

Guildford, Woking and Waverley Branch of Friends of the Earth

August 2014

Technical Review of Flood Risk Assessment (FRA) submitted in support of a planning application by Berkeley Strategic Land Ltd for the construction of 425 dwellings on land south of Cranleigh, Surrey



Wallingford HydroSolutions Limited

Guildford, Woking and Waverley Branch of Friends of the Earth

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Document issue details

WHS1255

Version number	Issue date	Issue status	Issuing Office
V1	21/08/14	Draft	Cardiff

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Date **21/08/14**

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1 Introduction

WHS have been commissioned by the Guildford, Waverley and Woking branch of Friends of the Earth to technically review a Flood Risk Assessment (hereafter abbreviated to FRA) prepared by WSP Ltd, dated 28th April 2014, submitted in support of a planning application for the construction of 425 dwellings on land south of Cranleigh (ref number: WA/2014/0912). This document was accessed via the online public planning record ¹.

This technical review has been formulated in line with the current planning policy relating to flood risk – namely paragraphs 100-104 of the National Planning Policy Framework (hereafter abbreviated to NPPF) which is supported by paragraphs 001-068 of the Flood Risk and Coastal Planning Practise Guidance (hereafter abbreviated to PPG).

The NPPF advocates that a site-specific flood risk assessment must demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.

2 Compilation of recent flood data

To assist the decision making process and flood assessment element of the FRA, we have collated locally-available photographic and anecdotal evidence of recent flooding that has occurred in the Cranleigh area.

It is considered that this data is suitable for use within the FRA and this data can be supplied to Surrey County Council and the Environment Agency directly.

2.1 Fluvial and Surface Water (Pluvial) flooding – December 2013 – February 2014

The winter of December 2013 – February 2014 saw persistent and widespread flooding across the UK. A briefing by the UK Met Office and the Centre for Ecology and Hydrology ² concluded that for England and Wales this was one of, if not the most, exceptional periods of winter rainfall in at least 248 years. The two-month total (December + January) of 372.2mm for the southeast and central southern England region was the wettest any 2-month period in the series from 1910. In addition, some rivers in the south east area (including the nearby River Wey) recorded their highest flows since September 1968. For context, the 1968 flood is depicted on the EA's "Historic Flood Map" as referenced in the FRA.

Appendix 1 provides a compilation of local data recorded at the time of this flooding event.

1 Planning Application Public Record for application number WA/2014/0912
[http://waverweb.waverley.gov.uk/live/wbc/pwl.nsf/\(RefNoLU\)/WA20140912?OpenDocument](http://waverweb.waverley.gov.uk/live/wbc/pwl.nsf/(RefNoLU)/WA20140912?OpenDocument) [last accessed 20/08/14]

2 "The Recent Storms and Flood in the UK February 2014", Met Office and Centre for Hydrology and Ecology
http://www.metoffice.gov.uk/media/pdf/1/2/Recent_Storms_Briefing_Final_SLR_20140211.pdf [last accessed 20/08/14]

This shows:

- Green route – flooding at Elmbridge Road on the section over the River Wey making the B2130 impassable in a flood and preventing access onto the A281. The 2014 event concurs with the EA records of the 1986 floods.
- Blue route – flooding at Alfold Road crossing the Littlemead Brook immediately adjacent to the proposed exit of the new development.
- Red route – flooding at Flash Bridge, Alfold Road making Alfold Road impassable at this point and preventing access onto the A281.
- Turquoise route – flooding at a Waterbridge over the Cranleigh Waters making Knowle Lane impassable at this point and preventing access onto the A281.

The FRA report was written around two months after this flooding occurred so it is reasonable to expect its inclusion.

For completeness, the Appendix also shows data that is already included in the FRA:

- Black route – road known to flood (Surrey County Council records)
- Orange route – roads likely to be flooded, as shown by the EA Flood Maps and the FRA

Without incorporating all this data we do not believe an appropriate assessment of flood risk has been undertaken and therefore recommend an objection on these grounds. As the assessment of flood risk informs the measures proposed by the FRA to avoid, manage and mitigate flood risk, this may also be incomplete.

3 Review of the use of the historic record

Section 2.9 of the FRA details the historic flooding record used to inform the assessment. This data has been obtained via consultation with various flood risk management bodies as listed in table 2.2 of the FRA.

We do not believe this consultation has been appropriately undertaken based on the following observations:

- Consultation with the Environment Agency. WSP summarise the EA comments as *"The Environment Agency has confirmed that it does not hold any record of flooding affecting the site itself"* (FRA Table 2.2) Appendix D provides a copy of the email correspondence (27/02/14) from which the above statement is drawn. Quoting the EA directly, the message appears quite different: *"Please advise that whilst we have no records of flood affecting the site, this does not mean that there has never been flooding on the site. We would advise that they make further checks locally"*.
- Consultation with Surrey County Council – WSP summarise their comments as *"Surrey County Council has confirmed that they hold two records of historic flooding within the vicinity of the site. Neither of the two records are within the site boundary itself; both are associated with the B2130 approximately 300m from the site."* This record of this consultation provided in Appendix F of the FRA indicates that the Highways Department were contacted in relation to the surface water and drainage elements FRA. It is therefore unclear whether Surrey County Council have been approached with regard to their Lead Local Flood Authority role in regards to local sources of flood risk.
- Consultation with Waverley Borough Council. WSP summarise the Waverley Borough Council comments as *"Waverley Borough Council has confirmed they do not hold records of historic flooding at the Application Site."* (FRA Table 2.2) Appendix F provides a copy of the email correspondence (dated 25/02/14) from which the above is drawn. Quoting Waverley Borough

Council directly, the message appears quite different: *"As the land is/was largely agricultural land we do not have any reports of flooding for this site."*

In summary this indicates a lack of formally recorded data rather than a lack of flood risk at the site.

In addition the FRA provides no evidence to demonstrate that "local checks" as recommended by the EA have been undertaken.

Incorporating the historical record of flooding is an important step in flood risk assessment, in particular to flood modelling, where the validating the model against "real" data is a critical component of model development. The FRA report was written around two months after the 2013/14 flood event occurred so it is reasonable to expect its inclusion.

The FRA's conclusions regarding the assessment of risk from Fluvial Flood Risk (section 4.1.4-12), Pluvial and Overland Flow (section 4.1.13-15) are therefore incomplete.

We therefore we recommend an objection on the grounds that a complete assessment of flood risk has not been undertaken. As the assessment informs the measures proposed by the FRA to avoid, manage and mitigate flood risk, this may also be incomplete.

4 Local Flood Risk

Following the significant floods in 2007, the Government gave local authorities new powers to help manage local flood risk in a more coordinated way. The Flood and Water Management Act 2010 requires county councils to lead the coordination of flood risk management for surface water, groundwater and smaller watercourses in their area. Surrey County Council are the lead local flood authority for this area.

Paragraph 002 of PPG reminds us of the importance of considering local flood risk on equal weighting to fluvial flood risk stating *"For the purposes of applying the National Planning Policy Framework, "flood risk" is a combination of the probability and the potential consequences of flooding from all sources – including from rivers and the sea, directly from rainfall on the ground surface and rising groundwater, overwhelmed sewers and drainage systems, and from reservoirs, canals and lakes and other artificial sources."*

Paragraph 045 of PPG provides the following specific advice in relation to the assessment of local flood risk *"Having regard to the available information on local flood risks, including the Strategic Flood Risk Assessment and the updated map of flood risk from surface water available on the Environment Agency's web site, local planning authorities may find it helpful to agree with lead local flood authorities the circumstances and locations where lead local flood authority advice should be sought about a planning application which raises surface water or other local flood risk issues. Where surface water or other local flood risks are likely to significantly affect a proposed development site, early discussions between the planning authority and the developer will help to identify the flood risk issues that the authority would expect to see addressed in the planning application and accompanying site-specific flood risk assessment"*.

It is also worth stating that the national generalised model that informs the EA Flood Maps only maps watercourses with a catchment greater than 3Km².³

By collating the historical and anecdotal evidence above we have demonstrated the existence of local flood risk issues relevant to the development proposal. We therefore also recommend an objection on the following (2) grounds:

- 1. The omission of the above local data from the FRA does not adequately equip Waverley Borough Council (or any of their consultees) to give appropriate considerations to local flood risks as required by NPPF.**
- 2. The historic data for this site suggests that local flood risk are likely to significantly affect the development and therefore we would expect the lead local flood authority (Surrey County Council) to be an important consultee to inform and assist the FRA. We therefore we recommend an objection on the grounds that there is no evidence on the public record of this consultation being completed by either the developer or Waverley Borough Council.**

5 Assessment of fluvial flooding in the Flood Risk Assessment

The current EA Flood Maps⁴ indicate the presence of an overland flow route from Cranleigh High Street which would take any water in this area through the site to join the Littlemead Brook along the site's southern boundary. This concurs with the topographic survey data available for the site which shows there is a general fall in a southern direction towards the two watercourses converging at the site (Table 2.1, FRA).

The argument presented in Paragraph 4.1.8 of the FRA is that a garden and car park walls to the rear of High Street, St James' Place and Cranleigh Methodist Church prevent this flood path from being active and therefore water does not reach the site in all flood scenarios up to and including the 1 in 1000 year (extreme) event.

The difference in modelling approach does (in part) explain the difference between the flood plain extents shown in the current EA Flood Zones 2 and 3 and in the FRA to support this application (Figures 5 and 7 Appendix E). Copies of these maps, highlighting the area discussed are presented in Figure 1 for completeness.

Paragraph 038 of PPG states that "*Developers (need) to demonstrate that development will be safe The following should be covered by the flood risk assessment ... the design of any flood defence infrastructure... operation and maintenance... any funding arrangements necessary for implementing the measures ...*"

The FRA modelling demonstrates the dependency of these wall structures to prevent water ingress on site. The FRA does not provide the details required by Paragraph 038 of PPG relating to these structures, in particular no evidence is provided on the following:

- Specific location of these assets
- Their structural adequacy for their use as flood protection measures

³ Environment Agency website – "Flood Map – your questions answered" <http://apps.environment-agency.gov.uk/wiyby/31662.aspx>
[last access: 20/08/14]

⁴ EA Flood Maps are available on http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=357683.0&y=355134.0&scale=1&layerGroups=default&ep=map&textonly=off&lang=_e&topic=floodmap [last accessed 21/08/14]

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- The ownership and maintenance arrangements – ie. How does the developer propose to secure continuance of these third party assets for the lifetime of the development? How will repairs and maintenance be secured for the lifetime of the development?

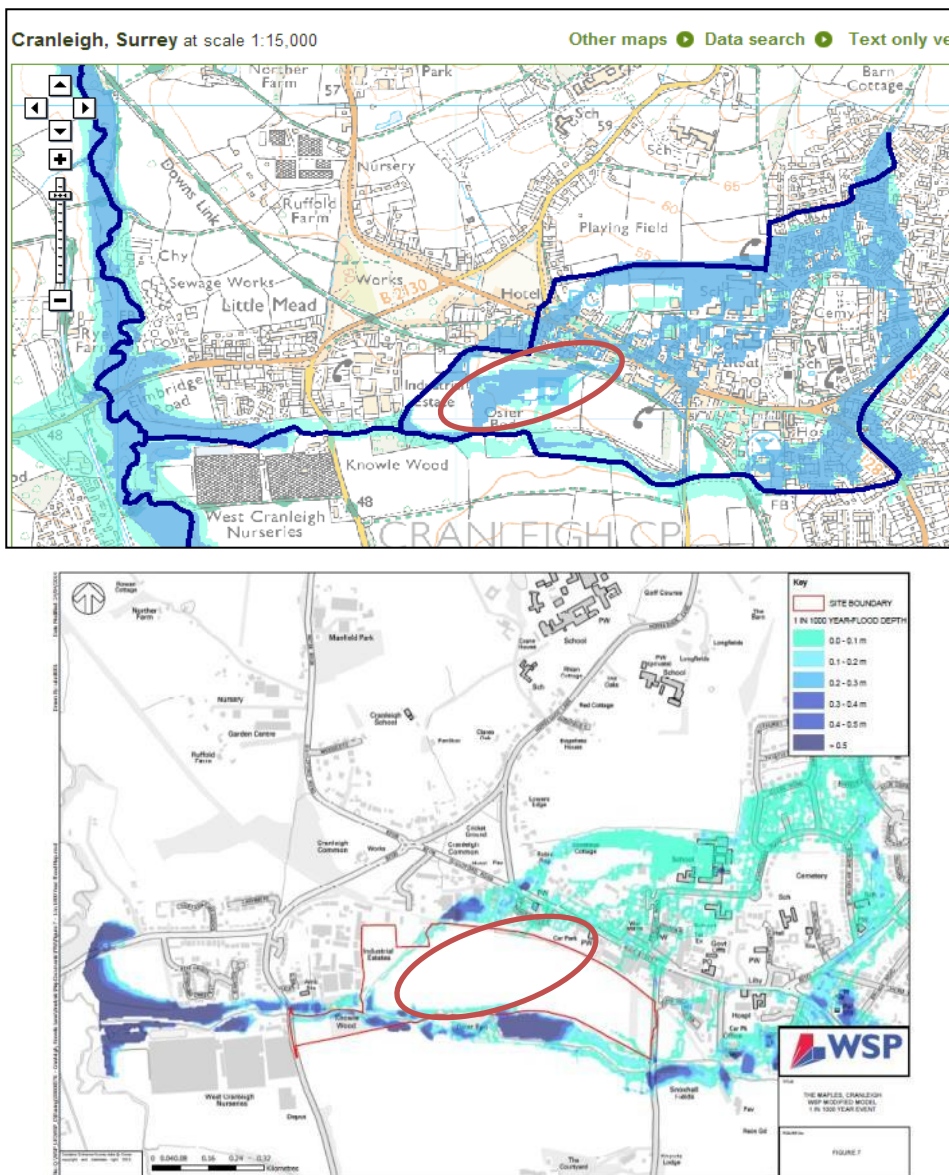


Figure 1: Comparison of EA Flood (top) and maps produced by the FRA (bottom). The area encircled indicates where flow path is located.

We therefore recommend an objection on the grounds that the measures proposed by the FRA to avoid, manage and mitigate flood risk (ie. reliance on walls to prevent the northern flow route) have not been appropriately secured for the lifetime of the development. This places new residents at unacceptable residual risk and compromises the safety of the development. If these structures cannot be adequately secured for the lifetime of the development, and advocating a precautionary approach, the FRA hydraulic modelling work should be revisited to remove the presence of these structures for flood risk assessment purposes.

6 Access and egress arrangements for the new development

We understand that the proposal is an outline planning application inclusive of reserved matters relating to access.

Paragraph 038 of PPG states that *"Developers (need) to demonstrate that development will be safe The following should be covered by the flood risk assessment ... access and egress..."*

As this application seeks Outline permission inclusive of reserved matters relating to access, we therefore understand that in line with NPPF and PPG the site-specific flood risk assessment should cover all the required access and egress matters.

Section 6.1.6 of the FRA details the developer's proposals to ensure safe access and egress in the event of a flood.

When addressing access and egress matters in terms of ensuring the safety of the development for its lifetime, the PPG provides the following guidance.

Paragraph 039 of the PPG states *"Access considerations should include the voluntary and free movement of people during a 'design flood', as well as the potential for evacuation before a more extreme flood ... Access and egress must be designed to be functional for changing circumstances over the lifetime of the development."*

The "design flood" is defined as any *"fluvial (river) flooding likely to occur with a 1% annual probability (a 1 in 100 chance each year),"* (paragraph 055, PPG). Note this applies to all fluvial (river) flooding, which includes both rivers which are mapped by EA Flood Maps and smaller local watercourses, frequently not mapped on EA Flood Maps, as previously stated.

Sections 2 - 4 clearly demonstrate that local flooding could restrict the voluntary and free movement of people during a 'design flood'. As Appendix 1 demonstrates, every access route away from the development will be inaccessible by foot or car in a flood event similar to the one that occurred this year. Even if (by the proposals to raise floor levels) the properties were lucky to escape flooding, people would be isolated for a number of hours/days whilst the surrounding flood waters recede.

We therefore recommend a further objection on the grounds that the voluntary and free movement of people during a 'design flood' has not been demonstrated in the FRA.

Paragraph 039 of the PPG goes on to specify:

"Access routes should allow occupants to safely access and exit their dwellings in design flood conditions. Vehicular access to allow the emergency services to safely reach the development during design flood conditions will also normally be required. Wherever possible, safe access routes should be provided that are located above design flood levels and avoiding flow paths. Where this

is not possible, limited depths of flooding may be acceptable, provided that the proposed access is designed with appropriate signage etc., to make it safe. The acceptable flood depth for safe access will vary depending on flood velocities and the risk of debris within the flood water. Even low levels of flooding can pose a risk to people in situ (because of, for example, the presence of unseen hazards and contaminants in floodwater, or the risk that people remaining may require medical attention)."

Again the evidence provided in sections 2-4 - 3 shows that vehicular access to allow the emergency services to safely reach the development during design flood conditions will be severely compromised – both by flood water and the suitability of existing roads to accommodate the number and size of emergency rescue vehicles likely to be required. For example, the road between the Knowle Lane access to the development at Cranleigh is a narrow laneway with only a single file pedestrian path.

We therefore recommend a further objection on the grounds that vehicular access to allow the emergency services to safely reach the development during design flood conditions has not been adequately demonstrated in the FRA.

With regards to the second part of Paragraph 039, hazard mapping has been undertaken for the FRA but only for Littlemead Brook and Nuthurst Stream. We have a number of concerns regarding this approach:

- The FRA only assesses access and egress matters in relation to the Littlemead Brook and Nulhurst Stream main rivers. Sections 2-4 details local flood risks that are relevant to this site and have not been considered by the FRA.
- Depending on the outcome of our objection outlined in section 5, the FRA hydraulic modelling work in relation to the Littlemead Brook and Nuthurst Stream could also need to be revised.

We therefore recommend an objection on the grounds that safe access routes during design flood conditions has not been demonstrated in the FRA.

Paragraph 040 of the PPG states: *"To demonstrate to the satisfaction of the local planning authority that the development will be safe for its lifetime taking account of the vulnerability of its users, a site-specific flood risk assessment may need to show that appropriate evacuation and flood response procedures are in place to manage the residual risk associated with an extreme flood event. Proposals that are likely to increase the number of people living or working in areas of flood risk require particularly careful consideration, as they could increase the scale of any evacuation required. To mitigate this impact it is especially important to look at ways in which the development could help to reduce the overall consequences of flooding in the locality ... through off-site works that benefit the area more generally."*

The proposal is for 425 dwellings of predominately family- sized homes. This could equate to additional 1500+ people living in an area risk of flooding, increasing the scale of any evacuation considerably. The FRA has not considered how this additional burden will be managed and has not suggested any off-site mitigations to reduce the overall consequence of flooding in the locality.

We therefore further recommend an objection on the grounds that the additional burden on the emergency services in a flood event has not been given due consideration in the FRA.

Finally on access and egress matters, paragraph 058 of the PPG states "*Local planning authorities are advised to consult with their emergency planning officers as early as possible during the preparation of Local Plans, and also regarding any planning applications which have implications for emergency planning. Where issues affecting emergency services are identified it may be relevant to contact the local resilience forum – multi-agency partnerships made up of representatives from local public services which prepare for local incidents and catastrophic emergencies. Or in some cases, it may be appropriate for the local planning authority to consult the emergency services on specific emergency planning issues related to new developments.*"

There is currently no evidence on the public record of this consultation being undertaken completed by either the developer or Waverley Borough Council.

We therefore recommend a final objection on the grounds that no evidence of consultation with either the Emergency Planning departments, Emergency Services or Local Resilience Forum as recommended in NPPF has been completed.

7 Summary

The above (10) recommended objections relate to the overarching statement in NPPF that "*a site-specific flood risk assessment must demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall*" (Paragraph 102). We do not believe this obligation has been fully demonstrated for this development.

Please note that due to time constraints the review has focused on the FRA's assessment of local, fluvial and pluvial sources of flood risk. Therefore the review does not cover the developer's assessment of groundwater, sewers, drainage, reservoirs and other artificial sources of flood risk.

Appendix 1 Map showing access routes affected by all sources of flood risk relevant to the application site

Flooding at Elmbridge, taken on 24/12/13



Flooding at Alfold Road exit, taken 24/12/2013



Flooding at Flash Bridge, taken 02/01/2014



Flooding at Waterbridge, taken 24/12/2013



⬠ Denotes location of photographs

Lines refer to access routes as described in section 2.1.

