Counters Creek Technical Appendix Flooding Investigations

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Section 1

Introduction

1.1 This is a technical appendix which provides supplementary information to the main Counters Creek Understanding of Flood Risk and Long-Term Strategy report. Table 1 shows the clauses in the performance commitment to which the supporting evidence relates. This information is provided as additional to the information contained in the Stage 1 to 4 London Flood Review Reports.

Table 1: Relevant clauses of the performance commitment

Requirement	Appendix section
A sufficient level of understanding of historic flooding within the Counters Creek Catchment and how the company will ensure it has processes in place to allow it to investigate and understand future flooding incidents when they occur. This applies to flooding incidents whether they are reported to the LLFA, Thames Water or/any other body.	2

Section 2

Processes to investigate sewer flooding

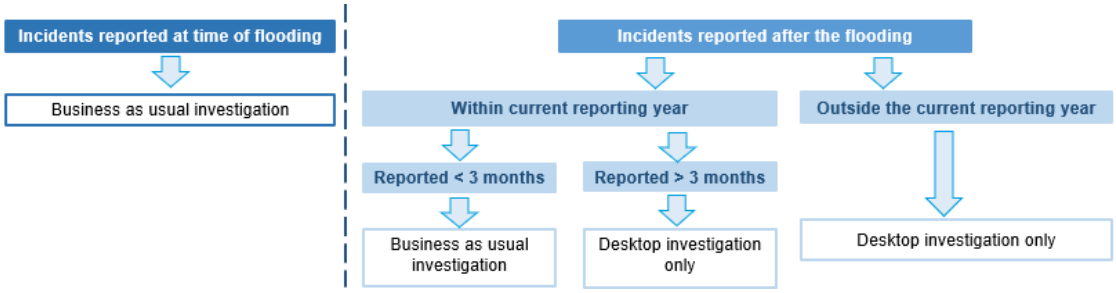
2.1 This section describes the processes we have in place to investigate and understand future flooding incidents.

A Process for investigating new risks

2.2 Our Sewer Flooding Methodology Supporting Guidance document details the processes that exist to capture and investigate reports of flooding events. Extracts are contained within this appendix. Figure 1 shows incidents are reported to us in one of two ways:

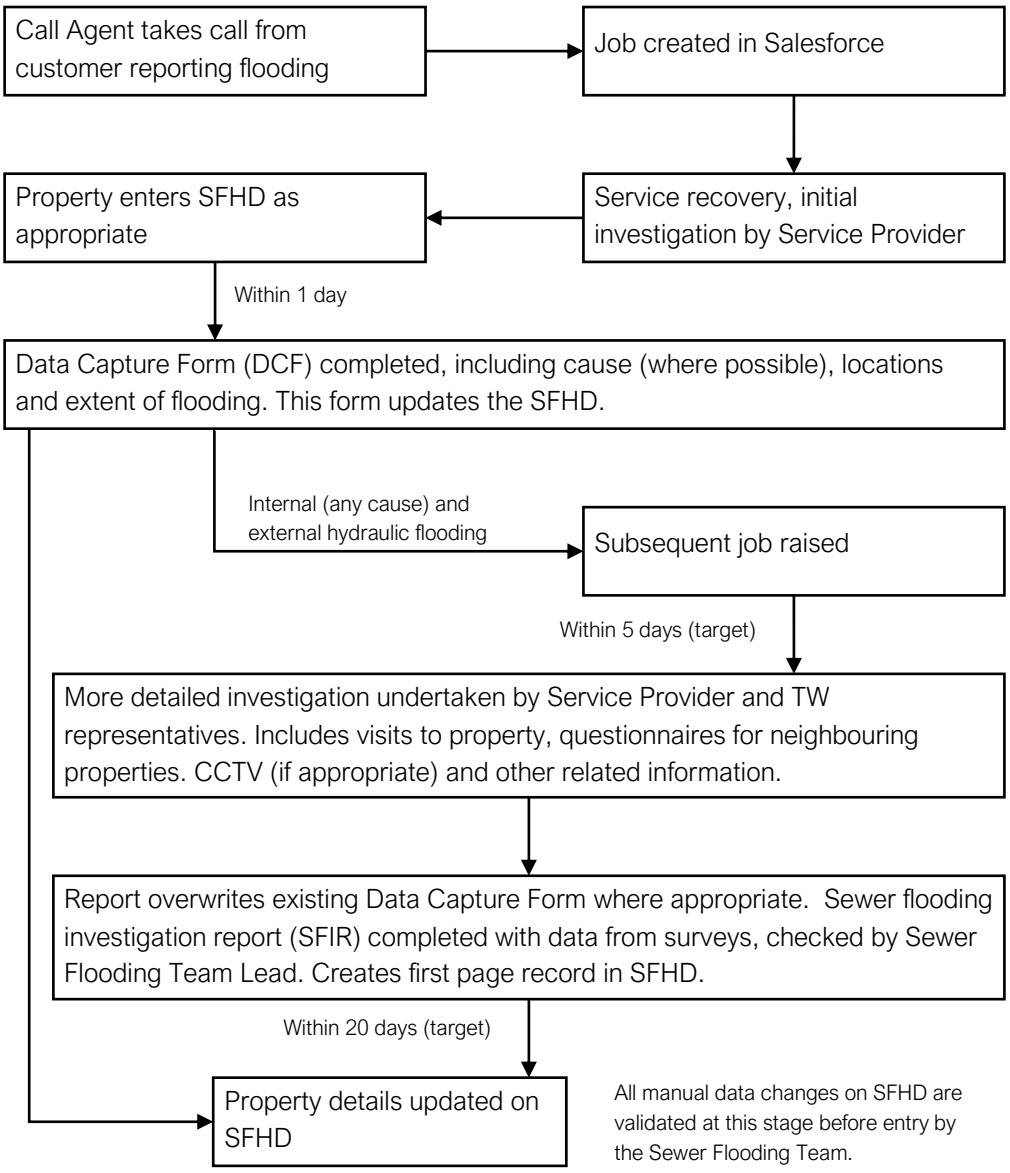
- Incidents and properties reported to us at the time of flooding
- Incidents and properties reported some time after the flooding has occurred (via questionnaires, surveys or other routes such as flooding instances reported to Lead Local Flood Authorities and social media)

Figure 1: Incident reporting timeline



2.3 Figure 2: Process for incidents reported at the time of floodingFigure 2 shows the process that occurs to investigate incidents reported at the time of flooding or within three months of the incident occurring.

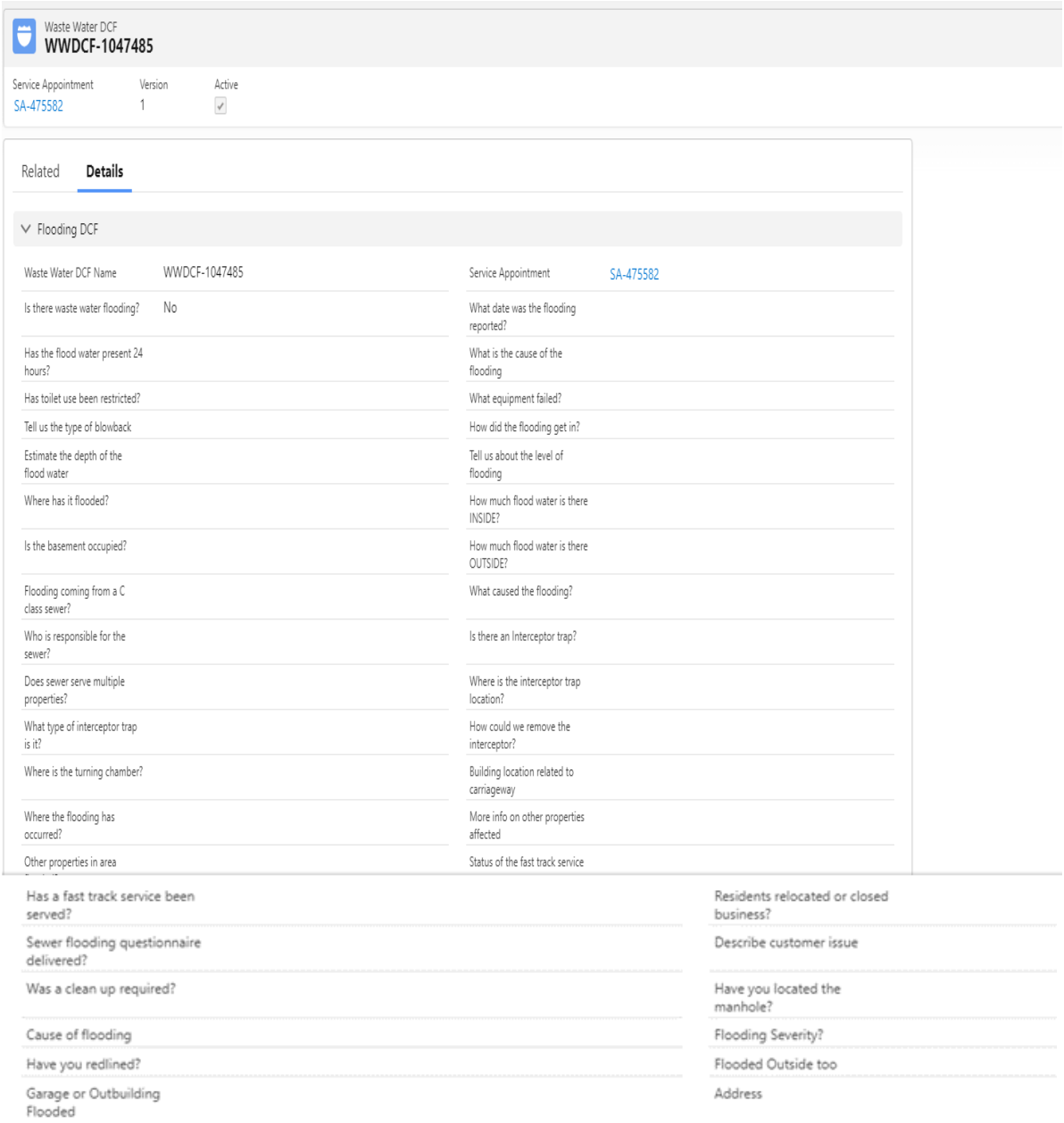
Figure 2: Process for incidents reported at the time of flooding



B Capturing data about flooding and root cause

2.4 The capturing of information early in the process is critical to the identification of the underlying root cause of flooding. Figure 3 shows the data capture form that is populated by Thames Water's representative on their first attendance at a location of reported flooding.

Figure 3: Screen shot of data capture questionnaire



Waste Water DCF
WWDCF-1047485

Service Appointment	Version	Active
SA-475582	1	✓

Related **Details**

Flooding DCF

Waste Water DCF Name	WWDCF-1047485	Service Appointment	SA-475582
Is there waste water flooding?	No	What date was the flooding reported?	
Has the flood water present 24 hours?		What is the cause of the flooding	
Has toilet use been restricted?		What equipment failed?	
Tell us the type of blowback		How did the flooding get in?	
Estimate the depth of the flood water		Tell us about the level of flooding	
Where has it flooded?		How much flood water is there INSIDE?	
Is the basement occupied?		How much flood water is there OUTSIDE?	
Flooding coming from a C class sewer?		What caused the flooding?	
Who is responsible for the sewer?		Is there an Interceptor trap?	
Does sewer serve multiple properties?		Where is the interceptor trap location?	
What type of interceptor trap is it?		How could we remove the interceptor?	
Where is the turning chamber?		Building location related to carriageway	
Where the flooding has occurred?		More info on other properties affected	
Other properties in area		Status of the fast track service	

Has a fast track service been served?	Residents relocated or closed business?
Sewer flooding questionnaire delivered?	Describe customer issue
Was a clean up required?	Have you located the manhole?
Cause of flooding	Flooding Severity?
Have you redlined?	Flooded Outside too
Garage or Outbuilding Flooded	Address

C Undertaking onsite investigations

2.5 An onsite investigation may involve surveys of the areas, CCTV, and sewer cleaning. For significant events and basement flooding in Hammersmith we are currently surveying every property in Holland Park which has flooded to understand the basement levels and the connectivity of the basement.

2.6 In any investigation survey calling cards are distributed to neighbouring properties if customers do not answer their doors. A sewer flooding investigation report is prepared and validated by our sewer flooding team for every internal and external hydraulic flooding event within 20 days of the incident of flooding.

2.7 Once CCTV and initial investigation work is undertaken, a series of decisions is made as to whether additional work is required. Flooding due to causes other than hydraulic is often investigated and ruled out, as per Table 2, prior to identifying an investigation for hydraulic flooding.

Table 2: Investigations to rule out other cause flooding

	Issue	Do raise work	Unsure Confirm work is not needed	Don't raise work
Structural Damage	Collapse/ Deformation	A collapse is where nothing can pass through the line and completely restricts the flow. Deformations must be severe and limiting flow as a result	Evidence of damage or deformation is visible, but no history of blockages	Fractures exist but aren't significant in number or size, deformation is present, but flow is not restricted
	Sewer Fracture/ Missing materials	Severe deformation or facture, with areas of missing bricks, fabric or mortar	Deformation, multiple cracks, factures and displaced or hanging bricks.	Deformation or cracking is visible but doesn't restrict flow. Some loss of mortar or fabric
	Displaced Joint	Displacement is severe for surface water or evident for foul, going against flow and catching debris. Invert is missing or dropped	Connections are badly made. Open joint could allow debris to ingress. Drop to invert could potentially affect future flow	Displacement is visible but unlikely to cause a blockage. Line is smooth and going with flow
	Belly	Belly is holding water and catching debris, no or low sewer gradient.	Belly on downwards gradient visible, but not collecting debris	Belly is present but not causing any immediate issues, gradient is steep
Service	Fats Oils and Grease	Heavy FOG build up in the line, which is	FOG build up presents potential risks in the future	FOG present on the sides with low or no obstruction risk

	Issue	Do raise work	Unsure Confirm work is not needed	Don't raise work
		restricting flow and catching debris		
	Scale	Scale is severe in line, restricts flow and is catching debris. There is also a history of blockages	Scale is present in line and restricts flow. No debris being caught, and no history of blockages	Scale is present but with little or no impact on flow
	Roots	Roots in line from the base of the sewer and/or severely restricting flow	Visible roots in sewer but not disturbing flow	Root ingress (i.e. fibrous roots) can be seen entering from the top or sides of the sewer
	Obstructions	Obstruction in the line and restricting flow	Obstruction in line but could potentially restrict flow in future	Obstruction not restricting flow
	Manhole	Broken or missing cover, cracked lid or presents a trip hazard	Hairline cracks or missing screws. Frame dented or doesn't sit flush. Rattling or seized cover	Surface rust on manhole. Other aesthetic reasons. No structural damage

D Reviewing the evidence

2.8 Every incident of reported flooding goes through five tests to ensure we understand what type of flooding it is, what causes it and how we can resolve it. The five tests shown in Figure 4 are:

- Test 1 – Does the flooding arise from a Thames Water asset? This test records whether the flooding is the responsibility of Thames Water or a third party or a third-party impact contributing to a hydraulic flooding incident. Where the impact is related to a third party, we will work with the appropriate Regional Flooding body to share data.
- Test 2 – What is the root cause of the sewer flooding? This test helps us understand whether the flooding is related to hydraulic or other cause reasons such as blockages, collapses, equipment failure, blow back or third-party damage. We will also consider the rainfall return period that occurred at the time of the incident using radar or rain gauge data.
- Test 3 – Is the flooding internal or external (property or non-property)? This test helps us categorise the type of flooding and how customers are affected by it.
- Test 4 – What level of evidence is available to validate tests 1-3? This test allows us to evidence our assumptions on tests 1 to 3 and assign confidence grades.

Evidence may be collected through on-site investigations such as CCTV and customer questionnaire responses, conversations with customers, and results from hydraulic models.

- Test 5 – Is the incident reportable as a flood or not? This helps us differentiate between actual flooding, restricted toilet use and damp.

Figure 4: Example of five tests

Test 1 – Asset Causing Flooding		
TW asset	Public sewer	✓
	TW SPS	×
	TW STW	×
	Other TW asset	×
Private asset	Private drain	×
	Private SPS	×
	Clean water asset	×
	Other non-TW asset	×

Test 2 – Flood Cause		
Sewer Flooding Other Cause	Blockage	✓
	Collapse	×
	Equipment failure	×
	Blow back	×
Incidents outside the company's control	Third Party Abuse	×
	Customer negligence	×
	Hydraulic overload	×
	Severe weather	×
Repeat flood		×

Test 3 – Location of Incident		
Internal flooding	Reception Room	✓
	Kitchen	✓
	Bedroom	✓
	Hallway	✓
	Bathroom / WC	✓
	Basement / Cellar	✓
	Suspended floor/void area	✓
	Conservatory	×
	Porch	×
	Integral Garage	×
	Basement Carpark	×
	Office space	×
	Commercial storage areas	×
External flooding	Detached / Link detached garage	×
	Shed, outbuilding or summer house	×
	Temporary Structure	×
	Outside toilet	×
	External Swimming pool / Jacuzzi	×
	Basement car park	×
	Domestic Garden	×
	Storage building	×
	Domestic storage building	×
	Driveway	×
	Car Park	×
	Agricultural barn / stables	×
Non property flooding	Parking / hardstanding area	×
	Highway	×
	Footpath	×
	Field / open space / parkland	×
	Road	×
	Railway	×

Test 4 – Level of Evidence		
Two or more sources required from this list	Customer statement	✓
	Engineer's comments	×
	Completed Data Capture Form	✓
	Photographs	✓
	Video footage	×
	Proof of a valid insurance claim	×
	Hydraulic modelling	×

Test 5 – Incident Type		
Flooding incident	Pool of sewage	✓
	Deposits of solids or rag around manhole	✓
	Sewage deposited in appliances, bath, sink or shower	✓
	A large damp area on the floor (>1m2)	✓
Non-flooding incident	A small damp area on the floor (<1m2)	×
	Restricted use of all plumbing features	×
	Surcharged sewer	×

2.9 For flooding incidents which are reported > 3 months or at the end of the year a desk top review is undertaken for any remaining flooding incidents. This review includes analysis of work orders, CCTV, and GIS mapping data including levels, property history and neighbouring property history, rainfall analysis and property age information.

2.10 Prioritisation of actions for resolutions of flooding is covered as part of our drainage and wastewater management plan process.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Water