment. The road seems to be for construction traffic and the embankment may be reinstated after construction is completed.</p>
<b>2.8 Initial Potential Mitigation Measures</b>	
<b>Non-structural measures</b>	Planning and Development control <input checked="" type="checkbox"/> Sustainable Urban Drainage Systems <input type="checkbox"/> Flood forecasting / warning <input type="checkbox"/> Change in Operating Procedures for water level control: <input type="checkbox"/> Public awareness campaign <input checked="" type="checkbox"/> Individual property protection <input checked="" type="checkbox"/> Land use management <input type="checkbox"/>
<b>Structural measures</b>	<p><b>Strategic development management for floodplain development:</b> <input type="checkbox"/>  <i>(integration of measures into strategic development proposals)</i></p> <p><b>Storage:</b> On-line <input type="checkbox"/> Off-line <input type="checkbox"/></p> <p><b>Flow diversion:</b> Flood relief channel <input type="checkbox"/> Flood relief culvert <input type="checkbox"/></p> <p><b>Increase conveyance:</b> Bridge works <input checked="" type="checkbox"/> Channel works <input type="checkbox"/> Floodplain <input type="checkbox"/></p> <p><b>Flood defences:</b> Walls <input checked="" type="checkbox"/> Embankments <input type="checkbox"/></p> <p><b>Localised works:</b> Defence raising <input checked="" type="checkbox"/> In-fill gaps <input type="checkbox"/> Trash screen <input type="checkbox"/></p> <p><b>Maintenance works:</b> Culvert / channel clearance <input type="checkbox"/> Asset maintenance <input type="checkbox"/></p> <p><b>Relocation of properties:</b> <input type="checkbox"/></p> <p><b>Improve existing defences:</b> <input checked="" type="checkbox"/> <b>(describe)</b></p> <p><b>Other (describe):</b></p>

<b>Outcomes</b>				
<b>PFRA Designation</b>	APSR <input checked="" type="checkbox"/> not an APSR <input type="checkbox"/> IRR <input type="checkbox"/>		FRI Score: 7449.5	
<b>Site Ground-truthing of PFRA Assessment (hazard mapping and receptors)</b>	<b>High Confidence (good)</b>	<b>Uncertain</b>	<b>Low Confidence (poor)</b>	<b>Not available</b>
		X		
<b>Site Visit Review Score</b>	190			
<b>Recommended Designation</b>	APSR <input checked="" type="checkbox"/> not an APSR <input type="checkbox"/> IRR <input type="checkbox"/>			
<b>Summary Comments (if required)</b>	While the Nenagh River generally has good in channel capacity and may not flood in lower return periods there is sufficient fluvial flood risk, including a historically proven risk to critical receptors, to warrant Nenaghs designation as an APSR.			



**Photo1:** View of Nenagh river, near the swimming pool (on right bank), looking downstream.



**Photo 2:** Gap in left bank embankment near the industrial estate.



**Photo 3:** Confluence of Nenagh River and tributary.



**Photo 4:** Timber piles protecting against erosion, downstream of the confluence.

