SITE ASSESSMENT - Guildhall

Address: High Street, Kingston, KT1 1EU

Area: 1.26 **Ha**

Site Reference: SA 019

Current Use	Proposed Use
Council Offices, Civic	Residential (177 units assuming 100% residential). Guildhall Building 1 must be conserved.

Current Vulnerability Classification	Proposed Vulnerability Classification
Less Vulnerable	More Vulnerable

Current Risk Summary

Fluvial / Tidal			Groundwater		
FZ2	100	% of Site	<25	1.1	% of Site
FZ3a	81.5	% of Site	25-50	22.1	% of Site
FZ3b	4.4	% of Site	50-75	76.8	% of Site
Surface Water			>75	0	% of Site
1 in 30*	1.4	% of Site	**Artificial**		
1 in 100*	20.2	% of Site	Reservoir	Y	At risk?
1in 1000*	43.1	% of Site	Canal	N	At risk?
Sewer Flooding			**Town Centre**		
No. Incidents		65-84	Y/N	Y	

Flood Defences

The site is not in an area benefitting from flood defences.

Flood Warning Area

The EA Flood Warning Service is available at this site.

FLUVIAL / TIDAL

Risk Assessment (Defended) - River Thames

Parameter	FZ3b	FZ3a	*FZ3a+CC	Units
Speed of inundation	N/A	N/A	N/D	Hrs
Min. Depth	N/A	N/A	0.154	m
Max. Depth	N/A	N/A	1.97	m
Max. Velocity	N/A	N/A	0.36	m/s
Max Flood Level	N/A	N/A	8.51	m AOD
Max Ground Level	N/A	N/A	8.57	m AOD
Min Ground Level	N/A	N/A	5.76	m AOD
Max Flood Hazard	N/A	N/A	2.17	N/A
Duration of Flood	N/A	N/A	N/D	Hrs

* The +35% Climate Change Allowance event (upper end allowance extreme case) is reviewed

Risk Assessment (Undefended) - Hogsmill

Parameter	FZ3b	FZ3a	*FZ3a+CC	Units
Speed of inundation	N/D	10.25	5	Hrs
Min. Depth	0	0	0	m
Max. Depth	3.22	3.6	4.26	m
Max. Velocity	1.80	1.88	1.71	m/s
Max. Hazard	8.31	9.29	10.07	N/A
Duration of Flood	N/D	>23	>23	Hrs

Description of Flood Mechanism

- The site is at risk of flooding from the River Thames and the Hogsmill River.
- The Hogsmill River presents the highest risk to the site as it flows directly through the site.
- The River Thames, which is located 0.2 km from the western boundary of the site also presents a risk to the site.
- Flooding originating from the Hogsmill inundates the site from the south east, covering most of the site.
- The flood extent for the climate change scenario covers the entire site. The flood hazard and depth is also expected to increase.
- Figures 1 and 2 show the fluvial flood risk from the Hogsmill River.

Note: EA are due to update River Thames model

Figure 1 - Fluvial Flood Depth Map

Site Access / Egress

Safe refuge areas should be provided on site to account for the predicted impact of climate change on flooding at the site.

Figure 2 - Fluvial Flood Hazard Map

Mitigation / FRA Requirements

- Only water compatible or essential uses (subject to the Exception Test) are permitted in FZ3b i.e. along the banks of the Hogsmill River in the centre of the site. Development in this area which is located above the design flood level is still designated as fucntional floodplain.
- Self-contained basement dwellings and bedrooms are not permitted in FZ2 (the entire site). See SFRA Level 2 Report mitigation requirement number 4.10 for additional basement stipulations.
- See SFRA Level 2 Report mitigation requirement number 4.8 for Main River stipulations.
- See SFRA Level 2 Report mitigation requirement numbers 4.3, 4.4, 4.5 and 4.6 for further development stipulations.
- Develop a Flood Emergency and Evacuation Plan for the site.
- Site users should be signed up to the EA's Flood Warning Service.

SURFACE WATER

Risk Assessment

Parameter	1 in 30	1 in 100	1 in 1000*	Units
Min. Depth	0	0	0	m
Max. Depth	0.60-0.90	>1.20	>1.20	m
Max. Velocity	1.00-2.00	>2.00	>2.00	m/s
Max. Hazard	1.25-2.00	>2.00	>2.00	N/A

*1 in 1000 year flood extent represents the potential climate change adjusted impact of current risk

Description of Flood Mechanism

- The south east of the site is at risk of surface water flooding.
- Surface water flows along the Hogsmill River channel and enters the site from the south east corner.
- Climate change is predicted to increase the extent of flood risk within the site, with surface water surrounding the site.

Site Access / Egress

Safe refuge areas should be provided on site to account for the predicted impact of climate change on flooding at the site.

Figure 3 - RoFSW Flood Depth Map

Mitigation - Flood Risk Requirements

- Developments should be restricted to areas of lower flood risk and directed away from the south-eastern corner of the site.
- See SFRA - Level 2 Report mitigation requirement numbers 4.2, 4.3, 4.5, 4.6 for further development stipulations.

Figure 4 - RoFSW Flood Hazard Map

Mitigation - Surface Water Drainage

- A Kingston SuDS Proforma must be submitted with the planning application.
- Developments should apply the Sustainable Drainage Hierarchy set out in Policy SI13 of the London Plan.
- Ground investigations are required to confirm whether infiltration based SuDS are suitable.

SITE ASSESSMENT - Guildhall

SEWER

Risk Assessment

• This site is located between two 4 digit postcodes, KT1 1 which has 65 recorded sewer flood incidents and KT1 2 which has 84.

Figure 5 - Thames Water Sewer Flood Map

Mitigation Requirements

• Applicant must consult with TWUL to confirm if the development site has historically flooded.
• Where historic flooding has occurred, the applicant must show how this risk will be managed for the lifetime of the development.

GROUNDWATER

Risk Assessment

• The majority of the site is located within an area classified as having 50-75% susceptibility to groundwater flooding.
• The southern section of the site also has area classified as having 25-50% groundwater susceptibility.

Figure 6 - Areas Susceptible to Groundwater Flooding Map

Mitigation Requirements

• Applicant should carry out a screening study (as a minimum) to establish if there are any subterranean flood risk issues that may require further investigation.
• If there is a potential impact, mitigation actions must be proposed.
• Must be prepared by a chartered professional or specialist.

ARTIFICIAL

Risk Assessment

• The site is at risk from a number of reservoirs including the Hampton (Grand Junction, Stain Hill, Sunnyside), Island Barn, Queen Elizabeth II, Queen Mother, Staines (North & South), Walton (Bessborough & Knight), and Wraysbury reservoirs.
• If any of these reservoirs breach on a wet day i.e. when the local rivers are at capacity, the site will be at risk of flooding.

Figure 7 - Outline Reservoir Flood Map

Mitigation Requirements

• Propose appropriate and proportionate risk management measures.
• A suitable emergency response plan should be put in place, including an emergency warning system in the event of a reservoir flooding incident.
• Local Authority Emergency Planning Officers must be consulted to create a reservoir failure emergency and evacuation plan.

PLANNING CONSIDERATIONS

Safety of Development

A. Can the development be future proofed for climate change considerations?
• Restrict development from FZ3b in the centre of the site.
• Yes. See SFRA - Level 2 Report mitigation requirement numbers 4.2 and 4.4 for the required finished floor levels and flood resistant / resilient building stipulations.

B. Can the development be designed safe throughout its lifetime without increasing flood risk elsewhere?
• Yes. The development must use surface water drainage techniques to manage surface water runoff onsite through above ground SuDS and / or below ground attenuation. Green drainage infrastructure should be prioritised to provide wider ecological / biodiversity benefits as per London Plan Policy SI 13.
• See SFRA - Level 2 Report mitigation requirement numbers 4.5 and 4.6 for compensatory flood storage and void stipulations.

C. What is the cumulative impact of the development land use change and will flood risk increase?
• The development land use is changing from the 'Less Vulnerable' to 'More Vulnerable' classification. The site is proposed to be used for residential purposes.
• The site is currently a brownfield site with hardstanding areas and little green space. This offers an opportunity to improve flood attenuation through the new development.
• Development must mitigate any increase in impermeable area to the site with flood plain compensation and runoff storage to prevent any increase in flood risk. An increase in impermeable area coverage on site will increase surface water runoff and flood risk if not managed properly.

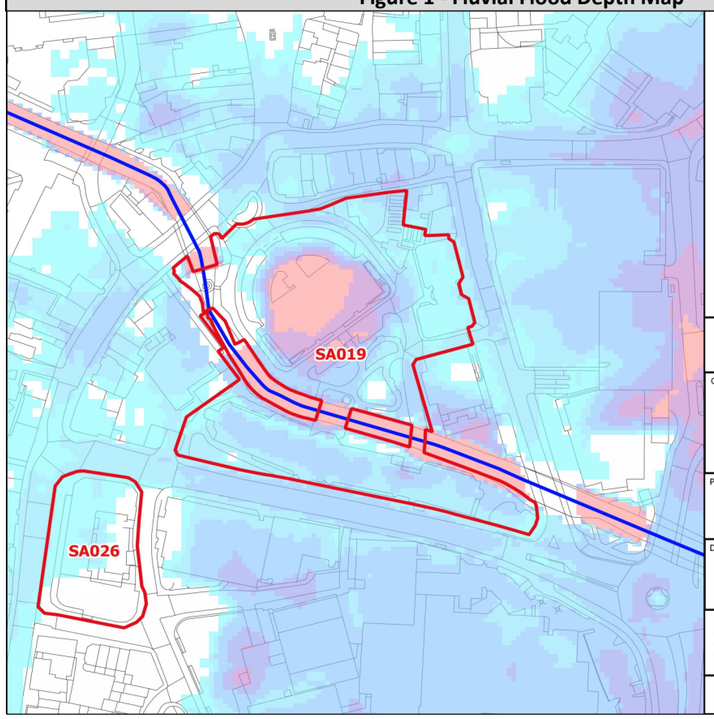
D. How can the development reduce risk overall?
• Directing development away from the south-eastern corner and centre of the site.
• Include SuDS to manage surface water runoff and reduce runoff rates to comply with Policy DM 4 in Kingston's Core Strategy.
• By complying with SFRA - Level 2 Report mitigation requirement numbers 4.2, 4.4 and 4.5.

E. Will development require a flood risk permit/watercourse consent?
• Yes. The site is within 8m of a Main River (Hogsmill River) so requires a flood risk activity permit in addition to planning permission.

F. Is the Exception Test required?
• Yes. The Exception Test is required for the site area located in Flood Zone 3a (most of the site). It can be passed by making the site safe throughout its lifetime without increasing flood risk elsewhere (see questions A, B, and C).

G. What are delivery challenges in developing at this site in terms of passing the Exception Test?
• Any new development must be set back by 8m from the bank of the Hogsmill River.
• Due to the high flood levels predicted for the 1 in 100 year + CC event, achieving the required finished floor levels may not be feasible (see SFRA requirement 4.3).
• A large proportion of the site requires flood compensation storage which may not be feasible given the volume-for-volume /level- for- level stipulation. (See SFRA - Level 2 Report mitigation requirement number 4.5).

Figure 1 - Fluvial Flood Depth Map



Legend

- Kingston borough boundary
- Site Allocations

Detailed River Network
- Main River
- Main River - Culverted
- Ordinary Watercourse
- Ordinary Watercourse - Culverted

Fluvial maximum flood depth (m) - 1 in 100 year+35% event
- 0.00 - 0.15
- 0.15 - 0.30
- 0.30 - 0.60
- 0.60 - 0.90
- 0.90 - 1.20
- >1.20

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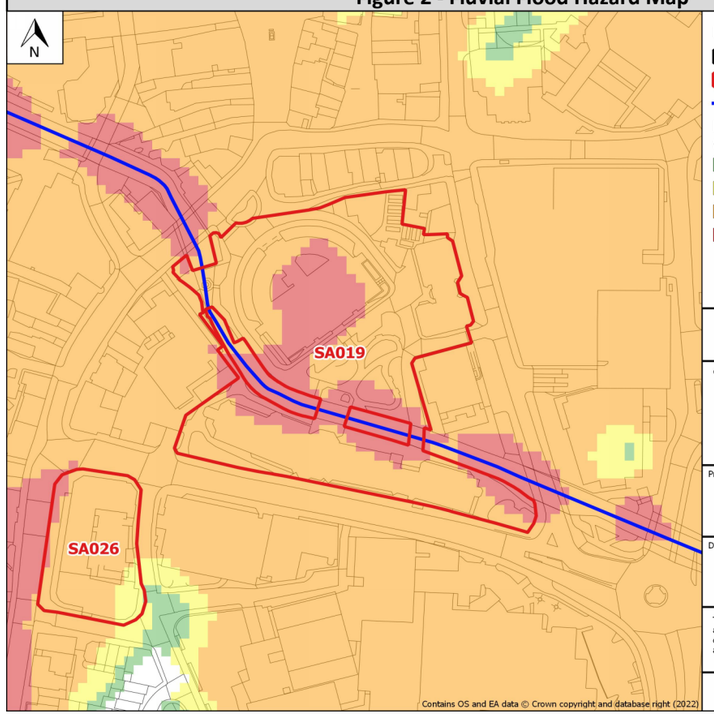
Client: The Royal Borough of Kingston upon Thames

Project Title: Level 2 Strategic Flood Risk Assessment

Drawing Title: Fluvial flood depth (1 in 100-year+35% Climate Change Allowance Event)

1:1,500 | Drawing Size A3 | Drawing Number Figure No.1

Figure 2 - Fluvial Flood Hazard Map



Legend

- Kingston borough boundary
- Site Allocations
- Main River

Fluvial maximum flood hazard rating (1 in 100 year + 35% event)
- Low Hazard
- Danger for Some
- Danger for Most
- Danger for All

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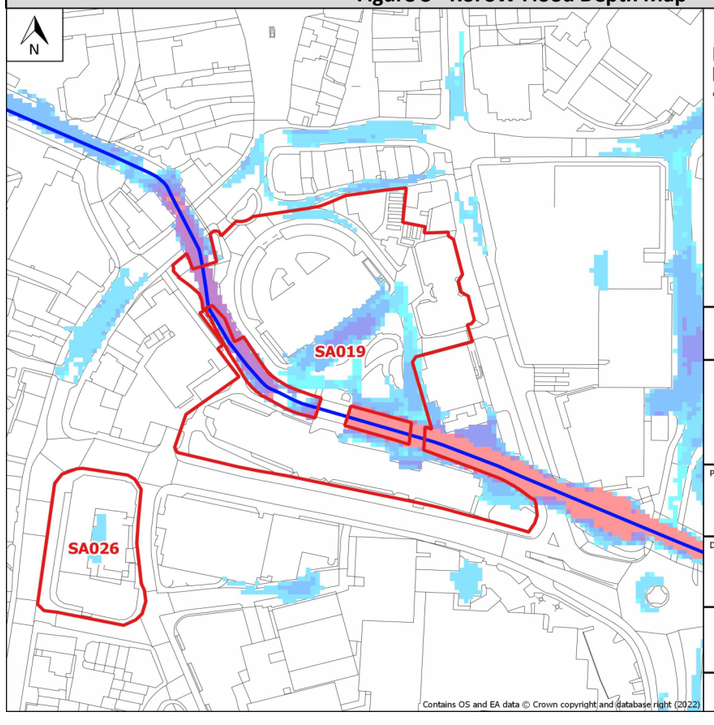
Project Title: Level 2 Strategic Flood Risk Assessment

Drawing Title: Fluvial flood hazard (1 in 100-year + 35% Climate Change Allowance Event)

1:1,500 | Drawing Size A3 | Drawing Number Figure No.2

Figure 3 - RoFSW Flood Depth Map



Legend

- Kingston borough boundary
- Site Allocations
- Main River

Surface Water flood depth (m) 1 in 100-year flood
- 0.00 - 0.15
- 0.15 - 0.30
- 0.30 - 0.60
- 0.60 - 0.90
- 0.90 - 1.20
- > 1.20

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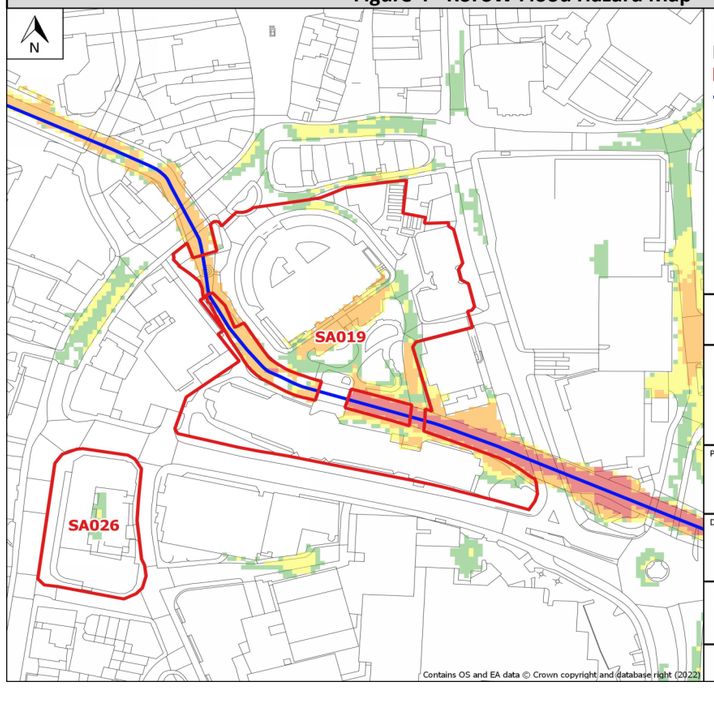
Project Title: Level 2 Strategic Flood Risk Assessment

Drawing Title: Surface Water flood depth

1:1,500 | Drawing Size A3 | Drawing Number Figure No.3

Figure 4 - RoFSW Flood Hazard Map



Legend

- Kingston borough boundary
- Site Allocations
- Main River

Surface Water Hazard 1 in 100-year flood
- Low Hazard
- Danger for Some
- Danger for Most
- Danger for All

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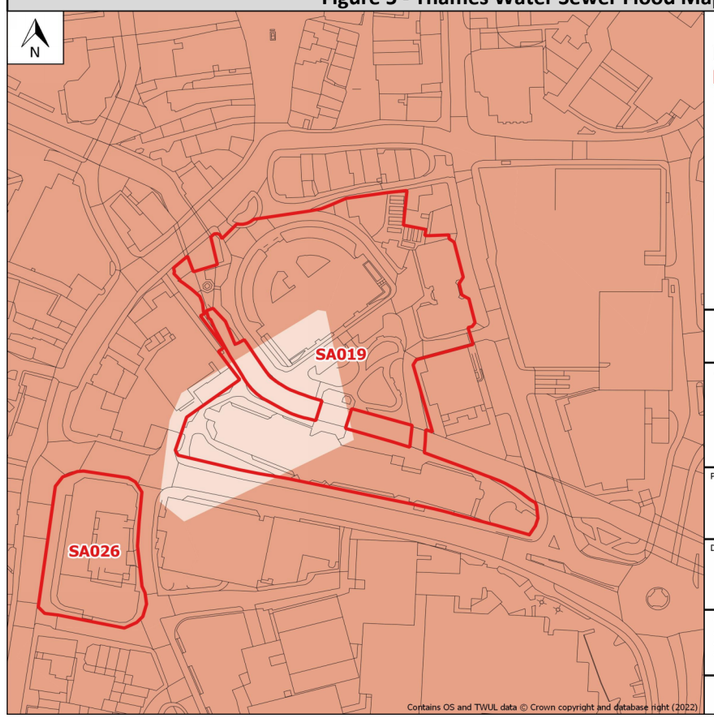
Project Title: Level 2 Strategic Flood Risk Assessment

Drawing Title: Surface Water flood hazard

1:1,500 | Drawing Size A3 | Drawing Number Figure No.4

Figure 5 - Thames Water Sewer Flood Map



Legend
- Kingston borough boundary
- Site Allocations

Sewer flooding
- 0 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200

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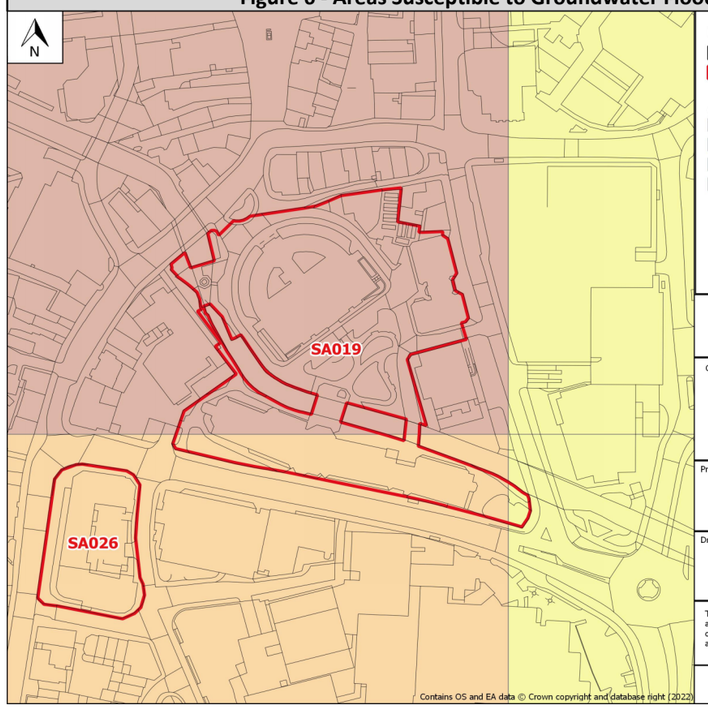
Project Title: Level 2 Strategic Flood Risk Assessment

Drawing Title: Thames Water 2022 Sewer Flooding Records

1:1,500	Drawing Size A3	Drawing Number Figure No.5

Figure 6 - Areas Susceptible to Groundwater Flooding Map



Legend
- Kingston borough boundary
- Site Allocations

Areas Susceptible to Groundwater Flooding
- < 25%
- >= 25% <50%
- >= 50% <75%
- >= 75%

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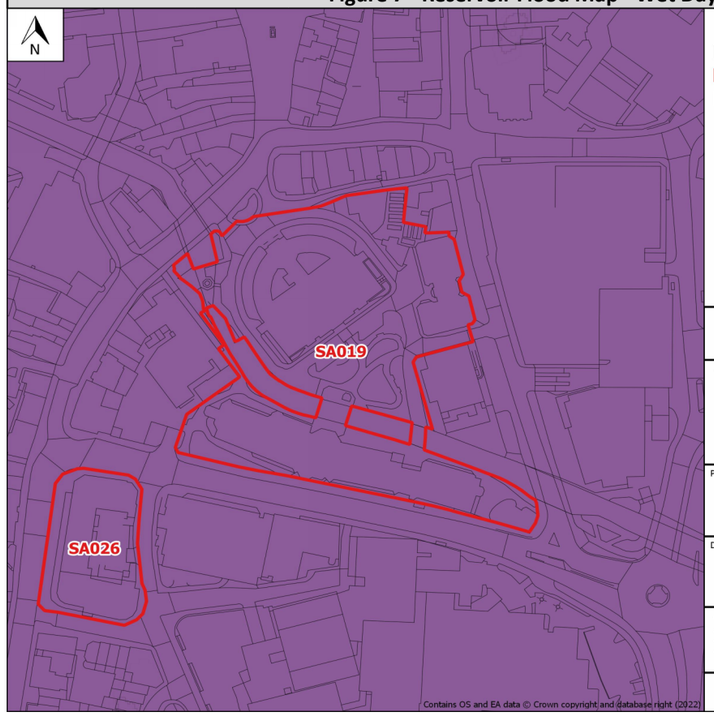
Project Title: Level 2 Strategic Flood Risk Assessment

Drawing Title: Areas Susceptible to Groundwater Flooding

1:1,500	Drawing Size A4	Drawing Number Figure No.6

Figure 7 - Reservoir Flood Map - Wet Day



Legend
- Kingston borough boundary
- Site Allocations
- Reservoir Flood Extents (Wet Day)

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Client: The Royal Borough of Kingston upon Thames

Project Title: Level 2 Strategic Flood Risk Assessment

Drawing Title: Reservoir Flood Extents (Wet Day)

1:1,500	Drawing Size A3	Drawing Number Figure No.7