

# Water Resource Assoc LLP

*A network of consultants in hydrology, water resources and environmental issues*

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Please reply to:  
Harvey Rodda

Water Resource Associates LLP  
PO Box 838  
Wallingford  
Oxon OX10 9XA

Tel: +44 (0) 1491 838190  
Mobile: +44 (0) 7971108980  
Email: harvey@watres.com

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The following text provides responses in red to comments made on the Recreation Ground Emergency Exit, Rowlands Castle, Hampshire Hydrological Survey from WRA LLP by members of Rowlands Castle Parish Council. The comments are in black:

Members noted that the draft report states WRA had not been provided with plans of the proposed location at the time of commissioning. Such plans have since arrived in draft form, subject to any recommendations WRA might make in its report. They were forwarded to WRA under separate cover with an explanation that whilst one plan indicated the surface for the element of the proposed exit which would go over the verge between the hedge and the highway could be tarmac for longevity and low-maintenance reasons, another surface treatment might be more suitable for drainage/aesthetic purposes. The plans still indicated there would only be a few metres of such material. Please could your report assess what increase (if any) such a surface might cause to any run-off to The Fairway? Are there any recommendations as to what material(s) should be used?

**The study was undertaken without having detailed plans for the exit and made an assessment of the potential flow of water at the exit location. Further work to calculate the flow of water generated from the exit based on the detailed design, and advice on the type of surface which could be used will be an additional £250+VAT**

If RCPC were to set a new section of hedge a few metres inside the Rec to replace the section it is proposed be taken out of the existing hedge, would that be another mitigating measure? If the current hedge provides a dam for water run-off, such a new hedge would be merely moving the dam further 'up-stream' by a few metres.

**The hedge and fence in its current location may form a dam to surface water runoff through material such as leaves being pushed up against the fence and creating a blockage. Particularly where the ground immediately upslope of the hedge forms a hollow. However the primary purpose is not as a barrier to water and having another hedge a distance upslope would not be a form of flood alleviation.**

Members noted that whilst the report states "... the impermeable clayey soils of the Recreation Ground combined with the moderate slope and the short grass cover would promote surface run

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#### Partners

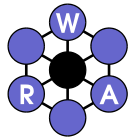
Frank A K Farquharson  
Paul A C Holmes  
Dr A Nick Mandeville

Ronald E Manley  
Dr Harvey J. E. Rodda  
Professor Paul G Whitehead

#### Head Office:

PO Box 838  
Wallingford  
Oxon OX10 9XA

Tel: +44 (0) 1491 838190  
E-mail: info@watres.com



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off on site ...” there does not appear to be any evidence included stating whether the Rec is actually contributing to such run off, other than anecdotal reports from those with a vested interest in the matter.

Section 2.3 describes the prediction of surface runoff from the contributing hillslope in some detail through the use of hydrological modelling software. This is a standard approach for estimating such flows for the purpose of flood estimation. The modelling used topographic data in its current form, without the second exit and this identified the flow pathway around the point of the second exit and the contributing catchment area which covered a large part of the recreation ground. Actual evidence of such flows would need to have been observed by eyewitnesses, filmed or photographed during flood events.

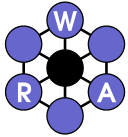
It would seem that it is only with the proposals for a possible second exit that such a direct linkage has been alleged between Recreation Ground run off and flooding in The Fairway. Members acknowledged that you may not be able to categorically state the situation either way, but in which case this should be included in the report rather than the implied suggestion that because it would then it is.

The hydrological modelling has identified the contributing area to the flow pathway originating between numbers 8 and 10 of The Fairway. This shows water will come from a large part of the recreation ground. The modelled evidence can only be validated by observing a flood event.

The records held by one councillor who is also Chair of the Flood Action Group, and whose well contains Environment Agency equipment to gauge water levels, notes that a whilst rainfall was intense on 8 February 2019, a greater volume fell on 26 August 2018 and 25 August 2014 and a similar volume fell on 29 July 2018 and 5 October 2015. On none of these 4 occasions are we aware of any reports in our records from residents of flooding of The Fairway.

Flooding is a combination of the incident rainfall and antecedent conditions, meaning that after a period of dry weather the same amount of rain falling on soil in the same time would have less propensity to cause flooding than if it were to fall after a period of wet weather. More of that rainfall would percolate into the soil and replenish sub-surface and surface storage. Also, rainfall is measured as a depth in mm so describing a quantity as a volume is also dependent on the area over which it fell.

The inclusion of 2 photos of flooding on The Fairway (Figures 1-11 and 1-12) were considered unnecessary and potentially inflammatory, and may be totally or predominantly down to factors unrelated to the Rec. The photographs show surface water flooding only on the road following the unusually heavy rainfall of 8<sup>th</sup> February 2019 when other areas of the village and wider area were also flooded. There is no evidence as to how short-lived or long-lived this occurrence was; that is whether it sat there for ages or drained away fairly rapidly. Members queried how reliable this information is as a guide to the potential for the likelihood of increased surface water on the road following the removal of 4m of hedging after such rare weather events. The



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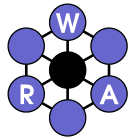
section of road that flooded is fed by a long area of tarmac all the way down The Peak and is the lowest point of the Fairway, thus it is inevitable that much, perhaps all, of the floodwater originated from the road surface and this should not be discounted. There is also reference to RCPC receiving “many” complaints about surface water flooding in February 2019, whereas RCPC’s website states it received “several”. It was felt the inclusion of a photo on the front cover of the driveways of 8 and 10 The Fairway was unnecessary and may be problematic in terms of privacy.

A review of flooding at a site should always provide evidence of historical flooding, if we were not to provide such evidence then this would not be meeting our professional requirements and that would leave us exposed to criticism from the Environment Agency and other parties. Any alternative images of flooding of the rec from council members would be welcomed which could replace those from the residents of The Fairway. The potential flow from the rec to The Fairway has been calculated in section 2.3, and the flooding of the road shown in the photos is commensurate with the estimates.

The report quotes Hampshire County Council (HCC) as stating the drains on The Fairway are “struggling to cope”. These and the properties of The Peak and The Fairway were constructed some time after the land which comprises the Rec was conveyed for the purposes of recreation, therefore it would be difficult to hold the trustees of the Ground responsible for such issues. The Fairway may be at risk of flooding but much of that is down to factors beyond RCPC’s control in terms of its stewardship of the Rec ie drainage inadequacies, uneven road surface etc. Before recommending extensive additional drainage facilities within the Rec, should recommendation not be made for Hants County Council to consider improving the existing drainage within The Fairway by, for example, renovating or extending the soakaways. As stated above, there is no assessment of the proportion of the flood water on The Fairway that might originate from the Rec. Therefore, even if the measures recommended in the report were implemented, there may still be flooding in The Fairway which would still require HCC to improve the drainage.

We agree that the improvement of drainage along the Fairway should be recommended as an action for the County Council. The report in section 2.3 has provided an estimate of the flows which would originate from the rec and impact this part of the Fairway. Water from other parts of the Fairway could still cause flooding if the alleviation measures were in place, but the source of the water would not be from the rec.

Members would also like to understand to what extent the existing hedgerow contributes to the prevention of surface water run-off and what effect the removal of a 4m section of hedge might have. Members noted your comments in a later email regarding the leaves pushed up against the chain link fence which “could be evidence of water ponding at the boundary”. The area is also in a corner of the Rec with a various trees around it, and you visited at a time when said trees have dropped all their leaves and been subject to some fairly high winds and a chainlink fence preventing them blowing elsewhere.



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A hedge and chainlink fence can act as a barrier to flood water if enough loose material is pushed up against them causing a blockage. This really needs to be observed during flood conditions to see the exact impact. The leaves could also have been blown by the wind. However, the removal of the hedge and fence would mean there is no potential for blockage.

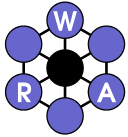
The report states: “The drains [on The Fairway] would also have been designed for road drainage and not to accommodate additional water from the Recreation Ground”. The drains have been in place since 1976, so can the report refer to the evidence supporting this assumption? The hedge and trees would not have been so large in 1976, so perhaps they provided less protection to flooding than they do now. Therefore, the 1976 design may have been based on a greater flow of water than there might be if part of the hedge were to be removed.

1976 was the date the County Council gave for when the road was adopted. As stated in the report the design in 1976 (or around that time) would not have been based on any proper hydrological modelling, it may have used a design rainfall estimate available at the time which had limited accuracy or was just a simple judgement-based approach.

Members considered reference to the proposed exit location being in the” worst location” as potentially inflammatory. They would request it be changed to, for example, the proposed location being “very problematic, in hydrological terms”. They would also welcome your views on whether to include reference to any proposed location exiting onto The Fairway being potentially problematic due to the ‘lie of the land’ to offset suggestions of an alternative location elsewhere on the Fairway. If possible within the current remit, they would also like to understand to what extent the risk of flooding on The Fairway might be increased by the proposed 2<sup>nd</sup> exit, and how that increase is measured.

The term has been modified in the report, the area further east where the main vehicle entrance is also very problematic in hydrological terms. Additional descriptions about the increase of the risk of flooding have been included in the text of the report.

Finally, there is unease about your proposed attenuation pond / borehole solution, especially located as it is so close to a children’s play area. It is understood that Rowlands Castle is in a Principal Aquifer area (as acknowledged in EHDC’s emerging Local Plan) , and much if not all of it is in a Groundwater Protection Zone 1c. Various recent developments within the village were not permitted infiltration drainage (boreholes) schemes by the Environment Agency and Portsmouth Water because of fears of the contamination of the aquifers. Either agency may not consider your recommended solution as acceptable. If a borehole is not allowed, the attenuation pond would have to discharge into a nearby surface water drain which would be The Fairway, so members questioned whether there would be any reduction in flooding? Ultimately, members wished to understand why the opening of a second exit no more than 4 metres wide should create the need for a seemingly ‘heavy-weight’ and costly solution.



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There is very little scope for contamination of the water from the recreation ground. It is basically rainwater with some eroded sediments from the playing field and potential nutrients from any fertiliser and plant residues. There is not going to be conveyance of hazardous chemicals, sewage effluent or hydrocarbons into the groundwater. In any case, the combination of the pond, wetland and borehole soakaway will provide treatment before the water is conveyed to the groundwater. The gravel trench will filter out any sediment, the pond overflow will also pass through a gravel filter and we could even include wetland plants which can remove excess nutrients.

The heavy weight and costly solution is needed since the Environment Agency require flood risk to be assessed based on the 100-year event plus an allowance for climate change.