

Appendix E - Critical Drainage Area Refinement



NOTE TO FILE

JBA Code 2019s0820
Contract Level 2 Hybrid SFRA
Client Greater Manchester Combined Authority
Date March 2020
Author Mike Williamson
Subject CDA Refinement Revision 02

1 Introduction

Eight of the ten GM district councils have Critical Drainage Areas (CDA) defined from previous SFRA (Stockport and Bolton districts have no defined critical drainage areas). The CDAs were defined for each council's own uses in order to impose more stringent guidelines on new development in CDAs. The CDAs however date back to between 2009-2011 and require updating using more recent and robust datasets.

The GM Level 1 SFRA (2019) produced 'Opportunity Areas for Further Critical Drainage Management' (OAFCDM) as a first step towards updating the CDAs using historic surface water and sewer flooding records held by the lead local flood authorities (LLFA) and United Utilities (UU); the surface water flooding hotspots from Greater Manchester Surface Water Management Plan (2013) and UU Drainage Area Zones.

2 Brief

The project brief for the Level 2 Hybrid SFRA is to refine the existing CDA and OAFCDM boundaries into updated CDAs. Recommendations for suitable surface water management in these areas should also be considered in a way that can be transferred into local planning policy.

The brief stated that the CDAs should be updated using the most up-to-date information available with a clear rationale for their locations/boundaries and enable practical use within the planning process. This should be supported by recommendations for management of surface water through the development planning system and policy approach for local plans.

Due to issues with data provisions and the timing of the GMSF programme, it was not possible to fully carry out the refinement of the CDAs and OAFCDMs. However, an agreed methodology has been formulated and is discussed in the following sections. This methodology is to be applied following the conclusion of the Level 2 SFRA for inclusion within a later stage of the GMSF and as part of individual district local plans.

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3 Datasets

In order to help satisfy the brief, UU were approached for information with the following datasets provided:

- Modelled Performance Data (2015)
- Historic flooding datasets (2009-2019) for internal (property) and external (outside of property) flood incidents

3.1 Modelled Performance Data

This point dataset represents over 110,000 manholes across GM that are represented in UU's drainage network model from 2015. The dataset shows, based on a model simulation up to a 1% AEP event, which manholes surcharge and which don't, and therefore where networks may be under capacity.

It also states whether floodwater is lost from the system i.e. to watercourses, therefore increasing volumes in nearby watercourses which may lead to fluvial flooding, via overland flow or is returned to the system as the flood event subsides.

Figure 2 shows all manholes modelled (red) and all manholes where water has been lost from the system (Flood_Type = 'Lost') to nearby watercourses via overland flow (blue). It is the manholes that surcharge and lose water from the drainage network that will be used to help refine the CDAs.

This data was not yet available for Bury district; the town of Bolton; Heywood in Rochdale; Leigh, Atherton and Lowton in Wigan district; and Irlam in Salford. However, UU stated that this data would be available in May 2020, which follows the deadline for the Level 2 SFRA. The decision was therefore taken to refine the CDAs following the SFRA once all required data is available.

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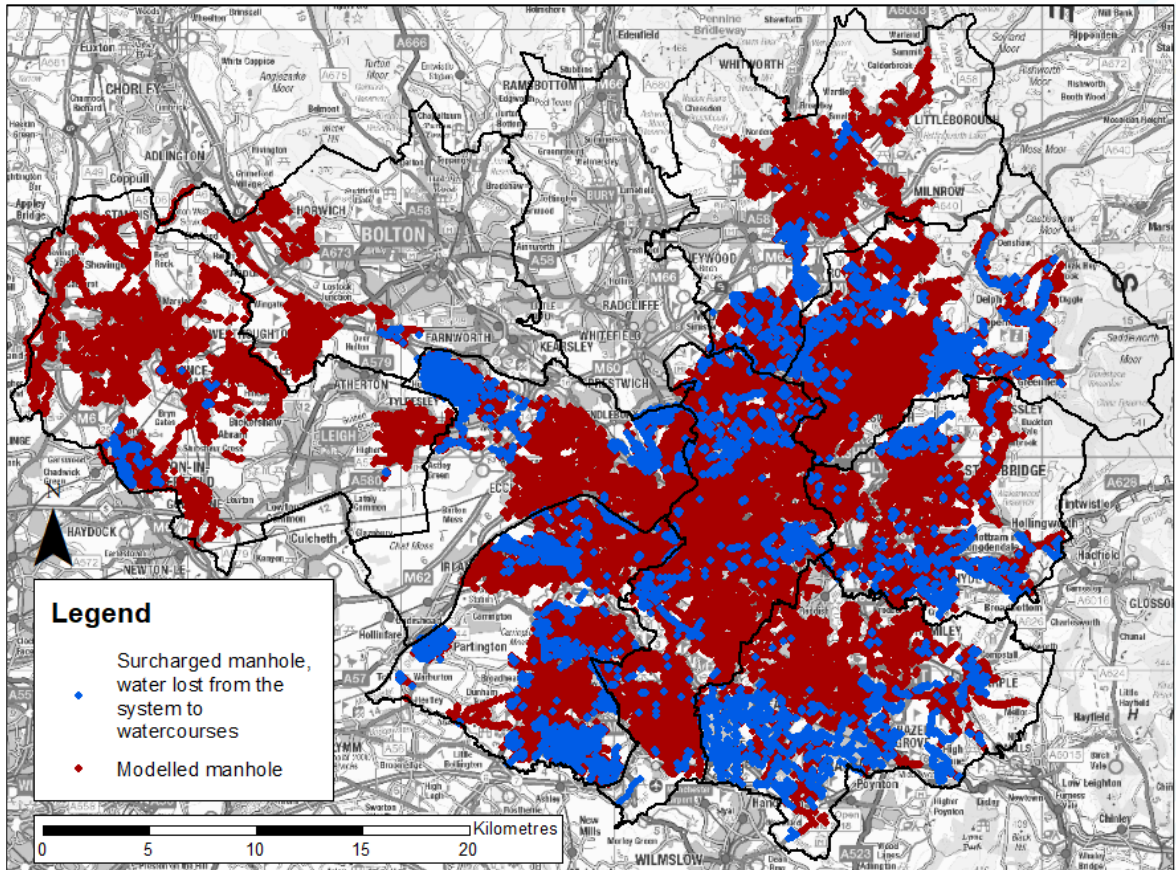


Figure 1: UU manholes from Modelled Performance Data dataset

3.2 Historic flooding

3.2.1 UU data

UU provided their database of historic surface water and sewer flood events from the period 2009 to 2019. The dataset is subdivided by whether the flood event flooded the interior of a property (internal) or land outside a property (external) i.e. gardens, driveways, roads, public open space. This dataset can be used to refine the CDAs based on locations that have been recorded as flooding in the past. Figure 2 below shows UU’s historic floods dataset.

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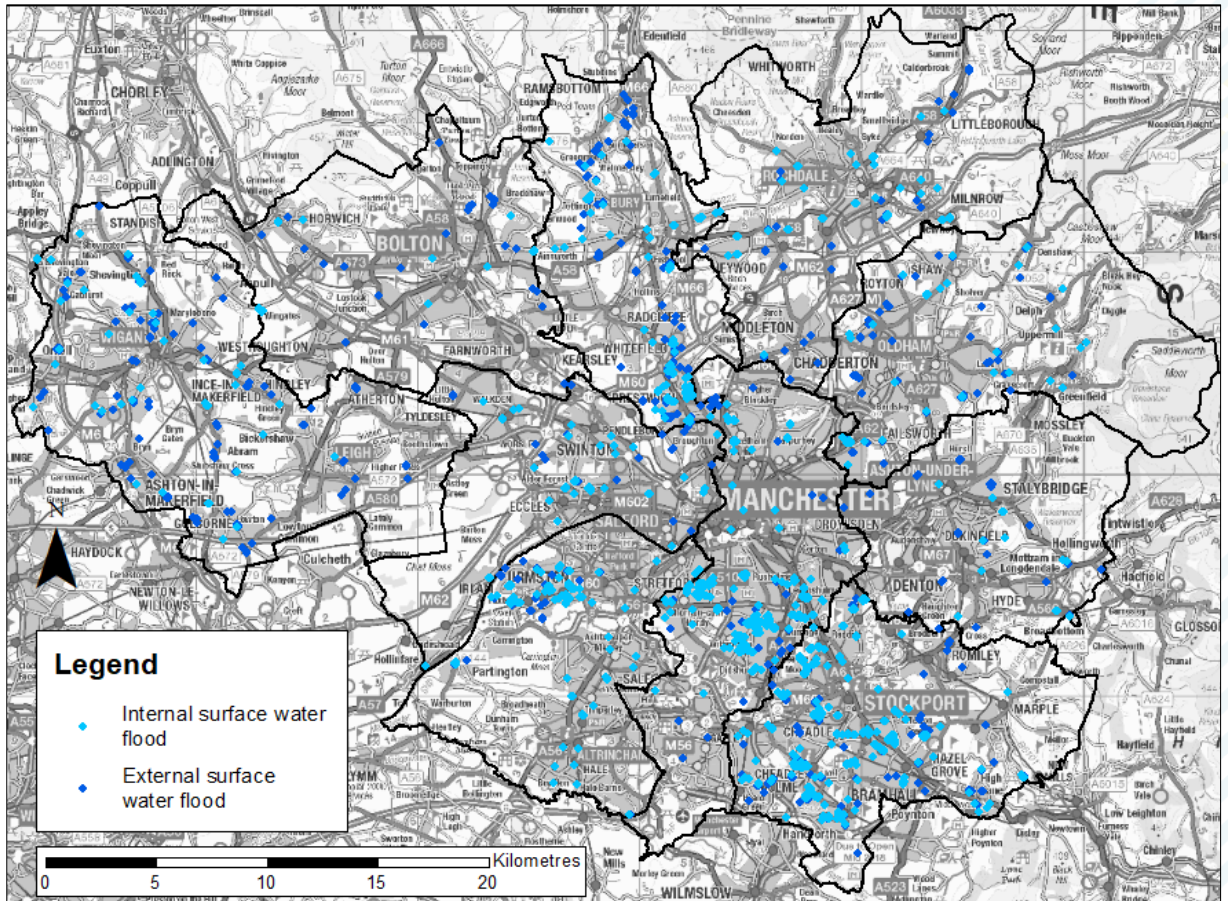


Figure 2: UU historic flood dataset

3.2.2 District Council and EA data

Bolton, Bury, Rochdale, Tameside, Trafford, Stockport and Wigan districts were able to provide their databases of recorded historic surface water flood events. The EA also provided a dataset of historic flooding from July 2019. These datasets can be used to assist with the CDA refinement.

The datasets include historic flood events from the following sources:

- Surface water runoff
- Runoff from land
- Sewers
- Groundwater

Figure 3 shows the historic locations.

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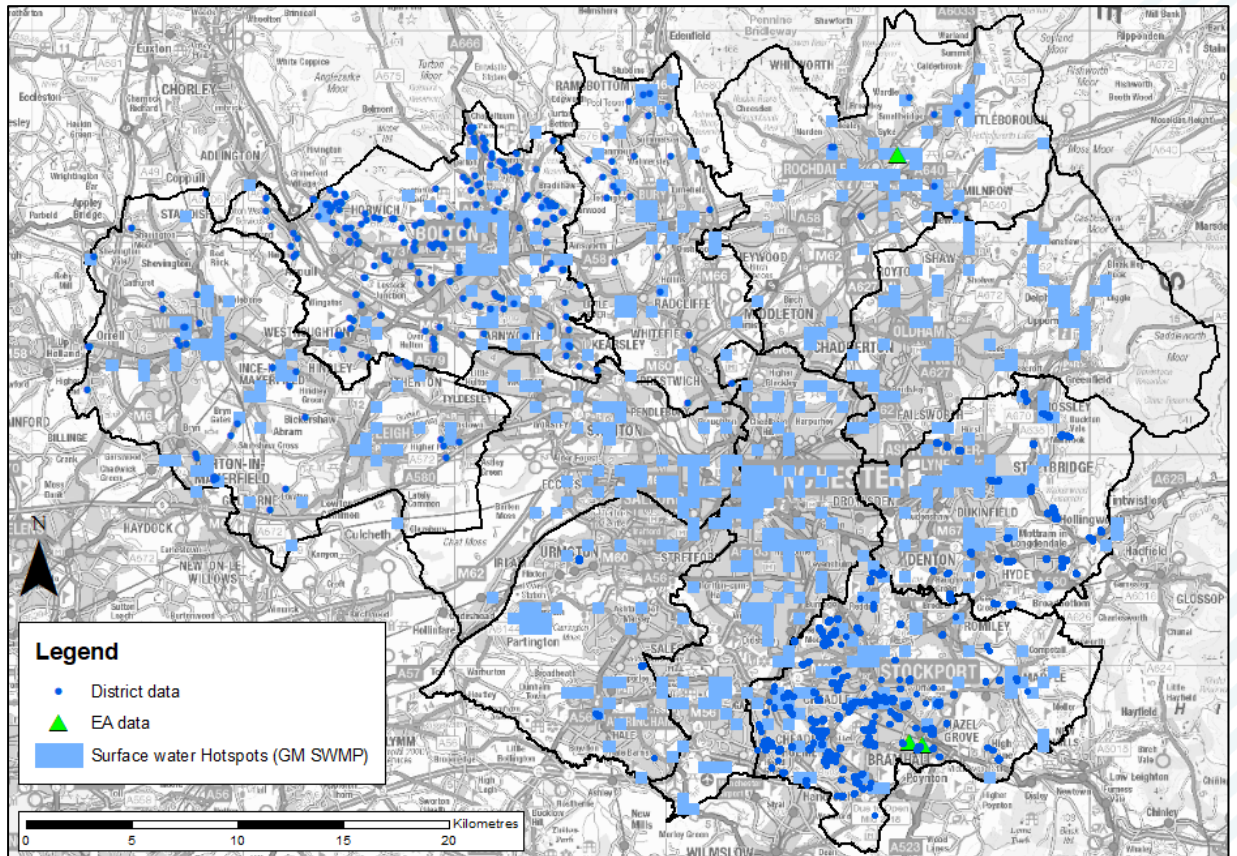


Figure 3: District and EA historic flood data

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4 Proposed Methodology

The datasets discussed can be used to refine the boundaries of the CDA and OAFCDM areas. Figure 4 maps each dataset against the CDA and OAFCDM boundaries.

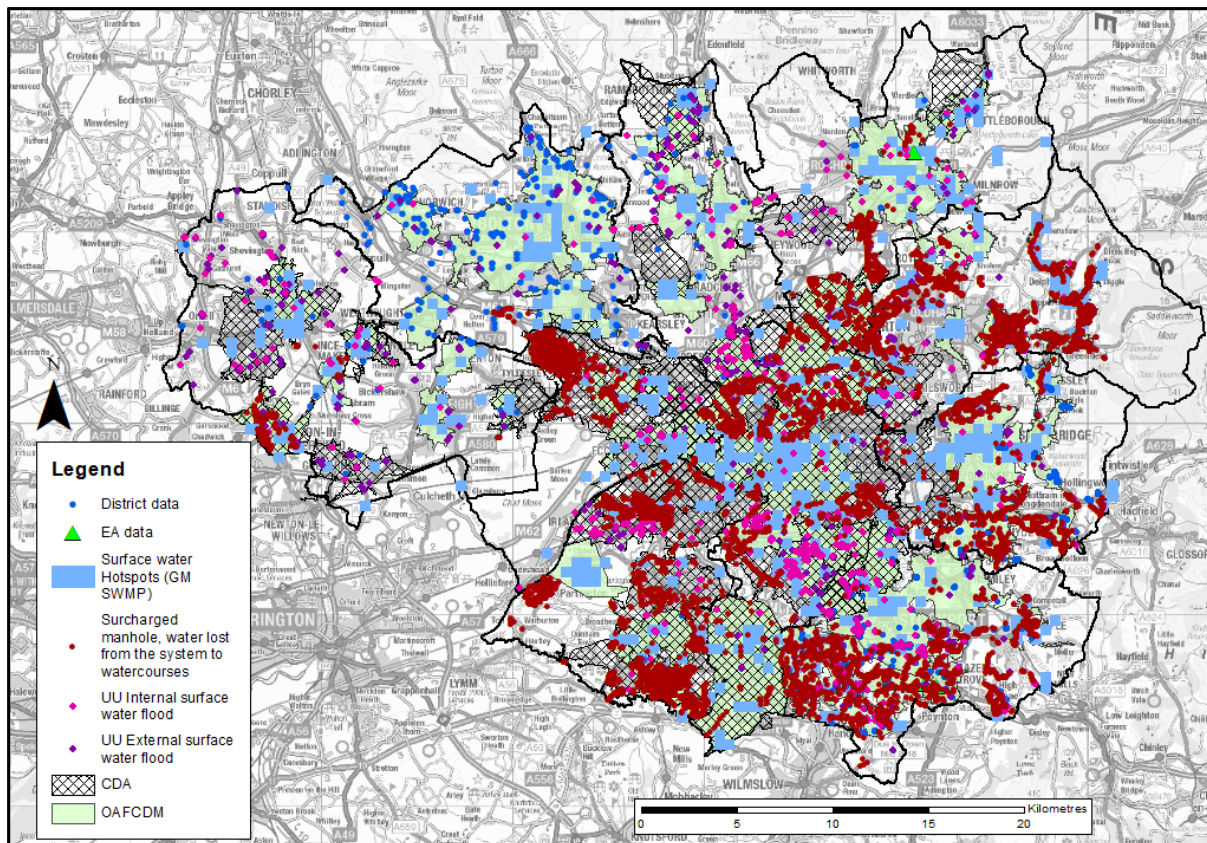


Figure 4: UU surcharging manholes, historic floods, CDAs and OAFCDMs

It should be possible to further refine the boundaries of the CDAs and OAFCDMs using the data provided and once the missing modelled performance data is made available by UU. It is noticeable when reviewing all current data, shown in Figure 4, that:

- Bolton Town Centre – currently an OAFCDM though could be a CDA based on the recorded historic evidence. Bolton District will have to agree to this,
- Partington in Trafford – currently not a CDA but there is evidence it should be given the number of surcharging manholes where water is

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lost to watercourses. Agreement will be required from Trafford District.

The methodology will involve manual editing of CDA and OAFCDM boundaries to:

- Include areas with significant clustering of historic surface water flood incidents within a CDA boundary,
- Exclude any area currently within a CDA where there is not any historic evidence, unless it is obvious from the topography that these areas drain into an urban area or where the LLFA advises otherwise based on local knowledge,
- Include areas shown by UU's modelled performance data to have significant clusters of surcharging manholes with water lost to watercourses.

The key to refining the CDAs is local knowledge from the LLFAs. Guidance will be required from the LLFAs to help inform on decisions taken, such as those examples above i.e. Trafford may not want Partington included within a CDA.

Once the missing UU modelled performance data is made available, a draft update of the CDAs and the OAFCDMs should be provided to districts for review and comment. Comments should then be accounted for in a final version of CDAs and OAFCDMs.

The end result should see the CDAs and OAFCDMs combined into a final Level 2 SFRA 2020 CDA dataset to be used by the districts to impose more stringent requirements on developers when managing surface water runoff on new developments.