HOW DO WE MAKE THE MOST OF PLYMOUTH’S WATER ENVIRONMENT?

Plymouth Plan topic paper
Water Resources
Plymouth Plan Topic Paper Water Resources

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What is this topic paper about?

This topic paper has been published as part of Plymouth Plan Connections. It is one of a series of topic papers that are being published to provide information and support the Council’s ongoing discussions with local people and organisations about the future of the city.

Make your comments on this document as part of the Plymouth Plan Connections before 25 October 2014. www.plymouth.gov.uk/plymouthplan
Background

The outstanding natural environment is recognised as one of the South West’s greatest assets. It is essential to livelihoods in the South West and helps attract visitors and businesses and so is vital to the economy.

The water environment is a vital part of that offer, providing services to tourism (bathing and water sports), farming (freshwater for livestock and irrigation), visitors and residents (drinking water), and for businesses (water for industrial processes).

Plymouth context

Plymouth’s water environment comprises marine, transitional (estuary) and freshwater components. Fresh water-courses arise both within and outside the city. The Tamar is a substantial estuary system bounding the west of the city and the Plym estuary intersects the eastern part of the council’s jurisdiction. The Plym and Tory Brook arise on Dartmoor, where there is a legacy of mining for metals and china clay which can affect water quality.

The Plymouth Sound and Estuaries European Marine Site\(^1\) designation recognises the high quality of the marine environment which surrounds the city (Fig. 1), which is confirmed by the recent designation of parts of the Tamar Estuary as a Marine Conservation Zone\(^2\).

Current position

In Plymouth, in common with other urban areas, streams, rivers, and coastlines have been physically modified, for instance to protect land and property from flooding, enable land drainage or to allow for navigation. These physical modifications alter the aquatic ecology and threaten species and habitats. Runoff and flooding, especially from urban areas, can cause pollution of streams, rivers, lakes and coastal waters. As well as needing to limit the impact of new developments, there is a legacy of impacts from earlier eras to reverse.

The drainage and sewage infrastructure has an important influence on water quality in the streams and rivers in Plymouth and in its coastal waters. A large number of untreated sewage discharges to Plymouth Sound and the Cattewater were removed and transferred to Plymouth sewage treatment works (STW) in 1998. Sewage is treated to a secondary standard with ultraviolet (UV) disinfection. Improvements to several untreated discharges into the lower Tamar Estuary (Hamoaze), were also completed at that time. Since completion of this scheme the bathing water quality at Plymouth Hoe West has improved significantly. Further improvements during the last decade have seen continued improvements to water quality.

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1  Tamar Estuary Sites MCZ Fact Sheet
2  Tamar Estuary Sites MCZ Fact Sheet publications.naturalengland.org.uk/publication/6037040860758016
Marine nature conservation areas in and around Plymouth
The majority of sewers in Plymouth are ‘combined sewers’ and carry both sewage and surface water from roofs and drains. ‘Combined storm overflows’ (CSO) operate during heavy rainfall when the sewerage system becomes overwhelmed by the amount of surface water. The overflow prevents sewage from backing up pipes and flooding properties and gardens. However, it also results in untreated sewage being discharged into the environment.

There is a storm overflow at West Hoe, which discharges to Plymouth Sound approximately 420m southwest of Plymouth Hoe West beach (a designated bathing water) (Fig. 2). There are also emergency and storm overflows that discharge into Plymouth Sound from neighbouring urban catchments. The operation of the overflows can lead to a drop in water quality in the Plymouth Sound and at Plymouth Hoe West bathing water.

A significant source of pollution in surface waters is rainwater runoff from roads. This carries a variety of contaminants and debris which enter the drainage system with rainfall. After long dry periods concentrations of pollutants can be very high. Some of the highway drains carrying this pollution will discharge direct to the environment, causing harm to wildlife and present potential health hazards for residents.
What are the key drivers of the need for change?

Vision and growth

The vision for Plymouth, as Britain’s Ocean City, is to be one of Europe’s most vibrant waterfront cities, where an outstanding quality of life is enjoyed by everyone. Maintaining a clean and sustainable environment is a key objective to achieving this vision. Water is a fundamental element of Plymouth’s environment – more so than for almost any other city. It has one of the world’s finest natural harbours, and an important marine environment protected for its wildlife. Plymouth Sound provides the setting for Plymouth’s waterfront, and the lido and bathing facilities offer valued leisure opportunities for local people and unique visitor attractions. It is important that new development or the legacy of existing development does not place additional stresses on the water environment through pollution or abstraction for drinking water or industrial processes.

Water Framework Directive

The Water Framework Directive (WFD) seeks the achievement of good ecological status for all waterbodies. It requires all relevant authorities to use their powers and duties towards this end. The Environment Agency has led a comprehensive programme of environmental quality assessment which has helped to identify waters that require action. They also regularly sample designated bathing waters for bacterial contamination (from sewage and from farm land). All water bodies in Plymouth require some action, but bathing water quality presents a particular challenge. The Tamar Estuaries European Marine Site is particularly sensitive.

Flood and Water Management Act

The Flood and Water Management Act 2010 requires Plymouth City Council, the Environment Agency and South West Water to prepare a joint strategy for managing flood risk. This document, the local flood risk management strategy, identifies specific issues concerning tidal, surface water and fluvial (from rivers and streams) flood risks. It identifies roles, responsibilities and actions required to address those risks. This includes actions that will have an impact on water quality, especially in relation to sewage and drainage infrastructure. A new set of powers and duties, soon to be implemented, extend the role of Plymouth City Council with respect to SUDS (sustainable urban drainage systems) so providing a new mechanism for managing water quality.

References:

7 Tamar Estuaries conservation status and advice http://plymouth.gov.uk/tecfdocumentsandpublications
8 Plymouth Local Flood Risk Management Strategy

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Bathing Water Quality

Changes to the Bathing Waters Directive have set higher standards of compliance which have implications for both of Plymouth’s designated bathing beaches, West Hoe and East Hoe. England’s wettest summer for over 100 years (in 2012) had its impact on bathing water quality throughout the country, contributing to the lowest compliance rates for over a decade. 93% of bathing waters complied with mandatory standards and 58.4% with guideline standards\(^9\). Fig 3 illustrates the records for Plymouth, from the official Bathing Water Data Explorer. In Plymouth, in dry periods the sewage and surface water drainage infrastructure is adequate. However, in wet periods the frequent operation of combined storm overflows causes unacceptable quantities of untreated sewage to enter the coastal waters around the city. In summer 2012 for example the bathing water quality was reduced to a level that beaches will be closed under similar conditions in the future because more stringent standards now apply.

Are there any other aspects of the water environment that we need to consider?

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\(^9\) Defra Bathing Water Newsletter, Jan 2013

What are the opportunities for addressing these needs?

South West Water’s recently approved business plan for 2015-2020(10) identifies significant investment in the sewage system in the city. This will include upgraded sewage treatment works, and upgrades to sewage mains in many locations throughout the city. One of the objectives of these works will be to reduce CSO discharges and so improve bathing water quality. Currently a comprehensive programme of modelling work is underway, commissioned by South West Water, to identify exactly where these improvements are needed to provide the most benefit to water quality.

In relation to water supplies, SWW will be constructing a new water treatment works at Roborough, just to the north of the city, to supply Plymouth and the South Hams. It will replace the existing works at Crownhill. It will use modern technology which is safer and will produce much better quality drinking water. This is part of a long-term strategy to ensure the security of supply to Plymouth and to meet growing needs as the city expands.

The preparation of the Local Flood Risk Management Strategy has required improved coordination between PCC, SWW and EA. The benefits for investment in flood and sewage infrastructure are already being demonstrated through the coordination of funding to maximise the value from individual schemes. Coordination with other lead local flood authorities, now that strategies are in place, would be beneficial (for example to reduce pollution risks from mining activity outside the city boundary) and the Council will need to explore the best approach to work with Environment Agency and South Hams District Council. This might best be achieved through a wider body considering broader issues of natural resource and landscape conservation.

The introduction of the Environment Agency protocols for short-term pollution (STP) incidents will enable better management of the risks from poor bathing water quality whilst minimising restrictions on bathing. The EA issues a daily forecast of the pollution risk at all appropriate sites and warn when water quality is likely to be reduced. The Environment Agency investigations and modelling of Plymouth marine waters has shown that reduced water quality at Plymouth Hoe East and West is principally associated with pollution sources from local urban drainage at The Hoe / Cattewater, and discharges to the Plym Estuary. The bathing waters are mainly affected during wet weather by pollution from combined sewer overflows, and from the flushing-out of the surface water drainage systems.

The 2015 Water Framework Directive deadline to achieve good environmental status for all water bodies is driving a wide programme of investment to improve water bodies. This includes works to improve the ecological functioning of rivers, such as removal of weirs, and habitat creation. These actions will also help manage water pollution and flood risk, and help adapt to the city to climate change.

Are there any other opportunities that we could use to improve Plymouth’s water environment?

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(10) South West Water Business Plan 2015-2020
What alternative strategies are we considering

There are many practical alternatives to dealing with specific pollution and other water quality and quantity issues. However, strategically the options are to continue with the status quo or to take a more pro-active approach, as detailed below.

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Commentary</th>
<th>Evidence</th>
</tr>
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<tbody>
<tr>
<td>Manage the status quo, dealing with periodic bathing water failures.</td>
<td>This would result in the periodic loss of an important resource for local people and visitors to Plymouth, and potentially damage the reputation of the city for tourism. New development will in any case disrupt the status quo.</td>
<td>EA monitoring records</td>
</tr>
<tr>
<td>Invest in new/upgrading infrastructure as and when opportunities arise</td>
<td>Water resource issues operate at a catchment level. A problem at any one point in the catchment is often the product of numerous problems elsewhere in the system. Thus <em>ad hoc</em> solutions risk failing to resolve the problem and provide poor value for money.</td>
<td></td>
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<td>Plan strategically (with partners) to identify critical infrastructure for managing water quantity and quality (including flood risk). Integrate solutions with new development and improvements in green infrastructure</td>
<td>This approach will require continued liaison between PCC, EA and SWW, and resources for strategic studies. However, the LFRMS and bathing water liaison groups provide mechanisms for this. The Plymouth Plan will need to provide an appropriate strategic spatial framework to ensure that multiple benefits are achieved for the city.</td>
<td>Plymouth Local Flood Risk Management Strategy South West River Basin Management Plan</td>
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What do we think is the likely direction of travel?

Water catchments provide a logical management unit for water resource issues and the Plymouth Plan should promote this approach. Catchments should be prioritised for upgrading water infrastructure based on an understanding of existing problems, and based on plans for new development. The Plymouth Plan should contain policies that prioritise the upgrading of sewage and watercourse capacity at known pinch-points and should have a long-term goal of separating all sewer and surface water drainage to reduce operation of CSOs and the consequent pollution.

Where possible, investments should achieve multiple benefits. Such benefits can be expected in relation to reducing flood risk, improving green infrastructure, and reducing the liabilities relating to maintenance of SUDs systems. The Plymouth Plan should identify (based on the LFRMS and Green Infrastructure Strategy) strategic interventions to improve the capacity of the water environment to slow down (attenuate) surface water flows during storm events and to provide additional storage capacity upstream of flood risk areas where these have been identified as beneficial.

The establishment of a SUDs Approval Body (SAB) within the Council will enable tighter control of SUDs systems in new development and ensure that their long-term management safeguards their performance. The Plymouth Plan will enable the definition of strategic drainage networks for the city, to which new developments will contribute.

Policies should promote retrofitting SUDS where opportunities arise through consented development. Given that this will be one of many competing priorities for wider benefit from development, the Plymouth Plan should identify priority objectives and locations in relation to retrofit of SUDS to aid negotiation of planning conditions and planning gain.

PCC should continue to liaise closely with the EA and SWW so achieve maximum benefit from their combined work programmes and investment capacities, especially with regard to improving bathing water quality aiming to achieve ‘Good’ status every year.

Engagement with sub-regional partners regarding a suite of related environmental issues would be beneficial for Plymouth’s water environment and more widely. Water resource and quality, flooding, nature conservation, green infrastructure, and landscape (and agricultural land management) are all closely related issues which span administrative boundaries. Plymouth City Council already works in many ways with relevant partners and improved coordination may result in both efficiencies and service improvements. (Relevant partners are: Cornwall Council, Devon County Council, South Hams District Council, Environment Agency, Marine Management Organisation, South Devon AONB, Tamar Valley AONB, Dartmoor National Park, and South West Water).

The marine nature conservation areas on Plymouth’s doorstep represent an opportunity to both promote Plymouth as a high quality destination for inward investment and for marine tourism and leisure.
Do you agree with the strategic approach to managing the water environment suggested above?

What do we think is the likely direction of travel?
What happens next?

Any comments received on this topic paper will be considered in the preparation of the Plymouth Plan. You can make comments at [www.plymouth.gov.uk/PlymouthPlan](http://www.plymouth.gov.uk/PlymouthPlan) or by email [plymouthplan@plymouth.gov.uk](mailto:plymouthplan@plymouth.gov.uk). Alternatively, please post your comments to:

Strategic Planning & Infrastructure Department  
Plymouth City Council  
Ballard House  
West Hoe Road  
Plymouth  
PL1 3BJ

The closing date for consultation responses is 25 October 2014.

**List of key Plymouth Plan evidence base documents for strategic overview of Plymouth Plan.**

- River Basin management Plan. Southwest River Basin District
- Plymouth Local Flood Risk Management Strategy
- Environment Agency bathing water quality monitoring data