



Flood & Water Management Act 2010

Section 19 Flood Investigation Report FI0089

Location: Pontblyddyn, Mold

Incident Date: October 2023

Document Control Sheet

Document Author	Elain Jones MEng (Hons) GMICE
Checker	Shaun Wasik PGCert MCIWEM PRINCE2 PMP
Approver	Mike Wellington BEng (Hons) MSc CEng CEnv FICE FCIWEM C.WEM IMaPS MAPM

Revision History

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Executive Summary

This report has been prepared for the purpose of meeting the requirements of Section 19 of the Flood and Water Management Act 2010. Under Section 19 of the Flood and Water Management Act 2010, the Lead Local Flood Authority (Flintshire County Council) on becoming aware of a flood in its area must, to the extent it considers necessary or appropriate, investigate, prepare and publish a Flood Investigation Report.

As a Lead Local Flood Authority (LLFA), it is the responsibility of Flintshire County Council (FCC) to manage the local flood risk from surface water, groundwater and ordinary watercourses such as streams and ditches (including lakes and ponds).

Section 19 of the Flood and Water Management Act 2010 states:

“On becoming aware of a flood in its area, a lead local flood authority must, to the extent it considers necessary or appropriate, investigate –

- (a) Which risk management authorities have relevant flood risk management functions, and*
- (b) Whether each of those risk management authorities has exercised, or is intending to exercise, those functions in response to the flood”.*

The flood risk management authorities in Flintshire are:

- Flintshire County Council
- Flintshire’s Environment Department
- Natural Resources Wales
- Dŵr Cymru / Welsh Water

The relevant Flood Risk Management Authority for this event is Flintshire County Council as flooding was mainly attributed to an ‘ordinary watercourse’. Internal flooding to a single residential property warrants that the incident should be investigated, and a report prepared in accordance with the Council’s Local Flood Risk Management Strategy (LFRMS):¹

In October 2023, Storm Babet brought periods of heavy rainfall across large areas of the United Kingdom. The Met Office reported that the 18th to the 21st of October saw “the third-wettest independent 3-day period for England and Wales in a series from 1891”.

Representatives of Waterco Ltd, on behalf of FCC, have carried out community engagement and communicated with relevant stakeholders to gain an understanding of the nature of the October 2023 flood event. This Report provides details of the flooding incident.

Across Pontblyddyn, there were 7 reports of internal flooding at various locations along and adjacent to the A541, Wrexham Road. The main cause of flooding can be attributed to surface water flooding runoff from land above Pontblyddyn flowing on to the highway and inundating the highway drainage system in the lower catchment at Pontblyddyn, surcharging of two culverts crossing the A541, Wrexham Road also occurred, and the

¹ <https://www.flintshire.gov.uk/en/PDFFiles/Flooding-and-Drainage/Flintshire-Local-Flood-Risk-Management-Strategy.pdf>.

DCWW foul/combined sewage pumping station was overwhelmed with surface water from combined connections.

Table 1 sets out the recommended actions required following the flooding of October 2023 and the stakeholder required to undertake each action.

Table 1 – Recommendations to address flooding

Ref	Stakeholder	Action
01	FCC Highways Authority	Inspect the existing culvert inlet adjacent to Alyn Terrace, along the A541, Wrexham Road on a frequent basis and remove debris as required.
02	FCC Highways Authority	CCTV the A541, Wrexham Road culvert from the watercourse adjacent to Dingle House to the outfall at the River Alyn, to ensure the culvert is free of blockage and any significant siltation. Take remedial action as required.
03	FCC Highways Authority	Review frequency of gully cleansing in high risk areas, for example on Alyn Terrace and Riverside Court.
04	FCC Highways Authority	Consider the implementation of traffic management plans that can be put in place when a storm event is predicted, to prevent passing vehicles creating bow waves that exacerbate flooding.
05	FCC LLFA	Communicate with local communities to raise awareness of property level flood resilience measures that can be implemented to help mitigate flood risk.
06	FCC LLFA	Continue to manage the risk associated with local ordinary watercourses discussed in this report and inform the riparian landowners if any issues are identified.
07	FCC LLFA	Investigate the benefits of natural flood management upstream of the A541, Wrexham Road culvert inlet, near Dingle House.
08	NRW	Ensure Main Rivers are inspected on a risk-based frequency and where appropriate and justifiable, a maintenance regime is documented and completed by an appropriate Risk Management Authority and/or Riparian Owner.

09	DCWW	Review customer complaints and investigate the associated sections of public sewer system to remove any blockage / significant debris following the October 2023 event. Establish if there were issues with the performance of the sewage pumping station. Notably the system surrounding Hollands Terrace.
10	Property Owners / Residents	Sign up to the free signing up to the NRW Flood Warning System and consider the implementation of property level flood resilience measures. These could include; the installation of non-return valves to prevent ingress of floodwater on private drainage systems and installing flood barriers or flood doors.

1.0 Introduction

- 1.1 Since the introduction of the Flood and Water Management Act 2010 (FWMA) Flintshire County Council (FCC) is the designated Lead Local Flood Authority (LLFA).
- 1.2 Under Section 19 of the FWMA, Flintshire County Council as the LLFA on becoming aware of a flood in its area must, to the extent that it considers necessary or appropriate, investigate and prepare a report.
- 1.3 Where a LLFA carries out an investigation then the report must be published, and any relevant risk management authorities notified.
- 1.4 Waterco have been commissioned by FCC to carry out a Flood Investigation Report in relation to flooding in Pontblyddyn during Storm Babet which occurred in October 2023. Storm Babet caused internal and external flooding to residential properties in Pontblyddyn.
- 1.5 The purpose of this Section 19 (S19) Flood Investigation Report is to identify the cause of internal flooding to properties in Pontblyddyn during the October 2023 flood event. This report will provide an overview of flooding mechanisms, identify relevant Risk Management Authorities and stakeholders, and provide a list of recommendations.
- 1.6 The opinions expressed in this report and the comments and recommendations given are based on an assessment of available information.
- 1.7 The information, views and conclusions drawn are based, in part, on information supplied to Waterco by other parties. Waterco has proceeded in good faith on the assumption that this information is accurate. Waterco accepts no liability for any inaccurate conclusions, assumptions or actions taken resulting from any inaccurate information supplied to Waterco from others.

2.0 Summary of Storm Babet and Impact

National Context

- 2.1 Storm Babet brought heavy and persistent rainfall across much of the UK and 'was the third-wettest independent 3-day period for England and Wales in a series from 1891' according to the Met Office². As shown in Figure 1, many parts of the UK received over 50mm of rain, with 75-100mm of rain recorded across areas of North Wales. Several areas across the UK received over 100% of the average rainfall amount for October.

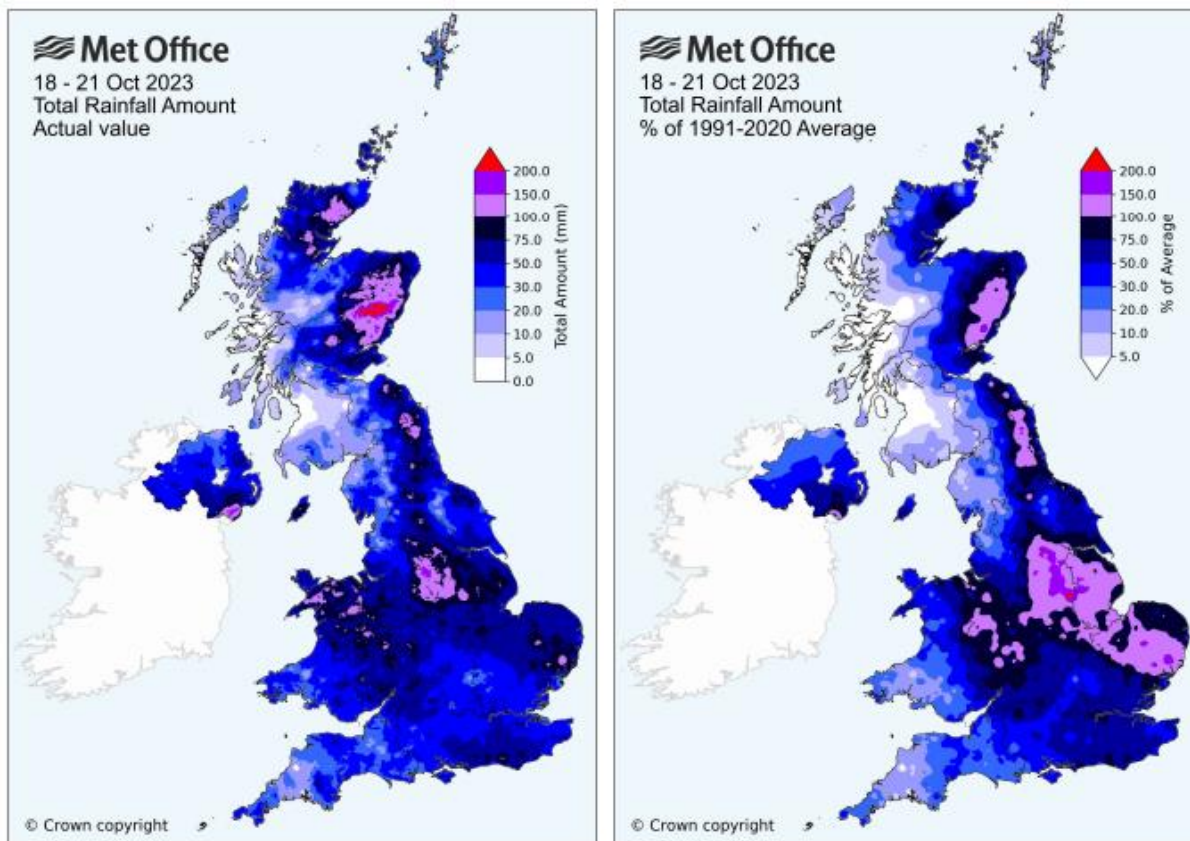


Figure 1 - Met Office Accumulated Daily Rainfall 18th-21st of October 2023

Regional Context

- 2.2 Unlike most storms, Storm Babet did not pass over rapidly. This allowed multiple fronts to add more rainfall over a prolonged period of time. The evapotranspiration rate in October was low and rainfalls were frequent throughout the month, with high levels of antecedent rainfall on October 13th / 14th (27mm in Mold) leading to soils being close to saturation.
- 2.3 Rainfall records have been obtained from NRW's Mold rain gauge³.
- 2.4 Figure 2 shows the rainfall in the days leading up to the flooding on the 20th of October. Flintshire experienced rainfall two days prior to the 20th of October, with 15.2mm of rainfall on the 18th and 11.8mm on the 19th. On the 20th of October, Mold rain gauge recorded 61.8mm of rainfall.

² Storm Babet Report https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/weather/learn-about/uk-past-events/interesting/2023/2023_08_storm_babet.pdf

³ <https://rivers-and-seas.naturalresources.wales/Station/1011?parameterType=2>

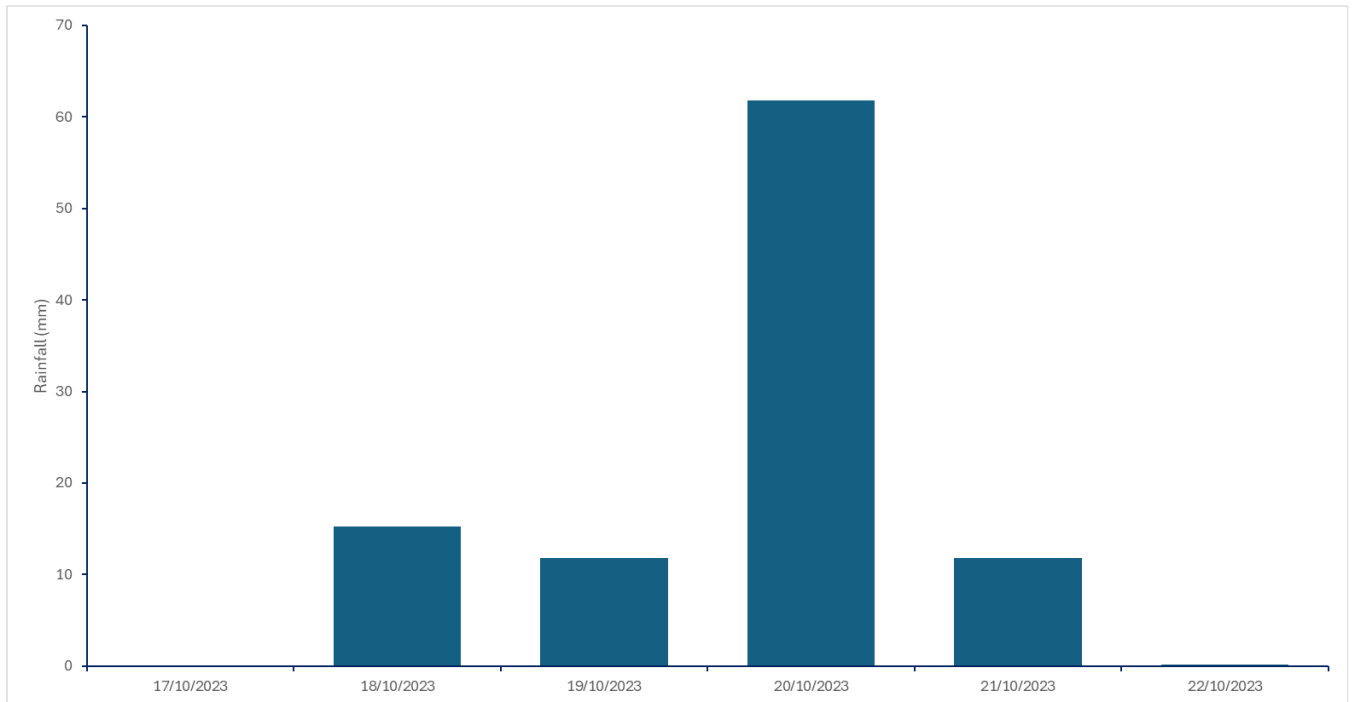


Figure 2 - NRW Mold Rain Gauge - Daily Rainfall From 18th-21st October

- 2.5 Figure 3 shows that there was a period of intense rainfall on Wednesday the 18th of October which began at 19:00pm and peaked between 21:00-22:00 with 5mm of rainfall per hour. There was some additional rainfall on Thursday the 19th of October peaking at approximately 1mm per hour. During 20th October, rainfall was prolonged with peak rainfall intensities at approximately 4.2mm per hour.

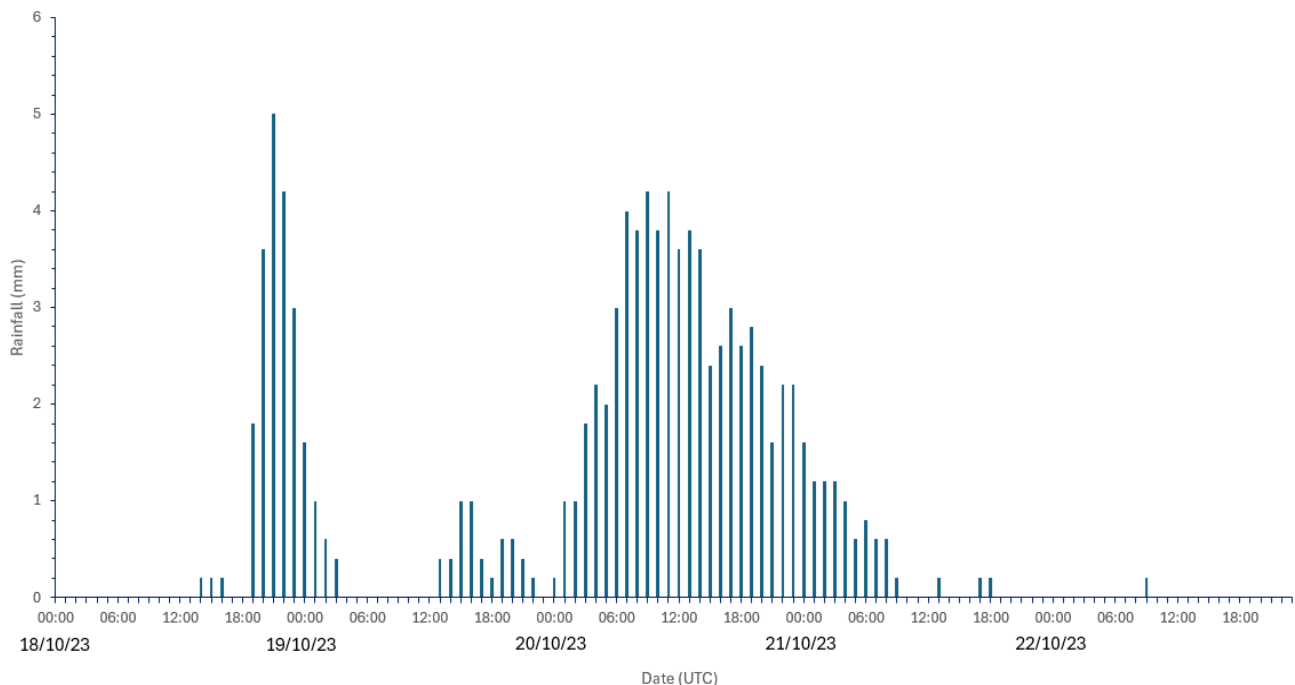


Figure 3 - Hourly rainfall between the 18th and 22nd of October

- 2.6 Flood Estimation Handbook (FEH) analysis estimates that a total of 61.8mm of rainfall over 24 hours (on the 20th of October), as recorded at the NRW Mold rain gauge, equates to a return period of 1 in 20 years.

- 2.7 Due to high amounts of rainfall throughout October, there would have been a lack of soil water storage and in consequence, higher and quicker runoff resulting in flooding.

Local Context

- 2.8 Community Engagement was undertaken by Waterco in Pontblyddyn on the 20th of August 2024. The purpose of the community engagement exercise was to gather information on the number of properties affected and the flooding mechanisms / source(s). In addition to speaking with householders, a questionnaire was posted to seek additional feedback. Table 2 shows a summary of the number of responses received.

Table 2 - Summary of Community Engagement Undertaken in Pontblyddyn

Location	Verbal responses received (properties)	Number of questionnaire responses
Woodland View	1	2
Stone Houses	1	0
Hollands Terrace	1	2
Wrexham Road	1	2
Riverside Court	2	2
The Bridge Inn	0	0
Alyn Terrace	2	2
Rivendell & Bankside	0	0

- 2.9 In addition to the community engagement exercise, a number of stakeholders were consulted regarding any information on flooding in Pontblyddyn:

- **Natural Resources Wales** – provided information on calls received during Storm Babet; a record of properties known to have flooded; and correspondence with North Wales Fire & Rescue Service.
- **FCC Highways Authority** – provided a call log showing where members of public had reporting flooding.
- **Dŵr Cymru Welsh Water** – held a post-Storm Babet meeting with FCC and Waterco to share details of asset performance and flooding records during Storm Babet.

- 2.10 Table 3 provides a summary of the locations and reported effects of flooding following the community engagement exercise and stakeholder engagement. A location plan of the affected areas can be found in Appendix B.

Table 3 - Summary of Flooding in Pontblyddyn During Storm Babet

Location	Internal Flooding	Impact
Woodland View	0	No confirmed internal flooding to properties, 2 properties nearly flooded internally. External driveway / garden flooding confirmed to at least 3 others.
Stone Houses	0	No confirmed internal flooding to properties, External flooding to minimum of 1 property.
Hollands Terrace	3	Internal flooding to 3 properties, external driveway / garden flooding confirmed to at least 1 other.
Wrexham Road	0	External flooding and damage to driveways / gardens.
Riverside Court	1	Internal flooding to 1 property, external driveway / garden flooding confirmed to at least 3 others.
The Bridge Inn	1	Internal flooding to 1 property, external driveway / garden flooding not confirmed.
Alyn Terrace	2	Internal flooding to minimum of 2 properties, external driveway / garden flooding confirmed to at least 2 others.
Rivendell & Bankside	0	-
Total Internal Flooding Reports	7	Number of internal flooding incidents based on community engagement exercises and stakeholder engagement. Flooding to additional properties may have occurred but not reported to FCC.

3.0 Study Area Overview

Location

- 3.1 Flooding in Pontblyddyn was reported at properties along the Northwest side of Wrexham Road, extending from Woodland View up to and including Alyn Terrace. Figure 4 shows the approximate locations of internal property flooding in Pontblyddyn.

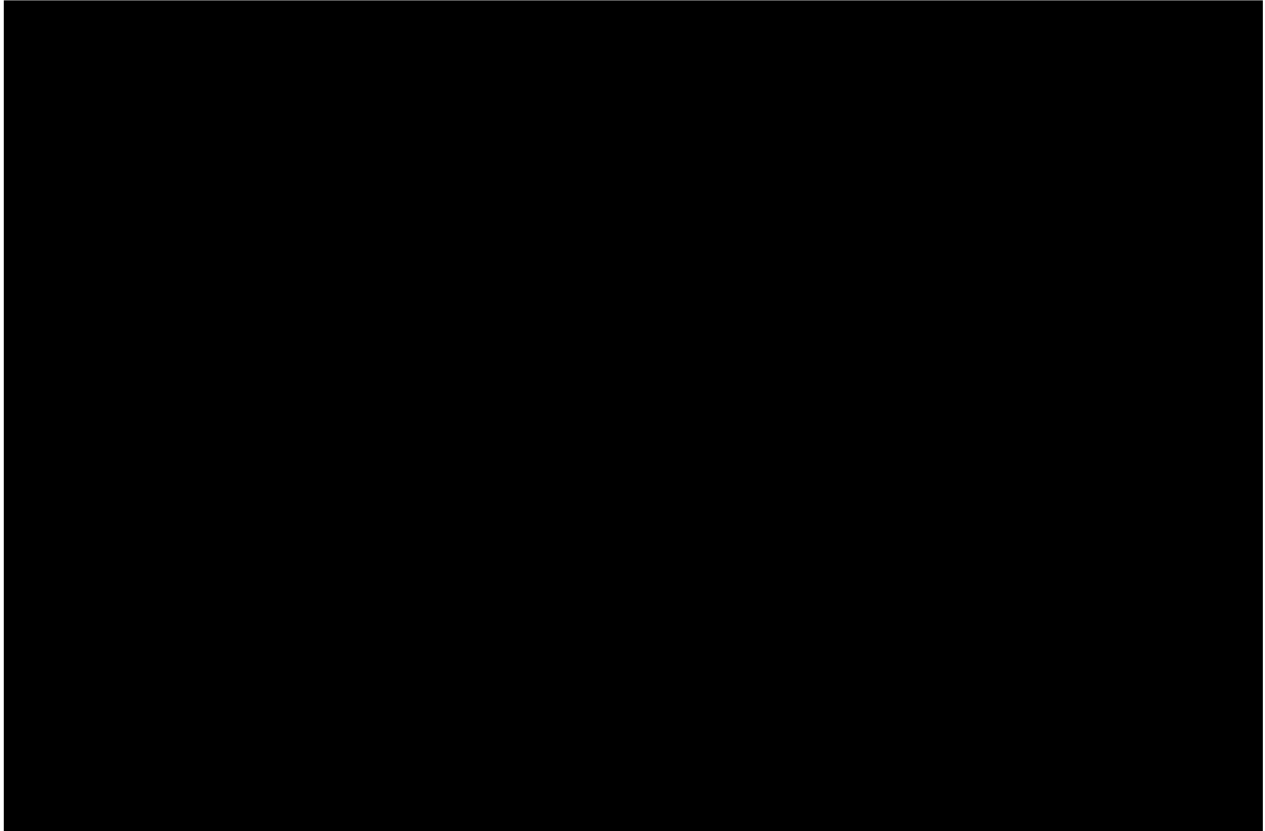


Figure 4 - Plan of Reported Flooding Areas
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Geology

- 3.2 The British Geological Survey (BGS)⁴ online mapping (1:50,000 scale) indicates that Pontblyddyn is predominantly underlain by superficial deposits of Alluvial Fan Deposits, generally comprising Sand and Gravel. The underlying bedrock geology is identified as being a mixture of Mudstone, Siltstone and Sandstone.

⁴ British Geological Survey - <https://mapapps2.bgs.ac.uk/geoindex/home.html>

Hydrological Setting

There are a number of unnamed watercourses to the West of Pontblyddyn which flow into the River Alyn flowing Southeast. The relevant unnamed watercourses are culverted beneath the A541, Wrexham Road at National Grid Reference (NGR): 327544, 360696 and 327766, 360395. The watercourses and culverts mentioned are shown in Figure 5.

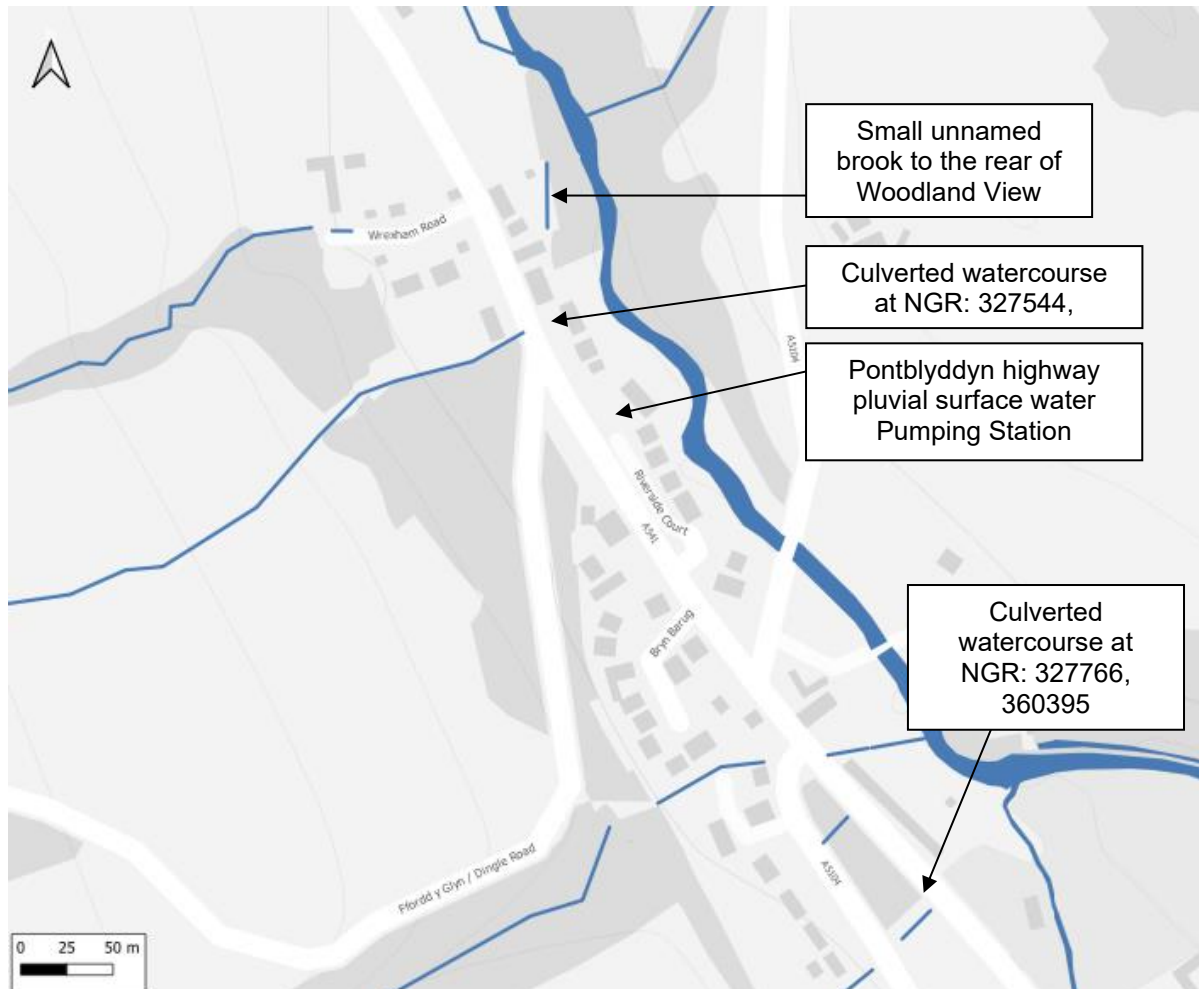


Figure 5 – Watercourse Map

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- 3.3 The catchment area of the River Alyn upstream from Pontblyddyn covers approximately 148.22km². Figure 6 shows the approximate catchment area generated using Scalgo software⁵.

⁵ Scalgo - <https://scalgo.com/>

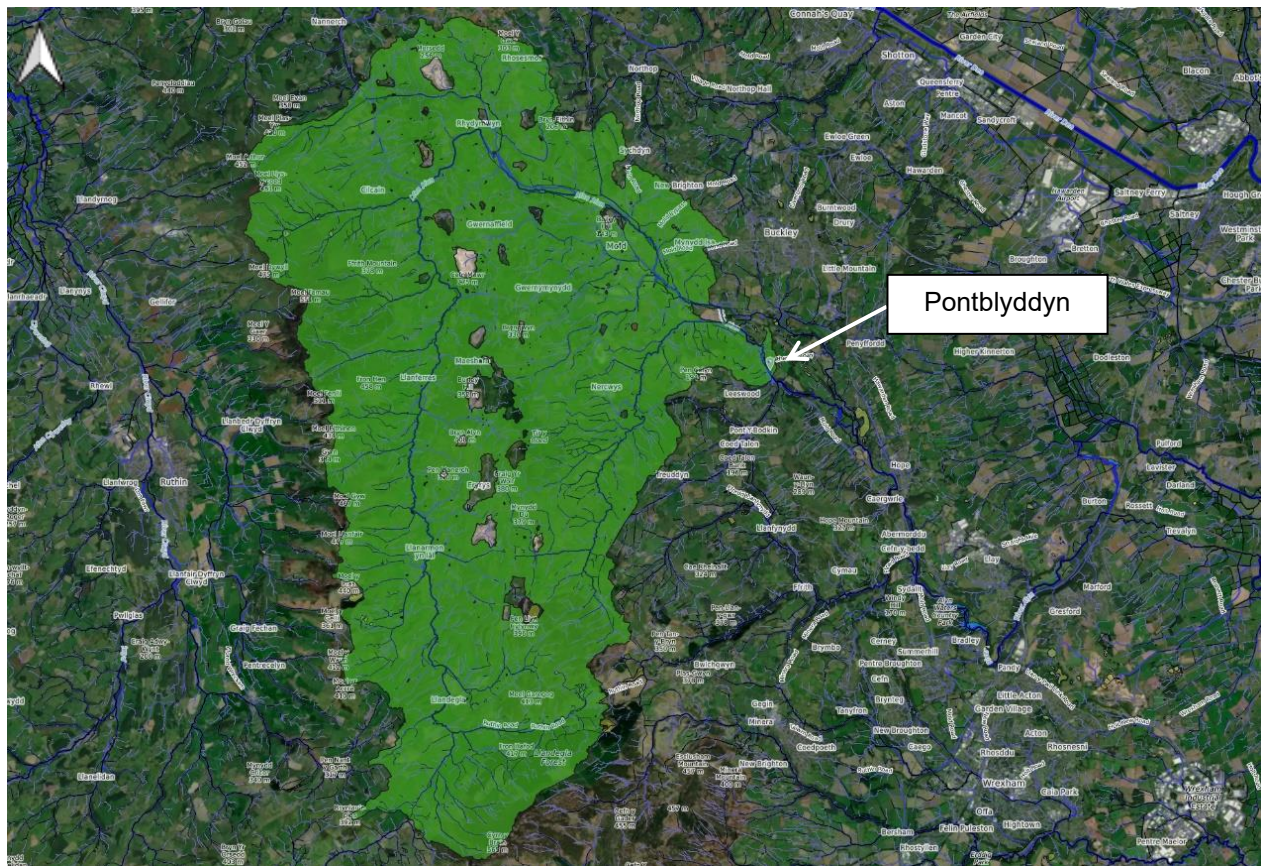


Figure 6 – Contributing Watercourse Catchment
(source: SCALGO)

Drainage Assets

- 3.4 Pontblyddyn highway pluvial surface water pumping station was installed within the layby along the A541 by FCC in 2003, following severe flooding events in November 2000. The pumping station was designed as part of a scheme to improve the surface water drainage system along the A541 and Riverside Court. The scheme comprised a new culvert collecting surface water from a watercourse at Queens Farm shown in Photographs 5 and 6 in Appendix A, flows from a secondary watercourse adjacent to Dingle Road and the local highway drainage system from along the A541 and adjacent layby. This previously drained via a 225 mm diameter pipe across the Riverside Court development and discharged into the River Alyn. The new culvert under normal weather conditions drains by gravity to the River Alyn. When high flows are experienced in the River Alyn during storm conditions a flap valve on the headwall where the culvert discharges closes and water backs up the culvert and spills into a surface water pumping station which then pumps all surface water into the River Alyn discharging at the same headwall structure. The pumping station has two pumps which work on a duty / standby arrangement and is powered by a single-phase power supply which is converted into three phase at the control kiosk.
- 3.5 Public sewer records have been obtained from Dŵr Cymru Welsh Water (DCWW)⁶. The sewer records show that large areas of Pontblyddyn, including the majority of Wrexham Road, are served by a combined drainage system. There is an unknown starting point for Combined/Storm overflow behind Woodland View properties, and a Combined Sewer pumping station next to Riverbank Cottage. DCWW sewer plans are included in Appendix E.

⁶ DCWW sewer plans - <https://gisportal.dwrcymru.com/>

NRW Flood Maps

- 3.6 The NRW 'Flood Map for Planning – Rivers, Surface Water and Small Watercourses' map (shown in Figure 7 and Appendix F) identifies the flood risk associated with small watercourses such as the unnamed watercourse which flows south through Pontblyddyn. The NRW map shows that a number of the properties / streets in Pontblyddyn are located in Flood Zones 2 and 3. Flood Zone 2 is defined as an area with between a 0.1% and 1% chance of flooding from surface water and / or small watercourses in any given year, including the effects of climate change. Flood Zone 3 is defined as an area with a greater than 1% chance of flooding from surface water and / or small watercourses in any given year, including the effects of climate change.
- 3.7 The flood risk shown on the NRW 'Flood Map for Planning – Rivers, Surface Water and Small Watercourses' map is based on a combination of rainfall and LiDAR data. The mapping identifies areas where surface water may flow or pool during heavy rainfall. LiDAR Mapping for context of elevations surrounding Pontblyddyn can be found in Appendix D.
- 3.8 NRW mapping shows significant pooling of surface water at the layby along Wrexham Road, which then appears to reach a depth which leads to flooding around Hollands Terrace.

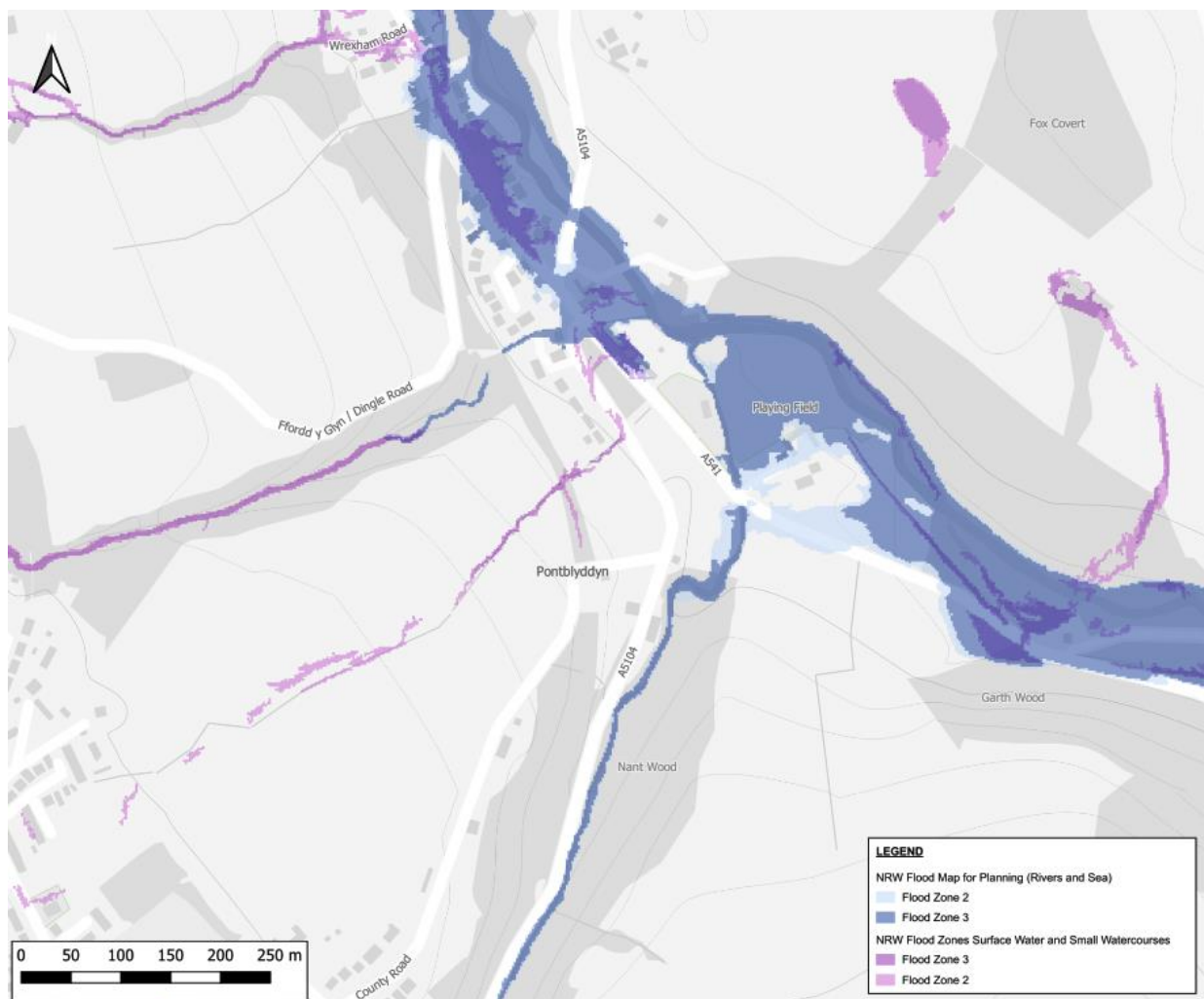


Figure 7 - NRW Flood Map for Planning – Rivers, Surface Water and Small Watercourses Map

Contains OS Data © Crown Copyright (2024) Contains Natural Resources Wales Information © Natural Resources Wales⁷ And Database Right. All Rights Reserved.

⁷ NRW Flood Risk Map - <https://flood-map-for-planning.naturalresources.wales/>

4.0 Flood Locations, Descriptions and Mechanisms

Woodland View

- 4.1 Based on the findings of the community engagement exercise and stakeholder engagement, the flooding at Woodland View is attributed to flooding from a small watercourse behind Woodland View.
- 4.2 Residents reported flooding to gardens and outbuildings at the rear of their properties from a small watercourse which flows parallel to the River Alyn. It is believed that this watercourse flows past Queens Farm and through a culvert beneath the A541 before joining into the watercourse behind Woodland view.
- 4.3 No internal flooding was recorded at Woodland View. However, one resident noted that flood was close to entering their property. It is understood that the gardens to the rear of the properties are much lower than the property level, with the level difference in the back gardens approximated using LiDAR to be up to 2m lower than the building threshold level.

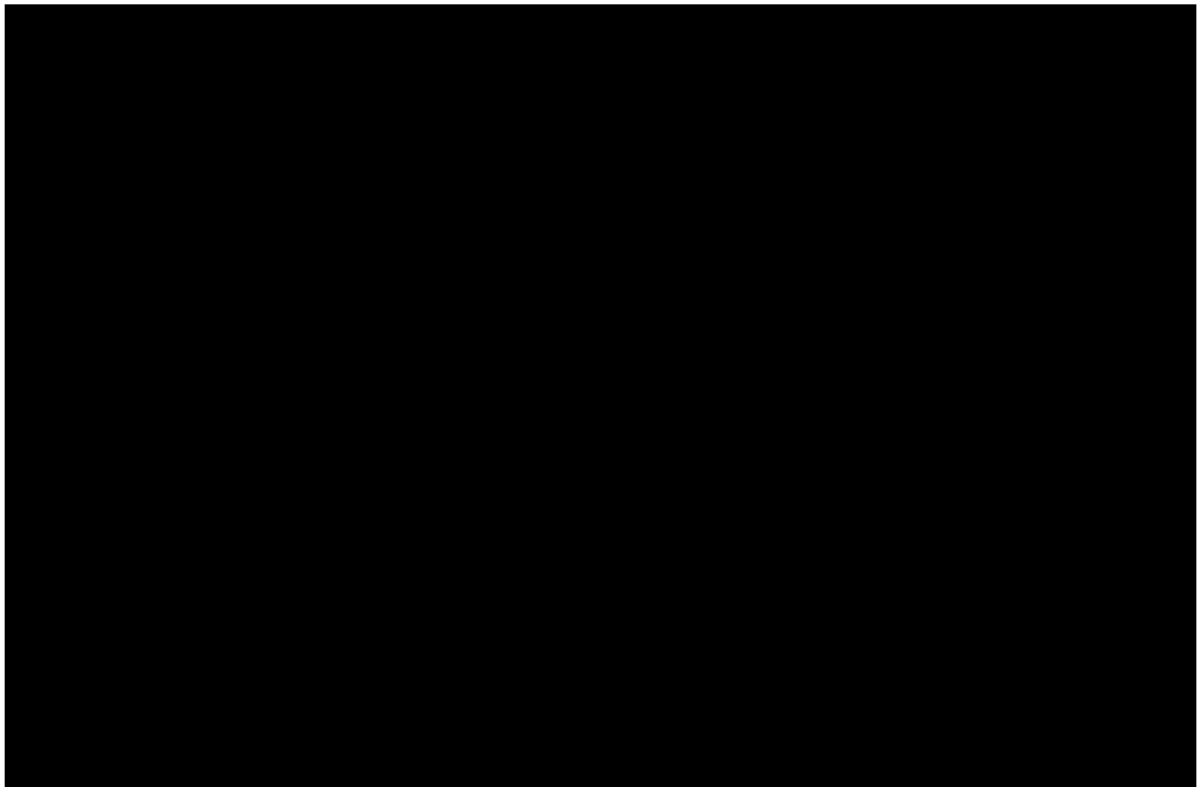


Figure 8 – Woodland View Area

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Stone Houses

- 4.4 Based on the findings of the community engagement exercise and stakeholder engagement, it is assumed that Stone Houses were flooded by surface water flooding which came from the A541, Wrexham Road. There were no resident reports of flooding from nearby watercourses.
- 4.5 NRW reported that flooding occurred from surface water. There is no evidence to suggest that the properties were flooded internally.

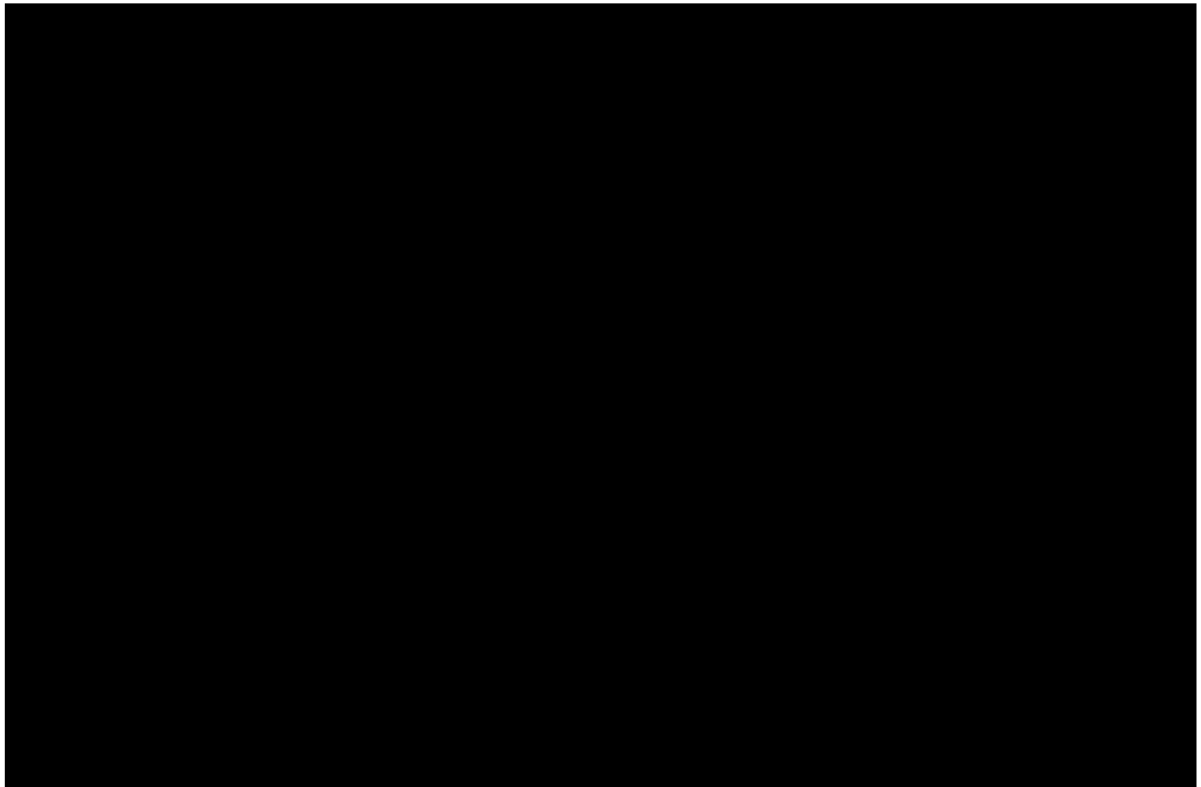


Figure 9 – Stone Houses Area

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Hollands Terrace

- 4.6 Based on the findings of the community engagement exercise and stakeholder engagement, the flooding to Hollands Terrace was a result of surface water flooding. Residents also reported flooding from the public combined sewer to the rear of the properties.
- 4.7 Residents reported that internal flooding occurred at two properties and was being caused by surface water. One resident reported that flooding within the property rose to approximately 0.9m depth consisting of rainwater and sewerage.
- 4.8 A review of DCWW sewer records identified that there is a combined sewer/storm overflow behind Woodland View properties, and a Combined Sewer pumping station further along the A541, Wrexham Road, next to Riverbank Cottage.
- 4.9 The Flood Incident Duty Officer at NRW reported that the highway surface water pumping station may not have been functioning during the incident. However, it has been confirmed by FCC that the pumping station was operational during the flooding event.

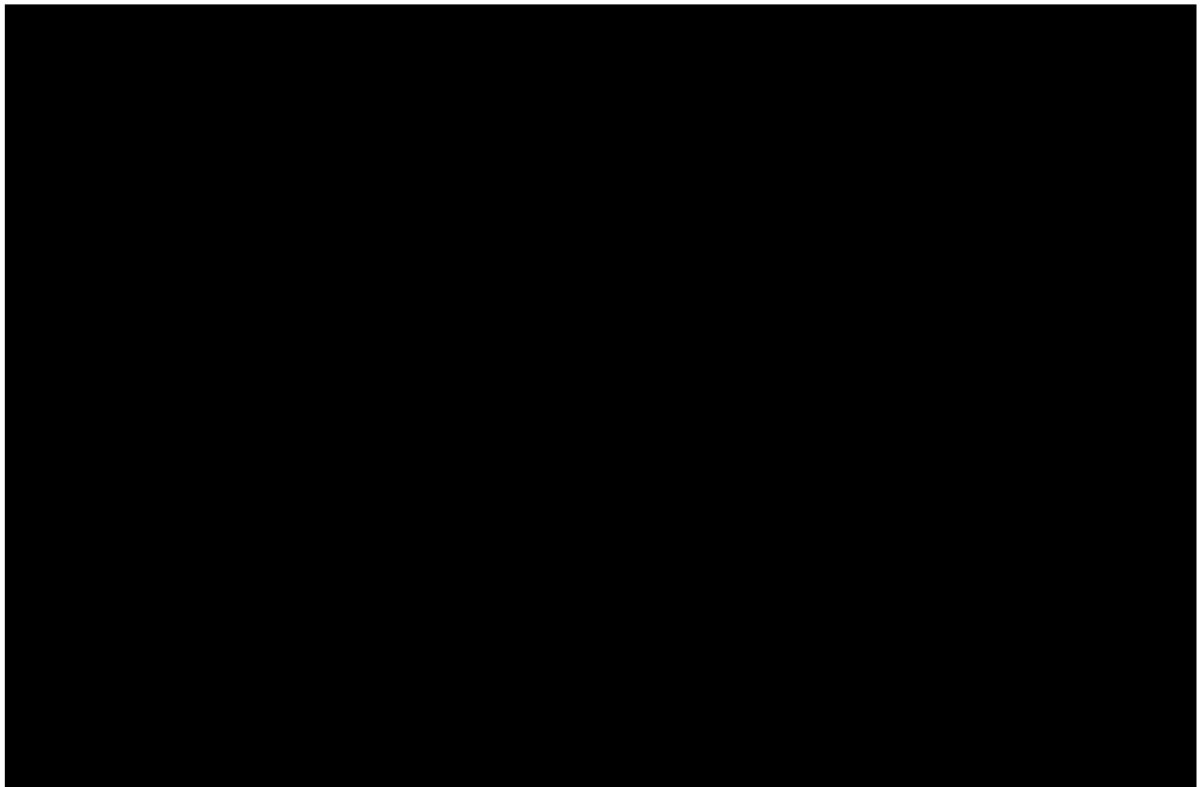


Figure 10 – Hollands Terrace Area

Contains OS Data © Crown Copyright (2024)

Wrexham Road

- 4.10 Based on the findings of the community engagement exercise and stakeholder engagement, flooding along Wrexham Road was a result of surface water flooding and water from a culverted watercourse beneath the A541, flowing from a watercourse adjacent to Dingle House, carrying flows from the upland agricultural land between Pontblyddyn and Leeswood.
- 4.11 According to residents, flooding was first noted as flowing from the layby off the A541, Wrexham Road and began to flow towards other areas as the water level rose. Residents reported having concerns as to whether Pontblyddyn highway pluvial surface water pumping station was functional during the storm. Stakeholder engagement with FCC confirmed that the pump was functioning during the flooding event and noted the pumping station was designed to accommodate a 1 in 5-year flood event. This indicates that the pumping station is not designed to pump flows witnessed in Storm Babet. FCC confirmed that the pumping arrangement is Duty and Assist and has not been changed since the pumping station was installed in 2003. The power supply is a single phase converted to three phase at the kiosk which was incorporated into the design on energy efficiency grounds and based on the likely operational use of the pumping station. Since construction in 2003 this is the first time that reports of the pumping station not functioning correctly have been made. There is evidence that the kiosk has been broken into with reports that this was carried out by unnamed local residents to establish if the pumps were running at the height of the storm.
- 4.12 Surface water which flowed along the A541, Wrexham Road resulted in flooding occurring in a number of adjacent areas, including Riverside Court and Hollands Terrace.

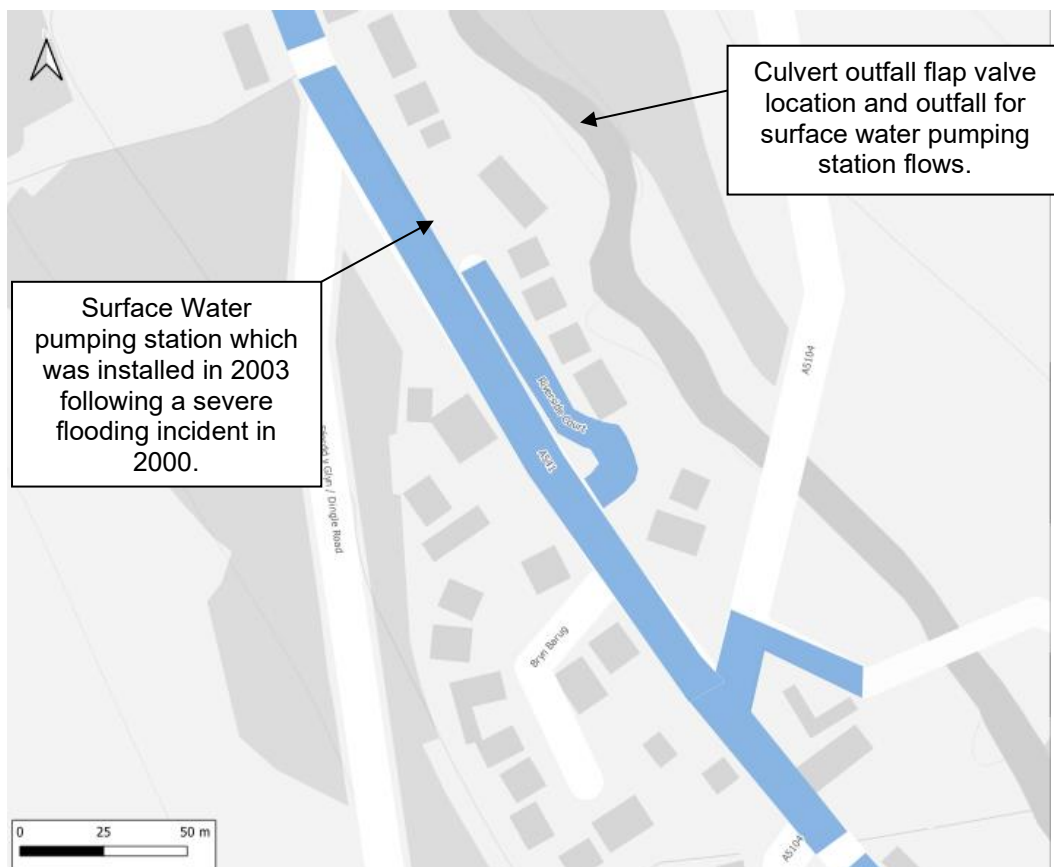


Figure 11 – A541, Wrexham Road Area
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Riverside Court

- 4.13 Based on the findings of the community engagement exercise and stakeholder engagement, flooding at Riverside Court was determined to originate from flooding which occurred along the A541, Wrexham Road. As discussed in Section 4.11 of this report, the majority of this flooding was due to surface water runoff and excessive flows from nearby watercourses from the upland catchment.
- 4.14 Residents reported internal flooding at one property, with numerous other residents stating that flooding was very close to entering their property. The level of flooding was worsened significantly by bow waves caused by traffic moving along the main road. Residents attempted to close the A541 themselves to reduce resultant flooding occurring at Riverside Court. During the community engagement exercise conducted in September 2024, it was noted that vegetation clearance had been performed along the River Alyn, located behind the properties at Riverside Court, but the debris had not been removed.
- 4.15 There were concerns from the public that Pontblyddyn highway pluvial surface water pumping station within the layby along the A541 was not functioning during the flooding event, which led to the control kiosk being opened by force (and unauthorised) by local residents in a bid to reduce flooding within the road. Other residents reported that DCWW attended the location at 15:00 on the 20th of October and confirmed that their pumping station was operational. Residents have reported that flooding was also attributed to highway drainage being inundated.

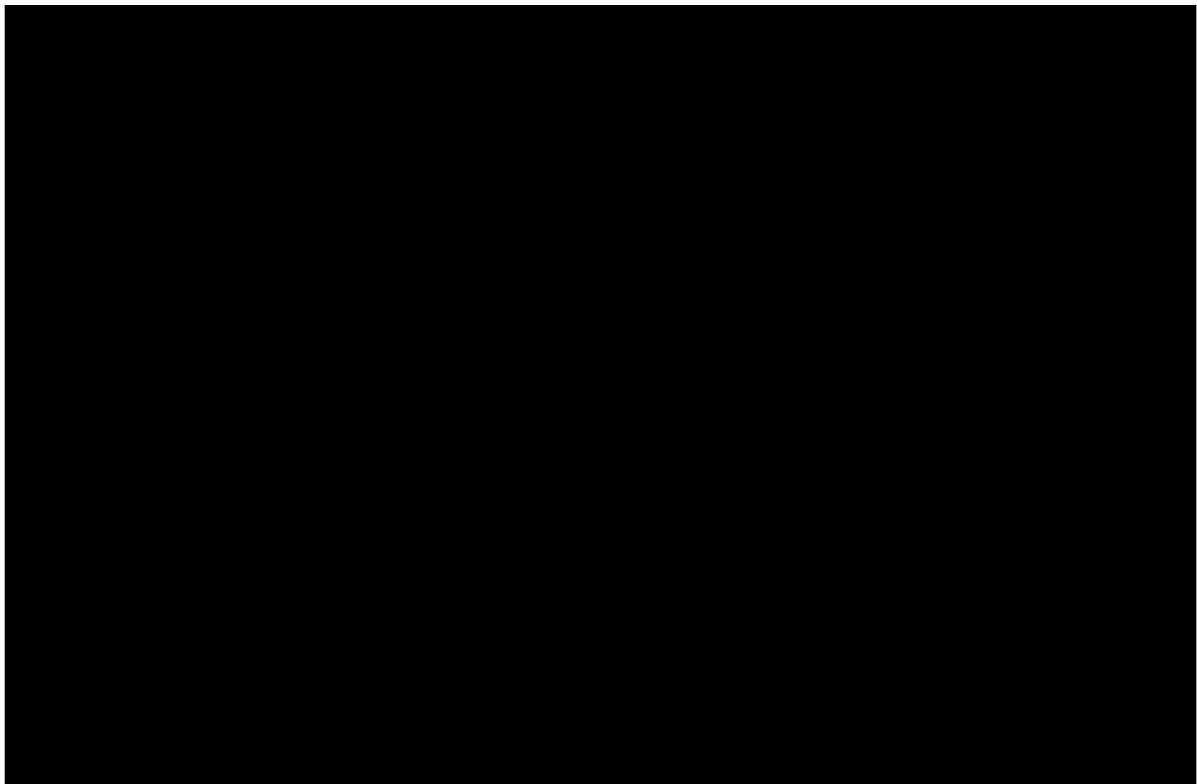


Figure 12 – Riverside Court Area
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The Bridge Inn

- 4.16 DCWW received reports of potential internal flooding at The Bridge Inn. This data was passed on to NRW and FCC. However, no response was received from the occupants during the community engagement exercise.

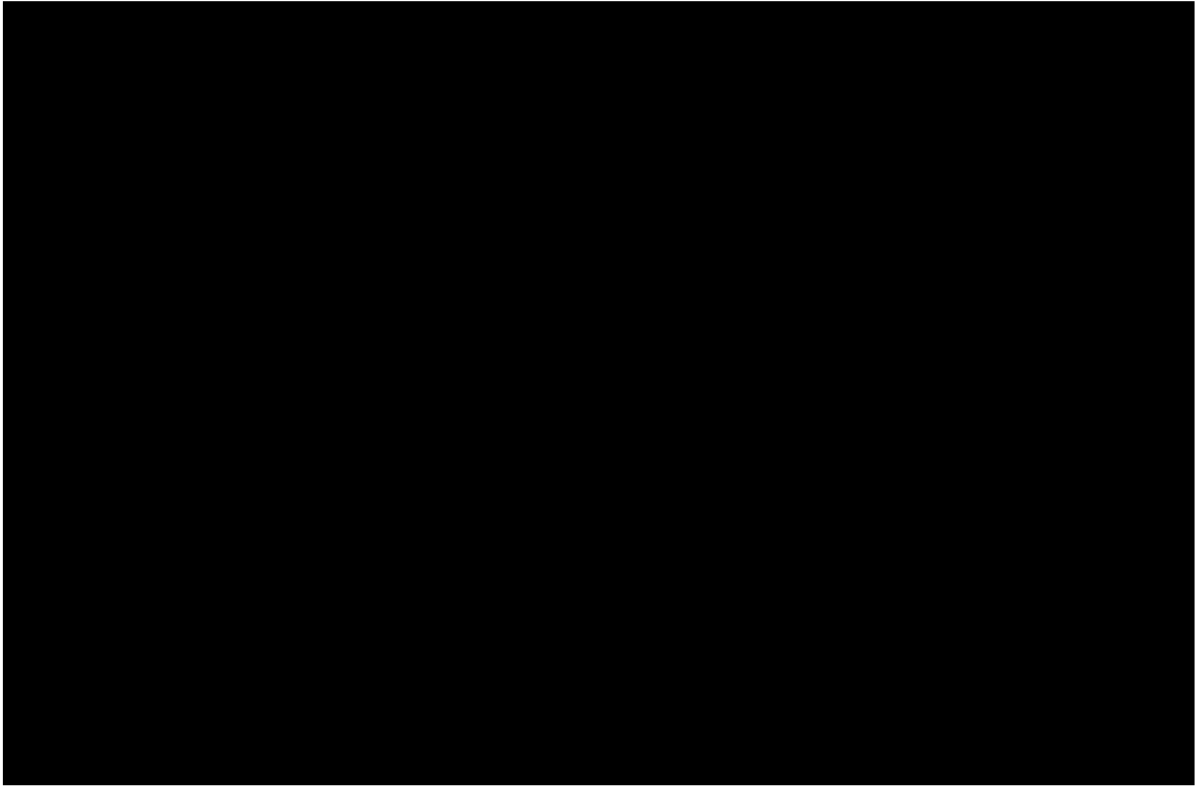


Figure 13 – The Bridge Inn Area
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Alyn Terrace

- 4.17 Based on the findings of the community engagement exercise and stakeholder engagement it is understood that the majority of properties along Alyn Terrace were flooded internally. It has been determined that the source of the flooding was from surface water as well as from a culvert to the Southeast of Alyn Terrace, which conveys flows from an unnamed watercourse from Leeswood. The inlet and outlet arrangement for the culvert was improved following the flooding that occurred in 2000, during the Community Engagement exercise the structure was visually inspected and appeared to be overgrown with vegetation making it difficult to establish if the culvert was running freely as referred to in point 4.20 below.
- 4.18 Residents informed that they had made contact with FCC in September 2023 in regard to the clearing of the culvert just to the Southeast of the terrace, and blocked drains outside of the properties, but they don't believe maintenance occurred before Storm Babet in October 2023.
- 4.19 Residents noted that flooding occurred from the front of the properties, which originated at the culvert to the Southeast of the properties. It is believed that this culvert was overgrown and blocked with debris, causing the watercourse to back up into the road.
- 4.20 During the community engagement site visit, it was observed that the culvert was overgrown with vegetation, and it could not be identified whether or not the screen was clear of debris. It was also observed that the drains along the pavement directly in front of Alyn Terrace were fully obstructed by dirt.

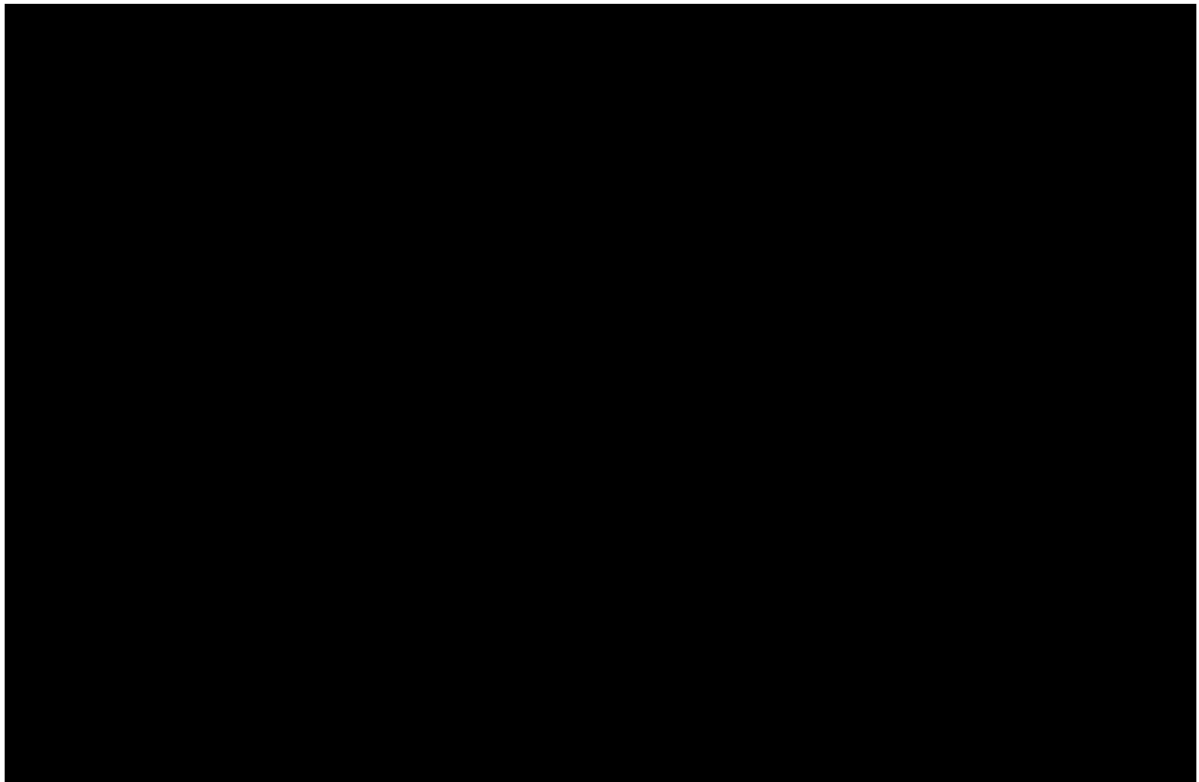


Figure 14 – Alyn Terrace Area
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Other Areas

Rivendell and Bankside

- 4.21 Residents from Riverside Court informed that properties Rivendell and Bankside may have also been affected by the flooding. However, no response was received from the residents themselves.

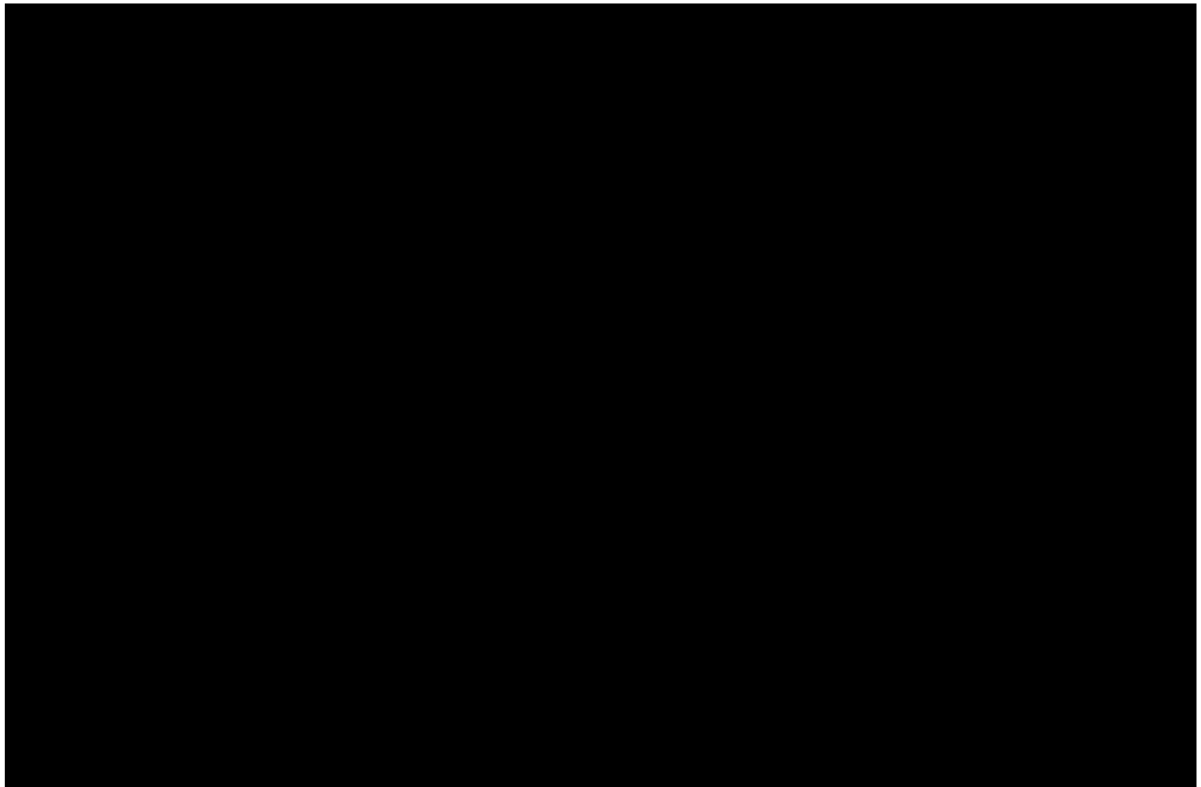


Figure 15 – Rivendell and Bankside Area

Contains OS Data © Crown Copyright (2024)

5.0 Relevant Parties Communication Register

- 5.1 The table below provides the details of communications that have taken place with relevant parties up to the time of writing this report. Relevant parties are considered to be all authorities and stakeholders directly involved and responsible for flood risk management, property owners affected by the flood event, and all parties who may be able to provide information salient to the flood investigation.

Table 4 - Relevant Parties Communications Register

Contact	Communications
Local Residents	Community engagement undertaken on 20/08/2024. Questionnaires and photographs returned to Waterco.
Flintshire County Council (FCC)	Shared details of call logs and confirmed flooding locations
Dŵr Cymru Welsh Water DCWW	Meeting on the 19/02/2024 to share information of flood locations and sources
Natural Resources Wales (NRW)	Email consultation from NRW with information on flood locations and sources. NRW also shared data from North Wales Fire and Rescue (on callouts / flood locations).
North Wales Fire & Rescue	

6.0 Conclusions

- 6.1 Waterco Ltd were appointed by FCC to prepare a Flood Investigation Report for Pontblyddyn following flooding from Storm Babet on the 20th of October 2023.
- 6.2 Surface water was noted to be running from the upland catchment and running down Dingle Road and Corwen Road and collecting in Pontblyddyn, where the drainage infrastructure was overwhelmed and inundated during Storm Babet resulting in localised flooding to the highway and residential properties.
- 6.3 The surface water flows experience in Storm Babet were greater than the design flows of the drainage infrastructure. It is likely that flooding occurred as a result of inflow from fluvial flood flows and overland flows. Combined sewers and highway gullies are not designed to accommodate fluvial flood flows.
- 6.4 Internal flooding was confirmed at properties in Hollands Terrace, with the source of flooding being from surface water and a combined sewer behind the properties. There was a report of internal flooding at Riverside Court with the source being from surface water originating from the layby along Wrexham Road, which was not being suitably drained by the existing pumping station which has been confirmed to be operating functionally on the day of the flooding caused by Storm Babet. It was also noted that the highway gullies did not appear to be functioning effectively during the flooding event. There were also reports of numerous properties along Alyn Terrace suffering from internal flooding, with the source of flooding being caused by a nearby culvert backing up into the highway.
- 6.5 Rainfall experienced during Storm Babet was prolonged and steady, and high levels of rainfall throughout October meant soils were already saturated which led to faster runoff rates.
- 6.6 Surcharge of the culvert near Alyn Terrace may be associated with overgrown vegetation and debris accumulation at the culvert inlet; however, the debris may have been transported during the flood event.
- 6.7 Surface water flooding at Wrexham Road was not being drained sufficiently by the existing infrastructure. Inspection of the pumps and the outfall into the River Alyn confirmed that the pumping station is functioning as expected, as of August 2024. It is understood that the pumping station was designed for a 1 in 5-year return period event. However, analysis of Storm Babet at the NRW Mold Rain Gauge estimates that the total rainfall over 24 hours (on the 20th of October), equates to a return period of 1 in 20 years.
- 6.8 During the community engagement exercise conducted in September 2024, it was noted that vegetation clearance had been performed along the River Alyn, located behind the properties at Riverside Court, but the debris had not been removed. For supporting photographs, please refer to Appendix A.
- 6.9 A total of 7 internal flooding incidents were reported in Pontblyddyn during Storm Babet.

7.0 Recommendations

7.1 Table 5 sets out the recommended actions required following the flooding of October 2023 and the stakeholder required to undertake each action.

Table 5 – Recommendations to address flooding

Ref	Stakeholder	Action
01	FCC Highways Authority	Inspect the existing culvert inlet adjacent to Alyn Terrace, along the A541, Wrexham Road on a frequent basis and remove debris as required.
02	FCC Highways Authority	CCTV the A541, Wrexham Road culvert from the watercourse adjacent to Dingle House to the outfall at the River Alyn, to ensure the culvert is free of blockage and any significant siltation. Take remedial action as required.
03	FCC Highways Authority	Review frequency of gully cleansing in high risk areas, for example on Alyn Terrace and Riverside Court.
04	FCC Highways Authority	Consider the implementation of traffic management plans that can be put in place when a storm event is predicted, to prevent passing vehicles creating bow waves that exacerbate flooding.
05	FCC LLFA	Communicate with local communities to raise awareness of property level flood resilience measures that can be implemented to help mitigate flood risk.
06	FCC LLFA	Continue to manage the risk associated with local ordinary watercourses discussed in this report and inform the riparian landowners if any issues are identified.
07	FCC LLFA	Investigate the benefits of natural flood management upstream of the A541, Wrexham Road culvert inlet, near Dingle House.
08	NRW	Ensure Main Rivers are inspected on a risk-based frequency and where appropriate and justifiable, a maintenance regime is documented and completed by an appropriate Risk Management Authority and/or Riparian Owner.

09	DCWW	Review customer complaints and investigate the associated sections of public sewer system to remove any blockage / significant debris following the October 2023 event. Establish if there were issues with the performance of the sewage pumping station. Notably the system surrounding Hollands Terrace.
10	Property Owners / Residents	Sign up to the free signing up to the NRW Flood Warning System and consider the implementation of property level flood resilience measures. These could include; the installation of non-return valves to prevent ingress of floodwater on private drainage systems and installing flood barriers or flood doors.

APPENDIX A

Photographic Record

Photo No.1	
Date: 20th August 2024 Description: Access to pumping station in layby along A541, Wrexham Road Source: Waterco Site Visit	

Photo No. 2	
Date: 20th August 2024 Description: Damaged control box for pumping station in layby along A541, Wrexham Road. Source: Waterco Site Visit	

Photo No.3	
Date: 20 th August 2024	
Description: Channel for Watercourse between The Bridge Inn and Alyn Terrace.	
Source: Waterco Site Visit	

Photo No. 4	
Date: 10 th September 2024	
Description: Outfall of Dingle House culvert outfall and pumping station outfall into River Alyn at NGR: 327608, 360695.	
Source: Waterco Site Visit	

Photo No. 5	
Date: 10th September 2024 Description: Banks along the River Alyn behind Riverside Court Source: Waterco Site Visit	

Photo No. 6	
Date: 10th September 2024 Description: Culvert 1 near Queen's Farm. Source: Waterco Site Visit	

Photo No. 7	
Date: 10 th September 2024	
Description: Culvert 2 near Queen's Farm.	
Source: Waterco Site Visit	

APPENDIX B

Location Plan and Ariel Image



Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

 Site Boundary



CLIENT:

Flintshire County Council



www.waterco.co.uk

SCHEME:

15972-Pontblyddyn S19 Flood
Investigation Report

PLOT TITLE:

Location Plan

PLOT STATUS:

FINAL

DATE:

19-09-2024

DRAWN:

EJ

CHECKED:

SW

APPROVED:

MW

PLOT SCALE AT A3:

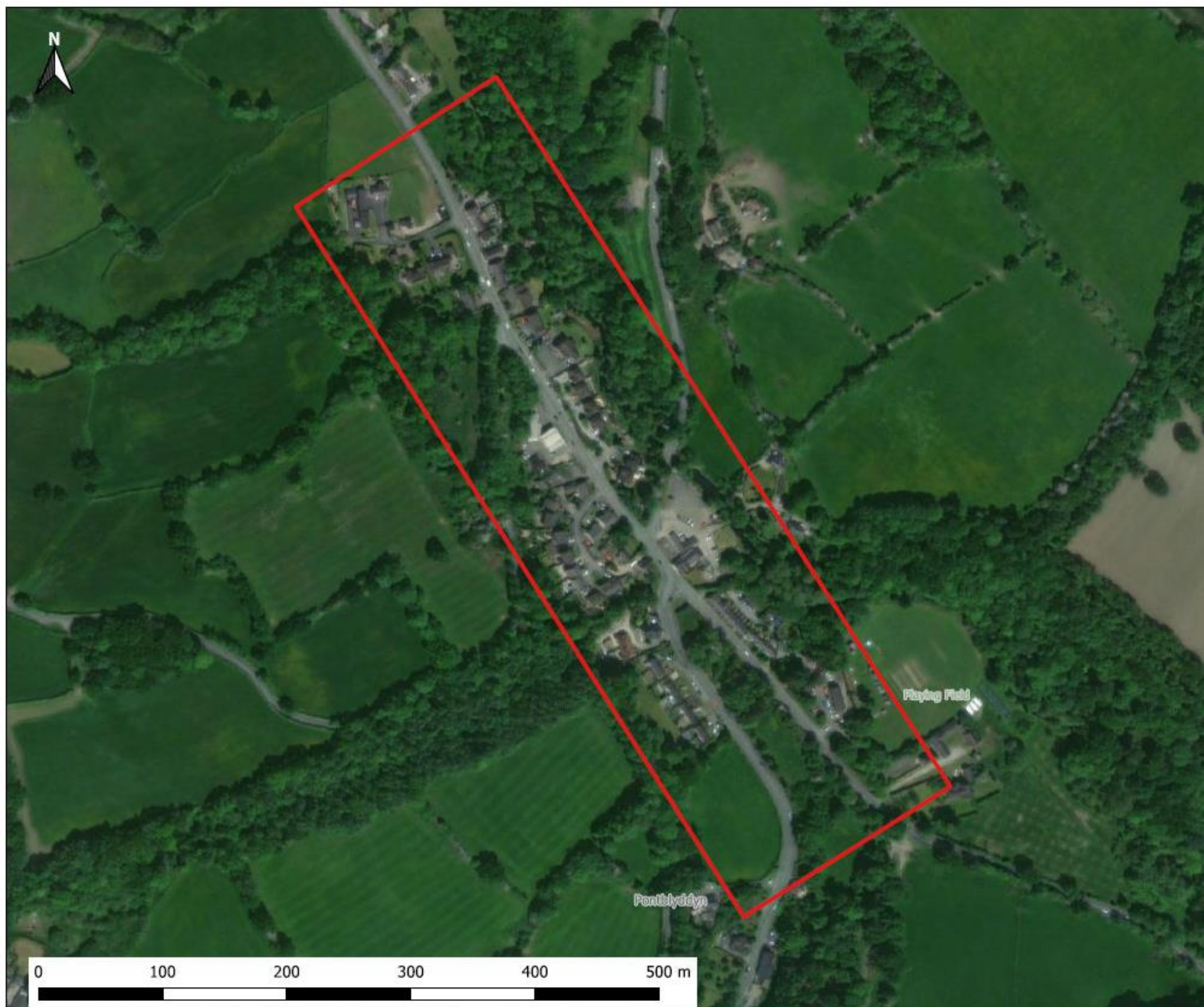
1:3000

PLOT NAME:

15972_Location_Plan

REVISION:

-



Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

 Site Boundary



CLIENT:

Flintshire County Council



SCHEME:

15972-Pontrhyddyn S19 Flood
Investigation Report

PLOT TITLE:

Aerial Plan

PLOT STATUS:

FINAL

DATE:

19-09-2024

DRAWN:

EJ

CHECKED:

SW

APPROVED:

MW

PLOT SCALE AT A1:

1:3000

PLOT NAME:

15972_Aerial_Plan

REVISION:

-

APPENDIX C

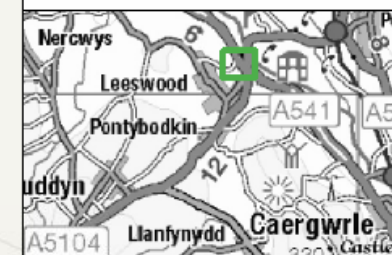
Reported Flooding Locations



Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

 Reported Flooding Areas - Pontblyddyn



CLIENT:

Flintshire County Council



www.waterco.co.uk

SCHEME:

15972-Pontblyddyn S19 Flood
Investigation Report

PLOT TITLE:

Reported Flooded Property Locations

PLOT STATUS:

FINAL

DATE:

19-09-2024

DRAWN:

EJ

CHECKED:

SW

APPROVED:

MW

PLOT SCALE AT A3:

1:2000

PLOT NAME:

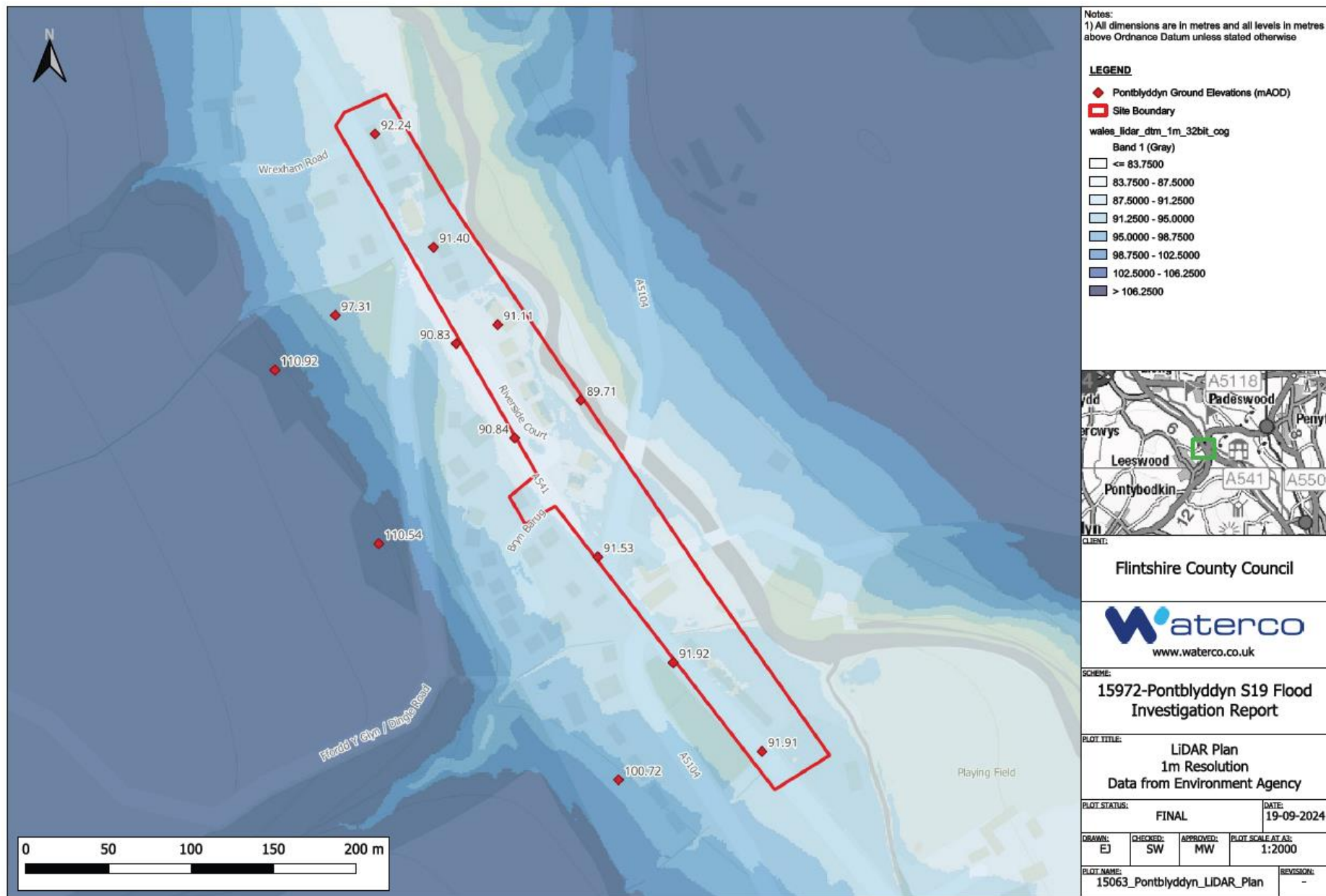
15063_Pontblyddyn_Reported_Flooding

REVISION:

01

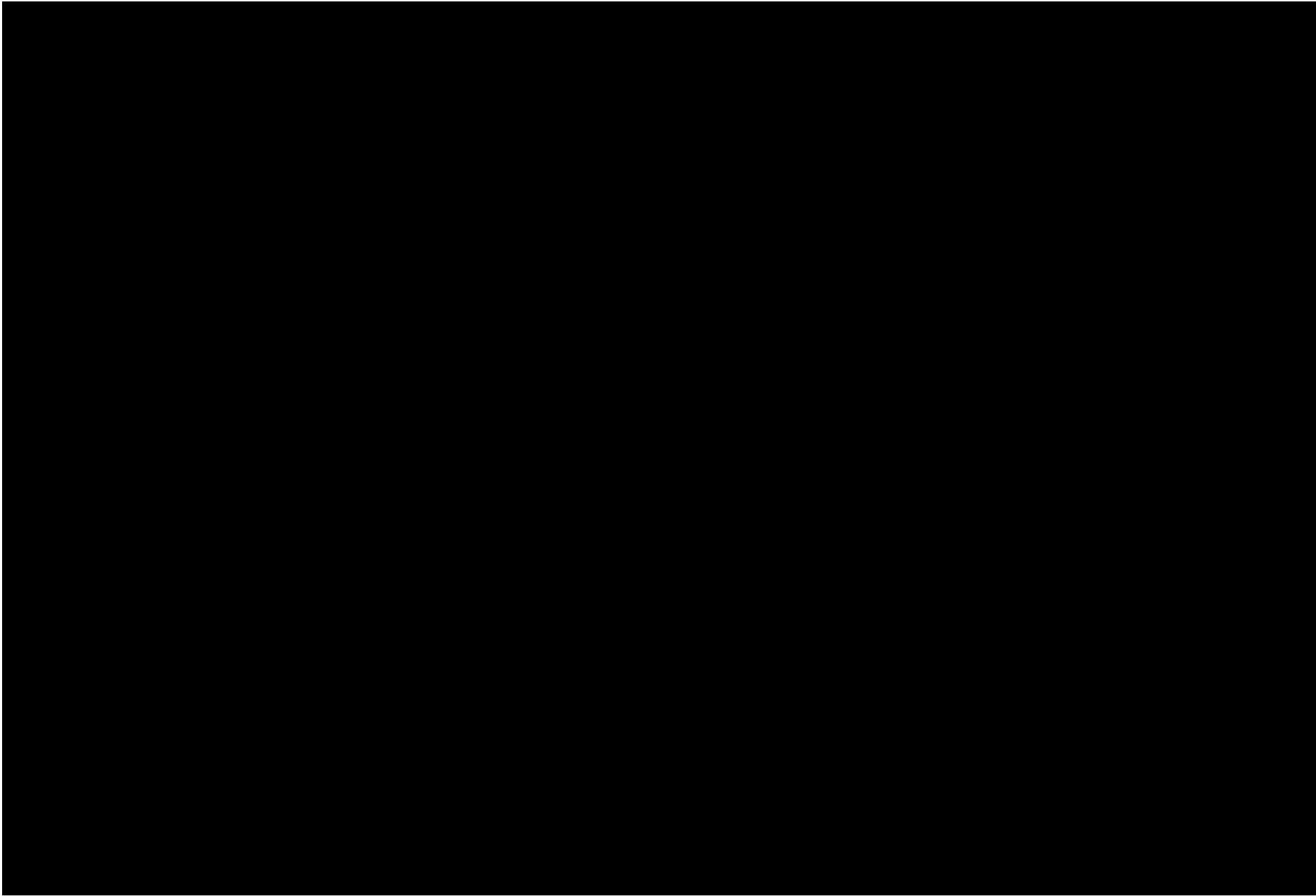
APPENDIX D

LiDAR Plan



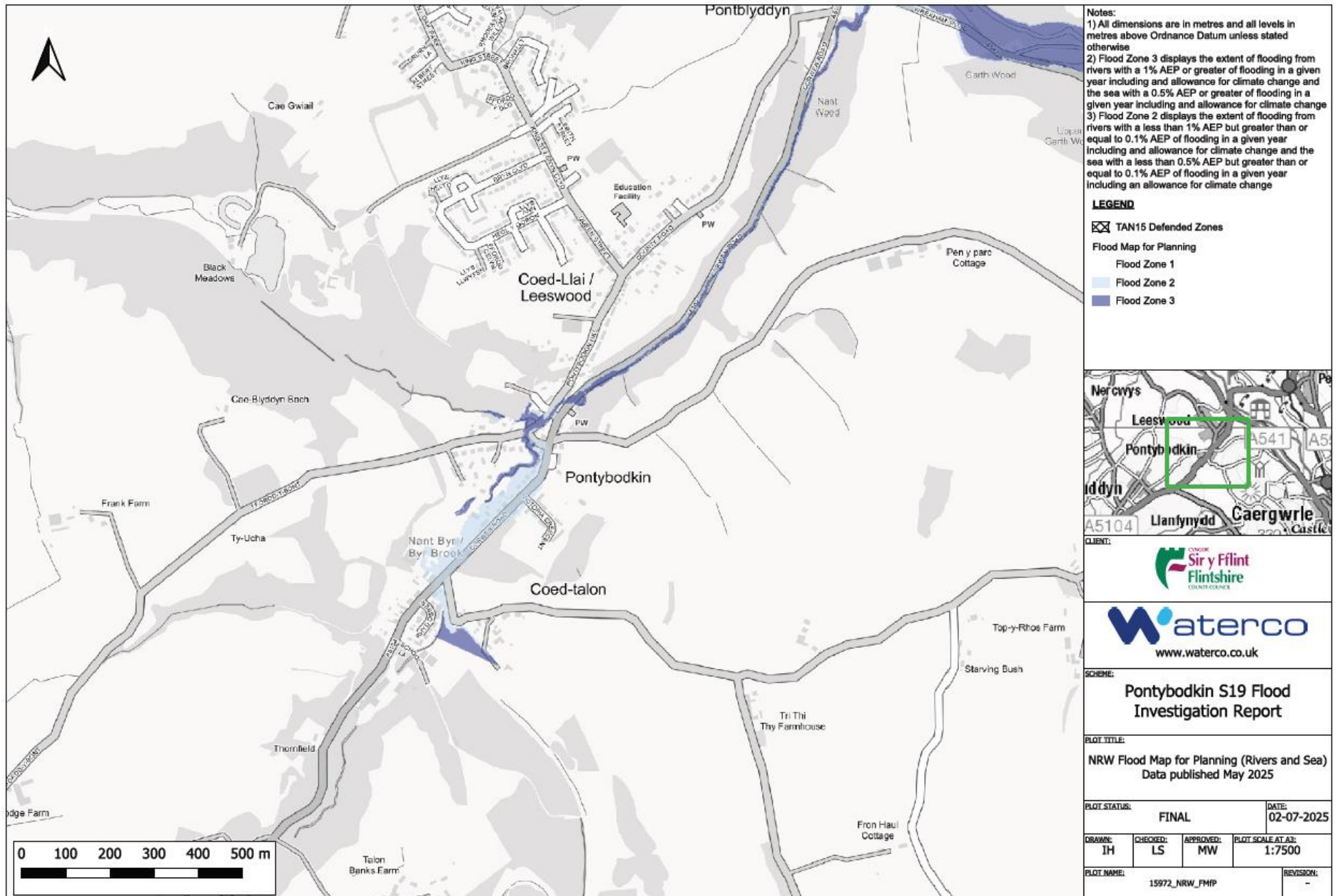
APPENDIX E

DCWW Sewer Plans



APPENDIX F

NRW Flood Maps



Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise
2) Flood Zone 3 displays the extent of flooding from rivers with a 1% AEP or greater of flooding in a given year including and allowance for climate change and the sea with a 0.5% AEP or greater of flooding in a given year including and allowance for climate change
3) Flood Zone 2 displays the extent of flooding from rivers with a less than 1% AEP but greater than or equal to 0.1% AEP of flooding in a given year including and allowance for climate change and the sea with a less than 0.5% AEP but greater than or equal to 0.1% AEP of flooding in a given year including an allowance for climate change

LEGEND

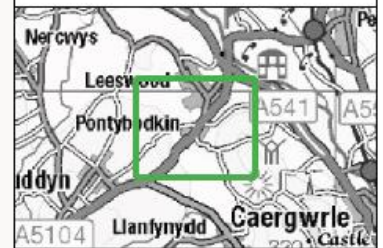
☒ TAN15 Defended Zones

Flood Map for Planning

Flood Zone 1

Flood Zone 2

Flood Zone 3



SCHEME:
Pontybodkin S19 Flood Investigation Report

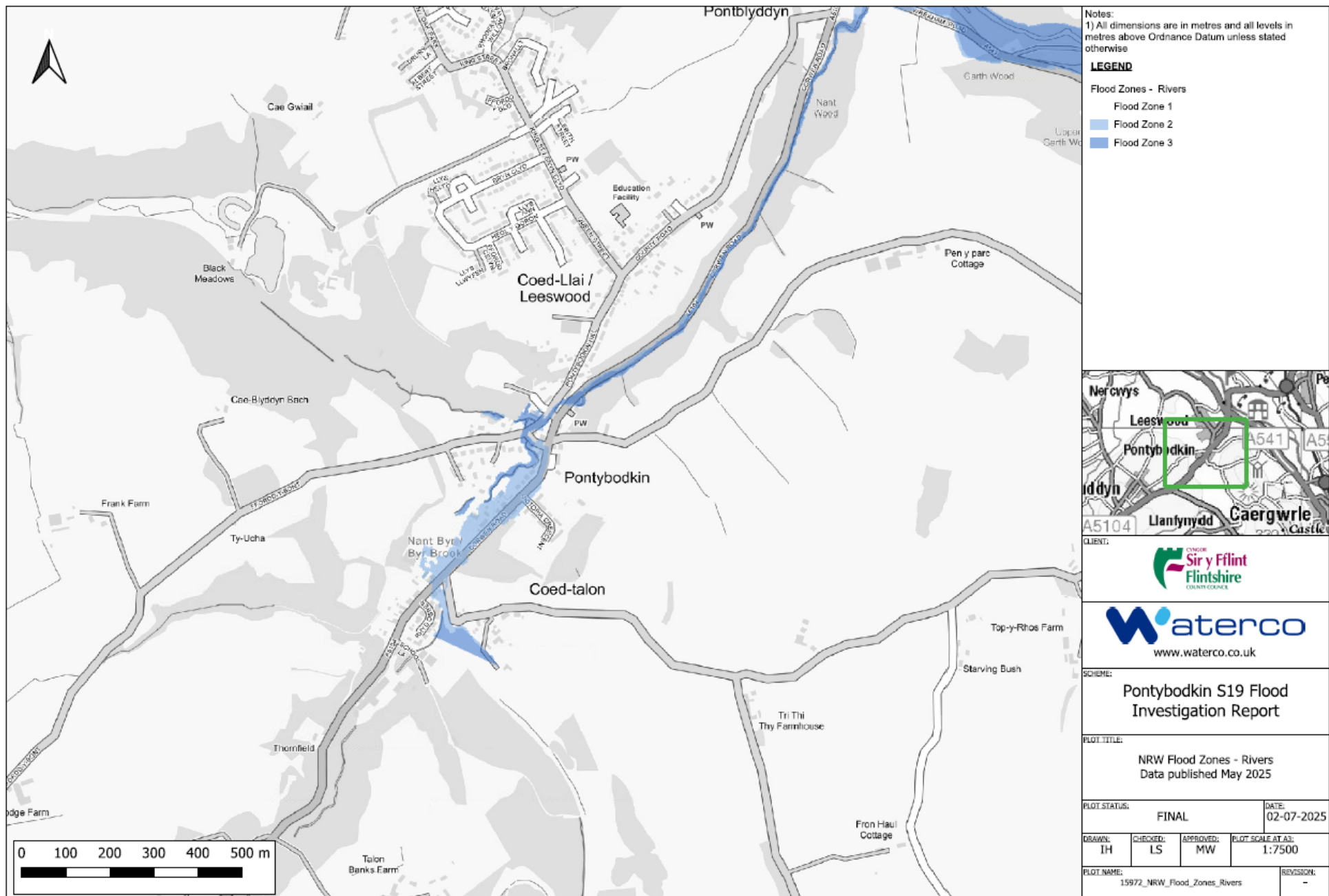
PLOT TITLE:
**NRW Flood Map for Planning (Rivers and Sea)
Data published May 2025**

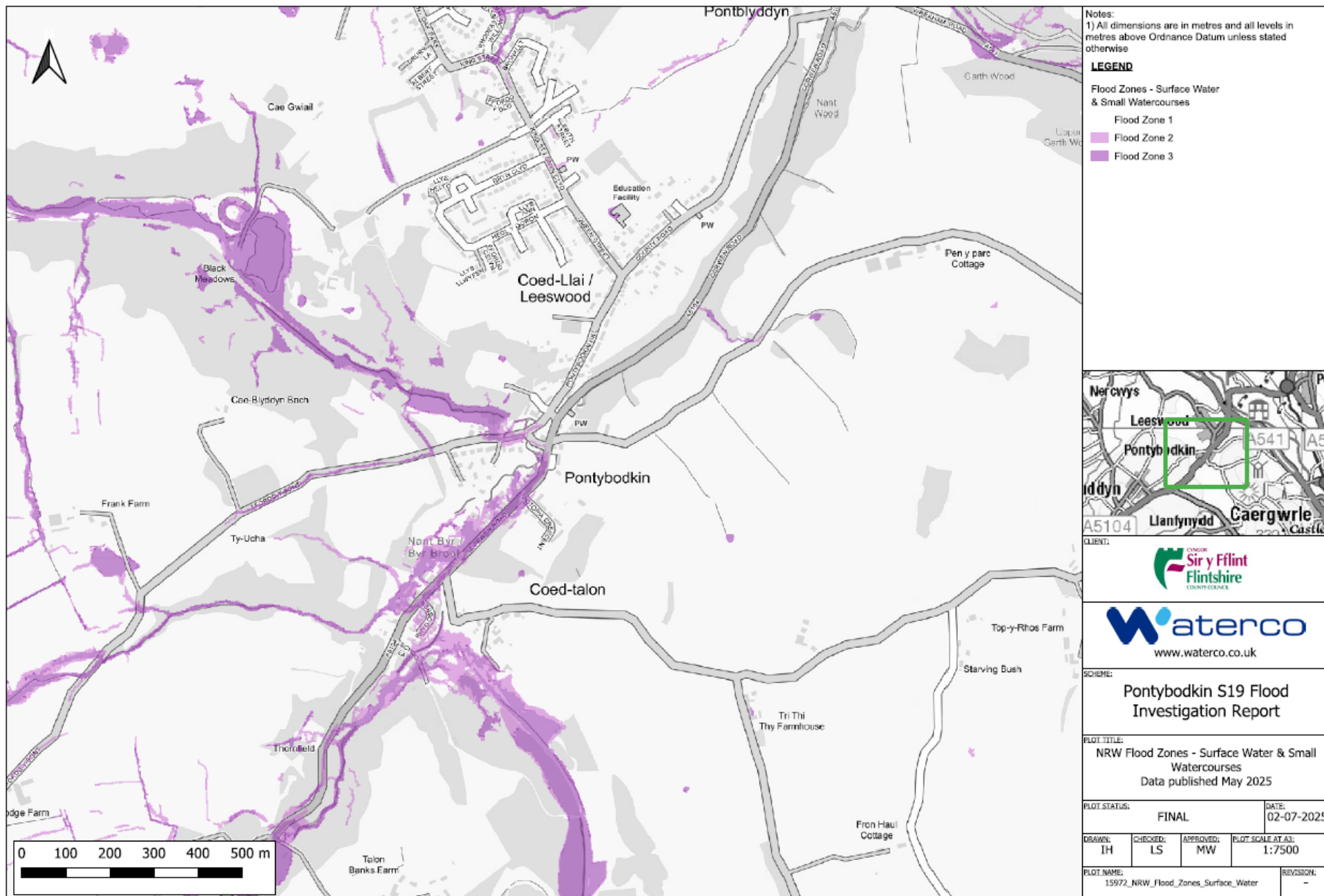
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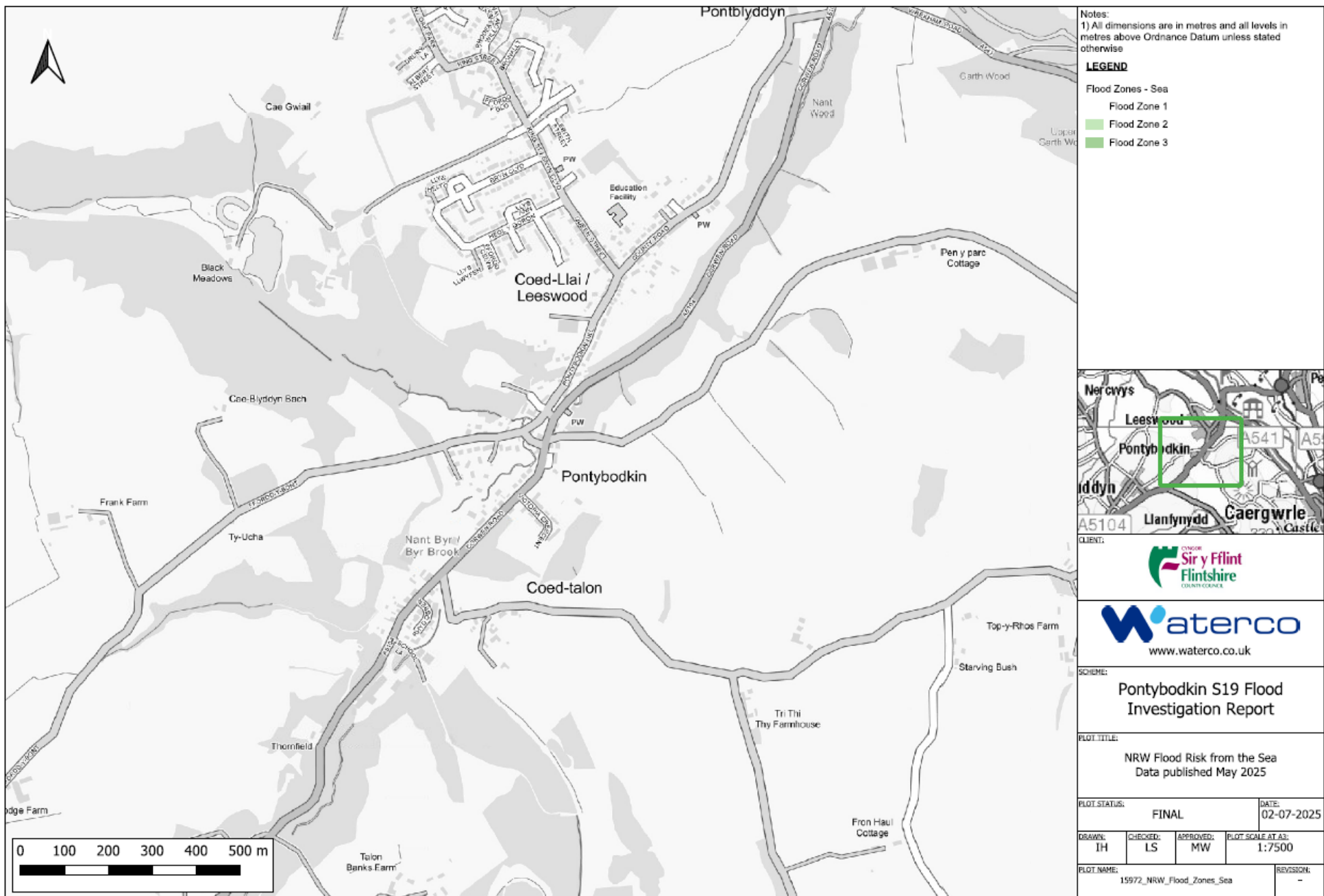
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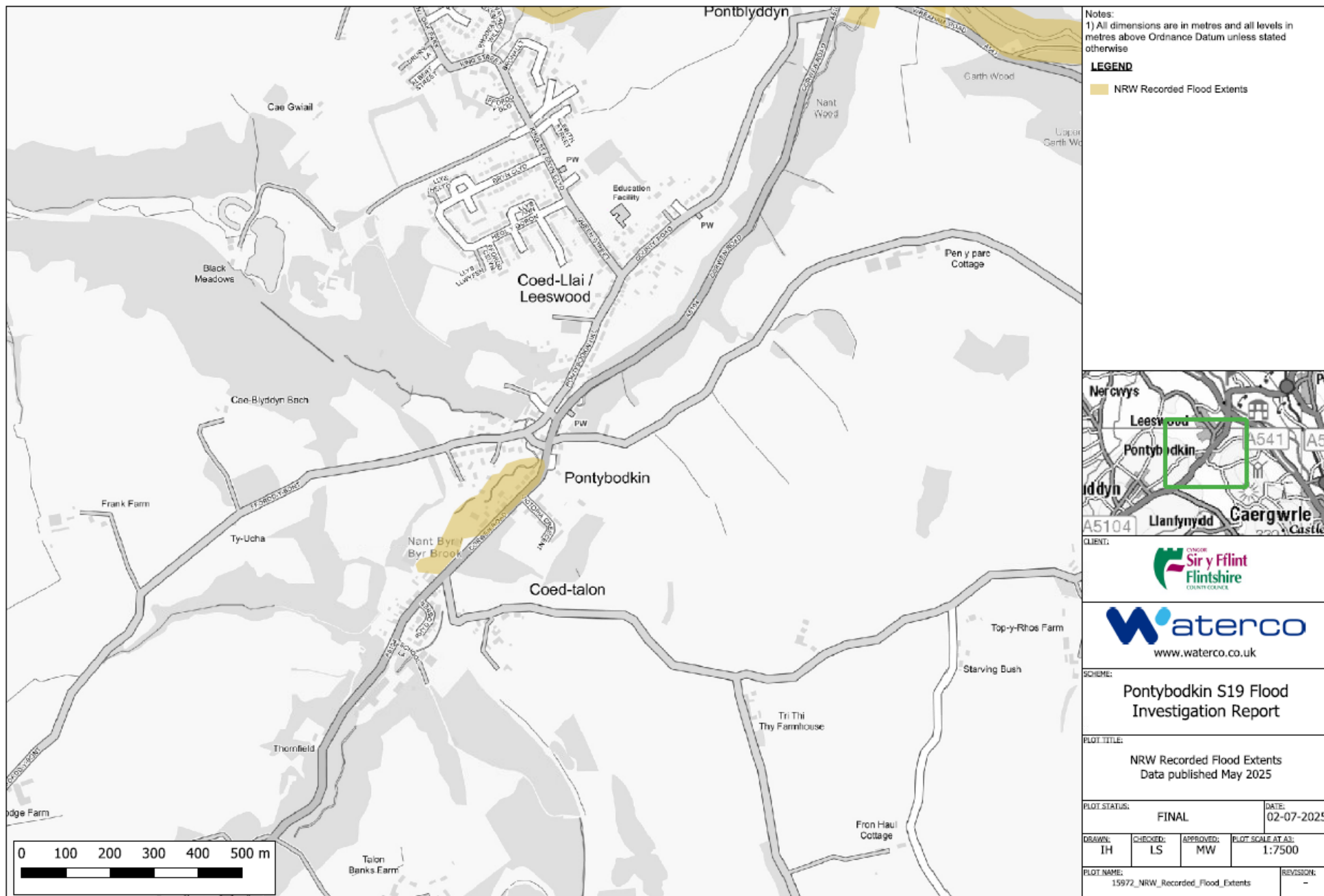
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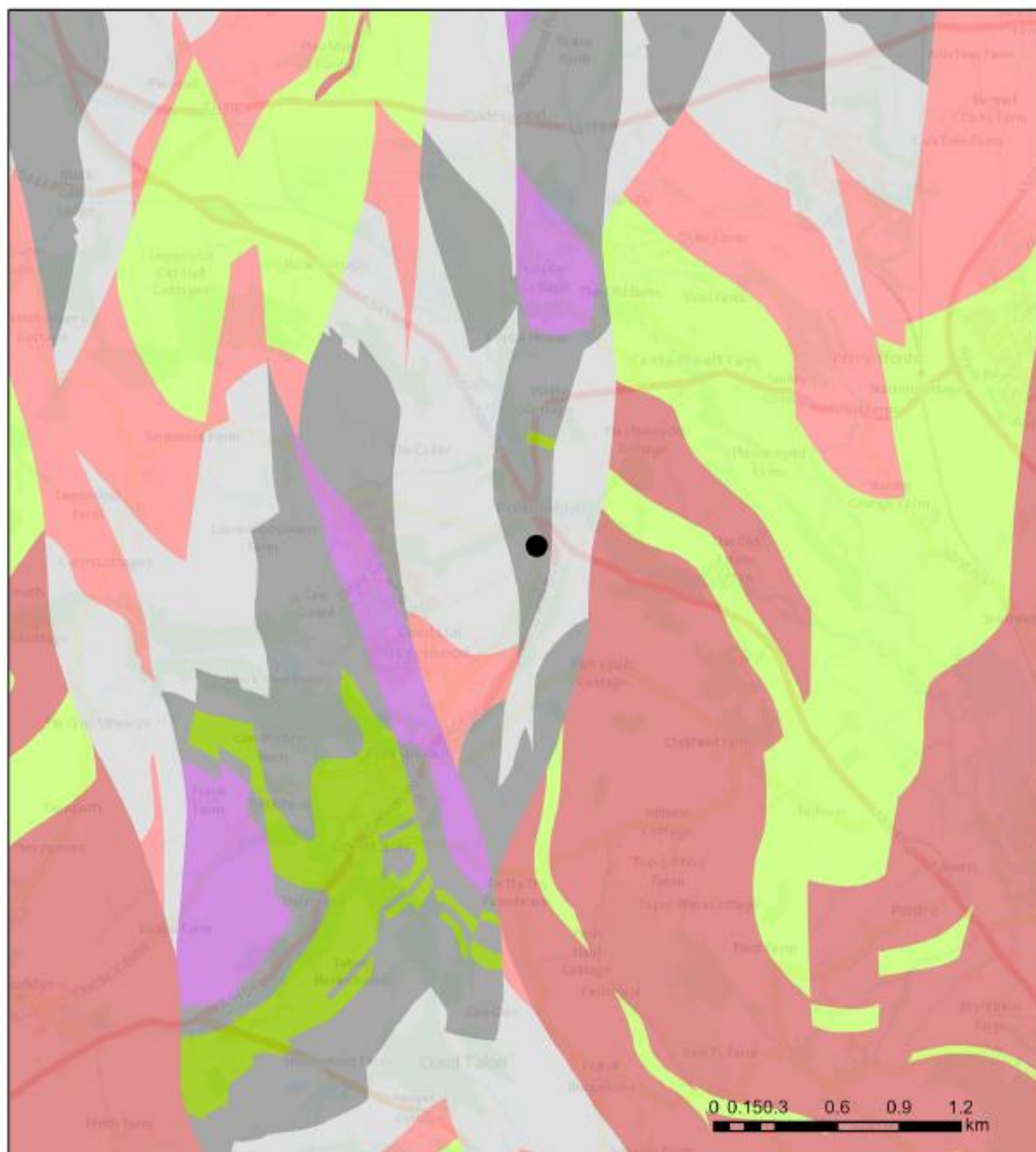
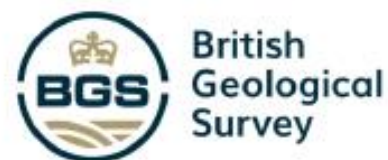




APPENDIX G

BGS Records

GeoIndex Report



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GeotIndex Onshore Data Sources: NERC, Natural England, English Heritage and Ordnance Survey

Map Key

Bedrock geology 1:50,000 scale

	<u>CEFN MAWR LIMESTONE FORMATION - LIMESTONE AND [SUBEQUAL/SUBORDINATE] ARGILLACEOUS ROCKS, INTERBEDDED</u>
	<u>PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE</u>
	<u>PENNINE LOWER COAL MEASURES FORMATION AND PENNINE MIDDLE COAL MEASURES FORMATION (UNDIFFERENTIATED) - MUDSTONE, SILTSTONE AND SANDSTONE</u>
	<u>ETRURIA FORMATION - MUDSTONE, SANDSTONE AND CONGLOMERATE</u>
	<u>MAIN SHALE BED (LLANGOLLEN AREA) - MUDSTONE</u>
	<u>CEFN-Y-FEDW SANDSTONE FORMATION - LIMESTONE</u>
	<u>MINERA FORMATION - LIMESTONE AND [SUBEQUAL/SUBORDINATE] SANDSTONE, INTERBEDDED</u>
	<u>GWESPYR SANDSTONE - SANDSTONE AND [SUBEQUAL/SUBORDINATE] ARGILLACEOUS ROCKS, INTERBEDDED</u>
	<u>SALOP FORMATION - MUDSTONE, SANDSTONE AND CONGLOMERATE</u>
	<u>KINNERTON SANDSTONE FORMATION - SANDSTONE</u>
	<u>PENNINE MIDDLE COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE</u>
	<u>MINERA FORMATION - SANDSTONE</u>
	<u>CEFN-Y-FEDW SANDSTONE FORMATION - SANDSTONE AND [SUBEQUAL/SUBORDINATE] ARGILLACEOUS ROCKS, INTERBEDDED</u>
	<u>BOWLAND SHALE FORMATION - MUDSTONE</u>
	<u>PENNINE LOWER COAL MEASURES FORMATION - SANDSTONE</u>
	<u>CEFN-Y-FEDW SANDSTONE FORMATION - CHERT</u>
	<u>HOLLIN ROCK - SANDSTONE</u>

GeoIndex Report



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GeoIndex Onshore Data Sources: NERC, Natural England, English Heritage and Ordnance Survey

Map Key

Superficial deposits 1:50,000 scale

	<u>GLACIOFLUVIAL DEPOSITS, DEVENSIAN - SAND AND GRAVEL</u>
	<u>GLACIOFLUVIAL ICE CONTACT DEPOSITS, DEVENSIAN - SAND AND GRAVEL</u>
	<u>GLACIOFLUVIAL SHEET DEPOSITS, DEVENSIAN - SAND AND GRAVEL</u>
	<u>TILL, DEVENSIAN - DIAMICTON</u>
	<u>ALLUVIUM - CLAY, SILT, SAND AND GRAVEL</u>
	<u>HEAD - CLAY, SILT, SAND AND GRAVEL</u>
	<u>RIVER TERRACE DEPOSITS (UNDIFFERENTIATED) - SAND AND GRAVEL</u>
	<u>ALLUVIAL FAN DEPOSITS - SAND AND GRAVEL</u>
	<u>LACUSTRINE DEPOSITS - CLAY AND SILT</u>
	<u>PEAT - PEAT</u>
	<u>SUPERFICIAL DEPOSITS - SEDIMENT</u>