9. Water Resources

Introduction

9.1 This Chapter, which was prepared by Waterman, presents an assessment of the likely significant impacts of the Development on flood risk and water resources. In particular, the management of surface water runoff and foul water drainage are considered. Consideration is also given to the potential impact of the Development on the capacity of potable water supply infrastructure.

9.2 This Chapter presents an overview of relevant legislation and policy, together with a description of baseline conditions, the methods used to assess the impacts and the likely significant impacts of the Development. Mitigation measures are discussed, where appropriate, to prevent, reduce or offset any significant impacts identified.

Legislation and Planning Policy Context

Legislation

9.3 The overall purpose of the Water Framework Directive (2000) is to protect and improve all controlled waters and to promote the sustainable use of water and reduce water pollution, especially by 'priority' and 'priority hazardous' substances. The Water Framework Directive sets a number of different objectives to prevent the deterioration in the quality of water bodies. Under the Directive water bodies should achieve at least a 'good status' by 2015. Where this is not possible, and subject to the criteria set out in the Directive, this target would be delayed until 2021 or 2027.

9.4 The Water Resources Act (1991) (as amended) relates to the control of the water environment. The Act aims to ensure that the polluter pays the cost of any consequences of their discharges. Aspects of the Act which are of particular relevance to the Development include the provisions concerning land drainage and flood mitigation.

9.5 The Land Drainage Act (1991) stipulates that the responsibilities relating to the drainage of land are given to the Environment Agency, Internal Drainage Boards, Local Planning Authorities (LPA), Navigation Authorities and riparian owners. Each has a role in the mitigation of flooding.

9.6 The Water Industry Act (1991) is relevant to a range of activities undertaken by the privatised water companies. The relevant provisions relate to trade effluent discharges to sewers, for which the privatised companies act as the regulatory authorities. The water companies control the nature and composition of the effluent, the maximum daily volume permitted, the maximum flow rate and the treatment works into which the effluent can be discharged.

9.7 The Flood and Water Management Act (2010) removes the automatic right of connection into public water sewers and places the onus on the LPA to adopt Sustainable Drainage Systems (SuDS). This legislation will fully come into force once secondary legislation is published in 2013, although it is currently being taken up by LPA.

National Planning Policy

9.8 Planning Policy Statement 25: '*Development and Flood Risk'* (PPS25) (2010) sets out Government policy on development and flood risk. The objectives of the policy are to ensure that flood risk is taken into account at all stages in the planning process to prevent inappropriate development in areas which are susceptible to flood risk. Where new development is located in areas of high flood risk, PPS25 aims to make such development safe without increasing flood risk elsewhere, and where possible, reduce flood risk overall.

9.9 PPS25 requires developers to provide for, and assess flood risk, including runoff implications appropriate to the nature and scale of the development proposed. PPS25 advocates the use of the risk-based sequential test, in which new development is directed towards areas of lowest probability of flooding, which are identified by Flood Zones. Flood Zone 1 is considered to have the lowest probability of flooding and Flood Zone 3 a high probability of flooding.

9.10 Practice Guidance (2009) which accompanies PPS25 states that annual flow rates up to and including the 1 in 100 year event should be accounted for, including for the effects of climate change.

9.11 Residential development is generally accepted to have a lifespan of 100 years. PPS25 (2010) suggests that for developments of this design life, increasing peak rainfall intensity by 30% may provide an appropriate precautionary response to the uncertainty of climate change impacts.

Local Planning Policy

Strategic Flood Risk Assessment

9.12 CDC and West Oxfordshire District Council Level 1 Strategic Flood Risk Assessment (SFRA) (2009) sets out the requirements for site-specific FRAs dependent upon the location of the Site. Table 13.1 of the SFRA states that with regard to Upper Heyford the porous geology could lead to potential land drainage issues and a site-specific FRA would need to include details of land drainage infrastructure.

Planning Policy

9.13 Although there are no saved policies in the adopted '*Cherwell Local Plan*' (CDC, 1996) relating to water resources, there is one relevant policy in the '*Non-Statutory Cherwell Local Plan 2011'.* Policy EN11 '*Water Resources*' stipulates that '*development would only be permitted where adequate water resources exist, or can be provided without detriment to existing use*'.

9.14 Policy SD6 of the Draft Core Strategy (2010) encourages the use of SuDS to allow for developments to better adapt to the predicted impacts of climate change based on site specific constraints. It is stated that SuDS should aim to mimic surface water flows arising from the site prior to the proposed development. There are no policies contained in the '*Draft Core Strategy*' (CDC, 2010) with respect to potable water supply.

Assessment Methodology and Significance Criteria

Assessment Methodology

9.15 A qualitative desk-based impact assessment was undertaken to ascertain the likely flood risk and drainage issues. The impact assessment was based upon the findings of the Stage 1 Flood Risk Assessment (FRA), which was prepared in accordance with the requirements and principles of PPS25. A copy of the FRA is presented in **Appendix 9.1**.

9.16 The FRA outlines the potential sources and risk of flooding on-Site. As part of the FRA, a preliminary drainage strategy was developed which outlines the principles and feasibility of implementing SuDS as part of the Development, in order to appropriately control and manage surface water runoff.

9.17 The Environment Agency and CDC were consulted to confirm the scope and key issues to be addressed within the FRA and to obtain information relating to historical flooding (see **Appendix 9.1**).

9.18 A Site visit was undertaken on 2 June 2010 to confirm points of discharge and the location of watercourses.

9.19 A qualitative assessment of the potential impact of increased demand on the capacity of potable water supply infrastructure at the Site was undertaken. The assessment was based upon available published information and a Utilities Report (Waterman Building Services, 2010) specific to the Site.

9.20 To facilitate a desk-based qualitative assessment of the potential impacts of the Development on flood risk and drainage, current baseline conditions were established using the following sources of information:

- Environment Agency's indicative flood plain map;
- Environment Agency's source protection zone map;
- Cherwell Catchment Abstraction Management Strategy (CAMS) (Environment Agency, 2005);
- '*The Environment in Oxfordshire*' (Environment Agency, 2009);
- Cherwell District Council and West Oxfordshire District Council Level 1 '*Strategic Flood Risk Assessment'* (April 2009);
- Aspinwall & Company Limited (June 1997) '*RAF Upper Heyford Land Quality Assessment, Phase Two: Intrusive Survey Factual Report*';
- Site sewer records and CCTV survey work;
- '*Revised Draft Water Resources Management Plan*', Thames Water, September 2009; and
- Utilities Report, Waterman Building Services, 2010.

Significance Criteria

9.21 There is no specific methodology or guidance for the assessment of impacts on water resources for the purposes of EIA. Significance criteria were therefore developed based on professional judgement and relevant experience. The significance criteria are set out in **Table 9.1**.

Assumptions and Limitations

9.22 The following assumptions were made in undertaking the assessment:

- areas of the Site which are not intended to be developed will continue to drain as per the existing situation;
- no infiltration discharge currently presumed within redeveloped areas due to lack of on-site soakage tests. Potential to be considered at the detailed design stage subject to confirmation of contamination, remediation and infiltration rates; and
- existing surface water runoff was calculated using the Modified Rational Method for areas of hard-standing, and the IH124 method (Marshell D.C.W & Bayliss A.C., 1994) for areas of soft landscaping.

Table 9.1: Significance Criteria for Water Resources Assessment

Significance Criteria	Description
Adverse Impact of Substantial Significance	Moderate to severe increases in flood risk. Permanent flooding or change to flow characteristics of watercourses. Moderate to severe local scale change in flow of groundwater underneath the site and/or modest changes in off-site groundwater flow. Increase in surface and/or foul water discharge which would require new infrastructure. Increase in water supply which would exceed the water resource capacity of the region and therefore require new sources e.g. application of an abstraction licence. Exceed the capacity of existing infrastructure.
Adverse Impact of Moderate Significance	Minor to moderate local scale increase in flood risk. Severe temporary flooding or change to flow characteristics of watercourses. Minor to moderate local scale change in flow of groundwater. Increase in surface and/or foul water discharge which would place undue pressure on existing infrastructure. Increase in water supply which would place undue pressure on existing local supplies and existing water supply infrastructure.
Adverse Impact of Minor Significance	A slight increase in the risk of flooding and minor and local scale change in groundwater flow. Increase in surface and/or foul water discharge which would require modifications to existing infrastructure. Increase in water supply which would place additional pressure on existing local supplies and existing water supply infrastructure.
Insignificant	No appreciable impact on flood risk. No appreciable impact on surface and/or foul water infrastructure. No appreciable impact on the capacity of water supply and the existing water supply infrastructure.
Beneficial Impact of Minor Significance	Minor local scale reduction in localised flood risk. Minor temporary local scale reduction in demand on surface and/or foul water infrastructure. Temporary local scale reduction in water supply demand and temporary increase in the capacity of existing infrastructure.
Beneficial Impact of Moderate Significance	Moderate scale reduction in localised flood risk. Minor permanent reduction in demand on surface and/or foul water infrastructure. Permanent local scale reduction in water supply demand and permanent increase in the capacity of existing infrastructure.
Beneficial Impact of Substantial Significance	Significant local scale and moderate to significant regional scale reduction in flood risk. Major permanent reduction in demand on surface and /or foul water infrastructure. Permanent regional scale reduction in water supply demand and permanent increase in the capacity of existing infrastructure.

Baseline Conditions

Topography

9.23 Topographically the Site falls in a south-easterly direction away from the ‘Flying Field’ situated to the north of the Site. Ground levels fall from approximately 127.5m Above Ordnance Datum (AOD) adjacent to the aircraft hangers to 116.7m AOD near to Field Barn Farm.

Geology

9.24 The British Geological Survey (BGS) map (Sheet 218, scale 1:50,000) shows that the solid geology underlying the Site comprises the Great Oolite Limestone, which is part of the Jurassic Great Oolite Series and consists of limestones, marls, sandstones, siltstones and mudstones. The maximum thickness of the Great Oolite Limestone is expected to be approximately 25m. The BGS map shows the Great Oolite Limestone to be underlain by the Inferior Oolite Series, which comprises the Lower Estuarine Series consisting of sandstone and thin mudstone, and the underlying Northampton Sand which consists of the sandy, shelly limestones and sandstones. The Inferior Oolite Series is underlain by the Lias Series comprising mudstones, siltstones and thin limestones.

9.25 The Phase 2 Intrusive Survey Factual Report (Aspinwall, 1997) states that shallow ground conditions at the Site generally comprise layers of silt and clay, often sandy with a significant proportion of cobble sized limestone. This is underlain by weathered limestone bedrock at an average depth of 1.5m (range of 2.6m to 0.9m) to the north of Camp Road and 1.3m (range of 2.7m to 0.8m) to the south of Camp Road.

Hydrogeology

9.26 The Site is not located within a groundwater Source Protection Zone according to the Environment Agency website. However, the Environment Agency classifies the underlying limestone bedrock beneath the Site as a Principal Aquifer. This classification refers to layers of rock or drift deposits that have high fracture permeability, meaning they usually provide a high level of water storage and they may support water supply and/or river base flow on a strategic scale.

9.27 Although there are no boreholes on the Site, seven boreholes have been advanced on the Flying Field area. Boreholes 5 and 6 are the closest to the Site are located to the north-east and south-west of the Site respectively. Borehole 5 shows very steady groundwater levels at an average of 1.2m below ground level (bgl) and a minimum of 1m bgl. Borehole 6 in comparison shows a relatively fluctuating water level located an average of 7m bgl, ranging between 4.72m bgl and 8.93m bgl.

Hydrology and Water Quality

9.28 An unnamed tributary of Gallos Brook is located along the southern boundary of the Site. Another unnamed tributary of Gallos Brook flows through the small parcel of land to the east of the main part of the Site. Gallos Brook enters the River Ray approximately 11km to the south of the Site. The nearest Main River to the Site is the River Cherwell, which is located approximately 1km to the west of the Site.

9.29 According to the '*River Basement Management Plan: Thames River Basin District*' (DEFRA & EA, 2009), the surface water quality across the District is generally good. However, the stretch of Gallos Brook from the source, which appears to be close to the Site, to Bletchingdon Stream to the south of the Site, has currently a poor ecological status. This stretch of Gallos Brook is reported to have a poor invertebrate population (DEFRA & Environment Agency, 2009).

Drainage

9.30 As shown in Figure 3 of the FRA (**Appendix 9.1**), there are four discharge locations adjacent to the Site which enter two tributaries of Gallos Brook: Outfalls 1 and 2 to the south of the Site; and Outfalls 3 and 4 to the east.

9.31 Figure 5 of the FRA shows the existing surface water drainage catchments based on information obtained through the topographic survey, on-Site records and the CCTV survey undertaken at the Site. Outfall 1 (which ultimately joins Outfall 2) drains the western area of the Site. Outfall 2 located to the south of the Site drains the central area to the south of Camp Road. Outfall 3 located beside Camp Road drains the central area to the north of Camp Road and Outfall 4 drains the north-eastern area of the Site.

9.32 There are large areas of existing residential properties in the south of the Site which do not appear to benefit from positive drainage systems. Through discussions with on-Site personnel it is understood that many of these properties are expected to have individual soakaways, although the location, size and design of these features are unknown.

9.33 The existing foul water drainage from the Site discharges to the private Sewage Treatment Works (STW) to the south-east of the Site through both a gravity and pumped foul water based network. Since the closure of the Airbase, the operational capacity of the STW has been reduced.

Flood Risk

Tidal and Fluvial

9.34 The Environment Agency's Flood Zone Map, as seen in Figure 4 of the FRA, shows that the proposed Development is located within Flood Zone 1 and has a low probability of flooding (annual exceedance probability <0.1%).

9.35 Mapping provided by the Environment Agency denotes five secondary and tertiary watercourses adjacent to the southern and eastern boundaries of the Site. The Environment Agency does not hold any records of flooding associated with these features.

9.36 The identified watercourses are located down gradient of the Site, which would not be affected by high water levels associated with extreme rainfall events or flow restrictions caused by debris in the channels. It is therefore concluded that the risk of fluvial flooding is low. Given the elevation of the Site (i.e. greater than 100m AOD) the risk of tidal flooding is effectively nil.

Groundwater

9.37 The Environment Agency and Site management team do not hold any records of groundwater flooding occurring at the Site. Furthermore, throughout the entire 10 year period of groundwater monitoring at the Site, no flooding was recorded. It is therefore considered that the risk of groundwater flooding to the Site is low.

Pluvial

9.38 Pluvial flooding occurs when natural and engineered systems have insufficient capacity to deal with the volume of rainfall. Pluvial flooding can sometimes occur in urban areas during extreme, high intensity, low duration summer rainfall events which overwhelm the local surface water drainage system; or in rural areas during medium intensity, long duration events where saturated ground conditions prevent infiltration into the subsoil. This flood water is then conveyed via overland flow routes dictated by the local topography.

9.39 There are no public sewers located on-site; however there are private sewer systems which connect into watercourses along the Site boundary. On-Site personnel have no recollection of instances of flooding at the Site over the last 40 years.

9.40 The surrounding topography gently falls in a southerly direction towards the adjacent fields. The Site would therefore only be at risk of pluvial flooding from the Site itself or the 'Flying Field'. No flooding has been reported at the Site and it is therefore assumed that the current drainage network is of adequate capacity to collect and dispose of surface water.

Water Resources

9.41 The Site is located within the catchment area of the River Cherwell. According to the '*The Environment in Oxfordshire*' (Environment Agency, 2009), across Oxfordshire the highest licensed volume of surface water and groundwater is abstracted for public water supply, accounting for 58% of the abstracted volume. In the area of the Site, water supply is largely from surface water supplies (Thames Water, 2009).

9.42 The Cherwell CAMS (Environment Agency, 2005) sets out the management of water resources at a local level. The Cherwell CAMS indicates the surface water resource availability for consumptive uses in the Water Resource Management Unit, within which the Site is located, is limited at low flows, although water resources may be available at high flows, with appropriate restrictions. Owing to a lack of large abstractions and the geology of the catchment, an assessment of groundwater resources is not included within the CAMS for this catchment.

Water Supply

9.43 Thames Water is responsible for public water supply in the locality of the Site. The '*Revised Draft Water Resources Management Plan*' (WRMP) published by Thames Water in September 2009, sets out how demand for water is balanced against the available supply over the period from 2010 to 2035. Thames Water forecast a growth in population within the SWOX Water Resource Zone from approximately 0.97 million to 1.1 million.

9.44 The Site is located within Thames Water Swindon, South and North Oxfordshire (SWOX) Water Resource Zone. The Water Resource Zone is defined as an area in which all water resources, including external transfers, can be shared and hence the zone in which all customers experience the same risk of supply failure from a water resource shortfall.

9.45 According to the WRMP, the SWOX Water Resource Zone currently has a supply demand deficit of 5% in 2009/2010. The deficit is expected to increase steadily over the planning period, with the deficit of 12% predicted in 2019/2020, which is the first assessment year provided in the WRMP after which the Development would be completed and operational.

9.46 To address the supply demand deficit, the WRMP sets out the preferred programme for reducing the deficit: this includes leakage reduction; metering; and water efficiency measures. The delivery of the programme is expected to be prioritised over other regions to reduce the deficits of the Water Resource Zone as soon as possible. Implementation of the preferred programme is predicted to significantly reduce the demand deficit to 8% in 2010/2011 and in 2019/2020 there is expected to be surplus supply of 2%. This surplus demand balance is expected to be maintained throughout the remainder of the planning period.

9.47 In addition to the above preferred measures, Thames Water is investigating longer term options. The preferred option is to construct a new reservoir near Abingdon, Oxfordshire by 2026 to supply water to Swindon, Oxfordshire and London Thames Water, 2009). Currently, it is anticipated that a reservoir with a capacity of 100 million cubic metres is required. In addition, Thames Water plan to develop new underground water sources to boost supplies in the Swindon and Oxfordshire area by 28 million litres a day. These measures would reduce the predicted gap between supply and demand for water in the SWOX Water Resource Zone.

Potable Water Supply Infrastructure

9.48 The Site has three water connections to the local grid, including: a main entering the Site from the east, terminating near to the main Site entrance on Camp Road; a main extending into the western part of the Site along the southern side of Camp Road; and a main running to the western boundary of the Site along the northern side of Camp Road. The water supply infrastructure across the Site has not been adopted by Thames Water.

Impact Assessment

Demolition and Construction Phase

Increased Flood Risk from Surface Water Runoff

9.49 Existing Site conditions comprise a combination of impermeable and permeable areas. The removal of buildings and hard-standing would temporarily increase the potential for infiltration and allow some attenuation of surface water flows. However, the impact is likely to be negligible since demolition and construction would be undertaken in phases. The main risk is likely to be an increase in runoff as a result of intense rainfall before completion of the drainage system or if ponding of surface water occurs on the Site leading to a surge of runoff into the drainage system. This would result in a temporary **adverse impact** of **minor significance**.

Completed Development

Increased Flood Risk from Surface Water Runoff

9.50 The Site currently has no surface water storage or attenuation infrastructure, and surface water runoff is currently drained into the private network before discharging into the local watercourses.

9.51 There is a downstream balancing pond located to the north of the B4030. However, it has not been possible to confirm the current performance of this feature and therefore the potential benefits of it reducing downstream flows have not been taken into account within this assessment.

9.52 Overall, the proposed Development would slightly decrease the impermeable area of the Site, although this would only give rise to a negligible decrease in the quantity of surface water runoff.

9.53 However, in accordance with national policy and the Environment Agency's aspirations, the impacts of climate change need to be taken into consideration for the lifetime of the Development, ensuring that discharge is not increased over the existing situation and where possible providing a level of betterment.

9.54 A preliminary drainage strategy has been developed and is set out within the FRA (see **Appendix 9.1).** This aims to increase the sustainability of the Site and presents options for SuDS which would be implemented as part of the Development to attenuate surface water runoff. The preferred options, which aim to reduce and attenuate runoff as close to the source as possible, are as follows:

- rainwater harvesting for the direct capture and use for domestic uses and/or irrigation of soft landscaped areas;
- permeable paving within hard-standing areas, car parking and private roads; and
- swales where appropriate within Development plots and alongside highways.

9.55 Balancing ponds are proposed where possible to enhance biodiversity within the Development. Where space constraints mean that ponds would be impracticable, underground storage tanks are proposed to manage surface water at the Site. The existing discharge rates have been calculated for each drainage catchment on-site and are included as Appendix D of the FRA (**Appendix 9.1**).

9.56 A range of storage volume estimates were calculated using WINDES Quick Storage Estimate for each drainage catchment (see Appendix D of **Appendix 9.1**). The estimated storage volumes required are based on a 1 in 100 year (plus 30% allowance for climate change) return period. Discharges from Catchments 1 and 2 have been limited to the existing rate with excess flows attenuated. The allowable discharge rate entering the watercourse from Catchments 3 and 4 would be reduced by 10% to give betterment over the existing situation. The range of the estimated surface water storage would be refined at a detailed design stage.

9.57 As demonstrated in the FRA, the inclusion of SuDS to reduce and attenuate surface water runoff would improve existing Site conditions, in accordance with current policy and guidance. This is assessed as being a local **beneficial impact** of **moderate significance**.

Impact on Capacity of Foul Water Drainage

9.58 As a result of the Development, there would likely be a greater quantity of foul water requiring treatment at the STW in comparison to the existing discharge. However, the volume should be comparable to that which previously discharged to the STW when the existing Site was fully occupied. The Environment Agency's discharge consent for the discharge of treated effluent into the Gallos Brook specifies a limit of 850 cubic metres per day. It is expected that the volume of foul water flow from the proposed residential Development would be 715 cubic metres per day, with 135 cubic metres emanating from the proposed commercial/school Development.

9.59 Since the closure of the Airbase, the operational capacity of the STW has been reduced with parts of the STW becoming redundant. Consequently, the STW would require refurbishment to bring it back into full operation. Following refurbishment, the STW would be able to accommodate the increase in foul water discharge (compared to the existing discharge) expected as a result of the Development.

9.60 Given that the estimated volume of foul water from the Development would accord with the volume specified in the existing discharge consent and would be accommodated by the capacity of the STW, the impact on the capacity of foul water drainage would likely to be **insignificant**.

Impact of Foul Water Drainage on Surface Water Quality

9.61 The effluent from the STW is discharged into a stream which currently has a poor ecological status (DEFRA & Environment Agency, 2009). By 2015, the ecological status of the stream is scheduled to be moderate, with a good ecological status to be achieved by 2027.

9.62 As mentioned above, the predicted foul water discharge is expected to comply with the conditions of the discharge consent, and that the STW would operate within Environment Agency compliance guidelines. Therefore, no further deterioration in the quality of the water in the stream would be expected. This would give rise to an **insignificant** impact on surface water quality.

Increased Demand for Water Supply

9.63 As part of the Development, new supply infrastructure would be provided for the new residential dwellings. For the existing residential dwellings, the existing infrastructure would be maintained or upgraded and replaced, where necessary. Therefore, the capacity of the water supply infrastructure would not be a constraint on the Development.

9.64 With the intensification of the Site following completion of the Development, the demand for water would increase compared to the existing conditions at the Site. Although the '*Revised Draft Water Resources Management Plan*' (Thames Water, 2009) indicates there would be a deficit in water supply and demand in 2019/2020, Thames Water has set out a preferred options programme to address the deficit in the SWOX Water Resource Zone.

9.65 CDC has set a housing target of 13,400 new homes to be built between 2006 and 2026 (CDC, 2010). The Site has been recognised by OCC and CDC as a strategic site for development, which could accommodate approximately 1,000 dwellings. Given that the Site has been identified for development, and that the demand supply forecast provided by Thames Water takes into account an increase in population within the Water Resource Zone, the additional demand on water resources resulting from the Development would be accommodated by existing resources.

9.66 Furthermore, water conservation measures would be employed to ensure that, as a minimum, the mandatory standards in the Code for Sustainable Homes would be achieved. Measures such as water efficient fittings and fixtures and rainwater harvesting for gardens (rainwater butts) would be incorporated into the Development. The incorporation of such measures would reduce water consumption, which is in accordance with local policies. Overall, the Development would likely give rise to an **insignificant** impact on the supply of potable water.

Mitigation Measures and Residual Impacts

Demolition and Construction Phase

Increased Flood Risk from Surface Water Runoff

9.67 All drainage flows and connections should be appropriately maintained throughout the demolition and construction phases. Providing this is implemented, the likely residual impact would be **insignificant**.

Completed Development

Increased Flood Risk from Surface Water Runoff

9.68 Providing the surface water drainage strategy is developed further and implemented, no additional mitigation measures would be necessary. On this basis, the likely residual impact on surface water flooding is assessed as remaining **beneficial** and of **moderate significance**.

Impact of Capacity on Foul Water Drainage

9.69 Following refurbishment of the STW, the capacity of the STW would be expected to accommodate the predicted foul water discharge flows from the completed Development. In addition, the estimated volume of foul water discharge is expected to remain within the limit specified by the discharge consent. For these reasons the likely residual impact on the capacity of foul water drainage would remain as **insignificant.**

Impact of Foul Water Drainage on Surface Water Quality

9.70 Refurbishment of the STW would likely be required as a condition on any planning consent for the Development. No further mitigation of discharge quality would be required, unless operational monitoring of the STW indicated that the required water quality improvements in Gallos Brook were unlikely to be achieved. Therefore, the likely residual impact of foul water drainage from the completed and fully occupied Development on surface water quality would remain as **insignificant**.

Increased Demand for Water Supply

9.71 Since water conservation measures would be employed to ensure that, as a minimum, the mandatory standards in the Code for Sustainable Homes would be achieved, no further measures to reduce water consumption are considered necessary. Therefore the Development's likely residual impact on the supply of potable water would remain as **insignificant**.

Conclusions

9.72 The Site is located in an area which has a very low risk of flooding from fluvial sources and a nil risk of tidal flooding. Ground levels would remain as existing and no basements are proposed. As a result, there would be no flood risk to the Development or increased flood risk off-site.

9.73 A preliminary surface water drainage strategy has been developed which includes SuDS to attenuate rainfall on-site and restrict the rate of surface water runoff into the local watercourses to the existing rate, including allowing for climate change. Furthermore, discharge entering the watercourse to the east of the Site would be reduced by 10%. The proposed Development would therefore not increase flood risk on-Site or elsewhere, which is in line with national and local policy as well as Environment Agency guidance, and would reduce flood risk overall.

9.74 The Development would increase the volume of foul water discharge from the Site to the STW in comparison to the existing Development population. However, this should be comparable to the volume that previously discharged to the STW when the Site was fully occupied and the proposed refurbishment of the STW may lead to an improvement in the quality of the treated effluent. The Development would also result in additional demand for local water supply. However, the implementation of water efficiency measures as part of the Development would minimise the increase in water consumption.