A Second Runway for Gatwick

Appendix

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Geo-environmental

YOUR LONDON AIRPORT
Gatwick

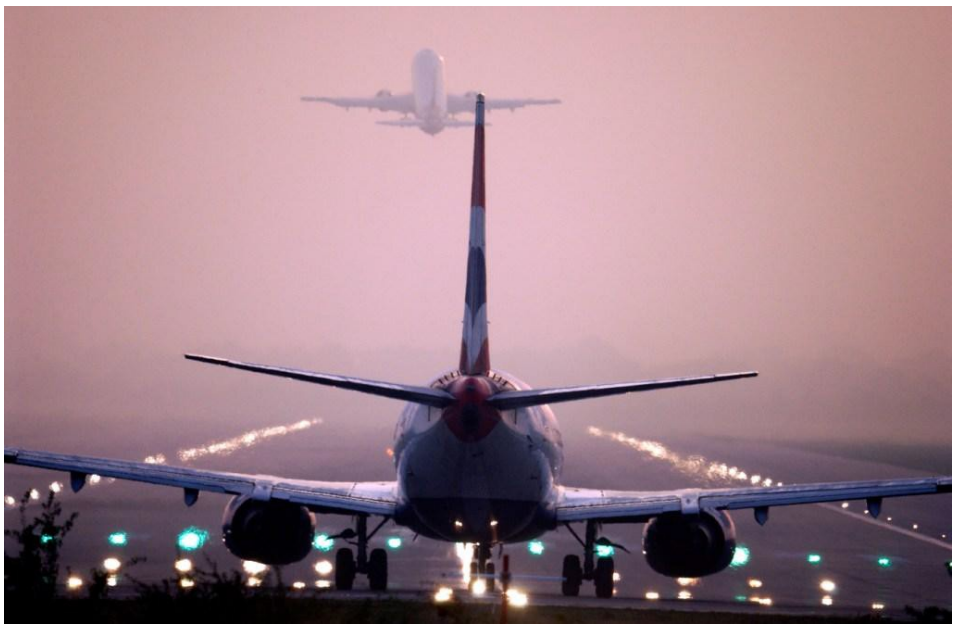
YOUR LONDON AIRPORT Gatwick

GATWICK R2

UPDATED SCHEME DESIGN FOR AIRPORTS COMMISSION MAY 2014

GEO-ENVIRONMENTAL REVIEW



7th May 2014

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EXECUTIVE SUMMARY

Gatwick Airport Limited (Gatwick) is developing a scheme setting out the feasibility and practicality of delivering a Gatwick solution to the need for additional airport capacity in London and the southeast, taking into account all the factors that would need to be managed and /or mitigated. Geoenvironmental issues are one of these key areas, as airport and adjoining land activities are known sources of potential environmental impact on soil, surface and groundwater quality. This report provides the necessary technical support to Gatwick in relation to geoenvironmental issues. This report summarises the findings of the work in the context of the Airports Commission Appraisal Framework Consultation (AFC) published in January 2014.

In order to understand the geological and environmental sensitivity of the area, and define the key receptors, a desk review has been undertaken to establish the environmental setting of the site – the surface and groundwater, geology, land quality, and sources of potential land contamination. This work supports the development of an Engineering Plan in accordance with the Commission's AFC Appendix B, addressing issues associated with potential land contamination, and the need to manage risks in a sustainable manner using a risk-based approach to optimize re-use of materials and eliminate risks to health and environment.

The study has shown that the second runway project (R2) is expected to encounter a limited volume of contaminated soils and groundwater, mainly associated with historical airport maintenance uses, a petrol station, some areas of minor industrial/commercial activity and a small number of waste recycling and management activities. There are no landfills on the development area, nor any heavy industrial land uses such as gasworks or chemical plants. There are no sites of geodiversity interest at the site, and hence no predicted impacts on geodiversity.

A hierarchy of mitigation is proposed which builds good environmental practice into the core of the approach to development of the site for R2. Residual impacts are expected to be minor negative to moderate positive, as the works would effectively eliminate any areas of land which are currently contaminated to a significant extent, and deliver a site which is fully suitable for use. The hierarchy comprises:

- The development and use of a Code of Construction Practice (COCP) to thread sustainable environmental working practice into the core of the works:
- The use of the CLAIRE: Development Industry Waste Code of Practice to optimize the re-use of excavated soils;
- The adoption of a Materials Management Plan to ensure effective control of earthworks;
- The application of site-specific remediation measures for any locally impacted sites;
- Management of ground and surface water to prevent physical impacts such as sediment run-off.

Contamination from both historical and current land use may be encountered by R2 but the impact of this would be mitigated through good working practice and correct on-site treatment. Good working practice during construction and operation would limit the potential for any contamination impact on health or the wider environment due to R2.

In addition to the scheme, Gatwick's Masterplan submission also identifies a possible alternative solution which includes taxiways around the ends of the existing runway. In relation to the assessment of effects of the scheme with EATs Geoenvironmental issues would be unchanged from that of the scheme without EATs described above. The potential Geoenvironmental effects of this option (the 'Updated Scheme Design with EATs') are described within this Report and further discussed in Appendix 6 of this report.

1 INTRODUCTION

1.1 INTRODUCTION

London needs new runway capacity by 2030, and Gatwick Airport Limited (Gatwick) can provide that additional capacity by the addition of a new runway parallel to the existing one. Gatwick has commenced a process of evaluating alternative options for provision of a second runway.

Gatwick is currently considering a second runway project (R2), comprising a new runway to the south of the existing runway, together with associated development including airport surface access connectivity from the M23 / A23, and associated passenger terminal facilities, aircraft stands, taxiways and supporting development. Gatwick would be submitting a refreshed scheme design in May 2014 to the Airports Commission (the Commission) showing the feasibility and practicality of delivering a Gatwick solution, taking into account all the factors that would need to be managed and /or mitigated. Geoenvironmental issues are one of these key areas, as airport and adjoining land activities are known sources of potential environmental impact on soil, surface and groundwater quality. This report provides the necessary technical support to the Gatwick submission in May 2014 in relation to geoenvironmental issues. This report summarises the findings of the desk study in the context of the Commission's Appraisal Framework Consultation (AFC) published in January 2014.

The Geoenvironmental impacts that are assessed in this report are based on Gatwick's Masterplan option for a new wide spaced runway to the south of the existing runway and with a new terminal between the runways. For aircraft to access the existing terminals from the proposed new runway, aircraft would have to taxi across the existing runway. Gatwick's Masterplan submission also identifies a possible alternative solution which includes taxiways around the ends of the existing runway, which would reduce or eliminate the need for aircraft to cross the existing runway. Appendix 6 of this report further discusses how the alternative option with end around taxiways would affect the results of the appraisal.A site location plan is provided as Figure 1. Figure 2 delineates the site boundary which this assessment is based on. The proposed development for the purpose of this assessment has been split into sections, presented on Figure 2.

The existing soil and geological conditions, together with the influences of historic industrial and current land use activities of a site can impose constraints on a proposed development. The proposed area for R2 has been locally affected previously by industrial / commercial activities, and has a varied geological setting.

Construction works which disturb land contamination, in the absence of mitigation measures, present a risk of remobilising contaminants and causing additional contamination through migration in drainage and groundwater, and in the air. In addition, direct exposure to contaminated material can potentially present a risk to those in its immediate vicinity, including construction workers and off-site neighbours.

1.2 OBJECTIVES

The objective of this geoenvironmental review is to assess the ground quality and potential contamination in the area of the proposed new airport development and consider the ground-related wastes that would be produced as a result of the proposed scheme. Both the impacts during construction and the long term impacts during operation are considered.

1.3 The assessment has been undertaken in the context of the Commission's AFC. The document is structured as follows:

Section 2 - sets out the methodologies used in the report in the context of the Commission's AFC and other relevant guidance. It describes the study area and introduces assessment criteria;

Section 3 – outlines the planning and regulatory context of the works and describes the baseline conditions of the current site;

Section 4 – describes the assessment of the potential impacts of the scheme in relation to geoenvironmental issues during the construction and operational phases and outlines applicable mitigation measures than may be adopted; and

Section 5 - presents the conclusions of the Geoenvironmental assessment.

2 METHODOLOGY

2.1 RELEVANT GUIDANCE

2.1.1 The Appraisal Framework

The Appraisal Framework Consultation deals with geo-environmental issues as part of the Engineering Plan, but the need to understand the environmental setting and geo-environmental sensitivity of the area threads it way through other Appraisal Appendixes such as Water and Place, and interacts with the need to manage waste in accordance with the Waste Hierarchy. It should be noted that flood risk issues flagged under the geo-environmental section of the Framework would be dealt with under the Water and Flood Risk Appendix Report.

The overall objective of the work dealt with in this report is to minimise impacts on geological conservation interests, maintain geodiversity, optimise the re-use of soils and protect land quality. The Sustainability Framework developed by Gatwick has further identified the following sub objectives:

- Would the proposal affect or be affected by any areas of land contamination?
- Does the proposal include appropriate measures to treat/remediate contaminated land and appropriately consider the associated costs?
- Does the proposal affect sites of importance for geodiversity protected under national legislation?
- Does the proposal affect sites of importance for geodiversity protected at regional or local level?
- Does the proposal address physical constraints to construction activity?
- Does the proposal minimise and manage pollution risks during construction?

2.1.2 *How has the AFC been applied?*

The base case for geo-environmental issues has been established by undertaking a detailed desk study of the land needed for the new airport development and a buffer zone around this of 250m width. This allows us to take account of possible migration of contamination through permeable ground to the development area, as well as looking at direct impacts.

The review comprises establishment of the environmental setting and the quality of land as measured by the potential for chemical contamination, and to a lesser extent, physical aspects such as soft soils or peats. This allows us to build a Conceptual Site Model which sets out the well-established Source-Pathway-Receptor model for identifying risk of impacts which might arise as a result of the construction and operation of the airport scheme.

The environmental setting defines:

- The superficial and bedrock geology;
- The presence of aquifers and non-aquifers;
- The location of surface water bodies;
- The location of areas of ecological or geodiversity interest;
- The proximity to built development which would remain after completion of the works.

Potential sources of contamination are then defined by the assessment of historical and current land use, using a range of sources of information. These present the baseline source mapping.

Pathways are defined by the nature and permeability of the geology, and the presence of aquifers which might provide a pathway of transmission of a contaminant, as well as acknowledging that air also provides a pathway for dust, gases and vapours.

Receptors are defined by the mapping of aquifers, surface water bodies and proximity to remaining housing or employment use land and sensitive ecological or geodiversity receptors around the perimeter of the new airport scheme. Clearly, receptors which currently lie within the footprint of the scheme would be impacted to the extent that they may be covered altogether, but below ground receptors (such as aquifers) would be identified and possible impacts mitigated.

The detailed desk study is provided as Appendix 1.

2.2 OTHER RELEVANT GUIDANCE

A desk based collation and review of relevant available information has been carried out in order to identify areas of the site at risk from potential contamination principally associated with historical or current land use. The work has been carried out in accordance with the Model Procedures for the Management of Land Contamination, CLR 11, published by the EA and Defra.

2.2.1 *Collated Documentary Information*

The main sources of information used to compile the desk study, and on which the Conceptual Site Model is based are set out below.

- Ordnance Survey Land ranger Map of Dorking & Reigate, Sheet 187, 1:50,000 series;
- Landmark Envirocheck Report dated 5 February 2014 (*Ref: 53013699_1_1*, dated 5th February 2014);
- Environment Agency webpage '*What's in Your Backyard*?' http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=_e
- BGS Webpage '*Geology of Britain Viewer*' http://mapapps.bgs.ac.uk/geologyofbritain/home.html

2.3 DEPARTURES FROM THE AFC

Apart from the inclusion of flood risk in the Water and Flood Risk Appraisal Appendix, this report covers geo-environmental issues in accordance with the Framework.

2.4 STUDY AREA

The Site is located north of the town of Crawley and adjoins the present boundary of Gatwick Airport (see Figure 1). The current land use is predominantly agricultural land, although there are a number of areas of land or individual sites where land contamination may exist due to historical or current land uses. These are summarized below with reference to Figure 2.

Figure 2, divides the site into six zonal areas designated A-F. The site has been split into zones for the purpose of historical site description presented in Appendix 1. The greater part of the proposed development would occur in Zones A, B, C & F.

Zone A
The north west part of this zone contains the far western end of the present runway and taxiways. The wider area is undeveloped agricultural land.

Zone B
The greater part of the proposed new airport development within and adjacent to the site lies within this zone. Maintenance Area 1 is located along the northern boundary of the site, directly adjacent to the current airport boundary, and has the potential to be locally impacted with oils, fuels and other chemicals used in maintenance work. There is an industrial estate located directly to the south of the current airport boundary (on site) at Lowfield Heath, which has land uses which might be a source of localized contamination.

To the south east of the airport boundary there is an office development around the Gatwick Beehive at City Place, and this is contiguous with the Manor Royal Industrial Estate. The latter falls within the airport boundary between the railway line and Rowley Wood. It has a range of small scale uses which could have caused local contamination.

A number of small, very localized potentially contaminative activities have been identified in the agricultural area to the south of the existing airport, including a licensed soil/construction waste recycling facility and a number of storage tanks (farm-related).

Zones C and F
Towards the east of the site, on the eastern side of the railway line, a large sewage works is located to the east south east of the current airport boundary and large car parks are situated in the east of the proposed new airport development area. Towards the far east of the zones are a small number of licensed waste activities including two soil recycling and metal recycling processes. A site visit identified that within the area east of the railway, there are also a small number of properties identified as having possible unlicensed waste processing activities on site. The exact nature of the activities could not be confirmed as access to the properties was not possible at the time of the site visit.

2.5 CONSULTATION

No consultations with the local authority and Environment Agency have been undertaken to date.

2.6 ASSESSMENT CRITERIA

2.6.1 *Environmental Risk Classification Methodology*

To assess the significance of a historical and/or current land use within the proposed development area on land quality the following criteria have been adopted.

2.6.2 *Contamination*

Historical and Current Potentially Contaminating Land Uses

In order to identify and broadly categorise areas of potentially contaminated land within a 250 m radius of the R2 site boundary, a desk-top review of information on the current and historical land uses has been undertaken.

The desk-top investigation was based on a detailed assessment of historic maps (1:2,500 and 1:10,000 scale) for the area, trade directory entries and sites subject to permits or licenses to identify activities that may have resulted in land contamination.

The desk based assessment has established that historical or current heavy industry activities were not located within the site boundary and surrounding area, and that sites that have been identified to be potentially contaminated can be readily remediated.

Uses of land in the area of the proposed scheme, with the potential to contaminate, have been identified and segregated into three Contaminative Use Classes as follows:

Class 1 – historic or current land uses with a low contaminating potential e.g. caravan park and car park;

Class 2 – historic or current land uses with a moderate contaminating potential e.g. waste transfer facility, sewage works, industrial estate with mixed use; and

Class 3 – historic or current land uses with a high contaminating potential e.g. Fuel/chemical storage tanks, petrol stations.

The results of the historical and current land use review whereby each land use has been assigned a class as defined above is presented in Appendix 2, Table 1 to 4. It should be noted that the mere presence of a contaminative land use does not automatically present a risk, as it is just the first part of the Source-Pathway-Receptor model. Its proximity to sensitive receptors and the potential existence of pathways finally define the risk rating for a site.

2.6.3 *Land Quality*

In order to assess the potential impacts of R2 on the geology and hydrogeology of the area, a baseline risk assessment has been undertaken. This involved reviewing available information on the geology, hydrology and hydrogeology, assessing the geological conditions and, therefore, the groundwater vulnerability and sensitivities of the area. The characteristics of a groundwater body are highly dependent on the geology that it flows through, as geology influences the nature of the body, its flow rate, quality and potential yield. Any contamination of the surrounding geology has the potential to leach into the groundwater, and depending on the size and connectivity of the body, may then migrate to impact a wider area, including surface water whereby the groundwater provides base flow to surface water bodies.

Hydrogeological Risk Rating Methodology

Figures 3 and 4 set out the geology and hydrogeology of the site, and define where groundwater bodies are likely to be present and the status of these aquifers. Each potentially contaminative land use identified as above (*Section 2.6.2)*, has been assessed against the sensitivity and vulnerability of the underlying hydrogeology of the site, and each potentially contaminative land use has then been allocated a risk rating as follows:

Risk Rating 1- Low hydrogeological environmental risk, whereby the land use is overlying an Unproductive Aquifer;

Risk Rating 2 - Moderate hydrogeological environmental risk, whereby the land use is overlying a Secondary Undifferentiated Aquifer; and

Risk Rating 3 - High hydrogeological environmental risk, whereby the land use is overlying a Secondary A Aquifer.

It should be noted that there are no Principal Aquifers underlying the R2 site. The results of the hydrogeological screening review whereby each site has been assigned a risk rating is presented in *Appendix 3.*

Hydrological Risk Rating

Figure 5 sets out the location of all surface water bodies at the site. Each potentially contaminative land use identified as above (*Section 2.6.2)*, has been assessed against the sensitivity and vulnerability of the hydrology of the area, and each site has then been allocated a risk rating as follows:

Risk Rating 1 - Low hydrological environmental risk, whereby the land use is located at a distance greater than 100 m from the nearest surface water body;

Risk Rating 2 - Moderate hydrological environmental risk, whereby the land use is located at a distance between 50 m and 100 m from the nearest surface water body; and

Risk Rating 3 - High hydrological environmental risk, whereby the land use is located adjacent to and up to 50 m from the nearest surface water body.

The results of the hydrological screening review whereby each site has been assigned a risk rating is presented in Appendix 4, Table 1 to 4.

Risk Category Methodology

An assessment of the source - pathway - receptor relationship for each site has been undertaken resulting in each site being allocated a Risk Category number. The Risk Category for each site has been calculated by multiplying the numerical ratings for each criterion: contaminative land use; hydrogeological risk rating; and hydrological risk rating. The resulting calculated risk rating is then assessed as follows:

0 to 3 - Low Risk; potential for limited land contamination and removal/treatment would require no /limited mitigation measures to protect human health and the environment;

4 to 8 - Moderate Risk; potential for moderate land contamination, and removal/treatment would require mitigation measures to protect human health and the environment; and

9 to 18 – High Risk; potential for more intense land contamination and removal/treatment would require extensive mitigation measures to protect human health and the environment.

The results of the Risk Category review whereby each site has been assigned a risk Category is detailed in Appendix 5, Table 1 to 4. *Figure 6* shows the outcome of this assessment. In summary, a total of 61 land areas within the R2 development area have been identified as having a potential historical or current contaminative land use. In accordance with the risk categorization process, 15 sites are assessed to have a possible high risk use, 27 have a moderate risk use, and 19 are low risk (one of which is located within the landtake for EATs). It should be noted that this predictive approach is not confirmation that actual land contamination exists, but provides a tool to prioritise and focus future site investigation on those areas with the greatest potential to have contamination and which is also relatively close to sensitive receptors.

3 BASELINE CONDITIONS

3.1 PLANNING AND REGULATORY CONTEXT

With respect to the Site, which is proposed to be developed for airport and commercial land use, the Planning Regime is considered the primary regulatory framework, although it should be noted that implicit within this is the requirement that the Site should no longer meet the definition of Contaminated Land under Part 2A of the Environmental Protection Act 1990.

Where a site is subject to redevelopment the Town & Country Planning Act 1990 normally requires the grant of planning permission. Contamination of land, or the possibility of it, is a material planning consideration, and a developer would need to undertake work to establish the extent and nature of contamination, and define appropriate remediation works.

The National Planning Policy Framework identifies that planning policies and decisions should ensure that:

- The site is suitable for its new use taking account of ground conditions and land instability, including from natural hazards or former activities such as mining, pollution arising from previous uses and any proposals for mitigation including land remediation or impacts on the natural environment arising from that remediation;

- After remediation, as a minimum, land should not be capable of being determined as contaminated land under Part 2A of the Environmental Protection Act 1990; and

- Adequate site investigation information, prepared by a competent person, is presented.

More detailed assessment, and the remediation work itself may be controlled through conditions attached to the permission, or by separate legal agreements. A number of statutory guidance notes have also been published by DEFRA and the EA, as well as local authorities dealing with activities relating to developments on sites affected by contamination. These include, but were not limited to:

- DETR Circular 01/2006 on Contaminated Land; and
- DEFRA/EA – CLR 11 Model Procedures for the Management of Land Contamination.

3.2 KEY PROJECT PARAMETERS

The key findings of work are set out below.

3.3 BASELINE CONDITIONS

3.3.1 Geology

According to the geological maps for the area, the site is underlain by drift deposits which are limited in coverage and relate to specific surface water features. The drift deposits underlying the site are presented on Figure 3. The drift deposits includes Flandrian aged Alluvium, comprising silty clay, silt, sand, peat and gravel. Quaternary deposits of River Terrace deposits are also present at locations associated with surface water features associated with the Rive Mole system. River Terrace Deposits comprise of sands and gravels, with lenses of silt, clay or peat are also associated with the river systems. Finally there is a small area located towards the centre of the current airport which is underlain by Quaternary Head Deposits of glacial origin, and this comprises of clay, silt, sand and gravel.

The solid geology (presented on Figure 4) underlying the majority of the site is the Weald Clay Formation, specifically the mudstone unit, and this comprises of a weathered brown/grey stiff fissured clay becoming dark grey thinly-bedded mudstones (shale) and mudstones with siltstones and fine- to medium-grained sandstones. Limited areas of Ironstone Weald Clay also underlie the site; Weald Clay is of the Cretaceous Period. The southeast corner of the development area is underlain with Upper Tunbridge Wells Sands, comprising of a succession of interbedded deposits of thinly bedded silty mudstones, siltstones, silty sandstones and fine-grained sandstones which are laterally persistent over long distances.

There are no geodiversity sites designated at either a national or local level in or within 50 metres of the site. In addition there are no mineral safeguarded areas or areas of mineral identified for extraction in the Local Minerals Plan.

3.3.2 Hydrogeology

According to the Environment Agency website the superficial deposits of River Terrace Deposits and Alluvium are classified as a Secondary A Aquifer, described by the Environment Agency as *' permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers'*. The small area of Head Deposits has been classified as a Secondary Undifferentiated Aquifer, described as *'cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type'*. The drift deposits aquifer designation is presented on Figure 3.

The underlying bedrock Weald Clay Formation has been classified as Unproductive Strata, described by the Environment Agency as *'rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow'*. The Upper Tunbridge Wells Sand formation located to the south east of the site has been classified as a Secondary A aquifer. The bedrock aquifer designation is presented on Figure 4.

The Environment Agency website indicates that the site is not located within a groundwater source protection zone and is not located within a groundwater nitrate vulnerable zone.

According to the *Envirocheck* report there is one groundwater abstraction on site, registered to Jeals Nurseries (Fernhill) Ltd, for general farming and domestic use. A second groundwater abstraction is location off site located 170 m south west of the site, registered to Eskimo Ice (London) Llp, for food and drink general use.

3.3.3 Hydrology

There are a number of watercourses that are located on site and within the surrounding area, which are presented on Figure 5. Under the River Basement Management Plan, according to the Environment Agency website the current and predicted (2015) ecological potential of the surface water bodies are presented in *Table 3.1* below.

Table 3.1 Ecological Potential of Surface Water

Water Course	Current ecological potential	Predicted ecological potential (2015)
River Mole (Crawley to Gatwick)	Moderate	Moderate
River Mole (at Gatwick Airport)	Moderate	Moderate
River Mole (Horley to Hersham)	Poor	Poor
Man's Brook	Moderate	Moderate
Tilgate Brook	Moderate	Moderate

It should be noted that under the River Basins Management Plan, there is no requirement to classify the surface water bodies within the area of the current Gatwick Airport and therefore no data was available on the EA web site regarding the chemical quality of the surface water bodies.

According to the *Envirocheck* report, there are no surface water abstractions registered on site or within 250m of the site.

According to the Environment Agency website the site is located in a surface water nitrate vulnerable zone.

3.3.4 *Sensitive Land Uses*

According to the *Envirocheck* report there are designated Adopted Green Belts located at the far eastern site of the development and beyond (Zone C & F), adjacent to the north west boundary (Zone A & D) and north of the existing airport (Zone D & E). There are no sites of special geodiversity interest in the site area.

3.3.5 *Historical Land Use*

The site and surrounding land use has predominantly been used for agricultural purposes which have the potential for localized contamination only relating to farming practices. Until the construction of the original (WW2) and current airport, limited industrial activity took place within the vicinity of the site. Industry has grown up around the existing airport in specific localities but is mainly small scale commercial activity such as workshops, storage depots and retail/business parks.

3.4 *FUTURE BASELINE CONDITIONS*

A permanent change to the geology in the area of the development would be created by a reduction in the thickness of drift cover overlying the bedrock in the development and building excavation areas. As the drift cover is naturally limited in extent over the low permeability bedrock, the effects of the removal of drift deposits would be localised and of minor significance during the construction and operation of R2.

It is likely that shallow groundwater flow patterns would be permanently affected by R2, with cuttings shifting flow direction and runway drainage potentially acting as a conduit for flow, but groundwater paths are expected to adapt and restabilise. The effects of the change in flow patterns are therefore likely to be localised and of minor significance.

On completion of construction, the development would affect shallow groundwater due to changes in drainage and infiltration resulting from the introduction of large areas of hard standing.

4 SCHEME ASSESSMENT AND MITIGATION

4.1 ASSESSMENT OF CONSTRUCTION IMPACTS

4.1.1 Land and Groundwater Quality

Little or no change in land quality baseline is likely to occur between now and the start of construction. The construction process would create a major change in ground levels, as the land is cut and filled to formation and foundation levels. Top soil would be removed across all built areas and re-used as needed. The future condition of the site for the operational stage of the development would consist of limited areas of land remaining unpaved, and this unpaved land would comprise either natural clays, gravels or mudstones, or reworked compacted natural soils.

There would be a potential for impacts to groundwater wherever dewatering activities are carried out during construction. To limit the impact of dewatering activities, it is envisaged that the groundwater would be discharged in a manner which would replace lost baseflow to the river. It is therefore considered that the dewatering activities would be of minor significance.

Some surface water courses would require realignment or be culverted to enable the construction of the R2 development. Any diverted surface waters would ideally be redirected back to surface waters, after any necessary treatment such as removal of suspended solids. It is therefore considered that the surface dewatering activities would be of minor significance.

4.1.2 Contamination

In advance of the main works, a detailed site investigation would be undertaken focused on those sites identified in this study which have a moderate or high risk of contamination and where the new development is likely to cut into the existing ground for the purposes of reaching formation levels. The investigations would include detailed sampling and laboratory analysis of soils and waters to characterise the sites and underlying water bodies. If contamination is encountered during construction, there is a potential for the contaminated land to impact human health, ground water and surface water. The necessary mitigation measures to reduce risks to human health and the environment would be adopted. In terms of risk to site workers, these measures would include processes to design out the risk, reduce the risk or protect against the risk by adoption of suitable levels of personal protective equipment (PPE) worn by earthworks personnel.

Measures would be put in place to prevent any contaminated material impacting on groundwater or surface waters. This would include strict segregation of contaminated material into areas where contaminants cannot leach into water bodies/courses.

Contaminated material would either be treated to improve quality or used in a location where it is suitable for use without further treatment.

The presence of contamination would require mitigation in terms of the materials used during construction. For example, concrete foundations would have to be resistant to chemical attack where aggressive contaminants are present in soils or groundwater. To enable the correct materials to be used, soil samples would be taken from sites with a contaminative potential (as identified by desk study) and analysed for aggressive chemicals such as sulphates and hydrocarbons. The results of the analysis would then be used to specify the necessary resistant materials, such as sulphate-resistant concretes.

Measures and procedures to enable the correct handling and treatment of contaminated areas would be developed and integrated within the Code of Construction Practice (CoCP) as the document evolves.

4.1.3 Waste

Spoil removal and disposal would be undertaken throughout the construction phase of the works.

The Project would seek to maximise the reuse of some of the excavated material on site under the *Definition of Waste: Development Industry Code of* Practice. It is possible but unlikely that some material may require landfill disposal. Due to the volume of spoil to be generated from site it is essential that a robust Material Management Plan is adopted. The movement of materials around the site would have an impact on the traffic movements in the area as well as on noise levels and air quality.

The impacts associated with the removal and reuse of spoil is considered to be moderate. Whilst the development of R2 may require the excavation and reuse of a significant volume of material, the land is not geo-environmentally sensitive or of major geological importance. Mitigation of this impact is limited by the generally good quality of soils to be excavated, and the need for re-use of such material over similar geology.

Other solid wastes and liquid wastes would not impact on the site as they would be handled in a controlled manner with the necessary mitigation measures in place. The impact of the removal and disposal of other construction and operational solids and liquid waste is therefore considered of minor significance.

The interaction of the built development with potential land contamination would be driven by the scheme layout and level. The runway, taxiways and aprons would be set at a level which, amongst other factors, would take account of the need to balance cut and fill of ground. The terminal building and satellite structures would have linear deep below ground structures to facilitate the construction of people-movers from the MidField Terminal out to the Midfield Satellite stands. These would require excavation down through the weathered Weald Clay into

mudstones. Other shallow features such as balancing ponds would require some excavation and some raised bunds, with a sealing layer to the interior of the structure. Materials to create both the bunds and the sealing layers are likely to be present on site. Where the identified possible land contamination sites coincide with excavation for the development, there is the potential to generate contaminated soils which may not be suitable for use without further treatment. However, different locations on site where soil is needed for building purposes (for example for noise or landscape bunds) may have lower sensitivity and impacted soil may be re-used in such locations without treatment. Acceptability criteria would be developed based on environmental and health risk factors to support this process.

4.2 ASSESSMENT OF OPERATIONAL IMPACTS

4.2.1 Ground Quality

The operation of R2 would have no direct impact on the geology of the site.

A permanent change to the geology in the area of the development would be a reduction in the thickness of drift cover overlying the bedrock, or a reduction in the thickness of the weathered zone of the bedrock itself in the building excavation areas. As the drift cover is naturally limited in extent over the low permeability bedrock, the effects of the removal of drift deposits or weathered bedrock would be localised and of minor significance during the operation of R2.

It is likely that shallow groundwater flow patterns would be permanently affected by R2, with cuttings shifting flow direction and runway drainage potentially acting as a conduit for flow, but groundwater paths are expected to adapt and restabilise. The effects of the change in flow patterns are therefore likely to be localised and of minor significance.

4.2.2 Contamination (see also section 4.5.2).

It is standard practice and operationally essential to undertake large scale deicing of paved surfaces and aircraft at the airport when conditions require. The airport drainage design would accommodate these activities and direct the run-off towards appropriate storage and treatment facilities. These activities should not, therefore, give rise to impacts except perhaps immediately within the pollution control system itself.

Nevertheless, the operation of R2 has the potential to cause impacts through unintentional spills of fuels, de-icing or other hazardous chemicals used during maintenance works etc. It is envisaged that the existing robust preventative measures and emergency and spill procedures would be extended to cover the R2 areas.

Any contaminated land issues on the site would be addressed during the construction phase.

The impact of potential contamination during the operation of R2 is considered to be of minor significance.

4.2.3 Waste

Solid and liquid wastes from maintenance activities (eg oils and greases, de-icing, discarded components) would be produced during operation and could impact the ground if handled incorrectly. It is envisaged that best practice methodologies would be adopted by R2 once developed to prevent significant impacts occurring during the scheme's operation. These measures already form part of the Gatwick Airport Environmental Management System (EMS), certified to ISO 14001.

4.3 ASSESSMENT OF CONSTRUCTION IMPACTS WITH MITIGATION

The following mitigation would be implemented to address the environmental impacts identified within this report.

4.3.1 Physical Ground Quality

Mitigation measures would be taken to limit potential physical impacts to ground quality.

- For temporary land uses, topsoil would be removed and stored for reuse after the temporary activity has ceased. The topsoil would be stored in an appropriate manner to ensure it is suitable for reinstatement. To assist in the re-establishment of vegetation, sub-soil horizons would be removed and stored separately.

- Measures to reduce the amount of exposed soils on the site would be introduced during the construction phase to minimise the potential for increased siltation and contaminated run-off. Such measures may include the covering of areas of exposed soils where possible and the introduction of timing controls i.e. conducting major soil stripping activities during calm weather (to reduce sediment mobilisation by water and air) or the damping down of potential dust areas during dry periods. Measures to minimise soil mobilisation by avoiding the removal of unnecessary vegetation during the construction phases and rapid replanting on completion of works would also be adopted. As the CoCP develops, these measures would be progressed for implementation and management during the construction phase.

- Physically poor quality soils such as soft clays may need to be lime-treated to improve their handling properties.

- The drainage design would incorporate measures to prevent any contaminated runoff associated with the construction or operation of the scheme from entering and polluting the local surface water drainage system.

- Any spoil or soil that is stored on site would be located in areas which minimize risk of sediment run-off to surface water . Measures would be introduced to control the location, duration and stability of stockpiles.

4.3.2 Contamination

In advance of the main works, a detailed site investigation would be undertaken focused on those sites identified in this study which have a moderate or high risk of contamination and where the new development is likely to cut into the existing ground for the purposes of reaching formation levels. The investigation would include chemical analysis of soil and water samples to establish the level of contamination. Where contamination is encountered during investigation, a risk assessment would be carried out to identify the risks posed by the contaminants to the airport scheme and the wider environment. This assessment would include further development of a conceptual site model identifying the source, pathways and receptors for each contaminated area encountered. The assessment would determine the levels of contamination which would lead to a potential risk to the identified receptors for the given end use of that area of the scheme and determine the amount of clean up required.

There would be a *Hierarchy of Mitigation* for contamination encountered during the construction period as follows:

- *Code of Construction Practice*: which sets out the rules governing construction works in terms of environmental and health protection and the steps which would be taken to minimise the exposure of construction workers and site neighbours to contaminants if encountered. The exposure of construction workers would be limited by varying design and working practices or use of personal protective equipment. Steps would also be taken to ensure contaminated material is removed promptly from site to limit the creation of contaminated run off from any stock piles of contamination. If justified by the amount of contaminated soil encountered (and to date, only relatively small volumes of soil at the site are expected to be significantly contaminated), a temporary soil treatment centre would be set up site to treat the soil to a standard where it can be re-used elsewhere on the development. The exposure to site neighbours would be controlled by dust, vapour and odour prevention measures.

- *CLAIRE Definition of Waste: Development Industry Code of Practice:* The Project would work within the framework of the Waste Code of Practice (WCOP) and adopt a risk based approach to contaminated soils. A Material Management Plan (MMP) would be produced and chemical re-use criteria developed to allow the movement of impacted soils to areas of the site that are seen to be suitable for reuse, and this would greatly reduce if not eliminate the

requirement for off-site disposal. The WCOP is a leading edge approach to ensuring compliance with the waste management regulations and the sustainable use of soils of varying quality in major construction projects. The WCOP has already been used successfully on a number of projects at the airport.

- *Site Specific Remediation:* Areas of the site that have been identified to have significant potential contamination e.g. petrol stations, may warrant advance remediation work ahead of the general construction works. This would render the site suitable for use, or ensure that soil arisings from the site can be re-used in a timely fashion during the works.

- Any groundwaters migrating through contaminated materials may be impacted, and treatment measures may be required prior to discharge of this groundwater into the drainage system or to airport balancing pond and treatment system.

- Any works with the potential to contaminate or otherwise affect groundwaters would be conducted in accordance with EA guidance, consultation and any consents issued.

- Contamination can lead to potentially aggressive local ground conditions and this would be countered by use of appropriate resistant materials for drainage pipework, foundations and other below ground elements.

On the basis of the above mitigation measures, the impact on the health of neighbours and construction workers and the wider environment from contaminated soils and groundwater is expected to be negligible.

4.3.3 Other

During construction work, dust and noise monitoring would take place. Within areas that have been identified to be potentially contaminated, vapour monitoring at the boundary of the site, and within the work area would be undertaken. These activities would be managed through the COCP.

4.4 ASSESSMENT OF OPERATIONAL IMPACTS WITH MITIGATION

4.4.1 Physical Ground Quality

It is not envisaged that the ground quality would be affected significantly during operational phases of the R2. The removal of drift deposits and therefore minor changes to groundwater water would be localized and of minor significance, in addition to the minor changes to surface water flow patterns.

4.4.2 *Contamination*

During the operational phase of R2, it is envisaged that the present good environmental practices adopted by Gatwick Airport, as set out in the ISO 14001 EMS, would be extended to the new site. These include good storage and handling of material e.g. ensuring all fuel tanks have double containment should leaks occur. Contaminated run off should be directed to settling ponds prior to discharge to the sewage works (as per current airport practices).

4.5 *CUMULATIVE AND INTER-RELATED EFFECTS*

Land uses that may be constructed and/or operated at the same time as R2 include:

- the current airport and associated buildings; and
- planned realignment of the A23.

This section discusses the likelihood of any cumulative impacts associated with physical ground quality, contamination and waste occurring.

4.5.1 *Physical Ground Quality*

The introduction of additional hard standing associated with the R2 development would add to changes in drainage in the area around the current and extended airport.

The A23 realignment and R2 have the potential to cumulatively affect shallow groundwater flow patterns during construction. However, construction periods are likely to be concurrent but would not occur at the same location. It is therefore unlikely that significant cumulative impacts would result from the construction of the schemes.

On completion of construction, the development would moderately affect shallow groundwater due to changes in drainage and infiltration resulting from the introduction of areas of hard standing.

4.5.2 *Contamination*

The operation of the current airport has the potential to cause impacts from a variety of activities including:

- accidental spilling or venting of aviation fuel during aircraft refueling;
- accidental spillage or incorrect application of aircraft or pavement de-icing media;
- aircraft and vehicle washing activities; and
- aircraft maintenance activities (fuels, oils, hydraulic fluids, degreasants, etc).

The airport has a comprehensive set of procedural and physical control measures which act to reduce the likelihood of contamination and ensure that, where spillages occur, they are contained.

Despite the above, localized contamination may be expected to be encountered at particular locations on the existing airport site, for example at Maintenance Area 1. This contamination may further impact contaminated material encountered during the development works.

It can be considered likely that contaminated spoil would be encountered during the construction of R2 and the A23 realignment. Providing the works are planned in the context of the overall Materials Management Plan and in the context of the WCOP, and materials retained on site, effects are predicted to be negligible.

5 CONCLUSIONS

In order to understand the geological and environmental sensitivity of the area, and define the key receptors, a desk review has been undertaken to establish the environmental setting of the site – the surface and groundwater, geology, land quality, and sources of potential land contamination.

This work supports the development of an Engineering Plan in accordance with the Commission's AFC, addressing issues associated with potential land contamination, and the need to manage risks in a sustainable manner using a risk-based approach to optimize re-use of materials and eliminate risks to health and environment.

A hierarchy of mitigation is proposed which builds good environmental practice into the core of the approach to development of the site for R2. Residual impacts are expected to be minor negative to moderate positive, as the works would effectively eliminate any areas of land which are currently contaminated to a significant extent, and deliver a site which is fully suitable for use. The hierarchy comprises:

- The development and use of a Code of Construction Practice to thread sustainable environmental working practice into the core of the works:
- The use of the CLAIRE: Development Industry Waste Code of Practice to optimize the re-use of excavated soils;
- The adoption of a Materials Management Plan to ensure effective control of earthworks;
- The application of site-specific remediation measures for any locally impacted sites;
- Management of ground and surface water to prevent physical impacts such as sediment run-off.

The study has shown that R2 is expected to encounter a limited volume of contaminated soils and groundwater, mainly associated with historical airport maintenance uses, a petrol station, some areas of minor industrial/commercial activity and a small number of waste recycling and management activities. There are no landfills in or near the development area, nor any heavy industrial land uses such as gasworks or chemical plants. There are no sites of geodiversity interest at the site, and hence no predicted impacts on geodiversity.

Contamination from both historical and current land use may be encountered by R2 but the impact of this would be mitigated through good working practice and correct treatment. Good working practice during construction and operation would limit the potential for any contamination impact on health or the wider environment due to R2.

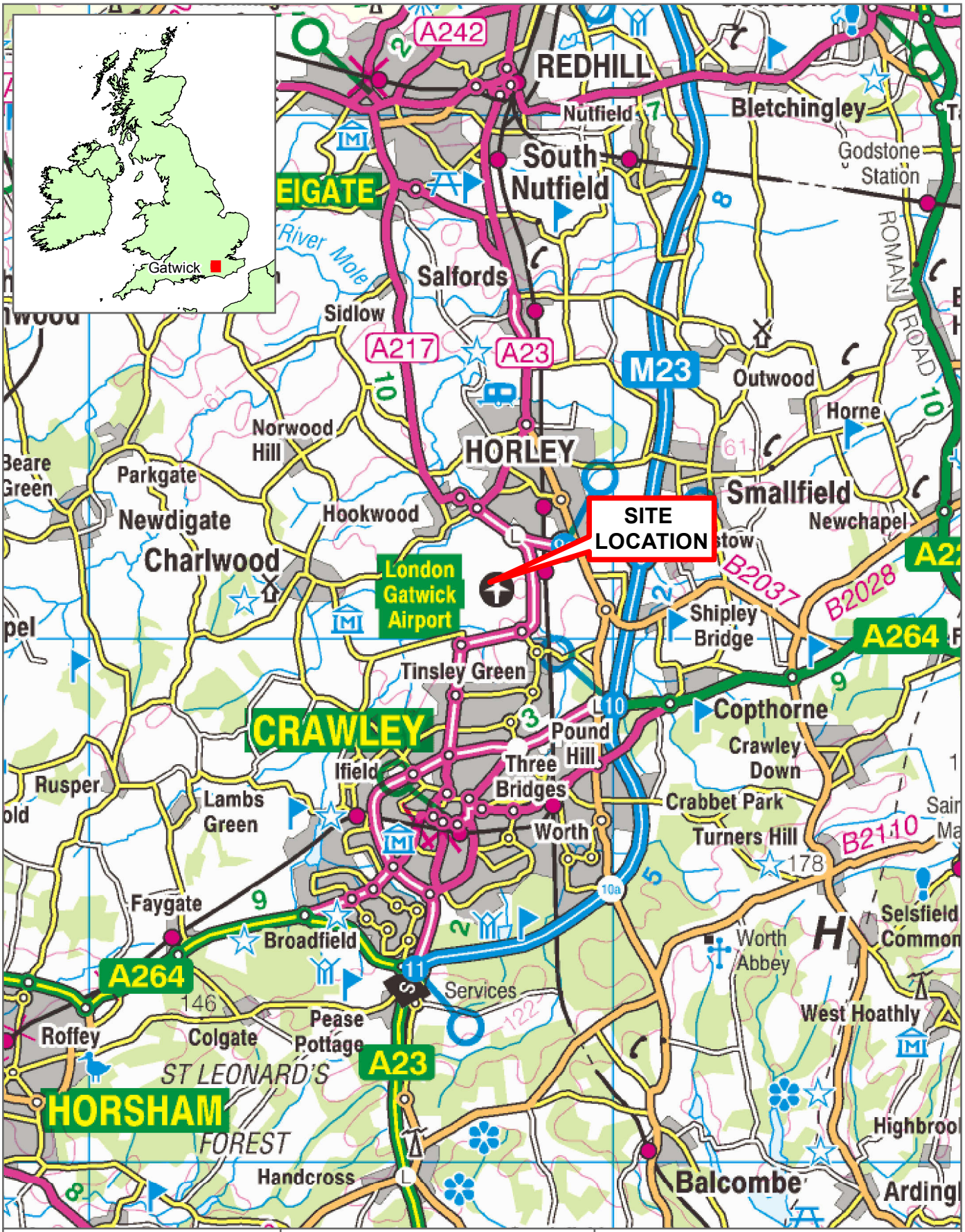
A large volume of material would require moving during the construction phase which has the potential to impact the site and areas out with the site in terms of geological setting, drainage, groundwater flow, noise, dust and traffic movements during construction. However, the application of a hierarchy of systematic mitigation measures is expected to greatly reduce the impacts to acceptable levels, and the final site would have much improved land quality from a chemical contamination standpoint.

The residual impacts of the scheme are summarised in *Table 5.1* below.

Table 5.1 Residual Physical Ground Quality, Contamination and Waste Impacts

Impact and significance before mitigation	Mitigation	Residual Impact after mitigation
Moderate negative Variation in shallow groundwater flow paths. Limited to localised significance	Measures to provide alternative groundwater flow pathways. All works to be conducted in accordance with EA guidance and current regulations.	*Minor negative* Groundwater flow paths should adapt rapidly and become stable
Minor negative The thickness of Alluvium and River Terrace Gravels may be reduced by scheme. This reduction in drift thickness increases risk to bedrock from contamination	Good practice throughout construction and operation would limit potential for contamination to migrate. All soils re-used would be suitable for re-use	*Neutral* Long term reduction in drift cover
Moderate Negative Cumulative impacts to shallow groundwater due to changes in drainage and infiltration resulting from the introduction of areas of hard standing associated with the development of R2.	The incorporation of suitable urban drainage systems into the developments	*Minor Negative* Long term alterations to drainage and consequential effects to shallow groundwater
Moderate negative The movement of material during the construction phase would impact the site and areas out with the site in terms of geological setting, drainage, groundwater flow, noise, dust and traffic movements during construction.	From a geological perspective, limited mitigation is available. The structural integrity of the material to be removed makes the majority suitable for reuse in landscaped areas and a proportion re-useable below runways and taxiways. Material would be reused wherever possible. The CoCP would mitigate issues such as noise, dust etc.	*Minor negative* The residual impact is of low significance as all bulk fill materials would be sourced on site, aiming to achieve a cut and fill balance, and drainage would be redesigned to maintain continuity
Moderate Negative Encountering contaminated material within construction areas	Adopt safe working practices under the Code of Construction Practice such as correct PPE, damping down for dust, vapour monitoring. Excavating contaminated material and reusing on site in areas which have been deemed suitable for reuse in accordance with WCOP. Targeted remediation where by contamination is reduced to an acceptable level	*Moderate Positive* Contaminated ground is treated or re-used on site at locations where it is suitable for use, hence avoiding future risk to health or environment.

FIGURES



0 0.5 1 1.5 2 2.5
Kilometres

N

Figure 1
Site Location Plan
Gatwick

SIZE: A4	VERSION: A
SCALE: 1:100,000	DRAWN: MTC
PROJECT: 0233666	CHECKED: CY
DATE: 07/05/2014	APPROVED: PC

ERM

Gatwick Airport Limited

PROJECTION: British National Grid

Path: T:\GIS Project\0233666GatwickGIS_MTC_CY\MAPS\0233666_SiteLocation_A01.mxd

A

B

C

D

E

F

Site Boundary

Zoned Area for Appendix 1

0 100 200 300 400 500

Metres

N

SCALE: See Scale Bar	VERSION: A
SIZE: A3	DRAWN: MTC
PROJECT: 0233666	CHECKED: CY
DATE: 07/05/2014	APPROVED: PC

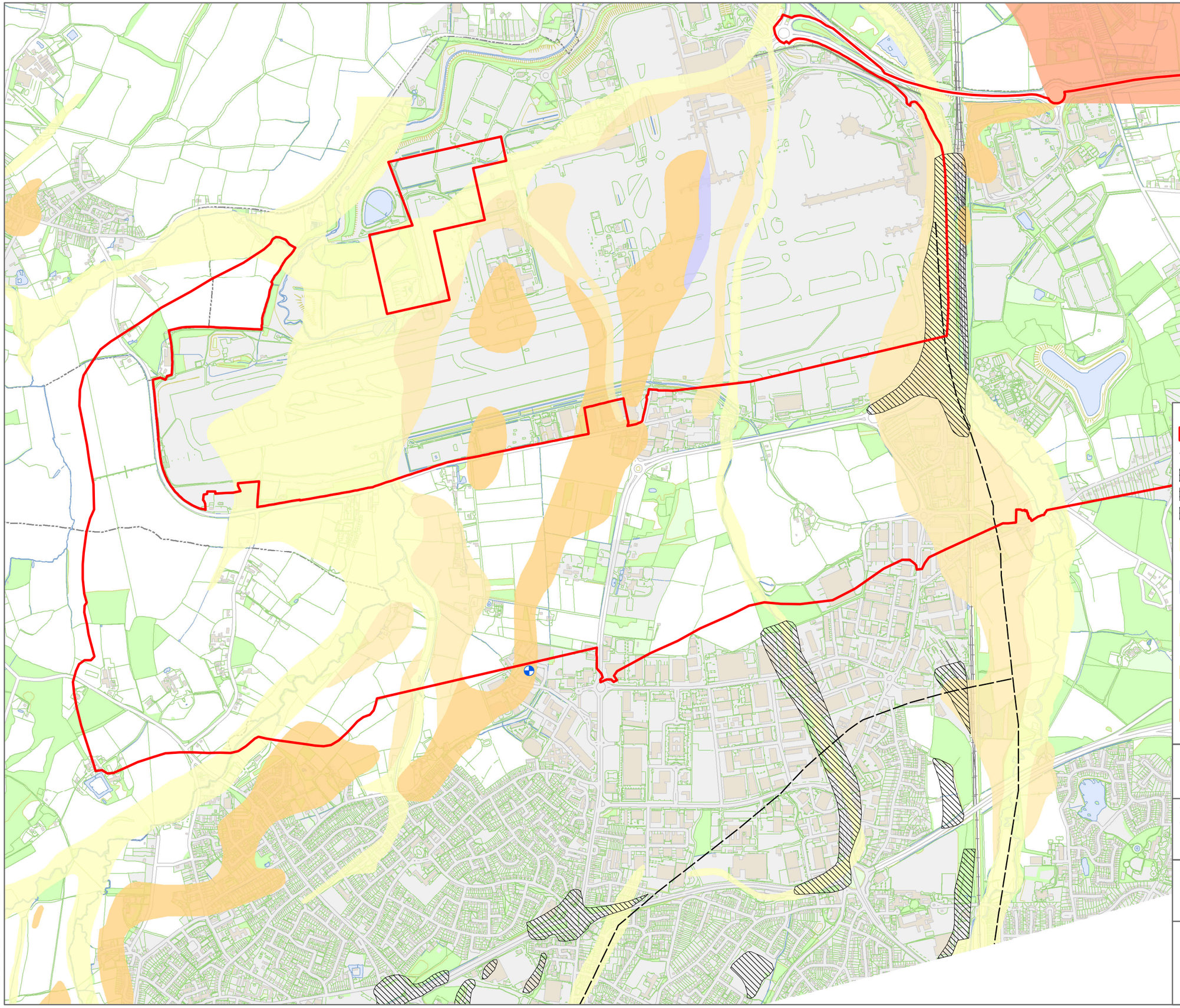
Figure 2
Site Layout Plan with Zoned Areas for Appendix 1
Gatwick

ERM

Gatwick Airport Limited

PROJECTION: British National Grid

Path: T:\GIS Project\0233666GatwickGIS_MTC_CY\MAPS\0233666_SiteLayoutZones_A01.mxd



SCALE: See Scale Bar	VERSION: A
SIZE: A3	DRAWN: MTC
PROJECT: 0233666	CHECKED: CY
DATE: 07/05/2014	APPROVED: PC

Figure 3
Drift Geology and Hydrogeology
Gatwick

ERM

Gatwick Airport Limited

PROJECTION: British National Grid

Path: T:\GIS Project\0233666GatwickGIS_MTC_CY\MAPS\0233666_SuperficialGeology_A01.mxd

Abstraction Well

Site Boundary

Weald Clay Formation - Clay-Ironstone (Unproductive Aquifer)

Weald Clay Formation - Limstone (Unproductive Aquifer)

Weald Clay Formation - Mudstone (Unproductive Aquifer)

Upper Tunbridge Wells Sand - Mudstone (Secondary A Aquifer)

Upper Tunbridge Wells Sand - Sandstone and Siltstone, Interbedded (Secondary A Aquifer)

Upper Tunbridge Wells Sand - Sandstone and Mudstone (Secondary A Aquifer)

0 100 200 300 400 500

Metres

N

SCALE: See Scale Bar	VERSION: A
SIZE: A3	DRAWN: MTC
PROJECT: 0233666	CHECKED: CY
DATE: 07/05/2014	APPROVED: PC

Figure 4
Bedrock Geology and Hydrogeology
Gatwick

ERM

Gatwick Airport Limited

PROJECTION: British National Grid

Path: T:\GIS Project\0233666GatwickGIS_MTC_CY\MAPS\0233666_BedrockGeology_A01.mxd

River Mole

Man's Brook

Crawter's Brook

Gatwick Stream

Man's Brook

River Mole

Crawter's Brook

Gatwick Stream

Site Boundary

Hydrology

0 100 200 300 400 500

Metres

N

SCALE: See Scale Bar	VERSION: A
SIZE: A3	DRAWN: MTC
PROJECT: 0233666	CHECKED: CY
DATE: 07/05/2014	APPROVED: PC

Figure 5
Hydrology
Gatwick

ERM

Gatwick Airport Limited

PROJECTION: British National Grid

Path: T:\GIS Project\0233666GatwickGIS_MTC_CY\MAPS\0233666_Hydrology_A01.mxd

Abstraction Well

Site Boundary

Low Risk

Moderate Risk

High Risk

Note:
'A' Series Onsite Land Uses
'B' Series Offsite Land Uses

0 100 200 300 400 500
Metres

N

SCALE: See Scale Bar	VERSION: A
SIZE: A3	DRAWN: MTC
PROJECT: 0233666	CHECKED: CY
DATE: 07/05/2014	APPROVED: PC

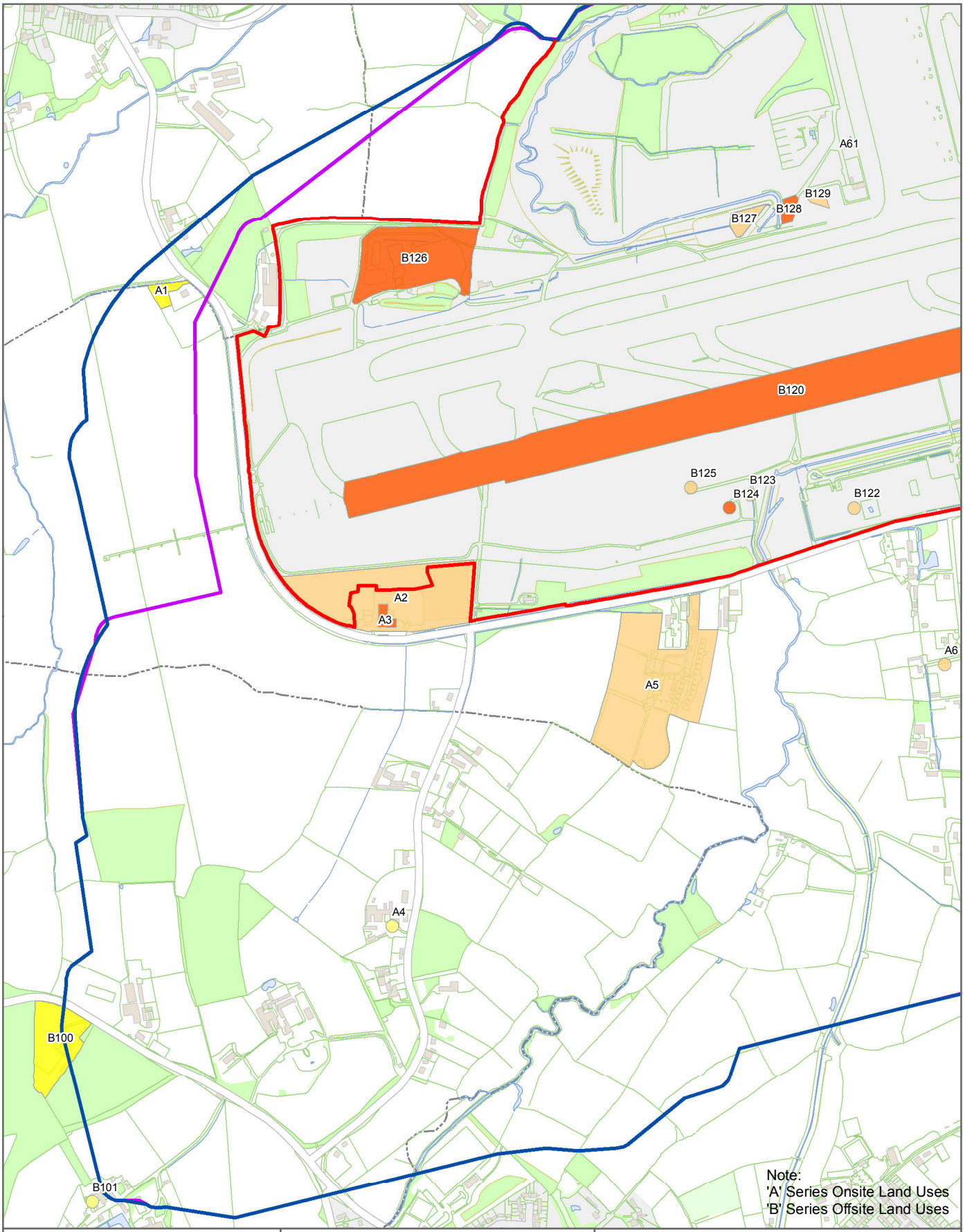
Figure 6
Land Use Risk Category, Gatwick

ERM

Gatwick Airport Limited

PROJECTION: British National Grid

Path: T:\GIS Project\0233666GatwickGIS_MTC_CY\MAPS\0233666_LandUseRiskCategory_A01.mxd



Existing Airport

Update Scheme Design with EATs Landtake Boundary

Update Scheme Design with no EATs Landtake Boundary

Low Risk

Moderate Risk

High Risk

0 50 100 150 200 250

Metres

N

Figure 7
Landtake Site Boundaries With and Without EATs, Gatwick

SCALE: See Scale Bar	VERSION: A
SIZE: A4	DRAWN: MTC
PROJECT: 0233666	CHECKED: CY
DATE: 07/05/2014	APPROVED: PC

ERM

Gatwick Airport Limited

PROJECTION: British National Grid

Path: T:\GIS Project\0233666GatwickGIS_MTC_CY\MAPS\0233666_SiteBoundary_EATs_A01.mxd

APPENDICES

Apppendix 1

Gatwick R2 Desk Geo-environmental Study

1 INTRODUCTION

Environmental Resources Management Ltd (hereafter referred to as '*ERM*') has been commissioned by Gatwick Airport Limited (GAL) to undertake a Geoenvironmental Review of the land take associated with the proposed second runway development at Gatwick Airport (referred to as "the Site" or "R2" located immediately south and east of the current Gatwick Airport.

This project is focussed on providing the necessary technical support to the GAL submission to the Airports Commission in May 2014 in relation to geoenvironmental issues. This Appendix 1 summarises the findings of the desk study.

A site location plan is provided as *Figure 1*. The proposed development for the purpose of this assessment has been split into zones, presented on *Figure 2*. *Figure 2* also delineates the site boundary which this assessment is based on.

1.1 CONTEXT

The existing soil and geological conditions, together with the influences of historic industrial and current land use activities of a site can impose constraints on a proposed development. The proposed area for R2 has been affected previously industrial / commercial activities, and has a varied geological setting.

Construction works which disturb contaminated land, in the absence of mitigation measures, present a risk of remobilising contaminants and causing additional contamination through migration in drainage and groundwater, and in the air. In addition, exposure to contaminated material can potentially present a risk to those in its immediate vicinity, including construction workers and off-site neighbours.

1.2 OBJECTIVES

This objective of this geoenvironmental desk study is to summarise existing information about the Site and assess the ground quality and potential contamination in the Site.

1.3 REPORT FORMAT

The remainder of this report has been structured as follows:

- *Section 2* describes the scope of works and limitations of the desk study and details the information reviewed during this process;
- *Section 3* includes published information on the environmental setting of the Site and its environments and a site and surrounding land use description, a review of the history of the site and surrounding area;

- *Section 4* describes the Preliminary Risk Screening for the site and surrounding area; and

- *Section 5* discusses the conceptual site model for the site identifying pollutant linkages based on the available information at the time of assessment.

The Envirocheck Landmark Database report for the site is provided as a separate standalone report in electronic format.

2 INFORMATION COLLATION AND DESK STUDY

2.1 SCOPE OF WORK AND LIMITATIONS

A desk based collation and review of relevant available information has been carried out in order to identify areas of the Site at risk from potential contamination principally associated with historical and current land uses.

It should be noted that a number of findings and conclusions presented in this report are based on information provided by third parties and/or historical records, which ERM has relied on in good faith. ERM accepts no responsibility for any deficiency, misstatements, or inaccuracy contained in this report as a result of errors, omissions or misstatements of said third parties in the information obtained.

2.2 COLLATED DOCUMENTARY INFORMATION

Ordnance Survey Land Ranger Map of Dorking & Reigate, Sheet 187, 1:50,000 series;
Landmark Envirocheck Report dated 5 February 2014 (*Ref: 53013699_1_1*, dated 5th February 2014);
Environment Agency webpage '*What's in Your Backyard*?' *http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=_e*
BGS Webpage *'Geology of Britain Viewer' http://mapapps.bgs.ac.uk/geologyofbritain/home.html*

3 BASELINE ASSESSMENT

3.1 SITE DESCRIPTION

The Site is located north of the town of Crawley and adjoins the present boundary of Gatwick Airport (see Figure 1). The current land use is predominantly agricultural land, although there are a number of areas of land or individual sites where land contamination may exist due to historical or current land uses. These are summarized below with reference to Figure 2.

Figure 2, divides the site into six zonal areas designated A-F. The site has been split into zones for the purpose of historical site description presented in this Appendix. The greater part of the proposed development would occur in Zones A, B, C & F.

Zone A
The north west part of this zone contains the far western end of the present runway and taxiways. The greater area is undeveloped agricultural land.

Zone B
The greater part of built development within and adjacent to the site lies within this zone. Maintenance Area 1 is located along the northern boundary of the zone, directly adjacent to the current airport boundary, and has the potential to be locally impacted with oils, fuels and other chemicals used in maintenance work. There is an industrial estate located directly to the south of the current airport boundary (on site) at Lowfield Heath, which has land uses which might be a source of localized contamination.

To the south east of the airport boundary there is an office development around the Gatwick Beehive at City Place, and this is contiguous with the Manor Royal Industrial Estate. The latter falls within the zone boundary between the railway line and Rowley Wood. It has a range of small scale uses which could have caused local contamination.

A number of small, very localized potentially contaminative activities have been identified in the agricultural area to the south of the existing airport, including a licensed soil/construction waste recycling facility and a number of storage tanks (farm-related).

Zones C and F
Towards the east of the site, on the eastern side of the railway line, a large sewage works is located to the east south east of the current airport boundary and large car parks are situated in the east of the proposed development area. Towards the far east of the proposed development are a small number of licensed waste activities including two soil recycling and metal recycling processes. A site visit identified that within the area east of the railway, there are also a small number of properties identified as having possible unlicensed waste processing activities on site. The exact nature of the activities could not

be confirmed as access to the properties was not possible at the time of the site visit.

3.2 SURROUNDING LAND USE

The site of the proposed second runway lies to the south of the current airport. This area is mainly farmland, except for the airport itself and the associated commercial development, which surrounds it, there are also a number of industrial estates located to the south of the Site. The main residential settlement areas are Horley located tot the north east of the development and Ifield located to the south of the development. Further residential properties are scattered throughout the area. The M23 is located to the east of the site, marking the eastern boundary of the proposed development.

3.3 ENVIRONMENTAL SETTING

3.3.1 *Geology*

According to the geological maps for the area, the site is underlain by drift deposits which are limited in coverage, and are presented on *Figure 3*. The drift deposits include Flandrian aged Alluvium, comprising silty clay, silt, sand, peat and gravel and Quaternary deposits of River Terrace gravels at locations associated with the River Mole and its tributatries. The River Terrace Deposits comprise of sands and gravels, with lenses of silt, clay or peat. Finally there is a small area located towards the centre of the current airport which is underlain by Quaternary Head Deposits, this comprises of clay, silt, sand and gravel.

The solid geology underlying the majority of the site is the Weald Clay Formation, specifically the mudstone unit, this comprises of dark grey thinly-bedded mudstones (shales) and mudstones with siltstones and fine- to medium-grained sandstones. Limited areas of Ironstone Weald Clay also underlie the site; Weald Clay is of the Cretaceous Period. The south of the area is underlain with Upper Tunbridge Wells Sands, comprising of a succession of interbedded deposits of thinly bedded silty mudstones, siltstones, silty sandstones and fine-grained sandstones which are laterally persistent over long distances. The solid geology is presented on *Figure 4.*

3.3.2 *Hydrogeology*

According to the Environment Agency website (accessed 18th February 2014) the superficial deposits of River Terrace Deposits and Alluvium are classified as a Secondary A Aquifer, described by the Environment Agency as *' permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers'*. The small area of Head Clay has been classified as Secondary Undifferentiated Aquifer, described as *'cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as*

both minor and non-aquifer in different locations due to the variable characteristics of the rock type'.

The underlying bedrock Weald Clay Formation has been classified as Unproductive Strata, described by the Environment Agency as *'rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow'*. The Upper Tunbridge Wells Sand formation location to the south east of the site has been classified as a Secondary A aquifer.

The Environment Agency website indicates that the site is not located within a groundwater source protection zone and is not located within a groundwater nitrate vulnerable zone.

According to the *Envirocheck* report there is one groundwater abstraction on site, registered to Jeals Nurseries (Fernhill) Ltd, for general farming and domestic use. A second groundwater abstraction is located off site some 170 m south west of the Site, registered to Eskimo Ice (London) Llp, for food and drink general use.

3.3.3 Hydrology

There are a number of watercourses that are located on site and within the surrounding area, which are presented on *Figure 5*. Under the River Basement Management Plan, according to the Environment Agency website (accessed 18th February 2014) the current and predicted (2015) ecological potential of the surface water bodies are presented in *Table 3.4* below.

Table 3.4 Ecological Potential of Surface Water

Water Course	Current ecological potential	Predicted ecological potential (2015)
River Mole (Crawley to Gatwick)	Moderate	Moderate
River Mole (at Gatwick Airport)	Moderate	Moderate
River Mole (Horley to Hersham)	Poor	Poor
Man's Brook	Moderate	Moderate
Tilgate Brook	Moderate	Moderate

It should be noted that under the River Basins Management Plan, there is no requirement to classify the surface water bodies within the area of the current Gatwick Airport and therefore no data was available on the EA web site regarding the chemical quality of the surface water bodies.

According to the *Envirocheck* report, there are no surface water abstractions registered on Site or within 250m of the Site.

According to the Environment Agency website (accessed on 18th February 2014) the Site is located in a surface water nitrate vulnerable zone.

3.3.4 Sensitive Land Uses

According to the *Envirocheck* report there are designated Adopted Green Belts located at the far eastern side of the development and beyond (Zone C & F), adjacent to the north west boundary (Zone A & D) and north of the existing airport (Zone D & E).

3.4 SITE ENVIRONMENTAL SENSITIVITY AND VULNERABILITY

Given that the majority of the site is directly underlain with bedrock geology; the Weald Clay (classified as an unproductive strata), groundwater vulnerability is considered to be low. However within area where Alluvium and River Terrace drift deposits (both classified as Secondary A Aquifer s) underlie the site, the groundwater vulnerability is considered to be moderate. The south east of the site is in parts underlain by drift alluvium deposits which are further underlain with the bedrock Upper Tunbridge Wells Sands (Secondary A Aquifer), or where the area is directly underlain with Tunbridge Wells Sands; the groundwater vulnerability is considered to be high. Due to the presence of two groundwater abstractions for domestic and drinking water use; one located on site towards the far north east and one off site to the south of the site the sensitivity of the groundwater is considered to be high.

Given that there are a number of surface water bodies that traverse the Site and surrounding area, surface water vulnerability is considered to be high. Given that the surface water bodies have an ecological potential of either moderate to poor and that under the River Basement Management Plan there is no requirement to classify the chemical quality of the water bodies within the vicinity of the current airport, the sensitivity of the surface water bodies is considered to be moderate.

3.5 SITE HISTORY

3.5.1 Introduction

A review of desk study information, including site history, has been prepared for the Site and its surrounding area. This information, along with the findings from reviewing publicly available historical ordnance survey mapping, is summarised below for the Site and its environments. The site history section has been split into six zones, which are summarised below and set out on *Figure 2*.

3.5.2 On-site History

Information regarding the history of the Site was obtained through a review of historical *Ordnance Survey* (OS) maps dating from 1872 to 2013 using scales of 1:10,000, 1:2,500. The on site historical review will cover Zones A, B, C, D, E and F.

Zone A

The 1879 map depicts the site as predominantly undeveloped, presumably agricultural. The land use remains this way until 1961, when the beginning of construction of the runway is identified. The 1974 map depicts the development of sporadic residential properties and a caravan park. By 2006 a number of buildings associated with the airport including car parks are presented on the map, however the majority of the site is undeveloped, presumably agricultural.

Zone B

The 1874 map depicts the site as predominantly undeveloped, presumably agricultural. A Windmill (Corn) is identified in the northern part of Zone B. The 1899 map identifies the development of sporadic residential properties. A printing works is identified in the 1946 map. The Beehive (the original terminal building) is constructed on the 1963 map which remains on site up to the most recent map, dated 2013. Construction of the runway is identified to the north by 1974 and widespread developments of industrial / commercial properties are present on the 1979 map, which replace an area of residential properties in Lowfield Heath. Additional industrial properties are also shown across the southern and eastern parts of the site. A balancing pond associated with the airport is depicted in the north east of the Zone B in the 1979 map and remains present in the 2013 map. The major road (A23) traverses the site from 1983 to 2013.

Zone C

The 1872 map depicts the site as undeveloped presumably agricultural until 1933 map which notes the construction of sporadic residential properties. A sewage works is depicted in the 1961 map, which is further developed to incorporate additional tanks, filter beds and sludge beds up to the most recent map dated 2013. A reservoir is identified in the 1988 map which is associated with the sewage works. A large Y shaped balancing pond is identified in the 2006 map, located adjacent to the sewage works. The 2014 map appears unchanged.

Zone D

The 1874 map depicts the site as undeveloped presumably agricultural. By 1961, sporadic residential properties are identified. A filter bed is depicted in the 1971 map and on the 1979 map a sludge pit is noted. A balancing pond, connected to a drainage network is identified in the 1979 map which is still present today.

Zone E

The 1874 map depicts the site as undeveloped presumably agricultural, with a railway line which traverses the site, running north to south. The 1897 map shows Gatwick Race Course, which by 1914 incorporates a golf course. This feature is no longer identified after 1914. The development of Gatwick Airport is identified in the 1961 map (some development occurred earlier, but was not

shown on OS maps for security reasons) which includes roads and sporadic buildings. A smaller race track is identified in the north west of Zone E between 1961 and 1976. Further development of Gatwick Airport is identified in the 1976 map, including the construction of the Terminal Building, Coach Station, balancing ponds and several car parks. Additional car parks are depicted in the north of the site by 1991 and a hotel is depicted adjacent to a car park in the 1988 map. The site layout remains unchanged in the 2013 map.

Zone F

The 1872 to 1914 map depict the site as undeveloped presumably agricultural with sporadic residential properties and farms. A Greyhound Race Track is identified in the 1961 map only. By 1979 two Poultry Houses are depicted to the east of Zone F and a large area is utilised for several car parks to the west. By 1988 several more car parks and a balancing pond are identified, which are associated with Gatwick Airport. The site layout remains unchanged in the 2013 map.

3.5.3 Off-Site History

Information regarding the history of the surrounding area within approximately 250m of the site was obtained through a review of historical Ordnance Survey (OS) maps dating from 1872 to the 2013 using scales of 1:10,000, and 1:2,500. All distances and directions cited in the historical review are approximate and taken from the boundary of the site to the feature.

Zone A

The 1874 map depicts the surrounding land use as undeveloped presumably agricultural. A single residential property identified as Ilfield Court is surrounded by a moat to the south west of the site. By 1961, sporadic residential properties are noted. The surrounding land use appears unchanged in the most recent map dated 2013.

Zone B

The 1874 map depicts the surrounding land use as undeveloped presumably agricultural. By 1899 a small number of sporadic residential properties are identified. Crawley and Ilfield Sewage Works is identified between 1919 and 1963, which comprise of filter beds, tanks and sludge beds. A Council Depot replaces the sewage works between 1974 and 1983. From 1974 widespread development of commercial / industrial properties is depicted within the surrounding 250m of Zone B. By 2006 these properties occupy retail parks and industrial estates.

Zone C

The 1872 map depicts the surrounding land use as undeveloped presumably agricultural. Sporadic residential properties are identified by 1899. By 1975, construction of the M23 motorway is presented, which traverses the off site area, running north to south. The surrounding land use appears unchanged in the most recent map dated 2013.

Zone D

The land surrounding Area D is depicted as undeveloped presumably agricultural, between 1874 and 2013.

Zone E

The 1874 map depicts the surrounding land use as undeveloped presumably agricultural. By 1897 Gatwick race Course traverses on site and off site until 1914. By 1961 a smaller race course is identified to the west of the site and construction of Gatwick Airport is identified to the south. The 1976 map depicts the construction of the main road A23 adjacent to the north of the site. A car park and warehouses are identified in the 1979 map, which are associated with Gatwick Airport. Between 1976 and 1988, a balancing pond is identified, which contains an oil beam. This pond is adjacent to the former firefighting training ground. A large balancing pond, adjacent to the River Mole is depicted in the 1979 map only and a secondary balancing pond is noted adjacent to the north east from 1976 to 2013. By 1991 development of additional car parks are identified.

Zone F

The 1872 map depicts the surround land use as undeveloped presumably agricultural. The 1976 – 1979 maps depict the construction of the M23 motorway which runs parallel with the north and east of the site. A balancing pond adjacent to the north of the site has been constructed by 2006 and is present on the 2013 map. A large mushroom farm is depicted adjacent to the east of the site from 1979 to 2013. The surrounding land use appears unchanged in the most recent map, dated 2013.

3.6 REGULATORY DATABASE REVIEW

ERM commissioned an 'Envirocheck' UK regulatory database search (*Ref: 53013699_1_1*, dated 5th February 2014) which provides information primarily on 'reported' or operational activities for which licenses or authorisations are required and have been obtained pursuant to environmental legislation/ regulations. It is possible that there are unauthorised and/or reported activities in the vicinity of the subject site, which are not identified in the report.

This review includes all on-site registrations as well as those sites within 250 m of the proposed site boundary. It should be noted that all distances and directions cited are from the nearest boundary of the main subject Site identified within the Landmark information. It should also be noted that the data incorporated in the Envirocheck comes from several different sources and the accuracy of the respective locations varies depending on whether, for example, precise grid references were used, postal addresses were taken or locations were marked manually. It is therefore possible that cited location could be inaccurate by tens or even hundreds of metres.

3.7 ZONE A

3.7.1 Discharge Consents

On site
There are seven active discharge consents to surface water only on site registered to:

- *Mr B Keating* (sewage);
- *Mr J Sutton* (sewage);
- *Decision Graphics UK Ltd* (sewage);
- *Crawley Borough Council* (surface water);
- *Terminus Securities Ltd* (sewage); and
- two registered to *Roband Electronics Plc* (sewage and trade discharge).

Off site
Two active discharge consents to surface water only registered to:

- *Commission for New Towns*, 50m south west (sewage); and
- *Mr M Gooda*, 230m south west (sewage).

3.7.2 BGS Recorded Mineral Site

On Site
One ceased BGS Recorded Mineral Site, located at *Westfield Common Brick Field* for the opencast extraction of common clay and shale.

Off Site
One ceased BGS Recorded Mineral Site located 190 north west at *Little Farm Pits* for the underground extraction of iron ore – ironstone.

3.7.3 Local Authority Integrated Pollution Prevention Controls

On Site
One Local Authority Pollution Prevention and Control permits registered to *Terminus Securities Ltd (Bcp)* for PG1/2 waste oil or recovered oil burners.

3.7.4 Pollution Incidents to Controlled Waters

On Site
Five significant and one minor pollution incidents to controlled waters on Site.

3.7.5 Substantiated Pollution Incidents Register

On site
One substantiated pollution incident register on site, relating to the release of an unidentified pollutant in August 2001 causing a category 1 major incident to water.

3.7.6 Historical Landfill Sites

On Site
One Historical Landfill Site registered to *A Colacicco*, previously authorised to accept inert waste.

3.7.7 Contemporary Trade Directory

On Site
There are nine active contemporary trade directories registered on site.

3.8 ZONE B

3.8.1 Discharge Consents

On Site
Six active discharge consents to surface water registered on site:

- three registered to *Thames Water Utilities Ltd*(sewage);
- one registered to *Asiacom Holdings Ltd* (sewage);
- one registered to *Mr & Mrs Wilson* (sewage); and
- one registered to *Baa Plc Gatwick Airport Ltd* (trade discharge).

3.8.2 Local Authority Pollution Prevention Control

On Site
Three Local Authority Pollution Prevention and Control permits, registered to:

- *Airline Services Ltd* for PG6/46 dry cleaning;
- *Airbase Interiors* for PG6/46 dry cleaning; and
- *Komfort Systems* for PG6/2 manufacture of timber and wood-based products.

Off Site
Five Local Authority Pollution Prevention and Controls registered to:

- *BP Oil UK Ltd* (PG1/14 petrol filling station) 140m south west;
- *County Oak Service Station* (PG1/14 petrol filling station) 140m south west;
- two registered to *Kirkham Motors* (PG1/1 waste oil burners) 200m south east and 230m south east; and
- *Camspec* (PG1/1 waste oil burners) 220m south east.

3.8.3 Pollution Incidents to Controlled Waters

On Site
One major, two significant and fifteen minor pollution incidents to controlled waters on Site. The major incident involved the release of unknown chemicals in May 1995.

Off Site
One significant and four minor pollution incidents to controlled waters within 250m of the Site.

3.8.4 Prosecution relating to Controlled Waters

On Site
One prosecution relating to controlled waters, for detergent foam washed from runway into nearby ditch, in February 2004.

3.8.5 Prosecution relating to Authorised Processes

Off Site
One prosecution relating to authorised processes located 240m south west, for failure to comply with packaging producer responsibility obligations in September 2009.

3.8.6 Licensed Waste Management Facilities

On Site
One Licenced Waste Management Facility, registered to Cook and Son Ltd.

3.8.7 Registered Waste Transfer Sites

Off Site
One Registered Waste Transfer Site which is exempt from licence, registered to *Dana Holdings Ltd* 20m east, authorised to accept contaminated gunwash solvent.

3.8.8 Contemporary Trade Directory

On Site
There are nine active contemporary trade directories registered on site.

Off Site
One contemporary trade directory located 40m east of the Site.

3.8.9 Fuel Station Entry

One fuel station entry registered to County Oak Connect (BP) 140m south west.

3.9 ZONE C

3.9.1 Discharge Consents

On Site
Four active discharge consents:

- Three registered to *Thames Water Utilities Ltd* (sewage); and
- one registered to *Mr J Cload* (sewage).

3.9.2 Local Authority Integrated Pollution Prevention Controls

On Site
Two Integrated Pollution Prevention and Control permits, registered to *Thames Water Utilities Ltd* for combustion – waste derived fuel.

3.9.3 Pollution Incidents to Controlled Waters

On Site
Four significant and five minor pollution incidents to controlled waters on Site.

Off Site
Three minor pollution incidents to controlled waters within 250m of the Site.

3.9.4 Prosecutions Relating to Controlled Waters

On Site
Two prosecutions relating to controlled waters on site for the following incidents; allowing diesel to enter a nearby watercourse (Gatwick Stream) in December 2003 and for polluting the Gatwick Stream with sewage when one pump failed suddenly while the other was under repair in November 1999.

3.9.5 Substantiated Pollution Incidents Register

On Site
Two substantiated pollution incident registers involving the release of gas and fuel oils in June 2002 causing a category 2 significant incident to water. (The two register entries probably relate to the same incident however they have separate incident reference numbers).

3.9.6 Historical Landfill Sites

Off Site
Two Historical Landfill Sites located at:

- *Blackcomer Wood* 120m south, previously authorised to accept inert waste; and
- *The Oaks* 220m east, previously authorised to accept inert waste.

3.9.7 Local Authority Recorded Landfill Sites

On Site
One Local Authority Recorded Landfill Site (but in practice a waste management activity) registered to *Surrey County Council* at Crawley Sewage Works.

3.9.8 Licensed Waste Management Facilities

On Site
One Licenced Waste Management Facility registered to Thames Water Utilities Limited.

3.9.9 Contemporary Trade Directory

On Site
Two active contemporary trade directory entries.

3.10 ZONE D

3.10.1 Discharge Consents

On Site
Two active discharge consents on Site registered to:

- *Gatwick Airport Ltd* (trade discharge contaminated surface water); and
- *BAA Plc Gatwick Airport Ltd* (surface water).

Off Site
Two active discharge consents both registered to *Thames Water Utilities Ltd*, 230m west and 250m west (sewage).

3.11 ZONE E

3.11.1 Discharge Consents

On Site
One active discharge consent on site registered to *BAA Plc Gatwick Airport Ltd* (trade discharge).

Off Site
Two active discharge consents registered to:

- *BAA Plc Gatwick Airport Ltd* (surface water) 40m east; and
- *Thames Water Utilities Limited* (sewage) 80m north west.

3.11.2 Local Authority Integrated Pollution Prevention Controls

On Site
One Integrated Pollution Prevention and Control permits registered to *Gatwick Airport Ltd* for combustion.

3.11.3 Local Authority Pollution Prevention Control

On Site
Three Local Authority Pollution Prevention and Control permits registered to:

- *Anc Rental Ltd* (PG1/14 petrol filling station);
- *Shell Gatwick North* (PG1/14 petrol filling station); and
- *Lex Transfleet Ltd* (PG6/34 repsraying of road vehicles).

Off Site
Two Local Authority Pollution Prevention and Control permits registered to:

Roc UK Ltd (PG1/14 petrol filling station) 190m north; and
Star Horley Service Station (PG1/14 petrol filling station) 230m north.

3.11.4 Pollution Incidents to Controlled Waters

On Site
One major, two significant and seventeen minor pollution incidents to controlled waters on Site. The major incident involved the release of unknown chemicals in April 1995.

Off Site
One significant and five minor pollution incidents to controlled waters within 250m of the Site.

3.11.5 Substantiated Pollution Incidents Register

On Site
One substantiated pollution incident register relating to the release of surfactants and detergents in September 2002 causing a category 1 major incident to water.

3.11.6 Planning Hazardous Substance Consents

On Site
Four Planning Hazardous Substance Consents registered to:

- *Esso Petroleum Co Ltd* (flammable liquids);
- *Shell Oil UK Products Ltd* (flammable liquids);
- *Esso Petroleum Fuel Farm* (automotive petrol and other petroleum spirits); and
- an unnamed operator (automotive petrol and other petroleum spirits).

3.11.7 Control of Major Accident Hazards Sites

On Site
Two Control of Major Accident Hazards Sites registered to:

- *Shell UK Oil Products Ltd* (Upper Tier); and
- *Esso Petroleum Company Limited* (Lower Tier).

3.11.8 Registered Radioactive Substance Site

Off Site
One Registered Radioactive Substance registered to *HM Revenue and Customs (Gatwick)* for disposal of radioactive waste.

3.11.9 Historical Landfill Site

Off Site
One Historical Landfill Site registered to *Gatwick Brickworks* 240m north, previously authorised to accept inert waste.

3.11.10 Licensed Waste Management Facilities

On Site
One Licenced Waste Management Facility registered to *Biffa Waste Services Ltd*, categorised as a special waste transfer station.

3.11.11 Contemporary Trade Directory

On Site
Nine active contemporary trade directories.

Off Site
One active contemporary trade directory within 250m of the Site.

3.11.12 Fuel Station Entry

On Site
One fuel station entry registered to *Shell Gatwick North.*

Off Site
Two fuel station entries registered to:

- *Roundabout Service Station (*ESSO) 190m north; and
- *Co-Op Brighton Road* (Texaco) 230m north.

3.12 ZONE F

3.12.1 Discharge Consents

On Site
Seven active discharge consents on Site registered to:

- *Thames Water Utilities Ltd* (sewage);
- *two registered to Mr Barry Field* (sewage);
- *Mrs D S Edwards* (sewage);
- *Flight Directors Limited* (sewage);
- *BAA Plc Gatwick Airport Ltd* (surface water); and
- *Aerocontracts Ltd* (sewage).

Off Site
Five active discharge consents registered to:

- *Mr Gene Hartfield* 60m north west (sewage);
- *Mr B Smith* 150m north west (sewage);
- Core Investments Limited 160m north west (sewage);
- *Thames Water Utilities Ltd* 190m north east (sewage); and
- *Mr David Linsell* 200m south east (sewage).

3.12.2 BGS Recorded Mineral Site

On Site
One ceased BGS Recorded Mineral Site, located at Lambs Brickworks registered to *WT Lamb & Son Ltd* for the opencast extraction of common clay and shale.

3.12.3 Local Authority Pollution Prevention Control

On Site
One Local Authority Pollution Prevention and Control permit registered to *BP Gatwick South* for PG1/14 petrol filling station.

3.12.4 Pollution Incidents to Controlled Waters

On site
Five minor pollution incidents to controlled waters on site.

Off Site
One minor pollution incident to controlled waters 160 north east.

3.12.5 Licensed Waste Management Facilities

On Site
Two Licenced Waste Management Facilities registered to: *Jupp Peter* (treatment of waste to produce soil); and
Mr Donald Simmonds & Mr Craig Simmonds (metal recycling).

3.12.6 Registered Waste Treatment or Disposal Sites

On Site
One Registered Waste Treatment or Disposal Site registered to *DRT Simmonds* authorised to accept electronic computers, empty used containers, ferrous and non-ferrous scrap metal.

3.12.7 Contemporary Trade Directory

On Site
Ten active contemporary trade directories.

3.12.8 Fuel Station Entry

On Site
One active fuel station entry registered to *Gatwick South Sf Connect (BP).*

The preliminary model identifies plausible pollutant linkages based on the information available at this initial stage of the assessment. The concept relies on:

- The identification of a potential contaminant (source) in, on or under the land at a concentration likely to have the potential to cause harm or pollution;
- The likely presence of a receptor, which may suffer harm; and
- A pathway by which the receptor may be exposed to the contaminant.

The historical and current land uses considered to have a high, medium and low contaminating potential are presented in *Appendix 2* of this overall report. The remainder of the site is considered to have a very low contaminating potential in terms of current and historic land use.

Assessment of Source-Pathway-Receptor Relationship

The following pathways have been identified:

- groundwater;
- permeable geological horizons;
- direct exposure;
- indoor and outdoor inhalation of vapours; and
- direct contact and associated dermal exposure, ingestion and inhalation of soil particles (dusts).

The following receptors have been identified:

- shallow groundwater in shallow subsurface and drift deposits;
- surface waters;
- construction workforce and visitors; and
- site neighbours.

Appendix 2

Historical and Current Land-Use Class

Table 1 - Historic On Site Land Use
Site: GAL Gatwick
Completed by: Laura-Anne Knapper
Checked by: Claire Illingworth Yurdakök

Zone	Land Use No	Land Use	Dates	Land Use Class	On Site / Off Site	Historic / Current
A	A3	Factory	1962 - 2006	2	On Site	Historic
A	A4	Tank	1897 - 1963	2	On Site	Historic
B	A7	Radar Tower	1992 - 1993	2	On Site	Historic
B	A9	Tank	1919 - 1946	2	On Site	Historic
B	A10	Electricity Substation	1992 - 1993	2	On Site	Historic
B	A12	Old Limekiln	1919 only	2	On Site	Historic
B	A13	Electricity Substation	1981 - 1993	2	On Site	Historic
B	A14	Tank	1913 - 1962	2	On Site	Historic
B	A16	Windmill (Corn)	1870 - 1983	2	On Site	Historic
B	A18	Printing Works	1946 - 1975	1	On Site	Historic
B	A19	Tank	1981 - 1988	2	On Site	Historic
B	A25	Electricity Substation	1988 - 2006	2	On Site	Historic
B	A27	Tank	1973 - 1975	2	On Site	Historic
B	A30	Tank	1962 - 1983	2	On Site	Historic
B	A31	Tank	1978 - 1988	2	On Site	Historic
C	A34	Sewage Works	1961 - 1976	2	On Site	Historic
C	A35	Additional Gas Holder	1978 - 1991	3	On Site	Historic
C	A41	Greyhound Race Track	1973 - only	1	On Site	Historic
F	A45	Poultry Houses	1975 - 1993	3	On Site	Historic
F	A47	Electricity Substation	1975 - 1993	2	On Site	Historic
F	A52	Greyhound Race Track	1961 only	1	On Site	Historic
F	A57	Timber Yard	1973 only	2	On Site	Historic
F	A58	Engineering Works	1973 only	2	On Site	Historic
E	A60	Pond	1988 only	1	On Site	Historic
E	A61	Balancing Pond	2006 only	1	On Site	Historic

Table 2 - Historic Off Site Land Use
Site: GAL Gatwick
Completed by: Laura-Anne Knapper
Checked by: Claire Illingworth Yurdakök

Zone	Land Use No	Land Use	Dates	Land Use Class	On Site / Off Site	Historic / Current
A	B100	Landfill Site		3	Off Site	Historic
A	B101	Tank	1874 -1910	2	Off Site	Historic
B	B104	Crawley & Ilfield Sewage Works	1919 - 1963	2	Off Site	Historic
B	B106	Electricity Substation	1986 - 1996	2	Off Site	Historic
B	B107	Works	1974 - present	1	Off Site	Historic
B	B108	Tank & Electricity Substation	1970 - 1996	2	Off Site	Historic
C	B112	Landfill Site		3	Off Site	Historic
E	B115	Electricity Substation	1988 - 1991	2	Off Site	Historic
E	B116	Car Park	2013	1	Off Site	Historic
E	B118	Electricity Substation	1973 - 1993	2	Off Site	Historic
B	B121	Radar Tower	1985 - 1993	2	Off Site	Historic
B	B122	Mast	1993 only	2	Off Site	Historic
D	B127	Balancing Pond	1988 - 2006	1	Off Site	Historic
D	B128	Fire Training Ground		3	Off Site	Historic
E	B131	Fire Training Ground		3	Off Site	Historic
E	B134	Pumping Station	1988 - 1991	2	Off Site	Historic

Table 3 - Current On Site Land Use
Site: GAL Gatwick
Completed by: Laura-Anne Knapper
Checked by: Claire Illingworth Yurdakök

Zone	Land Use No	Land Use	Dates	Land Use Class	On Site / Off Site	Historic / Current
A	A1	Pallet Process		1	On Site	Current
A	A2	Car Parks	2006 - present	1	On Site	Current
A	A5	Caravan Park	1974 - present	1	On Site	Current
B	A6	Sewage Pumping Station	1983 - present	2	On Site	Current
B	A8	Car Park		1	On Site	Current
B	A11	Works	1983 - present	2	On Site	Current
B	A15	Petrol Station - Car Wash / Parking	1993 - present	3	On Site	Current
B	A17	Industrial Estate/Commercial	1988 - present	2	On Site	Current
B	A20	Sewage Pumping Station	1988 - present	2	On Site	Current
B	A21	Electricity Substation	1988 - present	2	On Site	Current
B	A22	Farm - Waste Treatment Facility		2	On Site	Current
B	A23	Tank	2006 - present	2	On Site	Current
B	A24	Maintenance Area 1		3	On Site	Current
B	A26	Industrial Estate/Commercial	1988 - present	2	On Site	Current
B	A28	Depots and Warehouses	1988 - present	1	On Site	Current
B	A29	The Beehive	1963 - present	1	On Site	Current
B	A32	Balancing Pond	1973 - present	1	On Site	Current
B	A33	Railway Line	1874 - present	2	On Site	Current
C	A36	Gas Holder	1965 - present	3	On Site	Current
C	A37	Electricity Substation	1975 - present	2	On Site	Current
C	A38	Tank	1965 - present	2	On Site	Current
C	A39	Electricity Substation	1978 - present	2	On Site	Current
C	A40	Balancing Pond	2006 - present	1	On Site	Current
F	A42	Garden Centre		1	On Site	Current
F	A43	Used Car Sales		1	On Site	Current
F	A44	Licenced Waste Management Facility		2	On Site	Current
F	A46	Potential unauthorised activities		2	On Site	Current
F	A48	Potential unauthorised activities		2	On Site	Current
F	A49	Potential unauthorised activities		2	On Site	Current
F	A50	Potential unauthorised activities		2	On Site	Current
F	A51	Potential unauthorised activities / Disused Garden Centre		2	On Site	Current
F	A53	Licenced Waste Management Facility		2	On Site	Current
F	A54	Electricity Substation	1988 - present	2	On Site	Current
F	A55	Car Park	1979 - present	1	On Site	Current
F	A56	Car Park	1988 - present	1	On Site	Current
F	A59	Balancing Pond	1988 - present	1	On Site	Current

Table 4 - Current Off Site Land Use
Site: GAL Gatwick
Completed by: Laura-Anne Knapper
Checked by: Claire Illingworth Yurdakök

Zone	Land Use No	Land Use	Dates	Land Use Class	On Site / Off Site	Historic / Current
B	B102	Industrial Estate/Commercial	2006 - present	1	Off Site	Current
B	B103	Council Depot	1972 - present	1	Off Site	Current
B	B105	Industrial Estate/Commercial	1974 - present	1	Off Site	Current
B	B109	Industrial Estate/Commercial	1974 - present	1	Off Site	Current
B	B110	Industrial Estate/Commercial	1963 - present	1	Off Site	Current
B	B111	Petrol Station		3	Off Site	Current
F	B113	Balancing Pond	1979 - present	1	Off Site	Current
F	B114	Balancing Pond	1979 - present	1	Off Site	Current
E	B117	Balancing Pond	1961 - present	1	Off Site	Current
E	B119	Aircraft Services Compound		3	Off Site	Current
A	B120	Runway	1961 - present	2	Off Site	Current
A	B123	Electricity Substation	1974 - present	2	Off Site	Current
A	B124	Radar Aerial	1985 - present	2	Off Site	Current
A	B125	Electricity Substation	1974 - present	2	Off Site	Current
D	B126	Fire Training Ground		3	Off Site	Current
D	B129	Balancing Pond	2006 - present	1	Off Site	Current
E	B130	Maintenance Area 2		3	Off Site	Current
D	B132	Balancing Pond	1979 - present	1	Off Site	Current
E	B133	Car Park	1988 - present	1	Off Site	Current

Appendix 3

Hydrogeological Risk Rating

Table 1 - Historic On Site Hydrogeology
Site: GAL Gatwick
Completed by: Laura-Anne Knapper
Checked by: Claire Illingworth Yurdakök

Zone	Land Use No	Land Use	Hydrogeology Class	On Site / Off Site	Historic / Current
A	A3	Factory	2	On Site	Historic
A	A4	Tank	1	On Site	Historic
B	A7	Radar Tower	1	On Site	Historic
B	A9	Tank	1	On Site	Historic
B	A10	Electricity Substation	1	On Site	Historic
B	A12	Old Limekiln	1	On Site	Historic
B	A13	Electricity Substation	1	On Site	Historic
B	A14	Tank	2	On Site	Historic
B	A16	Windmill (Corn)	2	On Site	Historic
B	A18	Printing Works	1	On Site	Historic
B	A19	Tank	1	On Site	Historic
B	A25	Electricity Substation	2	On Site	Historic
B	A27	Tank	1	On Site	Historic
B	A30	Tank	2	On Site	Historic
B	A31	Tank	2	On Site	Historic
C	A34	Sewage Works	1	On Site	Historic
C	A35	Additional Gas Holder	1	On Site	Historic
C	A41	Greyhound Race Track	1	On Site	Historic
F	A45	Poultry Houses	2	On Site	Historic
F	A47	Electricity Substation	2	On Site	Historic
F	A52	Greyhound Race Track	2	On Site	Historic
F	A57	Timber Yard	1	On Site	Historic
F	A58	Engineering Works	1	On Site	Historic
E	A60	Pond	1	On Site	Historic
E	A61	Balancing Pond	2	On Site	Historic

Table 2 - Historic Off Site Hydrogeology
Site: GAL Gatwick
Completed by: Laura-Anne Knapper
Checked by: Claire Illingworth Yurdakök

Zone	Land Use No	Land Use	Hydrogeology Class	On Site / Off Site	Historic / Current
A	B100	Landfill Site	1	Off Site	Historic
A	B101	Tank	1	Off Site	Historic
B	B104	Crawley & Ilfield Sewage Works	1	Off Site	Historic
B	B106	Electricity Substation	1	Off Site	Historic
B	B107	Works	1	Off Site	Historic
B	B108	Tank & Electricity Substation	1	Off Site	Historic
C	B112	Landfill Site	1	Off Site	Historic
E	B115	Electricity Substation	1	Off Site	Historic
E	B116	Car Park	2	Off Site	Historic
E	B118	Electricity Substation	2	Off Site	Historic
B	B121	Radar Tower	2	Off Site	Historic
B	B122	Mast	1	Off Site	Historic
D	B127	Balancing Pond	2	Off Site	Historic
D	B128	Fire Training Ground	2	Off Site	Historic
E	B131	Fire Training Ground	2	Off Site	Historic
E	B134	Pumping Station	1	Off Site	Historic

Table 3 - Current On Site Hydrogeology
Site: GAL Gatwick
Completed by: Laura-Anne Knapper
Checked by: Claire Illingworth Yurdakök

Zone	Land Use No	Land Use	Hydrogeology Class	On Site / Off Site	Historic / Current
A	A1	Pallet Process	1	On Site	Current
A	A2	Car Parks	2	On Site	Current
A	A5	Caravan Park	2	On Site	Current
B	A6	Sewage Pumping Station	1	On Site	Current
B	A8	Car Park	2	On Site	Current
B	A11	Works	1	On Site	Current
B	A15	Petrol Station - Car Wash / Parking	1	On Site	Current
B	A17	Industrial Estate/Commercial	2	On Site	Current
B	A20	Sewage Pumping Station	2	On Site	Current
B	A21	Electricity Substation	1	On Site	Current
B	A22	Farm - Waste Treatment Facility	1	On Site	Current
B	A23	Tank	1	On Site	Current
B	A24	Maintenance Area 1	2	On Site	Current
B	A26	Industrial Estate/Commercial	3	On Site	Current
B	A28	Depots and Warehouses	3	On Site	Current
B	A29	The Beehive	2	On Site	Current
B	A32	Balancing Pond	2	On Site	Current
B	A33	Railway Line	2	On Site	Current
C	A36	Gas Holder	1	On Site	Current
C	A37	Electricity Substation	1	On Site	Current
C	A38	Tank	1	On Site	Current
C	A39	Electricity Substation	1	On Site	Current
C	A40	Balancing Pond	1	On Site	Current
F	A42	Garden Centre	2	On Site	Current
F	A43	Used Car Sales	2	On Site	Current
F	A44	Licenced Waste Management Facility	2	On Site	Current
F	A46	Potential unauthorised activities	2	On Site	Current
F	A48	Potential unauthorised activities	2	On Site	Current
F	A49	Potential unauthorised activities	2	On Site	Current
F	A50	Potential unauthorised activities	2	On Site	Current
F	A51	Potential unauthorised activities / Disused Garden Centre	2	On Site	Current
F	A53	Licenced Waste Management Facility	1	On Site	Current
F	A54	Electricity Substation	1	On Site	Current
F	A55	Car Park	1	On Site	Current
F	A56	Car Park	1	On Site	Current
F	A59	Balancing Pond	1	On Site	Current

Table 4 - Current Off Site Hydrogeology
Site: GAL Gatwick
Completed by: Laura-Anne Knapper
Checked by: Claire Illingworth Yurdakök

Zone	Land Use No	Land Use	Hydrogeology Class	On Site / Off Site	Historic / Current
B	B102	Industrial Estate/Commercial	2	Off Site	Current
B	B103	Council Depot	1	Off Site	Current
B	B105	Industrial Estate/Commercial	1	Off Site	Current
B	B109	Industrial Estate/Commercial	1	Off Site	Current
B	B110	Industrial Estate/Commercial	3	Off Site	Current
B	B111	Petrol Station	1	Off Site	Current
F	B113	Balancing Pond	2	Off Site	Current
F	B114	Balancing Pond	2	Off Site	Current
E	B117	Balancing Pond	2	Off Site	Current
E	B119	Aircraft Services Compound	2	Off Site	Current
A	B120	Runway	2	Off Site	Current
A	B123	Electricity Substation	2	Off Site	Current
A	B124	Radar Aerial	2	Off Site	Current
A	B125	Electricity Substation	2	Off Site	Current
D	B126	Fire Training Ground	1	Off Site	Current
D	B129	Balancing Pond	2	Off Site	Current
E	B130	Maintenance Area 2	2	Off Site	Current
D	B132	Balancing Pond	1	Off Site	Current
E	B133	Car Park	2	Off Site	Current

Appendix 4

Hydrological Risk Rating

Table 1 - Historic On Site Hydrology
Site: GAL Gatwick
Completed by: Laura-Anne Knapper
Checked by: Claire Illingworth Yurdakök

Zone	Land Use No	Land Use	Hydrology Class	On Site / Off Site	Historic / Current
A	A3	Factory	3	OnSite	Historic
A	A4	Tank	1	On Site	Historic
B	A7	Radar Tower	3	On Site	Historic
B	A9	Tank	2	On Site	Historic
B	A10	Electricity Substation	1	On Site	Historic
B	A12	Old Limekiln	3	On Site	Historic
B	A13	Electricity Substation	3	On Site	Historic
B	A14	Tank	3	On Site	Historic
B	A16	Windmill (Corn)	1	On Site	Historic
B	A18	Printing Works	1	On Site	Historic
B	A19	Tank	1	On Site	Historic
B	A25	Electricity Substation	2	On Site	Historic
B	A27	Tank	2	On Site	Historic
B	A30	Tank	2	On Site	Historic
B	A31	Tank	2	On Site	Historic
C	A34	Sewage Works	3	On Site	Historic
C	A35	Additional Gas Holder	3	On Site	Historic
C	A41	Greyhound Race Track	1	On Site	Historic
F	A45	Poultry Houses	3	On Site	Historic
F	A47	Electricity Substation	3	On Site	Historic
F	A52	Greyhound Race Track	3	On Site	Historic
F	A57	Timber Yard	3	On Site	Historic
F	A58	Engineering Works	3	On Site	Historic
E	A60	Pond	3	On Site	Historic
E	A61	Balancing Pond	1	On Site	Historic

Table 2 - Historic Off Site Hydrology
Site: GAL Gatwick
Completed by: Laura-Anne Knapper
Checked by: Claire Illingworth Yurdakök

Zone	Land Use No	Land Use	Hydrology Class	On Site / Off Site	Historic / Current
A	B100	Landfill Site	1	Off Site	Historic
A	B101	Tank	1	Off Site	Historic
B	B104	Crawley & Ilfield Sewage Works	1	Off Site	Historic
B	B106	Electricity Substation	1	Off Site	Historic
B	B107	Works	1	Off Site	Historic
B	B108	Tank & Electricity Substation	1	Off Site	Historic
C	B112	Landfill Site	3	Off Site	Historic
E	B115	Electricity Substation	2	Off Site	Historic
E	B116	Car Park	2	Off Site	Historic
E	B118	Electricity Substation	2	Off Site	Historic
B	B121	Radar Tower	3	Off Site	Historic
B	B122	Mast	2	Off Site	Historic
D	B127	Balancing Pond	3	Off Site	Historic
D	B128	Fire Training Ground	3	Off Site	Historic
E	B131	Fire Training Ground	3	Off Site	Historic
E	B134	Pumping Station	2	Off Site	Historic

Table 3 - Current On Site Hydrology
Site: GAL Gatwick
Completed by: Laura-Anne Knapper
Checked by: Claire Illingworth Yurdakök

Zone	Land Use No	Land Use	Hydrology Class	On Site / Off Site	Historic / Current
A	A1	Pallet Process	3	On Site	Current
A	A2	Car Parks	3	On Site	Current
A	A5	Caravan Park	3	On Site	Current
B	A6	Sewage Pumping Station	3	On Site	Current
B	A8	Car Park	3	On Site	Current
B	A11	Works	1	On Site	Current
B	A15	Petrol Station - Car Wash / Parking	3	On Site	Current
B	A17	Industrial Estate/Commercial	3	On Site	Current
B	A20	Sewage Pumping Station	2	On Site	Current
B	A21	Electricity Substation	3	On Site	Current
B	A22	Farm - Waste Treatment Facility	1	On Site	Current
B	A23	Tank	2	On Site	Current
B	A24	Maintenance Area 1	2	On Site	Current
B	A26	Industrial Estate/Commercial	1	On Site	Current
B	A28	Depots and Warehouses	3	On Site	Current
B	A29	The Beehive	1	On Site	Current
B	A32	Balancing Pond	3	On Site	Current
B	A33	Railway Line	3	On Site	Current
C	A36	Gas Holder	2	On Site	Current
C	A37	Electricity Substation	2	On Site	Current
C	A38	Tank	2	On Site	Current
C	A39	Electricity Substation	1	On Site	Current
C	A40	Balancing Pond	3	On Site	Current
F	A42	Garden Centre	1	On Site	Current
F	A43	Used Car Sales	1	On Site	Current
F	A44	Licenced Waste Management Facility	3	On Site	Current
F	A46	Potential unauthorised activities	3	On Site	Current
F	A48	Potential unauthorised activities	3	On Site	Current
F	A49	Potential unauthorised activities	2	On Site	Current
F	A50	Potential unauthorised activities	3	On Site	Current
F	A51	Potential unauthorised activities / Disused Garden Centre	3	On Site	Current
F	A53	Licenced Waste Management Facility	2	On Site	Current
F	A54	Electricity Substation	3	On Site	Current
F	A55	Car Park	3	On Site	Current
F	A56	Car Park	3	On Site	Current
F	A59	Balancing Pond	3	On Site	Current

Table 4 - Current Off Site Hydrology
Site: GAL Gatwick
Completed by: Laura-Anne Knapper
Checked by: Claire Illingworth Yurdakök

Zone	Land Use No	Land Use	Hydrology Class	On Site / Off Site	Historic / Current
B	B102	Industrial Estate/Commercial	3	Off Site	Current
B	B103	Council Depot	3	Off Site	Current
B	B105	Industrial Estate/Commercial	1	Off Site	Current
B	B109	Industrial Estate/Commercial	1	Off Site	Current
B	B110	Industrial Estate/Commercial	3	Off Site	Current
B	B111	Petrol Station	1	Off Site	Current
F	B113	Balancing Pond	3	Off Site	Current
F	B114	Balancing Pond	3	Off Site	Current
E	B117	Balancing Pond	3	Off Site	Current
E	B119	Aircraft Services Compound	2	Off Site	Current
A	B120	Runway	3	Off Site	Current
A	B123	Electricity Substation	2	Off Site	Current
A	B124	Radar Aerial	3	Off Site	Current
A	B125	Electricity Substation	1	Off Site	Current
D	B126	Fire Training Ground	3	Off Site	Current
D	B129	Balancing Pond	2	Off Site	Current
E	B130	Maintenance Area 2	3	Off Site	Current
D	B132	Balancing Pond	3	Off Site	Current
E	B133	Car Park	3	Off Site	Current

Appendix 5

Land-Use Risk Category

Table 1 - Historic On Site Risk Category
Site: GAL Gatwick
Completed by: Laura-Anne Knapper
Checked by: Claire Illingworth Yurdakök

Zone	Land Use No	Land Use	Dates	Land Use Class	Hydrogeology Class	Hydrology Class	Risk Category	On Site / Off Site	Historic / Current
A	A3	Factory	1962 - 2006	2	2	3	12	On Site	Historic
A	A4	Tank	1897 - 1963	2	1	1	2	On Site	Historic
B	A7	Radar Tower	1992 - 1993	2	1	3	6	On Site	Historic
B	A9	Tank	1919 - 1946	2	1	2	4	On Site	Historic
B	A10	Electricity Substation	1992 - 1993	2	1	1	2	On Site	Historic
B	A12	Old Limekiln	1919 only	2	1	3	6	On Site	Historic
B	A13	Electricity Substation	1981 - 1993	2	1	3	6	On Site	Historic
B	A14	Tank	1913 - 1962	2	2	3	12	On Site	Historic
B	A16	Windmill (Corn)	1870 - 1983	2	2	1	4	On Site	Historic
B	A18	Printing Works	1946 - 1975	1	1	1	1	On Site	Historic
B	A19	Tank	1981 - 1988	2	1	1	2	On Site	Historic
B	A25	Electricity Substation	1988 - 2006	2	2	2	8	On Site	Historic
B	A27	Tank	1973 - 1975	2	1	2	4	On Site	Historic
B	A30	Tank	1962 - 1983	2	2	2	8	On Site	Historic
B	A31	Tank	1978 - 1988	2	2	2	8	On Site	Historic
C	A34	Sewage Works	1961 - 1976	2	1	3	6	On Site	Historic
C	A35	Additional Gas Holder	1978 - 1991	3	1	3	9	On Site	Historic
C	A41	Greyhound Race Track	1973 - only	1	1	1	1	On Site	Historic
F	A45	Poultry Houses	1975 - 1993	3	2	3	18	On Site	Historic
F	A47	Electricity Substation	1975 - 1993	2	2	3	12	On Site	Historic
F	A52	Greyhound Race Track	1961 only	1	2	3	6	On Site	Historic
F	A57	Timber Yard	1973 only	2	1	3	6	On Site	Historic
F	A58	Engineering Works	1973 only	2	1	3	6	On Site	Historic
E	A60	Pond	1988 only	1	1	3	3	On Site	Historic
E	A61	Balancing Pond	2006 only	1	2	1	2	On Site	Historic

Table 2 - Historic Off Site Risk Category
Site: GAL Gatwick
Completed by: Laura-Anne Knapper
Checked by: Claire Illingworth Yurdakök

Zone	Land Use No	Land Use	Dates	Land Use Class	Hydrogeology Class	Hydrology Class	Risk Category	On Site / Off Site	Historic / Current
A	B100	Landfill Site		3	1	1	3	Off Site	Historic
A	B101	Tank	1874 -1910	2	1	1	2	Off Site	Historic
B	B104	Crawley & Ilfield Sewage Works	1919 - 1963	2	1	1	2	Off Site	Historic
B	B106	Electricity Substation	1986 - 1996	2	1	1	2	Off Site	Historic
B	B107	Works	1974 - present	1	1	1	1	Off Site	Historic
B	B108	Tank & Electricity Substation	1970 - 1996	2	1	1	2	Off Site	Historic
C	B112	Landfill Site		3	1	3	9	Off Site	Historic
E	B115	Electricity Substation	1988 - 1991	2	1	2	4	Off Site	Historic
E	B116	Car Park	2013	1	2	2	4	Off Site	Historic
E	B118	Electricity Substation	1973 - 1993	2	2	2	8	Off Site	Historic
B	B121	Radar Tower	1985 - 1993	2	2	3	12	Off Site	Historic
B	B122	Mast	1993 only	2	1	2	4	Off Site	Historic
D	B127	Balancing Pond	1988 - 2006	1	2	3	6	Off Site	Historic
D	B128	Fire Training Ground		3	2	3	18	Off Site	Historic
E	B131	Fire Training Ground		3	2	3	18	Off Site	Historic
E	B134	Pumping Station	1988 - 1991	2	1	2	4	Off Site	Historic

Table 3 - Current On Site Risk Category
Site: GAL Gatwick
Completed by: Laura-Anne Knapper
Checked by: Claire Illingworth Yurdakök

Zone	Land Use No	Land Use	Dates	Land Use Class	Hydrogeology Class	Hydrology Class	Risk Category	On Site / Off Site	Historic / Current
A	A1	Pallet Process		1	1	3	3	On Site	Current
A	A2	Car Parks	2006 - present	1	2	3	6	On Site	Current
A	A5	Caravan Park	1974 - present	1	2	3	6	On Site	Current
B	A6	Sewage Pumping Station	1983 - present	2	1	3	6	On Site	Current
B	A8	Car Park		1	2	3	6	On Site	Current
B	A11	Works	1983 - present	2	1	1	2	On Site	Current
B	A15	Petrol Station - Car Wash / Parking	1993 - present	3	1	3	9	On Site	Current
B	A17	Industrial Estate/Commercial	1988 - present	2	2	3	12	On Site	Current
B	A20	Sewage Pumping Station	1988 - present	2	2	2	8	On Site	Current
B	A21	Electricity Substation	1988 - present	2	1	3	6	On Site	Current
B	A22	Farm - Waste Treatment Facility		2	1	1	2	On Site	Current
B	A23	Tank	2006 - present	2	1	2	4	On Site	Current
B	A24	Maintenance Area 1		3	2	2	12	On Site	Current
B	A26	Industrial Estate/Commercial	1988 - present	2	3	1	6	On Site	Current
B	A28	Depots and Warehouses	1988 - present	1	3	3	9	On Site	Current
B	A29	The Beehive	1963 - present	1	2	1	2	On Site	Current
B	A32	Balancing Pond	1973 - present	1	2	3	6	On Site	Current
B	A33	Railway Line	1874 - present	2	2	3	12	On Site	Current
C	A36	Gas Holder	1965 - present	3	1	2	6	On Site	Current
C	A37	Electricity Substation	1975 - present	2	1	2	4	On Site	Current
C	A38	Tank	1965 - present	2	1	2	4	On Site	Current
C	A39	Electricity Substation	1978 - present	2	1	1	2	On Site	Current
C	A40	Balancing Pond	2006 - present	1	1	3	3	On Site	Current
F	A42	Garden Centre		1	2	1	2	On Site	Current
F	A43	Used Car Sales		1	2	1	2	On Site	Current
F	A44	Licenced Waste Management Facility		2	2	3	12	On Site	Current
F	A46	Potential unauthorised activities		2	2	3	12	On Site	Current
F	A48	Potential unauthorised activities		2	2	3	12	On Site	Current
F	A49	Potential unauthorised activities		2	2	2	8	On Site	Current
F	A50	Potential unauthorised activities		2	2	3	12	On Site	Current
F	A51	Potential unauthorised activities / Disused Garden Centre		2	2	3	12	On Site	Current
F	A53	Licenced Waste Management Facility		2	1	2	4	On Site	Current
F	A54	Electricity Substation	1988 - present	2	1	3	6	On Site	Current
F	A55	Car Park	1979 - present	1	1	3	3	On Site	Current
F	A56	Car Park	1988 - present	1	1	3	3	On Site	Current
F	A59	Balancing Pond	1988 - present	1	1	3	3	On Site	Current

Table 4 - Current Off Site Risk Category
Site: GAL Gatwick
Completed by: Laura-Anne Knapper
Checked by: Claire Illingworth Yurdakök

Zone	Land Use No	Land Use	Dates	Land Use Class	Hydrogeology Class	Hydrology Class	Risk Category	On Site / Off Site	Historic / Current
B	B102	Industrial Estate/Commercial	2006 - present	1	2	3	6	Off Site	Current
B	B103	Council Depot	1972 - present	1	1	3	3	Off Site	Current
B	B105	Industrial Estate/Commercial	1974 - present	1	1	1	1	Off Site	Current
B	B109	Industrial Estate/Commercial	1974 - present	1	1	1	1	Off Site	Current
B	B110	Industrial Estate/Commercial	1963 - present	1	3	3	9	Off Site	Current
B	B111	Petrol Station		3	1	1	3	Off Site	Current
F	B113	Balancing Pond	1979 - present	1	2	3	6	Off Site	Current
F	B114	Balancing Pond	1979 - present	1	2	3	6	Off Site	Current
E	B117	Balancing Pond	1961 - present	1	2	3	6	Off Site	Current
E	B119	Aircraft Services Compound		3	2	2	12	Off Site	Current
A	B120	Runway	1961 - present	2	2	3	12	Off Site	Current
A	B123	Electricity Substation	1974 - present	2	2	2	8	Off Site	Current
A	B124	Radar Aerial	1985 - present	2	2	3	12	Off Site	Current
A	B125	Electricity Substation	1974 - present	2	2	1	4	Off Site	Current
D	B126	Fire Training Ground		3	1	3	9	Off Site	Current
D	B129	Balancing Pond	2006 - present	1	2	2	4	Off Site	Current
E	B130	Maintenance Area 2		3	2	3	18	Off Site	Current
D	B132	Balancing Pond	1979 - present	1	1	3	3	Off Site	Current
E	B133	Car Park	1988 - present	1	2	3	6	Off Site	Current

Appendix 6

Scheme Assessment with EATs

APPENDIX 6 – END AROUND TAXIWAY ASSESSMENT

The Figure 7 included in this report illustrates the effects of the additional land take that would be required for the provision of the end around taxiway (EAT) on Geoenvironmental Issues. The provision of the taxiway would have a negligible effect on the Geoenvironment. The desk based assessment has identified that a single land use in the area needed for EATS that has been identified as having a potential historical or current contaminative land use, however the land use has been allocated a low risk category.

Overall, based on the low risk category of the land use, it is assessed that there would be no change in the performance of the potential scheme with the end around taxiway compared to the scheme without the taxiway.