

Oxford Flood Alliance (OFA) comments on revised Flood Risk Assessment dated November 2017

Submitted 29 November 2017

Dear Mr Murdoch

The Oxford Flood Alliance (OFA) maintains its objection to this planning application. We have reviewed the revised Flood Risk Assessment (dated November 2017) and have the following comments.

The Turley cover letter says of the revised FRA: 'The document does not comprise *any new material* or information which has not been submitted previously...' (emphasis added). The document actually includes a complete revision of the compensation calculations provided in the previous FRA. The revised calculations are made on an entirely different basis, and are presented in a different format to that in the previous FRAs. There is no explanation given for the revised approach, and there are inconsistencies in the new material which make it impossible for the reader to determine whether the calculations have been made correctly. It also appears that the excavations north of the car park, which are designed to compensate for the net loss of flood plain to the development, is in ground significantly lower than previously reported, making it even more prone to groundwater flooding. These points are analysed in detail later in this document.

The Revised FRA also includes a significant number of revisions which seek to address points previously raised by the Oxford Flood Alliance and others. Some of these amendments represent concessions and therefore weaken the overall case of the Applicant. Others seek to deflect criticisms which the Applicant cannot afford to concede without their whole case collapsing. This document analyses these revisions in turn, and provides additional evidence to support a challenge to those claims in the document which we consider erroneous and/or misleading.

Analysis of revisions in the FRA.

The November FRA now includes an Executive Summary which we do not intend to discuss in detail as it simply summarises arguments contained in the body of the FRA. It is significant, however, that the document now starts by acknowledging, in a much clearer way than previously, that this is an area prone to flooding (see additions also to main report described below). There is also greater recognition of the hazard posed by flooding. The Applicant also now says clearly that the SuDS will be compromised as soon as flooding occurs - more on this below. These are all critical points we have raised previously, and we are glad to see the Applicant finally beginning to deal with the challenges presented by trying to build a car park in the functional flood plain. However, despite these concessions, we believe there are still critical areas where the Applicant has failed to fully assess the risk, and of course we do not support the Applicant's interpretation of NPPF guidelines as permitting this kind of development. The arguments advanced on this question are spurious.

We are aware that the Environment Agency (EA) has said that it is not objecting, but its comments are confined to a very narrow set of issues, and do not deal with most of the issues of concern to

OFA. The EA mainly comments on flood compensation calculations about which we have significant concerns as explained in detail below.

Para 1.2.1 is new. It acknowledges that Oxford is prone to flooding, so the Applicant is now trying to signal that they have seriously thought about flood risk. Para 1.4.3 (new) also flags their awareness of flooding, and para 1.4.4 ditto. We're glad to see flooding as an issue being acknowledged – even if it is late in the process.

Para 1.4.7 used to say that some parts of the site were in flood zone 3a. It now seems it is all in flood zone 3b (though Table 1 hasn't been updated to reflect this.) See however the Planning Statement Addendum which continues to talk of the site being only partly in flood zone 3b. It would be helpful if the Applicant could make up their mind on this issue.

Paras 1.4.10-1.4.14 are considerably expanded from the old text. This section deals with the NPPF argument. The Applicant's position hasn't really changed, however, from the previous version - they try to argue that the development cannot be assessed under NPPF, and therefore they propose that it is Essential Infrastructure. The full justification for this (such as it is) is in the Planning Statement (PS) Addendum. The FRA says the PS 'explores the argument' that this is essential infrastructure. As we have argued previously, essential transport infrastructure, in the NPPF definition is infrastructure which has to 'cross' the flood plain. The NPPF guidance also says Essential Infrastructure should be built to remain operational during a flood. The Applicant provides no answer on the NPPF definition involving 'crossing' the flood plain (they simply ignore it). They do, however, accept that the car park won't be operational in times of flooding (but again seek to ignore this inconvenience). The Environment Agency has no difficulty applying NPPF guidance to the site, and advises that this is 'Less Vulnerable' development, and therefore incompatible with the functional flood plain. The Applicant misrepresents the EA position presenting the advice that this is 'less vulnerable' development as though the EA meant 'low risk'. That is clearly not the point the EA is making in its letter of 2 November. See our separate discussion of the Planning Statement Addendum for further discussion of these points.

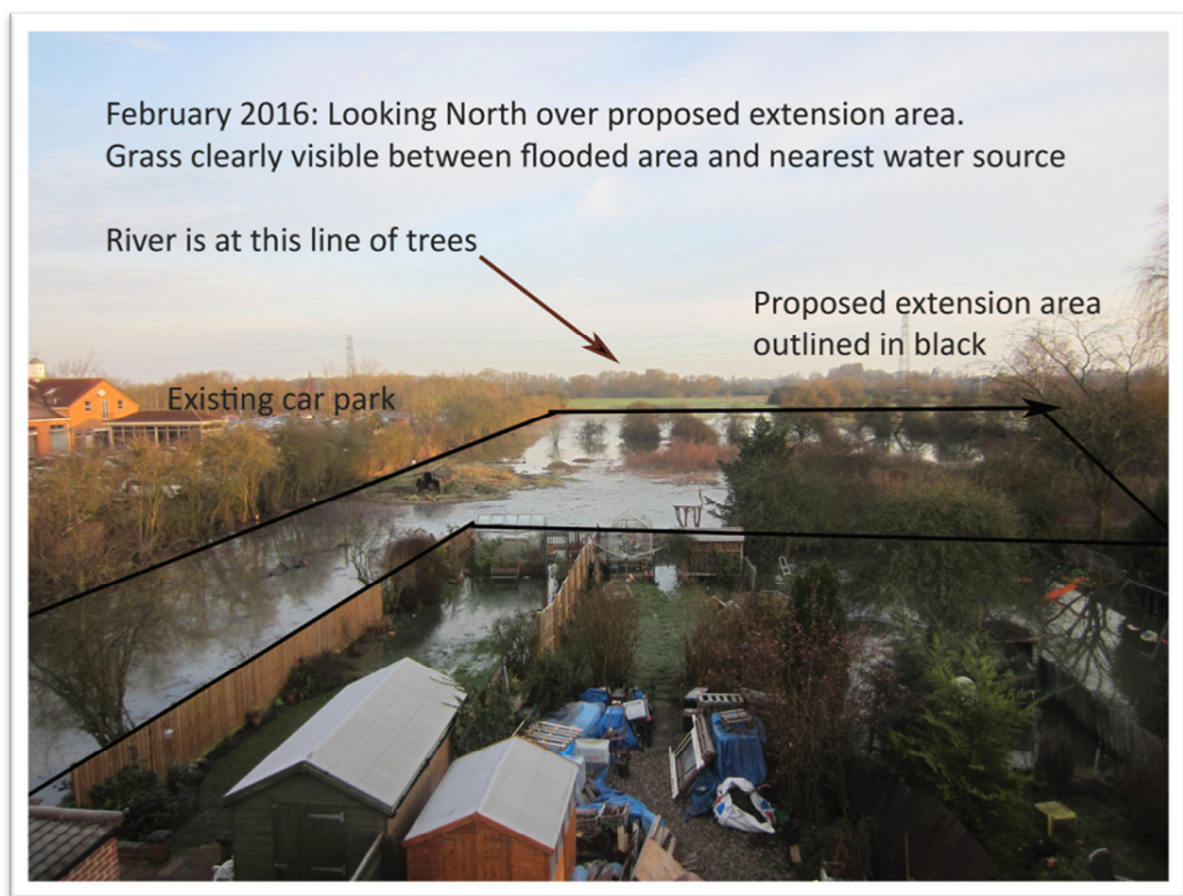
Para 2.3 is a new section on Geology (2 paras). This appears to have been added to indicate that there is a sufficient level of topsoil and made ground to accommodate the construction of the SuDS. This relates to a claim later in the document that this layer of soil will contain any groundwater flooding. This claim is addressed below.

Para 3.2.9 modifies previous wording to acknowledge that the flood model used by the Consultants does not include benefits of OFAS (this is pointed out to them in the EA 2/11 letter). This paragraph also confirms that the whole site is in flood zone 3b. It is interesting that the Consultants didn't appear to understand the model they were using. Our view is that as well as modelling for current conditions, as has been done, the Applicant should also be analysing how the car park extension and OFAS will interact with each other. This has not been done. The City Council is one of the sponsors of OFAS. It is a very costly development of major strategic importance to the city. The Council has a responsibility to ensure developments in this location are coherent. There is no serious discussion of OFAS in the planning documents. This is a major failing.

Para 3.2.11, which gives a partial list of recent flood events, has been amended to say the incomplete table is an 'extract' from the full list provided in Appendix C. But Appendix C has the

same list (9 events). The most recent flood events are still not mentioned in the FRA. A more complete list (13 events) appears in the Planning Statement Addendum. The FRA therefore gives an incomplete picture of flooding at the site and is in conflict with the Planning Statement. We note that a Groundwater Flood Map has been added now to Appendix C. This looks like the map OFA supplied in our previous comments.

Paras 3.4.4 and 3.4.5 are new and are important. The Applicant claims that risk of groundwater flooding will be contained by the 'cohesive layer above the sands and gravels' (i.e. by the top soil and made ground.) This relates back to 2.3 Geology. This brief statement is the Applicant's entire response to the evidence we have previously reported of groundwater flooding occurring at the site independent of fluvial flooding, including photographic evidence. The EA has not commented on groundwater, they say this is a matter for the LLFA, i.e. the County. But the County has not commented on groundwater, only on transport issues.



The photo shows groundwater flooding that is not due to fluvial flooding, although the Applicant alleges that groundwater flooding only occurs with fluvial flooding at this site. Local residents know that this field in particular remains flooded from groundwater for long periods. The photo also shows the extent of undulation in the site: some of the flooded areas are up to 1m deep, while other small patches are just above the floodwater.

OFA remains concerned that groundwater flooding and its implications have not been sufficiently considered in the application. Groundwater flooding is highly likely to occur in this area. According to the British Geological Survey: 'Local knowledge of groundwater flooding is patchy and can be unreliable, and often groundwater flooding is not identified as a distinct event, being masked by

surface water floods.' See: <http://www.bgs.ac.uk/research/groundwater/datainfo/GFSD.html>. This link includes a map of Oxford, the area of interest is the red, category C: Potential for groundwater flooding to occur at surface. The proposed P&R extension is in the red area.

The Applicant's Ground Investigation report (unchanged from original submission) says groundwater was encountered at between 0.5mbgl (meters below ground level) and 1.6mbgl. Section 6.3.1 of that report comments: 'It should be noted that the soakage rate may be affected by shallow groundwater and this rate should be confirmed at a wetter time of year as site work was carried out after a number of days of dry weather.' No follow up study has been conducted. The Applicant has failed to understand the behaviour of groundwater at the site and seriously understates the risk of groundwater emergence in the application documents.

We have three specific areas of concern in relation to groundwater flooding: a) the excavations compensating for loss of flood plain to the car park filling with groundwater and therefore not providing compensation, b) the impact of groundwater on the SuDs, including pollution issues, and c) implications of the recommended soil stabilisation process (see Ground Investigation Report 2016) for groundwater flooding in the area. Points a) and b) are discussed further below, c) is the subject of a separate document which has been submitted to you.

Para 4.2.1 contains a curious statement, unchanged from the Oct version. It says the Exception Test allows consideration of wider sustainability benefits '*as long as the development is not considered vulnerable to flooding*' (emphasis added). The site of course does flood, as the Applicant acknowledges, and therefore by their own account the Exception Test would appear not to allow consideration of 'wider benefits'.

Para 4.2.2 makes reference to the EA letter of 2/11 and tries to suggest that the statement 'we consider them [car parks] to be a 'less vulnerable' development' as the EA simply agreeing with the Applicant that the proposal is 'low risk'. This is wholly misleading. The term 'less vulnerable' has a specific meaning in the context of NPPF, and in the EA letter is clearly being used in that context. The implication of the EA's advice to the planning authority is that this is inappropriate development for the location. The EA does not have any difficulty applying NPPF guidelines to this site or arriving at a categorisation. The planning authority should heed their advice.

NPPF Guidance Notes Table 3: Flood Risk Vulnerability Classification.

Flood Zones	Flood Risk Vulnerability Classification				
	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a †	Exception Test required †	✗	Exception Test required	✓	✓
Zone 3b *	Exception Test required *	✗	✗	✗	✓*

Key:

✓ Development is appropriate

✗ Development should not be permitted.

” * “ In Flood Zone 3b (functional floodplain) essential infrastructure that has to be there and has passed the Exception Test, and water-compatible uses, should be designed and constructed to:

- remain operational and safe for users in times of flood;
- result in no net loss of floodplain storage;
- not impede water flows and not increase flood risk elsewhere.

Paragraph: 067 Reference ID: 7-067-20140306

Para 4.2.3 is expansion of the text in the October FRA, and now includes the extraordinary statement: 'compliance with the NPPF is not a prerequisite for suitable development.' The Introduction to the NPPF says (para 2): 'The National Planning Policy Framework must be taken into account in the preparation of local and neighbourhood plans, and is a material consideration in planning decisions⁴.' Is the Applicant arguing that the NPPF doesn't need to be taken into account? We note that in this paragraph the Applicant is no longer describing the Sequential Test as 'akin to' the NPPF process. Presumably this means they are claiming that the process followed is consistent with the NPPF, rather than standing outside of it. See however the Planning Statement Addendum where the Applicant still seems confused. As we have stated previously the Pitt enquiry recommended that the planning framework as it relates to flooding should be applied 'rigorously'. The NPPF is quite clear on which vulnerability category this development falls within. There is no ambiguity in the guidelines of the kind claimed by the Applicant.

Para 4.3.2 and 4.3.3 are mostly new and argue that while the Applicant accepts now that the car park will flood, they say that, in more extreme events, so will much of this area of Oxford. So it will not just be the P&R extension which would not be able to remain operational. The implication is that that makes the development acceptable. Of course in the most extreme events flooding will cause disruption in the surrounding area, but this is irrelevant. The car park extension is much lower than the surrounding roads and existing P&R, and still represents a hazard and a liability in less extreme flood events. In large scale events the risk of cars washing into the channel from the extension remains, regardless of whether surrounding areas are also flooded. The Oxford Flood Alleviation Scheme is designed to protect local road infrastructure from flooding, but it will only achieve this if allowed to function properly. OFAS makes use of the functional flood plain to protect houses and key infrastructure. The proposed car park extension is in the functional flood plain and needs to function as flood plain.

Para 4.4.1 is new and accepts that the extension will flood more frequently and to greater depths than the existing car park - so safety needs to be carefully managed. We welcome the acknowledgement that the flooded car park represents a hazard.

Para 4.4.10 is new and claims the flood management plan will ensure cars aren't stranded on the extension. If some cars do get stranded the Applicant says a post and rail fence can be built in such a way that it will contain cars on the site but won't collect debris and act as a dam. They don't explain how. The latest plan for the site, Appendix 1 in the FRA, now includes a description of the post and rail fencing as 'similar to existing', presumably meaning similar to the fencing used for the existing car park. The fencing is described as to 'delineate the backs' of parking bays. No mention is made of it being there to stop cars/debris leaving the site.

In Turley's response on Green Belt issues, p.18 (published 25th August, 2017), the post and rail fence is described as 1.8m high. Are we to assume that the information in the FRA supersedes this earlier document? The response on the Green Belt of August has not been withdrawn, nor updated, so again we have a conflict between different documents about the nature and purpose of the proposed fencing. The application remains unclear as to how stranded cars will actually be prevented from entering the flood channel/Seacourt Stream.

If a fence (of whatever size) is constructed it will need to be maintained. There is no mention of maintaining fencing in the proposal. A couple of photographs of the existing fencing at Seacourt P&R, taken on 25/11/17 are shown on the following page.

In paras 4.4.11 and 4.4.12 the references to OFAS have been updated but are still wrong! It is clear the Applicant is still giving no real consideration to the interaction of the development with OFAS. The Applicant says the design of the bund (protecting houses on Botley Rd) has not yet been agreed on. Appendix G shows the 3 options presented to the Sponsoring Group earlier in the year. The option of following the southern-most route was agreed months ago, and this has been incorporated into the scheme design. The end of 4.4.12 repeats the claim (made in the previous version) that flood waters will be contained within the site because of the 'flood wall'. This is untrue. Later in the document the Applicant says the bund will be built along the southern edge – reflect the actual design decision. Clearly very little effort has been made to represent the OFAS design accurately in this document. Cosmetic amendments have been made to try to create



Perimeter fence at Seacourt Park & Ride

the impression that the Applicant is on top of these issues. They clearly are not.

Para 4.5.3 is new and important – this states clearly that the SuDS will be compromised as soon as flooding occurs. The clarifications provided by the Applicant are helpful here. The SuDs have to be designed to cope with a 1:100yr+Climate Change storm (not a flood). Runoff in such an event should not be more than would have occurred from the undeveloped site. The SuDS is designed to deal with this difference in runoff, but, in making the calculation, the modeller ignores the fact that the site will almost certainly be flooded. The SuDS has to be designed this way because this is what the SuDS regulations require. The Applicant acknowledges that once the extension is flooded the SuDS won't work anymore. They describe this as 'a degree of redundancy' - in other words the regulations say you have to have a Lamborghini even though in practice you'll never be driving at more than 10mph. They say the porosity of the pavement will provide additional flood storage compared to the current clay soil – suggesting it will be able to store some fluvial flood water . This isn't true. Groundwater will have flooded the SuDS before fluvial flooding occurs, even in very low level events.

In order to test whether our concerns about groundwater were valid we contacted David Macdonald, a senior hydrologist and Head of Station, British Geological Survey (BGS), Wallingford. David lives in Oxford and is an expert on groundwater. He has written, amongst other things, an academic paper specifically on groundwater flooding in Oxford, see: <http://onlinelibrary.wiley.com/doi/10.1111/j.1753-318X.2011.01127.x/abstract> We asked David about how groundwater might interact with the SuDS. He said (in an email dated 21 November 2017, giving a personal opinion):

‘If the car park surface is permeable, then for the water to be directed towards a drainage channel there would need to be a poorly permeable surface beneath the permeable paving – is this the case? However, I doubt this would significantly inhibit rising groundwater.

If the car park surface is raised then that increases the void volume into which the rainwater can infiltrate. As you say, the channel will fill due to the ingress of groundwater as the water table rises – this may reduce the discharge to the channel from the car park.

It is possible that where the alluvium is thick with a high clay content that groundwater rise could be prohibited but my experience is that the alluvium is laterally highly variable in thickness and lithology and therefore further investigations would be required and I expect would likely show that the alluvium is insufficient to stop groundwater rising and ponding on the lower lying ground surface.’ (David’s comments are a response to our summary of what the application says, not on a detailed reading of the application which would have required a considerable amount of his time.)

So the SuDs become compromised as soon as groundwater flooding occurs, and this will happen independently of fluvial flooding. The Applicant’s attempts to dismiss our concerns with a bland one line assurance is not an adequate response on these issues. We will return to groundwater flooding in the following section on the compensation calculations.

Analysis of flood storage compensation

Page 37 of the November FRA, Table 4 Floodplain Compensation Volumes, is significantly different from the table in the October version. The bands within which calculations are made have changed

and the table is in a different format - showing cumulative volume, rather than gains and losses as in the previous table format. The October FRA said existing volume of storage at the site was 25,283 m³ (the reader has to add the volume at each band in Table 4 to arrive at this figure) and that after re-grading and compensating excavation of land to the north, there was a net gain of 37.5m³. The revised table shows existing volume of the whole site (cumulative volumes) as 80,175m³ and the volumes after re-grading at 80,251m³ - so a difference of 76m³. The revised Table4 actually gives the difference (top of right hand column) as 75m³ – we are assuming this is a rounding difference.

The new (November 2017) flood compensation map is of the whole car park - existing site and the extension. In previous versions of the FRA it is only the extension which was considered in relation to compensation. This explains why the new calculations show much larger volumes and have a lower range (a few bits of land to the west of the existing site are very low) and a higher range (because the existing car park is higher.) Storage capacity of the site is now being assessed not for the extension but for the whole site it would seem. There is no explanation for this major change of approach anywhere in the documents.

Detailed compensation analysis is found in Appendix L, which provides compensation calculations and has maps. The second map - after regrading - shows the excavated areas to the north of the site. Note that in Appendix L the calculation table has 18 rows, one more than in Table 4 – this is discussed further below.

If you just look at the car park area calculations in Appendix L the current volume of flood storage is 80,175m³ (the map next to the calculations just shows the carpark area), and after regrading this becomes 79,594m³ – so there is a net loss of 581m³. This has to be compensated for through excavations to the north. The calculations for the compensating area are at the top of the second page of Appendix L, next to the map of the area to be excavated. This shows cumulative existing volumes and cumulative proposed volume. If you take one from the other you have a gain in volume of: 657 - 517 = 140m³.

The process by which the Applicant has calculated the overall storage capacity after compensation is unclear. Does the 'existing volume' figure of 80,175m³ include the existing storage volumes in the area north of the site? Nowhere does the FRA state this is the case, but this would be the only way to arrive at an extra 76m³ net of flood storage. **If the 80,175m³ does not include the area of land to the north there is in fact a net loss of storage capacity of 441m³ (581 – 140m³).** It is not possible to determine from the documents whether the calculations are correct or not.

This difficulty is compounded by the lack of transparency about how Table 4 and the Appendix data relate to each other– they are calculated on a different basis, 17 versus 18 rows and different values for cumulative volumes in the two tables. The old Table 4, on page 32 of the October FRA, had only 10 bands – the lowest starting at 55.357m and the max level being 57.357m. This corresponded to the calculations in the old Appendix L which also had 10 bands. These also started at a minimum of 55.357m, going up to a maximum of 57.357m.

The compensating excavations in the October FRA have a totally different appearance from what is now proposed in the November FRA. The excavations were given in October as being in the 56.157-56.757m AOD range. The old drawing has a series of semi-circles of reduced levels. Now, in the

November document, we have very different contour pattern in various shades of green, covered by a complex patchwork of red shapes (which are not explained).

In the October calculations the compensation bands 4-6 correspond to equivalent bands in the car park extension – same AOD min/max. Volume after re-modelling is given as $2397+1609+492=4498\text{m}^3$. (No figure is given for volume before re-modelling so it is impossible to check the net gain.) In the new calculations (November FRA) the excavation bands 1-3 don't correspond to bands 1-3 for the rest of the site. The total cumulative volume is given as 657m^3 – a dramatically reduced value compared to the October FRA. Why is the volume so much smaller than previously calculated? Nowhere does the FRA explain this huge change in the volume of the excavated land.

Appendix L shows the levels where excavations are proposed are in the range 55.8-56.4m AOD – that's around the middle of the levels for the car park site. Some areas are marked in red but there's no key to explain the red. The old compensation excavations were in the 56.157-56.757m AOD range. **The excavations now proposed are in ground at a lower level – about 0.357m lower than previous.** Is this a different piece of land? Where is it? The contours of the land look completely different from the earlier version, but the outline shape of the area is identical in the old and new versions of the FRA.

Whether the compensation excavations work is dependent on them not filling with groundwater. There is no discussion of how groundwater flooding would affect the excavated area. We expressed concern in previous comments about the risk of groundwater flooding. No tests were carried out by the Applicant to determine groundwater levels in the area north of the site. It is our view that these excavations will fill with groundwater before any fluvial flooding takes place and that they will therefore provide no compensation in terms of additional storage. The Applicant's calculations assume these excavations remain dry at the point that fluvial flooding occurs.

The EA has made no comment on groundwater and seem not to have taken groundwater flooding on the site into account in their assessment of the compensation calculations. The LLFA which should be commenting on groundwater has made no comment. We asked David Macdonald (of the BGS, see above) about the likelihood of the excavated areas filling with groundwater. His answer (in an email dated 21 November 2017) was:

'...the lowering of the ground in compensation for the increased height of the car park will increase the storage of the floodplain by the volume of the material removed x (1-porosity of the material). If this is silty clay alluvium, the porosity may be ~0.4. However, if we look at the antecedent conditions to the flood it is very likely that prior to the event the groundwater level will be at or very close to the ground surface which removes the benefit of the area of lowered ground.'

In other words the excavations will very likely have filled with groundwater before fluvial flooding occurs removing any compensatory effect. How then can these excavations represent 'compensation' for storage capacity lost to the development?

The new suite of documents submitted by the Applicant in November includes an ecology report. This recommends a series of scrapes be created north of the car park to avoid loss of biodiversity. It is unclear from the documents where the ecological scrapes will be situated relative to the

compensation excavations. A map showing the position of both should have been included, so that the public can evaluate the proposals properly. The OFAS scheme also proposes scrapes in this area. No discussion seems to have taken place with the OFAS project team and the relationship of these new scrapes to the scrapes proposed by the OFAS team is unclear. Flood plain compensation and ecological features like scrapes need to be maintained. This has been an important topic of debate within the OFAS project. The Seacourt P&R extension proposals include no plans or budgetary provisions for maintenance of these features.

Finally, it appears that the Applicant is proposing to raise some areas of the existing P&R. The revised Table 4 (November), with 17 bands, starts at 54.52m and the top band 57.72- 57.92m. Appendix L in the new FRA (with 18 bands) starts at 54.52m AOD and the top band has a min level of 57.92 (so max of 58.12 as these are 200mm bands. The extension is all below the level of 57.357m (according to the original calculations.) But the compensation calculations show land being raised (loss of storage) in bands above 57.357m. The figures in Appendix L show:

Band	Current volume	Proposed volume	Loss of storage
57.82	13,538	13,548	38
57.72	13,958	13,920	38
57.52	12,811	12,815	-4

No details are provided which explain these figures. Is the Co-op (the landlord for the existing P&R) aware of this and agreeable to an area of the existing P&R being modified?

These are material changes from the previous version and no explanation is given for these revisions. The Turley cover letter says of the FRA: 'The document does not comprise any new material or information which has not been submitted previously...' A complete revision of the compensation calculations looks like a pretty material change to us, which we would have expected the Applicant to flag.

In our efforts to understand the reasons for the revised approach taken in calculating the required food compensation, we requested from you copies of the Environment Agency's email of 24 October 2017 to WYG, and WYG's response, which are referred to in the Environment Agency letter of 2 November. These documents have not been supplied to us. We do not believe it is possible for a member of the public to properly evaluate the new compensation calculations from the information provided.

Pollution during flooding

Car parks are a source of various pollutants which are toxic to the environment, including heavy metals such as zinc and copper, and hydrocarbons. These pollutants derive from wear and tear on the vehicle bodies, brake pads and tyres, and from oil leaks. Urban runoff is a major source of these pollutants which have a deleterious impact on living organisms. SuDS are increasingly being used successfully to contain pollution. But this depends on SuDS functioning as they are designed to

function. The problem with this proposal is that, as the Applicants themselves acknowledge, the SuDS will be compromised as soon as flooding occurs.

Advice in the literature about SuDS recommends planning for exceedance, that is for exceptional storm events. A typical example is this advice on the Susdrain website on what happens when a SuDS fails.

Q) What happens when the capacity of the SuDS is exceeded or it fails?

All drainage systems should be designed to incorporate the provision for flows above the design capacity, to be conveyed off site with the minimum impact. The design of SuDS should mean that less damage is done when their design capacity is exceeded or if it fails, than with conventional systems. The SuDS design philosophy, unlike traditional systems, is to use a train of SuDS components. For example, once the soakaway has reached its capacity, the overland flow can be stored in a pond or wetland or underground storage. Flooding, should it occur, can also be managed to reduce the impact, for example managing water on the surface where water levels are visible, as well as careful planning and design that can ensure that areas such as playing fields should be flooded before roads and that houses are positioned so they are less likely to be inundated.

<http://www.susdrain.org/faq.html#faqg9>

Because the P&R extension would be in the functional flood plain it is not possible to follow the typical design principles by which exceedance would be avoided. Design advice assumes SuDS will not be in a floodplain, and we have found no document which discusses how to deal with exceedance from regular groundwater and fluvial flooding. Following 'good design' principles would lead to SuDS being located in areas where they are not subject to frequent flooding from groundwater and rivers.

The fact that the SuDs will not function when flooded creates a problem with pollution. The proposal from the Applicant is that pollution from the car park extension will be addressed by the SuDs. In normal rainfall conditions the SuDS will contain pollutants within the drainage system, preventing them entering the Seacourt stream. But every time the car park floods the SuDS capacity is exceeded and contaminated water will flow freely into the surrounding floodplain and river system. The proposed car park location is close to sites which are ecologically vulnerable and nationally significant. It is not possible for the Applicant to build the car park at this location in a way which avoids regular pollution of local waterways.

As the Environment Agency points out in its letter of 2 November the Council may require a permit to discharge into the river. It seems fairly clear that the Applicant *will* need to apply for a permit, and it is hard to see how the site could qualify for a licence given the inability to control pollution when the site floods. The Applicant mentions pumping water out of the flooded car park after a flood event. This would transfer pollutants into the river system and is surely not consistent with pollution control standards. The Environmental Law website says:

"It is an offence to cause or knowingly permit a **water discharge activity** unless you are complying with [an environmental permit](#) or exemption. Things that count as water discharge activities are listed in Schedule 21. They include:

- discharging poisonous, noxious or polluting matter or solid waste matter into inland freshwater, coastal waters and relevant territorial waters. The legislation does not define poisonous, noxious or polluting. These words are normally given their ordinary meanings.”
- <http://www.environmentlaw.org.uk/rte.asp?id=110>

Maintenance of SuDS

We have made previous comments on the likely costs involved in maintaining the SuDS given the frequency with which it will flood. The Applicant in the revised (November) FRA claims that maintaining the porosity of permeable block paving is not a significant challenge. In normal circumstances this may well be the case. But, as with pollution control, all of the design advice assumes a SuDS will only be subject to flooding in very extreme circumstances. None of the industry websites which comment on maintenance envisage a scenario where the car park surface is submerged every few years under silty flood water. We continue to be of the view that maintenance costs will be higher than the Applicant currently appreciates. From a flooding point of view there is a risk that, with local authority budgets under pressure, maintenance is not adequately carried out and the porosity of the surface deteriorates resulting in increased rates of runoff.

Conclusion

The Oxford Flood Alliance maintains its strong objection to this planning application for the many reasons set out in this document and in our previous submissions in relation to the application. The Applicant has failed to satisfy our concerns in relation to planning policy, nor in respect of the flood risk posed by the development.