

Integrated Water Management

An investigation into the wider determinants of effective integrated water management in Greater Manchester.



Greater Manchester Combined Authority Overview & Scrutiny Committee
February 2023

Chairs foreword, thanks and acknowledgements and timeline of the review

Chairs Foreword

One of the key recommendations contained within the Independent Review of the GMCA scrutiny function was to use Task and Finish Groups to undertake more in-depth investigations, for which under the previous arrangements, there was insufficient capacity. This is the first review to be undertaken under these new governance arrangements.

The topic of 'flood risk' was initially chosen as a subject considered by most members of the committee to be amongst those that most concerned them.

We became aware at the outset that localised flooding was the product of the much wider issue of integrated water management (IWM) and so began to take a broader approach to the review.

The general misconception that flood risk was largely attributable to riverbank bursts immediately emerged, as the group learned of the more significant risk relating to surface water flooding across Greater Manchester.

It was also apparent that the issue of water management was not the responsibility of one single person or agency, creating a complex governance and accountability situation.

With floods already predicted for early 2023, we determined that it was important that this review should highlight the current challenges, barriers, manageable causes and impacts in relation to integrated water management for immediate action.

We were also made aware of the very significant challenges associated with addressing water quality pressures particularly in the urban area and how this

impacts the environment. Unfortunately, time did not allow for significant exploration of this matter, but it is critical and needs to remain high on the agenda.

This review does not attempt to provide a detailed subject briefing but brings together all the evidence and information we have gathered throughout its duration which have shaped our recommendations as outlined in section 1.

Those of us who have heard this evidence over the last few months are determined to bring it to the attention of the GMCA, our Local Authorities, and to the wider public, recognising that all have a role to play in addressing improved integrated water management.

We know that the climate emergency is with us now. Increased flooding is one of the ways that it will affect our future lives and those of our children here in Greater Manchester, by acting now, there is much that we can do to address this. We urge that our recommendations are brought to the attention of all those with the power to act on them so that we can improve the lives of all our citizens, not just those at greatest risk.

Members of the Task and Finish Group

Cllr Mandie Shilton Godwin, Manchester	Chair
Cllr Colin McLaren, Oldham	
Cllr Tom Besford, Rochdale	
Cllr John Leech, Manchester	
Cllr Mike Hurleston, Stockport	
Cllr Jill Axford, Trafford	
Cllr Joanne Marshall, Wigan	

Acknowledgements

Members of the group would like to extend their thanks to those who contributed to this review, including –

- David Hodcroft, Infrastructure Lead, GMCA
- Jill Holden, Greater Manchester Flood and Water Management Programme Manager, GMCA
- Councillor Alan Quinn, Greater Manchester representative on the Regional Flood and Coastal Committee
- Helen Telfer, Growth and Infrastructure Advisor, Environment Agency
- Dee Grahamslaw, Place Based Planning Pilot Lead, United Utilities
- Andrew Leysens, Planning Manager, United Utilities
- Robert Woods, Principal Engineer, Bolton Council
- Andy Southgate, Group Engineer, Bury MBC
- Richard Thomas, Flood Risk and Highway Development Control Manager, Manchester City Council
- Laura Peacock, Flood Risk Engineer, Manchester City Council
- Talha Esmail, Flood Risk Engineer, Manchester City Council
- Gareth Owen, Lead Local Flood Authority Senior Engineer, Trafford Council
- Laura Morrison, Flood Risk Engineer, Wigan Council
- Andrew Vincent, Environmental Services Manager, Tameside MBC
- Ben Scott, Area Flood Risk Manager, Environment Agency
- Sam Evans, Head of Natural Environment Strategy & Policy, GMCA
- Johnny Phillips, Surface Water Strategy Manager, United Utilities
- Nicola Ward, Statutory Scrutiny Officer, GMCA

Review timeline

The review was structured over a series of meetings between October 2022 and February 2023 as set out below –

17 October 2022	Initial scoping session
23 November 2022	Meeting with representative from the NW Regional Flood and Coastal Committee
14 December 2022	Meeting with representative from the Environment Agency

6 January 2023	Meeting with representative from United Utilities
16 January 2023	Meeting with Local Authority leads
8 February 2023	Draft report to GMCA Overview & Scrutiny Committee
8 February 2023	Meeting to explore further the potential of nature-based solutions
22 March 2023	Final report to GMCA Overview & Scrutiny Committee

1. Executive summary and recommendations

- 1.1 Most of Greater Manchester sits in a bowl surrounded by the Pennines to the North and the Peak District to the East. It is subject to run off from this higher ground in addition to rain that falls within the conurbation. It also consists of a complex hydrological network that connects the ten local authorities and intersects four river catchments; Irwell, Upper and Lower Mersey and Douglas which cross administrative boundaries incorporating parts of Lancashire, Derbyshire and Cheshire.
- 1.2 The Irwell and Mersey catchments account for 78% of the total GM catchment area and Glaze Brook, the River Bollin, Sinderland Brook and the River Douglas make up the remainder of the fluvial catchments. All catchments within the sub-region, apart from the River Douglas, drain into the Manchester Ship Canal.
- 1.3 Future climate change projections evidence a potential precipitation rise of 59% by 2050¹ even if we are able to meet our carbon reduction targets, with the Northwest projected to have the highest percentage increase in rainfall in the country. Winters will be wetter and summers drier. Rainfall will be more intense.
- 1.4 Flooding can come from many sources including rivers, 'fluvial', or surface water, sewers and ground water; 'pluvial'. Flooding is one of the greatest risks identified on the Greater Manchester Community Risk Register.

¹ [Future-Flooding-Main-Report-Sayers-1.pdf \(ukclimaterisk.org\)](#)

- 1.5 In Greater Manchester, there are 63,478 properties at risk from river flooding. However, there are also currently 162,979 properties at risk from surface water flooding². Surface water is the greater and more complex risk and, in some areas of GM is this risk that increases the most significantly due to increased rainfall levels and at a greater intensity.
- 1.6 Historically the drainage system in the UK was designed for less intensive rainfall and to convey water quickly from the urban development via the drainage system into the main rivers. It is already clear that current drainage and flood management infrastructure is struggling to cope with increasing weather volatility in Greater Manchester even now, let alone that predicted for the future.
- 1.7 To address the shortcomings of our legacy drainage systems would require significant investment and significant land capacity. United Utilities have estimated that using conventional water storage solutions would require a modelled volume equivalent to 35 Beetham Towers to ensure that all the predicted rainfall between now and 2050 could be managed in compliance with the Environment Act.
- 1.8 Ensuring new buildings and developments incorporate integrated water management into their initial design phase is one of the most effective approaches to managing Greater Manchester future flood risk. Conventional and hard engineered water storage options, which are traditionally below ground would require significant disruption, land, cost and carbon. Above ground Sustainable Drainage Systems and nature-based solutions will provide multifunctional benefits including carbon sequestration and biodiversity net gain. As increased levels of rain are now unavoidable and climate risks increase, more sustainable options must be used.
- 1.9 Research from the University of Manchester has shown that green and blue spaces currently make up half of the city region³. Every year the natural

² [Economic Development \(greatermanchester-ca.gov.uk\)](https://www.greatermanchester-ca.gov.uk/economic-development)

³ [Measuring Greater Manchester's Green and Blue Spaces: Creating an Urban Green Infrastructure Baseline - GM Green City](#)

environment in GM reduces the financial risk of flooding by £6m. Deploying nature-based solutions ⁴ at scale will be our strongest defence against the impact of increased levels of water in the future. However, these can not deliver the required outcomes in isolation and there needs investment at significant scale, alongside other solutions.

- 1.10 The climate is already changing, and we have a responsibility to act. We urgently need to rapidly scale up and deploy every tool that we can to mitigate the risks for our children and grandchildren from flood and drought brought about by the human-induced heating of the planet.

Recommendations

Recommendation One – Increase awareness

Use the roundtable discussions with the GM Mayor and other key partners to highlight the scale of the problem ahead publicising the projected scale of increased rainfall on Greater Manchester and the impact it will have on residents and communities if no action is taken.

Share this report with Local Scrutiny Committees to ensure they are aware of its findings and can make recommendations to their Local Authority as appropriate.

Agree how GMCA Overview & Scrutiny will monitor the implementation of the recommendations of this review in future.

Recommendation Two – A clear co-owned plan

Co-create a GM Integrated Water Management Plan with all responsible partner agencies, establishing a set of shared objectives, agreed outcomes against metrics, with clear lines of responsibility and accountability.

Recommendation Three – Strong governance framework

⁴ [Nature-based solutions: using the power of nature | IUCN NL](#)

Ensure that there are clear lines of accountability at GM level through an improved governance framework that actively engages with the relevant GMCA Portfolio Leads and ultimately reports to the GMCA.

Create a specific thematic board to oversee integrated water management, recognising its significance, building on from round table discussions and creating a mechanism to ensure that the objectives of the Integrated Water Management Plan are delivered.

Recommendation Four – Effective use of knowledge, skills and resources

Continue to lobby for adequate additional national resources to support Local Authorities to manage and mitigate the issues arising as a result of a poor legacy of integrated water management and to develop and strengthen the resources available at GM level to offer Local Authorities support, additional specialised advice and guidance and provide capacity for better collaboration to enable the effective delivery of projects.

Recommendation Five – Ensuring social justice is at the heart of action

Ensure that the co-owned strategy provides clear guidance to all partner organisations that all GM schemes must be viewed through the lens of social justice.

Recommendation Six – Influencing planning laws and guidance

Request that DLUHC (Department for Levelling Up, Housing and Communities) seeks guidance from GM Local Authorities as to how best to review current planning policy to ensure that integrated water management is a predominant consideration for all new planning developments.

Request that DLUHC implement Schedule 3 of the Flood and Water Management Act 2010 in line with the outcome of the consultation to ensure effective delivery with an appropriate level of central government resource devolved.

Recommendation Seven– Improving advice and information

Provide briefings, supported by a portal of information for all councillors, MPs, Council Leaders, portfolio holders, and planning committees.

Raise citizen awareness of the situation, and the role that everyone can play to manage water, by launching a calendar of campaign messages as part of the Integrated Water Management Plan.

Recommendation Eight – Effective measures

Introduce more effective ways of measuring the impact of improved integrated water management with a focus on wider benefits such as carbon sequestration or improved biodiversity over the number of homes at risk of flooding.

Develop mechanisms by which these and others can be used as a more appropriate metric to measure progress towards the successful delivery of the Greater Manchester Strategy.

Recommendation Nine – Learn from others

Seeking the experience of other areas of the UK will expand the awareness of good practice and collaboration in Greater Manchester. Developing relationships with Greater London Authority (and other highlighted examples) in order to share best practice, innovation and common messaging is recommended.

Recommendation Ten – Further areas for scrutiny review

Consider how the issue of water quality objectives from the North West River Basin Management Plan are integrated into future work plans for the GMCA Overview and Scrutiny Committee.

2. Introduction, purpose and scope of the review

- 2.1 The issue of flood management was raised by a number of members of the GMCA Overview & Scrutiny Committee as an area of concern across the city region and for many residents. It was considered that the most efficient way to scrutinise the current landscape surrounding this issue would be through a task and finish exercise.

Objective one – to investigate the effectiveness of integrated water management across Greater Manchester, including organisational responsibilities, current governance, funding and resourcing arrangements.

Objective two – to consider the effectiveness of the current Memorandum of Understanding between the GMCA, United Utilities and the Environment Agency and determine where there are any areas that should be strengthened through Greater Manchester's forthcoming Integrated Water Management Plan.

3. Context

Climate Emergency

- 3.1 On Friday 26 July 2019 the GMCA declared a climate emergency alongside the creation of a Five-Year Environment Plan⁵ to address climate change risks across GM.
- 3.2 Assuring population resilience in the face of the climate crisis is recognised as a key role for the GMCA, and the role of water management a significant challenge to achieving population resilience. Water supply will come under increasing pressure from periods of dry weather. The risk of flooding is also increasing significantly, impacting communities, infrastructure and pollution.
- 3.3 The fundamental issue is that the planet is warming. This results in higher levels of rainfall and more frequent flash flooding, amongst other outcomes, which some of the existing flood defences, such as those around the river Irwell, cannot withstand. 12% of flood defences in GM currently require improvements. There is insufficient funding to strengthen the resilience of existing assets, build new defences and address the growing risk from surface water.
- 3.4 This was evidenced⁶ in Radcliffe on Boxing Day in 2015 when over 2250 properties and £11.5m of critical infrastructure in GM were damaged by flooding caused by storm Eva and river heights rose to the highest seen for 80 years. Significant rainfall and increased surface water and river levels have become a more regular occurrence. In January 2022 over 300 properties in Didsbury were 20mm off being flooded following storm Franklin.
- 3.5 Although our region is wetter than some other parts of the UK, droughts and other extreme events are a natural feature of the region's climate. United Utilities

⁵ [Five-Year Environment Plan - Greater Manchester Combined Authority \(greatermanchester-ca.gov.uk\)](https://www.greatermanchester-ca.gov.uk)

⁶ [Boxing Day floods 2015: six years on from when Storm Eva battered the boroughs of Greater Manchester | ManchesterWorld](#)

Drought Plan⁷ cites the measures by which the risk of drought is mitigated and states that there is enough water in the Northwest to meet demand up until 2045 and beyond unless there is a significant change to the plan. Although there had been reports⁸ of low reservoir levels during 2022, the current risk level of a Drought Permit, whereby the Environment Agency gives permission to UU to take an increased level of water from specific sources, remained at 2.5%, which equates to one in 40 years.

The Greater Manchester Strategy (GMS)

- 3.6 How we manage water is already of key importance to achieving a fairer, more prosperous and greener city region.
- 3.7 The Greater Manchester Strategy⁹ provides a vision of “a place where everyone can live a good life, growing up, getting on and growing old in a greener, fairer, more prosperous city region.”
- 3.8 It is now unavoidable that climate change will bring about more extreme and unpredictable weather patterns increasing risk of flood, heat and drought.
- 3.9 The Greater Manchester Strategy refers to the Greater Manchester resilience Strategy, stating: “We will use our Resilience Strategy to build the capacity of individuals, communities, institutions, businesses and systems within a city to survive, adapt and grow no matter what kinds of chronic stresses and acute shocks they experience”. In the Strategy, progress towards mitigating flood risk is measured by the number of properties at risk of flooding.
- 3.10 The data which contributes to this GMS performance measure of ‘number of properties at risk of flooding’ focuses on both river and surface water flooding –

⁷ https://www.unitedutilities.com/globalassets/z_corporate-site/about-us-pdfs/final-drought-plan-2022/drought-plan-2022-customer-summary---english-v5.pdf

⁸ [Greater Manchester reservoir is 'lowest ever seen' as drought declared in eight areas of England - Manchester Evening News](#)

⁹ [Greater Manchester Strategy - Greater Manchester Combined Authority \(greatermanchester-ca.gov.uk\)](https://www.greatermanchester-ca.gov.uk)

the GM Flood Risk Investment Programme is aiming to reduce the risk of both across the city region. Evidence¹⁰ suggests that properties in more deprived communities are less resilient: at greater risk from extreme weather events and most vulnerable to shocks and stresses. This data does not capture flood risk to infrastructure, or risk from sewer flooding or reservoirs.

3.11 The GMS Progress Report (July 2022) stated that “Resilience and Adaptation work is underway to support this agenda, however the progress report has found further, and faster activity is needed in this area.”

3.12 Progressive policy commitments include –

- Taking an integrated catchment-based approach to managing flood risk.
- Expecting developments to manage surface water runoff through sustainable drainage systems and as close to source as possible.
- Working with natural processes and adopting a natural flood management approach to slow the speed of water drainage and intercept water pollutants.
- Securing the remediation of contaminated land and the careful design of developments to minimise the potential for urban diffuse pollution to affect the water environment.
- Conserving water and maximising water efficiency in new development.
- Ensuring Net Zero carbon development by 2028.
- Achieving 10% ‘Net Gain’ in biodiversity.

Greener GM

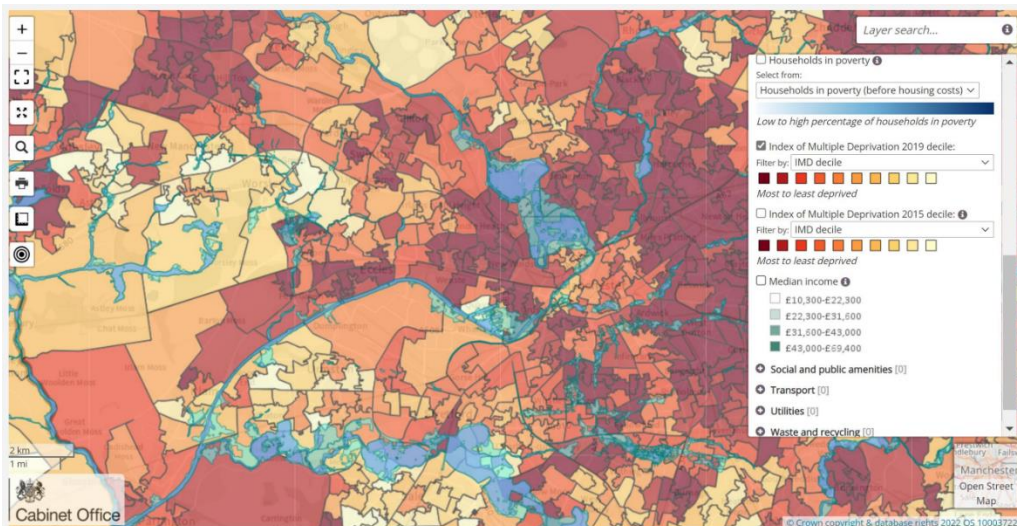
3.13 Pressures on water resources are increasing due to urbanisation, population growth, increased living standards, growing competition for water and pollution, all aggravated by climate change. Water is pumped around the network in GM requiring a significant amount of energy and generating energy, and where this is not green energy, carbon.

¹⁰ [Heading 1 \(publishing.service.gov.uk\)](https://publishing.service.gov.uk)

3.14 To create a region more resistant to climate change will take more than one intervention e.g., flood risk management, biodiversity net gain and carbon reduction. Conventional approaches to water management infrastructure known as ‘grey’ solutions, such as dams, drains and sewers, were built to supply water to the population then remove it as efficiently as possible. It is now appreciated that this approach has serious limitations and that there are real benefits to using alternative approaches through working with nature. ‘Green’ solutions range from restored ecosystems mitigating flood risk, to trees in urban areas improving water absorption. These approaches in themselves also have the benefit of supporting carbon sequestration.

Fairer GM

3.15 As the map below illustrates, many of Greater Manchester’s least affluent communities already live in areas at higher risk of flooding. It is imperative that impact on equalities is a central consideration when mitigation programmes are developed and prioritised, not least as these communities often have less access to personal resources to recover their position.



3.16 If more deprived communities are less resilient: at greater risk from extreme weather events and most vulnerable to shocks and stresses, its vital that these areas are prioritised for investment of integrated water management solutions,

however reducing the risk of flooding is just one outcome of such interventions as there are many health, environmental, well-being and social benefits.

3.17 The most vulnerable are more likely to be disproportionately affected by high CO2 emissions. Carefully planned place management can not only provide solutions for improving water management and air quality but provide natural habitats and access to green spaces for people, enhancing the social capital of a community.

More Prosperous GM

3.18 The economic losses from the winter 2019/20 flooding across the country were estimated to be about £333m¹¹.

3.19 In urban centres, natural watercourses have a significant role for generating and sustaining economic growth as well as providing a unique opportunity to contribute to the quality of the local natural environment. They also provide critical ecosystem services in reducing the urban heat island effect and mitigating air pollution, particularly when enhanced by the planting of appropriate species.

3.20 The natural capital approach values nature as an asset, or a set of assets, which benefit people. Life depends on water. Having plentiful supplies of water for our people and our economy, ensuring the quality of water for wildlife and recreational use, and managing flood risk all underpin the wider objectives outlined in the Greater Manchester Strategy. However, benefits are difficult to calculate and quantify in direct comparison to traditional 'grey' infrastructure solutions as outputs are very situation-specific dependent upon the intervention, situation, location, surroundings, soil type etc. The government published guidance (2021) on [Enabling a Natural Capital Approach \(ENCA\)](#) for policy and decision makers to help them consider the value of a natural capital approach. The guidance is supplementary guidance to HM Treasury Green Book.

¹¹ [Counting the cost of flooding - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/publications/counting-the-cost-of-flooding)

3.21 Modelling has been able to illustrate that the baseline natural capital accounts for Greater Manchester¹² show that current natural assets provide £1bn in annual benefits from the ecosystem provided.

3.22 In relation to jobs and skills, the sector also provides an opportunity for significant skills growth as there is a high demand for specialist integrated water management knowledge both in the public and private sector. In improving the skills offer in Greater Manchester there is the potential to increase the talent pool available and ensure that it ultimately contributes to economic growth.

4. Key issues

Current roles and responsibilities

- 4.1 Roles and responsibilities for the water environment are complex.
- United Utilities provide potable water and treat wastewater and is a significant landowner in the North West.
 - The Government provides policy direction to Ofwat through statutory regulation.
 - The Department for Environment, Food and Rural Affairs (Defra) is the policy lead for flood and coastal erosion risk management in England.
 - The Department for Levelling Up Housing and Communities provides funding to the Lead Local Flood Authorities and sets policy for planning and regeneration.
 - Local Authorities are responsible for new development, managing local flood risk i.e., surface water, ground water and ordinary watercourses and highways drainage and they have a legal duty in exercising their functions, to have regard to River Basin Management Plans which contain the main issues for the water environment and the actions needed to tackle them.
 - The Environment Agency have strategic overview of all sources of flooding (as defined in the Flood and Water Management Act 2010), responsibility for

¹² [MergedFile \(gmgreencity.com\)](#)

risk management activities on main rivers and reservoir safety as well as being the responsible body for producing River Basin Management Plans.

- There are catchment partnership groups delivering a more integrated and inclusive approach to managing the water environment at the catchment scale, working with charities, NGOs, public and private sector organisations that contribute to River Basin Management Plan objectives.
- Public and private landowners and infrastructure providers are instrumental in unlocking areas that can facilitate nature-based solutions. Landowners are responsible for maintaining the assets on their land and may not choose to do this.
- Homes, individuals and businesses create demand on the water environment from both a water abstraction and also impact water quality from their actions, such as creating litter, and disposing of pharmaceuticals, contaminants, either voluntarily or involuntarily.

4.2 There are no clear lines of accountability within GMCA governance in relation to integrated water management in GM. Work on the agenda crosses three portfolios at GM level, and also many portfolios at individual Local Authority level. There are a wide range of projects delivering on the ground, but there is no clarity to shared objectives or effective partnership arrangements, therefore there still remains a lack of integration across the Environment Agency, United Utilities, Local Highways Authorities, Local Planning Authorities, Lead Local Flood Authorities and Local Resilience Forums.

4.3 There are three Greater Manchester representatives on the North West Regional Flood and Coastal Committee. They are able to vote on the local levy, which provides an invaluable resource to help fund local priorities. It has already provided large contributions to major schemes, including Radcliffe and Redvales, and Rochdale and Littleborough.

4.4 Unlike many other public finances, local levy balances can be carried forward across financial years and earmarked for use in future years, providing flexibility to respond to evolving needs and programme changes, however further devolved

powers and responsibilities could enable them to prioritise funding and resources to the right places.

- 4.5 The North West Flood Risk Management Plan has recently been published, which is a requirement of the Flood Risk Regulations (2009). These are published every six years and are reviewed by Local Authorities. They contain national measures and special measures for identified flood risk areas. In GM only Ashton Under Lyne in Tameside is recognised by these criteria.
- 4.6 Policy direction is set nationally by different Government departments with guidance and detailed directions provided by government regulators such as Ofwat. Recently the Government published their Environment Improvement Plan that attempts to streamline national plans and offer further opportunities for devolved funding. It also references new surface water models the creation of Sustainable Approval Bodies (SaBs), and guidance on 'water positive' or 'net zero water' developments and roles for developers and water companies, however at the time of the review there was no clear indication as to how this would be delivered on the ground.
- 4.7 Each GM Local Authority is responsible for and has produced its own Flood Risk Management Strategy, but most have been done in isolation. Local Authority funding is not ringfenced to integrated water management which provides a further challenge for programme delivery. Grant Aid requires the ability to provide match funding to secure drawdown.
- 4.8 At local level, capacity is highly limited and constrained. In relation to flooding incidents, support is also outsourced in some instances.
- 4.9 Each investment programme for the GMCA, United Utilities (UU) and the EA run against different programme cycles and as a result are difficult to align. There have been a number of further identified opportunities for the potential alignment of programmes, but these are often restrained by current funding frameworks.

4.10 For example, the Flood and Coastal Erosion Risk Management (FCERM) six-year capital programme where capital investment is prioritised to the most economically deprived communities. Their current programme has an associated cost of £142m but requires £40m match funding which is often challenging to source. The Environment Agency also report that there is also circa £3m annual maintenance costs for infrastructure repairs to EA assets.

4.11 The GMCA agreed in September 2021¹³ to enter a Memorandum of Understanding with UU and the EA to strengthen partnership working in recognition that:

- Geographical boundaries did not fit and there was no place for water management to be brought together at a political or strategic/regional level.
- There were overlapping responsibilities and a lack of sufficient clarity regarding is decisions-making powers and responsibilities.
- Siloed policy and objectives were driving siloed decision-making via siloed planning and funding mechanisms, with insufficient time spent locating issues within a broader context and enabling the most effective and efficient measures funding to be identified and deployed.
- Lack of long-term strategic policy direction, with often short- term policy objectives and funding uncertainty, mean that we are in a stop-start competitive bidding processes, attempting to make funding bids meet govt criteria which may or may not be appropriate, and we lack the certainty to make and deliver long-term plans. There remains the challenge of multiple funding pots with different rules being applied by different departments that don't align.
- There were a plethora of activity and projects working across different elements of water management with different ways of working resulting in duplication of effort and inefficiencies and that at a time of such scarce resources, we can ill afford duplication of resources.

¹³ [GMCA agrees Environment Agency and United Utilities partnership to manage water differently - Greater Manchester Combined Authority \(greatermanchester-ca.gov.uk\)](https://www.greatermanchester-ca.gov.uk/news/gmca-agrees-environment-agency-and-united-utilities-partnership-to-manage-water-differently)

- 4.12 There was a consensus that the MOU would allow a number of different strategies to be brought together in order to deliver integrated water management more strategically and there would be greater efficiencies through collaboration.
- 4.13 Following the introduction of the MOU, both UU and the EA have allocated additional resources to support its integration and provide further focus on integrated water management across GM. Regular tri-lateral meetings take place with the GMCA to identify strategic issues and monitor the delivery of agreed actions.
- 4.14 The partnership through the MOU has also enabled joint sessions with Government departments to be held in order to influence change and provided a source of support across projects and funding bids. Greater Manchester is considered to be at the forefront of other sub-regional partnerships as many do not have arrangements in place to work with the Environment Agency or water companies as the GM MOU allows. However, there is further good practice that Greater Manchester could reflect on, such as the arrangements within the Greater London Authority.
- 4.15 The MOU has provided a clear mandate for partnership delivery and improved collaboration across three agencies involved. This forms the foundation from which to build a clear set of shared objectives within an Integrated Water Management Plan. It is clear that partners recognise the benefits of aligning delivery programmes to maximise outcomes.
- 4.16 Previous successful partnership working had been evident through programmes including Urban Pioneer, Natural Course and the Ignition Project. However, these were short term, specifically funded schemes without ongoing legacy arrangements. A clear example of this is the Green Recovery Programme¹⁴ (overseen by the Ofwat) within which there is a project for Sustainable Drainage Systems (SuDS) and Natural Flood Management (NFM) equating to £9.1m investment in sustainable drainage and natural flood risk management schemes

¹⁴ [Green Recovery 2022.pdf](#)

within the target areas of Eden, Fylde coast and Greater Manchester to reduce flood risk and mitigate the impact of climate change. The potential of such a scheme is enormous, however as funding is time limited and application deadlines too short, some the projects selected may not actually be able to bring about the widest benefits.

- 4.17 Individual Local Authorities are the Lead Local Flood Authorities. GMCA is not a regulator and does not hold Local Authorities to account. However, although the GMCA is not a Lead Local Flood Authority and has no statutory duties under the Flood and Water Management Act (2010), it can provide support to Local Authorities in terms of policy and leveraging of investment, convene partners to facilitate cross-sector, multi-agency working on this agenda and assist in influencing and shaping national policy, advocating on behalf of GM as mandated by the districts.
- 4.18 Within the Greater Manchester Combined Authority responsibility is dispersed across a number of portfolio areas and governance structures, including the Planning and Housing Commission, Green City Region Partnership, Resilience Forum and Strategic Infrastructure Board. Water management is a subset of many other issues rather than a strategic theme in its own right. Until recently there has been little challenge or opportunity for review against current good practice. Nor has a gap analysis been undertaken or any shared aspirational standards been developed, therefore it is difficult to prioritise projects as to which are required to achieve a determined target. As it stands the GMCA can only react to those projects led by the Local Authority, Lead Flood Authority, EA or UU with no overarching objectives for improved integrated water management.
- 4.19 Given the complexities and interdependencies that are apparent, a long-term co-ordinated approach to governance and accountability needs to be developed which involves all stakeholders.

Surface water

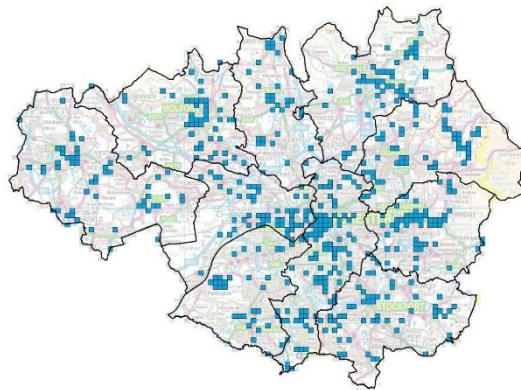
- 4.20 The increased risk from 'pluvial' (surface water) flooding is significantly higher than fluvial, in the urban areas of Greater Manchester. Much of our drainage system is a legacy of the Victorian era during which industrialisation significantly began to increase the population across the sub region. Its primary function was to transfer waste away from dwellings as quickly as possible in order to reduce the risk of disease and it was not designed to cope with the increased density of development, let alone increased rainfall levels, rainfall intensity and a reduction in Local Authority gully cleaning programmes.
- 4.21 There is still a lack of understanding as to how climate change is impacting our weather patterns, leading to flash rainfall, increased storms and levels of water that were not anticipated when drainage systems and flood defences were designed and installed in GM.
- 4.22 Pluvial flooding does not just affect homes and businesses but impacts on transport networks and utilities. An increase in intense rainfall events, population growth and the need to build new homes will further exacerbate this problem, as more of the land is covered with impermeable surface. This reduces the ability for the rainfall to drain away naturally putting additional pressure on the existing drainage network.
- 4.23 55% of sewers in Greater Manchester are combined, that is foul and surface water combined. The national average is 33%. Analysis of Met Office data¹⁵ shows that average annual water runoff in the North West is 28% higher than the average for England and Wales which means more water runs into our sewers.
- 4.24 Sustainable urban drainage (SuDS) provides a slow-release water and filtration management solution and helps to reduce the risk of surface water flooding and containments in town and city landscapes. This approach is still not widely adopted as standard in relation to new planning applications or highways developments. However, there is some work underway with Transport for Greater Manchester (TfGM) to develop a SuDS design guide which, it is hoped will be

¹⁵ [United Utilities - Storm overflows](#)

available for adoption across Local Authorities and partner organisations imminently. Currently there is a requirement for new builds to consider SuDS as a key component to their development. However, its utility is dependent on location and ground conditions and is not always the best method of diverting water. Developers can use 'viability' as a reason not to deliver the most effective SuDS.

4.25 Trees also provide effective water sequestration; however, encroaching Ash die-back is likely to cost 10% of the trees in Greater Manchester. The consequence is that a very significant level of sequestration will be lost, and it is unlikely that this will quickly be restored in the short term by smaller, younger trees.

4.26 The Surface Water Management Plan (2013) led by the Association of Greater Manchester Authorities included data from a Defra study which highlighted a number of areas in GM where 129 people or more are at risk of flooding from surface water within one 500m square.



4.27 In current planning guidance homeowners are allowed to pave up to five square metres using traditional materials under permitted development, or over that level if the surface used is permeable or drains away within their curtilage, for example, to a lawn or flower bed. However, many people are not aware of this and pave over greater areas. Residents are unlikely to be very aware of the impact on public drainage, for example, resin driveways, property extensions and artificial grass all reduce the overall amount of permeable surface. Stipulating the extent of permeable ground on a development site may be beneficial, but this is dependent on many other factors including soil type. Many Greater Manchester

boroughs have clay-based soil, which does not effectively aid natural drainage. Swales or tree pits are considered as more effective types of sustainable drainage and should be a preferred approach considered for any part of a new development.



Swales - [West Gorton, Manchester, gets a new park that drinks water - GrowGreen \(growgreenproject.eu\)](https://www.growgreenproject.eu/)



Tree pits - Bloom Street, Salford

Funding and resources

- 4.28 In the 2020 spending review the Government confirmed a £5.2b multi-year Grant Aid settlement for investment in flood and coastal defences to offer better protection for some 336,000 properties in England by 2027.
- 4.29 Since 2016 several million pounds have been spent in Greater Manchester on asset repair work and defence schemes for Salford, Bury, Radcliffe and Redvales.
- 4.30 Whilst these schemes help reduce the risk c. 57,000 homes remain at risk of flooding from both rivers and surface water across Greater Manchester, as the table below highlights:

Table 1 - Properties at risk of flooding in GM:

Flooding source	≤ 1:100 yr.	≤ 1:1000 yr.
Rivers(fluvial)	19,000 properties	60,500 properties
Surface water (pluvial)	25,000 properties	118,000 properties

- 4.31 The Grant Aid funding often requires partnership funding to unlock the money which is often challenging to acquire. There is also an expectation that Local Authorities will make significant financial match funding contributions but given continuing austerity that impacts heavily on local budgets.
- 4.32 Within GM, Lead Local Flood Authorities resource and capacity is limited. In some instances, there is just one flood risk officer per Local Authority and just one strategic Flood and Water Manager post sits within the GMCA. Therefore, there is a significant shortfall in resources to support Local Authorities to address planning breaches etc. In a recent Defra Select Committee Flooding Report¹⁶ (February 2021) there was a recommendation that Government should fund an expansion of local resourcing. This has not materialised to date.
- 4.33 Currently the Government also have access to the EU Solidarity Fund¹⁷ to provide financial support following natural disasters, however the majority of grants had been awarded outside of the UK due to the requirement for prompt applications from Government directly.

Skills and knowledge

- 4.34 With cuts across Local Authorities and partner organisations, together with the fragmentation of responsibilities, there is often insufficient skilled knowledgeable and experienced people resource for strategic proactive water management at

¹⁶ [Flooding \(parliament.uk\)](https://www.parliament.uk/business/committees/committees-a-z/commons-select/flooding/)

¹⁷ [Inforegio - EU Solidarity Fund \(europa.eu\)](https://ec.europa.eu/info/eu-solidarity-fund_en)

LA level. In addition, such skill sets are also highly sought after by private companies, resulting in real difficulty attracting and retaining staff.

- 4.35 More collaborative working, using the knowledge and skills held across GM would facilitate increased support for Local Authorities and other partners. For example, TfGM have used the knowledge of colleagues in the GMCA to support the development of their recent SuDS guidance document.
- 4.36 As well as additional capacity, effective leadership is also needed to ensure that an integrated approach is not only applied to new developments, but to all place-making activities across Local Authorities and partner organisations, especially within Greater Manchester's growth location areas.

Planning laws and guidance

- 4.37 Places for Everyone, the GM Spatial Framework, is likely to result in circa 180,000 more houses alone in the city region. The current drainage system will not be able to accommodate these additional new developments unless surface water is managed sustainably. Current planning requirements expect developers to design solutions into their developments to ensure there is no increase in flood risk, but this does not always happen.
- 4.38 Ensuring peat land and flood plains are not used for building land is vital to maximise remaining natural drainage routes. However, that alone is not sufficient to deal with current levels of heavy rainfall.
- 4.39 Current national planning policy frameworks need to be strengthened in relation to water management. The forthcoming introduction of Schedule 3 under the Flood and Water Management Act from Government would introduce the requirement to implement SuDS as a legal requirement in the planning process for new developments. Under the current arrangements Lead Local Flood Authorities can comment on a planning application, however once they reach the planning approval stage this comment is often excluded from the application pack submitted to the Committee. Schedule 3 would be a formal pre-requisite to a

planning application being granted, alongside a requirement to consider water efficiency and therefore together, ensures that an integrated water management approach cannot be overlooked.

- 4.40 The EA is currently a statutory consultee on planning applications, under the Town and Country Planning Act 1990, but for flood risk this relates to fluvial matters only when as we know pluvial risk is greater and increasing. Water companies are currently not a statutory consultee for drainage matters so it is difficult for them to influence development decisions.
- 4.41 Current building regulations require sewage to be kept separate from surface water until the last manhole on a development, where they can both be taken into the combined sewer. Ideally surface water should be diverted from the combined public sewer. and currently there are three options open to achieve this known as the drainage hierarchy) Developers however do actually have the right in law to connect to the public sewer. Schedule 3, if implemented, will remove this automatic right to connect making other options in the drainage hierarchy more appealing. Diverting to the natural water course is a preferred option in the drainage hierarchy but legally can be blocked by other landowners downstream or other ownership issues. There is currently no legal requirement for access to be granted across land for drainage and there are no incentives for landowners to cooperate. Legislative changes are needed for landowners to consider factors such as bio-diversity net gain or carbon offsetting.
- 4.42 All GM Local Authorities currently work under the Strategic Flood Risk Assessments (SFRAs) which inform policy and are useful in determining permissible discharge rates for new developments. When approving planning applications, integrated water management is considered so far as any runoff is required to be no more than the current run off rate, unless there is specific policy within Local Plans for a betterment following recommendations from the SFRA evidence.
- 4.43 All current new builds are charged to connect to the combined sewer at £300 per dwelling by United Utilities, a statutory charge, unchanged since the 1990's.

United Utilities offer a 90% charge reduction as an incentive to connect only foul water, but this sum is tiny in relation to the cost of improving infrastructure or installing alternative surrounding sustainable drainage, solutions that often do not fall to the developer. A financial incentive for new builds to consider sustainable drainage options first is required, and a change in legislation which enhances developers' rights access natural water courses.

- 4.44 Retaining water on site, 'water harvesting', is another, often overlooked alternative in the drainage hierarchy, as it can be expensive. This is when rainfall is collected onsite and used for internal or other non-potable uses such as watering plants or for flushing toilets. One of the greatest benefits of this method is to slow water into the combined sewer at the point of heavy rainfall.

Natural capital

- 4.45 Climate resilience should have nature recovery at its heart. Nature-based solutions can offer immense co-benefits including improved health and wellbeing, homes for wildlife, enhanced water quality and, depending on the type of nature-based solution, quite considerable carbon sequestration. A natural capital approach is a key tool in integrated water management, with the further benefit of slowing and managing water flow. Restoring peatland and wetland is particularly effective at carbon sequestration. The Peak District is one of the most degraded peat sites in the world. However recent work has demonstrated some amazing possibilities using sphagnum moss.¹⁸
- 4.46 DLUHC are currently consulting on a step change in relation to national planning policy which would see any future highways development being required to be tree lined.
- 4.47 Greater Manchester already has £1bn worth of natural capital benefits per year, which is not widely acknowledged and recognised.

¹⁸ <https://www.theguardian.com/environment/2022/sep/30/superhero-sphagnum-moss-save-communities-flooding>

4.48 Some recent examples of place-making in GM with natural capital and integrated water management at its heart include Mayfield Park, plans for Stockport Interchange and proposals for the River Irk. The Nature Recovery Initiative¹⁹ planned for 2023 would also support the delivery of IWM with nature recovery at its heart.



River Medlock and New City Park - Mayfield



Plan for green roof at Stockport Interchange

¹⁹ [Biggest ever nationwide initiative to restore nature in England set for launch - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/news/biggest-ever-nationwide-initiative-to-restore-nature-in-england-set-for-launch)



Proposals for River Irk Park – Northern Gateway

Water quality

- 4.49 Improving water quality across Greater Manchester is a priority recognised in the Five-Year Environment Plan. 97% of GM rivers are failing to meet the statutory requirements under the Water Management Directive Regulations (2017)²⁰.
- 4.50 The majority of waterbodies in GM are recognised as moderate status but a small number are classified as poor.
- 4.51 There are over 2400 km of river valleys within Greater Manchester, in addition to over 150 km of canals, which form a central component of the landscape, making a major contribution to biodiversity, geodiversity, wider green infrastructure, local identity, the sense of place and heritage.
- 4.52 Poor river quality is one of the direct outcomes of ineffective water management as a result of agricultural land contamination, surcharges from the combined sewer network and run off from highways. This is a significant issue however,

²⁰ [The Water Environment \(Water Framework Directive\) \(England and Wales\) Regulations 2017 \(legislation.gov.uk\)](https://www.legislation.gov.uk)

unfortunately time constraints for this review did not allow for the detailed consideration that this topic does require.

5. Conclusions

5.1 An integrated water management approach should consider a mix of solutions, e.g., green infrastructure, sustainable urban drainage and other nature-based catchment solutions to become standard, making space for water whilst slowing the flow. Small scale projects in GM have shown how these approaches can be delivered, including through:

- River Roch - approximately 6.72 million inward investment over the 10 years²¹ as a result of the town centre improvements. Which has reduced flood risk for 40 properties in the town centre bringing money into the local economy and increasing employment opportunities for local residents.



- Peatland restoration in upper catchments – such as around Dovestone (Oldham), which has increased the capacity for water storage in the Upper Mersey catchment alongside storing more carbon.

²¹ [Reopening the River Roch in Rochdale and reducing flood risk - Creating a better place \(blog.gov.uk\)](https://www.blog.gov.uk/2019/06/12/reopening-the-river-roch-in-rochdale-and-reducing-flood-risk-creating-a-better-place)

- Slow the flow projects – such as Smithills Estate (Bolton) where natural “leaky dams” have slowed the flow of water in the upland areas of the Irwell catchment and provide local biodiversity benefits.



- Sustainable Urban Drainage – such as implemented in highways in parts of Salford (as per the image on the front cover of this review), reducing surface water and providing natural spaces in urban areas.
- Salford Wetlands - The £10 million Salford flood scheme will reduce flood risk to almost 2,000 homes and businesses. In addition, it has created more than 5 hectares of urban wetland, bringing attractive landscapes for people and wildlife.



5.2 The wider benefits of effective integrated water management need to be shared. There are a number of projects that have already been delivered in Greater Manchester or are currently planned or being delivered which have not only contributed to reducing the risk of flooding but have provided a wealth of other benefits which are not widely recognised.

5.3 Gorton 'Sponge' Park in Manchester has been specifically designed to manage the flow of rainwater into the existing drainage system. Design features such as swales, wide shallow trenches planted with aquatic vegetation, will help capture excess water from nearby roads and slow the rate at which it flows into drains.



5.4 Often residents are not aware of the impact of their home improvements, such as the installation of resin driveways or artificial grass on surface water drainage. Information is available on the [Flood Hub Website](#), but not actively promoted. If

this issue is to be effectively addressed, this must be brought to residents' attention. We must all play our part.

6. Recommendations

Recommendation One – Increase awareness

- 6.1 Currently, flood and water management is not progressing at the pace of the rapidly changing climate. Therefore, first recommendation of this review is to raise awareness wherever possible of the scale of the problem we face and potential consequences for not taking action now.
- 6.2 An initial roundtable discussion has been held with the GM Mayor and key stakeholders to enable this agenda to be stepped up. However, this level of engagement is an ongoing requirement to ensure that the potential impact of poorly managed water and the need to act at scale attracts the level of attention it requires.
- 6.3 This review shall also be shared with local MPs and the Minister for Environmental Quality and Resilience to ensure that Government are aware of the recommendations it sets out for them to consider and highlights the issue as prominently as possible.
- 6.4 We also recommend that this review is shared with each GM Local Authorities through their relevant Overview & Scrutiny Committee in order for them to be made aware of its findings and discuss any relevant actions for each authority.
- 6.5 To ensure that the recommendations of this review are taken on board by the relevant organisations, it is suggested that a follow up report be brought to the GMCA Overview & Scrutiny Committee in 12 months' time to provide such evidence.

Recommendation Two – A Clear Co-Owned Plan

- 6.6 There is currently no vision or strategy for Integrated Water Management across Greater Manchester. The proposed Integrated Water Management Plan is anticipated to be co-owned and to co-ordinate strategy and plans for delivery over the next 10-15 years, within which SMART objectives and responsibilities are clearly defined. This is the next natural step to follow the introduction of the MOU with United Utilities and the Environment Agency which has been useful in building relationships and trust and created a mandate for increased opportunities for collaboration.
- 6.7 The Plan should be a high-level document that sets out –
- The current stage of the water environment in GM, key issues and challenges, and very much highlighting the scope and scale of the challenges ahead and the urgency of the need for action.
 - A long-term vision and aims for integrated water management for the next 10 years.
 - A framework of the key actions that need to be delivered.
 - The existing metrics and targets (and gaps) that relevant stakeholders are working towards to that the size of the challenge can be fully understood, and progress towards better management can be measured.
 - Quick win actions that can be progressed in the short term whilst working in parallel to address more longer-term goals.
 - Investment mechanisms and co-investment opportunities.
 - A 5-year initial delivery plan with annual milestones, ensuring that the plan is monitored, revised and reviewed on a regular basis.
 - An appropriate high level governance structure, identifying who has responsibility and accountability for delivery of the outputs as set out in the delivery plan, as well as how and to whom it is held accountable.
- 6.8 Commitment to a shared evidence base is also a prerequisite for providing modelling forecasts from a universal platform. This will lead to a framework of issues, required action, key stages, milestones, maturity requirements and metrics to challenge and measure performance. This will also enable a funding

strategy to be developed in order to enable GM to have access to as much available funding as possible.

- 6.9 It is also important to align the strategy with Greater Manchester's proposals for growth locations and future planning strategies to ensure that any new developments do not increase flood risk.
- 6.10 It is positive that the Greater Manchester trailblazer proposals make reference to nature recovery and improved planning guidance, however they also need to recognise that the proposed Integrated Water Management Plan requires accountability in order to build on from the successful partnership arrangements that have been created through the MOU.

Recommendation Three – Strong governance framework

- 6.11 With ten Local Authorities, ten Local Planning Authorities, ten Local Flood Authorities and a range of partner organisations with a role and remit surrounding water management it is important to ensure a strong governance framework with clear lines of accountability.
- 6.12 There needs to be a review of governance at a GM level to ensure that there are clear lines of accountability and reporting mechanisms that include the GMCA Portfolio Leads.
- 6.13 Creating a specific thematic board specifically for integrated water management would strengthen accountability, scrutiny and provide clarity of responsibility for all contributory partners. It would also create a mechanism by which the objectives of the Integrated Water Management Plan could be held to account for their delivery.

Recommendation Four – Effective use of knowledge, skills and resources

- 6.14 There is currently no central funding source, with all Local Authorities bidding for the same pot of Grant Aid with little ability to raise match funding. Other

Government funding to Local Authorities is not ring fenced, so often is used against other budgetary pressures.

- 6.15 LA funding should be fully devolved and encapsulated within a costed joint investment plan with oversight from the Regional Flood and Coastal Committee and regulated by the most appropriate body. Funding should be reviewed every 5 years, in line with single joint plan cycles in order to ensure coherency across investment plans.
- 6.16 Further devolution would enable projects to be completed quickly and efficiently without additional levels of bureaucracy. It would also enable Local Authorities and partner agencies to deliver more than their statutory duty and take a more holistic view to integrated water management solutions.
- 6.17 Once a flooding incident had occurred, a Government funding stream similar to the EU Solidarity Fund would enable areas of the UK to access funding to address national disasters. At the present time, this requires Government to promptly apply against other countries and therefore funding has not been forthcoming in recent years.
- 6.18 It is imperative that the current knowledge base is used as effectively as possible. Connecting Local Authorities to share knowledge and best practice across Greater Manchester and holding specific expertise at GM level will allow local authorities and partners to access this as required, rather than attempting to build their own detailed knowledge base with no additional support.

Recommendation Five - Ensuring that equality impact is prioritised

- 6.19 As with any of the other human-made issues that we face such as global heating, poor air quality, etc, we know that those with the least are often first in line to experience the worst issues. The Greater Manchester Combined Authority has social justice at the core of its values, and this means that schemes that also work towards the closing the gap between the best and worst off in our communities should be prioritised.

6.20 Improving social justice requires broader thinking than just focusing on the delivery of individual projects. It means targeting the education, work and skills opportunities that will arise in this sector at less advantaged communities to promote and encourage access to good jobs and rewarding and meaningful careers. A one-size-fits-all approach to integrated water management would result in inequalities for communities whereby it does not meet their needs. Therefore a 'place based' solution to every individual issue is required. This will ensure that the outcomes can be modelled against a very specific location to ensure that the most appropriate solution is found for that community.

Recommendation Six – Influencing planning laws and guidance

- 6.21 Planning policies are out of date in some areas, therefore DLUHC (Department for Levelling Up, Housing and Communities) should take advice and guidance from GM Local Authorities to review current planning policy to ensure that integrated water management is a predominant consideration for all new planning developments, with no adverse effect to local housing targets.
- 6.22 Furthermore, following the consultation, ensure that the amendments to Schedule 3 to enable it to be delivered effectively within Local Authorities are taken into account and that the right level of resources are provided from Central Government in order to enable delivery.

Recommendation Six – Improving advice and information

- 6.23 There are a number of general misconceptions amongst the public regarding effective water management, the first being the lack of awareness of the legacy infrastructure that is often the main cause of poor water management, secondly the blame culture that is often attributed to new developments which have met all the drainage requirements but can often be cited as the only cause of longer standing drainage issues.

- 6.24 However, there are also developments which do not follow planning guidance, often small-scale home improvements including tarmacking of drives and pathways which cover permeable surfaces. There are also larger scale developments which also do not comply, however with limited resources in Local Authorities to address these, they remain a contributing factor to poor integrated water management.
- 6.25 Improved promotion of planning and building advice should be made available to residents at all stages of the planning process, advising them about SuDS solutions and pointing them to further sources of information.
- 6.26 Furthermore, the provision of advice to all residents on how to make best use of water that falls on their property should also be increased, to ensure that all homeowners are aware of the benefits of water harvesting, drainage diversion and rain beds for their own gardens, green spaces and the wider benefits to the drainage network.
- 6.27 This information and additional briefings on the importance of integrated water management should also be easily available to elected councillors, especially those on Planning Committees taking decisions regarding proposed planning applications.
- 6.28 It is not right that the lack of consistency across Greater Manchester makes it difficult for residents and councillors alike to navigate the system in order to seek information that should be readily provided to them.
- 6.29 All of these elements should be considered when developing the communications plan for the Integrated Water Management Plan as this would be an ideal opportunity to seek greater engagement on the subject and increase awareness of the impact of not considering sustainable drainage solutions.

Recommendation Eight – More focus on effective measurement to ensure progress

- 6.30 The delivery measurable against this ambition in the Greater Manchester Strategy is the number of homes at risk of flooding. However, this is a very one-dimensional approach and does not fully capture the issue nor the solutions which have been put in place.
- 6.31 The measurable outcome for the current EA scheme Littleborough flood basin is the number of properties protected from flooding. This is clearly positive, but there are other measures which could have been used to fully capture the wider benefits of such a project.
- 6.32 A fully developed Integrated Water Management Plan will require a range of key performance indicators against which the scale and scope of the challenge as well as progress toward the shared vision can be monitored. Some of this will be very specific, for example might include the rate of waterflow; restored peatlands might include depth, volume of retained water number of species; or volume of carbon sequestered; and a new housing development on a brownfield site might look at the % of rainwater captured on site rather than diverted into the combined sewer network. The work currently being undertaken by the University of Manchester in relation to the Biggershaw Colliery may further support future projects in being able to quantify the value added through natural flood management solutions.
- 6.33 This should be considered in detail by lead officers to ensure that the most appropriate measures are included in the Greater Manchester Strategy performance monitoring going forward.

Recommendation Nine – Learn from others

- 6.34 Undertaking this review has illustrated the depth of the issue of integrated water management, and the more knowledge gained, the more knowledge it was apparent could be sought.

- 6.35 Although GM are noted as advanced in their partnership arrangements following the introduction of the MOU, there is still so much good practice to be learnt from across the UK and further afield.
- 6.36 Continual learning, sharing and collaboration will enable Greater Manchester to introduce improved measures within our City Region, so this is greatly encouraged.

Recommendation Ten – Further areas for scrutiny review

- 6.37 There were many areas that this review could have gone on to consider, however its scope and timeframe did not allow. Therefore, consideration should be given as to how to provide scrutiny to these topics in alternative ways.
- 6.38 Specifically, the GMCA Overview and Scrutiny Committee is asked to consider how the issue of water quality, in particular the spillage of sewage into water courses and run off from agricultural land and highways could be integrated into their future work programme.