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Via email:  
[steve@heathrowhub.com](mailto:steve@heathrowhub.com)

**Date:** 7 April 2014

Dear Steven

**Heathrow Hub - Heathrow Airport Expansion Proposals.**

Further to our recent meeting on 12 March 2014 and your subsequent request for information and data, please see the attached appendices.

We have answered your specific questions where possible and have also provided you with general advice with regard to environmental constraints, requirements and guidance associated with the proposals.

Please note that we have not yet received a full complement of comments from our internal technical consultees. We will send any further comments from our Catchment Co-ordinator, who leads on partnerships and local delivery of Water Framework Directive as soon as we can.

The data aspects of your request will be provided by our Customers and Engagement Team, who can be contacted by email at [NETenquiries@environment-agency.gov.uk](mailto:NETenquiries@environment-agency.gov.uk).

I hope that the information provided forms a suitable basis for our ongoing engagement.

If I can be of any further assistance, please do not hesitate to contact me.

Yours sincerely

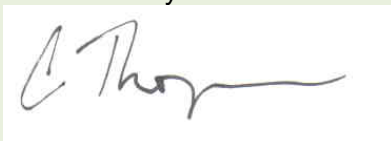
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# Appendices

## Appendix 1 – Surface Water Flood Risk

**Important Note:** The London Borough of (LB) Hillingdon is now the competent authority on all surface water flood risk matters within Hillingdon. The following comments are provided as advice only and should not outweigh any advice that you are given by LB Hillingdon. We will not be in a position to provide further advice on surface water flood risk issues. We recommend that you contact Vicky Boorman at LB Hillingdon on 01895 250111 for further engagement and advice regarding surface water issues.

**Q:** Please can you confirm that permissible surface water runoff rates from greenfield areas that are to be developed may be calculated using IOH124?

**A:** Yes, IOH124 is appropriate for calculating greenfield runoff rates.

**Q:** Please can you provide any guidance on preferred SUDS for airports?

**A:** We do not have standard guidance on the design of SUDs specific to airports. We recommend that you view the attached documents “Sites over 1 hectare factsheet” and “European Airport Greenroofs” for guidance.

Please note that the London Plan policies and any other local policies should also be adhered to.

**Q:** Please can you confirm that surface water flooding should be prevented for rainfall events with a return period of less than 1 in 100 years, including a 20% allowance for climate change?

**A:** The appropriate allowance for climate change should be used. This is dependent on the lifetime of the proposed development. Based on the expected timeframes and likely lifetime of the development, we would recommend a climate change allowance of 30% is used.

**Q:** Please can you provide surface water management and treatment requirements?

**A:** We recommend that the following standards are demonstrated as part of the surface water strategy:

- Runoff rates: Peak discharge rates from site should not increase as a result of the proposed development, up to a 1 in 100 chance in any year including an allowance for climate change storm event. Greenfield rates should be aimed for.
- Storage volumes: Attenuation storage volumes for all events up to a 1 in 100 chance in any year including an allowance for climate change storm event should be provided on site.

- Sustainable drainage techniques: Sustainable Drainage Systems (SuDS) such as green roofs, ponds, swales and permeable pavements should be used where possible. The SuDS hierarchy should be followed as you design the site.
- Residual Risk: The residual risk of flooding should be managed and contained safely on site should any drainage features fail (e.g. pumps or flow control devices) OR during an extreme storm event.

In addition to flood risk management, the discharge from airside drainage is regulated by the Environmental Permitting Regulations 2010. The Airport currently has a number of permits, regulated by us, to discharge site drainage comprising Airport drainage and construction drainage.

We expect a water strategy that identifies surface water which is non-contaminated and potentially contaminated. The strategy should uphold the principle of pollution prevention, considering emergency planning and factor in the following principles of Pollution Prevention Guidance 22:

- Contain at source
- Contain close to source
- Contain on the surface
- Contain in the drainage system
- Contain on the watercourse

In addition the site wide water strategy should include:

- Water quality, upholding the principle of pollution prevention - containment and sources, reuse, recovery, treatment – disposal.
- Water resources, upholding a sustainable use of resources

Apart from the risk of fuel and other hydrocarbons and the need for oil interceptors to serve areas such as taxiway, runway and car parking, the control of intermittent application of de-icant and anti-icant, which is potentially polluting matter, needs a detailed drainage strategy of containment and treatment.

The Airport currently has a series of pollution control systems, which enables an assessment of the quality of their airport (surface water) runoff and inform a decision to divert, containment, treat and release to foul or surface waters (controlled waters). A containment strategy and Treatment strategy should both be encompassed within the Water Strategy.

Under the Environmental Permitting Regulations 2010, the Permit holder (for example, Heathrow Airport Limited) has Permit conditions with environmental standards. Conditions are required to ensure compliance of WFD and to ensure no deterioration in river quality.

## **Appendix 2 - Fluvial Flood Risk**

**Q:** Please can you confirm that flood compensation storage is only required for floodwater generated by rainfall events with a return period of up to 1 in 100 year + 20% climate change?

**A:** It will need to be shown that any land raising or increase in built footprint within the 1 in 100 chance (1%) in any year including an allowance for climate change flood extent can be directly compensated for, on a volume-for-volume and level-for-level basis to prevent a loss of floodplain storage. A peak river flow climate change allowance of 20% would be appropriate.

**Q:** Please can you provide details of floodplain compensation requirements?

**A:** Floodplain impacts should be avoided wherever reasonably possible for all events up to the 1% annual probability, including an allowance climate change. Particular priority should be given to maintaining the conveyance of flows within the channel and “functional floodplain” areas and ensuring that the flood regime (shape of the hydrograph) does not change for these frequent flooding events.

Where floodplain impacts cannot be avoided, floodplain compensatory storage should be provided as substitution for the floodplain storage lost through the development. This is to ensure the mass balance of floodplain storage capacity is maintained within the river catchment, or distinct part thereof. This is critical where more or highly vulnerable receptors, such as dwellings, could be negatively impacted by changes to flood depth/extent/hazard for flood events up to the 1% annual probability flood, including an allowance for climate change.

Where floodplain compensation cannot be provided on a level-for-level basis, wider catchment improvements / floodplain enhancements and other mitigation such as volume-for-volume (but not level-for-level) compensation may be provided elsewhere in the catchment. Detailed hydraulic modelling will need to be undertaken to demonstrate how this storage will function and that risk to people and property will not be increased (and reduced where possible).

### **Appendix 3 – Culvert Design**

**Q:** Please can you provide culvert design guidance/requirements?

**A:** We have a general position against culverting mainly due to the associated impacts on flood risk and ecology and also on the aspirations of the Water Framework Directive. It should be demonstrated that all opportunities to either divert or realign watercourses have been considered and given priority. Culverting should only be considered if these options are not physically possible and we would expect to see full justification of why culverting is the only option.

The length of any culvert should be restricted to the minimum necessary to meet the objective. The proposal must include appropriate assessment of flood risk and environmental impact. You should take into account the possible effects of climate change and future development in the catchment, on the watercourse, when calculating the capacity of the culvert. Mitigation measures such as mammal ledges must be incorporated within the design, and the work must be carried out using best working practice to minimise environmental impact.

The following link provides a useful summary on culvert design:

<http://evidence.environment-agency.gov.uk/FCERM/en/FluvialDesignGuide/Chapter8.aspx?pagenum=6>

Please take particular note of Box 8.3 ‘Golden Rules’ of culvert design.

## **Appendix 4 - Biodiversity and Conservation and Water Framework Directive (WFD)**

**Q:** Please can you provide details of environmental/habitat continuity requirements?

**A:** You will need to demonstrate that the proposals will not cause any deterioration to Water Framework Directive (WFD) waterbodies or change in the ecological conditions of the Special Protection Area (SPA). This will need to be ensured and implemented through careful design, mitigation and provision of sites for ecological compensation.

A WFD preliminary compliance assessment should be carried out as an initial overview of where likely impacts may occur and where possible mitigation measures can be realised. This is essential at an early stage to see how the proposal will fit within the requirements of the Directive.

The reason for this is that new activities and schemes that affect the water environment may impact the biological, hydromorphological and/or physico-chemical quality elements. These impacts could lead to deterioration in the ecological status or potential of a water body which is not permitted under the Water Framework Directive (2000/60/EC) unless these changes are defensible under Article 4.7.

New activities and schemes may also render proposed improvement or mitigation measures ineffective and therefore lead to the water body failing to meet its good status or potential objective.

New activities and schemes must therefore be assessed to identify whether they will:

- cause deterioration to the ecological quality elements
- lead to a failure to achieve ecological objectives
- prevent implementation of actions outlined within Stage 3 investigations thereby obstructing the achievement of 'good' status.

Where a scheme does cause deterioration or failure to meet good status/potential objectives, in order to remain compliant with WFD, a series of conditions set out by Article 4.7 will need to be adequately demonstrated.

We would like to draw your attention to the fact that during dry weather, the River Crane suffers from very low flows. This is causing a WFD failure. Please see the attached spreadsheet containing River Basin Management Plan Mitigation Measures. We would very much welcome any opportunity to implement appropriate mitigation measures to address the low flow problem in the River Crane.

The proposals are in close proximity to the South West London Waterbodies (SWLWB) SPA. The Environment Agency is a competent authority for working on wetland based designated sites. In order to ensure the integrity of the SPA and the supporting wetlands, a Stage 1 Habitats Regulation Assessment will need to be carried out on the SPA and lakes noted 'of relevance' to the SPA. This should be carried out in accordance with guidance from Natural England and will need to dovetail with the WFD assessment considering the impact on lake waterbodies.

## **Appendix 5 - Groundwater and Contaminated Land**

**Q:** Please can you confirm that infiltration may be considered in uncontaminated permeable areas of the site?

**A:** Our records show that the proposed development is located on historical landfills. We are not likely to consider the use of soakaways appropriate in this location in order to protect groundwater from further deterioration and pollution via remobilisation of contaminants in soil and/or the creation of preferential pathways for contaminant migration.

If it can be demonstrated that the ground in question is not contaminated, then we would not preclude the use of soakaways, subject to their impacts being adequately demonstrated and addressed.

The following information comes from the document GP3 (Groundwater protection: principles and practice) – Position Statement G9:

We will only agree to the use of deep pit based systems (including boreholes or other structures that bypass the soil layers) for surface water or effluent disposal if the developer can show that all of the following apply:

- there are no other feasible disposal options such as shallow infiltration systems (for surface water) or drainage fields/mounds (for effluents) that can be operated in accordance with current British Standards;
- the system is no deeper than is required to obtain sufficient soakage;
- pollution control measures are in place;
- risk assessment demonstrates that no unacceptable discharge to groundwater will take place, in particular that inputs of hazardous substances to groundwater will be prevented; and
- there are sufficient mitigating factors or measures to compensate for the increased risk arising from the use of deep structures.

GP3 is available on our website here: <http://www.environment-agency.gov.uk/research/library/publications/144346.aspx>

## **Appendix 6 – Water Resources**

The following comments are provided solely from the perspective of water resources.

### **Reservoir Capacity**

The proposal would have implications for the Wraysbury reservoir. The Lower Thames reservoirs (operated by Thames Water) are critical infrastructure for maintaining the water supply for the residents of London. The implications and mitigation options (for maintaining storage capacity) would need to be clearly understood as part of any detailed feasibility assessment.

### **Displacement of contaminated groundwater**

There are potential issues linked to land contamination (due to previous landfill activity) and/or possible implications of construction activities on local groundwater resources. This in turn could have implications for water quality both for the natural environment (e.g. local river systems) and/or existing abstraction rights (licensed or non licensed activities) within the affected area. The proposed construction method will influence how much displacement of groundwater might take place. These implications will again need to be clearly understood as part of any detailed feasibility assessment. The mitigation opportunities should equally consider options for re-use to minimise the use of potable water.

### **Moving and/or changing watercourses**

As it is likely that watercourses will need to be re-aligned and/or flow regimes changed, there could be significant environmental and/or regulatory implications. This will need to be clearly understood as part of any detailed feasibility assessment.

### **Operational Water Use**

The expectation is that with the additional passenger capacity there will be a higher water demand. This isn't a matter to consider now but at the appropriate time there will be a requirement to consider how the site will operate with respect to water efficiency and water re-use. We would expect Heathrow Airport to be exemplary in this regard.