

Queen's Wood: Natural Flood Management (NFM) Scheme

Questions and answers

Introduction / Background

- Queen's Wood is an ancient woodland, a local nature reserve, a site of importance for nature conservation, along with Highgate Wood and Parkland Walk, and an ecological site of metropolitan importance.
- Due to the sloping nature of the site and defective drainage infrastructure beneath, the site in which much of the river was culverted many years ago, presents a flood risk to downstream residential properties, and nearby sporting facilities in the Wood Vale area.
- Queen's Wood falls within one of the Borough's Critical Drainage Areas (CDAs), Haringey's Surface Water Management Plan (2011) as well as the Environment Agency's (EA) Surface Water Flood Map which identified this area as having one of the highest numbers of properties at risk from flooding and where the effects of climate change are likely to increase this risk.
- Haringey as a Lead Local Flood Authority, in partnership with EA, explored a range of mitigation strategies to minimise of flooding to the woodland and downstream properties. These options include:
 - a) Do Nothing.
 - b) Do minimum – Continuing current annual maintenance regime.
 - c) Repair / Replacement of existing pipes in the woods and on the highway.
 - d) Remove pipes and create open channels.
 - e) Property level protection.
 - f) Creation of a Flood Wall on the site of the existing wall.
 - g) Daylighting of the existing storm water sewer and add Natural Flood Management (NFM) features.
- These options were then evaluated to narrow down to a short list where one option was subsequently chosen. This process was undertaken in a structured manner to ensure that the preferred option was arrived at in a logical manner, using the "Five case model"¹ methodology.
- There is also an existing Surface Water Sewer (SWS) running all the way within the woodland from West to East which is severely damaged and leaks into the woods and discharges into Wood Vale. To repair or replace these pipes will cause damage to the woodland due to its line and the necessary excavation involved.
- Considering the delicate ecological and historic nature of the site, the EA and the Council preferred a Natural Flood Management (NFM) approach to the scheme.

¹ The Five Case Model is the approach for developing business cases recommend by HM Treasury, the Welsh Government, and the UK office of Government Commerce.

- The proposed NFM on-site interventions include:
 - 1) The daylighting (open channelling) of the existing Thames Water SWS and diversion of these water flows into an open watercourse, or a modified existing watercourse, across the site.
 - 2) The construction of instream NFM structures such as channel stuffing, and leaky dams constructed from large woody debris to create natural attenuation and to control the flow within the watercourses.
 - 3) The formation of temporary wetted areas by installing earth berms to provide a 'floodplain' for the watercourse to spill into during times of heavy flows.
 - 4) The installation of localised retention basins to create attenuation and settlement areas.

- All these proposed interventions are to cater for 1 in 100yr plus 40% Climate Change allowance² with slowing the rate of the water flow to reduce erosion and protect properties from flooding. The project will help to reduce the level of floor risk to 10 residential and 2 non-residential properties.

- These NFM proposals were discussed with the council's Park Team representatives of Friends of Queen's Wood (FQW) during a site meeting on 17 October 2019 and there were no objections to the development of such proposals. During virtual meetings in April 2020 and December 2020 which were attended by these representatives, our consultant and Environment Agency officers, there was no opposition expressed over the developing scheme proposals.

- Following this meeting FQW submitted many ecological and other survey details to Council for consideration in the detailed design. FQW were concerned about the NFM features and the potential impact on the woods. Additionally, FQW submitted many questions to the Council, all of which were answered by officers.

² 40% Climate change is Peak rainfall intensity allowance to making sure there is no increase in the rate of runoff discharged from the site for the upper end allowance.

Questions and answers

1. What is the scheme value?

The budget costs for 2021/22 is £262,000. This information is available from the Council's Cabinet Meeting report of 9 March 2021.

2. What is the estimated cost of flood damage to properties?

The estimated cost of damage to properties has been worked out to £452k.

3. Which properties are subject to potential flooding?

10 Properties in Wood Vale along with Hanley and Georgian Tennis Clubs are subject to potential flooding.

4. Why cannot Thames Water upgrade their surface water drains?

There is an existing Surface Water Sewer (SWS) running all the way within the woodland from West to East which is severely damaged and leaks into the woods and discharges into the SWS in Wood Vale. To repair or replace these pipes will require excavations across the woodland, new manholes and diversions of the line of this SWS.

Thames Water are in agreement with our Natural Flood Management proposals and have shown interest in becoming our partner and providing some funding as a contribution to the scheme budget.

5. What is the source of this proposed scheme? Who, if anyone, will benefit from it?

Queen's Wood falls within one of the Borough's Critical Drainage Areas (CDAs), Haringey's Surface Water Management Plan as well as the Environment Agency (EA)'s Surface Water Flood Map all of which identifies this area as having one of the highest numbers of properties at risk from flooding. This risk is likely to further increase in severity and duration due to climate change. Droughts and heatwaves are also likely to become more severe and increase in duration as a result of climate change. Dry ground can result in more severe flooding as precipitation cannot be soaked into the ground as quickly and therefore may result in higher surface water runoff rates. Such climate changes will impact the functioning of the Wood's existing drainage.

The main beneficiaries will be for residents and occupiers downstream of Queen's Wood in the Wood Vale area as these properties will be better protected from future flooding events. For the woods, the proposals are of an open stream and a managed drainage system that controls woodland soils being washed away.

6. How does it relate to the Council's overall policy on climate change?

The scheme has been designed to cater for a 1 in 100-year flood event with a 40% allowance for climate change to provide assurance that the project will remain fit for purpose in the future.

The proposals align with the overall principles of don's Climate Change Adaptation work as well as the Council's emerging Parks and Green Spaces Strategy.

7. Queens Wood is ancient woodland, and thus could you advise whether these works would require planning consent?

Planning is aware of the proposals. This is considered permitted development and planning permission is not required. Permitted development includes the improvement, maintenance or repair of watercourse and land drainage.

8. Where is the evidence on which it is based? In 50+ years as a local resident I have never witnessed any flooding in this area.

Haringey, as a Lead Local Flood Authority, in partnership with the EA, has explored a range of mitigation strategies to minimise of flooding to downstream properties.

These options and the preferred one are in line with Haringey's Surface Water Management Plan as well as Environment Agency (EA)'s Surface Water Flood Map.

There is indication of excess water in open spaces downstream of the woods.

9. What impact assessment, if any, has been made on the ecology of Queens Wood and by whom?

Ecological assessments have been undertaken and the design team have taken expert recommendations into account within the design proposals. As part of this process, our ecologist and design consultants have reviewed the information provided by the Friends of Queens Wood Group along with all other consultees and members of the public who provided such data for consideration. The Council will ensure that ecological concerns will be addressed both before and during site works.

Method statements will be agreed with the contractor prior to the commencement of individual elements of work. It is proposed that the Contractor will employ an Ecological Clerk of Works (ECOW) who will oversee the works and ensure that there is minimal impact on sensitive ecological habitats during the works. The ECOW will have the power to stop the works at any stage should they consider that there is an undue risk to the environment or ecology within the wood.

10. What will be the overall cost to the public purse? Have the proposed costs been published?

This is an Environment Agency and Council Funded Project. The budget costs for 2021/22 is £262,000. This information is available from the Council's Cabinet Meeting report of the 9th March 2021.

11. What alternatives have been considered and costed?

Haringey as a Lead Local Flood Authority, in partnership with EA, explored a range of mitigation strategies to minimise of flooding to the woodland and downstream properties. These options include:

- a) Do Nothing – No further maintenance to the drainage system.
- b) Do minimum – Continuing current annual maintenanceregime
- c) Repair/Replacement of existing surface drainage water pipes in the woods and on Muswell Hill Road
- d) Remove surface water drainage pipes and create open channel
- e) Increase property Level protection

- f) Creation of Flood Wall on the site of the existing wall.
- g) Daylighting of the existing storm water sewer and add Natural Flood Management (NFM) features to slow down the flow

These options were then further evaluated further in terms of cost benefit analysis, flood prevention effectiveness and construction disruption to the ancient woodland. Considering the delicate ecological and historic nature of site, the option of 'Natural Flood Management' (NFM) emerged as the preferred solution.

12. What steps have been taken to discourage house owners from concreting over gardens and paths?

The important contribution that landscaping, planting and green space makes to mitigating flood risk and enhancing biodiversity is well known. Paving in gardens is classed as permitted development and can be installed without planning permission in the case of a front garden the area being less than 5 m² or the surface proposed is porous or the runoff is directed to porous or permeable areas.

If the new hard standing to be constructed is more than 5 m² in area, then planning permission will be required for laying traditional, impermeable surfaces that do not control surface water running off onto the road. Planning permission will not be required if the new driveway uses permeable surfaces such as gravel, permeable concrete, block paving or porous asphalt, or if the rainwater is directed to a lawn or border within the same property to drain naturally.

13. What worried me right from the start was the fact that the scheme seemed to be 'driven' by the Highways Agency who had somehow been provided with the money to undertake this very invasive irrigation of the wood. It would seem that Haringey has been trying to keep the scheme well under the radar and any attempts for clarification of specific details were not forthcoming. They were decidedly unwelcoming of any offers of the Friends of Queen's Wood providing expert knowledge of the woods and its ecology.

The proposal is driven by the need to address flood risk to properties downstream of Queen's Wood, in the Wood Vale area. Queen's Wood falls within one of the Borough's Critical Drainage Areas (CDAs), Haringey's Surface Water Management Plan as well as the Environment Agency (EA)'s Surface Water Flood Map which identifies this area as having one of the highest numbers of properties at risk from flooding, which is likely to further increase in severity and duration in the future due to climate change.

The project is jointly funded by the Environment Agency and Haringey Council. Information about the project and its funding is available in the Council's Cabinet Meeting report of the 9th March 2021.

A six-week public consultation exercise has recently been undertaken. We are currently reviewing the feedback and will address it as part of our next steps.

The Friends of Queen's Wood have been consulted at various stages of the project's development and their input has and will continue to be welcomed. Over the course of the project the Friends have asked several questions, which have been answered, whether in writing or at site or virtual meetings.

14. I have studied the plans and they give lip-service to being environmentally considerate but, if you look at what they are proposing, it will be impossible to fulfil that commitment.

The proposals are based on a 'natural flood management' approach, designed to reflect the nature of, and to minimise negative impacts upon, the ancient woodland.

Haringey, as a Lead Local Flood Authority, in partnership with EA, explored a range of mitigation strategies to minimise flooding to the woodland and downstream properties. These options include - see answer to Question 11.

These options were then further evaluated further in terms of cost benefit analysis and construction disruption to the ancient woodland. Considering the delicate ecological and historic nature of site, the option of 'Natural Flood Management' (NFM) emerged as the preferred solution.

Ecological assessments have been undertaken and the design team have taken expert recommendations into account within the design proposals. As part of this process, our ecologist and design consultants have reviewed the information provided by the Friends of Queens Wood Group along with all other consultees and any members of the public that provided such data for consideration.

Method Statements will be agreed with the contractor prior to the commencement of individual elements of work. It is proposed that the Contractor will employ an Ecological Clerk of Works (ECOW) who will oversee the works and ensure that there is minimal impact on sensitive ecological habitats during the works. The ECOW will have the power to stop the works at any stage should they consider that there is an undue risk to the environment or ecology within the wood.

15. What is the real motivation behind Haringey's Flood Mitigation scheme?

The motivation and funding for the project is explained in our responses in questions 13 and 14 above and are to prevent flooding to properties.

16. The big question is, "Do we really need flood mitigation through Queen's Wood?" If it really is a yes, Haringey needs to make a big effort to explain to us well-informed locals point-by-point why it needs to be on such a large, devastating scale.

The scheme is to address the identified flood risks within Haringey's Surface Water Management Plan (and the Environment Agency's Surface Water Flood Map is required).

The Council and the Environment Agency have looked at a range of options that would result in a resolution to flooding problems, and the natural flood management option has been identified as the most appropriate solution bearing in mind the nature of this ancient woodland site.

To provide further assurance, we are currently considering the feedback received from the consultation. We will work with the representatives of both responders and groups to ensure that the project is understood in terms of how ecological risks will be managed, how the project's objectives will be achieved and what benefits could be delivered to the wider community.

The Council will invite representatives of the consultees to a site meeting for further

discussions, to investigate their concerns and how these can be addressed.

17. Is there is an increased risk of surface water flooding in this location?

Queen's Wood falls within one of the Borough's Critical Drainage Areas (CDAs), Haringey's Surface Water Management Plan (as well as Environment Agency (EA)'s Surface Water Flood Map which identifies this area as having one of the highest numbers of properties at risk from flooding which is likely to further increase in severity and duration in the future due to climate change. Droughts and heatwaves are also likely to become more severe and increase in duration as a result of climate change. Dry ground can result in more severe flooding as precipitation cannot be soaked into the ground as quickly and may result in higher surface water run-off rates. This means that climate change may impact on the functioning of the Wood drainage.

As Lead Local Flood Authority, and in consultation with the Environment Agency, the Council undertook a detailed study which explored a range of mitigation strategies to minimise of flooding to downstream properties.

18. Have ecological assessments been undertaken and carefully considered as part of proposals?

Ecological assessments have been undertaken and the design team have taken expert recommendations into account within the design proposals. As part of this process, our ecologist and design consultants have reviewed the information provided by the Friends of Queens Wood Group along with all other consultees and members of the public who provided such data for consideration.

19. Will protection measures be taken both before and during the works?

The Council will ensure that ecological concerns will be addressed both before and during site works.

Method statements will be agreed with the contractor prior to the commencement of individual elements of work. For this scheme, it is proposed that the Contractor will employ an Ecological Clerk of Works (ECOW) who will oversee the works and ensure that there is minimal impact on sensitive ecological habitats during the works. The ECOW will have the power to stop the works at any stage should they consider that there is an undue risk to the environment or ecology within the wood.

20. Has the team engaged with local stakeholders, including biodiversity specialists, and is the team committed to a transparent and collaborative process?

The proposals for a Natural Flood Management (NFM) scheme within Queens Wood were not unsupported by representatives of Friends of Queen's Wood (FQW) during a site meeting on 17th October 2019 with Council Officers.

Since then, officers have received further feedback through engagement with local stakeholders, including FQW, at virtual meetings which took place in April 2020 and December 2020. The outcome of this consultation is currently being analysed and a report will be published once complete. The council also engaged their inhouse nature conservation officer within parks team for biodiversity issues. Feedback received during these sessions is being carefully considered by our consultant team as proposals are further developed.

21. Please can you let me know if Queen's Wood Natural Flood Management scheme includes water from outside the wood? for example surface water from adjacent roads?

Please note that due to the sloping nature of the site and poor drainage infrastructure running through the site, this presents a flood risk to downstream residential properties and nearby sporting facilities in the Wood Vale area. The catchment drainage area includes that from surface water run-off from Muswell Hill Road, Highgate Woods, Summersby Road and South Close as existing.

22. Will the works be in specific areas with vulnerable flora and fauna and what that works will be?

The work in the wood is essential part of Flood Alleviation. The proposals are shown in the plans and any ecological information will be considered.

23. What stage is the project at now (May 2021)?

The scheme is on halt at the moment.

24. What is the present surface water quality and will the existing streams change?

We are not aware of any water quality standards for opening up watercourses. Current proposals include a stilling pond located at the point where flows are diverted from the drain into the water course. This will remove larger silts and sediments.

Research of the performance of SuDS features confirmed that organic pollution will break down 'naturally' in soils that experience a wet and dry cycle.

We are working with our partners Environment Agency, Thames Water and Thames 21 who are expert on this issue and the water quality is that as currently flowing through the woods. Thames Water have checked that from the upstream catchment that this is surface water runoff. We are not changing any flow of water or disturbing the existing streams.

25. The route of the diverted flow in the Frogpool area is not made clear but appears to be through the pool. Could you confirm if this is correct?

There is existing pipework running under the pool. Our aim is to minimise the work in and around the Frogpool. We are proposing to divert the ditch through pipework around the frog pool on the path and return to the watercourse downstream.

26. The use of small machinery and manual tools is more responsible and appropriate in an Ancient Woodland and the fact that existing excavated soil is to be used for berms wherever possible, is an improvement. We would be very concerned if imported soil were used.

Topsoil from within the woods is proposed. Any imported topsoil will need to be approved.

27. There are references to ecological restraints and particular flora at risk but nowhere in the list of restraints are nesting birds mentioned.

According to the advice from our ecologist MKA, where the timing is not feasible, works should be preceded by a nesting bird check. Therefore, our contractors will carry out Nesting bird checks if within breeding season. Several visits throughout the breeding season will be carried out to check for presence, including later in the season. A route for machinery and contractors will also be determined in advance.

28. It would be helpful to have more clarity on the approximate extent of the leaky dams when full. Will they vary in size? What will be done to avoid trees being continuously or frequently in water when they are species for example English oak, for which this would not be suitable?

A copy of drawing no. INF01 showing the maximum level of water behind the leaky dams at the bermed areas is in the design details

- Where a leaky dam is specified without the berm it is the intention that the raised water level will be restricted within the channel, these are therefore not shown on the drawings.
- It is important to note that the water depth will decrease moving away from the dam.
- The extents shown in the drawing are in the worst scenario where a significant storm event can occur. i.e. 1 in 100 yr.
- The design approach was mainly to minimise where possible the number of significant trees within the 'flooded' area. It is also anticipated that these areas will drain and will not always contain water.

29. Can it now be confirmed that funding is now fully in place, and if so if there are any caveats in particular on timescale?

The funding is in place for 2021/22 financial year and that approved from EA is for the current proposed scheme.

30. Who will provide the Ecology Clerk whose role seems vital? Will she/he be on site for the whole of the work? To whom will he/she be accountable?

Our contractor will provide the Ecological Clerk of Works as a part of the works contract. He/She will be on the site as and when required and when the works are beginning within the critical zones. The Ecological Clerk of works will be accountable to the Project Team.

31. The textual notes on the detailed design drawings states that tree removal along the route of the diversion is required. What is the estimate of the number of trees, especially mature ones, to be removed?

According to the recent detailed design drawings, only couple of the small trees and scrubs will be removed. However, we will relocate any berms to avoid tree removals. So, ideally, there will no tree removal along the route of the diversion.

- 32. The visual aspect of the works, especially, the leaky dams, will depend very much on the extent to which they are holding water. When dry or muddy, they will not look pleasant. What estimates have been made of the extent to which in an average year these features will be muddy or dry?**

Leaky dams mimic the natural obstruction caused by trees and branches falling into the river. They range from a single large branch to several tree trunks tied together. Over the time the wood might get rotten and as a part of continued management and maintenance, certain items may need replacing time to time if they are not working effectively. The dryness or muddiness of these leaky dams are going to be weather dependent.

- 33. The detailed design has been changed so that the stream now runs through the Frogpool rather underneath. This reduces construction work but would radically change the Frogpool and its ecology. The MKA report was completed before the design change, so an immediate hydraulic and ecological study of the Frogpool area is now needed.**

While we are not doing work to the Frogpool, it is the case that Storm sewer will be conveyed through it, which was always the case.

There is an inlet screen to the pond to the West and an outlet from the pond to the East. The TW pipeline is separate and there is a manhole to the West of the pond which we have identified as an overflow by installing a gully top.

As a means of avoiding this, we will be proposing to divert the ditch through pipework around the frog pool on the path and return to the watercourse downstream.

- 34. A major feature of the scheme is the construction of berms and adjacent ponds. Could you please supply detailed plans showing where the expected excavation for clay and topsoil will take place. These areas and the adjacent areas where coppicing could take place need an immediate study to start considering the effects on the ecology and to inform the design.**

It is the intention to generate some of the fill material on site whilst creating the proposed watercourses as per the supplied drawings. However, this may not generate enough fill material to complete the required works. Therefore, we will be relying on the contractor for the locally supplied and carted imported fill material to construct the bunds.

- 35. The design includes a 'Stilling Area'. The public notice also refers to runoff from each rain event being detailed and treated in new drainage ditches. Please explain what this means.**

Stilling Area is depression in a channel / ditches to reduce the velocity or turbulence of the flow. As the water flows over through ditches into the downstream channel, it has a very high velocity or turbulence of flow. The excess flow must be dissipated so that it does not endanger the stability of bed and banks of the downstream channel. This is called Stilling area.

36. What will be the provenance of any soils introduced to the wood?

We will need to find out from our contractor before we place an order for the works, and we will update the FAQs with this information. However, it is assumed that it will be topsoil. The Council will welcome suggestions for sourcing this soil.

37. What will be the provenance/type of wood used for the leaky dams if enough is not found in the wood?

We will need to find out from our contractor before we place an order for the works, and we will update the FAQs with this information. However, it is assumed that if enough wood is not found then we will be utilising locally sourced wood. The Council will welcome suggestions for sourcing.

38. Will the design/size of the leaky dams and berms vary according to the different stream channels?

Yes, the size will vary accordingly.

39. What plans are there to restore the site after the works – e.g., replanting? This was mentioned in the original ecology survey but not dealt with in detail.

Any damaged trees, plants or scrubs will be re-instated back or replaced accordingly once the works are completed. The detail will not be known until the works are near completion.

40. The bringing to the surface, water now running through the surface water drain will substantially increase the water in the stream. Can you indicate how much water there could be and how often flows will occur.

The flow is rainfall runoff induced therefore it will greatly depend on the volume of rainfall across the upstream catchment. The worst-case scenario where a significant storm event can occur which is equivalent to 1 in 100yr storm.

It is also noted that, most of the time the water level will be restricted within the channel. The depth will decrease moving away from the dam. It is however difficult to quantify the increase in water without qualifying it based on these parameters.

The inlet chamber has been designed to maintain a connection back into the existing storm sewer as an overflow and with a valve on the outlet to the stream which would allow the flow to be managed, if required.

41. The consultation document refers to ‘runoff from each rain event is detailed and treated in the ditch. The retention time also promotes ‘pollutant removal through sedimentation’. What does ‘detailed and treated’ mean? What pollutants will be present, and will they be removed from the wood? What tests of the water quality have been carried out?

‘Detailed’ looks like a typo and should read ‘detained’. Runoff will be conveyed more slowly through the surface channels when compared with the closed pipe system. This in turn allied with surface conveyance provides opportunity for treatment of runoff.

The pollution anticipated would be diffuse pollution from upstream runoff. Organic pollutants would be subject to biodegradation within nature-based drainage components. Current proposals include a stilling pond located at the point where flows are diverted from the drain into the water course. This will remove larger silts and sediments.

Research of the performance of SuDS features confirmed that organic pollution will break down 'naturally' in soils that experience a wet and dry cycle.

42. All the works will be easily accessible to the public of all ages. Where new ditches are dug, or existing streams enlarged the subsoil will be revealed. Typically, this will be clay. The surfaces of the bottom and sides will be slippery and sometimes wet. Such a surface will not often become covered with plant growth, so will remain bare. This would be unsightly and risky for children. Do you have any plans for amelioration?

Excavations will be re-dressed with surface material. The design has sought to minimise excavation of new ditches and seeks to utilise the ditches and conveyance routes that currently exist across the site. It is the intentions that where the subsoil will be excavated from the places for the plant grown, the same will be replaced over by topsoil.

43. The berms will be covered with topsoil. In some areas there could be natural regeneration or planting to hold this in place. How long would this process take, and will there be a need to prevent public access? In other places, little or no growth is likely. How will these areas be managed?

Topsoil will be scraped from footprint/underside of berms and areas where subsoil can be gained. The subsoil will be excavated the placed-on areas to be built up. Topsoil will then be replaced over berm and areas of subsoil excavation.

The use of a Bio-degradable erosion control geotextile is specified for use on top of the berms as a means of providing structure and allowing regeneration to take place in the short to medium term. As with any landscape reinstatement it can take at least 1 year (growing season) for regeneration to take place.

44. Are you taking into account the presence of invasive Pennywort in Frogpool?

While we are not doing work to the Frogpool, it is the case that water will be conveyed through it, which was always the case. The works will not commence here until the Pennywort is being removed.

45. Are you able to confirm for example that the approach to earthworks is to avoid tree- felling and tree damage wherever possible?

All excavation will be carried out by hand in areas identified as vulnerable to tree / plants damage. The works will be cleared in such way to reduce violent movements and therefore cutting or lifting of roots and plants. The spoil will be placed on clear spaces identified for temporary storage and moved there by wheelbarrow using a designated route, possibly boarded out or covered by ground protection boards.

Compaction will be done by placing spoil or fill material if required by hand. Upon completion, additional soil will cover the area and a small compactor plate may be run over soil to complete compaction.

46. If works are due to start in April, then this is the height of the bird nesting season. should this not be delayed until August/September when the nesting season ends.

The contractor will be carrying out nesting bird checks including mounting bird boxes on the relevant trees following advice from our Ecologist. It is now likely that the works will not commence before September.

47. The pandemic: Again, we know parks and green spaces are rammed with people during good weather, some come April/May there will be an awful lot of people using Queen's Wood, as they did throughout the COVID period, that needs to be factored in.

We are not closing the entire woodland. Only parts of woodland will be fenced off during the works. The remaining areas will be open for public and there will be some restricted use of the entire woodlands due to these necessary works.

48. Will there be consultation over the proposed location of the compound and works access routes within the site?

There will be discussions within the project team.

49. Is all material for berms created only from on-site excavations? if not then where is this being sourced from? What licencing is required for anything imported?

It is the intention to generate some of the fill material on site whilst creating the proposed watercourses as per the supplied drawings. However, this may not generate enough fill material to complete the required works. Therefore, we will be relying on the contractor for the locally supplied and carted imported fill material to construct the bunds.

Importation will be by supplier with valid waste licence carrier certification.

50. Is the material for leaky dams from on-site sources or imported? if not then what? What licencing is required for anything imported?

These will be logs acquired from the site where possible. However, it is assumed that if enough wood is not found then the same will be imported from a local forestry / conservation supplier.

51. What protection is there for the shallow soils, the pH levels etc?

The project is not measuring any pH levels on site. Shallow soils will be topped with fill material from the site or locally imported, where required in the construction works/routes.

52. The existing (top)soils are very shallow (one or two inches) yet the proposed berms show 150mm topsoil. should this not be more like the 1 or 2 inches as per elsewhere in the site?

We propose to scrape off the topsoil soil / leaf mould from the footprint of the berms, construct berms then spread saved topsoil over the berm before covering with coir

matting. This topsoil depth will vary but probably no more than 75mm.

53. How will the movement of soil operations be managed to avoid damage?

Soils will be delivered to site and tipped in the compound area. It will be distributed to various areas along the existing paths in a 6-tonne dumper fitted with sports turf, low ground pressure floatation tyres. The dumper will leave the path directly adjacent to where the berm/s are to be constructed, tip then return to the stockpile via the path.

54. Are all the timbers to be site-won? If any are to be imported, what licencing is required for these?

Vertical timbers may have to be imported if not available on site. These will be FCS certificated timbers. Any local sources that are suggested will be considered e.g., Highgate Woods.

55. Are any of the timbers to be treated to prolong their life, if so with what? How will such chemicals impact on the site? If not, what replacement cycles have been considered and how will this be managed going forward?

The timbers used will be FCS certificated timbers. For the replacement cycles, over the time when the wood gets rotten and starts to become ineffective, they will need to be replaced. The Council will welcome suggestions for sourcing any local timbers.

56. Have the on-site timbers been assessed for suitability?

The suitability of on-site timbers will be assessed at the time of construction works. If enough wood is not found, then the same will be imported from local forestry / conservation supplier.

57. Where is the works compound proposed to go and how will the contractor get to it, from it and around the site to do the works without causing damage/trampling etc to the site and ensure undisturbed public access along paths etc?

It is the intention of contractor to use the Muswell Hill Road access near the café to bring both plant and machinery into the woods. It is also the intention to have storage by the café. We are yet to confirm and agree the access and storage arrangements with our contractor. This will be done under a Method Statement from Contractor and Council Parks officers' approval will be sought.

58. We'll need to see this (plan of works), and comment on/approve this before any decisions are made or any works can commence

A construction management plan will be provided before any works are commenced. Details will be posted on site and on the Council's web page.

59. Will the compound include welfare facilities and if so, how will they decommission this, i.e., without spilling anything into the Wood?

The compound will include welfare facilities and it will be emptied once a week. We will however need to confirm with our contractor as a part of their Method Statements for the works.

60. How will chemical toilets be managed, brought to site and taken away? We don't want large trucks accessing the site!

The welfare facilities will be emptied once a week and we are assuming it is from near the café. We will however need to confirm with our contractor as a part of their Method Statements for the works.

61. There is no information about the site circulation proposals.

The contractors have proposed to work from the East of the site, westward re-opening sections after agreed completion. This proposal is yet to be agreed by the Council and may be subject to change.

62. How will the works vehicles/operatives get around site when the paths are not fit for vehicles?

The contractors will access via paths using low pressure vehicles. They will take the condition pictures of the paths before and after the works.

63. What level of machinery will be held on site and how will it move around the site without it causing damage?

Small dumper and mini excavator for main works and 14t excavator for loading and lifting outlet structure are currently proposed and this will be subject to details from the contractor. The routes for vehicles will be part of the agreed Method Statements with the contractor.

64. Are all the excavations to be by hand, to avoid damage to the existing ecology etc?

The works would not be achievable if carried out by hand, but it is the intention that works to be carried out in a sensitive manner.

65. How will any damage be avoided/addressed/reinstated?

Condition pictures of the work areas and the paths will be taken before and after the works. Any issues will be addressed / reinstated before signing off by the Council.

66. Any tree removals must be kept to an absolute minimum and only be for very small trees or dead, dying, diseased or dangerous trees.

According to the recent detailed design drawings, only a couple of the small trees and scrubs will be removed. We will relocate any berms to avoid tree removals. So, ideally, there will no tree removal along the route of the diversion.

67. How will the contractor and works protect the various ecosystems, in particular:

i. Trees/tree roots (in particular ancient trees, but also any trees)?

Avoiding the root system where possible, use small low ground pressure machinery and protection with boards where necessary.

ii. **Birds (x27 species of which 5 are notable)?**

Daily nesting bird checks if within breeding season. Extra caution exercised if works will take place in the breeding season – several visits throughout the breeding season will be made by contractor to check for presence, including later in the season.

iii. **Bats (x11 species of which 7 are notable or rare)**

No trees with bat potential should be disturbed, and disturbance within the vicinity should be kept to minimum. An ECoW will be present to monitor works near trees with bat potential, and fencing will be erected to protect trees with bat potential. Additional bat boxes will be installed during the project.

iv. **Ancient woodland indicator plants**

Identify and avoid sensitive areas. Keep site routes to the very minimum.

68. The areas at the north/west end of the site, the path that comes from the café and peels off toward the Frogpool, regularly floods and is eroding because of water damage. Why is this aspect of the flooding of the site excluded from the proposed scheme?

The NFM scheme is not for the management and care of Queen's Wood. The intention of the current design is to address the major flooding issues to the fullest.

69. Pre-implementation we would like to see clear signage at every entrance and key locations around the site setting out what is going to happen, why and when.

These details have been provided within our consultation letter. Again, all the affected residents will be sent a works notification letter providing them of any start and approximate finish dates. Any signing will be provided as a part of the fenced off working areas.

70. Post-implementation we want you to allow for permanent signage/interpretation to explain what they interventions are for etc?

This is Natural Flood Management Scheme, and we are just creating drainage ditches, leaky dams, and berms. These features do not require any permanent signing.

71. The footpath at the Wood Vale end becomes impassable at this time of the year and is this being dealt with as part of this scheme?

The scheme is not for the management and maintenance of Queen's Wood as this fall within regular management and maintenance.

The Council, for this project, are the Lead Local Flood Authority responsible for managing the risk of flooding from surface water, ground water and ordinary watercourses.

72. Please can you explain where is water coming from that goes through Queen's Wood?

The catchment drainage area includes that from surface water runoff from Muswell Hill Road, Highgate Woods, Summersby Road and from South Close.

73. Imported clay, timber and topsoil will encourage invasive species and damage trees. What will you do about this?

The clay will be from excavations. Similarly, existing local timber and topsoil will be used for the leaky dams and earth berms. Our specialist has confirmed that the scheme should not encourage or result in an increase of invasive species. The project team has been informed that the development of invasive species is largely dependent upon weather and climate conditions and not necessarily on the provenance of timber and topsoil.

74. Why can't we have diverted the entire water from the woodland via a new pipe or pumped the water and discharge somewhere else?

The topography of site is sloping in nature and has poor drainage infrastructure running at the moment.

This proposal will fall within the remit of Thames Water as they are responsible for the existing sewer system. This proposal will require a major civil engineering works and that will be expensive to pump the entire water going through the woodland to a different drainage system. This is likely to require bigger pipes in the Thames Water network and may result in flooding elsewhere. This is not currently considered a viable and affordable solution.

75. What are you going to do with any salt that may be present within the water running through the wood from Muswell Hill Road?

We are not aware of any salt content within the water that is currently running within the existing surface water sewer. Again, we are not sure if Muswell Hill is part of the winter salting regime and if it is then the salt will only be laid in the winter months, as required. Most of the salt will be diluted within the snow/ice/rainwater therefore we anticipate there will be a minimal amount of salt will present within the water that will run through the woodland. It would also be possible to divert the flows down the existing pipe in the immediate period after future salting therefore mitigating any risk.