**Flood Plan Review and Revisions – Parish Council 8th March 2021**

**Introduction**

The original Flood Plan was evolved before the village had an operational storm water pumping station (PS) when the thrust of the support required was to target harden properties individually against flooding. This required a large number of people to be available to help put door guards in place and to provide and place sand bags at critical locations to stop the inevitable flood water, that flowed primarily along The Beck, from doing too much damage. Prior to the plan the flood water was controlled partly by the topography of the road and partly the spill level of the discharge point (now Victoria Meadow) into the river flood plain. This natural outfall still required significant pumping support and assistance from the emergency services to avoid flooding of property. As a result of this repetitive and heavy demand on the Fire Brigade, and following the Environment Agency (EA) classifying the Green Brook culvert / brook as ‘Main River’ back to the A513, a powerful pumping station was provided by the EA on the Green Brook at the junction of Church Road and The Beck. The land available for the PS was very limited and the PS has some inherent hydraulic problems which the EA engineers constantly try to mitigate with control improvements..

As a result of the PS provision the protection of property is done generically by controlling the level of flood water on The Beck. Consequently the fitting of door guards, provision of sand bags and monitoring of each house during flood events is unnecessary as by controlling the flood level on The Beck all property is jointly protected. This fundamentally changes the focus of our efforts to provide support for the EA who provide the pumping capacity previously provided by the Emergency Services that could be made available to us. Our Flood Plan already part recognises the changes and it requires the EA to provide additional action in the case of power outage and/or pump failure but the Action Plan for us as flood wardens can now be beneficially moved on and it’s that new focus for action that is the subject of this report.

It is also opportune as part of this revision to include the issue of succession planning as one of the Principal Flood Wardens, Brain Green, has just died and the other PFW is not getting any younger. We offer our thanks and condolences to Brian Green’s family.

**Pumping Station Constraints**

From our experience of various flood events over the last ten years it is clear that providing the PS operates effectively the village can be protected from flooding of property. Because of the constraints of the small ‘wet well’ from which the water is pumped to the river it is periodically necessary to have some controlled water spilled out onto The Beck which understandably give rise to concerns for the local householders. However because of the difficulties of getting water to the pump at critical times having the culvert surcharged with water on The Beck is beneficial. As Flood Warden I try to calm nerves and ensure that everyone knows the system is working and there is no risk of flooding to property, sometimes this is not enough for some residents but it is manageable.

The PS itself is at risk because of the potential loss of power or pump failure so we have agreed with the EA that they have both backup generator capacity and backup pumps available at short notice with response times that fit with the experienced rates of flood progression. This has been refined over the last few years with bespoke delivery pipes being made specifically for the support pump for our PS. Also modifications / improvements have been made to make the connection of the generator very simple and thereby speed up its connection into the control gear.

There are constant changes being made by the EA to the control mechanism for the pump. The exceptional pumping capacity is good but with that power and the under size wet well come the control complications. If the wet well from which the water is pumped was the size of a house control would be simple irrespective of pump size as the fluctuation in level of the water in the well during operation would be very slow, easy to read and control the pump speed to match the flow. Unfortunately the wet well available to the EA is under the size of a small car meaning the fluctuation in surface level when the large pump cuts in is very fast and significant. That means that the pump, at certain flows, draws down the water level too fast and the pump thinks the flow has dropped so it switches off only for the surge of the water left in the culvert to tell the pump to switch back on. Getting a high delivery pump to operate under limitless flow conditions with a very small difference in the on off level has been a nightmare for the EA engineers but they have been little short of ‘magicians’ in managing the system. I must state here that the problem was not created by any mistake in the original design. The EA were faced with political pressure to provide a solution asap following the two floods of 2007 and they could only use what infrastructure was available to provide a timely response. A second factor would also have been the cost benefit of a larger scheme and it is beyond question that the cost benefit of any larger scheme would not have been supportable given the relatively low number of properties that flooded. I would remind people that after the provision of the PS the EA also provided a substantial inlet structure on the Green Brook at The Green as well as a very significant investment in lining the brick culvert feed to the PS to mitigate hydraulic pressures and potential failure of the culvert all made possible by the EA action in making a section of the Green Brook ‘Main River’. The EA continue to support the village with a vigorous maintenance regime for the PS with continual refinement of the control gear.

The two options to resolve or further mitigate the pumping problem are:

* Increase the ‘wet well’ capacity
* Decrease the volume of flow requiring pumping

The first is impossible to justify on a cost basis as the PS is tightly hemmed in by private gardens and again the cost of the works would be impossible to justify on a cost benefit basis.

The second option is in fact mentioned in the Flood Plan as a Phase 3 development. The main threat to the village from a flood point of view is the flood water in the Green Brook as when the river water is held back by the penstock gate in the PS all water in the Green Brook has to be over-pumped into the river dictating a maximum pumping capacity. Phase 3 involves the removal of the bulk of the Green Brook water from the culverted section of the brook.

In past days there was a length of ditch that ran from the side of No 61 The Beck across to Brickhouse Lane effectively allowing excess storm water in the Green Brook to be diverted around the village away from The Beck. No doubt that was the historic solution provided by people with less technology and more understanding of the land and its drainage problems at times of storm. This system has been lost, although small sections do still exist, but it is not continuous and is on a very circuitous route. A ditch constructed in a straight line across the farmland from The Green to half way across the field where a significant scale ditch still exists connecting to Brickhouse Lane and beyond bypassing the village would allow the bulk of the water to be released by gravity. It also reduces significantly the flood risk to property. The topography of the land has been checked and shown there is a natural half a metre of fall adequate for a land drainage ditch of the length required.

This solution would require more investment in Elford flood protection measures including a professional design and land purchase but it would enable the pumping capacity of the PS to be drastically reduced enabling a smaller pump to operate in the future with more easily controlled pumping regimes. Over time it would also cost much less in power supply and management / maintenance costs. This solution was not developed at the time of the first plan as considerable investment had been made in the system that existed and it was not considered expedient or practical to change something that had been provided quickly and was efficiently controlling flooding and reducing the repetitive call on scarce emergency services. However in the light of subsequent flooding and in the interests of long term cost effectiveness now may be the time to start to look for a better solution to implement when a significant PS refurbishment is required.

**Operational Action Plan Changes**

As I have stated the action plan focus could beneficially change as there are facilities that we can provide as a community that will help those that help us at time of flooding. I will deal with each issue in turn:

1. Traffic Control

The location of the PS means that support vehicles obstruct the road at The Shrubbery / Church Road / The Beck junction. The control of traffic is not the utmost problem for the attending EA staff so there are two things we can do here.

* Optimise the number of vehicles left in the road and provide parking in the village hall car park.
* Have a pair of stop go boards supported with walkie/ talkies and provide two people to help control the traffic if plant or vehicles have to park adjacent to the PS.

There is also a problem of people driving through flood water on The Beck creating a wave that at critical levels can cause significant problems if water levels are high. Consequently we should have some cones to close off the road at both ends of the flooded section. We may need to ask questions on the legality and liability aspects of this action, as with the traffic control above.

2. Pastoral and Social Support for Emergency Staff on Site

Throughout past event there has been a need for EA and Emergency Service personnel to be on site for considerable lengths of time including overnight. Whilst we have provided ad hoc food and drinks there has been no planned domestic support provided. Neither has there been any planned support for toilets or rest areas for staff. I accept that there are shift systems in place for relief of staff but at times of sever regional flooding personnel have been on site for double shifts and have travelled many miles to attend, Stratford on Avon is a far flung depot that has supported us in the past several times.

I would propose that:

* The Village Hall be provided as a rest centre for all people attending and supporting action providing warmth and toilets for all involved.
* Hot drinks are made available at all times and some sustaining and easily provided food is available
* An information board is made available for all status of key actions being written on it to inform and person interested where we are, what is being done and when we anticipate an end to events.

In the past staff attending have asked where there were shops so that they could get food. Given where we are and the proximity of closed roads during flooding we must not make helpers go looking for food. Greg Watkins the Chair of the village Hall Committee has given his full support for the use of the Village Hall and carpark for the uses defined.

3. Flood Control

As we know once water is flooding The Beck the role of the gullies is crucial to controlling flood levels and maintaining a competent pumping regime. Many gullies get blocked each year at leaf fall and despite badgering the Highway Authority their maintenance regimes are insufficient to solve all our problems. The gullies form part of the network of road, culvert and pumping station that protect us. So my proposal is:

* That we purchase a gulley dipping ladle and organise periodic cleaning of the gullies on The Beck over the length of the road that the culvert runs.
* That we pursue the double flap cover suggested as part of the Working Men’s development to allow us to more easily supplement the gullies flows in any a critical emergency situation.
* That we have spare cones or barriers to mark the location of the double flap opening when in use.

One result of storm water flooding is that the foul system drowns out and is effectively washed clean or pollutes the storm whichever way you want to interpret it. What that means in practice is that the foul system can act as a supplementary pipework system from which to pump excess storm water. There is generally a reluctance for emergency support pumps to pump from a foul chamber but by the time it would be necessary there is usually clean water streaming out from beneath the foul system lids. There is a critical foul manhole close to the PS which would provide an effective deep pumping sump adjacent to the PS delivery sump which could be crucial in a very severe flood event. Effective pumping requires good submergence for the suction pipe this chamber can provide that. Inevitably foul sewage gets pumped to the river at times of storm flooding as the systems are connected, illegally but it happens everywhere, so using that fact to advantage in critical circumstances seems sensible if not essential. I propose that:

* We clearly identify the foul chamber to any emergency pump provider either EA or Fire Brigade that they can use the chamber without detrimental effect.

4. Update Critical Data in Flood Plan

The information included in the flood plan has not been updated for several years and there are critical bits of data that need to be updated. The plan was quite wide ranging and can now because of the PS provision can now be optimised and retargeted. Some of the information needing updating is:

* Review names of residents in the bungalows
* Review the names and roles for Auxiliary Flood Wardens
* Appoint a replacement Flood Warden for Brian Green – letter to Brian’s family to give them our condolences and let them know how grateful we were for all his hard work.
* Contact numbers and new names where personnel changes have occurred for all involved bodies.

5. Review of Number and Roles for the Auxiliary Flood Wardens

It is suggested that a meeting of all flood wardens of whatever designation that are still interested be held and full review undertaken and the necessary pages of the Flood Plan amended and updated. All changes will be agreed with the Parish Council prior to updating of the document. This process may well take several months as we want input from all organisations involved, particularly the EA and Highway Authority.

Some of the matters for discussion are:

* Need for succession planning for principal Flood Wardens to ensure knowledge is spread and maintained.
* Clear guidance on past event circumstances is held and understood.
* FW’S / AFW’S have any training necessary to undertake the duties of the new roles

**Conclusions**

The Flood Plan has fulfilled the purposes for which it was prepared despite never having been fully expedited. All subsequent floods have been handled promptly and effectively thanks to the prompt actions and effectiveness of the Environment Agency personnel.

It also had several other benefits:

* It has set out a history of the flooding in the village for record purposes
* It has demonstrated a commitment from the community to assist action in the village at times of flood
* It has helped generate additional investment in the flood relief system in the village
* It has helped us plan for the future
* The detailed understanding of the hydrology and topography of the village has enabled wider works to be carried out for the benefit of vulnerable property, timely input to planning applications to address long standing problems and act as a focus for ongoing storm drainage issues.

It is hoped that with competent succession planning a revised plan can continue to help develop action that will target harden the village against flooding into the future. It is certain that the flood events are unlikely to reduce in either intensity or regularity and as Elford is a riverside village it is essential that we at least try to stay ahead of the curve. We all know that there is a storm event out there that will be a real challenge, let’s hope it plays the game and stays true to the science and does not occur for hundreds if not thousands of years hence!

A meeting will be held in the summer with two volunteers who have agreed to help with succession planning and ongoing practical support.

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