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4 Bridge Street, Merthyr Tydfil

FLOOD CONSEQUENCE ASSESSMENT



Site:

4 Bridge Street,
Troedyrhiw,
Merthyr Tydfil,
CF48 4JX

January 2020

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EXECUTIVE SUMMARY

This Flood Consequence Assessment was commissioned by Mr M Jones, referred to hereafter as 'the client'. The flood Consequence Assessment has been prepared to support a planning application for the change of use of the existing dental clinic to a Café with a single residential dwelling above at 4 Bridge Street, Troedyrhiw, Merthyr Tydfil.

The Natural Resources Wales mapping identifies the site lies within Flood Zone 2 and is indicated as Flood Zone C2 on the Welsh Assembly Government's Development Advice Maps; however from further discussion with Merthyr Tydfil County Borough Council's Engineering Division flood defenses are understood to be present and were not considered when designated therefore is it reasonable to consider the site within Flood Zone C1. Technical Advice Note 15 (TAN 15) requires that planning applications for development proposals within this zone be accompanied by a Flood Consequence Assessment. The residential nature of the development proposals means the classification of the site is 'highly vulnerable' in Figure 2 (TAN15).

The Flood Consequence Assessment has reviewed all sources of flood risk to the proposed development including; fluvial, tidal, pluvial, groundwater, sewers and flooding from artificial sources.

This report has been prepared in consultation with the relevant interested parties and incorporates their comments where possible. The Flood Consequence Assessment is considered to be commensurate with the development proposals and in summary, the development can be considered appropriate in accordance with TAN 15.

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Specialist Software

- Flood Estimation Handbook FEH CD-ROM (v.3.0) - Determination of Catchment Descriptors and depths of rainfall
- MicroDrainage WinDES (v.12.6.1) - Calculation of Greenfield run-off rates IH124/ICP-SUDS, Greenfield run-off volumes, rates of rainfall and stormwater storage estimates

Abbreviations & Acronyms

AEP	Annual Exceedance Probability	mAOD	Metres Above Ordnance Datum
BGL	Below Ground Level	NGR	National Grid Reference
BGS	British Geological Survey	NPPF	National Planning Policy Framework
CC	Climate Change	NSRI	National Soil Resource Institute
FEH	Flood Estimation Handbook	NRW	Natural Resources Wales
FCA	Flood Consequence Assessment	OS	Ordnance Survey
FZ	Flood Zone	QSE	Quick Storage Estimate

Ha	Hectare	SFRA	Strategic Flood Consequence Assessment
IDB	Internal Drainage Board	SuDS	Sustainable Urban Drainage Systems
LIFA	Lead Local Flood Authority	TWL	Top Water Level
LPA	Local Planning Authority	UKCIP	United Kingdom Climate Impacts Programme
MTCBC	Merthyr Tydfil County Borough Council	WW	Welsh Water

1.0 Introduction

1.1 Planning Policy Context

- 1.1.1 All forms of flooding and their impact on the natural and built environment are material planning considerations.
- 1.1.2 Government policy with respect to development in flood risk areas is contained within the Planning Policy Wales, Technical Advice Note 15, (TAN15) 'Development and Flood Risk' which was issued in July 2004.
- 1.1.3 TAN15 builds on 'Flooding in Wales' published by the Environment Agency Wales in March 2001 in response to the October/November floods of 2000.
- 1.1.4 A Flood Consequence Assessment (FCA) is required as the site lies within a zone considered to be at flood risk according to the Development Advice Maps (DAM) and the Environment Agency's online Flood Maps.

1.2 Site Context

- 1.2.1 The Flood Consequence Assessment has been prepared to support a planning application for a change of use of an existing Dental Clinic to a Café with a Single Residential Dwelling above.

1.3 Consultation

- 1.3.1 The preparation of this report has been undertaken in consultation with the following interested parties; Merthyr Tydfil County Borough Council (MTCBC), Natural Resources Wales (NRW) and Welsh Water (WW).
- 1.3.2 The Local Planning Authority (LPA), Merthyr Tydfil County Borough Council, will make the final decision with regard to any planning permission. Merthyr Tydfil County Borough Council also acts as the Lead Local Flood Authority (LLFA). The NPPF advises that the LPA should consult with the Environment Agency who will provide advice and guidance on flood issues at a strategic level and in relation to planning applications.
- 1.3.3 Natural Resources Wales were contacted to discuss the nature and extent of information to be provided in this Flood Consequence Assessment (FCA) and for any background knowledge of flood risk specific to the site (correspondence is included in Appendix D).

- 1.3.4 Welsh Water Developer Services were contacted to discuss whether WW have any historical flooding issues in the area or any background knowledge on flood risk specific to the site (correspondence is included in Appendix G).
- 1.3.5 Merthyr Tydfil County Borough Council were contacted to discuss the nature and extent of information to be provided in this Flood Consequence Assessment (FCA) and for any background knowledge of flood risk specific to the site (correspondence is included in Appendix H).

2.0 Existing Site Location

2.1 Location

2.1.1 The application site is located approximately 15m from the junction between Merthyr road and Bridge Street, in the village of Troedyrhiw, Merthyr Tydfil. The Ordnance Survey National Grid Reference (OS NGR) for the site is 307123 (Easting), 202411 (Northing) and the postcode is CF48 4JX. The site Location plan is shown in Appendix A.

2.1.2 The site is bounded; to the north by Troedyrhiw Primary school, to the east by commercial buildings (with residential accommodation above) and further residential dwellings along Cardiff Road, to the south by residential dwellings off Wyndham Street, to the west by a mix of commercial and primarily residential dwellings.

2.1.3 The total site area is approximately 50m².

2.2 Existing and Historical Land Use

2.2.1 At present the application site comprises a former bank building that is now in a D1 Dental clinic use.

2.3 Topography

2.3.1 The site is considered generally level (138.937mAOD). The finished floor level of the ground floor is 138.937mAOD. The finished floor level of the residential dwelling is 142.220; The existing drawings are included within Appendix B and the proposed drawings are included within Appendix C.



Figure 1: Aerial Photograph of site (OS maps 2020)

3.0 Development Proposals

3.1 Nature of the development

- 3.1.1 The flood Assessment Consequence has been prepared to support a planning application for the change of use of the existing dental clinic to a Café with a single residential dwelling above, at 4 Bridge Street.
- 3.1.2 The pertinent planning drawings are included in Appendix C; an extract of the development proposal is shown in figure 2 (below).
- 3.1.3 The total site area is approximately 50m²; there are no changes to the permeable area of the site.

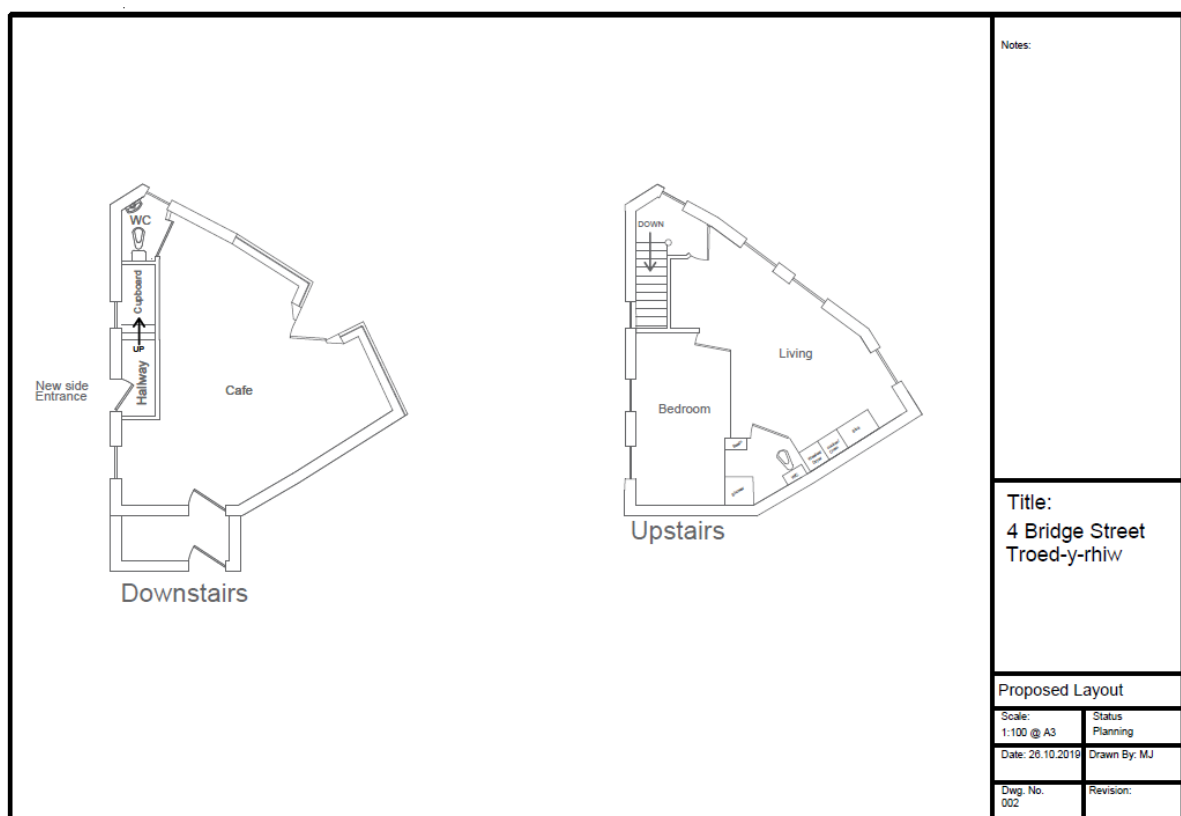


Figure 2: Planning Layout Extract (Mark Jones 2020)

4.0 Sources of Flood Risk

4.1 Fluvial Flood Risk

- 4.1.1 Information relating to the flood risk at the site has been obtained from the Environment Agency's (EA) online Flood Map and from NRW; an extract of which is shown in Figure 3 (below). Information from Welsh Assembly Government's (WAG) TAN15 Development Advice Map (DAM) is also shown in Appendix C.
- 4.1.2 Examination of the Flood Map shows that the site is located within Flood Zone 2; Appendix D shows the online flood map and statement in full.
- 4.1.3 Discussion with Merthyr Tydfil County Borough Council's Engineering Division established that flood defences are understood to be present and were not considered when designated therefore it is reasonable to consider the site to be within Flood Zone C1.



Figure 3: Flood Zone Map Extract (Environment Agency 2020)

- 4.1.4 The River Taff is located approximately 260m to the southwest; the flood risk associated with these watercourses during the extreme events is indicated by the light blue shading in Figure 3 above.
- 4.1.5 The extent of Flood Zone C is determined based on the undefended water level for the 1%AEP (100 year) fluvial event; therefore, the extent of Flood Zone C is based on the level 138.75m AOD (see table 1 below).

- 4.1.6 The levels on the site are approximately 138.937mAOD and on the first floor 142.220mAOD, this indicates that extent of Flood Zone C does not encroach on to the proposed development area for the 1%AEP(100year), however the ground floor would be affected by the 0.1%AEP(1000year).

Undefended	Fluvial	
Elevation, mean (mAOD)	1%AEP (100year)	0.1%AEP (1000year)
	138.75	140.09

*(Data taken from Natural Resources Wales Data Sheet): levels in mAOD
Merthyr Tydfil to Merthyr Vale – Depth and Velocity Modelling Report, Mott MacDonald September 2010*

Table 1: Undefended River Levels Extract (Natural Resources Wales 2020)

- 4.1.7 The 1%AEP (1 in 100 year) event would have no impact on the site based on the existing ground levels. The 0.1%AEP (1 in 1000 year) event would mean a flood depth of 1.153m above FFL based on the existing ground levels. There would be no impact on the proposed residential area above FFL 142.220mAOD.
- 4.1.8 The velocity provided by NRW for the location of the dwelling is 0.28m/s (mean) and 0.57m/s (max.).
- 4.1.9 The hazard rating for the 1%AEP based on *Table 4 – Hazard to People Classification using Hazard Rating ($HR = d \times (v + 0.5) + DF$) from the Supplementary note on flood hazard rating and thresholds for development planning and control purpose* (below) is calculated to be 0 (max.); based on a depth of 0m and a max. velocity of 0.57m/s. A flood hazard rating less than 0.75 equates to 'Very low hazard – Caution'. The hazard rating for the 0.1%AEP is calculated to be 2.23; more than 2.0 equates to 'Danger for all – includes the emergency services'. Both equations for the proposed residential dwelling above would equate to 0.

HR	Depth of flooding - d (m)													
	DF = 0.5					DF = 1								
Velocity v (m/s)	0.05	0.10	0.20	0.25	0.30	0.40	0.50	0.60	0.80	1.00	1.50	2.00	2.50	
0.0	0.03+0.5= 0.53	0.05+0.5= = 0.55	0.10+0.5= = 0.60	0.13+0.5= = 0.63	0.15+1.0= = 1.15	0.20+1.0= = 1.20	0.25+1.0= = 1.25	0.30+1.0= = 1.30	0.40+1.0= = 1.40	0.50+1.0= = 1.50	0.75+1.0= = 1.75	1.00+1.0= = 2.00	1.25+1.0= = 2.25	
0.1	0.03+0.5= 0.53	0.06+0.5= = 0.56	0.12+0.5= = 0.62	0.15+0.5= = 0.65	0.18+1.0= = 1.18	0.24+1.0= = 1.24	0.30+1.0= = 1.30	0.36+1.0= = 1.36	0.48+1.0= = 1.48	0.60+1.0= = 1.60	0.90+1.0= = 1.90	1.20+1.0= = 2.20	1.50+1.0= = 2.50	
0.3	0.04+0.5= 0.54	0.08+0.5= = 0.58	0.15+0.5= = 0.65	0.19+0.5= = 0.69	0.23+1.0= = 1.23	0.30+1.0= = 1.30	0.38+1.0= = 1.38	0.45+1.0= = 1.45	0.60+1.0= = 1.60	0.75+1.0= = 1.75	1.13+1.0= = 2.13	1.33+1.0= = 2.33	1.53+1.0= = 2.53	
0.5	0.05+0.5= 0.55	0.10+0.5= = 0.60	0.20+0.5= = 0.70	0.25+0.5= = 0.75	0.30+1.0= = 1.30	0.40+1.0= = 1.40	0.50+1.0= = 1.50	0.60+1.0= = 1.60	0.80+1.0= = 1.80	1.00+1.0= = 2.00	1.50+1.0= = 2.50	2.00+1.0= = 3.00	2.50+1.0= = 3.50	
1.0	0.08+0.5= 0.58	0.15+0.5= = 0.65	0.30+0.5= = 0.80	0.38+0.5= = 0.88	0.45+1.0= = 1.45	0.60+1.0= = 1.60	0.75+1.0= = 1.75	0.90+1.0= = 1.90	1.20+1.0= = 2.20	1.50+1.0= = 2.50	2.23+1.0= = 3.23	3.00+1.0= = 4.00	3.75+1.0= = 4.75	
1.5	0.10+0.5= 0.60	0.20+0.5= = 0.70	0.40+0.5= = 0.90	0.50+0.5= = 1.00	0.60+1.0= = 1.60	0.80+1.0= = 1.80	1.00+1.0= = 2.00	1.20+1.0= = 2.20	1.60+1.0= = 2.60	2.00+1.0= = 3.00	3.00+1.0= = 4.00	4.00+1.0= = 5.00	5.00+1.0= = 6.00	
2.0	0.13+0.5= 0.63	0.25+0.5= = 0.75	0.50+0.5= = 1.00	0.63+0.5= = 1.13	0.75+1.0= = 1.75	1.00+1.0= = 2.00	1.25+1.0= = 2.25	1.50+1.0= = 2.50	2.00+1.0= = 3.00	3.50	4.75	6.00	7.25	
2.5	0.15+0.5= 0.65	0.30+0.5= = 0.80	0.60+0.5= = 1.10	0.75+0.5= = 1.25	0.90+1.0= = 1.90	1.20+1.0= = 2.20	1.50+1.0= = 2.50	1.80+1.0= = 2.80	3.00	4.00	5.50	7.00	8.50	
3.0	0.18+0.5= 0.68	0.35+0.5= = 0.85	0.70+0.5= = 1.20	0.88+0.5= = 1.38	1.05+1.0= = 2.05	1.40+1.0= = 2.40	1.75+1.0= = 2.75	3.10	3.80	4.50	6.25	8.00	9.75	
3.5	0.20+0.5= 0.70	0.40+0.5= = 0.90	0.80+0.5= = 1.30	1.00+0.5= = 1.50	1.20+1.0= = 2.20	1.60+1.0= = 2.60	3.00	3.40	4.20	5.80	7.00	9.00	11.00	
4.0	0.23+0.5= 0.73	0.45+0.5= = 0.95	0.90+0.5= = 1.40	1.13+0.5= = 1.63	1.35+1.0= = 2.35	1.80+1.0= = 2.80	3.28	3.70	4.80	6.40	7.75	10.00	12.25	
4.5	0.25+0.5= 0.75	0.50+0.5= = 1.00	1.00+0.5= = 1.50	1.25+0.5= = 1.75	1.50+1.0= = 2.50	2.00+1.0= = 3.00	3.50	4.00	5.00	6.80	8.50	11.00	13.50	
5.0	0.28+0.5= 0.78	0.60+0.5= = 1.10	1.10+0.5= = 1.60	1.38+0.5= = 1.88	1.65+1.0= = 2.65	2.20	2.75	4.30	5.40	6.50	9.25	12.00	14.75	
Flood Hazard Rating (HR)		Colour Code	Hazard to People Classification											
Less than 0.75			Very low hazard - Caution											
0.75 to 1.25			Danger for some – includes children, the elderly and the infirm											
1.25 to 2.0			Danger for most – includes the general public											
More than 2.0			Danger for all – includes the emergency services											

Table 2: Hazard to People Classification using Hazard Rating(EQ/HR Wallingford 2008)

- 4.1.10 The speed of inundation and the rate of rise of the floodwaters are also unknown (no data was available from NRW) and modelling is not considered commensurate with the scale of the proposed development.
- 4.1.11 The impact on adjacent infrastructure is considered to be negligible as there are no proposed changes to the existing drainage.
- 4.1.12 The impact on neighbouring properties and elsewhere in the floodplain is considered negligible as there are no external changes to the dwelling.
- 4.1.13 It should be noted that the site is within an EA flood warning area and advanced notice of any potential flooding event can be obtained by signing up to this service.

4.2 Tidal Flood Risk

- 4.2.1 Due to the distance from the coast and estuarine waterways the risk of flooding from tidal sources is considered low.

4.3 Artificial Sources of Flood Risk

- 4.3.1 The proposed development is indicated to be at flood risk from reservoirs on the EA's online Reservoir Flood Map; the extent of the flood risk from reservoirs is indicated by the green shading in figure 4 (below).
- 4.3.2 It should be noted that the risk of catastrophic failure is considered to be very low, as the reservoirs are such major Welsh Water assets it is understood that there are appropriate maintenance regimes and regular reviews undertaken confirming integrity of the embankments.

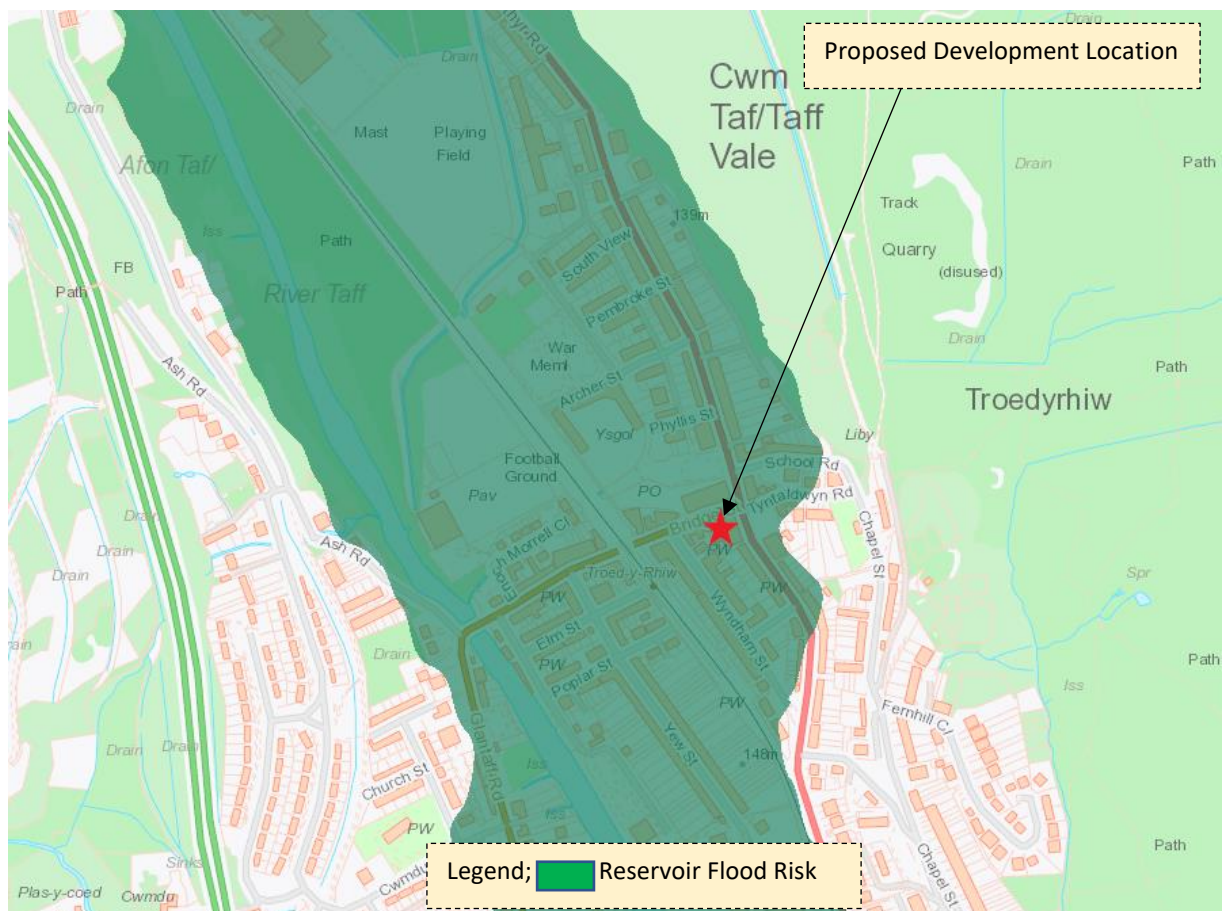


Figure 4: Reservoir Flood Map Extract (Environment Agency 2020)

- 4.3.3 There are no canals within the immediate vicinity of the proposed development that present a flood risk to the site.

4.4 Pluvial Flood Risk

- 4.4.1 Intense rainfall that is unable to soak into the ground or enter drainage systems can run-off land and result in flooding. Local topography and the land use can have a strong influence on the direction and depth of flow. Large catchment areas are particularly prone to this type of flooding. The volume and rate of overland flow from land can be exacerbated if development increases the percentage of impermeable area.
- 4.4.2 The topography of the development and surrounding area means there is little likelihood of significant flows impacting on the proposed development or on land and property adjacent to the

development. The only flows that are likely to be present on site are from direct rainfall on areas of hardstanding.

- 4.4.3 Any overland flows generated by the proposed development must be carefully controlled; safe avenues of overland flow away from the existing and proposed dwellings are advised.

4.5 Groundwater Flood Risk

- 4.5.1 In general terms groundwater flooding can occur from three main sources: - raised water tables, seepage and percolation and groundwater recovery or rebound.
- 4.5.2 If groundwater levels are naturally close to the surface then this can present a flood risk during times of intense rainfall. No groundwater flood risk has been identified during consultation with the various interested parties.
- 4.5.3 Seepage and percolation occur where embankments above ground level hold water. In these cases water travels through the embankment material and emerges on the opposite side of the embankment. At present there are no reported problems with groundwater flooding.
- 4.5.4 Groundwater recovery / rebound occurs where the water table has been artificially depressed by abstraction. When the abstraction stops the water table makes a recovery to its original level. There is the potential for groundwater flooding in low lying areas where groundwater levels have been depressed below their pre-pumping conditions, where these were at or close to ground level. As with the seepage scenario the likelihood of flooding from this source is low.

4.6 Sewer Flood Risk

- 4.6.1 In urban areas, rainwater is frequently drained into surface water sewers or sewers containing both surface and waste water known as 'combined sewers'. Foul water flooding often occurs in areas prone to overland flow and can result when the sewer is overwhelmed by heavy rainfall and will continue until the water drains away. It can also occur when the sewer becomes blocked or is of inadequate capacity, this could lead to there being a high risk of internal property flooding with contaminated water.
- 4.6.2 Consultation with various parties has not identified any existing sewer flood risk issues or historical flooding of the immediate site area.

4.7 Historical and Anecdotal Flooding Information

- 4.7.1 An Internet based search for flooding events highlighted a flooding event in December 1979 at Nant Rhyd y car, Merthyr Tydfil; *'A culvert under the embankment of a disused mineral railway became blocked during an unusually long period of heavy rainfall from 26-27 December 1979. Waters were impounded to the full height of the 7-metre high embankment, before the structure failed abruptly. Two lives were lost when the dam-burst flood met obstructions in the watercourse, the waters rapidly filling the ground floor of housing at Rhyd y car.'* This Flood was recorded as a culvert blockage and embankment failure is considered as a sole event and to be treated accordingly.

- 4.7.2 Consultation with Welsh Water, confirmed that there had been no recorded incidents of flooding within close proximity (30 meters) of the property (Appendix G).

4.8 Flood Risk Vulnerability Classification and Flood Zone Compatibility

- 4.8.1 The development is classified as 'highly vulnerable' in Figure 2, TAN15 and this type of proposed land use is allowed in Flood Zone C1 provided a series of planning requirements are met. These include: -

- Application of the justification test (section 6) including acceptability of consequences (section 7 and appendix 1)
- Conforming to the surface water management requirements

- 4.8.2 The acceptability criteria include: -

- Acceptable consequences for the nature of use
- Flood defences adequate
- Agreement for construction and maintenance costs secured
- Occupiers aware of flood risk
- Escape/evacuation routes present
- Effective flood warning provided
- Flood emergency plans and procedures

4.9 Justification the location of the development

- 4.9.1 Development, including transport infrastructure, will only be justified if it can be demonstrated that: -

- i. Its location in zone C is necessary to assist, or be part of, a local authority regeneration initiative or a local authority strategy required to sustain an existing settlement; or,
- ii. Its location in zone C is necessary to contribute to key employment objectives supported by the local authority, and other key partners, to sustain and existing settlement or region;

And,

- iii. It concurs with the aims of PPW and meets the definition of previously developed land (PPW fig.2.1); and,
- iv. The potential consequences of a flooding event for the particular type of development have been considered, and in terms of the criteria contained in section 5 and 7 and appendix 1 of TAN15 are found to be acceptable.

- 4.9.2 Section 4.0 of this report assesses flood risk and the consequences of flooding in accordance with point iv, points i-iii require confirmation with the LPA. The mitigation measures in section 4.11 (below) aim to ensure that the development is as safe as possible and there is:

- Minimal risk to life;
- Minimal disruption to people living and working in the area;
- Minimal potential damage to property;
- Minimal impact of the proposed development on flood risk generally; and,
- Minimal disruption to natural heritage.

4.10 Mitigation Measures

- 4.10.1 Due to the level of the residential FFL, there is no fluvial flood risk during a 1%AEP or 0.1%AEP. The ground floor of the site, would not be affected by the 1%AEP as the FFL is 187mm higher than the undefended fluvial flood level of 138.75AOD (Table 1)

4.11 Residual Risks

- 4.11.1 No residual risks have been identified.

4.12 Flood Planning Preparation

- 4.12.1 The following section of the report draws heavily on EA guidance as there is no Merthyr Tydfil Flooding Response Plan available at present.
- 4.12.2 The receipt of and response to warnings of floods is an essential element in the management of the residual risk of flooding. The EA's Floodline number 0345 988 1188 and website www.environment-agency.gov.uk/homeandleisure/floods/ gives information and advice on all matters concerning flooding.
- 4.12.3 Unfortunately, telephoning may not be an option. With a large scale emergency telecommunications are likely to be disrupted, either by water damage or by pressure of calls overwhelming the system. In addition the mobile network may be closed down to give precedence to emergency services. Television and radio, particularly local radio, are an alternative source for announcements. A battery or wind-up radio is a useful standby.
- 4.12.4 The Environment Agency operates a flood warning service in areas at risk of flooding from rivers or the sea. If flooding is forecast, warnings are issued using a set of three easily recognisable codes: -



Flood Alert - Issued when rivers are running bank full and further rainfall is expected. There may be minor flooding of low-lying land, roads and gardens. The alert is issued in order that the public at risk and the emergency services and civil authority are aware of increasing chance of flooding and take appropriate preparatory action. Flash flood risk from summer thunderstorms is such that Flood Watches may be issued for catchments before rainfall has commenced.



Flood Warning - Issued when flooding of homes and businesses is expected. Property owners, the public at risk, the emergency services and the civil authority should act to protect life and property. The rapid response of urban catchments to summer thunderstorms may preclude issue of a Flood Warning before some flooding has occurred.



Severe Flood Warning - Issued when severe flooding is expected and there is extreme danger to life and property. This could relate either to extreme water depths or velocities, or when 100 or more properties are expected to be flooded in a particular flood warning area. In such circumstances, it is likely that there would be considerable disruption to traffic movement due to extensive road flooding. In the event of a breach in defences or an intense summer thunderstorm, a Severe Flood Warning may be issued without prior issue of either a Flood Watch or a Flood Warning. A breach in the tidal defences would trigger an immediate Severe Flood Warning.

- 4.12.5 Officers from MTCBC and NRW will inspect their own coastal flood defences and assets when alerts are issued.
- 4.12.6 Flood Planning is a function of The Civils Contingencies Unit, with input from the NRW and other relevant organisations.
- 4.12.7 At present the specific site location is outside of a MTCBC Flood Response Plan Sector and it is understood that no Flood Warden exists for this area either.
- 4.12.8 If there is sufficient warning, sandbagging will help to keep water out. Sandbags will not be necessary if a formal defence mechanism is not employed, such as a detachable flood barrier for the entrances/accesses to the building.
- 4.12.9 If sandbags are to be utilised; they are available at builders' merchants but can be homemade from carrier bags or pillow cases filled to three-quarter capacity with sand or earth. Over-filled bags will not lie together snugly and water will seep through small gaps therefore, it is best to put a plastic sheet underneath to act as a seal and arrange the bags end to end like brickwork. If the sandbag wall is to be more than two bags high, lay a double line at the bottom to give stability. All other possible entry points for water, such as air vents and utility inlets, should be sealed. In a prolonged flood sandbagging will delay but not prevent water from entering. Eventually water will seep through brickwork and percolate up through the floor.
- 4.12.10 **Before the flood** - In the building, turn off gas and electricity, and have buckets and mops ready in case of back-up from drains and lavatories. Move all people upstairs with supplies of food, warm clothes and blankets, any medication needed, and a torch. Do not use lifts, they may cease running suddenly as power is cut.
- 4.12.11 **During the flood** - Do not go out unless absolutely necessary. It is easy to underestimate the power of a flood. Twenty centimetres of fast-flowing water can knock an adult off their feet. Floods remove manhole covers, uproot paving stones and distribute debris. Road works, steps and other hazards are concealed by water. Driving is equally hazardous. If caught in water, the technique at fordable levels is to proceed slowly but evenly in a low gear to avoid the build-up of a bow wave. Most 4WDs will operate up to their wheel arches but saloons cannot deal with the flood waters as easily. Once water enters the air intake, an engine is likely to be damaged.
- 4.12.12 **After the flood** - Contact your insurance company immediately. As well as dealing with claims, insurers can usually recommend professional cleaners and other help. The utilities companies

(gas, electricity and water) will provide advice about reconnection. Household appliances and electrical wiring should be tested before use. In the event of sewage contamination vaccinations may be necessary, particularly for children, and drinking water should be boiled. MTCBC will be able to give further guidance depending upon the specific circumstances.

4.13 Evacuation

- 4.13.1 In severe conditions, the authorities may decide to evacuate. Information will be given over the usual channels and/or by load hailer. You may be told to hang a sheet out of the window to alert rescuers. If evacuated you will be taken to a reception centre where warm clothing and food will be provided. Rules for evacuation are: dress warmly, take the minimum (remembering any medication) and be ready to leave at short notice.
- 4.13.2 It is possible that roads in the area may be flooded by surface water/groundwater flooding before fluvial flooding occurs. Such flooding may impact the road network in the area and not all routes may be accessible.
- 4.13.3 In such an event the protection of evacuation routes will become a critical priority; once flooded only adequately equipped vehicles may be able to negotiate these roads.
- 4.13.4 MTCBC may activate a Helpline if evacuation is deemed probable, to provide information, advice and guidance to the public in relation to evacuation arrangements, welfare, temporary accommodation etc.
- 4.13.5 The evacuation route from the development location is as indicated on the plan (Figure 5) on the following page.
- 4.13.6 Evacuation from the dwelling is proposed initially by heading northeast along Bridge Street to the junction with Merthyr Road (A4054). From this junction there are two options; firstly straight up Tyntaldwyn Road to higher ground and the second alternative is right (southeast) towards Merthyr Vale.
- 4.13.7 There is no flooding along the evacuation route for the 100 year return period storm event from the proposed dwelling. The depths and velocities (and resulting hazard) are discussed earlier in the report in section 4.1. The extent of 100 year floodplain shown on the mapping data indicates that there is no immediate danger at the dwelling.

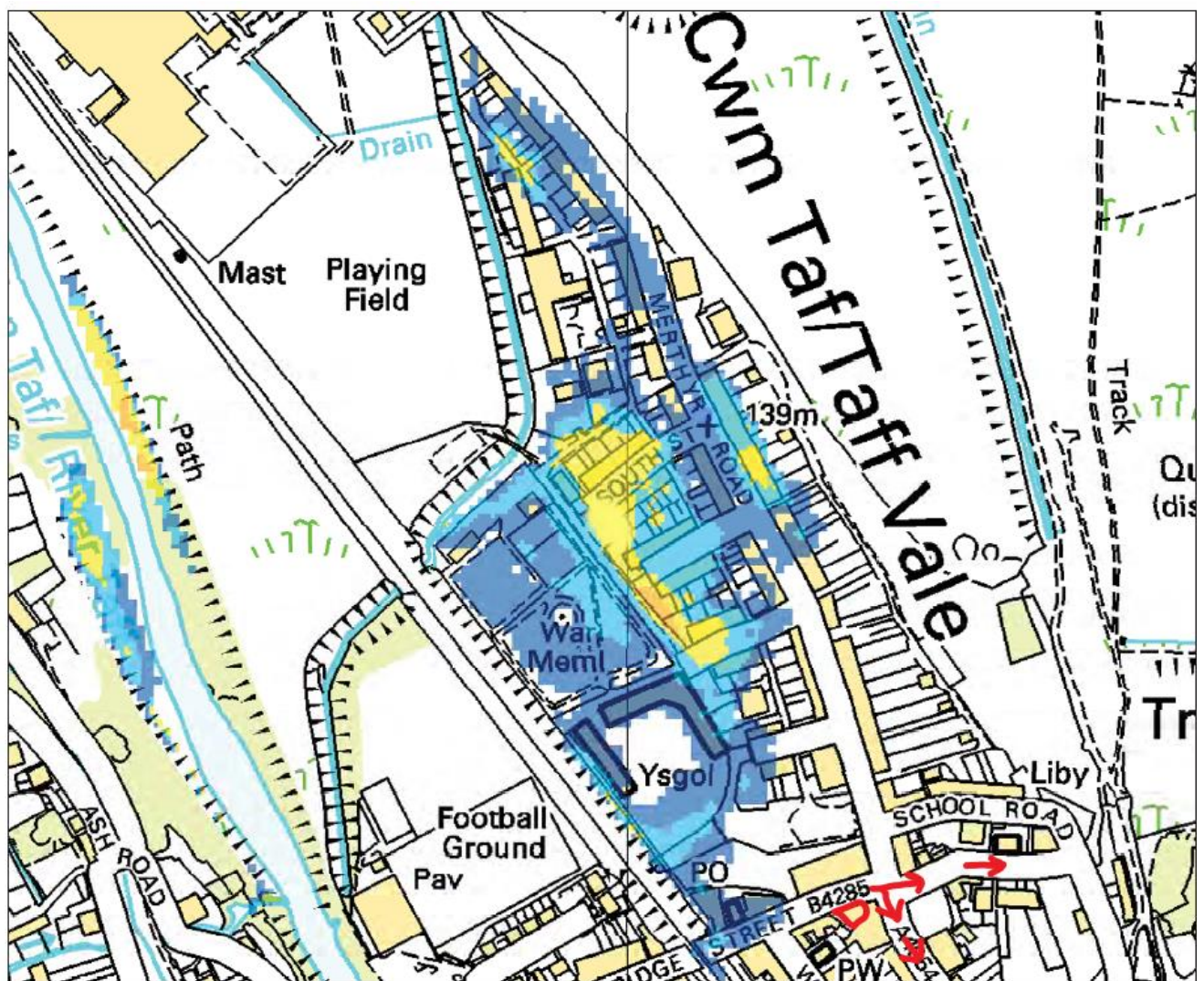


Figure 5: Evacuation Route Plan (Mark Jones 2020)

5.0 Surface Water Management

5.1 Pre-development Surface Water Run-off

- 5.1.1 There will be no alterations to the current surface water run-off.

5.2 Post-development Surface Water Run-off

- 5.2.1 No alterations have been made; therefore this does not need to be considered.

5.3 Sustainable Drainage Systems (SuDS)

- 5.3.1 In accordance with TAN15, Sustainable Drainage Systems (SuDS) should be specified wherever possible to manage surface water. This in turn reduces the burden downstream on both watercourses and sewerage systems.
- 5.3.2 SuDS have the ability to address three core objectives; water quantity, water quality and amenity value. With the appropriate system specified, all three core objectives can be satisfied. Where possible, peak surface water discharge rates to watercourses and sewers should be reduced.
- 5.3.3 Preference should always be given to SuDS over the traditional methods of buried sewers wherever possible and practical. Runoff from car parking areas and roads could be conveyed through swales, permeable pavements, bio-retention areas and petrol interceptors to provide a degree of treatment before flows are carried to public sewers.
- 5.3.4 Opportunities should be taken to provide soft landscaping where at all possible on site to assist in minimising surface water run-off. Added benefits include biodiversity and visual enhancements.
- 5.3.5 The drainage system already exists, and no alterations are anticipated.

5.4 Methods of Surface Water Management

- 5.4.1 There are no proposed alterations to the existing drainage.

5.5 Discharge via Infiltration

- 5.5.1 There are no proposed alterations to the existing drainage.

5.6 Discharge to Watercourse

- 5.6.1 There is no intention to discharge any surface water flows generated by the proposed development to the adjacent watercourse.

5.7 Discharge to Sewer

- 5.7.1 There are no proposed alterations to the existing drainage.

5.8 Climate Change

- 5.8.1 There are indications that the climate in the UK is changing significantly and it is widely believed that the nature of climate change will vary greatly by region. Current expert

opinion indicates the likelihood that future climate change would produce more frequent short duration and high intensity rainfall events with the addition of more frequent periods of long duration rainfall.

- 5.8.2 The NPPF Technical Guidance Table 5 states that the recommended national precautionary sensitivity ranges for increase of peak rainfall intensity is 30% until 2115. It is widely believed that the impact of climate change means there is likely to be a long term increase in the average sea levels, with an expectation that sea levels will rise gradually.
- 5.8.3 An increase in flood water levels means that future flooding events will occur more frequently and will have a greater impact.
- 5.8.4 Any increase in the level of flood risk to the proposed development from climate change is likely to be related to the increase in rainfall intensity and duration and its impact upon the surface water drainage system.
- 5.8.5 Climate Change should be accounted for within the design and it is recommended that an increase in peak rainfall intensity of 30% is allowed for.

6.0 Foul Water Management

- 6.1 There are no proposed changes to the current foul water management in place.
- 6.2 Based on the proposals for the change of use to café and a single residential dwelling above, the approximate peak foul water flows generated by the development are approximately 0.05l/s. This is based on 4000 litres per dwelling per 24 hours; the guidance contained within Sewers for Adoption (SFA).

7.0 Summary and Conclusions

- 7.1 The Flood Consequence Assessment has been prepared to support a planning application for the change of use of 4 Bridge Street, Merthyr Tydfil from a dental clinic to a café with a residential dwelling above.
- 7.2 The site lies on the border of Flood Zone C according to the Development Advice Maps and TAN15 requires that planning applications for development proposals within this zone be accompanied by a Flood Consequence Assessment.
- 7.3 The development is classified as 'highly vulnerable' in Figure 2, TAN15 and this type of proposed land use is allowed in Flood Zone C1 provided the development can be justified and the consequences of flooding assessed and sufficiently mitigated.
- 7.4 The Flood Consequence Assessment (FCA) has reviewed all sources of flood risk to both the proposed development and to the existing adjacent development as a result of the proposals, including; fluvial, tidal, pluvial, groundwater, sewers and flooding from artificial sources.

- 7.5 An Internet based search for flooding events highlighted a flooding event on 26-27th of December 1979 at Nant Rhyd y car, Merthyr Tydfil. This flood was due to a blockage in a culvert under the embankment of a disused mineral railway. Water was held behind the railway embankment until it failed. Consultation with Merthyr Tydfil Council highlighted the same historical flood even on the 27th Dec 1979; as a consequence of that flood a flood defence bund was constructed between the un-named watercourse located between South View and the playing fields to the north. This historical flooding event is also indicated on the Natural Resources Wales mapping data.
- 7.6 The proposed development has been justified and suitable mitigation measures proposed to ensure that the development is as safe as possible and there is: minimal risk to life, minimal disruption to people living and working in the area, minimal potential damage to property; minimal impact of the proposed development on flood risk generally; and, minimal disruption to natural heritage. Although the hazard rating for the proposed development equates to 'Danger for most', the dwelling lies within an EA flood warning zone and signing up to this service is highly recommended.
- 7.7 There are no proposed changes to the current drainage system.
- 7.8 The Flood Consequence Assessment is considered to be commensurate with the development proposals and in summary, the development can be considered appropriate in accordance with TAN15.

8.0 Recommendations

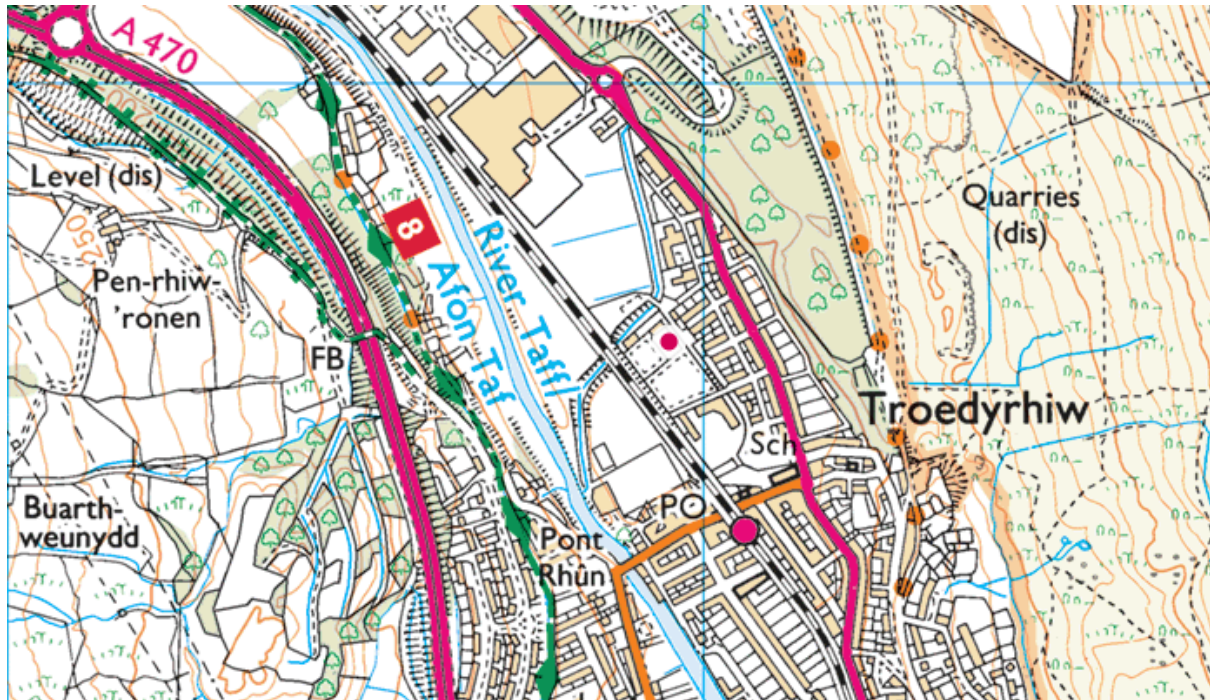
- 8.1 There are no recommendations as the existing drainage systems are adequate.

APPENDIX A: Location Plan

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Location Plan

4 Bridge Street, Merthyr Tydfil



OS X (Eastings)	307123
OS Y (Northings)	202411
Post code	CF48 4JX
Lat	N51:42:45 (51.712713)
Long	W3:20:44 (-3.345692)
Grid Reference	SO 07123 02411

Flood Consequence Assessment
4 Bridge Street, Merthyr Tydfil

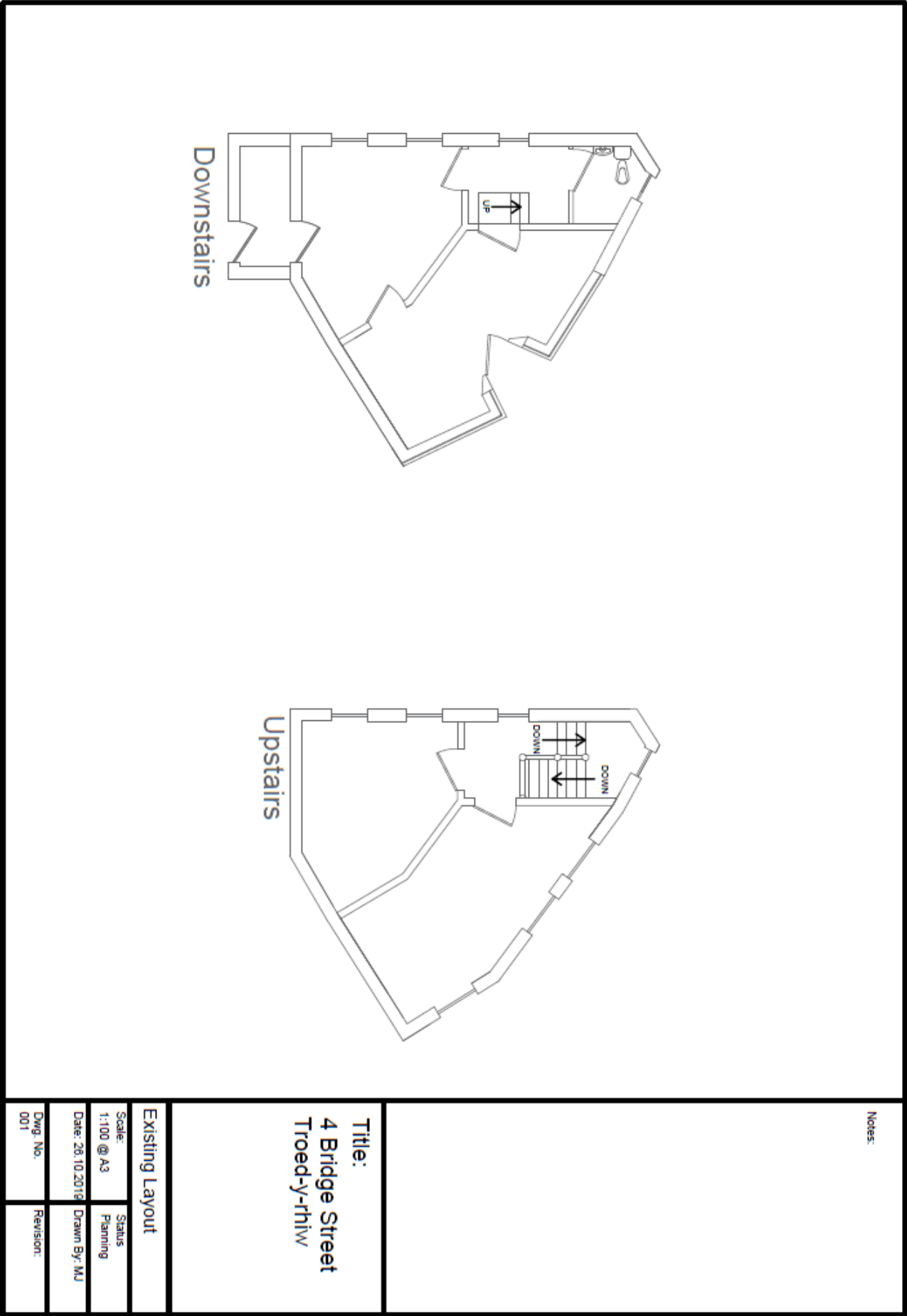


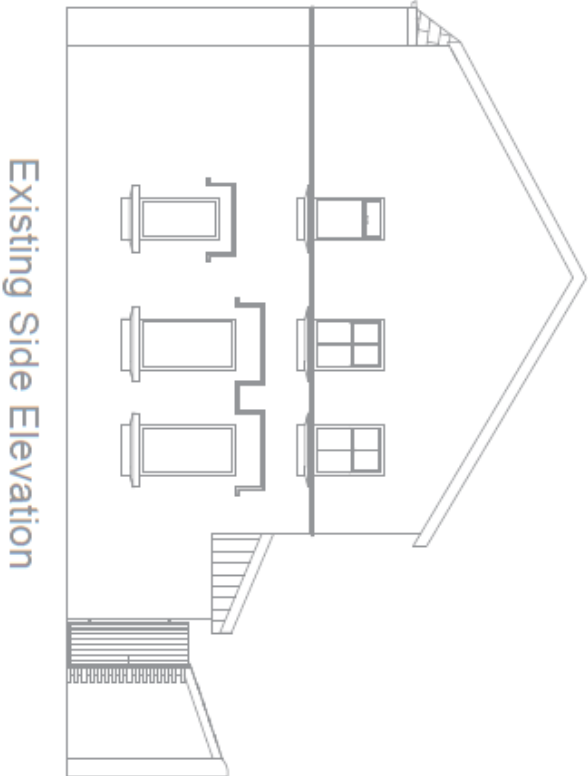
Search Reference:	1920_00068	Merthyr Tydfil County Borough Council Estates Department Unit 5 Triangle Business Park Pentrebach Merthyr Tydfil CF48 4TQ Tel: 01685 725294	 
Property Address:	4, Bridge Street Troedyrhiw Merthyr Tydfil CF47 8YP		
Date:	12-Jun-2019	Scale:	1: 1250
Reproduced from the Ordnance Survey mapping with the permission of the Controller of Her Majesty's Stationery Office © Crown copyright. Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings, Merthyr Tydfil County Borough Council, Ordnance Survey Licence Number: 100025302			

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APPENDIX B: Existing Layout

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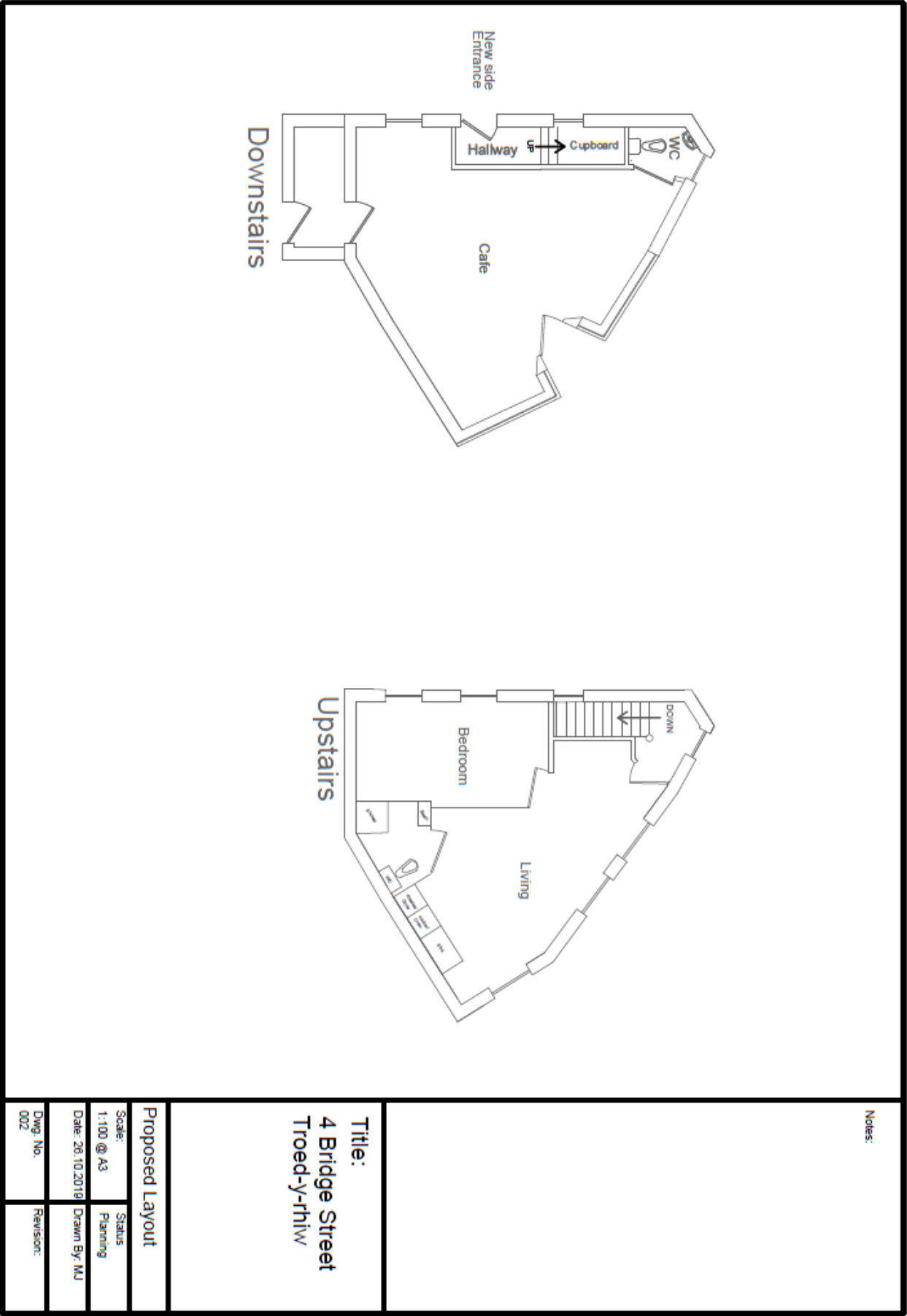


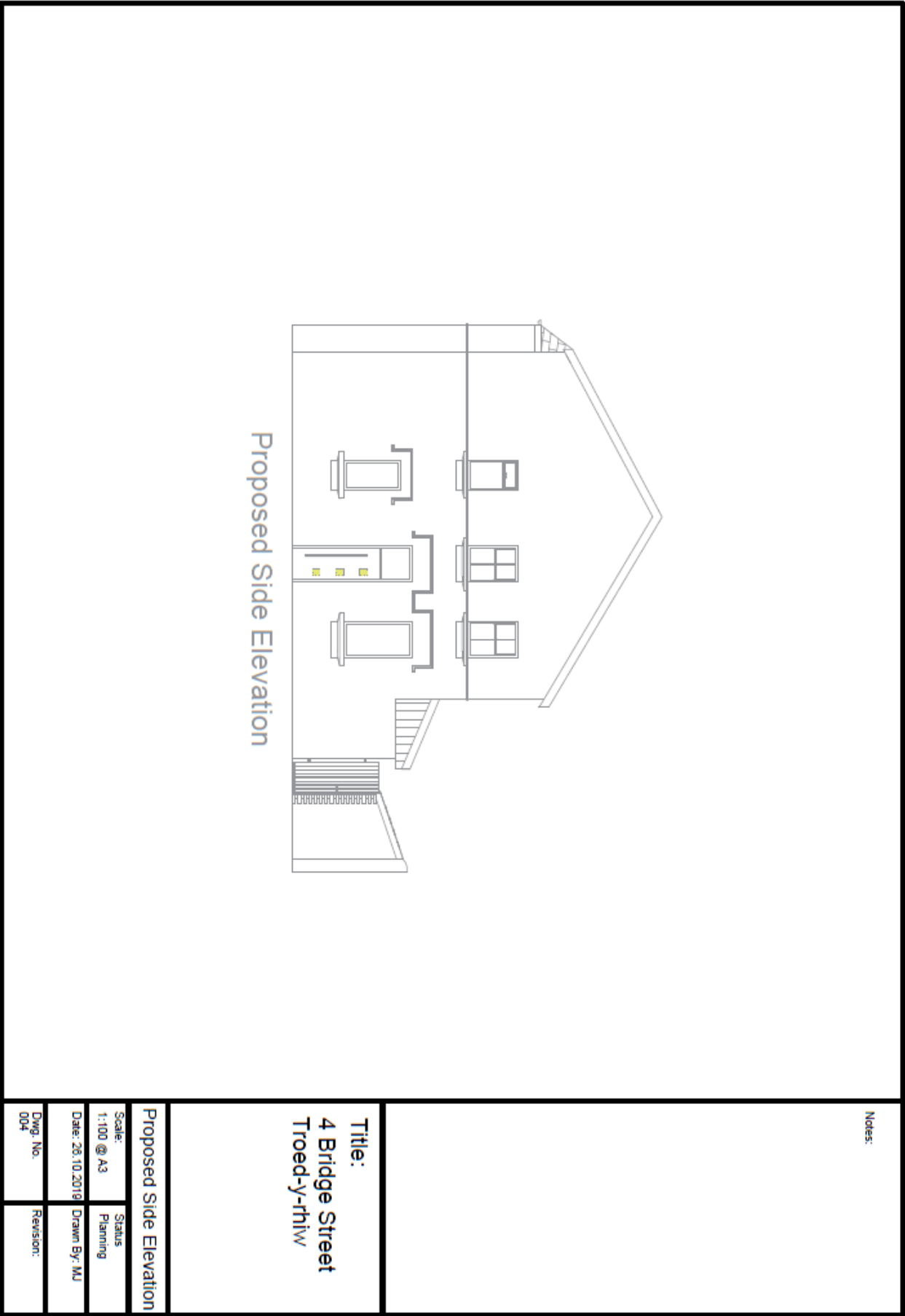
Notes:	
	
Title: 4 Bridge Street Troed-y-rhiw	
Existing Side Elevation	
Scale: 1:100 @ A3	Status Planning
Date: 26.10.2018	Drawn By: MJ
Dwg. No. 003	Revision:

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APPENDIX C: Proposed Planning Layout

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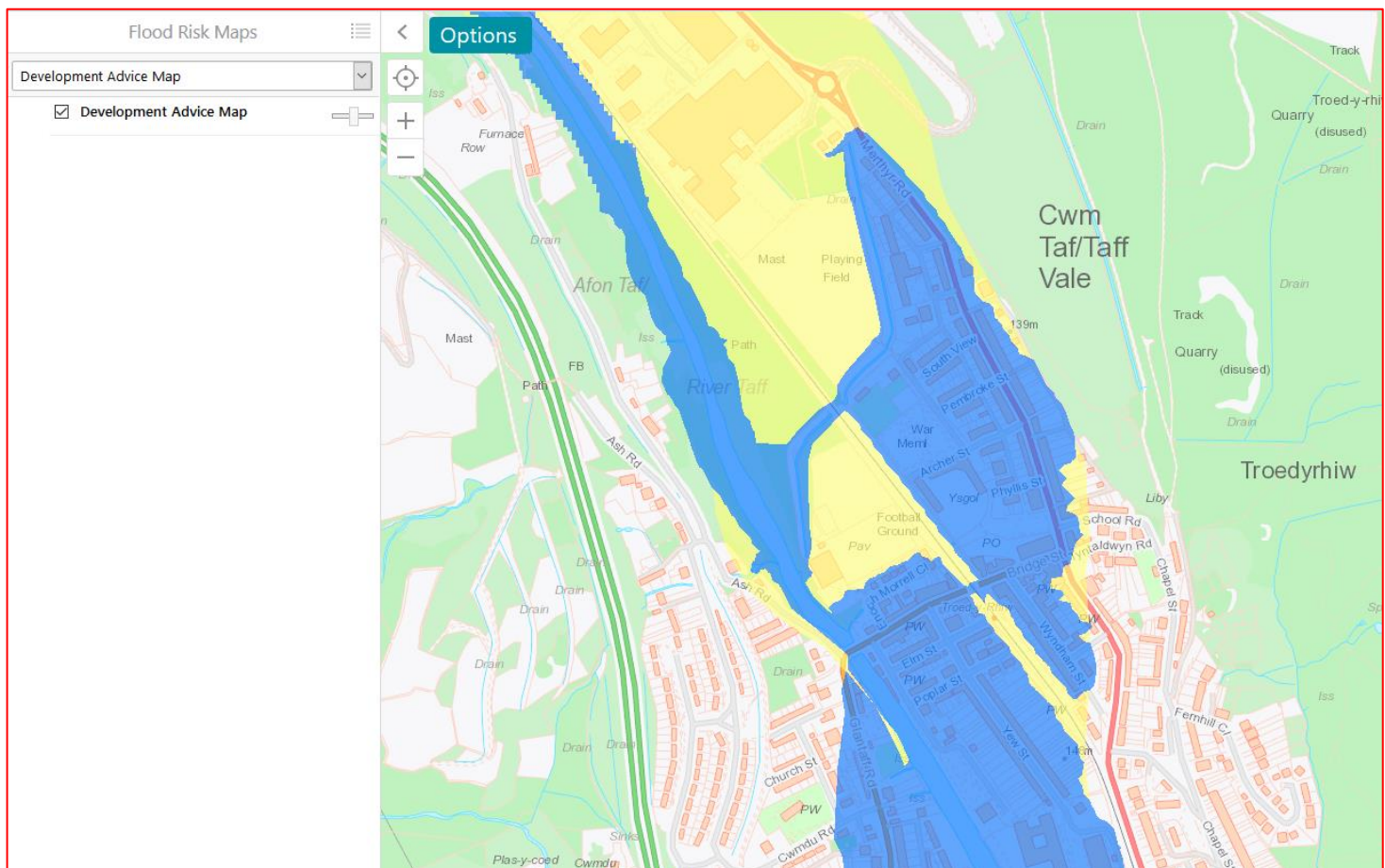
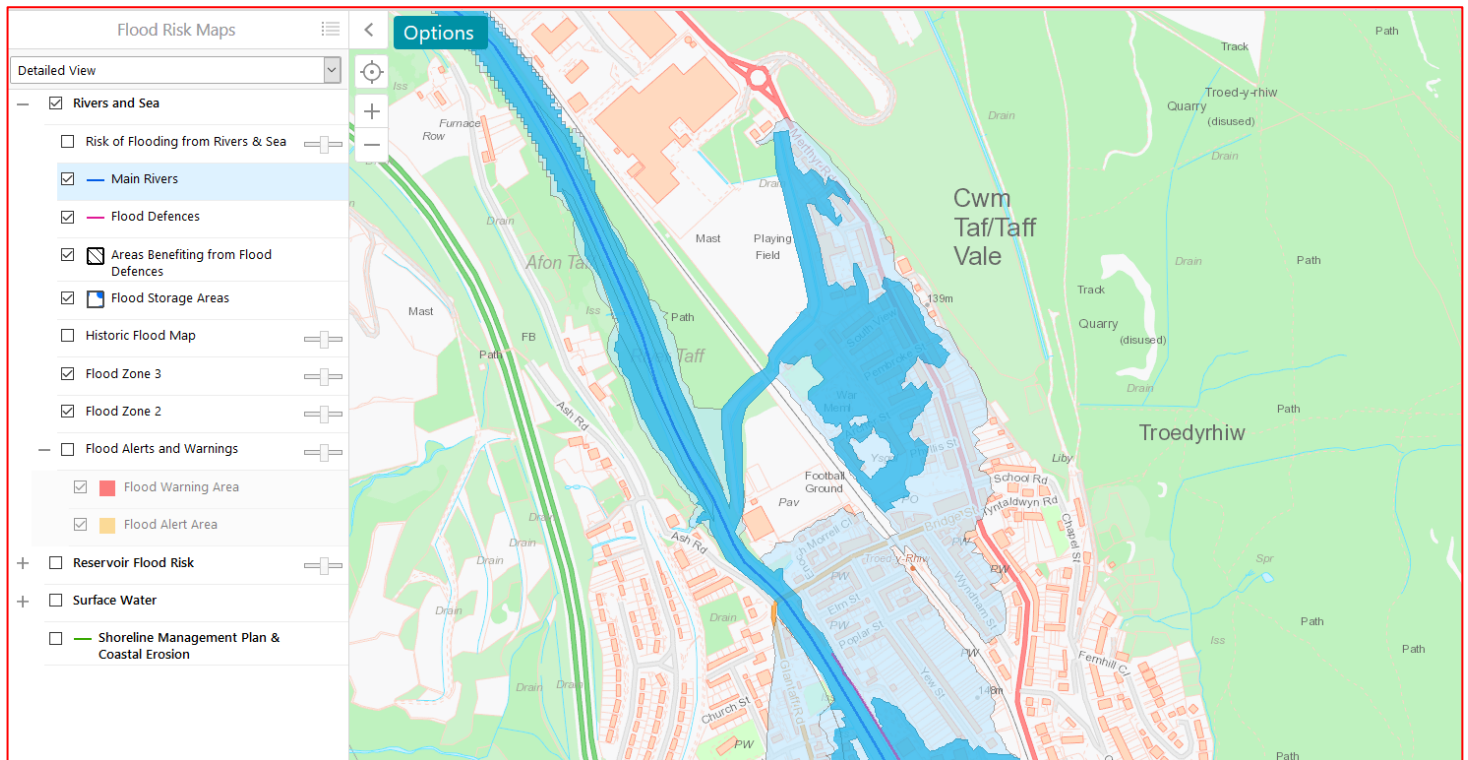


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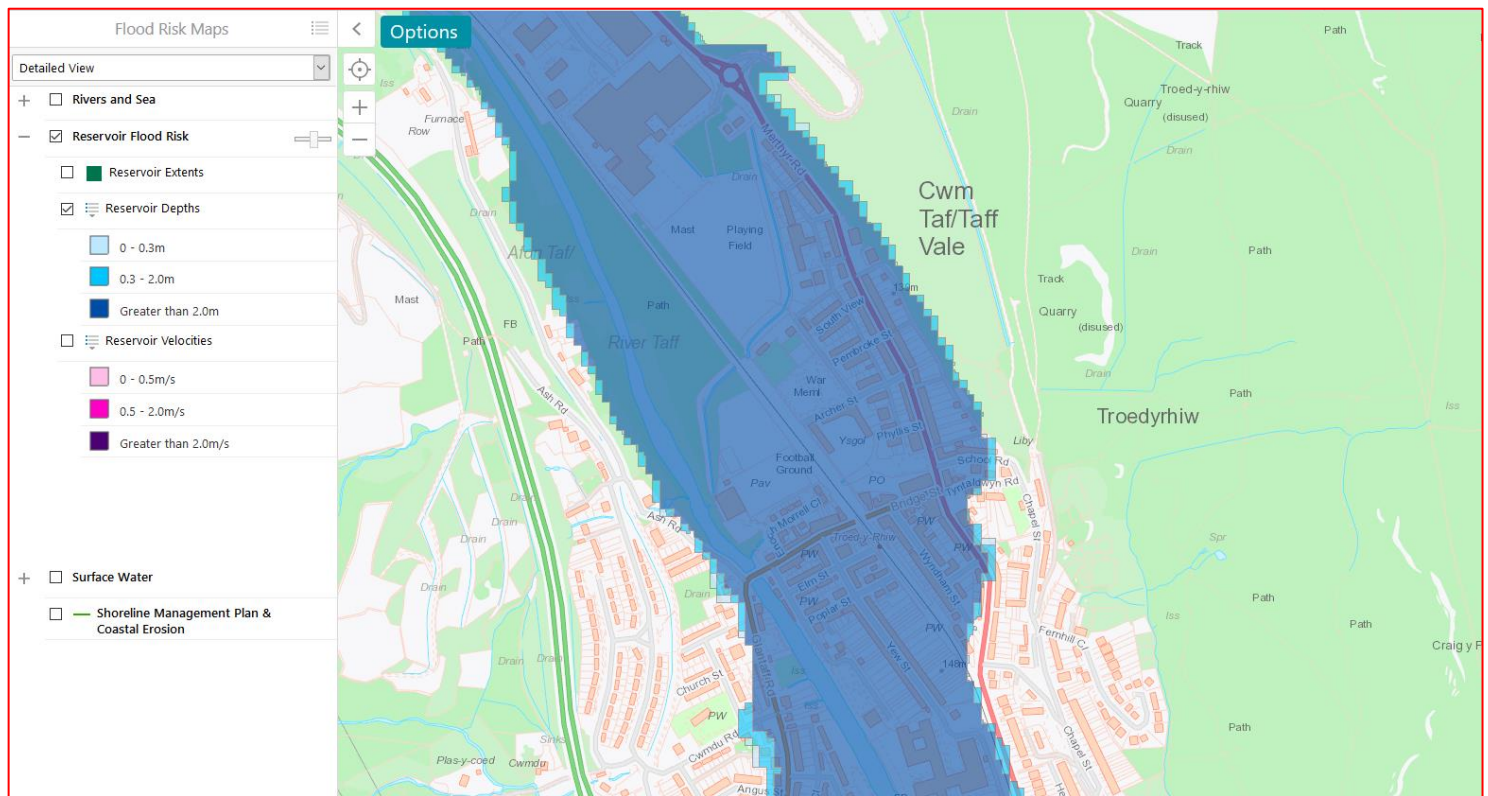
APPENDIX D: EA Flooding Information & Correspondence

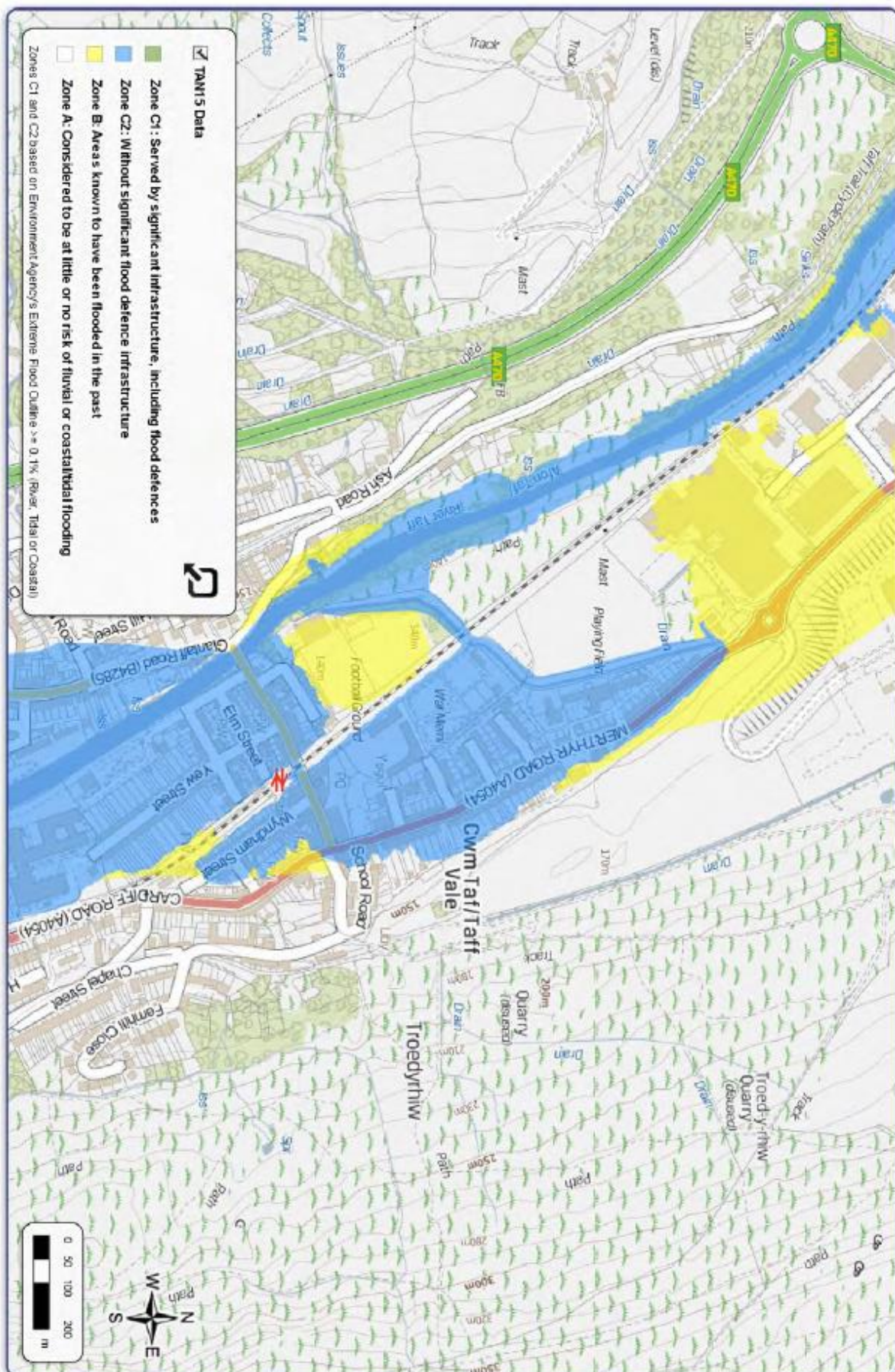
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Flood Consequence Assessment 4 Bridge Street, Merthyr Tydfil



Flood Consequence Assessment
4 Bridge Street, Merthyr Tydfil





Flood Consequence Assessment

4 Bridge Street, Merthyr Tydfil

From: **Jonathan Jones** <jonesjonathan2015@gmail.com>
Date: Mon, Jan 13, 2020 at 9:52 AM
Subject: Flood Consequences Assessment
To: <enquiries@naturalresourceswales.gov.uk>
Cc: <mrkjnsmark9@aol.com>

Hi All,

I am currently applying for planning permission for a property in Merthyr Tydfil. I have been asked by the planning authority to prepare a Flood Consequences Assessment (FCA) and that it needs to be carried out by a competent person. Could you describe what qualifications would be necessary to carry out a flood assessment? I work with a civil engineer with a HNC degree and over 15 years of experience in the industry, would they qualify as competent? In addition, I looked through a previous FCA for a different property and they had email correspondence with NRW - the email asked to provide product 4 and also requested any information that would be useful for that site. Could you describe what is product 4 (that's if it is still available) and if there are any fees to be paid to obtain that information?

Kind Regards,

Jonathan Jones

From: **Data Distribution** <datadistribution@cyfoethnaturiolcymru.gov.uk>
Date: Tue, Jan 14, 2020 at 3:58 PM
Subject: RE: Flood Consequences Assessment
To: jonesjonathan2015@gmail.com <jonesjonathan2015@gmail.com>

Dear Mr Jones,

Thank you for your e-mail.

Please could you provide full details of the site in Merthyr Tydfil you are looking at, plus provide us with a plan outlining the site and it's boundary.

A list of our Flood Products and their costs are attached. Please note we don't hold all of these Products for every site across Wales. Once we have received the full details of the site from you, your request will be added to our queue. Once your request is logged we will find out from the flooding teams what data is available and let you know.

You may like to look at openly available flood data on the Geo-Portal for Wales - Lle - at this link <http://lle.gov.wales/Catalogue?lang=en&text=flood> and our website <https://naturalresources.wales/evidence-and-data/maps/long-term-flood-risk/?lang=en>

Your request for advice on the Flood Consequence Assessment has been passed to a further team who will reply to you separately.

Kind regards,

Tim Cyswilt Cyfoeth / Customer Hub Team

E-bost / E-mail: datadistribution@cyfoethnaturiolcymru.gov.uk
Gwefan / Website: <https://naturalresources.wales/?lang=en>

Ewch i / Browse our [Data Services Webpage](#)

Yn falch o arwain y ffordd at ddyfodol gwell i Gymru trwy reoli'r amgylchedd ac adnoddau naturiol yn gynaliadwy.
Proud to be leading the way to a better future for Wales by managing the environment and natural resources sustainably.

From: **Nutt, Christopher** <Christopher.Nutt@cyfoethnaturiolcymru.gov.uk>
Date: Thu, Jan 23, 2020 at 11:03 AM
Subject: RE: RE: Flood Consequences Assessment NRW:06670026
To: Jonathan Jones <jonesjonathan2015@gmail.com>
Cc: mrkjnsmark9@aol.com <mrkjnsmark9@aol.com>, Data Distribution <datadistribution@cyfoethnaturiolcymru.gov.uk>

Hi Jon,

Before undertaking an FCA, I would recommend getting in touch with Merthyr CBC in the first instance to confirm they are satisfied there are overriding reasons for granting the application contrary to the guidance in TAN15. Please see the guidance in our response to the LPA in December: <http://plandocs.merthyr.gov.uk/81/NorthgatePublicDocs/00071705.pdf>

If proceeding with the FCA, we hold a detailed hydraulic model for Troedyrhiw including flood risk from the River Taiff and the unnamed channel to the north of your site which could be used to inform your assessment. Please contact our Data Distribution team (cc'd), to request a copy of this information and they will be able to confirm the charges.

I've attached a checklist of the detail we would expect to see in the FCA. Any queries please get in touch.

Kind regards,

Chris

Chris Nutt
Development and Flood Risk/Datblygu a Pherygl o Lifogydd
Natural Resources Wales/Cyfoeth Naturiol Cymru

External Tel/Ffôn allanol: 03000 653 106
Internal Tel/Ffôn mewnol: 3106
E-mail/E-bost: christopher.nutt@naturalresourceswales.gov.uk / christopher.nutt@cyfoethnaturiolcymru.gov.uk
Website/Gwefan: www.naturalresourceswales.gov.uk / www.cyfoethnaturiolcymru.gov.uk

ATI-01617a – South View, Merthyr Tydfil

E: 306981 N: 202663

1.0 Current Flood Map

Figure 1 shows the current Flood Map (version 201305) at this location. The Flood Map represents the undefended fluvial flood extents derived from a combination of detailed local modelled and nationally generalised modelled data.

More information on our Flood Map can be obtained from the Environment Agency website www.environment-agency.gov.uk

2.0 Local Flood Risk Mapping Study

Model Summary

The results summarised below are taken from the Merthyr Tydfil to Merthyr Vale – Depth and Velocity Mapping Study, undertaken by Mott MacDonald in September 2010. For this study the River Taff has been modelled using ISIS-TuFLOW. The hydrology has been estimated using ReFH methodology. The results are taken from version 1 of the model, dated September 2010.

The final design model was run for defended and undefended fluvial flood events.

Results

The polygons shown in the figures have been used to query the height, depth and velocity grids for the site to provide the results in Tables 1 and 2. These represent the current day scenario together with a 100 year climate change scenario.

Example depth grids for the defended 1 in 100 year and 1 in 1000 year events are reproduced in Figures 4 and 5.

Table 1: Defended Level data

	Defended									
	1 in 5	1 in 10	1 in 15	1 in 20	1 in 50	1 in 75	1 in 100	1 in 100CC	1 in 200	1 in 1000
Model Grid Size (m)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Wet Cells	0	0	0	0	21	21	21	21	21	21
Elevation, mean (mAOD)	NULL	NULL	NULL	NULL	138.33	138.67	138.80	138.87	139.09	140.07
Elevation, max (mAOD)	NULL	NULL	NULL	NULL	138.33	138.67	138.80	138.87	139.09	140.07
Depth, mean (m)	NULL	NULL	NULL	NULL	0.2476	0.5931	0.72	0.79	1.01	1.99
Depth, max (m)	NULL	NULL	NULL	NULL	0.433	0.7785	0.90	0.97	1.19	2.18
Velocity, mean (m/s)	NULL	NULL	NULL	NULL	0.1314	0.2473	0.30	0.28	0.36	0.43
Velocity, max (m/s)	NULL	NULL	NULL	NULL	0.2655	0.53	0.58	0.56	0.63	0.64

Table 2: Undefended Level data

	Undefended	
	1 in 100	1 in 1000
Model Grid Size (m)	2.5	2.5
Wet Cells	21	21
Elevation, mean (mAOD)	138.75	140.09
Elevation, max (mAOD)	138.75	140.09
Depth, mean (m)	0.67	2.00
Depth, max (m)	0.86	2.18
Velocity, mean (m/s)	0.28	0.44
Velocity, max (m/s)	0.57	0.64

3.0 Additional Information

The approximate extents of flooding during the December 1979 historical flood event are shown in Figure 2.

The local authority may be able to provide information on issues such as localised flooding from sewers, drains and culverts.

4.0 References

1. Merthyr Tydfil to Merthyr Vale – Depth and Velocity Modelling Report, Mott MacDonald September 2010.

5.0 Notes

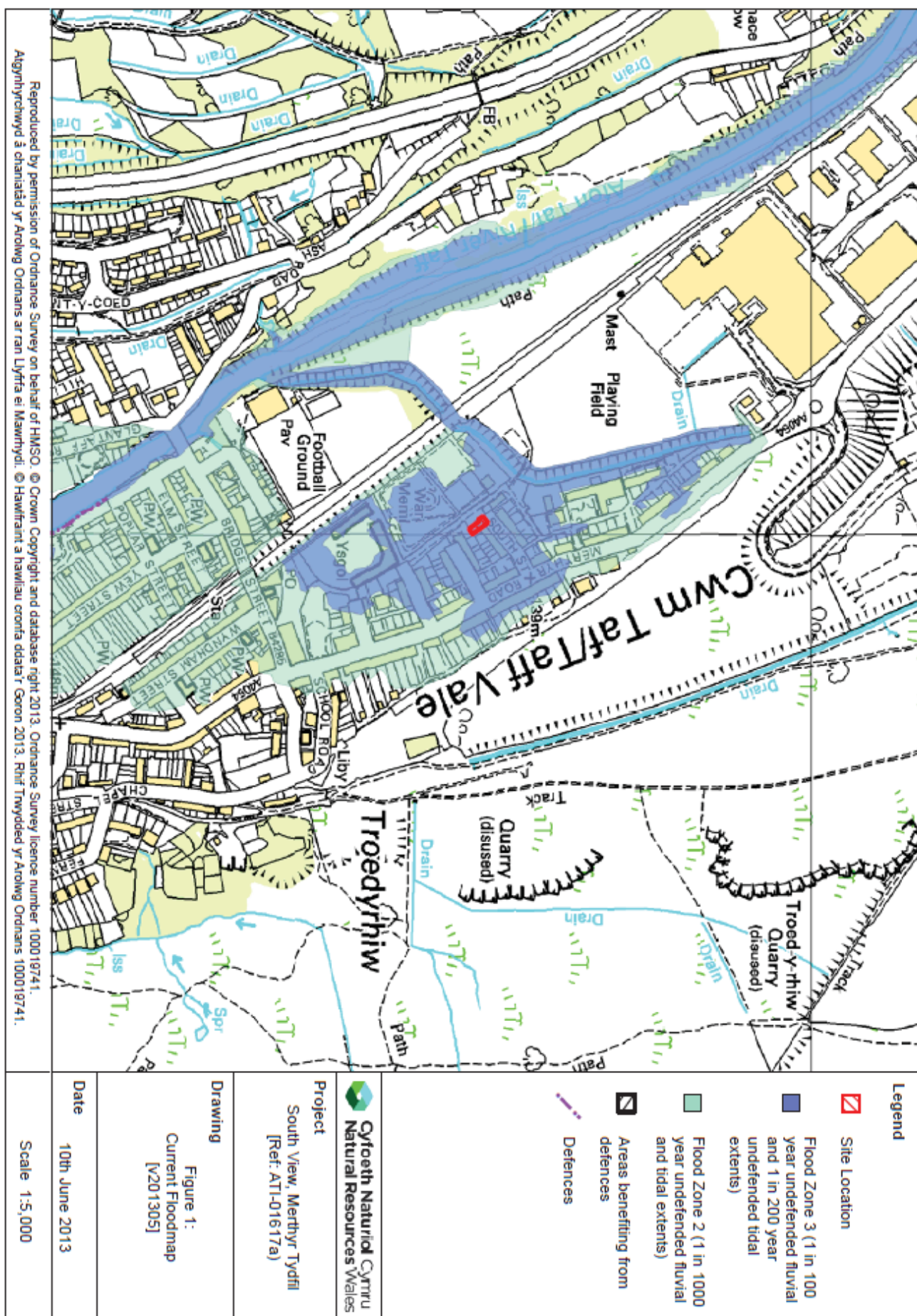
Undefended scenarios are provided as being a possible worst case scenario in the event of defence failure. They are used as the basis of the flood map.

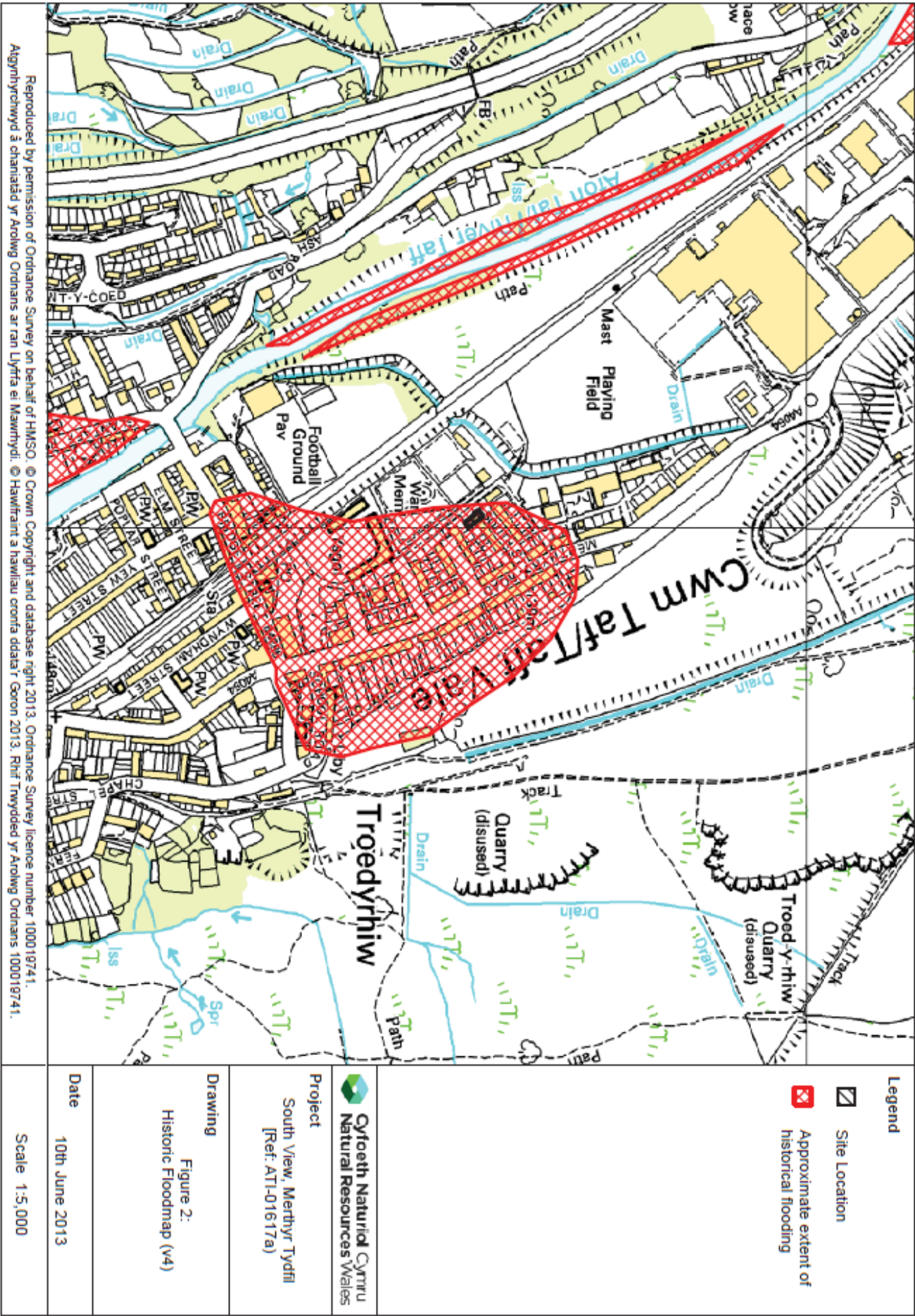
The scope of the model is the mapping of flood risk, it is not intended for detailed design. The model should be considered as the starting point for more detailed modelling, commensurate with the consequences of flooding at the site of interest.

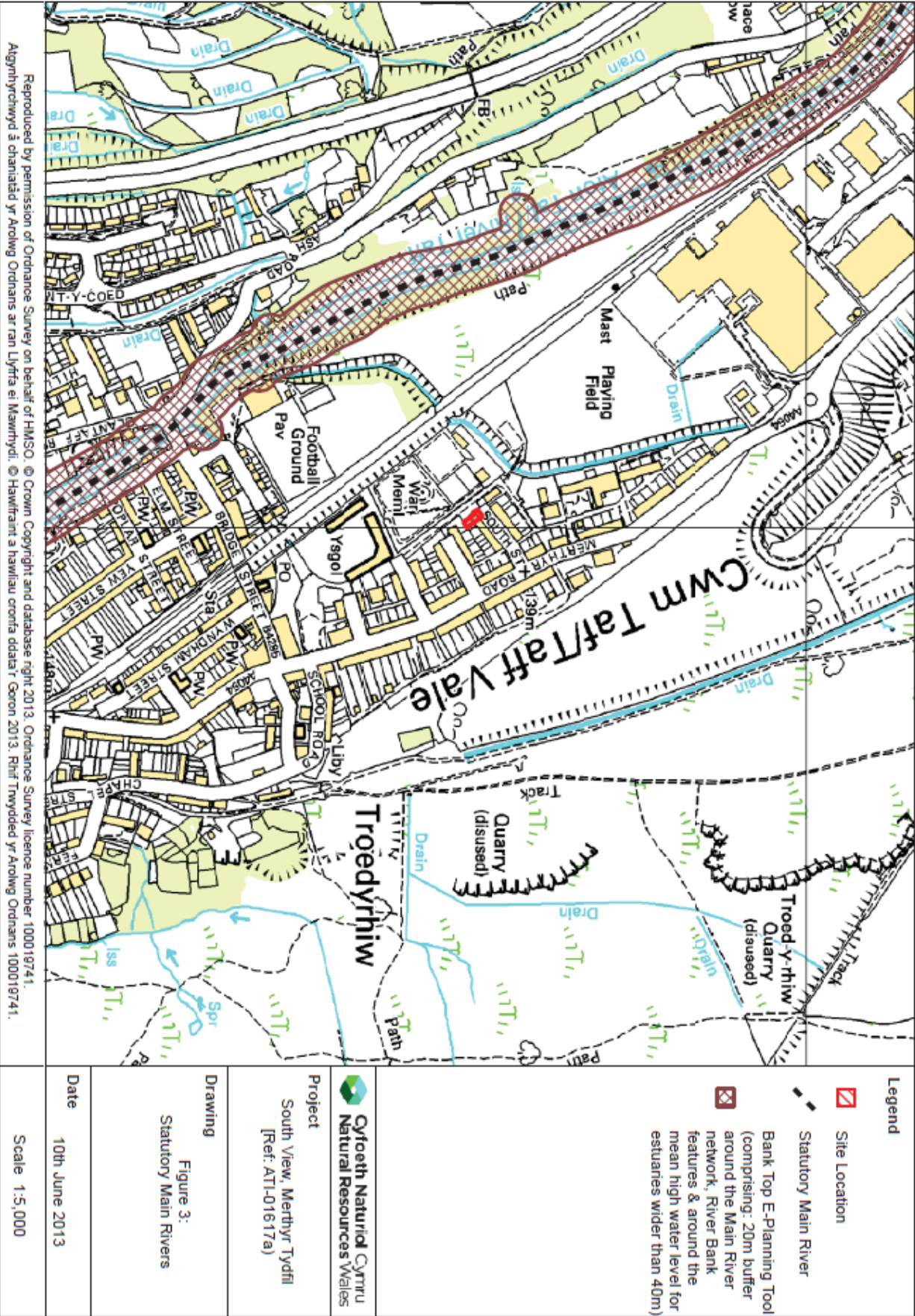
NRW models are available under licence agreement for the purpose of further development. Contact Natural Resources Wales Access to Information team for details of terms, conditions and pricing.

If the data is used in support of an FCA, please include the reference number.
Please refer to NRW standard terms and conditions.

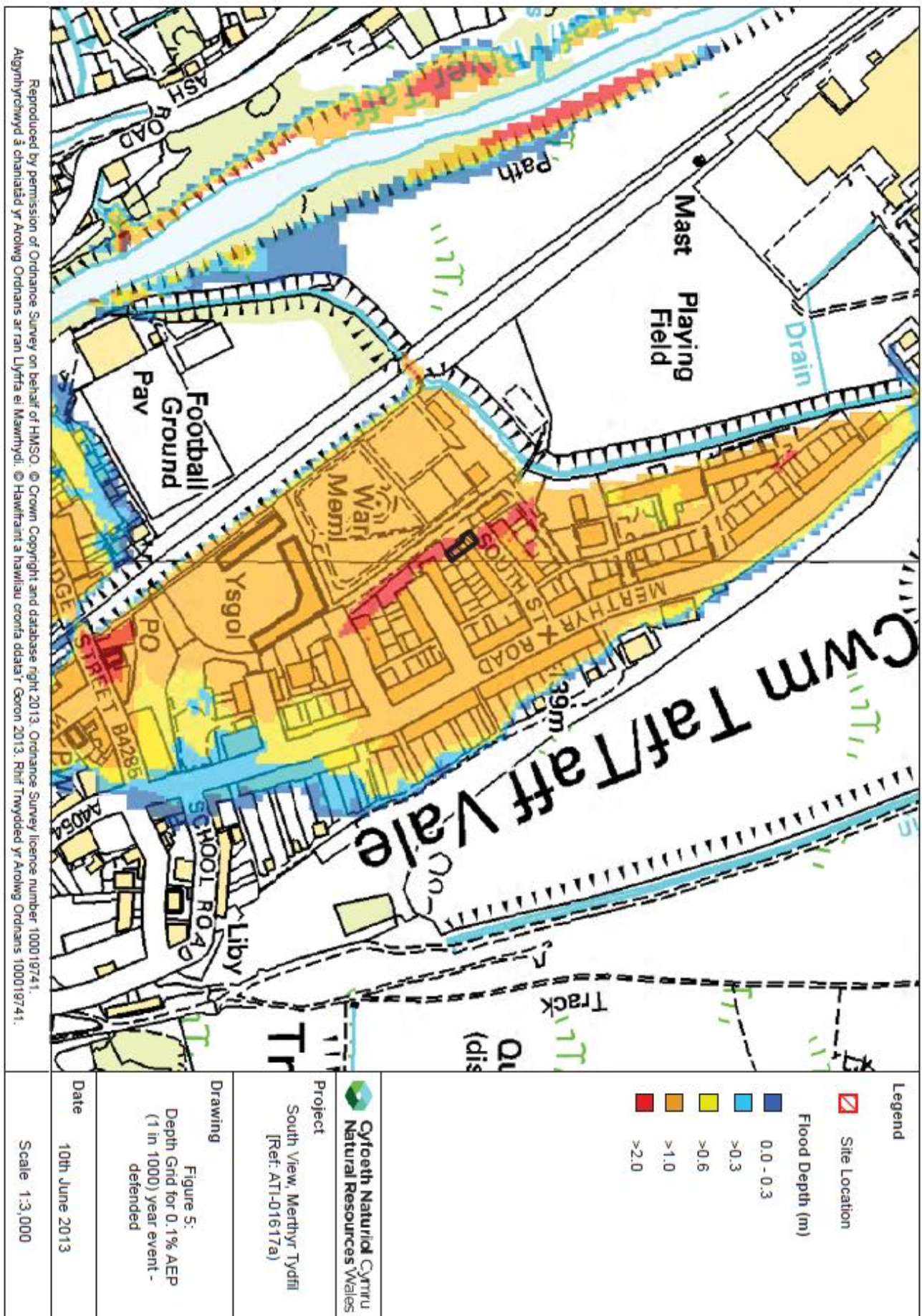
Flood Risk Analysis
10/06/2013







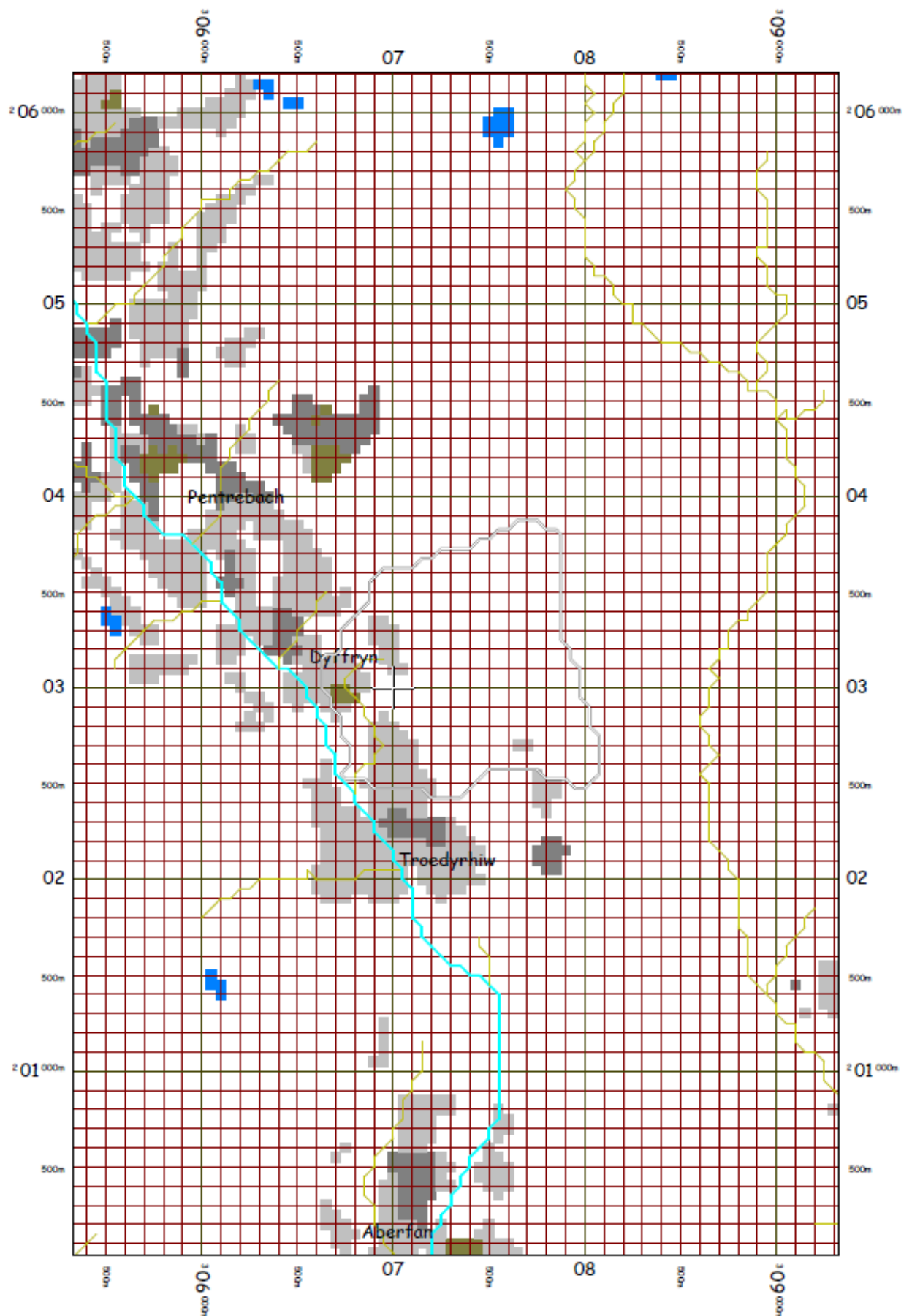




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APPENDIX E: FEH Catchment Data & Descriptors

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Flood Consequence Assessment
4 Bridge Street, Merthyr Tydfil

VERSION	FEH CD-ROM	Version	3 exported at	08:24:26 GMT Wed 12-Jun-13
CATCHMENT	GB	306800	202500 SO 06800 02500	
AREA		1.49		
ALTBAR		262		
ASPBAR		250		
ASPVAR		0.78		
BFIHOST		0.59		
DPLBAR		1.2		
DPSBAR		239.1		
FARL		1		
LDP		2.37		
PROPWET		0.54		
RMED-1H		11.8		
RMED-1D		54.3		
RMED-2D		72.7		
SAAR		1501		
SAAR4170		1543		
SPRHOST		25		
URBCONC1990		0.486		
URBEXT 1990		0.0512		
URBLOC1990		0.607		
C		-0.02702		
D1		0.47621		
D2		0.44089		
D3		0.36997		
E		0.29266		
F		2.52358		
C(1 km)		-0.027		
D1(1 km)		0.493		
D2(1 km)		0.447		
D3(1 km)		0.361		
E(1 km)		0.293		
F(1 km)		2.532		

DESIGN RAINFALL DEPTHS

Calculate : **Design rainfall** for

☒ catchment 306800 202500 [SO 06800]
☐ 1 km grid point 307000 203000 [SO 07000]
☐ Manually entered values ☐ for a point

Area : 1.4900 km²

C : -0.02702 D3 : 0.36997
 D1 : 0.47621 E : 0.29266
 D2 : 0.44089 F : 2.52358

Duration : 6 Hours ☐ Fixed ☒ Sliding

Return period : 1.0004 Years ☒ AM ☐ POT

Rainfall depth 17.2599 mm

Calculate... Export... Cancel

 An areal reduction factor of 0.977 has been applied to a point rainfall of 17.7 mm to yield a catchment design rainfall of 17.3 mm.



Calculate : **Design rainfall** for

☒ catchment 306800 202500 [SO 06800]
☐ 1 km grid point 307000 203000 [SO 07000]
☐ Manually entered values ☐ for a point

Area : 1.4900 km²

C : -0.02702 D3 : 0.36997
 D1 : 0.47621 E : 0.29266
 D2 : 0.44089 F : 2.52358

Duration : 6 Hours ☐ Fixed ☒ Sliding

Return period : 2.0 Years ☒ AM ☐ POT

Rainfall depth 31.2713 mm

Calculate... Export... Cancel

 An areal reduction factor of 0.977 has been applied to a point rainfall of 32.0 mm to yield a catchment design rainfall of 31.3 mm.



Calculate: **Design rainfall** for

☒ catchment 306800 202500 [SO 06800]
☐ 1 km grid point 307000 203000 [SO 07000]
☐ Manually entered values for a point

Area: 1.4900 km²

C: -0.02702 D3: 0.36997
 D1: 0.47621 E: 0.29266
 D2: 0.44089 F: 2.52358

Duration: 6 Hours ☐ Fixed ☒ Sliding

Return period: 50.0 Years ☒ AM ☐ POT

Rainfall depth: 65.3516 mm

Calculate... Export... Cancel

An areal reduction factor of 0.977 has been applied to a point rainfall of 66.9 mm to yield a catchment design rainfall of 65.4 mm.

Calculate: **Design rainfall** for

☒ catchment 306800 202500 [SO 06800]
☐ 1 km grid point 307000 203000 [SO 07000]
☐ Manually entered values for a point

Area: 1.4900 km²

C: -0.02702 D3: 0.36997
 D1: 0.47621 E: 0.29266
 D2: 0.44089 F: 2.52358

Duration: 6 Hours ☐ Fixed ☒ Sliding

Return period: 100.0 Years ☒ AM ☐ POT

Rainfall depth: 87.9485 mm

Calculate... Export... Cancel

An areal reduction factor of 0.977 has been applied to a point rainfall of 90.1 mm to yield a catchment design rainfall of 87.9 mm.

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APPENDIX F: NPPF Technical Guidance Extracts

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Table 1: Flood zones

(Note: These flood zones refer to the probability of river and sea flooding, ignoring the presence of defences)

Zone 1 - low probability

Definition

This zone comprises land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding (<0.1%).

Appropriate uses

All uses of land are appropriate in this zone.

Flood risk assessment requirements

For development proposals on sites comprising one hectare or above the vulnerability to flooding from other sources as well as from river and sea flooding, and the potential to increase flood risk elsewhere through the addition of hard surfaces and the effect of the new development on surface water run-off, should be incorporated in a flood risk assessment. This need only be brief unless the factors above or other local considerations require particular attention.

Policy aims

In this zone, developers and local authorities should seek opportunities to reduce the overall level of flood risk in the area and beyond through the layout and form of the development, and the appropriate application of sustainable drainage systems².

Zone 2 - medium probability

Definition

This zone comprises land assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% – 0.1%), or between a 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.5% – 0.1%) in any year.

Appropriate uses

Essential infrastructure and the water-compatible, less vulnerable and more vulnerable uses, as set out in table 2, are appropriate in this zone. The highly vulnerable uses are only appropriate in this zone if the Exception Test is passed.

Flood risk assessment requirements

All development proposals in this zone should be accompanied by a flood risk assessment.

Policy aims

In this zone, developers and local authorities should seek opportunities to reduce the overall level of flood risk in the area through the layout and form of the development, and the appropriate application of sustainable drainage systems.

Zone 3a - high probability

Definition

This zone comprises land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%), or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.

Appropriate uses

The water-compatible and less vulnerable uses of land (table 2) are appropriate in this zone. The highly vulnerable uses should not be permitted in this zone.

The more vulnerable uses and essential infrastructure should only be permitted in this zone if the Exception Test is passed. Essential infrastructure permitted in this zone should be designed and constructed to remain operational and safe for users in times of flood.

Flood risk assessment requirements

All development proposals in this zone should be accompanied by a flood risk assessment.

Policy aims

In this zone, developers and local authorities should seek opportunities to:

- reduce the overall level of flood risk in the area through the layout and form of the development and the appropriate application of sustainable drainage systems;

- relocate existing development to land in zones with a lower probability of flooding; and
- create space for flooding to occur by restoring functional floodplain and flood flow pathways and by identifying, allocating and safeguarding open space for flood storage.

Zone 3b - the functional floodplain

Definition

This zone comprises land where water has to flow or be stored in times of flood.

Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. But land which would flood with an annual probability of 1 in 20 (5%) or greater in any year, or is designed to flood in an extreme (0.1%) flood, should provide a starting point for consideration and discussions to identify the functional floodplain.

Appropriate uses

Only the water-compatible uses and the essential infrastructure listed in table 2 that has to be there should be permitted in this zone. It should be designed and constructed to:

- remain operational and safe for users in times of flood;
- result in no net loss of floodplain storage;
- not impede water flows; and
- not increase flood risk elsewhere.

Essential infrastructure in this zone should pass the Exception Test.

Flood risk assessment requirements

All development proposals in this zone should be accompanied by a flood risk assessment.

Policy aims

In this zone, developers and local authorities should seek opportunities to:

- reduce the overall level of flood risk in the area through the layout and form of the development and the appropriate application of sustainable drainage systems;
- relocate existing development to land with a lower probability of flooding.

Table 2: Flood risk vulnerability classification

Essential infrastructure • Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk. • Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including electricity generating power stations and grid and primary substations; and water treatment works that need to remain operational in times of flood. • Wind turbines.
Highly vulnerable • Police stations, ambulance stations and fire stations and command centres and telecommunications installations required to be operational during flooding. • Emergency dispersal points. • Basement dwellings. • Caravans, mobile homes and park homes intended for permanent residential use⁵. • Installations requiring hazardous substances consent⁴. (Where there is a demonstrable need to locate such installations for bulk storage of materials with port or other similar facilities, or such installations with energy infrastructure or carbon capture and storage installations, that require coastal or water-side locations, or need to be located in other high flood risk areas, in these instances the facilities should be classified as "essential infrastructure")⁶.
More vulnerable • Hospitals. • Residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels. • Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels. • Non-residential uses for health services, nurseries and educational establishments. • Landfill and sites used for waste management facilities for hazardous waste⁶. • Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.⁷
Less vulnerable • Police, ambulance and fire stations which are <i>not</i> required to be operational during flooding. • Buildings used for shops, financial, professional and other services,
restaurants and cafes, hot food takeaways, offices, general industry, storage and distribution, non-residential institutions not included in "more vulnerable", and assembly and leisure. • Land and buildings used for agriculture and forestry. • Waste treatment (except landfill and hazardous waste facilities). • Minerals working and processing (except for sand and gravel working). • Water treatment works which do not need to remain operational during times of flood. • Sewage treatment works (if adequate measures to control pollution and manage sewage during flooding events are in place).
Water-compatible development • Flood control infrastructure. • Water transmission infrastructure and pumping stations. • Sewage transmission infrastructure and pumping stations. • Sand and gravel working. • Docks, marinas and wharves. • Navigation facilities. • Ministry of Defence defence installations. • Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location. • Water-based recreation (excluding sleeping accommodation). • Lifeguard and coastguard stations. • Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms. • Essential ancillary sleeping or residential accommodation for staff required by uses in this category, subject to a specific warning and evacuation plan.

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APPENDIX G: Water Company Records Correspondence

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[How to Contact Us](#) › Developer Services Enquiry

[How to Contact Us](#)

[Livechat with us](#)

[Paperless Billing De-registration](#)

If you contact us by email, please allow up to ten working days for a response.

Your details

(Please note that fields marked* are mandatory)

Name	Jonathan Jones	*
Email address	jonesjonathan2015@gmail.com	*
Full property address	4 Bridge Street	*
Address Line 2	Troedyrhiw	
Address Line 3	Merthyr Tydfil	
Postcode	CF48 4JA	*
Telephone number (Day time)	07561172486	*
Telephone number (Evening)	07561172486	*
Customer reference number		

Your enquiry

Full details of your enquiry	To whom it may concern 4 Bridge Street, Merthyr Tydfil OS X (Eastings) 307123 OS Y (Northings) 202411 Nearest Post code CF48 4JX Lat N51:42:45 (51.712713)	*
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Full details of your enquiry must have at least 0 and no more than 512 characters.

[Click here](#) to read our privacy statement to understand how we may use your personal information.

[Click here to submit enquiry](#)

Flood Consequence Assessment 4 Bridge Street, Merthyr Tydfil

From: **Evans Maria** <Maria.Evans@dwrcymru.com>
Date: Tue, Jan 14, 2020 at 1:01 PM
Subject: 4 Bridge Street, Troedyrhiw, Merthyr Tydfil, CF48 4JA
To: jonesjonathan2015@gmail.com <jonesjonathan2015@gmail.com>
Cc: Castle Sam <Sam.Castle@dwrcymru.com>

Dear Mr Jones

Thank you for your email regarding the above site.

I can confirm that we do not appear to have any recorded incidents of flooding within close proximity (30 metres) of the property at this time.

We hope the above is satisfactory, however should you require further assistance please do not hesitate to contact us.

Kind regards

Maria



Maria Evans
Development Control Officer | Developer Services | Dwr Cymru Welsh Water
Linea | Cardiff | CF3 0LT | T: 0800 917 2652 | www.dwrcymru.com

P Before you print please think about the **ENVIRONMENT**

From: formsubmission@dwrcymru.com <formsubmission@dwrcymru.com>
Sent: 13 January 2020 13:49
To: services developer <developer.services@dwrcymru.com>
Subject: Developer Services Enquiry

Please process the following Developer Services Enquiry:-

Customer Name: Jonathan Jones

Email Address: jonesjonathan2015@gmail.com

Customer Address: 4 Bridge Street, Troedyrhiw, Merthyr Tydfil, CF48 4JA

Telephone (Daytime): 07561172486

Telephone (Evening): 07561172486

Customer reference:

Enquiry: To whom it may concern 4 Bridge Street, Merthyr Tydfil OS X (Eastings) 307123 OS Y (Northings) 202411 Post code CF48 4JX Please could you confirm whether you have any information that you feel would be valuable to a Flood Risk Assessment for the above site, including details of historical flooding; this would be greatly appreciated. Please do not hesitate to contact me on the details provided to discuss further should you require additional information or clarification.

Dwr Cymru Welsh Water is firmly committed to water conservation and promoting water efficiency. Please log on to our website www.dwrcymru.com/waterefficiency to find out how you can become water wise. Mae Dwr Cymru Welsh Water wedi ymrwngomo i warchod adnoddau dwr a hyrwyddo defnydd dwr effeithiol. Mae cyngor i'ch helpu i ddefnyddio dwr yn ddoeth yn www.dwrcymru.com/waterefficiency

***** This email and any file attached is confidential. If you are not a named recipient or believe you may have received this email in error please delete from your system and promptly inform the sender. Dwr Cymru Cyf (trading as Welsh Water) is a company registered in England and Wales, number 02366777, registered office Pentwyn Road, Nelson, Treharris, Mid Glamorgan CF46 6LY. Mae'r neges e-bost yma ac unrhyw ffeil sydd ynghlwm wrthi'n gyfrinachol. Os nad chi yw'r derbynnydd a enwir, neu os ydych chi'n credu eich bod wedi derbyn y neges yma ar gam, dylech ei dileu o'ch system ar unwaith a hysbysu'r anfonwr. Cwmni sydd wedi ei gofrestru yng Nghymru yw Dŵr Cymru Cyf (yn masnachu fel Dŵr Cymru), ei rif cofrestredig yw 02366777, ac mae ei swyddfa gofrestredig yn Heol Pentwyn, Nelson, Treharris, Morgannwg Ganol CF46 6LY. *****

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APPENDIX H: LA Correspondence

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Flood Consequence Assessment

4 Bridge Street, Merthyr Tydfil

From: **Jonathan Jones** <jonesjonathan2015@gmail.com>
Date: Mon, Jan 13, 2020 at 11:29 AM
Subject: 4 Bridge Street, Merthyr Tydfil
To: <planning@merthyr.gov.uk>
Cc: <mrkjnsmark9@aol.com>

To whom it may concern,

4 Bridge Street, Merthyr Tydfil, CF48 4JX

-
Please could you confirm whether you have any information that you feel would be valuable to a Flood Risk Assessment for the above site (location plan attach), including details of historical flooding; this would be greatly appreciated.

Please do not hesitate to contact me on the details below to discuss further should you require additional information or clarification.

Kind Regards,

Jonathan Jones

From: **Planning** <Planning@merthyr.gov.uk>
Date: Mon, Jan 13, 2020 at 2:10 PM
Subject: RE: 4 Bridge Street, Merthyr Tydfil
To: Jonathan Jones <jonesjonathan2015@gmail.com>

Hi,

Thank you for your email, all our applications are available to view online, you may find a flood risk assessment in one of the applications within that area.

Public Access will allow you to view files online via www.merthyr.gov.uk . Choose Planning and Building Control, Planning Search and Weekly Lists, Continue to the Public Access Search, enter the Application No. eg P/18/0054, or Street Name, click Search, choose External Document Tab and View Associated Documents, then click on the Application No. on the left to access the document you want to view.

Regards

Julie Heard

Technegydd Cofrestru/Registration Technician

Cyngor Bwrdeistref Sirol Merthyr Tudful/Merthyr Tydfil County Borough Council

Ffon/Phone: 01685 726283

Ebost/Email: Julie.heard@merthyr.gov.uk

**Flood Consequence Assessment
4 Bridge Street, Merthyr Tydfil**



Centre: 336851.390433 Date: 03-06-2013 Scale Approx 1: 1773

Extract from Map from Public Sewers

The position of underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available.

The actual positions may be different from those shown on the plan and private pipes, sewers or drains are not recorded.

United Utilities will not accept any liability for any damage caused by the actual positions being different from those shown.

© The plan is based upon the Ordnance Survey Map with the sanction of the Controller of Her Majesty's Stationery Office. Crown and United Utilities copyright are reserved. Unauthorised reproduction will infringe these copyright.

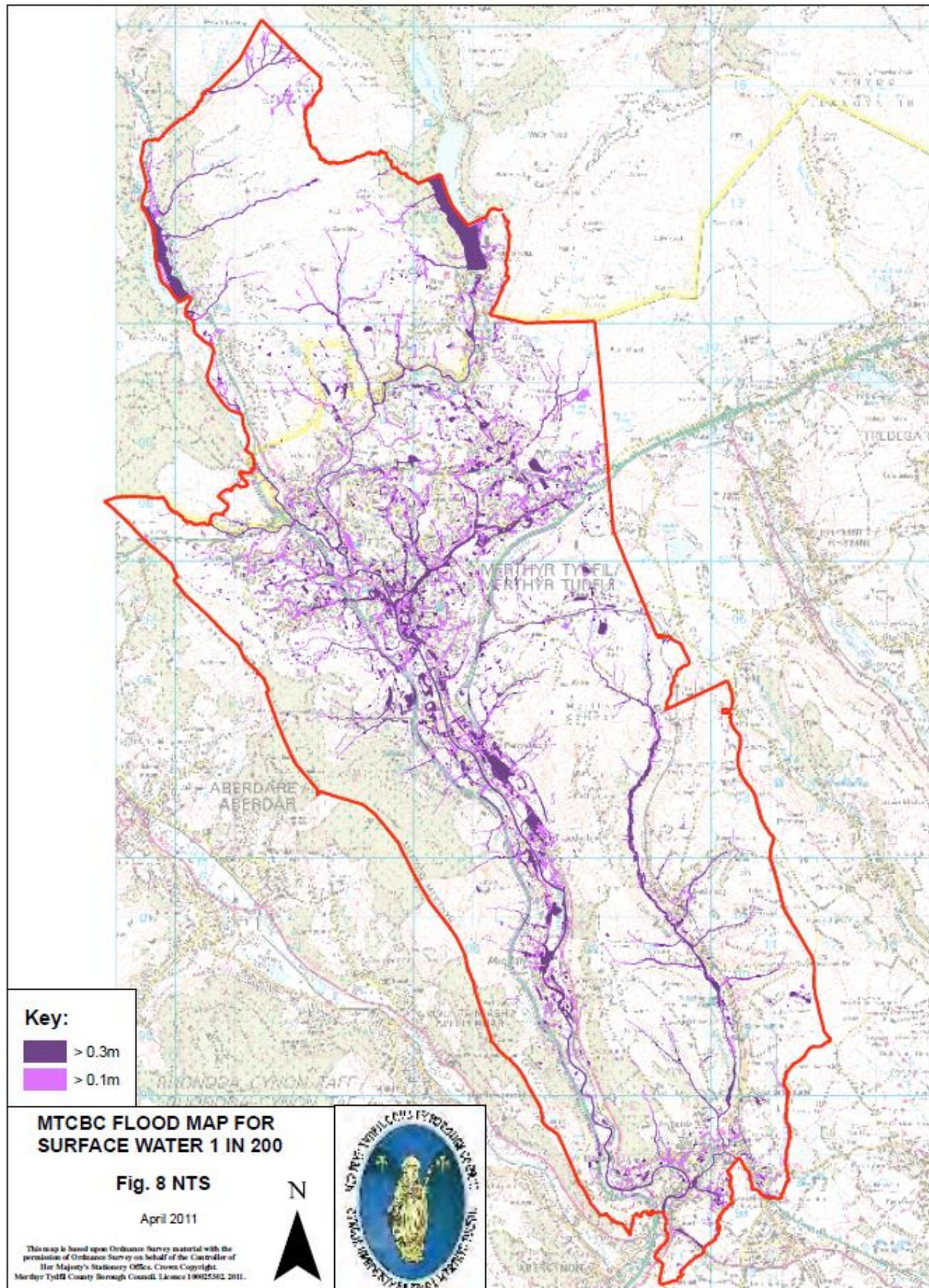
- Red or Brown - Foul Sewers
- Blue - Surface Water Sewers
- Public Sewer
- Highway Drain
- Private Sewer
- Pumping Main

DO NOT SCALE
Approximate Scale 1: 1773
United Utilities

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APPENDIX I: SFRA Information

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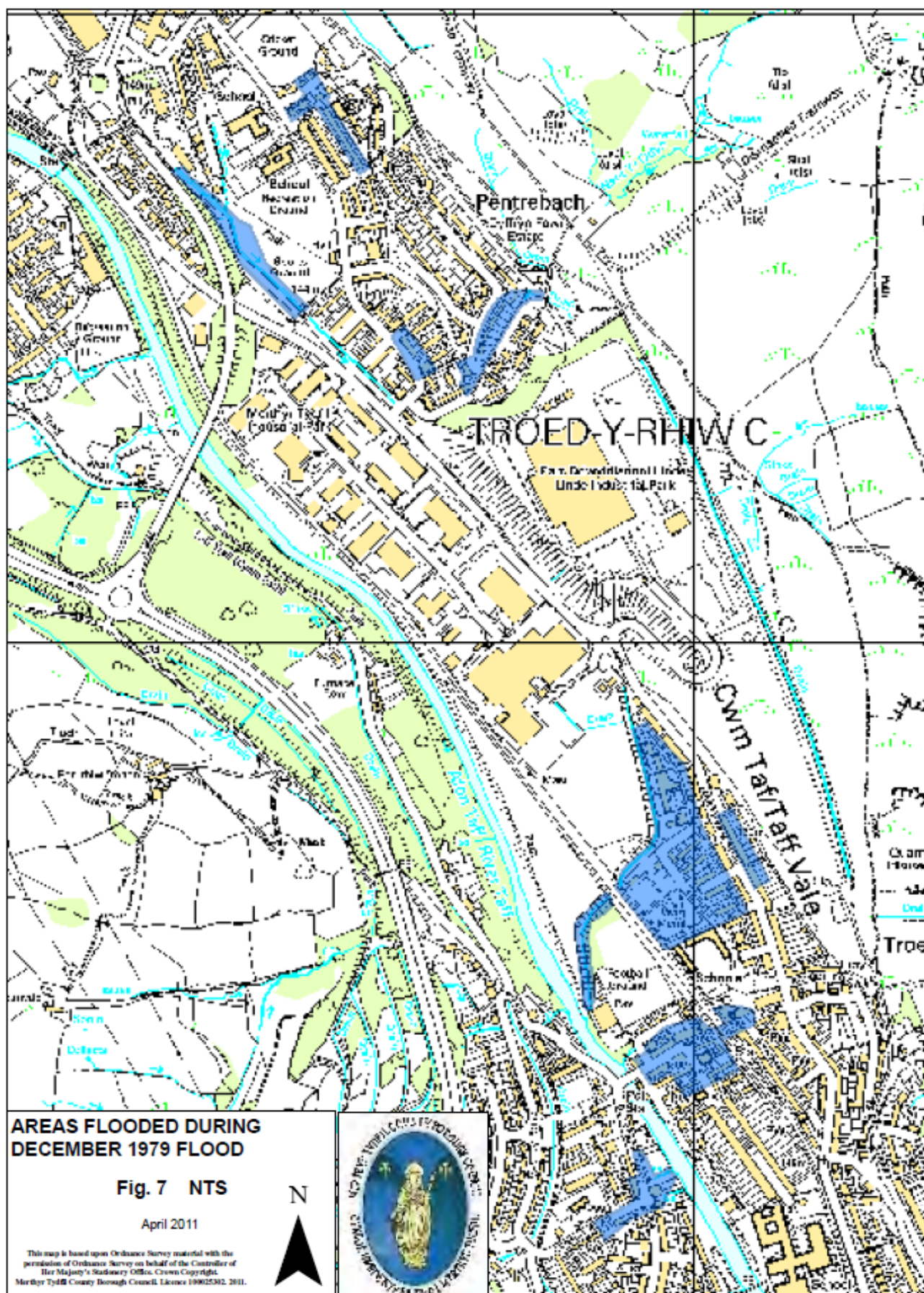
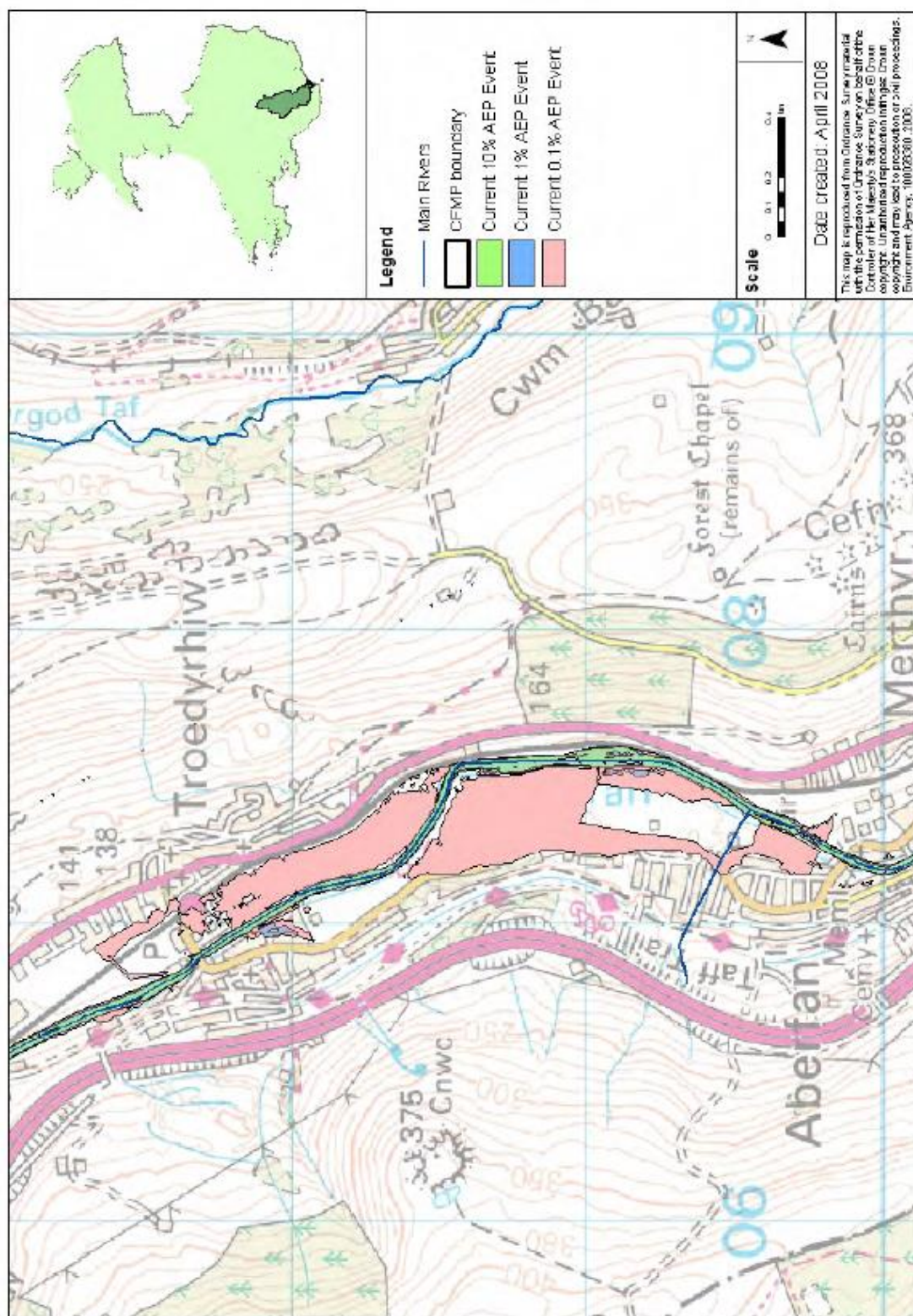


Figure 3-5: 10%, 1% and 0.1% AEP event flood extents in Aberfan and Troedyrhiw



APPENDIX J: Notes of Limitation

The data essentially comprised a study of available documented information from various sources together with discussions with relevant authorities and other interested parties. There may also be circumstances at the site that are not documented. The information reviewed is not exhaustive and has been accepted in good faith as providing representative and true data pertaining to site conditions. If additional information becomes available which might impact our conclusions, we request the opportunity to review the information, reassess the potential concerns and modify our opinion if warranted.

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