

Construction of 99 Dwellings at Hogshaw, Fairfield, Buxton.

Application Reference HPK/20230/0192

Response to Environment Agency and LLFA Comments dated 26th Sept 2024

Our Ref: H8797-BAH-XX-XX-RP-DR-300561-P02

	Consultee Comment	Barratt Response
1	The development proposes to include a surface water attenuation pond over the Nun Brook culvert, this is an ordinary watercourse culvert and is under the remit of the LLFA.	Agreed.
2	An assessment of the condition of the Nun Brook culvert would be necessary for confidence that it is structurally able to sustain the proposed construction and machinery activities.	We have carried out a CCTV survey of the Culvert. The results of the culvert survey is included with this pack. The video of the survey can be downloaded from the following WeTransfer link: https://we.tl/t-Ek861G5s8K The survey shows the culvert is in very good condition, with only minor root ingress at some of the joints The inlet to the culvert does not have a headwall. A photo is included with this pack.
3	The Environment Agency will normally object to proposals to build over existing culverts because of health and safety considerations, increased maintenance costs and complexities and because future options to restore the watercourse may be precluded. We will, where we deem appropriate, take possible cumulative impacts into account when making decisions.	Noted
4	We are opposed to the culverting of any watercourse because of the adverse ecological, flood risk, geomorphological, human safety and aesthetic impacts. Watercourses are important linear features of the landscape and should be maintained as continuous corridors to maximise their benefits to society. We will actively pursue the restoration of culverted watercourses to open channels	Noted. The watercourse is in an existing culvert, which we are not proposing to daylight or do any work to. Please see the comments below in Point 5.
5	We acknowledge that the proposed attenuation basin is a less substantial structure than a typical development and the LPA and LLFA should consider whether the proposed basin and surrounding development would allow them sufficient access and working area around the culverted Nun Brook should they be in a position to daylight the culvert in the future, or undertake maintenance works.	We have given significant consideration to the positioning of the Attenuation Basin to the development. Its position has been severely constrained by Site Topography, Site Geology, Geo-Environmental, Ecology, and Arboriculture. The land to which the basin currently sits has had to be brought into the development boundary, especially for the purpose of positioning the basin, as no suitable alternative basin location was available. The current location has the least impact for the following reasons. Topography The development site shows existing site gradients of up to 1 in 6. Locating the attenuation basin within the site, and providing a reasonable and safe 1 in 3 batter to the basin produces a significant batter due to the distance it takes the basin to catch up to existing ground levels. I have attached a sketch drawing showing the impact of a basin within the development. To carry out such would involve significant loss of land, which essentially makes this development uneconomic and unfeasible. Tye current basin location levels are relatively flat, thus allowing us to spread the large volume of water over a greater area, and minimising the depth of storage, and minimising the land take due to batters. A Topo Survey is attached. Site Geology The current basin location is within the former landfill, with significant depths of Made ground of upto circa 8m. If the basin was within the housing area, this would involve a significant cut into the Natural Bedrock, which is a difficult and expensive operation, again making the construction costs and development uneconomic and unfeasible. Geoenvironmental. The attenuation basin lies in an area of former contaminated landfill. Introduction of the basin reduces the depth of the landfill and thus has the potential to reduce the impact of contamination migrating downwards and finding its way into the watercourse and water table. Furthermore, the basin can be lined with an impermeable

clay layer which will again reduce the migration of contaminated surface water into the culvert and provide a break layer between the contaminated landfill and the habitats at the surface.

Arboriculture.

The current basin location, size, and shape has been designed to have the minimal impact on the existing trees and vegetation, and thus minimal impact on habitats and ecology. As can be seen from the attached aerial Image overlay, the site photos, and the attached topo survey, the basin is in a location where tree cover is minimal. Some tree loss is required but positioning the basin in other areas, outside the culvert easement would results in greater tree loss. Some of these trees are also subject to a Tree Preservation Order (TPO), a copy of which is attached. Tree loss mitigation is being provided throughout the development site.

Ecology & Biodiversity

Introduction of the Basin improves the Biodiversity of this area, which currently is blighted by large amounts of rubbish and waste at the surface arising from the landfill. Introduction of a wetland area within the site boundary provides improved biodiversity metric

Whilst the drawing shows the Basin as a formal structure, the intention is to create a small basin with an overflow area for extreme storm events. The Attenuation Basin is designed such that the 1 in 30-year rainfall event storage is contained within the main basin and outside of the 6.5m Stand-off stipulated by the LLFA. Only SW volumes in excess of the 1 in 30-year event would overflow the main basin and encroach on the 6.5m stand-off, and to a modelled depth of circa 130mm for the 1 in 100-year event.

Refer to the following drawings:

H8797-BAH-XX-XX-DR-CE-300002-P03-Engineering Layout

H8797-BAH-XX-XX-DR-DR-300120-P03 Attenuation Basin Details

The access for maintenance (Dig-Down) of the culvert is currently severely restricted by Trees and existing vegetation, as can be seen from the Aerial Image and Topo Survey. We could therefore argue that the locating the basin in this area improves access for maintenance.

The Basin also reduces the ground level and thus the depth to the culvert over the footprint of the basin, and therefore could be argued as improves access for dig-downs and maintenance.

We appreciate that dig downs over the attenuation basin could be impacted by severe storm events in excess of the 1 in 30-year event, however in the unlikely instance that a dig down is required during a severe storm event, we feel this could be easily overcome with pumping and possible temporary bunding to control the overflow. We could also argue that if a dig down for maintenance or daylighting is required in future, it may also require the removal of some of the existing trees elsewhere in the landfill site, which could provide the opportunity to relocate, and resize the attenuation basin overflow area to a location and size that is further away from the culvert/watercourse.

Notwithstanding the above, I would suggest that daylighting of the culvert is very unlikely, for the following reasons.

- The culvert lies within an area significantly impacted by mature trees, many of which are subject to a tree preservation order.
- The area is designated as a Non-Statutory “Local Wildlife Site” (LWS) of “High Strategic Significance”, and daylighting of such would have a significant impact on the LWS and its habitats.
- As the culvert is up to 8m deep, this would result in a significant depth of cut, with a significant width of cutting circa 50m width, which would have a significant impact on the LWS. We have attached a drawing showing the impact of Daylighting on the LWS.
- Daylighting of the culvert would expose significant depths of contaminated landfill, thus mobilising significant quantities of landfill and potential contamination.
- Daylighting of the Culvert would require a significant volume of contaminated landfill to be removed and taken to another registered landfill site, the cost of which would likely be cost prohibitive.
- As has been demonstrated from the hydraulic modelling done within the FRA the presence of the culvert acts as a flow restriction for the downstream watercourse which helps to reduce flooding to existing

		properties. Removal of the culvert would remove the restriction and cause a greater level of flooding downstream.
6	We understand that the culvert is around 8m below ground due to the overlying made ground from historic landfill. A substantial access area for potential future excavations may therefore be required, to do works to the culvert.	The culvert depth varies from 5m at the upstream inlet to 8m at the downstream outlet. The Culvert is 1.2m diameter. The LLFA have stated a 6.5m stand-off is required. The stand off is now shown on the drawings included with this pack.
7	As this is an Ordinary Watercourse rather than a main river, it is the responsibility of the LLFA rather than the EA and we will not therefore object on this point.	Noted.
8	It is unclear from the plans if the headwall of the attenuation pond is proposed to link to the culvert appropriately. The LLFA should be satisfied that the proposed site drainage and attenuation pond outfalls meet requirements and regulations.	The inlet to the culvert currently has no headwall and no safety grate. The culvert is a 1200mm pipe which currently has a potential for blockage due to its proximity to a post and wire mesh fence very close to the inlet. A photo of the existing inlet is attached, which also shows that the inlet is partially restricted by vegetation and broken timber panels. The exposed inlet is also a safety concern for unauthorised access to the culvert. It is our intention to construct a new Headwall on the line of the existing culvert. It is our intention to shorten the culvert by circa 5m to allow extra space for wingwalls, and to move the headwall away from the post and wire mesh boundary fence. The headwall will have a sloping inlet grate to prevent blockage. The Headwall will be a bespoke, custom designed headwall with an outlet from our basin cast into the side of the wing wall. The Headwall will be constructed to the requirements of the adopting authority. Given the steepness of the ground around the existing inlet, the headwall would also provide easier access for future maintenance. Please refer to drawing H8797-BAH-XX-XX-DR-DR-300100-P02-Headwall Details.
9	It would also be advised for the LLFA to confirm the distance of the attenuation pond from the entrance of the culvert, as an assurance that the attenuation pond is located outside the Flood Zone 3 outline on the Flood Map for Planning.	Para 2.2.3 and Figure 2-5 of the Hydraulic modelling shows the Peak Water level for a 1 in 100 year event +29% climate change, of 299.90m AOD. Drawing H8797-BAH-XX-XX-M2-DR-300302-P01-Flood Levels and Routing Plan included with this pack, shows the Flood zone 3 contour of 299.90m highlighted in Blue. As can be seen from the drawing the attenuation pond is located outside Flood Zone 3. The Drainage network has been modelled with a non-return valve at the outfall and a surcharged outfall level set at 299.90m AOD, which shows no flooding of the site or basin occurs during a 1 in 100 year +29% event, hence all site run-off is controlled within the Basin Area. Furthermore, the above assessment is a very conservative assessment as the surcharge model assumed a fixed surcharge level for the storm event. In reality the height of the surcharge will vary over time. In addition, the time of concentration of the peak surcharge levels and the peak site discharge will be significantly different and are therefore very unlikely to coincide the peak river level with peak site discharge rate.
10	The proposed attenuation basin is located over an existing culverted ordinary watercourse. The LLFA objects to the construction of any part of a proposed development over a culverted watercourse to the extent that such construction would restrict access to the culvert or limit the ability to maintain or remove the culvert at some point in the future.	Please refer to Barratt response to point 5 above.
11	The proposed attenuation pond is shown to be constructed in made ground that is reported (Soiltechnics, Ground Investigation Report, rev 03 (April 2023)) as having the following consistency below 0.7m "Very loose to loose dark grey slightly clayey GRAVEL. Gravel consists of plastic, shale, slag, coal, timber, pottery and bricks." Additional information is needed to demonstrate how this area is suitable for an attenuation basin.	Refer to Sections 9.11, 9.17 and 9.18 of our updated site investigation report (ref STQ4642M-R03-Rev_A dated August 2024), which provides Risk assessments for the basin area. Creating the attenuation basin will require the removal of some of the made ground landfill. The made ground will be taken to a permitted landfill site for safe disposal. Removal of this made ground will reduce the likelihood of contamination of the Secondary A Aquifer or the watercourse. In creating the basin we will be including a 300mm thick clay impermeable lining. Refer to Drawing HXXXXXX. This reduces the impermeability of the basin area, thus minimising the likelihood of surface water infiltrating through the made ground, and reducing the potential for contamination of the Secondary A Aquifer. The Clay layer also provides a break layer between any contamination and the Surface. As such, placing the basin in this area provides a betterment for the local wildlife site. The removal of soils and replacement of an impermeable lining and periodic filling with water is unlikely to promote long term settlement of soils supporting the basin and is unlikely to adversely impact the culvert's structural integrity.
12	The new hydraulic modelling provided in the FRA show mixed results where flood depth increases slightly upstream of the site and flood depth and extent decrease slightly downstream of the site. Also reported is a culvert blockage analysis that indicates that under the blockage scenario the area of the proposed attenuation pond would be inundated. The	The Hydraulic model shows the upstream flood depths have increased by 0.05m (50mm), and that the extent is unchanged. However, as listed in Para 3.3 of the Hydraulic Modelling report by JBA, the post development scenario has been modelled with a constant 45.2L/s flow, which is a very conservative overestimate as flow rates are likely to vary over time, with only the peak flow rate being at 45.2L/s.

	results of modelling do not demonstrate that increased flood risk from the proposed development is sufficiently mitigated.	As stated in Para 3.4, though the modelled flood depth has increased by 0.05m, the extent of increased flooding is negligible due to steepness of the watercourse banks and catchment. The change in flood volume is due primarily due to the re-distribution of Greenfield run off changing from discharging downstream of the culvert to discharging upstream of the culvert. Consequently, this has resulted in a slight decrease in downstream flooding which is to the betterment of the existing flood issues in the Buxton Town Centre, and something that has been asked by consultees previously. Drawing H8797-BAH-XX-XX-M2-DR-300302-P01-Flood Levels and Routing Plan shows a deluge analysis which can demonstrate flood flow paths and areas of possible flooding. The blue hatch highlighted shows the Flood Zone 3 level of 299.90m. During the 100% Blockage Scenario, the FRA states the peak water level to be 301.78m. the lowest road level for the development is 301.804m. The lowest FFL is 302.325. As such the development is not at risk of flooding during the blockage scenario. As such the flow in the blockage scenario does not impact on the development site. The flow will run across the Local Wildlife site before entering the watercourse at the culvert outlet. For clarity, the proposed development does not increase the likelihood of blockage. Construction of the inlet headwall, and safety grate will decrease the likelihood of blockage, and provide for improved access for maintenance.
13	There is well documented flooding downstream of the site in the vicinity of the confluence of Nun Brook and Hogshaw Brook (Lightwood Road area). The LLFA produced a S19 report in 2020 that documents 3 major flooding events (1975, 1998, 2019) where as many as 32 properties were internally flooded. With any new development in the catchment area there is concern over the potential to further increase flood risk in these areas. Given this situation, the LLFA would request that the developer seek to fully satisfy flood risk mitigation standards and exceed these standards where possible including consideration of performing or contributing to NFM initiatives outside of the redline boundary.	The Hydraulic modelling has already demonstrated that there is a slight decrease in Flood Risk downstream. This largely due to the redistribution of greenfield run off from downstream of the culvert, to upstream of the culvert, where run off is constrained by the culvert. We have also reduced the Greenfield run off rate from the development from 116.2L/s to 45.2L/s, some 60% reduction in greenfield run off rate, which does satisfy and exceed the requirements set out in the DEFRA Non-statutory technical standards for sustainable drainage systems. Given the above, we feel that Barratt have already made considerable efforts to reduce flooding and flood risk of the properties downstream of the site. Whilst we would be willing to discuss with the LLFA regarding contributing to further flood mitigation measures to benefit the downstream areas, we do not own or have control over any land outside of our red edge. Only the LLFA and/or EA or Landowners have powers to procure or implement initiatives for NFM outside of our site. We therefore have no authority or powers to carry out flood mitigation or Natural Flood Management (NFM),
14	The LLFA would request a modified surface water management strategy that would leave at least a minimum 6.5m (each side of the culvert centreline) free of any critical infrastructure.	Please refer to Points 4 & 5 Above. We believe that the “critical infrastructure” is at least 6.5m from the culvert centreline. Only the extreme storm overflow lies within the 6.5m standoff.
15	Further review of the submitted surface water management strategy is not possible until the issues have been resolved.	Please refer to the above. We hope the above goes some way to resolving the issues identified. We would be pleased to arrange a meeting with yourselves/LLFA in order to discuss the surface water strategy, and the constraints to which we are having to work with.
16	We maintain our previous objection as the report provided is a Ground Investigation Report (similar to a Phase 2 Site Investigation and Generic Quantitative Risk Assessment) and does not contain the previously requested information in line with the requirements of the Land Contamination Risk Management (LCRM) guidance. We will not accept reports that are written without reference to and in the required sequence prescribed in the LCRM Guidance. The LCRM guidance requires the completion of a Preliminary Risk Assessment (also known as a Phase 1 Desktop Study) before undertaking a Phase 2 Site Investigation, so that gap analysis is undertaken to formulate an initial conceptual site model and risk assessment is provided. The provided report has not followed this LCRM approach and has undertaken a conceptual site	Our updated report (ref STQ4642M-R03-Rev_A dated August 2024) has been written in accordance with a number of guidance documents published by BSI and the EA, which includes the LCRM guidance (refer to Section 1.3). Our Tier 1 Preliminary Contamination Assessment is presented in Section 3 of the report, based on the desk study findings as presented in Section 2. A Tier 2 (GQRA) is presented in Section 9, with remedial requirements outlined in Section 9.18 and recommendations for further works presented in Section 11. Our Tier 1 assessment has not been issued as a standalone (Phase 1) report due to the delivery timescales involved for the scheme. It is common practise to combine the Tier 1 and 2 assessments in the same report for expediency, providing the iCSM has suitably highlighted all potential pollution linkages (PPLs) and contaminants of concern (CoC). Whilst not issued as a formal standalone report for review, the Tier 1 assessment was completed (following our fully audited project procedure) for the site to suitably inform our approach to the Phase

	model after the site investigation is undertaken, therefore the risks and conceptual site model were not assessed and factored into the design of the site investigation. We are unable to review the provided information until a proper Preliminary Risk Assessment (PRA) report is provided that complies with the requirements of the LCRM guidance is provided in the first instance, so the assessed risks to Controlled Waters are clearly understood. Once this is provided for us to review, we can then review the PRA report alongside the provided Ground Investigation report and provide comments protective of controlled waters.	2 Ground Investigation (GI) prior to intrusive works taking place. In addition, given our experience of the wider site and GI previously completed since issue of our original GI report in 2019 (ref STQ4642M-G01-Rev00), PPLs and COC were fully understood prior to completion of further investigation, which forms part of the latest report ref STQ4642M-R03-Rev_A. In our opinion, we have suitably followed the risk management framework outlined in LCRM guidance, albeit the Tier 1 assessment was not formally reviewed by Consultees prior to completion of the Tier 2. However, in our opinion we have clearly outlined the risks to controlled waters (and all other receptors) within the Tier 1 analysis, which are quantitatively assessed within our Tier 2 analysis and appropriate measures recommended to protect controlled waters (and other identified receptors) where necessary.
17	A preliminary risk assessment (phase 1 geo-environmental risk assessment) which includes a desk study, conceptual model and initial risk assessment. This information must demonstrate to the local planning authority that the risk to controlled waters has been fully understood and can be addressed through appropriate measures.	Discussed above.
18	The phase 1 report needs to fully assess the risks from off-site historical landfill (Hogshaw Refuse Tip) which has been identified to the west approximately 34m from the site straddling part of the Local Wildlife Area. From available aerial photos it appears that the ground has been disturbed more extensively than the indicative boundary of the historic landfill and therefore a historic landfill may be closer than anticipated to the development site. Hogshaw Refuse Tip (EAHLD32424) and is known to contain industrial waste and commercial waste. The historic landfill is a pre- Control of Pollution Act, 1974 and therefore it is likely that a wide range of waste may have been disposed at the landfill site.	Identified, discussed, and assessed at the PRA stage within sections 2 & 3 of report STQ4642M-R03-Rev_A dated August 2024. Discussed above. Results of soil sampling discussed in Sections 9, 10 and 11.
19	Take into account the following information and risks -our records show the following information in relation to the historic landfill. These historic landfill records are old and are not guaranteed to be accurate in terms of landfill boundary or materials input, therefore the applicant will need to undertake their own site investigations and risk investigations to confirm the current position.	Refer to the results contained within the most recent GI report ref STQ4642M-R03-Rev_A dated August 2024. Based on the number of exploratory investigation points in and immediately adjacent to the landfill area, we have clearly defined its extents and composition of soils within the currently proposed developable zone.
20	Give due consideration to the presence of infilled material and made ground in the vicinity of the culvert for Nun Brook which runs through the site area proposed for the attenuation pond.	Refer to Sections 9.11, 9.17 and 9.18 of the updated report (ref STQ4642M-R03-Rev_A dated August 2024). Also refer to Barratt response to Point 11 above.
21	Give due consideration to the undertaken ground investigation, we are aware of waste material in the site ground including slag, timber and plastic encountered so far.	Refer to the updated GI report (ref STQ4642M-R03-Rev_A dated August 2024) for further assessment of soils making up the area of the landfill.
22	Give due consideration to that the provided ground investigation report does not cover the full red line boundary for the site and the proposed area of the attenuation basin has not been investigated at all, or enough, therefore further investigation will need to be undertaken. Insufficient land contamination risk assessment and site investigation has been undertaken to adequately characterize the site.	Refer to the updated GI report (ref STQ4642M-R03-Rev_A dated August 2024).
23	We think the proposed development of the attenuation basin constructed over and through the culverted Nun Brook is problematic and ill-conceived and the justification for this should be provided or re-evaluated.	Please refer to Barratt response to point 5 above.
24	The applicant should also note that due to the off-site and possible on-site historic landfill site use and recent waste identified in the ground investigation and potential for made ground around the Nun Brook Culvert, it is highly likely that a Phase 2 Site Investigation and Generic Quantitative Risk Assessment (GQRA) report will also be required to be provided to characterize the risk to controlled waters arising from the site. This will need to be in line with good practice and include soil, groundwater and surface water sampling for the contaminants of concern identified.	Refer to the updated GI report (ref STQ4642M-R03-Rev_A dated August 2024), in particular Sections 9.11. 9.17 and 9.18.

Enclosures:

Culvert Inlet1.pdf
Culvert Inlet2.pdf
Culvert Outlet.pdf
Culvert Survey Report.pdf
Drawing to demonstrate the impact of Daylighting the culvert.pdf
Drawing to demonstrate the impact of moving the basin into the steep site.pdf
Ground Investigation report - STQ4642M-R03-Rev_A.pdf
H8797-8AH-XX-XX-DR-CE-300002-P03-Engineering Layout with Aerial Image Overlay.pdf
H8797-BAH-XX-XX-DR-CE-300002-P03-Engineering Layout with Tope Overlay.pdf
H8797-BAH-XX-XX-DR-CE-300002-P03-Engineering Layout.pdf
H8797-BAH-XX-XX-DR-DR-300100-P02-Headwall Details.pdf
H8797-BAH-XX-XX-DR-DR-300120-P03 Attenuation Basin Details.pdf
H8797-BAH-XX-XX-M2-DR-300302-P01-Flood Levels and Routing Plan.pdf
Site Photo of Attenuation Basin Area.pdf

Download the above from:

<https://www.dropbox.com/scl/fi/ihooowczs3getiqts8o9/Hogshaw-Response-to-Environment-Agency-and-LLFA-comments-dated-26-Sept-24.zip?rlkey=8gsgjjhugjv0mxfdg5eojxyhq&st=vz1rq752&dl=0>

End