

## J. Action Plan

**Paddock Wood Surface Water Management Plan**

**Action Plan**

Version 1.0

Action ID	Action Name	Detailed description	Drivers / issues	Action type	Asset type(s)	Priority	Status	Timescales				Required role of partner organisations					Key stakeholders	Capital cost	Operational cost (per annum)	Confidence in cost	Potential funding sources (not binding)	
								Term	Target Start By	Target Complete By	Next review due	Tunbridge Wells Borough Council	Kent County Council	Environment Agency	Southern Water	Medway IDB						Paddock Wood Town Council
PW_SWMP_001	Determine ownership and maintenance of open channel in Station Car Park	Continue working with Network Rail (landowner) and Southern Railway (car park operator) to ensure maintenance of the short open section of the "Station Car Park" Stream within the station car park	Manage existing flood risk	Organisational	Ordinary watercourse	High	In progress	Short (<1 year)	Dec-11	Mar-12		Lead organisation	Significant role	No significant role	No significant role	No significant role	No significant role	Network Rail / Southern Rail	None	Unknown	High - detailed design / analysis	
PW_SWMP_002	Create gate access to open channel in Station Car Park and maintain channel	Install locking access gate to short section of watercourse to enable regular maintenance and access to the culvert inlet screens in the event of a blockage. Gate design needs to consider method of maintenance and type of plant requiring access.	Manage existing flood risk	Capital works	Ordinary watercourse	High	In progress	Medium (1-5 years)				Lead organisation	Significant role	No significant role	No significant role	No significant role	No significant role	Network Rail / Southern Rail	£3,000	Unknown	Very low - guesstimate	Riparian owner
PW_SWMP_003	Provide guidance on a suitable maintenance regime for managing five ponds currently maintained by Paddock Wood Town Council	Paddock Wood Town Council currently maintain five attenuation ponds in the Green Lane estate and Putlands Leisure Centre. As non-specialists in this type of work, PWTC require clear guidance on suitable regimes which will maintain the capacity of the ponds but also avoid prosecution for environmental damage. Assistance is required from the partnership (including EA biodiversity team) to design a suitable maintenance regime.	Manage existing unfunded maintenance commitments.	Partnership / education / engagement	SUDS	High	Not yet started	Short (<1 year)				Significant role	Lead organisation	Significant role	No significant role	No significant role	Significant role		Unknown	Unknown	Unknown	
PW_SWMP_004	Agree interim arrangements for adoption of SUDS prior to full implementation of Kent SUDS approval board.	There is a need to ensure that, prior to full implementation of the full SUDS approval board process, any SUDS installed at new developments have adequate arrangements to ensure their long-term maintenance, including agreement on which organisation will maintain, financing, design standards. The most appropriate means to implement this would be to develop a SUDS policy within the LDF, based on existing guidance e.g. CIRIA SUDS manual, Cambridge City Sustainable Drainage Design and Adoption Guide ( <a href="http://www.cambridge.gov.uk/ccm/content/planning-and-building-control/urban-design/sustainable-drainage-systems.en">http://www.cambridge.gov.uk/ccm/content/planning-and-building-control/urban-design/sustainable-drainage-systems.en</a> )	Flood and Water Management Act	Organisational	SUDS	Medium	Not yet started	Short (<1 year)				Significant role	Lead organisation	Significant role	Significant role	Significant role	Significant role	Developers	None	Unknown	Unknown	KCC
PW_SWMP_005	Paddock Wood Stream maintenance	The Paddock Wood Stream is a Main River maintained by the Environment Agency. It has been designated with their highest level of maintenance, which includes annual cutting of weeds and bank vegetation, and 5-yearly CCTV inspection of the culverts. The EA reports that "Works required from surveys undertaken last year are planned to take place during 2012/13 subject to funding being obtained. This includes jetting of the culverts and removal of roots penetrating the culvert."	Manage existing flood risk	Organisational	Main River	Medium	Not yet started	Medium (1-5 years)	Apr-12	Mar-13		No significant role	Significant role	Lead organisation	No significant role	Significant role	No significant role		Unknown	Unknown	Unknown	No requirement for additional funding.
PW_SWMP_006	Reducing fly-tipping in watercourses - Education actions	Fly-tipping (in particular in the Gravelley Way Stream) exacerbates flood risk by causing blockages. MIDB check watercourses regularly and in advance of heavy rain, however reducing fly-tipping would both reduce risk and save FMAs operating costs (time spent cleaning, waste disposal costs etc). This action would be education / communications based targeted at high-risk areas.	Manage existing flood risk	Partnership / education / engagement	Main River Ordinary watercourse	Medium	Not yet started	Medium (1-5 years)				Significant role	No significant role	Significant role	No significant role	Significant role	Significant role	Lead role to be confirmed.	None	£500	Very low - guesstimate	
PW_SWMP_007	Reducing fly-tipping in watercourses - co-operative working	There has historically been good co-operation between TWBC and UMIDB regarding removal of waste, with TWBC covering the cost of removing wastes taken from watercourses by UMIDB. However, on one occasion UMIDB have been asked to pay for disposal. Liaison with TWBC waste team required to ensure the previous agreement continues.	Manage existing flood risk	Organisational	Main River Ordinary watercourse	Medium	Not yet started	Short (<1 year)	Dec-11	Jun-11		Lead organisation	No significant role	Significant role	No significant role	Significant role	No significant role	TWBC waste team.	None	£0	Unknown	
PW_SWMP_008	Survey of Paddock Wood Stream	There is no recent survey information of the Paddock Wood Stream from north of the railway to the confluence with the Rhoden system. Given that this watercourse takes a large percentage of the urban runoff from Paddock Wood and potentially impacts the industrial areas north of the railway, a survey of this watercourse is recommended.	Better technical information	Surveys and investigations	Main River	Medium	Not yet started	Medium (1-5 years)				No significant role	No significant role	Lead organisation	No significant role	Significant role	No significant role	Commercial landowners for access.	None	£2,000	Medium - cost models etc	
PW_SWMP_009	Determine ownership and maintenance of "un-owned" drains and channels	There are a small number of drainage assets which are not claimed by any of the Risk Management organisations, but which cause a disproportionately large number of nuisance flooding and complaints. Some may be privately owned, others may require adoption by appropriate organisation. As a minimum, if the assets are determined to be private, they should be mapped in order to ensure records of their existence and ownership are held. This action links to KCC's duty under the FWMA to develop an asset register.	Better technical information	Surveys and investigations	Sewers Ordinary Watercourses	Medium	Not yet started	Medium (1-5 years)				Lead organisation	Significant role	No significant role	Significant role	Significant role	No significant role	Riparian owners	None	Unknown	Unknown	
PW_SWMP_010	Flood wardens	A flood warden service has been provided for a number of years by a Paddock Wood Town Councillor and other volunteers. This has involved checking watercourses and assets to identify blockages etc. Due to retirements new volunteers are required to maintain and develop this service. Partners may be able to offer training and guidance to a local flood warden service.	Manage existing flood risk	Organisational	Ordinary watercourses Main rivers	Medium	Not yet started	Medium (1-5 years)				Significant role	Significant role	Significant role	No significant role	Significant role	Lead organisation	Community organisations Existing flood wardens	None	£500	Very low - guesstimate	
PW_SWMP_011	Synergies with traffic management measures	Possible introduction of traffic calming measures is a current issue in Paddock Wood. Should such measures be considered, there are potential synergies with surface water management measures including rainwater gardens and flood pathway management. However, technical implementation could be difficult given: 1. Predominantly narrow roads and small or no verges. 2. Need to prevent water ingress into road sub-surface. 3. Shallow groundwater levels.	Measures	Capital works	Highway drainage	Low	Not yet started	Medium (1-5 years)				Significant role	Lead organisation	No significant role	No significant role	No significant role	Significant role		Unknown	Unknown	Unknown	
PW_SWMP_012	Survey culverts beneath railway to the east and west and between the East and West Rhoden.	It is understood that there are additional culverts beneath the railway in the fields to the east and west and between the two branches of the Rhoden. These have not been mapped and their capacity is unknown. They potentially play an important role in conveying flood waters in this area. A topographic survey is required to identify their location and dimensions, followed by a CCTV inspection. Assets are Network Rail's, therefore engagement with Network Rail is required initially.	Better technical information	Surveys and investigations	Ordinary watercourse	Medium	Not yet started	Short (<1 year)				Significant role	No significant role	No significant role	No significant role	Significant role	No significant role	Lead role to be confirmed but liaison with Network Rail is essential.	None	£3,000	Very low - guesstimate	

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								Term	Target Start By	Target Complete By	Next review due	Tunbridge Wells Borough Council	Kent County Council	Environment Agency	Southern Water	Medway IDB						Paddock Wood Town Council
PW_SWMP_013	Stakeholder engagement activities - follow-up to SWMP	Actions to consider on publication of the SWMP include: Communicate with all attendees of the public engagement event and with the invited organisations. Communicate with developers at 6 sites reviewed.	Stakeholder engagement	Partnership / education / engagement	N/A	Medium	Not yet started	Short (<1 year)	Dec-11	Jun-11		Lead organisation	Significant role	Significant role	No significant role	Significant role	Significant role		None	£500	Very low - guesstimate	
PW_SWMP_014	Stakeholder engagement - update and implement plan.	As other actions are progressed, there will be a requirement to update the Communications and Engagement Plan and implement engagement through a range of methods. As a general rule, Stakeholder engagement should remain as a standard agenda item for all meetings held to discuss flood risk management activities. The "key stakeholders" column of this Action Plan gives a guide to specific engagements required by individual activities, but the partnership will need to ensure that this is carried out in a co-ordinated way.	Stakeholder engagement	Partnership / education / engagement	N/A	Medium	Not yet started	Long (>5 years)				Lead organisation	Significant role	Significant role	Significant role	Significant role	Significant role		None	Unknown	Unknown	
PW_SWMP_015	Identify and implement appropriate partnership arrangements	The partnership model adopted during the development of the SWMP has demonstrated benefits in terms of data-sharing and common understanding. At the Action Plan workshop the partnership agreed that it will continue to operate, covering the Paddock Wood area and with TWBC providing a co-ordinating role. The partnership must decide the remit of the partnership, frequency of meetings, the structure and organisation of the partnership.	Strategy	Partnership / education / engagement	N/A	High	Not yet started	Short (<1 year)	Dec-11	Jun-11		Lead organisation	Significant role	Significant role	Significant role	Significant role	Significant role		None	Unknown	Unknown	
PW_SWMP_016	Develop emergency planning response to surface water flood risk.	The outputs of the SWMP provide new information to Emergency Planners in TWBC and KCC on flood risk in the town. The implications of this should be considered in liaison with TWBC and KCC emergency planners. Issues for consideration would include: 1. Access routes during a flood 2. Safeguarding vulnerable receptors and people. 3. Protecting critical infrastructure	Emergency Planning	Partnership / education / engagement	N/A	Medium	Not yet started	Short (<1 year)	Dec-11	Nov-12		Significant role	Lead organisation	Significant role	No significant role	Significant role	No significant role	Emergency planners. Emergency services. Utilities and transport operators	None	Unknown	Unknown	
PW_SWMP_017	Develop a policy to manage and reduce the impact of urban creep and misconnections	Paddock Wood has not yet experienced the wholesale loss of front gardens to hard-standing parking and general urban intensification experienced in many larger settlements. However, the paving of driveways has increased and incremental increases in impermeable areas have been demonstrated to increase the risk of flooding if unchecked. TWBC already has a guidance leaflet with respect to the paving of driveways ( <a href="http://www2.tunbridgewells.gov.uk/Default.aspx?page=1065">http://www2.tunbridgewells.gov.uk/Default.aspx?page=1065</a> ). Further policy and guidance in this area might consider: 1. Public and industry education and awareness of the restrictions on paving of front gardens. 2. Advice with respect to the drainage of small developments and developments carried out under permitted development rights. 3. Education on the issue of household drainage and avoiding misconnections. 4. Identify how Development Control can implement this policy without creating large amounts of additional activity. This should tie in with the ongoing review of Development Control Policies within TWBC, and the newly published Draft Green Infrastructure Plan ( <a href="http://www2.tunbridgewells.gov.uk/default.aspx?page=4507">http://www2.tunbridgewells.gov.uk/default.aspx?page=4507</a> )	Urban creep and misconnections	Policy	Private drainage	Medium	Not yet started	Short (<1 year)	Dec-11	Jun-12		Lead organisation	Significant role	No significant role	Significant role	No significant role	No significant role	TWBC Development Control Driveway installation companies	None	Unknown	Unknown	
PW_SWMP_018	Policy regarding culverting (piping) of watercourses.	Adopt a policy of presumption against culverting of watercourses except for access roads. This policy would apply within the existing urban areas as well as to new developments. Wherever possible, existing watercourses and drainage channels should remain above-ground, offering risk management authorities benefits in terms of maintenance, future upgrading, biodiversity and pollution prevention. The CIRIA (2010) Culvert Design and Operation Guide provides guidance in this area. The policy would need to be managed and applied by TWBC, EA, KCC and UMIDB when reviewing planning applications and Land Drainage consents. The EA already has a policy on culverts and this could be used as a model.	Asset management	Policy	Main Rivers Ordinary watercourses Culverts	Medium	Not yet started	Short (<1 year)	Dec-11	Nov-12		Lead organisation	Significant role	Significant role	No significant role	Significant role	No significant role		None	Unknown	Unknown	
PW_SWMP_019	Policy regarding runoff reduction in Brownfield sites	The SFRA (Table 11-1 Development Control Flood Risk Assessment Guidance) recommends runoff reduction (compared to the pre-redevelopment state). However it is not quantified what rate should be applied and to what developments this applies. It is recommended that a policy be developed which requires at least 50% reduction (as in the London Plan) but which seeks to match greenfield runoff rates. This should apply to all "Major Development" as defined in Town and Country Planning Act 1990.	Development control	Policy	SUDs Sewers	Medium	Not yet started	Short (<1 year)	Oct-11	Sep-12		Lead organisation	Significant role	Significant role	Significant role	Significant role	No significant role	Development Control	None	Unknown	Unknown	
PW_SWMP_020	OPTION 1: Feasibility study - SUDs retro-fit	Undertake a feasibility study for a small number of SUDs retro-fit works in public spaces and/or highway curtilages within Paddock Wood. The purpose would be to undertake an audit of public spaces, and test the costs and benefits of SUDs retro-fit to areas of public open space, highway curtilage and larger public buildings. Wherever possible, opportunities afforded by redevelopment, resurfacing of roads etc could be used to reduce the costs and disruption of SUDs retro-fit. Any pilot schemes undertaken should be monitored, both for physical impact on runoff and for public awareness and acceptance.	Reduce existing flood risk	Surveys and investigations	SUDs Sewers	Medium	Not yet started	Medium (1-5 years)				Lead organisation	Significant role	No significant role	Significant role	No significant role	Significant role	KCC Highways	£40,000	None	Very low - guesstimate	
PW_SWMP_021	OPTION 2a: Feasibility study - Storage on Tudeley Brook / Gravelley Ways Stream	Undertake a feasibility study to investigate the viability and cost-benefit of a storage / defence scheme on the Tudeley Brook and Gravelley Ways Stream. This should consider joint probability of flooding with Medway, location, land-take, interaction with sewerage system etc.	Reduce existing flood risk	Surveys and investigations	Ordinary Watercourse Sewers	High	Not yet started	Medium (1-5 years)				Significant role	Significant role	Significant role	Significant role	Significant role	Significant role	Lead role to be confirmed. Residents, farmers and landowners	£40,000	None	Medium - cost models etc	

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PW_SWMP_022	OPTION 2b: Feasibility study - Paddock Wood Stream storage	Limited feasibility study to identify possible locations for storage south of Badsell Road. Study should include more detailed assessment of damages (i.e. to include damages of frequent road closures) and further modelling to define storage requirements. In the event of development of the Land at Mascalls Farm Site (site 7), explore opportunities for storage on this site, perhaps combining with SUDs features required to balance the site's own drainage. If site 7 does not progress, this option may have some merits but would require a more detailed analysis of costs and benefits to take into account other criteria such as the impact on road traffic and pedestrians.	Reduce existing flood risk	Surveys and investigations	Main River Ordinary Watercourse	Low	Not yet started	Medium (1-5 years)					Lead organisation	Significant role	Significant role	No significant role	No significant role	No significant role	KCC Highways	£15,000	None	Medium - cost models etc
PW_SWMP_023	OPTION 4: Railway culvert upsizing: Feasibility study	Modelling has indicated that, as an overall strategy, upsizing all of the culverts beneath the railway would not resolve all flood risk and has a poor benefit-cost ratio. However, initial results indicate that upsizing or replacement of the Paddock Wood Stream and/or Station Car Park stream culverts could offer some benefit. A small feasibility study would be required to confirm this, and also improve confidence in the engineering feasibility, method of construction and costing.	Reduce existing flood risk	Surveys and investigations	Main River Ordinary watercourse	Medium	Not yet started	Medium (1-5 years)					Significant role	Significant role	Lead organisation	No significant role	No significant role	No significant role	Network Rail	£10,000	None	Low - Based on limited evidence
PW_SWMP_024	OPTION 5: Land management to reduce runoff: Feasibility study	A small feasibility study is required to identify the possible extent and practicability of installing land management measures in order to manage runoff from the upstream catchment. This is likely to involve desktop and site investigations plus communications with landowners. It has not been identified which partners should lead and be involved in this - this would need to be established prior to initiating a feasibility study.	Reduce existing flood risk	Surveys and investigations	Ordinary watercourses Land	Low	Not yet started	Medium (1-5 years)					Unknown	Unknown	Unknown	No significant role	Unknown	Unknown	Farmers and landowners	£5,000	None	Low - Based on limited evidence
PW_SWMP_025	OPTION 6: Property-level protection: Feasibility study	Using existing modelling results, visit areas of significant flood risk at the 1 in 30 year return period to identify their suitability for property-level protection. The study should consider a) fixed in place measures (e.g. Raised thresholds) and b) the possibility of an improved flood warning service which would enable the use of removable barriers.	Reduce existing flood risk	Surveys and investigations	All	Medium	Not yet started	Medium (1-5 years)					Significant role	Significant role	Significant role	Significant role	Significant role	Significant role	Residents	£10,000	None	Very low - guesstimate
PW_SWMP_026	Infiltration SUDS map	Consider purchase of the BGS-CEH Infiltration SUDS Map for Paddock Wood. Expected cost in the region of £1.50/km2	Better technical information	Surveys and investigations	SUDS	Medium	Not yet started	Short (<1 year)					Lead organisation	Significant role	No significant role	No significant role	No significant role	No significant role		£15	None	High - detailed design / analysis
PW_SWMP_027	Flood risk at 3663 site on Transfesa Road	The largest contribution of predicted flood damages are a single site, the "3663" food distribution site on Transfesa Road. The level of this site is significantly below the road, and the model predicts high ponding depths even at low return periods. However, detailed site drainage has not been modelled. It is possible that closer examination of drainage at this site would show that this is not a significant risk. It is therefore recommended that a site visit be arranged with 3663 to discuss their drainage and confirm whether any flooding problems have been experienced.	Better technical information	Surveys and investigations	Private drainage	Low	Not yet started	Medium (1-5 years)					Unknown	Unknown	Unknown	No significant role	No significant role	No significant role	Whirlpool Ltd	£500	None	Low - Based on limited evidence
PW_SWMP_028	Designation of Paddock Wood as an area of critical drainage.	The Level 2 SFRA recommends that Paddock Wood "should be designated as an area of critical drainage and that any planning application ... should be supported by a flood risk assessment." This recommendation is backed up by the findings of the SWMP; TWBC and the EA should discuss if and how this can be formalised.	Development control	Policy	All	Medium	Not yet started	Short (<1 year)					Lead organisation	Significant role	Significant role	No significant role	No significant role	No significant role		None	Unknown	Unknown
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