

Manchester City Council – Core Strategy Flood Risk Appraisal

Introduction

1. This document sets out Manchester City Council's approach to meeting the requirements of Planning Policy Statement 25 (PPS25 – Development and Flood Risk), in preparing its Core Strategy.

PPS25 sets out the Government's position on planning and flood risk:

'The aims of planning policy on development and flood risk are to ensure that flood risk is taken into account at all stages in the planning process to avoid inappropriate development in areas at risk of flooding, and to direct development away from areas at highest risk. Where new development is, exceptionally, necessary in such areas, policy aims to make it safe without increasing flood risk elsewhere and where possible, reducing flood risk overall.'

2. The Sequential approach to assessing and managing flood risk set out in PPS25 involves undertaking flood risk assessments at different spatial levels, to assess the risks from all forms of flooding in the appropriate level of detail. A Regional Flood Risk Appraisal (RFRA) for the North West was undertaken by the then Regional Planning Body to help inform the scale and spatial distribution of development in the Regional Spatial Strategy (RSS).
3. The Secretary of State for Communities and Local Government announced the revocation of Regional Strategies (RSs) on 6 July 2010. Prior to this announcement, the North West RSS was part of the development plan for Manchester, setting out the broad scale and spatial distribution of development within the region up to 2021. The core of the Manchester City Region, (including within Manchester the Regional Centre and surrounding Inner Areas), was identified as the primary focus for new development within the North West in terms of policy focus and scale of development. The RSS requires 90% of new housing in Manchester to be constructed on brownfield sites.
4. The Council's Core Strategy has been under preparation whilst the RSS was being prepared and after it was adopted, and this has helped inform the scale and spatial distribution of development in the Core Strategy, which was required to be in general conformity with the RSS prior to the revocation. Following the revocation of the RSS, the Council determined to continue planning for the same scale of growth, having regard to all relevant evidence, including the RFRA, and the recently completed Manchester – Salford – Trafford Strategic Flood Risk Assessment (SFRA), as well as housing and employment forecasts.
5. Following a High Court ruling on 10th November 2010, the Government intends to formally revoke Regional Strategies through the Localism Bill, which is currently before Parliament. The North West RSS is currently part of the development plan for the City of Manchester and the Core

Strategy generally conforms to it. However, should the Regional Strategies be revoked through the Localism Bill, the scale and spatial distribution of development proposed for Manchester would still be supported by more local evidence, such as demographic and economic forecasts, land availability and the SFRA.

6. The Manchester Salford Trafford SFRA was produced by the three authorities in recognition of the hydraulic linkages between watercourses across the three authorities, which together effectively drain a large part of the Greater Manchester conurbation via the river Irwell and Mersey catchments and the Manchester Ship Canal. The SFRA was produced using the best available information at the time, and with the full involvement of the Environment Agency, and it is considered to be a robust assessment of flood risk from all relevant sources and consistent with PPS25. The SFRA will be a cornerstone of future flood risk management within the City, informing not only the Core Strategy and site specific Flood Risk Assessments, but also the Surface Water Management Plan, the Preliminary Flood Risk Assessment and future local Flood Risk Management Strategies.
7. New and revised data in relation to different types of flooding is being produced almost all the time, such as the new 2010 flood maps for surface water from the Environment Agency. The SFRA will be updated at appropriate intervals to reflect these changes to available data.
8. The SFRA preparation overlapped with the preparation of the Council's Strategic Housing Land Availability Assessment, the associated viability assessment and the Employment Land Review. Through this work a number of Strategic Locations for employment and housing development have been identified, as well as the Manchester Airport Strategic Site. Flood risk was considered through these pieces of work to varying degrees.

Sustainability Appraisal

9. The Sustainability Appraisal (SA) of the Pre-Publication Partial Consultation Core Strategy document appraised development locations as set out below. Flood risk was considered under SA criteria 19 – Reduce Impact of Climate Change.
10. The SA found that flood risk could potentially have a significant effect for EL1, EL2 and EL3, but that even for these locations, given the protection given by the policy in the Core Strategy relating to Flood Risk (EN6 (now changed to EN14)), that flood risk should not be a serious problem at present, although it may become more significant in future as a result of climate change. For the other locations, no significant negative effects were identified, and comments are listed below.

EL1 City Centre:

Comment from the SA of the Pre-Publication Partial Consultation Core Strategy:

“The City Centre employment opportunities as depicted on the City Centre Plan contain a number of areas, including Strangeways, identified by the Environment Agency and the SFRA Level 2 as being within Flood Zones 2 and 3. An intensification of development in these areas could increase the risk from flooding to people and property. However, development will be in accordance with PPS25 and will consider the SFRA thus the risk of flooding is likely to be minimised. However, the long term effects of climate change may mean that long term flood risks are not capable of mitigation.”

EL2 Central Park:

Comment from the SA of the Pre-Publication Partial Consultation Core Strategy:

“The SFRA Level 2 indicates that parts of the strategic area may be at risk from both river and canal flooding. An intensification of development in these areas could increase the risk from flooding to people and property. The policy specifically requires that the development of sites ensures that identified flooding risks are addressed which could minimise this effect. However, the long term effects of climate change may mean that long term risks are not capable of mitigation.”

EL3 Sport City *:

Comment from the SA of the Pre-Publication Partial Consultation Core Strategy:

“The SFRA Level 2 shows that the broad strategic allocation could include areas that are in Flood Risk Zones 2 and 3. The policy states that flooding risk should be addressed through proposals. An intensification of development in these areas could increase the risk from flooding to people and property. The policy specifically requires that the development of sites ensures that identified flooding risks are addressed that could minimise this effect. However, the long term effects of climate change may mean that long term risks are not capable of mitigation.”

* Sport City is now known as Eastlands

EL4 Airport City:

Comment from the SA of the Pre-Publication Partial Consultation Core Strategy:

“The SFRA Level 2 suggests that the strategic location is not within

Flood Zone 2 or 3. An increase in development could increase the risk of flooding through an increase in surface water runoff. However, this effect is likely to be minimised through other CS policies including policies that seek to encourage the use of SUDS.”

EL5 University Hospital South Manchester:

Comment from the SA of the Pre-Publication Partial Consultation Core Strategy:

“The SFRA Level 2 indicates that the strategic area does not contain any identified Flood Risk areas. However, an increase in development could increase the risk of flooding through an increase in surface water runoff. However, this effect is likely to be minimised through other CS policies including policies that seek to encourage the use of SUDS.”

H4 Strategic Housing Location:

Comment from the SA of the Pre-Publication Partial Consultation Core Strategy:

“The SFRA Level 2 indicates that the strategic area includes some locations that are within EA Flood Zones 2 and 3. An increase in development could increase the risk of flooding through an increase in surface water runoff. However, this effect is likely to be minimised through other CS policies including policies that seek to encourage the use of SUDS.

Core Strategy Policy En 6 outlines that development should avoid sites at risk of flooding in line with PPS25. The latter specifies that development will not be permitted in areas within Flood Zones 2 and 3 without a more detailed site-specific Flood Risk Assessment (FRA), as detailed in para 14.42 of the Core Strategy.”

MA1 Manchester Airport:

Comment from the SA of the Pre-Publication Partial Consultation Core Strategy:

“The site is not within Flood Risk Zones 2 or 3. However, the increase in hard surfacing may increase the risk of flooding on site and in the surrounding area (see assessment under Objective 12). Adherence to sustainable design standards in the buildings could help the population on site to adapt to the effects of the changing climate to some degree.”

11. The Core Strategy has been produced through an iterative process, the sites and locations contained in earlier versions of the document have been amended to some extent. It was therefore considered helpful to

formally appraise all the planned development locations contained in the publication version of the Core Strategy against the SFRA, to ensure that the locations are sustainable in terms of current and future flood risk, and are able to safely accommodate the proposed type and scale of development without increasing flood risk elsewhere.

Development & Policy Context

12. The Council's Core Strategy sets out the plan for the future sustainable growth of the city, including the development of Manchester Airport, future housing and employment development, and District Centres. Future housing provision will come forward across the City, but will be focused within the strategic housing location to the north and east of the City Centre. Employment development will also come forward across the City, but will be focused in twenty-eight strategic locations; there are also seventeen District Centres, and the Manchester Airport Strategic site.
13. The development that the Council is planning for in the Core Strategy is broadly consistent with the RSS in terms of scale and spatial distribution; the RSS was subject to a RFRA.

Sequential Approach

14. The absence of actual sites in the Core Strategy (apart from the Airport) means that the Sequential Test from PPS25 (which is about allocating sites in Local Development Documents) is not strictly applicable; however, the Sequential Approach to minimising flood risk (also from PPS25) is applicable, and has been followed in this document, in order to show that the proposed scale and distribution of development can be accommodated without being subject to, or leading to, unacceptable levels of flood risk. However, given the above development & policy context, and other relevant evidence such as the relatively small size and highly urbanised nature of the City, means that there is little land available for development that will not be required over the fifteen years of the Core Strategy. This means that the sequential approach to different sites is also not relevant to Manchester, if the scale of development planned for is to be achieved.
15. The sequential approach to flood risk, informed by PPS25 and the Manchester Salford Trafford Strategic Flood Risk Assessment (SFRA) (2010), will be applied where possible, and especially in relation to site-specific issues, where careful consideration of the uses, layout, design and potential mitigation measures will be particularly important in locations where flood risk is identified as an issue. The PPS25 Exception Test provides a means of "managing flood risk whilst still allowing necessary development to occur" and is an important part of the Sequential Approach. "Necessary development" in these circumstances would be covered by what PPS25 states with regard to "wider sustainable development reasons...to avoid social or economic blight...". A development site that is at some risk of flooding, but is key to the transformational regeneration of a wider area, and through careful layout

and building design and other measures can be delivered safely, should be.

16. Site specific flood risk assessments would be required in these circumstances to demonstrate that development could be brought forward safely. PPS25 notes that “flood risk should be considered alongside other spatial planning issues such as transport, housing, economic growth, natural resources, regeneration, biodiversity, the historic environment, and the management of other hazards”. In Manchester, regenerating the inner city areas is a key part of the Council’s plans for sustainable development and economic growth. Community engagement has been undertaken over a number of years to shape redevelopment proposals and the different delivery approaches, drawing upon different funding sources from both the public and private sector. At times of reduced public funding, sustainable development is one of the ways through which flood risk management can be improved, for both new residents and existing communities.

Flood Risk Appraisal

17. The Manchester Salford Trafford SFRA has been used to appraise the development locations contained within the Publication version of the Core Strategy and the results of this are presented in this document. Residual risk of flooding from man-made sources such as canals and reservoirs has not been considered in this appraisal, however, the SFRA does identify these risks (within the parameters of national security) and in these areas developers would be expected to have regard to these risks in bringing forward their proposals, through appropriate site-specific Flood Risk Assessments (FRAs).
18. In addition, the SFRA sequentially appraised a total of 147 development / capacity sites for fluvial and surface water flood risk. However, the approach to development sites and locations within the Core Strategy has evolved since this was done, and the approach contained within this document is now tailored to the current Core Strategy.

District Centres

19. The different types and extents of flood risk affecting the District Centres in the Core Strategy are shown on the plans contained in the SFRA, with full details contained in the tables in Annex 1 of this document.
20. All 17 District Centres proposed in the Core Strategy are affected by surface water flood risk to some extent, according to the SFRA. The degree of susceptibility varies across those parts of the District Centres affected, from High to Intermediate to Low susceptibility, and often it is the roads within the District Centres that are at greatest risk of surface water flooding, as shown on SFRA plans SS_4.2_C, F, I, J, and M.

21. Five of the 17 District Centres proposed in the Core Strategy are affected by fluvial flood risk by having parts of flood zones 2, 3a and 3b within their areas. The affected District Centres are Longsight (from Chorlton Platt Gore), Chorlton (from Chorlton Platt Gore), Northenden (from the Mersey), Withington (from Cringle Black Brook), and, Hulme (from Corn Brook). These are shown on SFRA plans FL_1.2_I, J and F and the table in Annex 1.
22. Baguley, Chorlton, and Northenden are the only District Centres to be affected by groundwater flood risk (including groundwater rebound). These are shown on SFRA plan GW_2.1 and the table in Annex 1.
23. As the District Centres contained within the Core Strategy are either existing, or based upon existing concentrations of shops and facilities, it is not considered that the level of flood risk (including cumulative where relevant) that has been identified would have a bearing on these designations, but development within the District Centres over the Plan period, including proposals for 28,000 sq m of B1 office space in total for all District Centres would need to be considered against a range of factors, including flood risk. Where relevant, planning applications would be supported by site specific Flood Risk Assessments (FRAs).

Manchester Airport Strategic Site

24. The different types and extents of flood risk affecting the Manchester Airport Strategic Site in the Core Strategy are shown on the plans contained in the SFRA, with full details contained in the tables in Annex 1 of this document.
25. The Manchester Airport strategic site in the Core Strategy is affected by surface water flood risk. The degree of susceptibility varies from High to Intermediate to Low susceptibility across the strategic site, and illustrated on SFRA plan SS_4.2_N and the table in Annex 1.
26. A small part of the Manchester Airport strategic site is affected by fluvial flood risk from the River Bollin, specifically flood zones 2 and 3b to the south west of the end of runway 1. The runway itself is not shown at risk of fluvial flooding from the Bollin due to its location at a higher elevation and the river being contained within a valley; no development is proposed for this part of the strategic site, because its location at the end of the runway would impact on flights into and out of the Airport. This is shown on SFRA plan FL_1.2_N and the table in Annex 1.
27. The Manchester Airport strategic site is not affected by groundwater flood risk (including groundwater rebound), as shown on SFRA plan GW_2.1.
28. The SFRA assessed potential flood risk to future development at the Airport and concluded that there were no major issues, although there were some limited surface water and fluvial flood risk issues that should be

explored through a site specific Flood Risk Assessment (FRA) if appropriate. More details on this are contained within Annex 2.

29. Manchester Airport is an existing facility and it is not considered that the level of flood risk that has been identified would present a significant problem for future development within the strategic site, including the expansion of passenger capacity to 45 million people per annum by 2030. New development within the strategic site would need to be considered against a range of factors, including flood risk, over the plan period.

Strategic Housing Location

30. The different types and extents of flood risk affecting the Strategic Housing Location in the Core Strategy are shown on the plans contained in the SFRA, with full details contained in the tables in Annex 1 of this document.
31. The Strategic Housing Location within the Core Strategy is affected by surface water flood risk. The degree of susceptibility varies from High to Intermediate to Low susceptibility across the area, as shown on SFRA plans SS_4.2_C and F and the table in Annex 1.
32. The Strategic Housing Location within the Core Strategy is affected by fluvial flood risk from the rivers Irk, Moston Brook, Medlock and Corn Brook and other smaller watercourses; different parts are affected to different extents illustrated by flood zones 2, 3a and 3b and shown on SFRA plans FL_1.2_C and F the table in Annex 1.
33. The Strategic Housing Location is not affected by groundwater flood risk (including groundwater rebound) as shown on SFRA plan GW_2.1.
34. Reflecting the spatial approach to future development proposed at that time in the Core Strategy, a number of parcels of land (many of which are now contained within the Strategic Housing Location) were assessed in the SFRA, and the results set out in Annex 2. None of the sites assessed through the SFRA were considered to have prohibitive development issues in terms of flood risk, although West Gorton, Irk Valley, Holt Town and Lower Medlock Valley (all within the Strategic Housing Location) were identified as being at significant risk of flooding, and site layout, design and uses would therefore require careful consideration. On this basis, it is considered that the numbers of homes proposed in the Core Strategy can be accommodated in the Strategic Housing Location and other appropriate locations. New housing development within the City will be considered against a range of factors, including flood risk, over the plan period. Where relevant, planning applications would need to be supported by site specific Flood Risk Assessments (FRAs) having regard to all relevant guidance including the SFRA.

Strategic Employment Locations

35. The different types and extents of flood risk affecting the Strategic Employment Locations in the Core Strategy are shown on the plans contained in the SFRA, with full details contained in the tables in Annex 1 of this document.
36. The Strategic Employment Locations within the Core Strategy are affected by surface water flood risk to different extents. The degree of susceptibility varies from High to Intermediate to Low susceptibility as shown on SFRA plans SS_4.2_C, E, F, I, J, M, and N and the table in Annex 1.
37. The Strategic Employment Locations contained within the Core Strategy are also affected by fluvial flood risk from the rivers Irwell, Irk, Medlock and Corn Brook and other smaller watercourses; different parts are affected to different extents illustrated by flood zones 2, 3a and 3b and shown on SFRA plans FL_1.2_C, E, F, I, J, M and N and the table in Annex 1.
38. Some of the Strategic Employment Locations are affected by groundwater flood risk (including groundwater rebound) to some extent, as shown on SFRA plan GW_2.1 and the table in Annex 1.
39. Reflecting the spatial approach to future development proposed at that time in the Core Strategy, a number of parcels of land, many of which overlap with the Strategic Employment Locations, were assessed in the SFRA, and the results set out in Annex 2. None of the sites assessed through the SFRA were considered to have prohibitive development issues in terms of flood risk, although Strangeways, Eastern Gateway and Oxford Corridor (all within the City Centre / City Centre Fringe) were identified as being at significant risk of flooding, and site layout, design and uses would therefore require careful consideration. On this basis, it is considered that the level of employment development proposed in the Core Strategy can be accommodated in the Strategic Employment Locations and other appropriate locations. New employment development within the Strategic Employment Locations and elsewhere in the City will be considered against a range of factors, including flood risk, over the plan period. Where relevant, planning applications would need to be supported by site specific Flood Risk Assessments (FRAs) having regard to all relevant guidance including the SFRA.

Residual Risk - Canal / Reservoir

40. The Manchester – Salford – Trafford SFRA looked at all sources of flooding across the city, including the residual risk of canals overtopping or breaching. Whilst this has not been used to appraise sites and locations, it should be considered in site specific Flood Risk Assessments as required.
41. The residual risk of reservoirs overtopping or breaching is a matter of national security and so has not been considered in the SFRA.

Conclusion

42. The SFRA does not identify any prohibitive levels of risk with the sites it assessed, although it does recognise that some locations will require careful consideration of uses, design and layout (see Annex 2). This flood risk appraisal of the development proposed in the Core Strategy was undertaken using the SFRA and also comes to the conclusion that flood risk is a significant issue for many development locations within the City, but that development could be brought forward safely.
43. The sequential approach to development and the guidance contained within the SFRA should be adhered to by developers as much as possible to minimise flood risk. For locations that are at risk of flooding, this may influence the scale, layout and design of development that is / would be appropriate, although overall, with the land available, it is considered that Manchester can safely accommodate the levels of development planned for, in a way that is consistent with PPS25.

ANNEX 1

Strategic Housing Location – Areas at risk from fluvial, surfacewater and groundwater flooding

Address	Total Area (ha)	Total Dwellings	FZ1 (%)	FZ2 (%)	FZ3a (%)	FZ3b (%)	Surfacewater Low Susc. %	Surfacewater Int. Susc. %	Surfacewater High Susc. %	Groundwater %
Iron Street 162-208 Oldham Road	1.274676	45	100	0	0	0	0	0	0	0
	0.400629	44	100	0	0	0	1	0	0	0
West Gorton Chancellors Place	55.889973	1100	63	21	14	2	6 (4 beyond Flood Zones)	9 (only 4 beyond Flood Zones)	0.25 (all within Flood Zones)	0
	16.530202	1852	99.3	0.2	0	0.5	7	1.5	0	0
Coverdale Crescent / New Bank Street	9.245659	200	100	0	0	0	2	0	0	0
Coverdale Crescent / New Bank Street	8.63902	200	100	0	0	0	7	1	0	0
Devonshire Street / Stockport Road	0.8242	100	100	0	0	0	0	0	0	0
Munday Street	0.068415	14	100	0	0	0	0	0	0	0
Lower Medlock Hargreaves Street	49.058108	800	78	11	4	7	4 (only 3 beyond Flood Zones)	1 excluding River Course (only 0.5 beyond Flood Zones)	Wthin River course only	0
	7.643945	394	93.9	1.5	0.6	4	2.5	0	0	0
Collyhurst Road	3.379016	243	29	34	11	26	11 (only 2 beyond flood zones)	10 (only 0.3 beyond flood zones)	Wthin River course only	0
	2.190546	220	92.7	7	0.3	0	0	0	0	0
Dantzie Street	0.322043	9	100	0	0	0	0	0	0	0
Bunyard Street	0.222414	19	88	12	0	0	1	0	0	0
Fitzgeorge Street	0.099464	3	100	0	0	0	0	0	0	0
Eckford Street	0.090946	3	0	0	100	0	52	6	0	0
Calthorpe Avenue Rear 2-20 Leicester Road	0.076147	3	100	0	0	0	0	0	0	0

Address	Total Area (ha)	Total Dwellings	FZ1 (%)	FZ2 (%)	FZ3a (%)	FZ3b (%)	Surfacewater Low Susc. %	Surfacewater Int. Susc. %	Surfacewater High Susc. %	Groundwater %
Pitsford Road	2.868309	77	100	0	0	0	0	0	0	0
Tidebrook Walk	0.413146	14	100	0	0	0	6	0	0	0
Southwell Street / Conran Street	0.304686	11	100	0	0	0	41	2	0	0
Water Street / Fernclough Road	0.302151	11	100	0	0	0	0	0	0	0
Queens Road	0.248491	9	100	0	0	0	18.5	1.5	0	0
Carisbrook Street	0.230347	8	100	0	0	0	0	0	0	0
Palgrave Avenue	0.191761	7	100	0	0	0	0	0	0	0
Carisbrook Street	0.154348	5	100	0	0	0	0	0	0	0
Collyhurst East Of Rochdale Road	52.476753	1300	98.65	0.6	0.05	0.7	7	3	0.2	0
Lord Lovat PH	35.1846	800	100	0	0	0	7	3	0	0
Kingsbridge Road	0.2558	15	100	0	0	0	0	0	0	0
Denese Care Home, Silchester Drive	0.2386	10	100	0	0	0	0	0	0	0
James Street / Rochdale Canal	2.087	134	100	0	0	0	3	0	0	0
South of Sawley Road	1.529498	122	100	0	0	0	2	0	0	0
Vickers Street / James Street	0.955368	61	100	0	0	0	0	0	0	0
James Street	0.388258	25	100	0	0	0	6	0	0	0
Ringstead Drive	2.661383	133	100	0	0	0	14	0	0	0

District Centres – Areas at risk from fluvial, surfacewater and groundwater flooding

District Centre	Total Area (ha)	Fluvial Zone 1%	Fluvial Zone 2%	Fluvial Zone 3a%	Fluvial Zone 3b%	Surfacewater Low Susc. %	Surfacewater Int. Susc. %	Surfacewater High Susc. %	Groundwater %
Rusholme	9.8	100	0	0	0	8.8	6.63	2.34	0
Fallowfield	8.4	100	0	0	0	9.16	7.86	0.95	0
Newton Heath	13.6	100	0	0	0	8.7	1.8	0	0
Openshaw	4.8	100	0	0	0	11.45%	0	0	0
Longsight	11.3	99.93	0	0	0.07	7.7	9.29	0.2	0
Chorlton	17.1	92.35	7.6	0.05	0	11.69	2.46	0	76.46 (67.85% Rebound)
Didsbury	5.5	100	0	0	0	11.27	0.36	0	
Northenden	4.6	92.2	0.8	0	0	12.39	1.96	0	0.9
Levenshulme	14.6	100	0	0	0	9.93	8.15	0.3	0
Gorton	12.8	100	0	0	0	8.6	0.54	0	0
Cheetham Hill	8.7	100	0	0	0	2%	0.8	0	0
Withington	4	86	11	3	0	2.75	7.5	0	0
Wythenshawe	23.3	100	0	0	0	7.94	2.57	0	0
Eastlands	11.5	100	0	0	0	10.3	5.3	1.3	0
Harpurhey	13.3	100	0	0	0	7	3.3	0	0
Baguley *	17.74	100	0	0	0	9.47	1.3	0	3.3
Hulme *	7.23	98	2	0	0	6.36	0.7	0	0

* Boundaries are provisional, to be formalised through Allocations DPD

Manchester Airport – Areas at risk from fluvial, surfacewater and groundwater flooding

	Total Area (ha)	Fluvial Zone 1%	Fluvial Zone 2%	Fluvial Zone 3a%	Fluvial Zone 3b%	Surfacewater Low Susc. %	Surfacewater Int. Susc. %	Surfacewater High Susc. %	Groundwater %
Manchester Airport Strategic Site	727ha (approx)	100.00%	0	0	0.00%	13.3	3.7	0.4	0

Fluvial risk is from the river Bollin, at the end of Runway 1.
 Surface Water (current) risk is present across the Airport strategic site

Employment Sites – Areas at risk from fluvial, surfacewater and groundwater flooding

	Sites / Locations *	Total Area (ha)	Fluvial Zone 1%	Fluvial Zone 2%	Fluvial Zone 3a%	Fluvial Zone 3b%	Surfacewater Low Susc. %	Surfacewater Int. Susc. %	Surfacewater High Susc. %	Groundwater %
City Centre Locations	Civic Quarter	21.9	100	0	0	0	4.8	1.7	0.12	0
	Spinningfields	15.7	90.4	9.2	0.4	0	12.9	2.54	0.2	0
	Eastern Gateway and Mayfield	40.09	92.9	3.68	1.3	2.1 (river course)	10.57	2.6	0.9	0
	ORC - First Street	7.33	94.8	5.2	0	0	11.54	0.45	0.47	85.66
	ORC - Great Jackson Street	9.3	93.79	6	0.03	0.18	4.04	0.3	0	7.17
	ORC - remainder	173.52	80.72	13.91	4.43	0.94	19.7	4.5	0.8	5.33
	Granada	5.5548	82.11	17.89	0	0	12.1	0	0	0
	City Centre North	22.2024	95.8	4.2	0	0	6.5	2.59	0.88	0.47
	North Manchester Locations	Strangeways and Collyhurst (CCF)	48.99	72.66	25.85	0	1.49	4.56	3.32	0.84
	Strangeways and Collyhurst North	136.38	91.37	6.35	1.48	0.8	10.00	2.56	0.35	0.45
	Manchester Business Park	7.8401	36.65	8.14	26.33	28.88	9.6	12.7	0.95	60.96
East Manchester Locations	Ancoats (CCF)	55.30	100	0	0	0	10.64	3.72	0.71	0
	Chancellor's Place (CCF)	16.201	99.3	0.2	0	0.5	7	1.5	0	0
	Ardwick Yards (CCF)	39.86	100	0	0	0	8.99	10.16	4.12	0
	Eastlands	107.2523	100	0	0	0	17.58	7.6	1.3	0

	Sites / Locations *	Total Area (ha)	Fluvial Zone 1%	Fluvial Zone 2%	Fluvial Zone 3a%	Fluvial Zone 3b%	Surfacewater Low Susc. %	Surfacewater Int. Susc. %	Surfacewater High Susc. %	Groundwater %
Central Manchester Locations	Central Park	179.9143	100	0	0	0	13.7	6.3	1.2	0
	Manchester Science Park (CCF)	7.0469	85.45	10	4.55		13.6	0.95	0	0
	Birley Fields (CCF)	6.5884	99.24	0.68	0.08	0	9.4	0.12	0	22.39
	Techno Park (CCF)	3.11	100	0	0	0	3.2	0	0	39.82
	ORC (CCF)	124.23	71.08	10.74	18.18	0	20.30	2.71	0.2	12.8
	Hyde Road & Stockport Road	16.97	100	0	0	0	18.5	2.58	0	0
	Redevelopment of MMU Hollings campus	1.5536	100	0	0	0	0.006	0	0	0
South Manchester Locations	Redevelopment of MMU Elizabeth Gaskell campus	2.1463	100	0	0	0	8.6	8.3	0	0
	Redevelopment of MMU Campus Broomhurst	2.7933	79.1	0.85	0	20.05	24.23	16.94	0	8.28
Wythenshawe Locations	Mediparc	27.8568	100	0	0	0	6.85	3.97	0.86	0
	Airport City	35.0706	100	0	0	0	8	2.49	0	0
	Roundthorn	79.0393	100	0	0	0	25.2	9.97	0	0
	Sharston	48.54	86.45	9.53	4.02	0	16.74	3.1	0.3	0

These are the main broad locations for future employment development, often containing existing buildings and uses, but with the potential for future redevelopment. The Airport Strategic Site and District Centres are addressed separately.

Annex 2

The Level 2 Strategic Flood Risk Assessment includes a Flood Risk Balance Sheet, which provides a short summary of the risk assessment and the characteristics of that risk and its likely mitigation. It is intended to help planning authorities facilitate the Exception Test and demonstrate the acceptability and soundness of the proposed development sites.

Within Manchester the levels of risk identified in the Flood Risk Balance Sheet are not prohibitive for any of the uses or locations considered, and using the spectrum of risk are shown as green, light green or yellow, roughly equating to Very Low, Low or Mid levels of risk, to be considered and addressed through site specific Flood Risk Assessments. No locations within Manchester are classed as High (orange) or Very High (red) risk in the Flood Risk Balance Sheet.

Employment locations considered in the Flood Risk Balance Sheet

Eastern Gateway (M0001)

Recommendation: A limited range of land uses could be put forward after careful consideration and detailed FRA, but more vulnerable uses should be steered to lower risk areas. Flood risk is an important influence on how the area could be developed, both spatially and in the design response (1st floor accommodation may be necessary).

Commentary: Riverside areas next to the River Medlock to the north of the site are at risk in 1 in 100 year event and considering climate change. There is residual risk in riverside areas in extreme events, with larger areas of significant depths and hazards. In flow path so any mitigation measures, such as land raising would need careful consideration. Development on the north of the site would need to take account of the risk from a breach on the Ashton Canal. It would be difficult to provide flood warning for such an occurrence. Proceeding with development here would need careful consideration of urban form, with appropriate low vulnerability uses in the higher risk areas and should be sequentially avoided in the areas of highest risk from the River Medlock in a 1 in 100 year event, considering climate change. Surface water flood risk associated with a 'lost watercourse' to the north of the site needs further consideration in a FRA.

Central Park (M0003)

Recommendation:

Acceptable with some detailed consideration of flood risk issues in a FRA and where planning policies will ensure vulnerable development will not be placed in high flood risk areas

Commentary:

Development on the centre of the site would need to take account of the risk from a breach on the Rochdale Canal in urban design. It would be difficult to provide flood warning for such an occurrence. Surface water flood risk associated with 'lost watercourses' needs further consideration in a FRA.

Strangeways (M0004)

Recommendation: A limited range of land uses could be put forward after careful consideration and detailed FRA, but more vulnerable uses should be steered to lower risk areas. Flood risk is an important influence on how the area could be developed, both spatially and in the design response (1st floor accommodation may be necessary).

Commentary: Most at risk from breach or overtopping in an extreme 1 in 1000 year event. May be difficult to warn for breach. Significant residual risk in extreme event affecting around 25% of site would need to be carefully planned for. In flow path so any mitigation measures, such as land raising would need careful consideration. Proceeding with development here would need careful consideration of urban form, with appropriate low vulnerability uses in the highest risk areas. Surface water flood risk associated with 'lost watercourses' needs further consideration in a FRA.

Victoria (M0005):

Recommendation: Acceptable with some detailed consideration of flood risk issues in a FRA and where planning policies will ensure vulnerable development will not be placed in high flood risk areas.

Commentary: The west central part of the site is at residual risk in an extreme 1 in 1000 year event. Proceeding with development here would need careful consideration of urban form, with appropriate low vulnerability uses in the highest risk areas. Surface water flood risk associated with a 'lost watercourse' to the south needs further consideration in a FRA.

Roundthorn (M0006):

Recommendation: Acceptable with some detailed consideration of flood risk issues in a FRA and where planning policies will ensure vulnerable development will not be placed in high flood risk areas

Commentary: High susceptibility to surface water flooding with need for careful consideration of urban form and management of exceedence flows. Limited risk from the Fairywell Brook.

Manchester Airport (M0007)

Recommendation: Acceptable subject to FRA.

Commentary: Limited flood risk from surface water and the Fairywell and Timperley Brooks should be explored further in a FRA.

Oxford Road Corridor (M0042):

Recommendation: A limited range of land uses could be put forward after careful consideration and detailed FRA, but more vulnerable uses should be steered to lower risk areas. Flood risk is an important influence on how the area could be developed, both spatially and in the design response (1st floor accommodation may be necessary)

Commentary: Riverside areas next to the River Medlock to the north of the site are at risk in 1 in 100 year event and considering climate change. There is residual risk in riverside areas in extreme events, with larger areas of significant depths and hazards. In flow path so any mitigation measures, such as land raising would need careful consideration. There is also a risk

of flooding from the Corn Brook, which is expected to be shallow, becoming more widespread for extreme events. Development on the west of the site would need to take account of the risk from a breach on the Bridgewater Canal and it would be difficult to provide flood warning for such an occurrence. Surface water flood risk associated with 'lost watercourses' needs further consideration in a FRA. Proceeding with development here would need careful consideration of urban form, with appropriate low vulnerability uses in the higher risk areas and should be sequentially avoided in the areas of highest risk from the River Medlock in a 1 in 100 year event, considering climate change.

Mixed Use locations considered in the Flood Risk Balance Sheet

Sport City * Visitor Destination (M0002) (mixed use):

Recommendation: Acceptable with some detailed consideration of flood risk issues in a FRA and where planning policies will ensure vulnerable development will not be placed in high flood risk areas.

Commentary: Development on the south of the site would need to take account of the risk from a breach on the Ashton Canal in urban design. It would be difficult to provide flood warning for such an occurrence. Flood risk associated with the River Medlock culvert needs further consideration in a FRA.

* Sport City is now known as Eastlands

Housing locations considered in the Flood Risk Balance Sheet

Miles Platting (M0008)

Recommendation: Acceptable with some detailed consideration of flood risk issues in a FRA and where planning policies will ensure vulnerable development will not be placed in high flood risk areas.

Commentary: Development on the south west of the site would need to take account of the risk from a breach on the Rochdale or Ashton Canals and overtopping from the Rochdale Canal in urban design. It would be difficult to provide flood warning for such an occurrence. Surface water flood risk associated with 'lost watercourses' needs further consideration in a FRA.

Newton Heath (M0009)

Recommendation: Acceptable subject to FRA.

Commentary: Surface water flood risk, including that associated with a 'lost watercourse' needs further consideration in a FRA.

West Gorton (M0010)

Recommendation: A limited range of land uses could be put forward after careful consideration and detailed FRA, but more vulnerable uses should be steered to lower risk areas. Flood risk is an important influence on how the area could be developed, both spatially and in the design response (1st floor accommodation may be necessary).

Commentary: Areas to the west of the site are at significant risk from the Corn Brook in a 1 in 100 year event, with increasing risk for extreme events.

Proceeding with development here would need careful consideration of urban form and should be sequentially avoided in the areas of highest risk in a 1 in 100 year event, considering climate change.

Brunswick (M0011)

Recommendation: Acceptable with some detailed consideration of flood risk issues in a FRA and where planning policies will ensure vulnerable development will not be placed in high flood risk areas.

Commentary: Areas to the west of the site are at some risk from the Corn Brook in a 1 in 100 year event and with climate change. There is residual risk associated with localised significant depths and hazards in an extreme 1 in 1000 year event. Development here would need careful consideration of urban form to account for residual risk.

Coverdale Crescent (M0012)

Recommendation: Acceptable subject to FRA.

Commentary: Surface water flood risk, including that associated with 'lost watercourses' needs further consideration in a FRA.

Collyhurst (M0013)

Recommendation: Acceptable with some detailed consideration of flood risk issues in a FRA and where planning policies will ensure vulnerable development will not be placed in high flood risk areas.

Commentary: Extreme events give rise to limited residual risk on the site from the River Irk and Moston Brook. Development here would need careful consideration of urban form to account for this residual risk. Surface water flood risk associated with a 'lost watercourse' needs further consideration in a FRA.

Harpurhey/Moston (M0015 to M0020)

Recommendation: Acceptable subject to FRA

Commentary: Limited surface water flood risk should be explored further in a FRA.

Irk Valley (M0021)

Recommendation: A limited range of land uses could be put forward after careful consideration and detailed FRA, but more vulnerable uses should be steered to lower risk areas. Flood risk is an important influence on how the area could be developed, both spatially and in the design response (1st floor accommodation may be necessary).

Commentary: Riverside areas next to the River Irk are at risk in 1 in 100 year event and considering climate change. There is residual risk in riverside areas in extreme events, with larger areas of significant depths and hazards. In flow path so any mitigation measures, such as land raising would need careful consideration. Proceeding with development here would need careful consideration of urban form and should be sequentially avoided in the areas of highest risk in a 1 in 100 year event, considering climate change.

Booth Hall (M0022)

Recommendation: Acceptable subject to FRA.
Commentary: Limited surface water flood risk should be explored further in a FRA.

Blackley Village (M0023)

Recommendation: Acceptable subject to FRA.
Commentary: Limited flood risk from surface water and a minor tributary of the River Irk should be explored further in a FRA.

Holt Town (M0024):

Recommendation: A limited range of land uses could be put forward after careful consideration and detailed FRA, but more vulnerable uses should be steered to lower risk areas. Flood risk is an important influence on how the area could be developed, both spatially and in the design response (1st floor accommodation may be necessary)

Commentary: Highest risk is to riverside areas in the south of the site with significant depths and hazards expected locally to the river. Development on the centre of the site would need to take account of the risk from a breach on the Ashton Canal in urban design. It would be difficult to provide flood warning for such an occurrence. Proceeding with development here would need careful consideration of urban form and should be sequentially avoided in the areas of highest risk from the River Medlock in a 1 in 100 year event, considering climate change.

Chancellors Place (M0025) (including area within Eastern Gateway at risk from the River Medlock):

Recommendation: Acceptable with some detailed consideration of flood risk issues in a FRA and where planning policies will ensure vulnerable development will not be placed in high flood risk areas

Commentary: There is generally low risk to the site with the exception of residual risk to a limited area in the north west corner of the site from the River Medlock, with significant localised depths and hazards in an extreme 1 in 1000 year event. In flow path so any mitigation measures, such as land raising would need careful consideration. Proceeding with development here would need careful consideration of urban form and should be sequentially avoided in the areas of highest risk from the River Medlock in a 1 in 100 year event, considering climate change.

Lower Medlock (M0026):

Recommendation: A limited range of land uses could be put forward after careful consideration and detailed FRA, but more vulnerable uses should be steered to lower risk areas. Flood risk is an important influence on how the area could be developed, both spatially and in the design response (1st floor accommodation may be necessary).

Commentary: Highest risk is to riverside areas in the south of the site with significant depths and hazards expected. Development on the west of the site would need to take account of the risk from a breach on the Ashton Canal in urban design. It would be difficult to provide flood warning for such an occurrence. In flow path so any mitigation measures, such as land raising would need careful consideration. Proceeding with development

here would need careful consideration of urban form and should be sequentially avoided in the areas of highest risk from the River Medlock in a 1 in 100 year event, considering climate change. Surface water flood risk associated with a 'lost watercourse' needs further consideration in a FRA.