KENT FLOOD RISK MANAGEMENT COMMITTEE

Monday, 23rd November, 2020

2.00 pm

Online

AGENDA

KENT FLOOD RISK MANAGEMENT COMMITTEE

Monday, 23rd November, 2020, at 2.00 pm Ask for: **Andrew Tait**

Online Telephone **03000 416749**

Membership (7)

Conservative (6):	Mr A R Hills (Chairman), Mr A H T Bowles, Mrs L Hurst, Mr P W A Lake, Mr K Pugh and Mr H Rayner
Liberal Democrat (1)	Mr I S Chittenden

UNRESTRICTED ITEMS

(During these items the meeting is likely to be open to the public)

1. Substitutes
2. Declarations of Members' Interest relating to items on today's agenda
3. Minutes of the meeting on 9 March 2020 (Pages 1 - 14)
4. Mitigating Surface Water Flood Risk on the Highway (Pages 15 - 30)

   (This report was presented to Cabinet on 22 October 2020 and is for Information only)
5. Environment Agency and Met Office Alerts and Warnings and KCC severe weather response activity since the last meeting (Pages 31 - 36)
6. Virtual Site Visit to Little Venice (Pages 37 - 42)
7. Other Items which the Chairman decides are Urgent

EXEMPT ITEMS

(At the time of preparing the agenda there were no exempt items. During any such items which may arise the meeting is likely NOT to be open to the public)

Benjamin Watts
General Counsel
03000 416814

Friday, 13 November 2020

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KENT COUNTY COUNCIL

KENT FLOOD RISK MANAGEMENT COMMITTEE

MINUTES of a meeting of the Kent Flood Risk Management Committee held in the Council Chamber, Sessions House, County Hall, Maidstone on Monday, 9 March 2020.

PRESENT: Mr A R Hills (Chairman), Mr M J Angell (Substitute for Mr K Pugh), Mr A H T Bowles, Mr I S Chittenden, Mrs L Hurst, Mr P W A Lake, Mr H Rayner, Mrs J Blanford (Ashford BC), Mr D Mortimer (Maidstone BC), Mr H Rogers (Tonbridge and Malling BC), Mrs C Mackonochie (Tunbridge Wells (BC), Mrs G Brown (KALC), Mr C Mackonochie (KALC) and Mr D Brown (Kent Fire and Rescue)

ALSO PRESENT: Mr M A C Balfour, Miss S J Carey, Ms S Hamilton, Mr M D Payne, Mrs P A V Stockell and Mrs L Wright (Thanet DC)

IN ATTENDANCE: Mr M Tant (Flood and Water Manager), Mr T Harwood (Resilience and Emergency Planning Manager) and Mr A Tait (Democratic Services Officer)

UNRESTRICTED ITEMS

1. Minutes of the meeting on 11 November 2019
(Item 3)

RESOLVED that the Minutes of the meeting held on 11 November 2019 are correctly recorded and that they be signed by the Chairman.

2. Environment Agency on National Flood and Coastal Risk Management Strategy - Presentation by Sally Harvey, Environment Agency Kent and South London Area Director and
(Item 4)

(1) Ms Sally Harvey (Area Director – Environment Agency, Kent and South London) briefly introduced herself. She said that the recent flooding events and the frequent occurrences of extreme weather that were being experienced both demonstrated the need for all agencies to work closely together.

(2) Simon Curd (EA Area Flood and Coastal Risk Management Support Officer) gave the detailed presentation. The accompanying slides are contained within the electronic papers on the KCC website.

(3) Mr Curd said that the Environment Agency was committed to protecting an additional 300,000 homes nationally from flooding by the end of its current six-year programme in March 2021. The EA had already achieved half of this figure.

(4) There were currently 60,000 properties (50k residential and 10k commercial) at risk of flooding from rivers and the sea in Kent. These were mainly located along the North Kent Coast, Thanet, South East Kent and the River Medway.

(5) Mr Curd then said that Kent and South London had secured an allocation of £114m for its 2019/21 Capital Programme out of an overall total of £846m. It was forecast that over 21,000 properties in the Region would see reduced flood risk over the next two years. These were mainly those where the works were expected to be more complicated than those that had already been completed.

(6) Mr Curd showed a slide which demonstrated the Flood Defence Grant in Aid (FD GIA) for the years 2015/16 to 20/21 divided into EA and Local Authority Projects. He explained that "OMs" were Outcome Measures. OM2s represented homes that were better protected from flooding and OM3s were homes that were better protected from coastal erosion.

(7) Ms Harvey explained that there were very clear rules determining how the FD GIA money was spent. These rules were usually very helpful but, in some cases, made it difficult to deliver schemes. She added that the EA was optimistic that it would shortly receive a revised longer-term settlement, including revisions to the funding rules that would assist in providing greater clarity and, in turn, ensuring that allocations could always be spent as needed.

(8) Mr Curd then set out the Local Authority Capital Programme for 2020/21. The overall total of £5.78m (including Medway) was apportioned between the Chatham Waterfront, Hythe to Folkestone Beach Management and Beach Recharge.

(9) Mr Curd turned to the method of allocating funding for capital schemes. This was based on the partnership funding model. The previous model had been based on cost benefit analysis which had prevented any funding for projects that failed to achieve the required score. The new model enabled them to go ahead if cost savings or other funding could be found to meet the remainder.

(10) Mr Curd said that the EA had developed a robust pipeline of future projects for what was expected to be the next 6-year capital programme starting in 2021. These were mainly projects that would be technically difficult or which would need securement of partnership funding.

(11) Ms Harvey replied to a question from Mr Angell by saying that the EA had a Regional Team which responded to consultations on all planning applications. The EA had a performance indicator which measured whether the outcome had been in line with its decision to support or object to the application in question. She confirmed that the EA did not have the authority to insist that permission should be refused.

(12) The Chairman referred to a speech by Sir James Bevan (Chief Executive of the EA) in which he had indicated that in the event that a Local Authority did permit a housing development in the flood plain, it should ensure that the properties were flood-resilient.

(13) Mrs Blanford said that Sir James Bevan's speech referred to the need to avoid building in the flood plain but also indicated that a sensible flood-resilient measure

was to have the residential part of the property on the first floor above the garage. This would, however, run the risk of leaving the residents stranded if they could not use their vehicles to leave the property whilst the land around was flooded. She added that Ashford BC had recently turned down a major application where the developer had wanted to build a large number of properties in the flood zone and green corridor with inadequate flood mitigation measures.

(14) Ms Harvey replied that the EA recognised that Local Planning Authorities had competing priorities. They needed to build more homes and the EA did not wish to be an agency which was against growth. At the same time, it wished to avoid supporting development in the flood plain wherever possible. She added that some people moved into a property in the full knowledge of its location in a flood plain but would then sell it on to people who were not aware of this. Awareness of the risk was often lost, especially as flooding events often did not occur with regularity.

(15) Mr Curd then set out some of the schemes that were in the programme but would not be delivered. These were the Flood Alleviation Schemes in the Great Stour Flood Plain (300 properties at risk) which were still being worked on and would be in the next programme and East Peckham (192 properties at risk) because the partnership funding required could not be raised.

(16) Mr Curd replied to a question from Mr Payne by saying that the EA was progressing the Property Resilience Scheme in East Peckham at a cost of £600k as an alternative to the flood alleviation scheme.

(17) Mr Curd said that the options appraisal for the Nailbourne groundwater flooding Scheme had just been completed and was now under evaluation.

(18) Mr Curd then showed the most important capital programme Schemes for 2021. These were: Rother Tidal Walls East and West; River Stour FAS; Tillingham and Scots Float Sluice Refurbishment; Romney Marsh Pumping Station Refurbishment; Medway Estuary and Swale schemes; Capital Maintenance to EA and LA defences; Lydd Sea Defences project; and Five Oak Green. All of these would require some element of partnership funding.

(19) The Shoreline Management Plans were currently in the process of being refreshed. This would take the form of a high-level review of projects that had already been undertaken.

(20) Mr Curd said that the UKCP climate change projections were being taken into account. The updated predictions would be incorporated into all future schemes. This could increase the funding gap as costs increased.

(21) Ms Harvey replied to a question from Mr Chittenden by saying that Sir James Bevan's personal view was that house building should not take place in flood plains. The EA's response when consulted on planning applications in these circumstances was to highlight the risks as clearly as possible.

(22) Mr Rodgers said that the required funding for the East Peckham scheme had not been forthcoming, although Tonbridge and Malling BC had offered a substantial sum as its contribution. The landowners and businesses had, however, been

reluctant to make significant contributions of their own. He asked for details of the East Peckham Walls scheme that had appeared in the presentation slides.

(23) Mrs Brown said that Yalding PC had recently been faced with two housing applications on the riverbank which had included downstairs bedrooms. The Borough Council had not needed to consult them on these applications because they conformed to EA guidelines. She asked whether the guidelines could be tightened up.

(24) Mr Curd noted this comment and agreed to discuss it with the local EA Planning Team.

(25) Mrs Mackonochie referred to a previous presentation from the EA on Property Flood Resilience. She had asked whether any money was set aside for new build. Recent events had suggested that this policy was not the right one and could lead to local authorities having to adopt a different approach to property planning applications.

(26) Mr Curd replied that the government funding policy was not to fund protection measures for properties built after 2012 as it was the developer's responsibility to ensure that their buildings were flood resilient. He did not expect this policy to change.

(27) Mr Lake thanked the Environment Agency for explaining the Leigh and Hildenborough scheme to the people of Leigh and Penshurst. He then said that he was concerned that the more that Leigh and Hildenborough were protected, the higher the water levels would be in Edenbridge, which had just experienced its third flooding event in a year. He stressed the need to dredge the rivers Medway and Eden and their tributaries.

(28) Mr Curd replied that if the Leigh flood storage area were to affect Edenbridge, the water would be coming over the A21 viaduct. This was represent an impossibly high high water level. He accepted that a major cause of flooding in Edenbridge was the result of issues. The responsibility for this would rest with the EA in part as well as the Highways Authority, landowners and the local IDB.

(29) Mr Tant said that when water reached a certain level in Edenbridge, there was nowhere for rainfall in the town to drain to. Mitigation measures would be neither cheap nor easy to implement. These was not the responsibility of the EA. This was a drainage issue, which was not the EA's responsibility.

(30) Ms Harvey said that the responsibility for each tributary was clearly mapped out and that she could provide Mr Lake with the details.

(31) The Chairman said that all agencies needed to develop the way in which they worked together in order to overcome the historical complexity of the issues of responsibility.

(32) RESOLVED that Ms Harvey and Mr Curd be thanked for their presentation and that its content be noted.

3. Natural Flood Defences - Presentations by Tom Cook (Environment Agency and Phil Williams (Natural England)
(Item 5)

(1) Both of the presentations for this item can be found in the electronic agenda papers for this meeting on the KCC website.

(2) Mr Tom Cook (EA Biodiversity Specialist) gave the first presentation. He said that Defra had allocated £15m in 2016 to the EA for Natural Flood Management (NFM) across the UK. £300k of this had been allocated to Medway NFM enabling the testing of nature-based techniques to contribute to the evidence base, whilst reducing the flood risk to properties, drawing in other funding, engaging with communities and delivering multiple benefits.

(3) Medway NFM was part of the Medway Flood Partnership. It worked together with the South East Rivers Trust which was leading and co-ordinating delivery of the project which was currently match-funded by FRAMES (an EA interreg funded project) together with contributions from Maidstone BC and other partners (including KCC). The EA also reported on the property benefits, biodiversity and landscape character, building up an evidence data bank for future NFM work.

(4) Mr Cook went on to say that the Medway Flood Partnership had begun its work by identifying the areas in the Medway where NFM would be most achievable. The best place to start was in the upper catchment so that water could be stored before reaching the vulnerable villages and hamlets lower down. The EA's national mapping tool had been used to gather evidence, including mapping, elevations, soil types of all the water bodies. This information was then mapped in conjunction with those properties which were known to be at risk. This had yielded 10 water bodies located in the catchment area. The South East Rivers Trust had then spent a great deal of time in discussion with local landowners as well as Natural England and other partners in order to ascertain where the monies could best be put to use during the project's two-year life.

(5) The first project was at Bedgebury Forest, in partnership with the Forestry Commission. This site had been planted with conifers over a period of a hundred years. It had good drainage facilities which had enabled the landowners to maximise their profits. The project involved slowing the waterflow by installing leaky wood dams to distrubute overflow on the forest land. It would change the nature of the forest by enabling it to store more water. It was an important demonstration site as it showed Forestry Commission staff what NFM could achieve. At the same time, environmental surveys were being undertaken to assess the nature and level of change to the natural habitat.

(6) The second demonstration site was at Sissinghurst Castle. The main partners were the National Trust who had a large estate beyond the gardens and had also decided to adopt NFM measures on their own land, locally and nationally.

(7) Mr Cook explained that the EA's site was at the Hammer Stream, which was an IDB watercourse where the riverbed lay some 3 metres below the flood plain, resulting in the water flowing very rapidly downstream. The project had involved capturing some of the peak flow from the Sissinghurst Stream which joined the

Hammer Stream on the estate. The historic old channels were utilised to store water which was also able to infiltrate the soil. Surveys had also been carried out to analyse the impact of the increased water on the soil's quality.

(8) Mr Cook then said that the School Stream at Headcorn was the location of the third project. A number of properties were at risk of flooding because, although the Stream was small, it was in a catchment area that was intensively used and had a high run-off rate from the escarpment – although it was prone to dry out completely during the summer. A mature fallen willow upstream was almost blocking the watercourse and served an important NFM function. South East Rivers had carefully mapped all the features, including pathways in order to develop the best site-specific option. There had only been limited take up by the large number of landowners, but it was hoped to be able to adapt the pathways and install leaky wood dams and to encourage more landowners to participate as they saw the benefits occurring. The work already carried out included digging out and extending a pond in order to increase its storage capacity.

(9) Mr Cook said that the largest project was on the Alder Stream in Five Oak Green, where some 100 properties were at risk of flooding. This was a very steep-sided valley of pasture and woodland. A large proportion of the landowners were engaged and carrying out interventions. The project involved the installation of several natural structures to slow down the water flow, which had proved successful during the recent storm events.

(10) Mr Cook confirmed that the EA and the Forestry Commission had prepared a risk assessment guide for leaky wood dams to assess their safety.

(11) The outputs from the project were that the South East Rivers Trust had engaged successfully with landowners and developed two key demonstration sites. It was hoped to secure further funding after it came to an end during the summer. Meanwhile the data gathered would be collated in order to determine all its multiple benefits and would also be published on the internet. The final report would inform the national debate about the role of NFM in flood prevention and mitigation.

(12) Mr Cook concluded his presentation by saying that the legacy of the NFM work with such organisations as Natural England, the Forestry Commission, the National Trust and the RSPB was that it would influence land management nationally and help inform targeting for future land management grants. This was an opportunity to strengthen partnership working on water management to deliver multiple benefits to the communities. These included more drought and flood resilient farming, carbon offsetting, biodiversity and net gain through habitat creation as well as landscape and recreational benefits.

(13) Mr Phil Williams (Natural England Conservation Advisor) began his presentation by explaining that that his purpose was to set out Natural England's national policy on Natural Flood Management. It was very important to ensure that NFM not only prevented or mitigated flooding, but also that it delivered significant environmental benefits.

(14) Mr Williams said that stakeholders had priorities which varied from the restoration of pristine wetland natural habitats on the one hand to hard engineering solutions on the other. Natural England sought to persuade them that hard

engineering would work better if more natural features were built into a project. An example of this was that NFM could “de-synchronise” the discharge of tributaries into rivers. If they could be made to discharge at different times, there would be a smaller peak downstream.

(15) Natural England was interested in NFM that was holistic, sustainable, integrated, based on the principles of natural function and which delivered for the natural environment. It should not just use nature as an engineering material. An example of what was not required would be the creation of a reservoir surrounded by bunds, failing to deliver anything for nature.

(16) Mr Williams described Natural England’s pyramid of what constituted an ideal project. It should be based on natural function, understanding the causes of the flooding within the catchment. It should recognise the effects of previous flood alleviation by mitigating sustainability and building natural capital. It should identify and take advantage of opportunities for environmental enhancement. There would always need to be compromises which would need to be explained to the local communities. The project would need clear objectives and expectations based upon the principles of nature and the way in which the catchment worked.

(17) Mr Williams said that the evidence for NFM was difficult to quantify in the way in which hard engineering solutions could be measured. The evidence was necessarily “soft” as it could not clearly demonstrate cause and effect. Nevertheless, it was clear that NFM was effective for flooding at moderate scales and could deliver wider biodiversity to the eco system in general. More research was needed, including monitoring of the impact of pilot schemes.

(18) Mr Williams said that NFM could not solve flooding on its own but that it could help where there was a viability gap in funding more expensive schemes. NFM was worthwhile for the sake of the wider benefits to the countryside. NFM should be undertaken on a “no regrets” basis for this reason, even if it transpired that the expected flood alleviation benefits did not result.

(19) NFM was relevant on a large or landscape scale. This was difficult to achieve if there were several landowners. It was preferable (if not always achievable) to carry out an NFM approach that benefited the whole catchment. It was also relevant from the headwater source to the sea. An example of the latter would be the encouragement of saltmarsh development to help prevent coastal erosion. SuDS was also an NFM solution as it held up water in a controlled way which prevented a “boom and bust” effect.

(20) Mr Williams then said that the NFM measures did not necessarily have to be put in place at the point where the problem showed. Work should often start at the top of the catchment in all the tributaries so that the effects were beneficial further downriver. NFM was not a competing land use. It could be integrated into the existing use of the land quite easily. He added that NFM was “a layer cake not a pie.”

(21) Mr Williams gave an example of NFM using a leaky woody dam. It could be said that this was an example of a feature that was more ecologically functional providing less flood risk benefit. He added that river morphology, involving re-instating meanders and bends was more useful than de-straightening them through

hard engineering. There was also a lot of scope for the re-connection of rivers with their plains because so much of the river had been embanked. Wet woodland was a priority habitat because it had the effect of slowing water as it passed through the rough terrain.

(22) Mr Williams said that he worked in Land Management and was experienced in discussing flood alleviation measures with farmers. The first consideration was whether NFM such as riparian buffer strips could be employed to improve the functionality of their land holdings. Natural England was always keen to show how conservation management could reduce flooding. It also promoted landscape-scale delivery in its C21 Strategy Document.

(23) Natural England responded to consultations on planning applications which might affect designated sites. This enabled them to push for sustainable planning decisions and to promote a greed infrastructure approach. They advocated the use of Net Gain as a tool to build in NFM.

(24) Mr Williams concluded his presentation by summing up Natural England's future work. They would continue to advocate NFM to the Government and push for NFM principles in the new Flood and Coastal Erosion Risk Management (FCERM) Strategy. They were shaping the approach to NFM in the new Environment Land Management Scheme (ELMS) which would soon replace the Countryside Stewardship Scheme. More locally, it would support local teams through the development of an NFM toolkit and continue to provide advice to farmers on Catchment Sensitive Farming on how to reduce soil erosion and flooding on their land as well as on a landscape-scale. Finally, they would continue to gather evidence to demonstrate the benefits of NFM in alleviating flooding, which had often been a result of hard engineering.

(25) Miss Carey (KCC Environment Cabinet Member) asked whether there were any NFM techniques were not recommended. Mr Cook replied that the data was still being evaluated. He could provide data on case studies for information. In general terms, cost benefit analysis was important. An apparently excellent project might be of less value if it was prohibitively expensive. Leaky Wood Dams were usually a very cheap and effective option.

(26) The Chairman replied to a question from Mr Bowles by saying that the presentations given to the Committee enabled its Members to disseminate the information in their Districts, Parishes and the wider community as well as within KCC itself.

(27) Mrs Brown said that the KALC Area Committees were always looking to invite speakers. She could ask the KALC Chief Executive to promote these presentations to them.

(28) Mr Mackonochie said that he had been invited to inspect the work at the Alder Stream at Five Oak Green *(see para 9)*. The work being undertaken there had impressed him, particularly in his capacity as a Flood Warden. This was certainly an example that KALC would find interesting. His only concern was that the leaky wood dams wood need community involvement to keep them up to scratch.

(29) Mr Brown said that Kent Fire and Rescue would like the presenters to provide input on NFM as part of their training programme for Flood Managers on *Module 5 Water Incident Management*. He asked whether Volunteers were used to help build the flood management dams.

(30) Mr Cook replied that some of the dams were built by contractors as they involved specialist skills such as chainsawing. The scheme at Bedgebury was mostly carried out by Volunteers.

(31) Mr Rogers said that one of the most difficult tasks was the identification of land that could be used for NFM projects. He was aware in his capacity as Chair of the Upper Medway Drainage Board that there were conflicting interests for farming landowners between their aim of maximising crop output and the protection of their land from flooding.

(32) RESOLVED that Mr Cook and Mr Williams be thanked for their presentations and that their content be noted.

4. December 2019 Floods - KCC Debrief Report
(Item 6)

(1) Mr Harwood explained that the report only related to the heavy flooding event of Thursday, 19 December 2019, which had continued into the weekend. Further debriefs had taken place following Storms Ciara and Dennis as well as the more recent event of 5 and 6 March 2020. These would be reported in due course.

(2) Mr Harwood continued that it was vital to capture learning from the responses and to assimilate that learning as expeditiously as possible as this was a time of unprecedented challenge in terms of climate change and rate of urbanisation in Kent as well as significant changes in land use on agricultural land and in the suburbs. This change required speedy adaptation.

(3) Mr Harwood turned to the report itself, saying that the KCC internal debrief had involved officers from Highways Drainage, Emergency Planning and Adult Social Care and Health amongst others.

(4) Mr Harwood said that the debrief had concluded that amongst the things that had gone well was that close links had been established very quickly (and maintained thereafter) between the KCC Emergency Centre and the Environment Agency Incident Room. These links had notably enhanced the response. There had not been a large and cumbersome Command and Control system. The model followed had, instead, been one of single agency command supplemented by regular inter-agency discussion. The telephone lines had been left permanently open, enabling immediate response to any issue that arose, unencumbered by any layer of bureaucracy.

(5) There had also been effective co-ordination between KCC and the Kent Fire and Rescue Service (including the Tactical Adviser Water and Flooding) which had enhanced the effectiveness of the response. This had been successful across the whole county where surface water was an issue and not just in the flooding hotspots.

The benefit had been that it had enabled a proactive response which, in many cases, had headed-off flooding to properties before it happened.

(6) Mr Harwood drew attention to the finding that enhanced flood storage at the recently restored semi-natural land on the River Len floodplain upstream of Maidstone town centre had significantly ameliorated downstream impacts from increased flows. This underlined the message given earlier in the meeting on the value of NFM. Water from the River Len had been released at the optimum times in order to ensure that Maidstone itself was not impacted by flooding from the Len and Medway.

(7) Mr Harwood replied to a question from Mrs Brown by saying that the draft debrief reports on Storms Ciara and Dennis were close to being ready. As soon as they were, they would be sent to Members of the Committee. Any additional comments would be assimilated into the final version of the debrief reports.

(8) Mr Bowles said that he concurred with the recommendations in the debrief report but warned that drafting them did not necessarily mean that they would be put into place. He noted that one of them was that "*Specific locations where ditches and other flood attenuation features have been lost to be identified and communicated to Flood Risk Management Team*." He asked how this would be carried out.

(9) Mr Tant added to Mr Bowles' comments by saying that simply locating such ditches did not mean that they could simply be reinstated.

(10) Mr Rayner placed on record his concern at the risks now being run by all those living and those involved in emergency flood response activity at the Little Venice Country Park residential caravan site in Yalding. He then asked to move, seconded by Mr Bowles the following motion:

This Committee requests the Cabinet Member for the Environment to arrange for a full risk assessment of the continued residential occupation and those tasked with evacuation and shelter of residents of the Little Venice Country Park residential caravan site at Yalding.

KCC as strategic authority for emergency planning and severe weather response in co-operation with Maidstone BC (should she wish) are asked to examine the possibility of KCC purchasing Little Venice Country Park at Yalding, being the total area in which residents reside, if necessary by compulsory purchase, in order that the existing leases and licenses permitting those who reside there will cease to do so as soon as may reasonably be arranged.

(11) The Chairman ruled that he would not accept this motion because Members of the Committee had not had the opportunity to consider it beforehand and did not have the information necessary to reach an informed decision. It had implications for other Local Authorities and also because it had only a tenuous connection to the Committee's Terms of Reference.

(12) The Chairman then said that, as Mr Rayner had raised this matter, he would write to the Cabinet Member for the Environment in order to formally notify her of the Committee's interest and arrange for a report to be produced, possibly with input from Maidstone Borough Council, the Environment Agency, Kent Fire and Rescue

Service and Yalding Parish Council, setting out in detail what options had been considered and whether compulsory purchase was practical in all the circumstances.

(13) Mrs Brown said that she was meeting one of the Directors of Maidstone BC on this matter during the following week. She said that this was a complicated and explained that the site had originally been for use as holiday homes and had been closed during the winter months. A later landowner had rented out the caravans as residences for 11 months each year without specifying which 11 months these were. It was a commercial premise which meant that Yalding received no precept for it. During the previous week's flooding event there had been 16 vulnerable residents who had been evacuated to the Church before being placed in hotels. When the Emergency passed, no agency was prepared to pay for them to be returned to the site. She added that she had been struck by the increase in the number of vulnerable people now resident since the evacuation in December 2019. This was a state of affairs that could not be allowed to continue and she would be happy to ask the appropriate Maidstone Director to contact KCC to discuss proposed courses of action.

(14) Mr Mortimer said that he was the Chairman of Maidstone BC's Housing and Environment Committee. He was aware of the complexity of the situation and the difficulty of resolving it. He understood that there had been some 24 Little Venice residents in temporary accommodation over the weekend, and that most of them had now returned home. He said that he would also like to be a part of Maidstone BC's discussions with Yalding PC in order to help move things forward.

(15) Miss Carey said that there were significant flooding problems across Kent and that the available budget covered all of it. It was therefore necessary to weigh up the issues and prioritise spending. She would take note of what had been said at the meeting but was unable to promise that she would allocate funding in the way put forward.

(16) Mrs Blanford said that she was concerned that the maintenance of drains was not being sufficiently updated. Some cottages on the A28 had recently flooded. Kent Fire and Rescue had needed to clear out the drainage system in order that the water could flow away. She had long considered that maintenance work was not being undertaken frequently enough and that land next to the roads was flooding as a consequence. She asked whether there were actual maintenance plans or whether drainage was investigated after a complaint had been raised.

(17) Mr Tant said it was very rare for a ditch to be the responsibility of KCC Highways. Most of them were owned by the adjacent landowner, who had responsibility for the maintenance. This was the same for pipes. He suggested that anyone who had seen such an issue should contact him in order as he would ensure that the responsible landowner was identified. Reactive (rather than proactive) repairs could then be carried out.

(18) Mrs Brown referred to Mr Earl Bourner's presentation to the previous meeting of the Committee (*Minute 15/19*) in which the discussion had focussed on the maintenance of old and new ditches. The flooding in Yalding during the previous week had seen more water than usual flooding off the land. The result had been that the road had turned into a "river of mud." Yalding PC had therefore written to KCC to ask whether it had any powers to dig new ditches. The reply from Mr Bourner

had indicated that this was a grey area. He had been content for this letter to be passed to Helen Grant, MP for her to raise this question with Defra with the aim of tightening up the legislation if possible.

(19) Mr Bowles said that he had often come across this particular problem over the years and that he supported the aim of seeking clarification from Defra.

(20) Mrs Mackonochie said that there had been no special KCC emergency telephone number. It had subsequently taken 40 minutes to get through to Southern Water. She asked whether KCC could provide a number that was to be used only during an emergency. This would save time, which was particularly important if power outages were being experienced for example.

(21) Mr Rayner said that the 1980 Highways Act gave powers to the Highways Authority to enforce riparian landowners to drain their land or, if the landowner did not do so, to enter the land and take such action as was necessary and to charge the landowner for it.

(22) Mr Payne said that KCC had allocated additional resources for the improvement of Highways drainage assets. The greatest difficulty facing the Authority in this regard was the extremes of weather. For much of 2019, the major issue had been the threat of drought as a result of a very lengthy dry spell which had been interspersed with very heavy downpours, saturating the sun-baked land and creating huge drainage problems, no matter which landowner or agency was responsible for its maintenance in each individual case. This had also applied to drainage systems where the level of risk was 1 in 100 or greater. The challenge for Highways was in developing a successful approach to dealing with drainage problems that were not directly caused by water running off Highways land. The flooding events over the past two weeks had placed an additional pressure of some £2m on the service.

(23) Ms Hamilton referred to the issue of Common Land where the ditches needed to be cleared. In Lamberhurst, the Parish Council was responsible for clearing the ditches on a piece of common land and she had been asked to gather advice on who they should approach to provide the resources for this significant work. Mr Tant agreed to discuss this matter in detail with her after the meeting.

(24) Mr Bowles said that it would be useful for the Committee to receive a definitive explanation of what KCC Highway's legal powers were in respect of clearing ditches on private land.

(25) Mrs Hurst said that the best way for Parish Councils to get necessary work done quickly on drains, ditches and culverts was to report the problem online.

(26) RESOLVED that the report be noted together with the comments made about the debrief report and on Little Venice Country Park in Yalding as set out in (10) to (15) above.

5. Environment Agency and Met Office Alerts and Warnings and KCC severe weather response activity
(Item 7)

(1) Mr Harwood introduced the report by highlighting the very high number of severe weather alerts and warning since 11 November 2019. He provided updated figures which took account of the events that had taken place since publication of the agenda papers. The figure for Flood Alerts in paragraph 2.4 of the report had risen from 131 to 147 whilst that for Flood Warnings had risen from 30 to 44, bringing the cumulative total to 193.

(2) Mr Harwood then said that the figures given only related to the fluvial and coastal flood plains. A lot of the response activity had also been related to surface water and highway flooding.

(3) Mr Harwood drew attention to the corresponding figure of 25 Flood Alerts and Warnings for the same period in 2018/19, demonstrating the unpredictability and extreme variations in weather patterns from year to year.

(4) Mr Harwood moved on to update the figures in Appendix 2 of the report in respect of Met Office Severe Weather Warnings. The Warnings for rain had risen from 21 to 22 and for wind from 17 to 18. This gave an overall total of 49, contrasting with the figure of 13 during the same period in 2018/19.

(5) Mr Harwood said that KCC had contacted the Government in order to express an interest in claiming under the Bellwin Scheme because it had spent more than 0.2% of its entire budget on response activity over the Winter.

(6) Mr Harwood concluded his remarks by saying that an important factor had been the cumulative impact of the prolonged intermittent severe weather events over the Winter. Relatively small downpours were now resulting in major flooding events because catchments were full and the ground saturated. This had been evidenced on 5 and 6 March 2020 by the severe flooding on the A26 between Mereworth and Hadlow, the A20 at Bethesden and on the A228, all of which had resulted in road closures for a long period. There had also been a significant impact on the rail infrastructure, resulting in disruption, including the collapse of the Martello Tunnel between Folkestone and Dover.

(7) RESOLVED that the very high number of Alerts and Warnings since the last meeting be noted.

6. Recent Flooding Events in Yalding and Collier Street
(Item 8)

(1) The Chairman agreed to take this oral report as an Urgent Item as the most recent flooding had taken place after the agenda papers had been published.

(2) Mrs Brown addressed the meeting in her role as Chairman of Yalding PC. She described the Parish Council's activities during the three flooding events over the Winter. The recent event had been better than the previous two, although there had been a greater amount of surface water, leading to more road closures than had been the case during Storms Ciara and Dennis.

(3) Yalding PC was part of a pilot scheme for road closures, enabling them to close roads themselves and to notify KCC after it had done so. Simon Jones (KCC Director of Highways, Transportation and Waste) had provided the Parish Council with plastic water-filled barriers in order to implement the road closures.

(4) Mrs Brown said that tremendous support had been provided by South East 4x4, who had been permanently present throughout each of the three events. They also had a direct line to Kent Police, which had helped ensure that the road closures were respected.

(5) Mrs Brown continued that the Confluence Communications Group, consisting of KCC Emergency Planning, Kent Fire and Rescue, the Environment Agency, Yalding and Collier Street Parish Councils, Maidstone BC and KCC Adult Social Care and Health had held two conference calls each day so that all the participating agencies were fully briefed on the entire response to the event and were also able to provide whatever was needed when requested. This had worked brilliantly, and could, hopefully be rolled out to other parts of the County.

(6) The recently installed property flood resilience (PFR) measures in Yalding and Collier Street had only been tested at Acott Fields. The Environment Agency had previously organised exhibition events in both Yalding and Collier Street to demonstrate to the residents how to put them up properly. It would not have been possible for the Flood Wardens to do so as there were not enough of them. Most houses did have PFR, but there were still 46 properties with no protection at all.

(7) Mrs Brown summed up her report by saying that everybody in the community needed to learn to work together. People should not expect the Borough Council to do everything for them. She thanked all the agencies who had supported Yalding so well.

(8) RESOLVED that Mrs Brown be thanked for her report and that its content be noted.

From: **Simon Jones, Director of Highways, Transportation & Waste**

To: 1) Cabinet – 12 October 2020

Date: 2) Kent Flood Risk Management Committee – 23 November 2020 (For Information)

Subject: **Mitigating Surface Water Flood Risk on the Highway**

Summary:
During the Cabinet meeting on Monday 22 June 2020 it was resolved that a further report be brought to a future meeting to discuss a wide range of options for flood mitigation plans and proposals. This follows on from numerous severe weather events, including those in the winter of 2019/2020, which had a significant impact upon the residents and communities of Kent with the highway service responding to an exceptional level of enquiries and requests for emergency support.

The report outlines how the authority has made an initial assessment of areas of the county that would benefit from investigations into measures for increased resilience against surface water flooding. Geographic Information Systems have been used to identify and prioritise areas of interest using our own data as well as published information. This will help to inform our three to five-year capital forward works programme for the Highway Drainage Asset Management team by undertaking proactive investigations into our assets in these areas. The report also provides details of our trials into smarter gully maintenance via the 'Live Labs' project. These proposals may also aid a future update to Kent County Council's Local Flood Risk Management Strategy.

Recommendations:
Cabinet is asked to:

a. Note the increasingly persistent impact of flooding on our roads and Kent County Council's current approach to the development and implementation of the capital works programme focusing on existing identified issues.

b. Agree that a further report outlining the results of the 'Live Labs' project and Kaarbontech trial for improved gully maintenance be brought to a future meeting of this Cabinet.

c. Endorse the approach taken to identify and proactively develop a programme of works focusing on identified areas of potential surface water flood risk on our strategic and locally important highway network.

d.	Note the potential risks for future funding of works post 2021 and that potential changes in policy and/or service levels would be required in order to do more to use our own drainage systems in a greater flood defence role.

1. Background

1.1 We are experiencing intense rainfall events on an increasingly frequent basis, with recent rainstorms generating a volume and intensity of rain well beyond that of the above design capability of highway drainage systems. As well as winter rainfall, summer 'flash flooding' is becoming an increasingly significant risk to the highway authority. For example, on 15th August 2020 over 40mm of rain fell in the Sittingbourne area in just 45 minutes. To put this into some perspective, the average amount of rainfall for the entire month of August for the region is 56.3mm.

1.2 The burden on our highway drainage systems can also be exacerbated by many other factors including:

- The age and condition of highway drainage systems. Some systems can be more than 100 years old and / or be operating beyond their original design life.
- Operational issues arising from budget limitations for ongoing routine maintenance.
- Capacity issues of drainage systems not under the control of the Highway Authority, such as public sewers or private ditches and watercourses into which they connect.
- Structural damage to drainage systems by third parties or site environs (such root damage from adjacent trees and hedges) that may go unnoticed until significant rainfall occurs.
- Poor maintenance of drainage features in land adjacent to the highway which then flows onto the highway (including ditches and culverts, as well as urban drainage).
- 'Urban Creep' effects such as additional run-off onto highways from the paving of front gardens.
- Increases in the peak intensity of rainfall brought about by climate change.

1.3 Our highway drainage systems are designed to drain water from the highway surface only and generally were not intended to be flood defences. However, they still play a key role in managing local flood risk.

1.4 They were usually designed to cope with what is known as a '1 in 5 year' event. An example of such a storm is one which produces approximately 20mm of rainfall in a one-hour period. Whilst such a storm is significant, many occurrences have been noted in recent years that exceed that design standard.

1.5 In these events, run-off does not just originate from the highway, but often uses the highway as a conduit to escape to lower ground. This can be as 'overland flows' following the topography or 'exceedance flows' where a drainage system is unable to cope. Highway flooding or property damage can occur which may be remote from the original source of the flood water. Some photographs in the appendix illustrate these issues.

1.6 This often gives the impression that the run-off originated solely from the highway and should have been dealt with by the drainage system in that location. Hence, the Highway Authority often receives criticism or blame for flooding that may have been outside of their reasonable control.

2. Current Capital Investment

2.1 As well as being the Highway Authority, KCC is the Lead Local Flood Authority for Kent and has produced a range of Surface Water Management Plans (SWMPs) intended to increase the understanding of local flood risks and provide a high level action plan to identify measures to mitigate local flooding risks. The majority were produced during 2012 and 2013 so predate some notable surface water flooding events of recent years.

2.2 The current one and two-year programme of works for capital drainage improvements for the 'Well Managed Highways' approach (financial years 2019/20 and 2020/21) was based upon a Geographic Information System (GIS) analysis of customer enquiries involving highway flooding and/or properties damaged by flood.

2.3 This allowed an initial focus on areas with existing reported issues rather than place reliance on the SWMP action plans. These are considered out of date and do not cover the entire county.

2.4 In the last two years, schemes have also been jointly funded or delivered by Highway Drainage Asset Management Team and the Flood and Water Management Team which pilot the use of Blue- Green Infrastructure. Further details of these are included in the appendix to this report.

3. Improving Revenue Funded Asset Maintenance

3.1 It is also key to manage our existing assets appropriately to reduce the risk of flooding occurring. In addition, it is important to protect our investment in areas where capital funded repairs and drainage improvements are carried out. This is likely to require additional future revenue funding and smarter use of existing funding.

3.2 The Highway Drainage Asset Management team has been exploring better drainage management via the 'Live Labs' project in order to seek a more encompassing software platform, dedicated to the complexities of drainage, that has the functionality to support our maintenance activities while

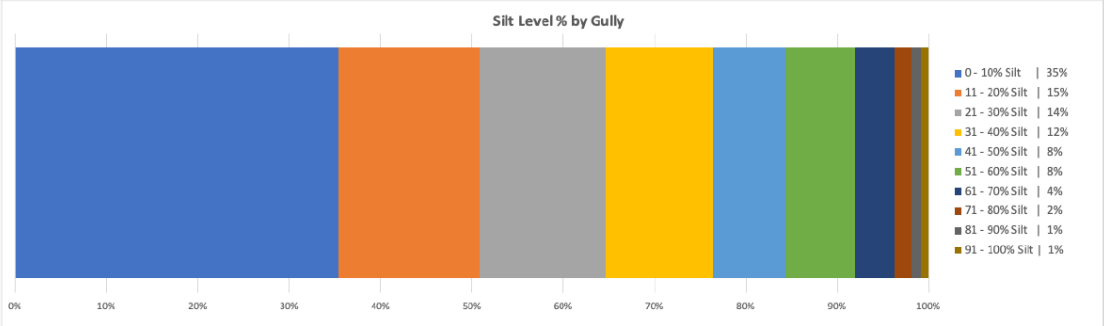
communicating as much data as required to the Pitney Bowes Confirm system (WAMS) already in operation within the authority.

3.3 In addition to the improved customer service experience, our research highlighted several areas where the financial opportunity for better management of the drainage network is significant. In comparison to similar county councils, our average cyclical/scheduled crew productivity is 65 gullies per day, vs their 99 which represents a 52% opportunity for improvement.

3.4 Kaarbontech were identified as the appropriate platform for KCC and their trial includes several stages and options as part of an approach to drainage management differently in Kent. The chosen trial area is the District of Maidstone and the broad goals of the project include:

a) Collecting an inventory of drainage assets.
b) Attributing historic information from other council systems to assets.
c) Defining and prioritising zones of interest.
d) Risk profiling maintenance based on prioritised assets.
e) Assessing if and how handhelds devices can play a part in future maintenance.
f) Allowing ongoing data collection to feed into the risk profiling automatically.
g) If the trial is successful invest in the asset management software platform to map all our drainage assets to include the final outfalls, this will reduce cost as future investigations will not be required as we have the asset plotted, including all CCTV surveys.

3.5 21,639 assets across 1,097km of highway in Maidstone have been validated and surveys carried out to validate the data on silt levels and depth of gully pots. A chart of silt level % by gully has been presented:



3.6 The charts note that half of the assets contain less than 20% capacity of silt. Only 4% contain greater than 71% silt capacity. This clearly indicates that significant parts of the drainage network could be reduced in cleansing frequency but there may be a need to target the smaller proportion that requires more frequent maintenance.

3.7 As part of the ongoing Live Lab works, several smart gully sensors from different manufacturers, have been installed across the County to record data which will also be factored into future proactive cleansing. Following the trial, the sensors which are most effective in performance and costs will be installed across the County as future funding becomes available. Examples of these are included in the appendix to this report.

4. Developing Our Future Capital Investment Programme

4.1 We proposed to develop a map of the locations where the risk of surface water flooding is high and/or where climate change impacts may affect the risk of flooding in future. This will allow a more proactive asset management approach to be taken rather than focusing solely on customer enquiries.

4.2 A GIS analysis was undertaken to identify and scores a number of ‘flood cells’ across the County based upon a series of metrics. Using GIS to present the data ensures multiple factors are taken into consideration when assessing a site. When looking at 1 in 100-year events the map shows surrounding areas which are contributing to the main flooding site and allows a broader view of the issue.

4.3 An example of a ‘flood cell’ at Swanscombe is shown below to illustrate the area which may contribute to a flooding issue. The coloured markers represent reports of flooding issues and jobs attended from WAMS:

4.4 The table below describes the metrics and risk weighting / scores in more detail:

Metrics and Scores	**Comments**
Proportion of the flood which is on the Highway	The area of the 'flood cell' which is affecting the public highway
Proportion of the flood within is affecting buildings	The area of the 'flood cell' which is affecting buildings adjacent to the public highway
Flood Depth Score	The modelled depth of flooding taken from the EA surface water map to determine the risk to the highway from the flooding – deeper water will give risk to a higher safety risk and higher likelihood of adjacent property damage
Road Category Score	A weighting is applied to reflect the type of route – The Resilient Highway Network receives a weighting of 100%, A Roads 90% and B Roads 80%. This is to give weight to the strategic and locally important highway network.
Residential Score	The number of properties affected multiplied by the proportion of flooding (where the

	highway is more than 20% of the total 'flood cell'. This score is then doubled.
Non-Residential Score	As above but this is not doubled so that additional weight is given to residential property flooding.
Climate Change Score	A combination of the metrics to look at the difference in flood extent between the modelled 1 in 30-year flood and 1 in 100-year flood. Note in some instances the highway becomes a less proportion of the flood as sources of surface water outside of the highway become the overriding factor
Enquiry Score	Whilst the assessment does include existing reports of flooding, this has been given limited weight so as not to adversely affect the identification of flood risk areas which may be either go unreported, or that are not a risk now but may become a risk in the future.
Total Score	The total score is made up of the Climate Change Score, Enquiry Score, and other Metrics to give an overall risk rating.

4.5 The analysis provides a high-level overview of the risk and the area where surface water run-off may contribute to that risk, but each 'flood cell' location will require a more detailed review in the future. By undertaking this, we can inform our three to 5-year capital works programme where these more proactive inspections reveal issues.

4.6 Not every site identified will require drainage improvement works to reduce the risk of flooding. There may be instances where minor repairs or an enhanced maintenance regime are sufficient. In other circumstances there may not be a solution that is viable or within KCC's control to deliver.

4.7 Opportunities for mitigation could include, but are not limited to, the following:

- Enhanced maintenance regimes where the existing drainage system is in sound operational order but is liable to blockage from leaves or silt. These areas could potentially be linked into future trials following in the 'Live Labs' project.
- A like-for-like replacement of existing assets where operational or structural issues are found where existing reports of flooding are minimal.
- Use of modern techniques to extend the life of existing drainage assets, such as trenchless and no-dig cast in place pipe and culvert lining and stabilisation.
- Retrofit of Sustainable Drainage (SuDS) features and Blue-Green Infrastructure such as permeable paving, rain gardens, open attenuation for exceedance flows etc.

- Replacement or supplementing of existing assets with new or upsized assets (for example larger or additional soakaways) where greater resilience is required.
- Attenuation of surface water to accommodate additional run-off volume with a controlled discharge back into the network so as not to increase flood risk elsewhere.
- Separation of surface water from existing sewers and redirection to an alternative outfall (where viable) to ease sewer capacity issues.

4.8 It should also be noted that future improvements must be cost-beneficial (i.e. is the costs of delivering them must be outweighed by the benefits they provide) and any improvements made are unlikely to completely eliminate the risk of surface water flooding - all measures can be overwhelmed by a rainfall event of sufficient extremity.

4.9 There is also an obvious need to work closely with the various water and utility organisations to develop co-operative programmes to align our operational needs to their ongoing asset modernisation and water management obligations.

4.10 In those cases we would propose to include areas of interest within the next update of KCC's Local Flood Risk Management Strategy where collaborative working between risk management authorities (such as the sewerage undertakers, Environment Agency etc.) is required over a longer time period.

5. Funding for Capital Works and Maintenance

5.1 At present the Highway Drainage Asset Management Team benefits from an increased capital budget of £15m spread over a 3-year period from financial year 2019/20 until 2021/22. This is likely to be sufficient to deliver the current highway works year one and two capital programme but clearly there are significant uncertainties on future funding allocations currently.

5.2 It should be noted that performing works to our own highway drainage systems such that they perform more a of flood defence role is considered to be a change in policy as it is beyond the current level of service we provide and likely to be beyond our statutory duties as a Highway Authority.

5.3 Is however important to note that the roles of highway drainage and those of the Lead Local Flood Authority need to interlink so we act as one council. However, this will involve either jointly funded and seeking further funding beyond that which we have for usual highway maintenance and capital improvement activities if we wish to increase use our use of highway drainage systems to serve a flood defence role.

5.2 In April 2020 the government announced that it will double its investment in flood and coastal defences in England to £5.2 billion over the next six years. This gives opportunity to seek external funding for some drainage schemes where they can be demonstrated to offer a good cost benefit ratio and/or be match funded by KCC. Changes to the previous scheme have introduced a

new risk category which will enable schemes that prevent surface water flooding to qualify for more funding.

5.4 It is important that KCC continues to seek investment in its highway drainage infrastructure to support the delivery of improvements as even with external funding, match funding is usually required to enable delivery and potentially significant investment is required to support the investigation and design of drainage schemes before any bids can be made.

5.5 As noted, it is of great importance to ensure future maintenance needs of our highway drainage systems are met so that our investment can be protected into the future, together with smarter maintenance of our existing assets. This will greatly assist with future resilience against surface water flooding.

6.

Appendix – Examples of 'Overland Flow', 'Exceedance Flow' and 'Exceedance' of Drainage Capacity

'Overland Flows' from fields near the A20 London Road, West Kingdown and the subsequent overwhelming of highway drains on the highway. This flooded the strategic route and nearby properties in Ash Tree Close in June 2019.

'Exceedance Flows' exiting manhole covers from overwhelmed sewers contributing to flooding at Albert Road, Deal in August 2020.

‘Exceedance’ of drainage capacity at A2 Canterbury Road, Sittingbourne where a large existing drainage system is present within an area of borough council owned green space. This flooding occurred in May 2019. A similar flood also occurred in August 2020 following a severe thunderstorm:

‘Exceedance’ of drainage capacity at Lower Road, Teynham also in May 2019. A similar but less extensive flood also once again occurred in June 2020 following localised heavy rainfall.

Appendix – Example Blue-Green Infrastructure Projects

BLUE-GREEN CITIES IN THE SPOTLIGHT: KENT

An introduction to Blue-Green Infrastructure pilot projects in the county of Kent, England

By Kent County Council and Bax & Company

In Kent, Blue-Green Infrastructure (BGI) connects urban hydrological functions with urban nature, landscape design and planning. Put simply, it's about combining green spaces and good water management.

BGI reduces flood risk by using a more natural approach to water management within the urban environment. This is typically done by utilising existing green assets and infrastructure e.g. parks, rather than building grey infrastructure e.g. new piped drainage. Not only can the utilisation of green assets reduce flood risk, but it can also create multifunctional spaces. Blue-Green Infrastructure typically provides more amenity value to local residents and increases the resilience of urban spaces to climate change, while improving the liveability for the wider community. In particular, small 'orphaned' (underutilised) urban green spaces, such as Pocket Parks and Village Greens, present a unique opportunity to manage floodwater, improve the ecological value and enhance the amenity of the local areas.

In Kent, the increased frequency of intense rainfall events, often associated with summer thunderstorms, has led to more frequent flooding of residential and commercial properties across the county. The existing urban environment and infrastructure don't have the capacity to deal with unprecedented climatic events, which presents challenges for reducing flood risk.

Heavy rainfall events are anticipated to increase in severity and frequency. Climate change is expected to reduce the liveability of our urban environments for communities across Kent. Kent County Council is one of six European partners of the three-year BEGIN (Blue Green Infrastructure through Social Innovation) Interreg North Sea Region project **(northsearegion.eu/begin).**

BEGIN has funded two pilots projects in Kent. One in **Sittingbourne** and another in **Margate**.

The objectives of these pilots are to:

1. Trial the delivery of BGI projects in Kent
2. Engage Kent residents within the BGI design process using social innovation techniques
3. Identify the social, environmental and economic benefits that can be achieved for the local communities.

Co-designing with communities

BELL ROAD, SITTINGBOURNE

At Bell Road, 12 residential properties were frequently flooded during heavy rainfall events, due to the highway drainage system becoming overwhelmed. A large urban green space adjacent to Bell Road provided the opportunity to divert water away from the highway into an attenuation soakaway. The soakaway has a capacity of 300,000 litres with the surface water stored within the system draining to the chalk below.

GEORGE PARK, MARGATE

At George Park a scheme has been designed to divert surface water from the surrounding roads into the park. Previously excess surface water within this area would have discharged into the combined sewer causing flooding due to the capacity constraints. As a result of the BGI pilot project the water will now enter the park through swales and will then be is discharged into ponds in the park. Over time the water will slowly and naturally filter into the chalk below.

These two pilot projects in Kent have delivered significant landscaping improvements for the local community. For example, the creation of wildflower meadows, swales and ponds, as well as the planting of new trees within the existing Council green spaces.

The projects have provided KCC with their first-ever opportunity to work with local communities in co-designing BGI spaces. This has been done by working in partnership with the local community through the support of the *Places Team*, *Kent Wildlife Trust, Isle of Thanet Trees and Woodland Initiative* and *Swale in Bloom*.

The two pilot projects have demonstrated that:

1. Blue-Green Infrastructure provides a viable solution to managing urban flood risk, whilst utilising the existing green infrastructure within our urban environments and across Kent county.
2. Working with the community to co-design BGI creates spaces which communities can have greater ownership of and contribute to the long-term maintenance.
3. Previously, public green spaces had only provided one single function. Retrofitting BGI within Local Authority existing assets and spaces can deliver a multifunctional place and space with multiple social, environmental, and economic benefits for both KCC and communities across Kent.

For more information, contact:
Louise Smith (Kent County Council): Louise.smith@kent.gov.uk
Ellen Kelder (BEGIN Project Coordinator): ETG.Kelder@dordrecht.nl

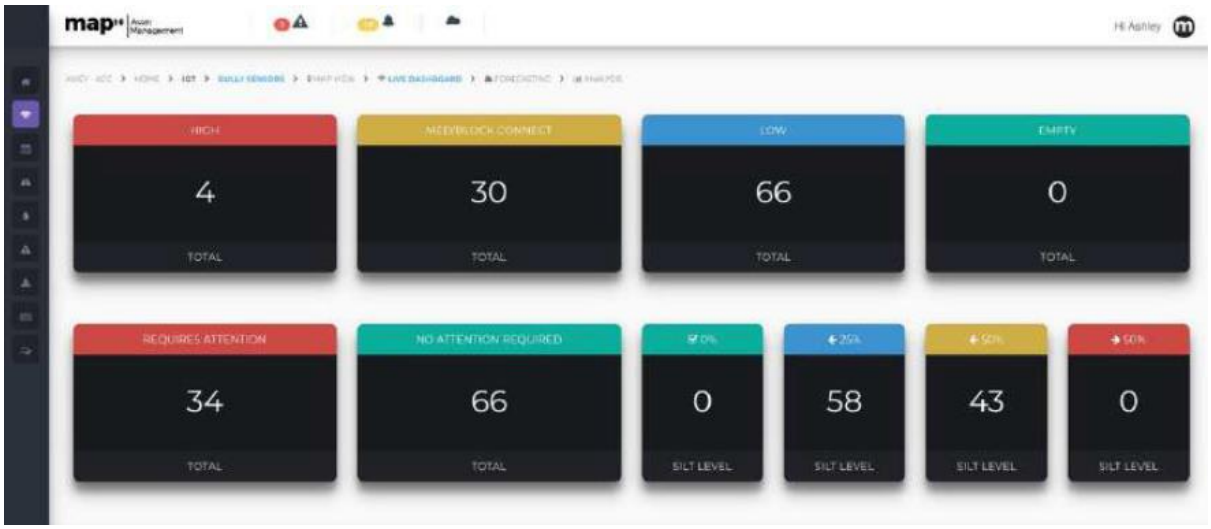
Kent's story relates BGI to communities by demonstrating the value to them.
For further information read the **BEGIN Policy Brief** at: baxcompany.com/begin-policy-brief/

Appendix – Examples of Smart Gully Sensors and Monitoring Software

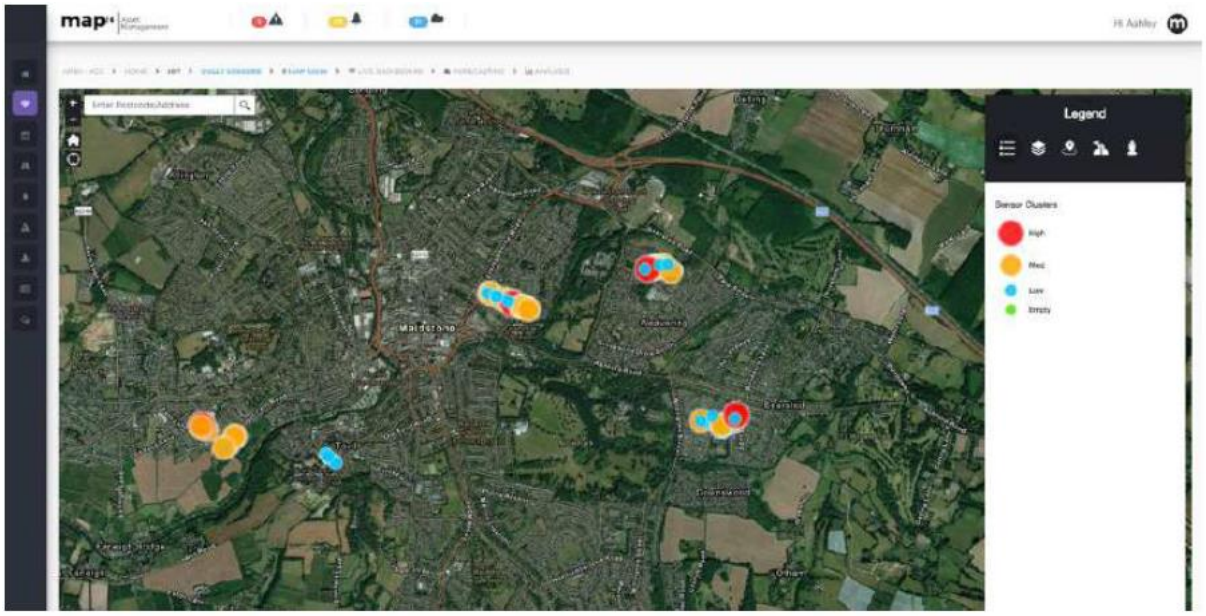
Example of ‘DMS Live Grid’ in which a sensor is embedded into a gully grid:

Example of ‘Internet of Things Sensors’ installed below existing gully grids:

Example of the live dashboard showing us clearly the live status of every sensor, how many needed attentions and what the current silt levels were within those gullies:



Example map view providing a real time insight into gully sensor status during a heavy rainfall event in Maidstone, showing where a risk of flooding was being detected:



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To: Kent Flood Risk Management Committee – 23rd November 2020

From: Stephanie Holt-Castle, Interim Director of Environment, Planning and Enforcement

Subject: Environment Agency and Met Office Alerts and Warnings and KCC severe weather response activity.

Classification: Unrestricted

Summary: To update Kent Flood Risk Management Committee on the current local water resources situation, Environment Agency and Met Office Warnings, and flood response activity since the last meeting of the Committee on 6 July 2020.

1. Background

1.1 This report is the latest of the regular updates to the Committee addressing the current water situation and severe weather and flood response activity, and covers the period from July to November 2020.

1.2 The KCC Resilience and Emergency Planning Service Duty Emergency Planning Officer (DEPO) and KCC Contact Point receive Environment Agency (EA) and Met Office alerts and warnings regarding severe weather on a 24/7 basis. Site specific severe weather impacts are notified to the DEPO by the emergency services and other resilience partners, with reports from the public received by Contact Point and passed on to the DEPO and/or Kent Highways. DEPO further initiates multi-agency reporting using the innovative Severe Weather Impacts System (SWIMS) to capture resources and costs arising from severe weather incidents.

1.3 Some 85,500 residential and commercial addresses across Kent are located within areas identified as at risk from fluvial (river) or tidal (coastal) flooding. Where possible, flood vulnerable properties are offered a free Flood Warning Service by the EA, which provides warnings by telephone, email or text message. Early warning of flood risk to communities (including areas outside of floodplains) is delivered through Flood Guidance Statements (which are issued by the EA / Met Office Flood Forecasting Centre and provide information for emergency responders to assist emergency planning and resourcing decisions), Met Office Severe Weather Warnings, and mobilisation of the Kent Resilience Forum (KRF) Severe Weather Advisory Group (SWAG).

2. Latest situation

2.1 The period July to September 2020 saw a succession of drier than average months in Kent, with July recording 71%, August 76% and September 73% of long-term average rainfall respectively. October was a much wetter month, with 172% of long-term average for the county. Temperatures were around normal from July to October, with the exception being August, which saw a total +2.3°C. above the mean.

2.2 Monthly mean river flows across Kent are currently mostly at the top of their normal ranges or above normal as a consequence of the above average rainfall experienced through October.

2.3 Significant soil moisture deficits at the end of September returned to near normal with the above average rainfall in October.

2.4 By the end of October groundwater levels were best characterised as normal, with more reactive catchments, including local chalk and gravel aquifers, in the upper part of that range.

2.5 Reservoir levels started to rise during October, although not until the end of the month at Bewl, finishing at 59% of capacity, while Bough Beech had reached 54% of capacity.

2.6 A dry summer and relatively calm weather conditions in autumn saw just seven Flood Alerts issued by the EA since the last meeting of the Committee in July 2020 (four fluvial and three coastal)[1]. This contrasts with 47 flood alerts and five warnings (nine fluvial and 43 coastal) for the same period last year.

2.7 The Met Office issued 47 Weather Warnings for Kent between June and October (the last period for which data is available)[2]. These Warnings related to predominately summer thunderstorms.

2.8 The Thames Barrier was closed on two occasions since the last meeting (both for test purposes)[3]. The figure for the corresponding period last year was three (twice for test and once for operational purposes).

3. Looking forward

3.1 The Met Office three-month outlook (November to January) indicates above average temperatures as being slightly more likely than below average

[1] Please see appendix 1
[2] Please see appendix 2
[3] Please see appendix 3

temperatures. In terms of rainfall, below-average precipitation is slightly more likely than above-average precipitation.

3.2 We are currently in a La Niňa year, which is where warmer waters are pushed further west than is usual across the Pacific Ocean by strong easterly winds. This influences global weather patterns from January to March, including in Europe and the UK and often leads to an increased chance of mild, wet and windy conditions, but a few colder spells are still possible. Vigilance is therefore required going forward into the New Year in relation to a potential increased risk of stormy conditions.

3.3 The EA continuously runs surge forecasts, informed by astronomical tide calculations. If a risk of coastal flooding is forecast, then this information is communicated to partners. Elevated spring tides with a corresponding higher risk of coastal flooding, if in combination with high winds, are forecast between: 27th and 29th November; 13th and 15th December; 11th and 14th and 26th and 29th January; and 9th and 12th and 25th and 28th February.

3.4 Kent Flood Risk Management Committee will continue to receive regular updates on water resources, flood alerts, weather warnings and response.

4. Recommendations

4.1 That Members note the warnings received since the last meeting of the Committee; and contribute to planning and response policy and practice through oversight and debate.

5. Contact Details

Report Author: Tony Harwood (Resilience and Emergency Planning Manager), Growth, Environment and Transport, tel. 03000 413 386, e-mail tony.harwood@kent.gov.uk

Service Head: Mike Overbeke (Group Head - Public Protection) Growth, Environment and Transport, tel. 03000 413 427, email mike.overbeke@kent.gov.uk

Relevant Director: Stephanie Holt-Castle (Interim Director of Environment, Planning & Enforcement), Growth, Environment and Transport, tel. 03000 412 064, email stephanie.holt-castle@kent.gov.uk

Appendix 1: EA Flood Alerts and Warnings issued since 6 July 2020		
Date issued	**Flood Zone**	**Status**
19/09/20	Isle of Sheppey and Coast from Kemsley to Seasalter	Alert
02/10/20	Rivers Shuttle and Cray	Alert
	Isle of Sheppey and Coast from Kemsley to Seasalter	
03/10/20	River Bourne from Hadlow to East Peckham	Alert
	Rivers Eden and Eden Brook	
17/10/20	Coast from Fairlight to Dungeness including the Tidal Rother	Alert
25/10/20	River Rother and its tributaries from Turks Bridge to the Royal Military Canal	Alert

Appendix 2: Met Office Severe Weather Warnings – June 2020 to October 2020		
Weather Element	**Number of Warnings**	**Dates of Weather Events**
Fog	N/A	N/A
Rain	7	**18 Jun, 27 Aug, 2-4 Oct, 21 Oct**
Wind	6	**21 Aug, 25-26 Aug (Storm Francis), 21 Oct**
Thunderstorm	31	**14-18 Jun, 25-26 Jun, 31 Jul, 9-17 Aug, 26-28 Aug**
Wind and Rain	3	**2 Oct, 24 Oct**

Appendix 3: Environment Agency Thames Barrier closures since 6th July 2020		
Thames Barrier closures	**Date**	**Status**
Thames Barrier closed	06/07/20	Test
Thames Barrier closed	04/10/20	Test

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To: Kent Flood Risk Management Committee – 23rd November 2020

From: Tony Hills, Chairman of the Kent Flood Risk Management Committee
Stephanie Holt-Castle, Interim Director of Environment, Planning and Enforcement

Subject: Virtual Site Visit to Little Venice

Classification: Unrestricted

Summary: To inform the Committee of the virtual site visit to Little Venice on 23 September 2020

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1. Background

1.1 The issue of Little Venice was raised during the Kent Flood Risk Management Committee meeting on 9 March 2020. I therefore invited interested parties to participate in a site visit and discussion. At the same time, legal advice on the possibility of undertaking a compulsory purchase was sought in accordance with the Committee's wishes.

1.2 Due to the Covid-19 pandemic, it proved impossible to hold a physical site visit. Furthermore, the use of a drone to film the site was not possible due to GDPR considerations. Nevertheless, all the attendees were very familiar with the site which ensured that a productive discussion could take place on a Virtual basis.

2. The Virtual Site Visit

2.1 The Virtual site visit was held on 23 September 2020. The list of attendees was:

Tony Hills (KCC – Chairman of Kent Flood Risk Management Committee)
Max Tant (KCC – Flood and Water Manager)
Tony Harwood (KCC – Resilience and Emergency Planning Manager)
Derek Mortimer (Maidstone BC – Chairman of Communities, Housing and Environment Committee)
James Bailey (Maidstone BC – Development Manager)
Geraldine Brown (Yalding PC – Chairman)
Guy Gardener (Kent Resilience Team - Senior Resilience Officer)
Luke Thompson (Environment Agency – Area Incident Manager; Kent, South London and East Sussex)
Jonathan Alawo (Environment Agency - Team Leader Flood Resilience Team; Kent, South London & East Sussex)

Grant Brooker (Kent Fire and Rescue- Water Resource and Flooding).
Andrew Tait (KCC Democratic Services)

2.2 All participants agreed that the safety of the residents was paramount. They also noted that legal advice separately obtained by both Maidstone Borough Council and Kent County Council clearly stated that the CPO option suggested at the Committee meeting was incapable of being successfully pursued. The attendees therefore discussed what measures could be undertaken to improve health and safety on the site.

2.3 Major flooding events are expected to occur more often as a consequence of climate change. Research has established that a 1 in 100-year flooding event occurs every three years somewhere in the UK. This does not, however mean that any one location is at a level of risk substantially greater than that.

2.4 Little Venice is a site which is inhabited by a significant number of elderly and vulnerable residents. It is very prone to flooding. The evacuation of vulnerable people is typically a challenge to achieve safely.

2.5 The Environment Agency identified a Community Flood Plan for Little Venice had been developed following the event of 2013/14. This had provision for Flood Wardens, although there is not one there at this time. The aim is to rectify this through training for flood wardens which was due to be held shortly after our Virtual meeting took place. The updates to the Flood Plan will follow the flood warden training and be written bearing in mind the debrief following the events of the winter of 2019/20.

2.6 The draft Medway Confluence Flood Plan covers Laddingford, Yalding and Collier Street and sets out arrangements for sandbag provision and highways management in those localities during a localised event. As stated above, there was a debrief following the events of the winter of 2019/20.

2.7 Little Venice was previously covered by three different warning systems that were issued at different times. This has now been reduced to a single warning that is tailored to the site without warning the rest of the Yalding community unnecessarily.

2.8 Gauge boards have been installed on site to enable water height to be measured at Hampstead Lock so that the anticipated extent of the flooding can be communicated to the residents. The residents typically expect the site to be flooded to some degree every winter. The Flood Warning messaging service and the gauge boards improve the ability of site residents to understand the level of severity during any flooding event that is going to happen. The 2013/14 Flood Plan and the Evacuation Plan that arose from it have worked very well since its creation and the residents on site have been able to self-evacuate quite effectively. This was also the case during the 2019/20 event where there was a *de facto* Flood Warden to assist. There were, however, significant issues for the most vulnerable residents.

2.9 One of the problems with the Evacuation Plan for Little Venice is that it is unclear who has the responsibility to decide who should be evacuated and who should remain on site. In March 2020, Little Venice was left with 16 very elderly and vulnerable people who the Fire Authority had to evacuate overnight by boat. It then proved problematic to move them to appropriate temporary accommodation. Maidstone BC as the evacuating authority bore the cost of doing so. This did not extend to returning those people to their homes once the Emergency was over. The aim should be to ensure that evacuation of all residents is undertaken at the same time rather than piecemeal as was the case on this occasion. Responsibility for returning people to their homes after the event needs to be clarified.

2.10 From an Emergency Planning perspective, it was a complex matter to resolve how to evacuate people, who were elderly and vulnerable, without inflicting harm. In March 2020, there were significant problems in persuading people to evacuate and to identify appropriate specialist accommodation. The difficulties experienced in evacuating the Little Venice site have grown between 2013 and 2020 as the residents have become older and more vulnerable.

2.11 There is an inherent risk to mobile homes, even though they are tethered. Furthermore, many of the residents initially reacted to the March 2020 flood event with complacency. Consideration needs to be given to how the site can be made safer in terms of layout. Some parts of the site are very vulnerable to flooding, representing a danger to life when taken in combination with the vulnerability of some of the residents. This risk is born by residents, rescue workers and volunteers, which also places pressure on Adult Social Care and Health staff, who must ensure safeguarding.

2.12 Mobile homes are still being advertised at Little Venice for sale at a price that is attractive for people who have retired. It is not clear whether people contemplating purchase have been informed of the risks associated with purchasing a mobile home in sites such as Little Venice. One suggested response is to warn the residents of the nature of the risks, possibly by a letter undertaken by the Parish Council.

2.13 The point was made that quite a few of the residents mistakenly believed that they had purchased permanent homes and had sold their former houses under this misapprehension. Furthermore, some of the more elderly and vulnerable residents have acquired the right to live there permanently over time.

2.14 Little Venice has an extensive planning history. An enforcement investigation was carried out by Maidstone BC some ten years ago because the lawful use was for temporary holiday homes rather than for permanent accommodation, and it was believed that a number of people had been living there permanently for a considerable period.

2.15 Maidstone BC informed the virtual site meeting that there are some planning restrictions, including a S106 Agreement which is effectively a tie within the main park area for a restriction of usage for that area on site. There is also a permission for the access; a 2019 Lawful Development Certificate (LDC) for the ancillary recreational use of an area in connection with Little Venice Country

Park. A new application has been received by Maidstone BC for quarter of the land covered by the LDC. If granted, this would lead to a further 40 caravans with the possibility of a further 120 if the planning process were to be repeated.

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3. Conclusions

3.1 The meeting identified a number of aspects that would benefit from further multi-agency consideration. These are:-

3.1.1 exploring further were zoning the site by floodwater depth and velocity (although care would need to be taken to ensure that the residents would not be misled into believing that they would no longer be at risk if placed in a lower risk zone);

3.1.2 better informing the residents of the flood risks on site

3.1.3 establishing the exact level of responsibility for the duty of care at the site, including for evacuation and return of residents, and how this will be enforced if required.

3.2 The participants all agreed that they had become better informed of the full circumstances prevailing at the site, including options which could most productively be pursued.

3.3 The exercise was in my opinion an important step forward in improving health and safety at Little Venice. This meeting came about as an Initiative raised at the Committee. This reflects very well upon the manner in which it carries out its role. Whilst the site visit has not solved the problem, it has been able to facilitate work towards an improved situation.

3.4. I recommend that the Committee should receive an update report on progress at Little Venice within the next calendar year.

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4.1	The Committee is invited to note the report and the three areas at 3.1 that will continue to be explored to a point of resolution
4.2	The Committee is invited to agree that an update will be presented within the next calendar year.

5. Report Author:

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