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| Location: Sixmilebridge, Co. Clare | | Unique ID: 270482 (from PFRA database) | |
| Initial OPW Designation | APSR <input checked="" type="checkbox"/> | AFRR <input type="checkbox"/> | IRR <input type="checkbox"/> |
| Co-ordinates | Easting: 147400 | | Northing: 165935 |
| River / Catchment / Sub-catchment | Ratty River (Owengarney River) / Shannon Estuary | | |
| Type of Flooding / Flood Risk (identify all that apply) | Fluvial non-tidal <input checked="" type="checkbox"/> Fluvial tidal <input type="checkbox"/> Coastal <input type="checkbox"/> | | |

| Stage 1: Desktop Review | |
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| 1.1 Flood History (include review of Floodmaps.ie) | River Flow Path <p>The Ratty River (also called the Owengarney River) flows through Sixmilebridge on its eastern boundary. It flows into the Shannon Estuary around 7km to the south-southeast.</p> <p>Flood event records</p> <p>There are nine flood records listed: 2 recurring and 7 singular events, through reports dated 1991-2009.</p> <p>Severe flooding of a number of dwellings in Sixmilebridge occurred during the winter of 1994/95 when the Owenagarney River burst its banks. Serious flooding in the same area had previously occurred in 1991. An OPW scheme was completed on site in 1996.</p> <p>The majority of the flood occurrences are along the R462 the main road which runs north to south through the centre of the town, parallel to the Owenagarney River.</p> |
| 1.2 Relevant information on flooding issues from OPW and LA staff | <p>PFRA database comments (<i>in italics</i>):</p> <p>OPW comments <i>None</i></p> <p>LA comments <i>Owenagarney River on occasions has burst it banks, 15 metres of Regional Road, 4/5 commercial properties at risk, Not a regular occurrence. OPW Flood Defence scheme completed some 15 years ago. Regional route import route for county.</i></p> <p>Meeting / discussion summary comments:</p> <p>OPW comments</p> <ul style="list-style-type: none"> Flooding was experienced here in 2009. The Owengarney (Ratty) river is a very slow system so when in flood, water levels take a long time to recede. High tides can influence this area up to Ballyliddan West (just downstream of Sixmilebridge). Ballyliddan West flooded 3-4 times in the early 90s prior to the construction of defence embankments (OPW) in 1996. OPW believe these embankments may have been constructed to protect up to the 75 year event (approx). |

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| | <ul style="list-style-type: none"> During the 2009 floods, a 150mm pump was provided to the properties at Ballyliddan West as some seepage was observed coming through or under (more likely) the embankments. The pump kept the situation under control The OPW deepened sections of the tributary of the Owengarney river as flood waters used to come out of bank. An embankment was also built on the left bank of this tributary opposite the houses. This minor tributary is located on the southeast edge of the town. New development on the right bank of the Owengarney River may be putting pressure on the system. <p>LA comments</p> <ul style="list-style-type: none"> Town flooded in 2009. Areas affected include Greyhound Bar and 4-5 Commercial properties. OPW embankments present. | | |
| 1.4 PFRA Data | | | |
| 1.4.1 PFRA hazard mapping | PFRA mapping available in GIS layer: PFRA mapping included on FRR map: | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | |
| 1.4.2 Summary of Principal Receptors | Type Arch_Regional_Weighted_F_E Monument_LV_Weighted_F_E Total | FRI score (if available) 21.1 10.1 809.48 | |
| 1.7 Stage 1 Evaluation | Aspect Flood History (1.1) OPW / LA Information (1.2) PFRA Evaluation (1.4) Overall Desktop Evaluation (if any above aspect is uncertain then overall designation is uncertain) | Clearly APSR X X | Uncertain X |
| 1.8 Proposed level of assessment for Stage 2 site visits | Level A Site Visit Level B Site Visit | X | |

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| Stage 2: Site Inspection | | Level A Assessment | | |
| Date and Time of Inspection | | Date: 06/06/11 | | |
| | | Time: 14:30 | | |
| Names of inspection team (including OPW/LA staff if present) | | Iain Blackwell | | |
| | | Lewis Maani | | |
| | | | | |
| | | | | |
| 2.1 Ground-truthing of Hazard Mapping | Fluvial non-tidal <input checked="" type="checkbox"/> Fluvial tidal <input type="checkbox"/> Coastal <input type="checkbox"/> Not available <input type="checkbox"/> | | | |
| | Generally reasonable flood outlines in principle. Flood extent is shown to be greater on left bank than right bank which is confirmed as being the case on site. | | | |
| 2.2 Spot check ground-truthing of selected receptor vulnerability | Receptor Type | Location description (if not obvious) | Exists? | Overall Vulnerability / Risk (L / M / H) |
| (also note any key receptors noted during visit that are not identified by PFRA) | Houses | | Yes | H |
| | Commercial properties (typically retail, small businesses) | | Yes | H |
| | Local road | | Yes | H |
| 2.3 Local knowledge - on-site comments (OPW, LA and any info volunteered by local residents during visit) | No onsite comments | | | |
| 2.4 Comments on hydraulic constrictions (bridges, etc.) and conveyance routes | <p>Weir at upstream end of village is the hydraulic control, giving a head loss estimated at 0.5m to 1.0m. This could lead to overtopping of the river bank / wall adjacent to the mill on the left bank.</p> <p>Channel narrows downstream of the mill causing possible restriction. At the bridge crossing of the R471 there is a main arch in the centre of the bridge and two skewed culverts (approximately 30-45 degrees to the flow direction). These additional culverts, although skewed, provide increased capacity of the bridge.</p> <p>Monument in centre of river immediately downstream of the bridge.</p> <p>Out of bank flows will be on the left bank, with a possible conveyance route along the main N-S road (R462) through the village. Depending on local levels, this flow may re-enter the watercourse, or it may result in ponding on the road.</p> | | | |

2.5 SVRS Assessment Matrix

Weightings:

A - x1 - reasonable expectation of flooding

B - x2 - high expectation of flooding
or flooding is tidal (any risk)

C - x5 - risk to life

| Approx. Number | 1 to 4 | | | | 5 to 20 | | | | >20 | | | |
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| Weighting | | A | B | C | | A | B | C | | A | B | C |
| Property (domestic) | 10 | | | | 100 | X | | | 200 | | | |
| Property (small retail or business) | 20 | | | | 200 | X | | | 400 | | | |
| Property (large retail or business) | 50 | | | | 500 | | | | 1000 | | | |
| Road or Rail Infrastructure | 30 | X | | | 300 | | | | 600 | | | |
| Critical Infrastructure (local) [hospital, school, police/fire/ambulance station, substation, WTW/WWTW, gov bldg, other (specify)] | 50 | | | | 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 | | | |
| Total SVRS | | | | | | | | | 330 | | | |

2.6 Defence Assets

Formal and Informal Flood Defence Assets

(include effective and ineffective assets to inform asset survey and potential mitigation measures)

Open Channel Watercourses

Man-made river channel ☐ Flood relief channel ☐ Canal ☐
Mill leat ☒ Drainage channels / back drains ☐

Bridges and Culvert crossings

Single Arch bridge ☐ Multi-Arch bridge ☒
Single Span bridge ☐ Multi-Span bridge ☐
Box culvert(s) ☐ Pipe culvert(s) ☐ Arch Culvert(s) ☐

Culverted Watercourses (culvert length is greater than just a crossing)

Box culvert(s) ☐ Pipe culvert(s) ☐ Arch Culvert(s) ☐ Irregular Culvert(s) ☐

Walls and Embankments

Embankment(s) ☒ Raised wall(s) ☐ Retaining wall(s) ☐

Control Structures – weirs, gates, dams

Fixed crest weir ☒ Adjustable weir ☒ Dam / Barrage ☐
Sluice gates ☐ Lock gates ☐ Radial gates ☐

Storage

On-line storage (natural) ☐ On-line storage (artificial) ☐ Off-line storage ☒

Outfalls

Flapped outfall(s) into watercourse ☐ Unflapped outfall(s) into watercourse ☒
i.e. from smaller watercourses, drains etc. into river / estuary / sea

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| | Tidal flap(s) <input type="checkbox"/> Tidal sluice(s) <input type="checkbox"/> <i>i.e. from main watercourse into estuary / sea</i> Other Pumping Station <input type="checkbox"/> Erosion Protection <input type="checkbox"/> Sand Dunes <input type="checkbox"/> Additional notes (if required): There is an embankment on the left bank downstream of the church, plus another embankment on the small watercourse (land drainage ditch) joining the main river from the left bank. The weir at the mill raises upstream water levels, increasing the likelihood of the river going out of bank at the upstream end of the village. This weir has a fixed crest as well as (possibly now redundant) removable weir boards / sluice openings. |
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2.8 Initial Potential Mitigation Measures

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| Non-structural measures | Planning and Development control <input type="checkbox"/> Sustainable Urban Drainage Systems <input type="checkbox"/> Flood forecasting / warning <input checked="" type="checkbox"/> Change in Operating Procedures for water level control: <input type="checkbox"/> Public awareness campaign <input type="checkbox"/> Individual property protection <input checked="" type="checkbox"/> Land use management <input type="checkbox"/> |
| Structural measures | Strategic development management for floodplain development: <input type="checkbox"/> <i>(integration of measures into strategic development proposals)</i> Storage: On-line <input type="checkbox"/> Off-line <input checked="" type="checkbox"/> Flow diversion: Flood relief channel <input type="checkbox"/> Flood relief culvert <input type="checkbox"/> Increase conveyance: Bridge works <input type="checkbox"/> Channel works <input checked="" type="checkbox"/> Floodplain <input type="checkbox"/> Flood defences: Walls <input checked="" type="checkbox"/> Embankments <input type="checkbox"/> Localised works: Defence raising <input checked="" type="checkbox"/> In-fill gaps <input checked="" type="checkbox"/> Trash screen <input type="checkbox"/> Maintenance works: Culvert / channel clearance <input type="checkbox"/> Asset maintenance <input checked="" type="checkbox"/> Relocation of properties: <input type="checkbox"/> Improve existing defences: <input checked="" type="checkbox"/> (describe) Various minor improvements to existing embankments may be appropriate, to tie in to other walls / assets to make a continuous defence (on the tributary to main river). Other (describe): Adjust water level control through changes to the weir arrangements adjacent to the mill, reducing risk of flow coming out of bank at the upstream end of the village. |

| Outcomes | | | | |
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| PFRA Designation | APSR <input checked="" type="checkbox"/> not an APSR <input type="checkbox"/> IRR <input type="checkbox"/> | | FRI Score: N/a | |
| Site Ground-truthing of PFRA Assessment (hazard mapping and receptors) | High Confidence (good) | Uncertain | Low Confidence (poor) | Not available |
| | X | | | X |
| Site Visit Review Score | 330 | | | |
| Recommended Designation | APSR <input checked="" type="checkbox"/> not an APSR <input type="checkbox"/> IRR <input type="checkbox"/> | | | |
| Summary comments (if required) | | | | |



Photo 1: Upstream end of Sixmilebridge. Properties on right bank are elevated well above flood plain

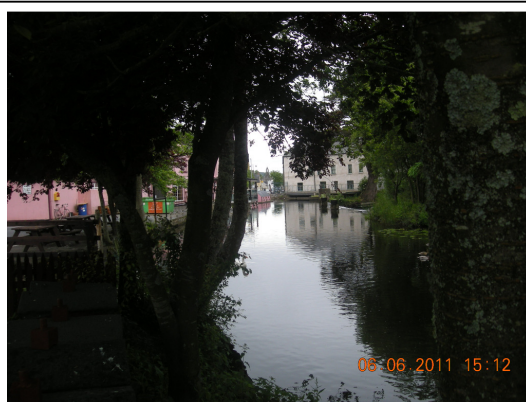


Photo 2: River looking downstream towards the mill



Photo 3: Weir and sluice structures at the mill



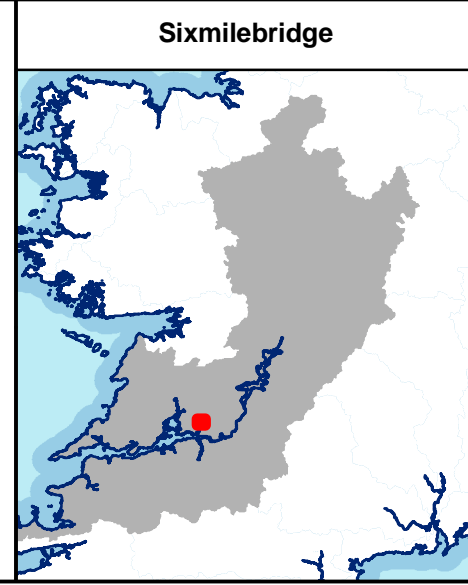
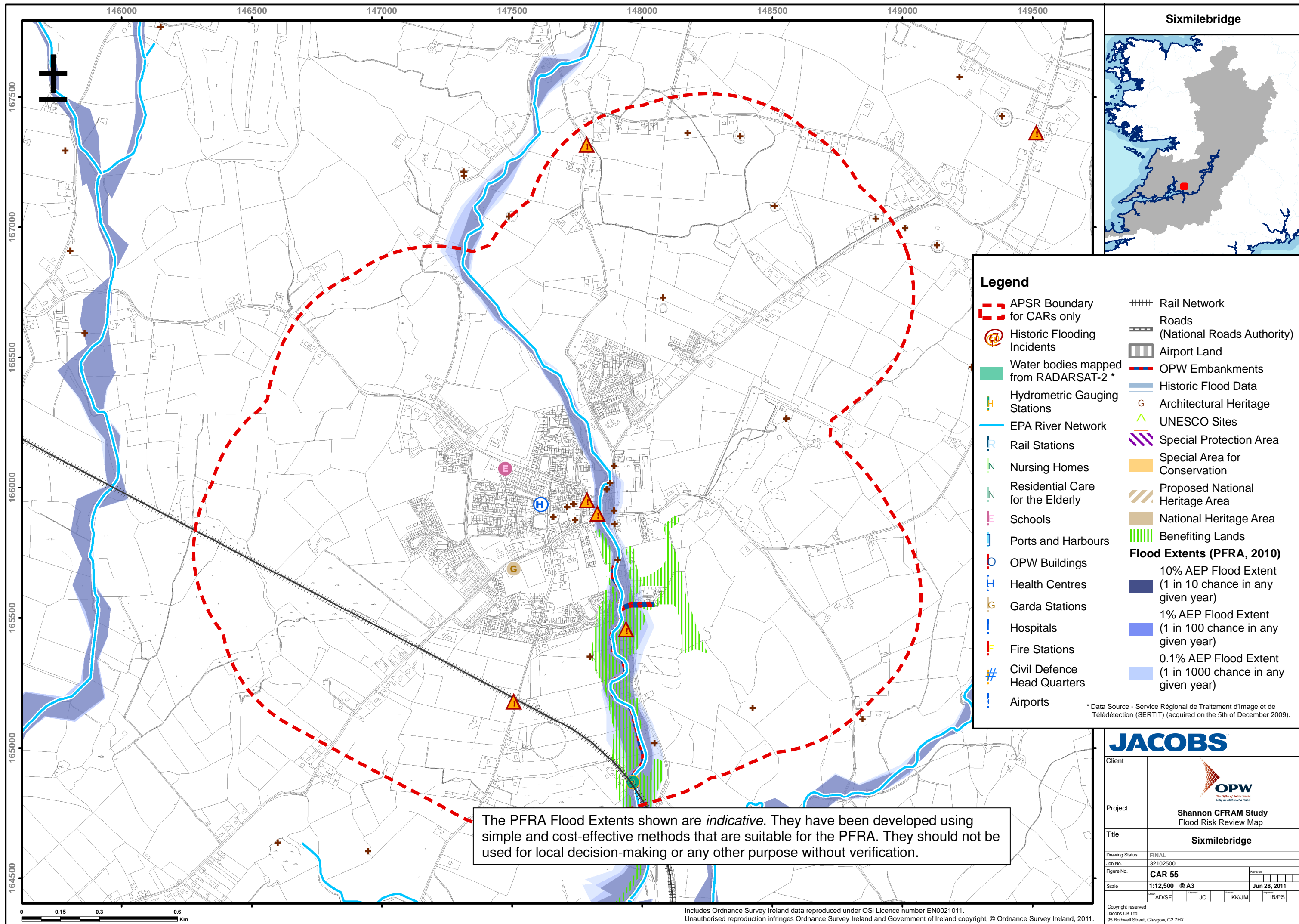
Photo 4: Approach to the bridge over the Owengarney (Ratty) River on Pound Street




Photo 5: Downstream side of bridge on Pound Street



Photo 6: River towards the downstream end of Sixmilebridge looking upstream from the right bank. Church in the background.



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| Client | |  | |
| Project | | Shannon CFRAM Study Flood Risk Review Map | |
| Title | | Sixmilebridge | |
| Drawing Status | FINAL | | |
| Job No. | 32102500 | | |
| Figure No. | CAR 55 | Revision | |
| Scale | 1:12,500 @ A3 | Jun 28, 2011 | |
| Drawn | AD/SF | Checked | JC |
| | | Reviewed | KK/JM |
| | | Approved | IB/PS |
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