

Crawley Data Centre Campus – Site Condition Report

Digital Realty (UK) Limited
EPR/UP3604MT/A001



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Executive Summary

EcoAct was commissioned by Digital Realty (UK) Limited, known as 'Digital Realty' to produce a Site Condition Report (SCR) in support of their Environmental Permitting (England and Wales) Regulations 2016 permit application for Crawley Data Centre Campus. Digital Realty Crawley campus has two units called Digital Realty - Unit 1 and Unit 2. The whole site has an area of 10.29 hectares and the surrounding land use is a mix of industrial, commercial, retail and residential.

The building on the southern side of the campus is called Unit 1 Crawley – LGW15 which was constructed in 2012/13 (approximately) while the building on the north side of the campus is called Unit 2 Crawley North – LGW16 which was constructed in 2015/16 (approximately). The south building is accessed via Crawley Avenue and the north building is accessed via Manor Royal. The campus also has an internal road, Power Avenue.

In Unit 1 building there are 10 generators have a total rated thermal input of 34.2 MWth, two generators are 1.23 MWth and 8 generators are 3.93 MWth each. All the generators are located on the roof towards the south of the building.

In Unit 2 building there are 7 standby diesel generators each with a rated thermal input of 5.49 MWth. These backup generators have a total combustion capacity of 38.4 MWth. Each generator is fed from a 2000 litre day tank and all seven generators are fed from 2 bulk storage tanks with a capacity of 38,000 litres each. The generators are located to the south of the building in an external designated area.

The installations do not share any technical linkage. Unit 2 currently holds an individual UK ETS permit. Diesel standby generators provide electricity generation capacity to power the data centre in the event of a mains power failure.

The southwest corner of the site is located on superficial deposits of Alluvium (Clay, Silt, Sand and Gravel) overlaying bedrock deposits of Weald Clay formation - Mudstone (North and southwest sections of the site). Upper Tunbridge Wells Sand - Sandstone bedrock formation is found on the southeast corner of the site. The Alluvium superficial deposit is highly permeable.

The source-pathway-receptor linkage is the method of identifying potential risks of contamination. The potential risks identified include:

- Unknown historic/legacy contamination beneath the site from previous chemical laboratories.
- Significant spills or leaks of hydrocarbon fuels and chemicals from primary storage and/or equipment.

The following receptors were identified:

- Site employees
- Construction workers (excavation)
- Surrounding residential inhabitants and commercial buildings

- Onsite priority habitat (woodland)
- Onsite and surrounding groundwater system
- Nearby surface water bodies and local sewerage system

The site has been given an overall risk classification of low risk, based on the historical development of the site, and the multiple layers of resilience management which mitigate any potential impact from the large quantities of hydrocarbon fuel storage on-site. If the site continues to adhere to good environmental site management practices, including the use of spill kits, emergency response plans, visual inspections, maintenance of the generators and associated fill point and leakage alarms, then the current operation is unlikely to cause an impact to the existing site condition.

1 Introduction

1.1 Scope of Work

EcoAct was commissioned by Digital Realty (UK) Limited, known as 'Digital Realty' to produce a Site Condition Report (SCR) in support of their Environmental Permitting (England and Wales) Regulations 2016 permit application for Crawley Data Centre Campus located at Unit 1, Power Ave, Crawley RH10 9BE and Unit 2, Connect Way, Manor Royal, Crawley RH10 9BD.

The aim of this report was to identify the baseline conditions with regards to soil and ground water contamination by carrying out a site visit, and by reviewing additional relevant data and reports.

1.2 Background

The Environment Agency has requested that a permit application be submitted for the area of land identified in Figure 1, Annex A.

The area of land under consideration is the Digital Realty Crawley Data Centre Campus, 'known as the 'Crawley Campus' located at Unit 1, Power Ave, Crawley RH10 9BE and Unit 2, Connect Way, Manor Royal, Crawley RH10 9BD, UK and requires an installation permit under section 1.1 of the Industrial Emissions Directive (IED) for combustion activities, implemented through the Environmental Permitting (England and Wales) Regulations 2016.

This report has been written in accordance with Environment Agency H5 guidance for producing a Site Condition Report (SCR) and comprises a site walkover; review of previous reports; Groundsure data (GS-6790366/GS-6790367) and involved discussions with the Environment Agency. This report has also been completed in accordance with BS 10175:2011 – "Investigation of Potentially Contaminated Sites", code of practice and CLR 11 – "Model Procedures for the Management of Contaminated Land".

The work undertaken for this SCR comprises:

- a site walkover assessment,
- a review of the historical land uses associated with the site to assess the potential for ground contamination,
- a review of the environmental setting to assess the sensitivity of the surrounding environment to contamination/pollution,
- consultation with the regulatory authorities to establish whether there are any significant, environmental issues that may impact upon the site,

- a review of the Groundsure Geo and Enviro Insight reports dated 10/06/2020 reference GS-6790366 /GS-6790367.
- A review of additional publicly and commercially available reports and data sets.

The environmental risk assessment presented within this report has been prepared having regard to the source-pathway-receptor model introduced under Part IIA of the Environmental Protection Act 1990 and associated guidance on contaminated land published by the Department of Environment, Food and Rural Affairs. The methodology is essentially a qualitative assessment based on the identification and evaluation of potential 'source-pathway-receptor pollutant linkages'. On the basis of this risk assessment, consideration has been given to the potential for the site to be designated as 'contaminated land' (under the local authority contaminated land inspection strategy) as defined in Part IIA of the Environmental Protection Act 1990.

This report has been produced solely for supporting Digital Realty (UK) Limited's permit application (EPR/UP3604MT/A001). EcoAct is not liable for any other use of its contents other than those listed in this report nor for use by any other 3rd party than Digital Realty (UK) Limited. A statement of limitations is presented at the end of this report.

2 Site Setting

2.1 Site Location

The Digital Realty Crawley campus has two units called Digital Realty - Unit 1 and Unit 2. The Crawley campus is approximately 1 km south of Gatwick International Airport.

Site: Crawley Unit 1	Site: Crawley Unit 2
Address: Unit 1, Power Ave, Crawley RH10 9BE	Address: Unit 2, Connect Way, Manor Royal, Crawley RH10 9BD.

The National Grid Reference for Crawley south/Crawley North is: TQ277380/TQ276381

The whole site is 10.29 hectares in area and is shown in Annex A, Figure 1. The application focuses on the main operation of the site, including the generators and boilers.

2.2 Surrounding Land Use

The current land use in the area is a mix of industrial, commercial, retail and residential. The surrounding area hosts a range of operations including:

- Various car dealers and repair service providers
- Warehouses and manufacturing
- Various catering services
- Printing equipment and supplies
- Laundry services

The Crawley rail station is on the south side of the campus (3 km) while the Gatwick airport is on the north side of the campus (1 km).

2.3 Site Layout – Operations and Infrastructure

The following observations were made during the site walkover carried out on 10th September 2021.

The campus is spread over 10.29 hectares and has two buildings. The campus is located on an industrial estate to the north of Crawley. The building on the southern side of the campus is called Unit 1 Crawley – LGW15 which was constructed in 2012/13 (approximately) while the building on the north side of the campus is called Unit 2 Crawley North – LGW16 which was constructed in 2015/16 (approximately). The south building is accessed via Crawley Avenue and the north building is accessed via Manor Royal. The campus also has an internal road, Power Avenue.

By entering into the campus via Power Avenue from Manor Royal (north side) the Crawley north – LGW16 building is on the left-hand side and the car park is on the right-hand side. By continuing on the Power Avenue, the Crawley south – LGW15 building is on the left-hand side while there is an open field on the south-west side of the campus. There is a substation in between both the Unit 1 and Unit 2 building.

In Unit 1 building there are 10 generators have a total rated thermal input of 34.2 MWth, two generators are 1.23 MWth and 8 generators are 3.93 MWth each. All the generators are located on the roof towards the south of the building.

In Unit 2 building there are 7 standby diesel generators each with a rated thermal input of 5.49 MWth. These backup generators have a total combustion capacity of 38.4 MWth. Each generator is fed from a 2000 litre day tank and all seven generators are fed from 2 bulk storage tanks with a capacity of 38,000 litres each. The generators are located to the south of the building in an external designated area.

Details of the site drainage is shown in Annex A, Figures 2 and 3.

2.4 Site History

The site is located under the Local Planning Authority of Crawley Borough Council and a review of nearby planning applications and historical maps of the site are described below.

2.4.1 Planning History

There are two records of planning applications based on the site’s postcode RH10 9BE and are directly related to the site.

No	Address	Description	Reference
1	Glaxo Smithkline, Manor Royal, Northgate, Crawley, RH10 9QJ	Erection of extension to plant room to include improved thermal and sound properties	Ref No : CR/2008/0230/FUL Registered Date :

			02/04/2008 Decision : Permit
2	Glaxo Smithkline, Manor Royal, Northgate, Crawley, RH10 9QJ	Prior notification - Demolition of a building	Ref No : CR/2012/0071/DEM Registered Date : 15/02/2012 Decision : Prior approval not required
3	Former GSK site, Manor Royal, Northgate, Crawley	Outline application for erection of a mixed use employment park to include use classes B1C (light industrial), B2 (General Industrial), B8 (storage and distribution) and a business hub accommodating a mix of uses, including B1A (offices), B1C, B8, C1 (hotels), A1 (retail), A3 (restaurant and cafes), A5 (hot food take- away) and car dealership (SUI- GENERIS)	Ref No : CR/2012/0134/OUT Registered Date : 15/03/2012 Decision : Permit
4	Former GSK site, Manor Royal, Telecon Metals & Carpenters tech site, Napier Way, Northgate, Crawley	Erection of 2 x B8 Data storage buildings, associated external plant, HV substation, future siting of prefabricated data storage building, associated plant, car/lorry parking, site access, internal roads, boundary security fencing & hard/soft landscaping	Ref No : CR/2013/0255/FUL Registered Date : 03/06/2013 Decision : Permit
5	Former GSK site, Manor Royal, Northgate, Crawley	Erection of external water tank with associated pump house	Ref No: CR/2014/0611/FUL Registered Date: 28/08/2014 Decision: Permit
6	Former GSK site, Manor Royal, Northgate, Crawley	Approval of reserved matters for the design, appearance and layout of 4 buildings to	Ref No : CR/2014/0415/ARM Registered Date :

		include 2 data storage halls, 1 business hub building, comprising cafe at ground floor with offices above and an emergency power building together with associated car parking, servicing arrangements and landscaping.	19/06/2014 Decision : Approve
7	Former GSK site, Manor Royal, Northgate, Crawley	Approval of reserved matters for design, landscaping, layout and scale of building 1 (fronting manor royal) pursuant to CR/2012/0134/OUT to include amendments to building design previously approved under (CR/2014/0415/ARM)	Ref No : CR/2015/0286/ARM Registered Date : 07/05/2015 Decision : Approve
8	Former GSK site, Manor Royal, Northgate, Crawley	Discharge of conditions 17 (sustainable drainage scheme), 18 (surface water drainage infiltration), 19 (contamination scheme), 21 (piling/foundation design) & 22 (surface water scheme) pursuant to CR/2012/0134/OUT for outline application for erection of a mixed use employment park to include use classes B1c, b2, B8 and a business hub accommodating a mix of uses, including B1A, B1c, B8, C1, A1, A3, A5, and car dealerships (SUI-GENERIS)	Ref No : CR/2012/0134/CC4 Registered Date : 02/03/2017 Decision : Approve
9	Former GSK site, Manor Royal, Northgate, Crawley	Discharge of conditions 1 (materials), 4 (bird hazard management plan), 5 (surface	Ref No : CR/2015/0286/CC2 Registered Date :

		water) & 6 (cycle and smoking shelter) pursuant to CR/2015/0286/ARM for approval of reserved matters for design, landscaping, layout and scale of building1 (fronting manor royal) pursuant to CR/2012/0134/OUT to include amendments to building design previously approved under CR/2014/0415/ARM	28/02/2017 Decision : Approve
10	Unit 1, Power Avenue, Northgate, Crawley	Erection of Secondary roof over the existing roof-mounted plan with associated changes to the existing elevation screening	Ref No: CR/2016/0216/FUL Registered Date: 16th June 2016 Decision: Approve
11	Magpie wood, Digital Realty, Units 1& 2, Connect Way, Northgate, Crawley	Mature Oak – remove all deadwood. Lift crown to approx. 5 metres above ground level to clear footpath & access road for any member of public & vehicles Reference: T1 TAG 35635 T2 35636/ T3 35638/ T4 35639/ T5 35748/ T6 35749/ G7 35750 (Group of x 5 oaks)/ T8 35751/ G9 35752 (Group of x 4 oaks)/ T10 35753/ G11 35754 (Group of x 4 oaks)/ T12 35703/ T13 35704/ T14 35705/ T15 35706. Oak with die back – reduce dead crown down to first live growth points Reference: T16 35734. Mature oak – remove all deadwood. Remove 3 large lower limbs to	Ref No: CR/2023/0435/TPO Registered date: 25/07/2023 Decision:

		cut points marked on the submitted photograph Reference: T17 35708.	
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Table 1: Historical Planning Records

2.4.2 Historical Mapping

Historical maps dating back to 1870 up to present day have been used to summarise the site’s developmental changes over time in table 1.2 below.

Table 1.2: Summary of key developments using historical maps

Date	Key Features
1874	The site is located on agricultural land and covers a few field boundaries. There is a south coast railway line identified on the map to the east of the site.
1895	Farmland is identified around the site
1896	There are a few ponds identified at the north-eastern, east and north-western sides of the site. There is also a river that runs from the northeast side of the site through to the south-western corner of the site.
1909	The site remains unchanged and is located on the agricultural land. There are few residential developments within 750m identified at the north-west side of the site.
1919	No significant changes have been observed at and around the site.
1948	There are various residential and commercial building has been constructed on the east, west and south side of the site.
1963	The field boundaries have changed, and a factory has been constructed on the site. Also, a sports field is located on the south side of the site. There has been substantial industrial development around the site. Factories can be found to the north, east and west of the site and residential building to the south. Three schools can be found to the southeast, northeast and southwest of the site within 750m.
1973	On the site, the factory has been changed to research laboratories. Also, there are few tanks constructed within the site boundary. The surrounding area remains fairly unchanged.
1981	There has been a lot of infrastructure and redevelopment at 500m around the site.
2001	There have been new buildings constructed on the southeastern side of the site. Also, there is industrial and business park development with improved road construction identified around 750m of the site.

2010	There has been extension added to the building located at the southeastern side of the site. The new extension reduced the sports field area at the site.
2020	Most of the small buildings at the site have been removed and now there are only two big buildings at the site. A road has through road (Power Avenue) has been created connecting the site to the A2011 on the south end and to Manor royal on the North side. A petrol station can be found roughly 500m to the northeast of the site.

Table 2: Historical Mapping Summary

2.5 Potentially Contaminative Land Uses

There are a number of potentially contaminative land uses within 250m of the site including electricity substations, tanks and various companies for engineering services, industrial products, vehicle repair, testing services etc.

There are 76 historical contaminative land uses within 500m of the site including laboratories, factories and other industrial works.

There are 66 historical tanks found both on (8) and within 500m of the site.

There are 61 historical electricity substations/transformers within 500m of the site, of which 2 were on site.

There is one historical landfill site that was identified on a survey carried out on behalf of the DoE in 1973 within 500m of the site.

There are 31 waste exemptions within 500m of the site, 2 of the waste exemptions are on site.

There are 74 potentially contaminative current land within 500m of the site, of which 4 are on site (electricity substations and tanks).

There is one petrol station (now obsolete) and List 2 Dangerous Substance site within 500m of the site. Also, there is one Control of Major Accident Hazards (COMAH) area and List 1 Dangerous Substances area on the site. The COMAH status is for an historical 'Notification of Installations Handling Hazardous Substances', and the List 1 Dangerous Substances, is for the historical site use as GSK.

There are 6 licensed pollutant release – Part A(2)/B) permits within 500m of the site. One of which was on site for the historical permit: Coating processes GSK.

There are no National Grid high-pressure gas transmission pipeline and high voltage underground electricity transmission cables within 500m of the site. There are no site determined as contaminated land within 500m of the site. There are no regulated explosive sites within 500m of the site. There are no hazardous substance storage/usage within 500m of the site.

There are 9 Licenced Discharges to controlled waters within 500m of the site all of which are miscellaneous discharged into surface water.

There is one List 2 Dangerous Substances from the plating shop of chromium, copper, lead and nickel within 500m of the site.

There were 2 Pollution Incidents within 500m of the site, both occurred in 2003 and were minor in water impact status. The incidents included both inert/agricultural materials and wastes.

3 Environmental Setting

3.1 Geology

Geological information has been obtained from the Groundsure Report and the British Geological Survey (BGS) Map website². Both these sources use the BGS 1:50,000 Digital Geological Map of Britain.

The southwest corner of the site is located on superficial deposits of Alluvium (Clay, Silt, Sand and Gravel) overlaying bedrock deposits of Weald Clay formation - Mudstone (North and southwest sections of the site). Upper Tunbridge Wells Sand - Sandstone bedrock formation is found on the southeast corner of the site. The Alluvium superficial deposit is highly permeable. The underlying Weald Clay formation - Mudstone sedimentary bedrock formed approximately 126 to 134 million years ago in the cretaceous period and has low permeability. The Upper Tunbridge Wells Sand - Sandstone formed approximately 132 to 139 years ago in the Valanginian period has high permeability.

The southeastern corner of the site is located on Upper Turnbridge Wells Sand-Sandstone and the rest of the site is located on Weald Clay Formation-Mudstone. These sedimentary rocks are fluvial, palustrine and shallow marine in origin. They are detrital, forming deposits reflecting the channels, floodplains, and deltas of a river in a coastal setting. The ground condition is a mixture of non-plastic, low plasticity, and medium plasticity.

There is a bedrock fault on site that runs from the northeast corner to the southeast corner. In terms of bedrock permeability, the fracture flow types are considered to have low permeability at a maximum and very low as a minimum. Where the flow type is mixed the maximum permeability is high and low at a minimum.

The southeast corner of the site has a shrink swell clay hazard rating of negligible and a small portion is very low. The rest of the site has a low hazard rating whereby ground conditions are predominantly medium plasticity. The majority of the site has negligible running sand conditions however the southeast corner has a low hazard rating for running sand conditions. A high hazard rating of running sand conditions may be present in the southwest corner of the site, constraints may apply to land uses involving excavation or the addition or removal of water. Furthermore, compressible, and uneven settlement hazards are probably present. Land use should consider specifically the compressibility and variability of the site.

The site is not located in a Radon Affected Area, as less than 1% of properties are above the action level, therefore no radon protective measures are required.

There are no boreholes within 250 meter around the site.

3.2 Hydrology and Surface Water Features

There are various levels of groundwater vulnerability on the site. On the southwest corner of the site there is a secondary superficial aquifer of medium vulnerability. The southeast corner of the site has a high vulnerability bedrock aquifer. The rest of the site is classified as an unproductive aquifer. The leaching classes are between low and intermediate with infiltration values of 40-70%.

There is one inland river not influenced by normal tidal action on site located in the west area of the site. There are also 2 inland rivers not influenced by normal tide, one overground and the other underground within 250m to the southeast of the site.

There is one surface water body river catchment in the centre of the site. The nearest surface water feature is an inland river located approximately 150m east of the site. The mole upstream of Horley runs within 200m southeast of the site.

There is no river quality information within 1.5km of the site, therefore, there is no chemical or biological river quality analysis available.

There are no active surface water abstraction licences identified within 2km of the site.

3.3 Hydrogeology

The superficial geology below the southwest corner of the site as well as within 250m south and southeast of the site is classified as Secondary (A) Aquifer which comprises permeable layers. These permeable layers are 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 normally classified as a Minor Aquifers.

The underlying bedrock on the southeast side of the site (as well as within 250m south and east of the site) is classified as Secondary (A) aquifer has high permeable layers therefore it is capable of supporting water supply and river base flow. However, the underlying bedrock on the remaining part of the site has low permeability and negligible significance for water supply and river base flow.

3.4 Flood Risk

3.4.1 Surface Water Flooding

The site is not located in an Environment Agency designated Flood Zone 2 and 3 and is not at risk of flooding from rivers and sea (RoFRaS).

The southwest corner of the site has a 1 in 30 year return period of flooding between 0.1m – 0.3m, this lowers to a 1 in 100 year return period of flooding between 0.1 –

0.3, 1 in 250 year return period of flooding between 0.1-0.3 in the west and a 1 in 1000 year return period of 0.1- 0.3m west and centrally. The highest risk on site is in the west and northeast of the site where there is a 1 in 30 year return period of 0.3 – 1m.

3.4.2 Groundwater Flooding

Based on Ordnance Survey the highest risk of flooding within 50m of the site is to the west of the site. The western side of the site is seen to be highly susceptible to groundwater flooding including patches in the northeastern area of the site. The rest of the site has patches of moderate-high flooding and moderate flooding.

3.5 Environmental Sensitivity

There are 4 Designated Ancient Woodlands around 1km from the site as well as a Local Nature Reserve. There are a further 11 Designated Ancient Woodlands within 2km of the site.

The site is located within a Sites of Special Scientific Interest (SSSI) Impact Risk Zone on site. The reason for the citation is as follows:

- Infrastructure - Airports, helipads, and other aviation proposals.
- Air pollution - Livestock & poultry units with floorspace > 500m², slurry lagoons > 750m² & manure stores > 3500t.

There is one Priority Habitat Inventory 'Habitats of principal importance as named under Natural Environment and Rural Communities Act (2006)' on the northwest side of the site. This includes two deciduous woodland habitats. The site also has a tree felling licence.

None of the following environmentally sensitive designations exists within 2km of the site:

- Conserved Wetland sites (Ramsar Sites)
- National Nature Reserves (NNR)
- Special Areas of Conservation (SAC)
- Special Protection Areas (SPA)
- Biosphere Reserves
- Forest Parks
- Marine Conservation Zones
- Green Belt
- Possible Special Areas of Conservation (pSAC)
- Potential Special Protection Areas (pSAP)
- Nitrate Sensitive Areas
- Nitrate Vulnerable Zones
- Sites of Special Scientific Interest Units (SSSI Units)

Regulatory Setting

4.1 Environmental Permits

There are no historic IPC or Part A(1), IPPC Authorised Activities or Dangerous Substances Inventory Sites within 500m of the site. There is one record of Historic Licensed pollutant release (Part A(2)/B) on-site and five records within 500m (north side) of the site. There are no radioactive substance authorisations.

There is one record of Control of Major Accident Hazards (COMAH) on site however the tier is unknown. The operational status is historical NIHHS site. This data includes upper and lower-tier sites and includes a historical archive of COMAH sites and Notification of Installations Handling Hazardous Substances (NIHHS) records.

There are no records of Category 3 or 4 Radioactive Substances Authorisations.

4.2 Discharge Consents and Industrial Processes

There are no Red List identified within 500m of the site. No records of Water Industry Referrals within 500m of the site.

There are nine records of Licensed Discharges to controlled waters within 500m of the site.

4.3 Landfill and Waste Licences

There are no records of Active or recent landfill, Historical landfill (BGS records), Historical landfill (LA/mapping records) and Historic landfill (EA/NRW records) within 500m of the site.

There is one record of Historical waste sites within 500m (northwest side) of the site.

4.4 Records of Pollution Incidents and Contaminated Land

There are two records of substantiated pollution incidents records within 500m on the eastern side of the site. In both the records, the water impact was minor and there was no impact on land and air.

4.5 Petroleum Licences

There was one TEXACO petrol filling station approximately 500m from the site which is now obsolete.

4.6 Mining

No historical mining, Coal Authority coal mining activities have been identified within 1km of the site boundary. However, there is one non- coal mining (Iron Ore) record on site. The assessment is drawn from expert knowledge and literature in addition to the digital geological map of Britain.

4.7 Ground Workings

There are twelve surface ground workings records found within 250m of the site. Historical land uses identified from Ordnance Survey mapping that involved ground excavation at the surface. However, there is no record of underground working within 1 km of the site.

4.8 Railways and Tunnels

No underground railway lines or tunnels have been identified on site or within 250m of the site.

Three Historical railway sidings have been identified from approximately 229m east of the site.

Baseline Soil Conditions

5.1 Baseline Soil Conditions

The Groundsure data identified fourteen on site records of estimated background soil chemistry. The element and estimated concentrations are as follows:

- Arsenic = 15-25 mg/kg
- Cadmium = 1.8 mg/kg
- Chromium = 60-120 mg/kg
- Nickel = 15-45 mg/kg
- Lead = 100 mg/kg

Environmental Risk Assessment

6.1 Risk Assessment Framework

The following environmental risk assessment has been prepared using the source-pathway-receptor model introduced under Part IIA of the Environmental Protection Act 1990. Guidance on contaminated land published by the Department of Environment, Food and Rural Affairs has also been used.

The methodology is a qualitative assessment based on the identification and evaluation of potential 'source-pathway-receptor pollutant linkages'.

An environmental risk assessment involves assessing the likely probability and consequence of a pollutant linkage existing, in order to obtain a level of risk. For a risk to exist all three of the following components must be present:

- Source of contamination
- Pathway for the contaminant to move from source to receptor
- Receptor that could be affected by the contaminant

The following sections identify the potential sources, pathways and receptors present on site the potential linkages.

6.2 Potential Sources

Table 3 below identifies the potential sources of contaminants on the site and qualitatively assesses their significance on a scale of 1 (Low) to 5 (High), versus the likelihood on a scale of 1 (Unlikely) to 3 (Very likely).

The risk score is the product of the significance and likelihood has been categorised as follows:

- 1-4 = Low Potential Risk
- 5-10 = Medium Potential Risk
- 11-15 = High Potential Risk

<i>ID</i>	<i>Potential Source</i>	<i>Potential Significance (1 low, 5 high)</i>	<i>Likelihood (1 unlikely, 3 very likely)</i>	<i>Risk Score</i>
1	Unknown historic/legacy contamination beneath the site from previous chemical laboratories	3	1	3
2	Significant spills or leaks of hydrocarbon fuels and chemicals from primary storage and/or equipment	5	1	5

Table 3: Potential Sources On-site

The two potential sources are considered medium risk due to the information provided in the historical mapping and the site walkover.

6.3 Potential Pathways

Table 4 below identifies the potential pathways that exist on-site.

<i>ID</i>	<i>Potential Pathways</i>
1	Vertical and lateral leaching through the soil
2	Minor aquifer flow (the sands)
3	Dermal contact and ingestions during excavation without PPE
4	Inhalation during excavation
5	Surface water drainage
6	Potential onsite groundwater and surface water flooding
7	Dermal contact and ingestion

Table 4: Potential Pathways On-site

6.4 Potential Receptors

Table 5 identifies the potential receptors that have been identified on-site and in the surrounding area.

<i>ID</i>	<i>Potential Receptors</i>
1	Site employees
2	Construction workers (excavation)
3	Onsite and surrounding groundwater system
4	Surrounding residents and commercial buildings
5	Surface water bodies and local sewage systems
6	Onsite priority habitat (woodland)

Table 5: Potential Receptors

6.5 Potentially Complete Source-Pathway-Receptor Linkages

<i>Potential Receptors</i>							
		Site Employees	Construction Workers (Excavation)	Onsite/Surrounding Groundwater System	Surrounding residents and commercial buildings	Surface water bodies local sewage systems	Onsite Priority habitat (2006)
Potential Sources	Unknown historic/legacy contamination beneath the site	N/A	Inhalation, ingestion and dermal contact	Vertical and lateral leaching of contaminants through the permeable superficial deposits into the onsite and surrounding groundwater system	Lateral leaching of contaminants. Inhalation, ingestion, and dermal contact	Lateral/vertical leaching of contaminant into surface water bodies and sewage systems	Lateral/vertical leaching of contaminant into onsite priority habitat
	Significant spills or leaks of hydrocarbon fuels and chemicals from primary storage and/or equipment	Inhalation, ingestion and dermal contact	Inhalation, ingestion and dermal contact	Vertical and lateral leaching of contaminants through the permeable superficial deposits into the onsite and surrounding groundwater system	Lateral leaching of contaminants. Inhalation, ingestion, and dermal contact	Lateral/vertical leaching of contaminant into surface water bodies and sewage systems	Lateral leaching into the priority habitat

Table 6: Review of source-pathway-receptor linkages on-site

Potential Source	Pathway	Receptor	Risk	Rationale
Unknown historic/legacy contamination beneath the site	Inhalation of vapours, ingestion, and dermal contact	Construction workers (during excavation)	Low	The redevelopment of the site has reduced the potential for historic contamination through the excavation of potential historic contaminated soils. The use of appropriate personal protective equipment (PPE) by construction workers and following the environmental management system (EMS) procedures during any excavations will mitigate any potential risk.
	Vertical and lateral leaching of contaminants through the permeable superficial deposits into the groundwater system	Onsite/Surrounding groundwater system	Low	The redevelopment of the site has reduced the potential for historic contamination through the excavation of potential historic contaminated soils. There is a potential for historical contamination beneath the site to migrate through the underlying superficial deposits of Alluvium and underlying Upper Tunbridge Wells Sands that underlays the southeast corner of the site classed as high vulnerability and contaminate groundwater. The secondary superficial aquifer is medium vulnerability and crosses the southwest corner of the site. The rest of the site is classed as unproductive and therefore has low risk of leaching.
	Lateral leaching of contaminants. Inhalation, ingestion, and dermal contact	Surrounding residents and commercial buildings	Low	The redevelopment of the site has reduced the potential for historic contamination through the excavation of potential historic contaminated soils. Residents to the south of the site and commercial buildings to the north of the site are a considerable distance from the site and therefore there is a low risk from unknown historic/legacy contamination beneath the site.

	Lateral/vertical leaching of contaminant into surface water bodies and sewage systems	Surface water bodies local sewage systems	Low	The redevelopment of the site has reduced the potential for historic contamination through the excavation of potential historic contaminated soils. There is a potential for historical contamination beneath the site to migrate through the underlying superficial deposits of Alluvium and underlying Upper Tunbridge Wells Sands which can leach through the secondary bedrock aquifer that underlays the southeast corner of the site classed as high vulnerability and contaminate groundwater. The secondary superficial aquifer is medium vulnerability and crosses the southwest corner of the site. The rest of the site is classed as unproductive and therefore has low risk of leaching into surface water bodies and the local sewage system.
	Lateral/vertical leaching of contaminant into onsite priority habitat	Onsite Priority habitat (2006)	Low/medium	The redevelopment of the site has reduced the potential for historic contamination through the excavation of potential historic contaminated soils. There is a potential for historical contamination beneath the site to migrate through the underlying superficial deposits of Alluvium and underlying Upper Tunbridge Wells Sands which can leach through the secondary bedrock aquifer that underlays the southeast corner of the site classed as high vulnerability and contaminate groundwater. The secondary superficial aquifer is medium vulnerability and crosses the southwest corner of the site. The rest of the site is classed as unproductive and therefore has low/medium risk of leaching into the onsite priority habitat.
Significant spills or leaks of hydrocarbon fuels and chemicals from primary storage and/or equipment Construction workers Construction workers	Inhalation of vapours	Site employees	Low	Given the large quantities storage of hydrocarbons stored on-site in storage tanks and equipment, there is a potential risk of spills and leakage. Integral bunding of the tanks as well as robust incident response plan and operational procedures to identify and mitigate spills and leakages at the site. If the appropriate PPE and clean up equipment is used by site workers when dealing within spills and leakages, this will reduce the potential risk to them.

	Ingestion and dermal contact	Site employees	Low	Given the large quantities storage of hydrocarbons stored on-site in storage tanks and equipment, there is a potential risk of spills and leakage. Integral bunding of the tanks as well as robust incident response plan and operational procedures to identify and mitigate spills and leakages at the site. If the appropriate PPE and clean up equipment is used by site workers when dealing within spills and leakages, this will reduce the potential risk to them.
	Inhalation of vapours	Site employees	Low	Given the large quantities storage of hydrocarbons stored on-site in storage tanks and equipment, there is a potential risk of spills and leakage. Integral bunding of the tanks as well as robust incident response plan and operational procedures to identify and mitigate spills and leakages at the site.
	Ingestion and dermal contact	Construction workers	Low	Given the large quantities storage of hydrocarbons stored on-site in storage tanks and equipment, there is a potential risk of spills and leakage. Integral bunding of the tanks as well as robust incident response plan and operational procedures to identify and mitigate spills and leakages at the site.
	Vertical and lateral leaching of contaminants through the permeable superficial deposits into the groundwater system	Surrounding groundwater system	Low	There is a potential risk of spills and leakages from the bulk fuel storage located at basement level on-site to migrate through the underlying superficial deposits of Alluvium and underlying Upper Tunbridge Wells Sands which underlays the southeast corner of the site and contaminate groundwater. The secondary superficial aquifer is medium vulnerability and crosses the southwest corner of the site. The rest of the site is classed as unproductive and therefore has low risk of leaching. Given the large quantities storage of hydrocarbons stored on-site in storage tanks and equipment, there is a potential risk of spills and leakage. Integral bunding of the tanks as well as robust incident response plan and operational procedures to identify and mitigate spills and leakages at the site. The presence of concrete hardstanding will reduce the potential for

				leaching of contaminants into the underlying strata.
	Inhalation of vapours	Surrounding residents and commercial buildings	Extremely low	There is a potential risk of spills and leakages from the bulk fuel storage located at basement level on-site. Given the large quantities storage of hydrocarbons stored on-site in storage tanks and equipment, there is a potential risk of spills and leakage. Integral bunding of the tanks as well as robust incident response plan and operational procedures to identify and mitigate spills and leakages at the site. The presence of concrete hardstanding will reduce the potential for leaching of contaminants into the underlying strata.
	Ingestion and dermal contact	Surrounding residents and commercial buildings	Extremely low	Given the large quantities storage of hydrocarbons stored on-site in storage tanks and equipment, there is a potential risk of spills and leakage. Integral bunding of the tanks as well as robust incident response plan and operational procedures to identify and mitigate spills and leakages at the site.
	Lateral/vertical leaching of contaminant into surface water bodies and sewage systems	Surface water bodies and surrounding sewerage system	Low	Given the large quantities storage of hydrocarbons stored on-site in storage tanks and equipment, there is a potential risk of spills and leakage. Integral bunding of the tanks as well as robust incident response plan and operational procedures to identify and mitigate spills and leakages at the site. There is therefore a low risk of lateral and vertical leaching to surface water bodies and surrounding sewerage systems.
	Lateral leaching into priority habitat	Onsite Priority habitat (2006)	Low	Given the large quantities storage of hydrocarbons stored on-site in storage tanks and equipment, there is a potential risk of spills and leakage. Integral bunding of the tanks as well as robust incident response plan and operational procedures to identify and mitigate spills and leakages at the site. There is therefore a low risk of lateral leaching into the onsite priority habitat.

Table 7: Summary of potentially complete Source-Pathway-Receptor linkages and risk ratings identified on-site

Conclusions and Recommendations

7.1 Conclusions

The site has been given an overall risk classification of low risk, based on the historical development of the site, and the multiple layers of resilience management which mitigates any potential impact from the large quantities of hydrocarbon fuel storage on-site.

If the site continues to adhere to good environmental site management practices, then the current operation is unlikely to cause an impact to the existing site condition.

7.2 Recommendations

The following recommendations should be adhered to in order to reduce the impact of the potential source, pathway and receptor linkages:

- Continue to adhere to the site's environmental management system which includes an Emergency Response Plan and Pollution Prevention Response Plan, which has been communicated to all staff. Staff should continue to use the available spill kits to manage any potential contaminative material.
- Use of PPE by site employees and contractors to reduce any risk of potential contamination through inhalation, ingestion and dermal contact.
- Maintenance of the fuel storage tanks, fill point and leakage alarm system linked to the BMS.
- Regular visual inspections of hardstanding to reduce potential leakage off site.

Statement of Limitations

This report has been prepared in accordance with the scope of work outlined within this report and is subject to applicable cost, time and other constraints. EcoAct performed the services on behalf of the Client in a manner consistent with the normal level of care and expertise exercised by members of the environmental profession. No warranties, expressed or implied, are made.

Except as otherwise stated, EcoAct's assessment is limited strictly to identifying the specified environmental conditions associated with the subject site and does not evaluate structural or geotechnical conditions of any part of the site (including any buildings, equipment or infrastructure).

All conclusions and recommendations made in the report are the professional opinions of the EcoAct personnel involved with the project and, while normal checking of the accuracy of data has been conducted, EcoAct assumes no responsibility or liability for errors in data obtained from such sources, regulatory agencies or any other external sources, nor from occurrences outside the scope of this project.

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This report does not constitute legal advice.

Annex A Figures

Figure 1 – Site Boundary and Location

Figure 2 – Unit 2 Site Drainage Plan

Figure 3 – Unit 3 Site Drainage Plan

Figure 4 - Hydrogeology Map

Figure 5 – Flood Map from surface water

Figure 6 – Flood Map from groundwater

Figure 7 – Designated Environmentally Sensitive Sites Maps

Figure 8 – Habitat Designations Map

Figure 1: Site Boundary and Location



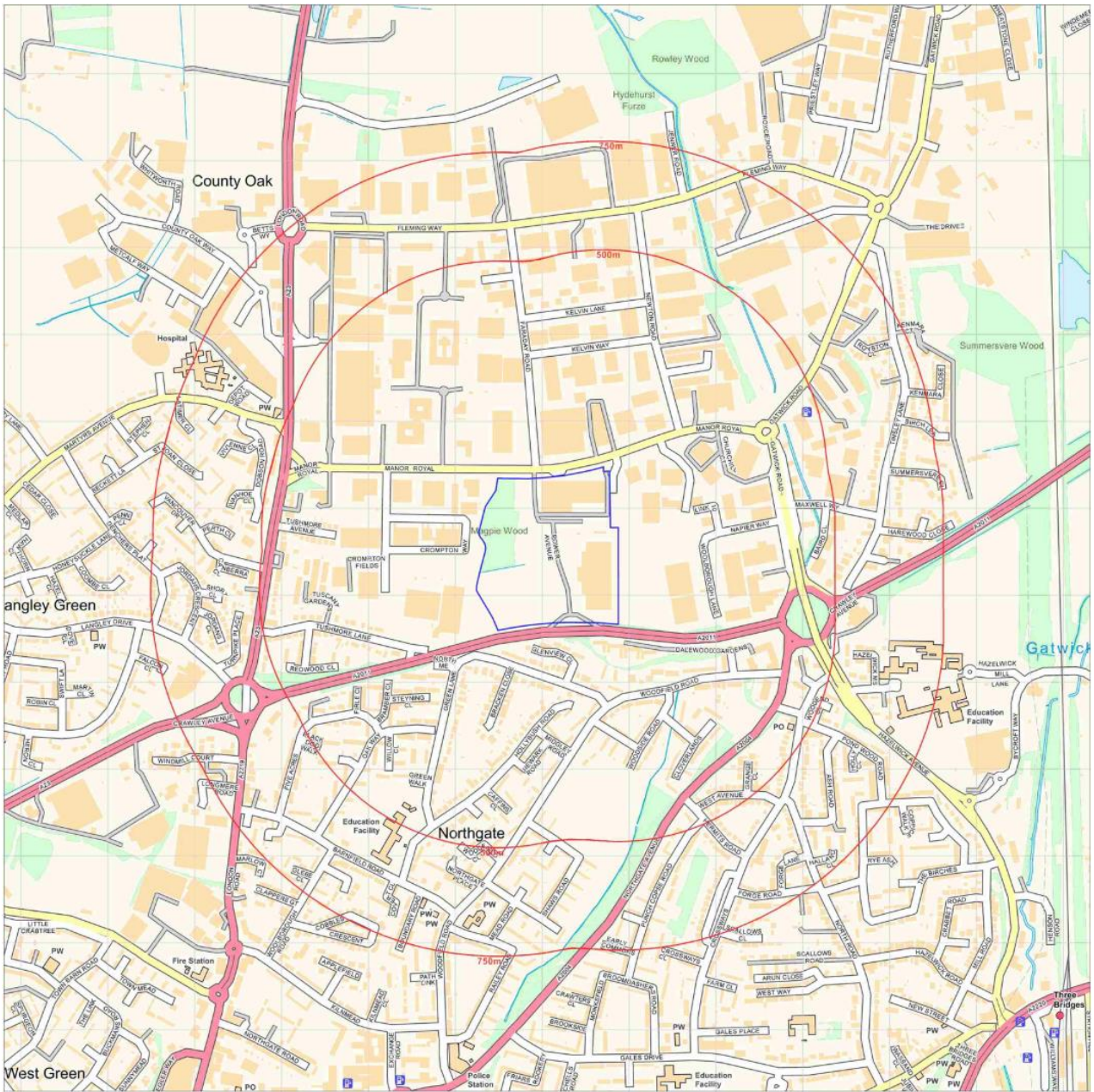


Figure 1: Unit 1 Site Drainage Plan

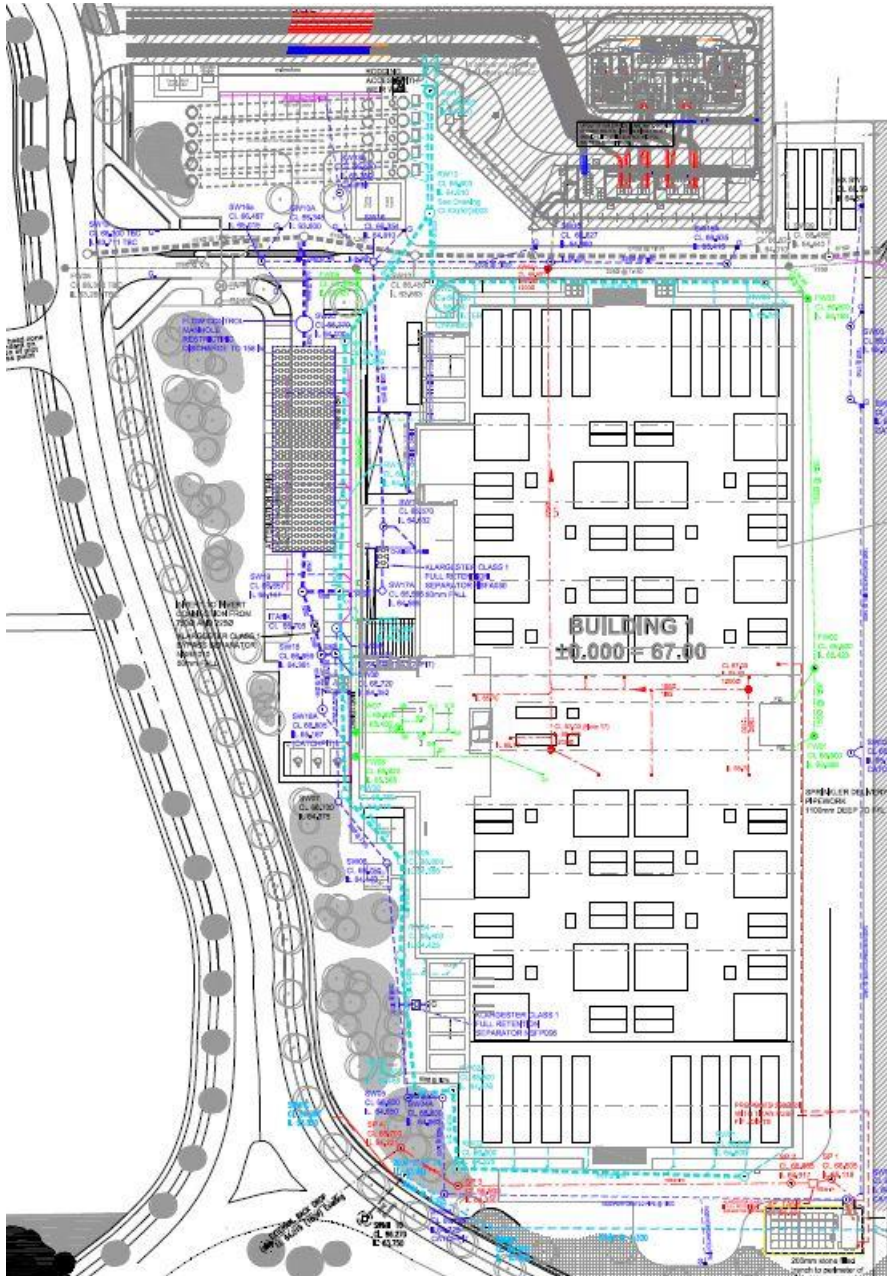


Figure 3: Unit 2 Site Drainage Plan

EXTERNAL DRAINAGE

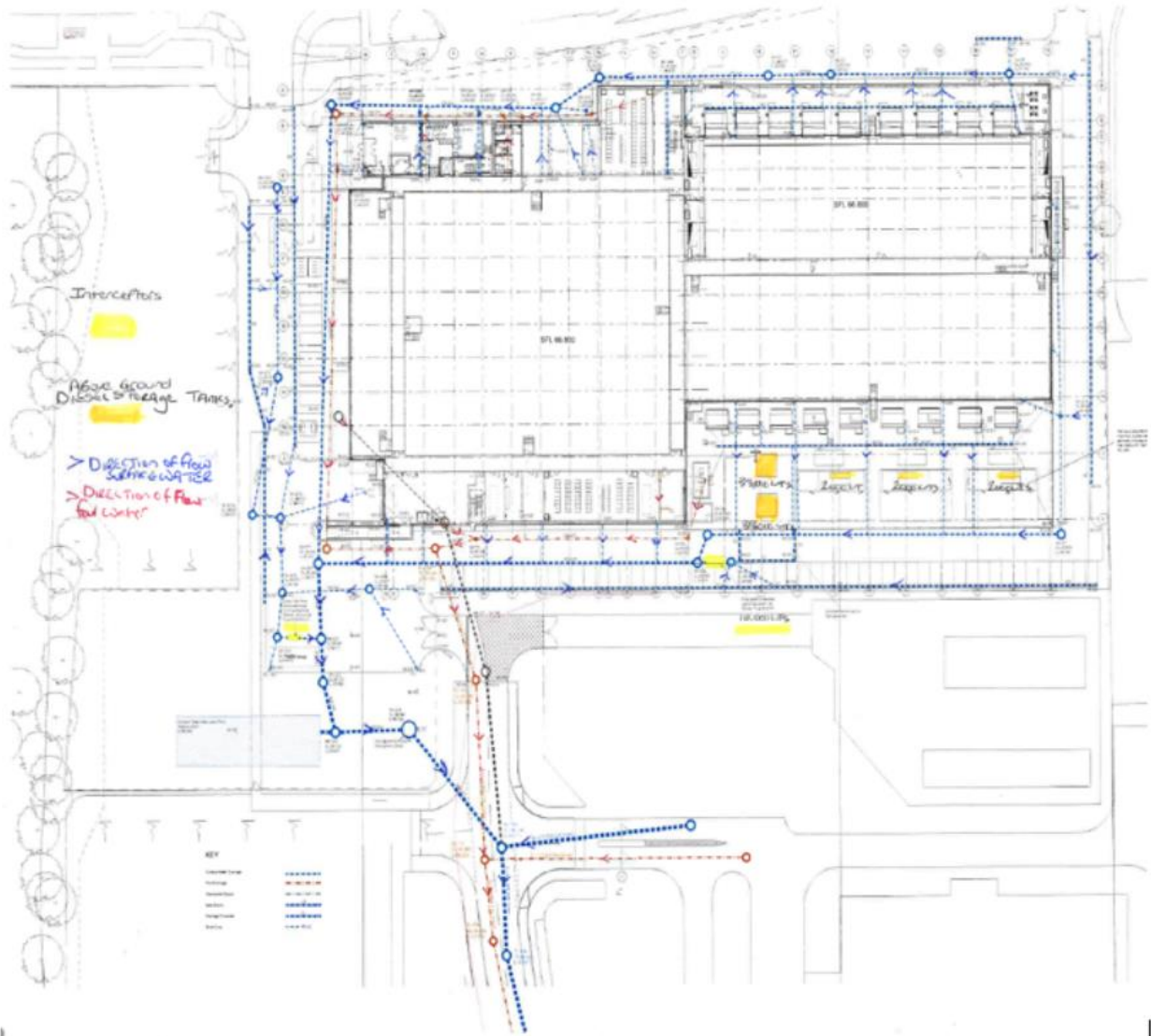


Figure 4: Hydrogeology Map

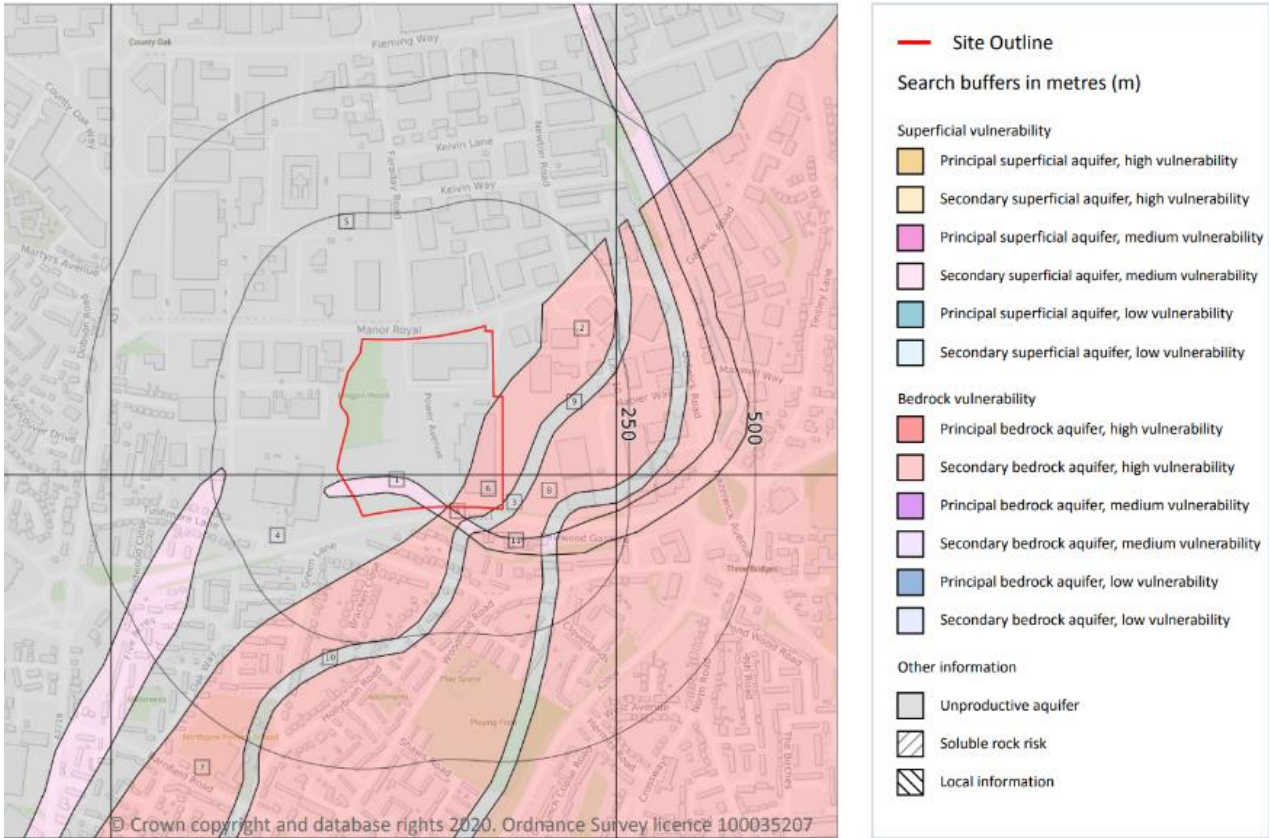


Figure 5: Flood Map from surface water

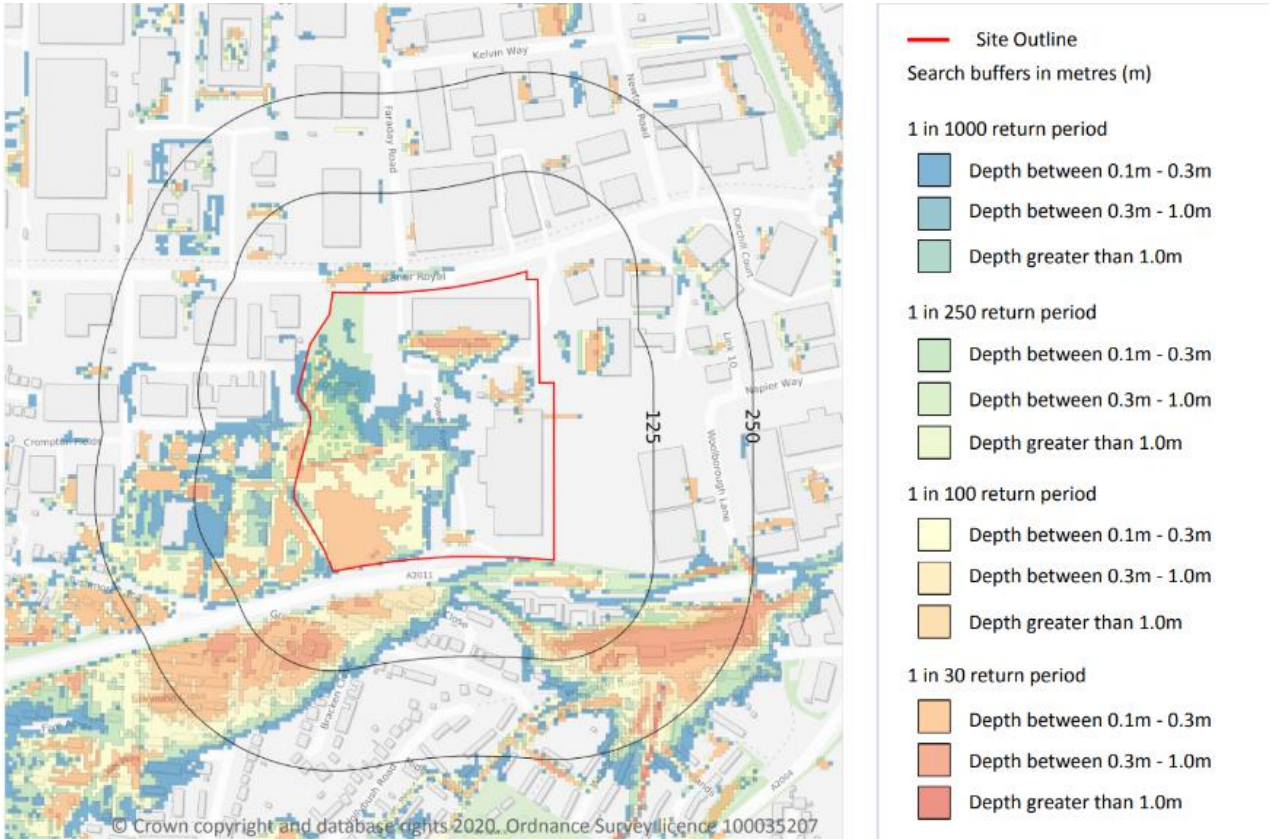


Figure 6: Flood Map from groundwater

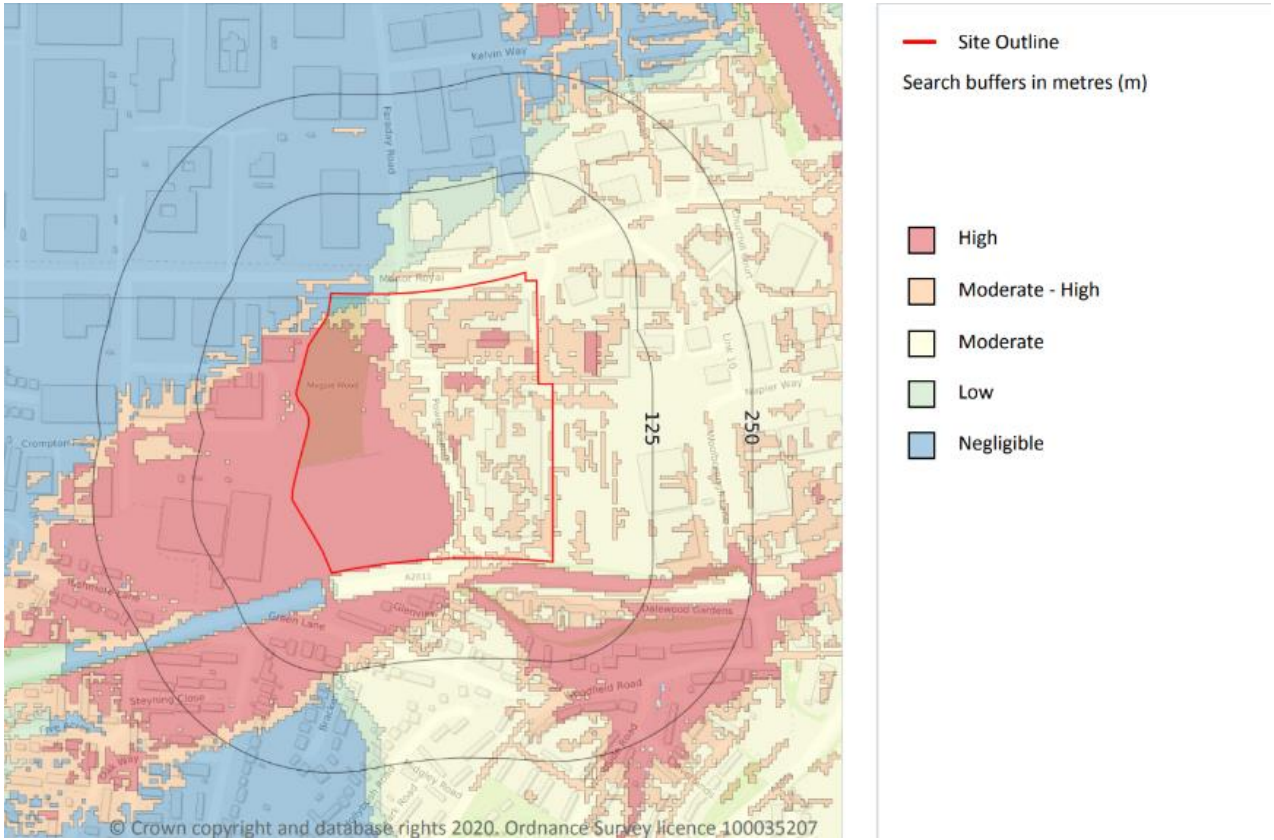
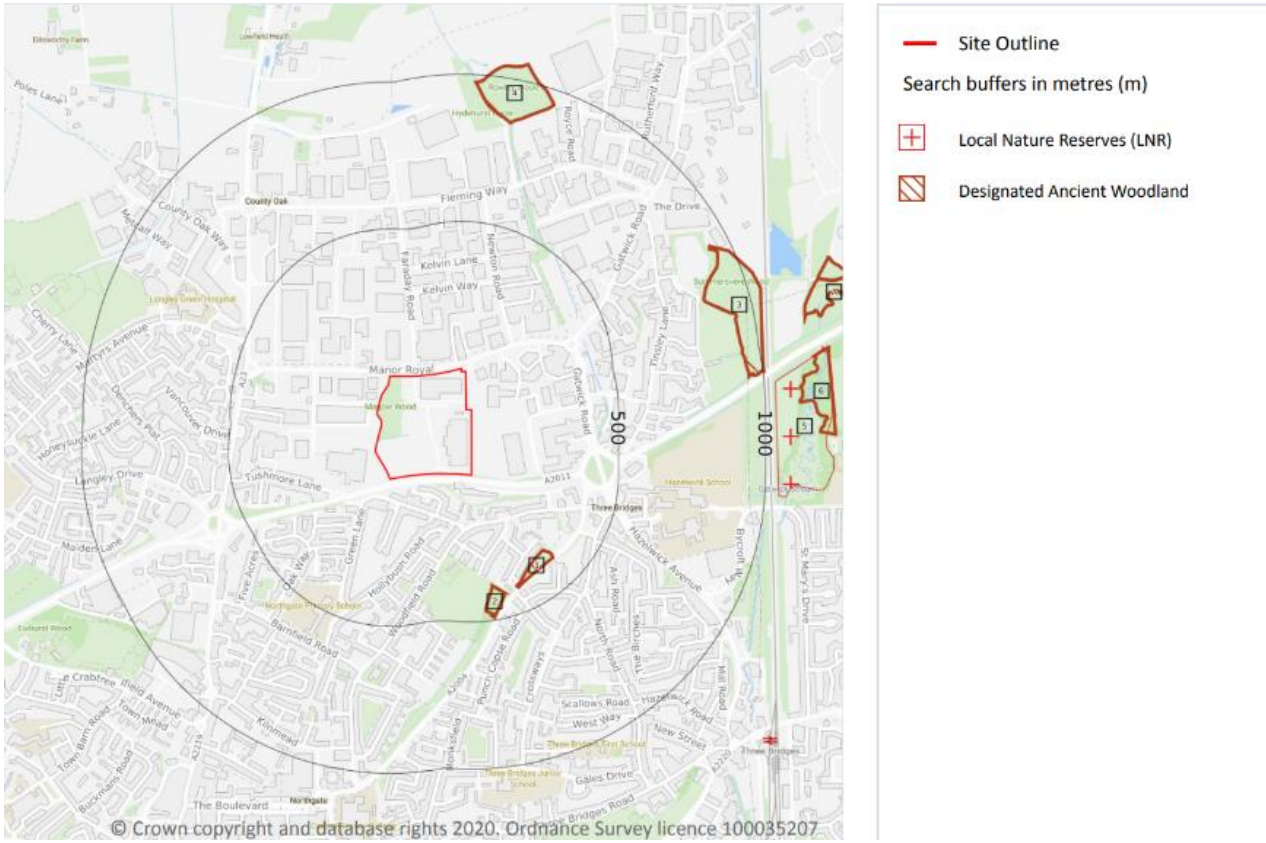
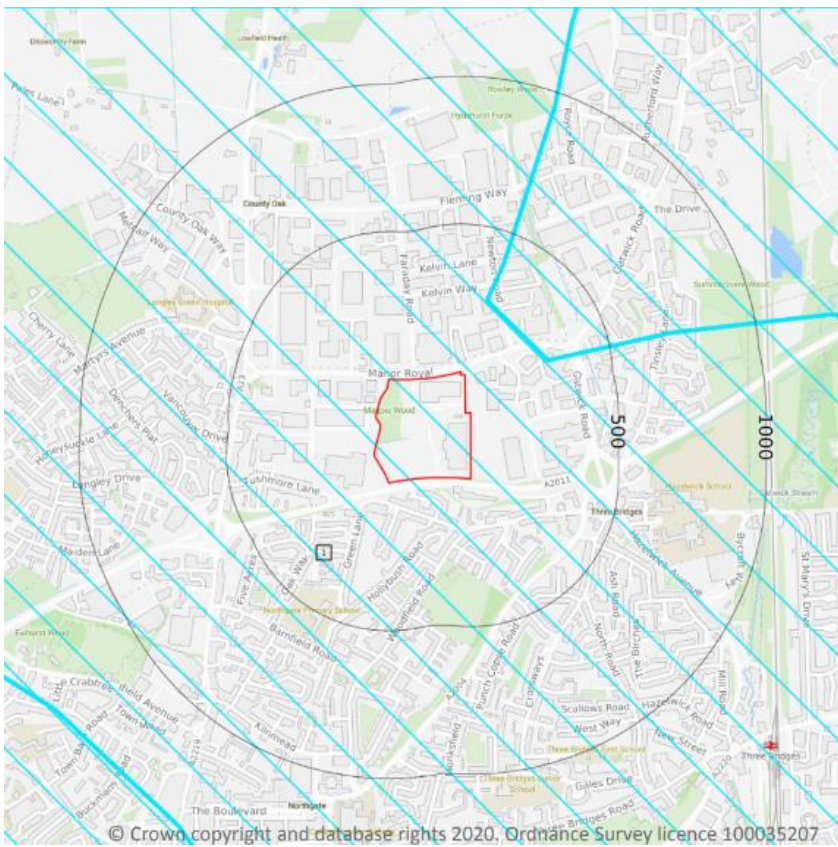


Figure 7: Designated Environmentally Sensitive Sites Maps





- Site Outline
- Search buffers in metres (m)
- SSSI Impact Risk Zones
- SSSI Units
- Not recorded
- Favourable
- Unfavourable - Recovering
- Unfavourable - No change
- Unfavourable - Declining
- Partially destroyed
- Destroyed

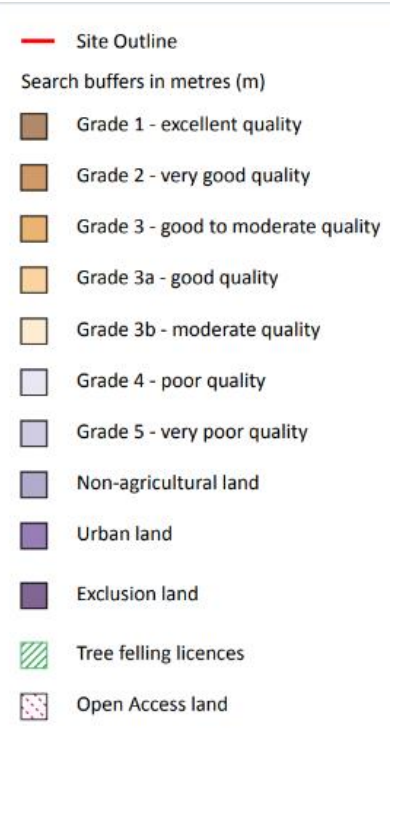
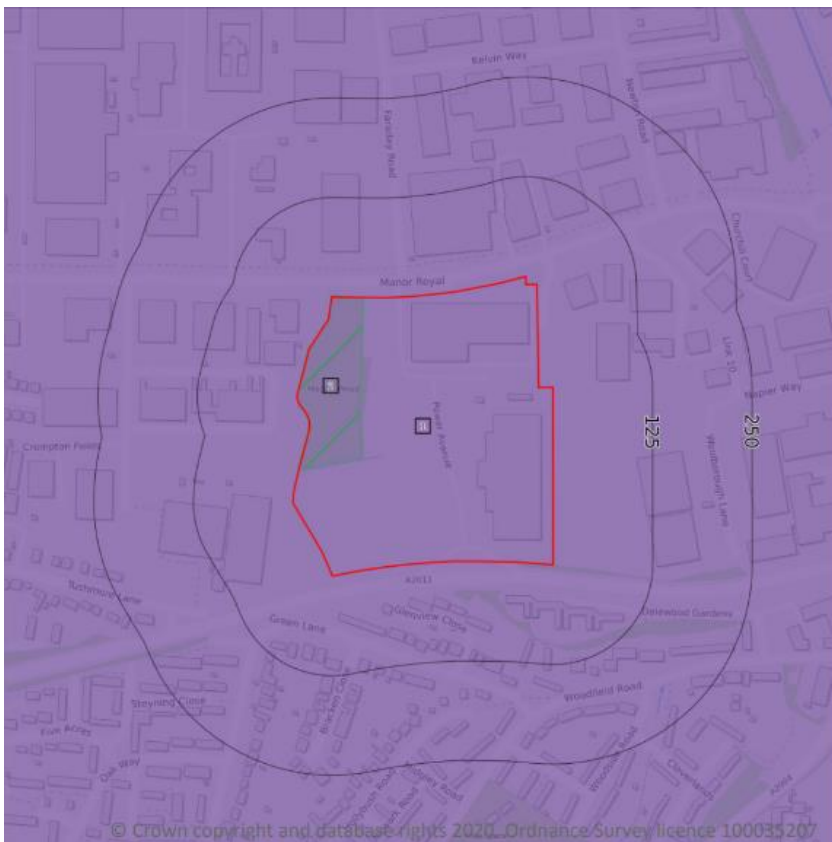
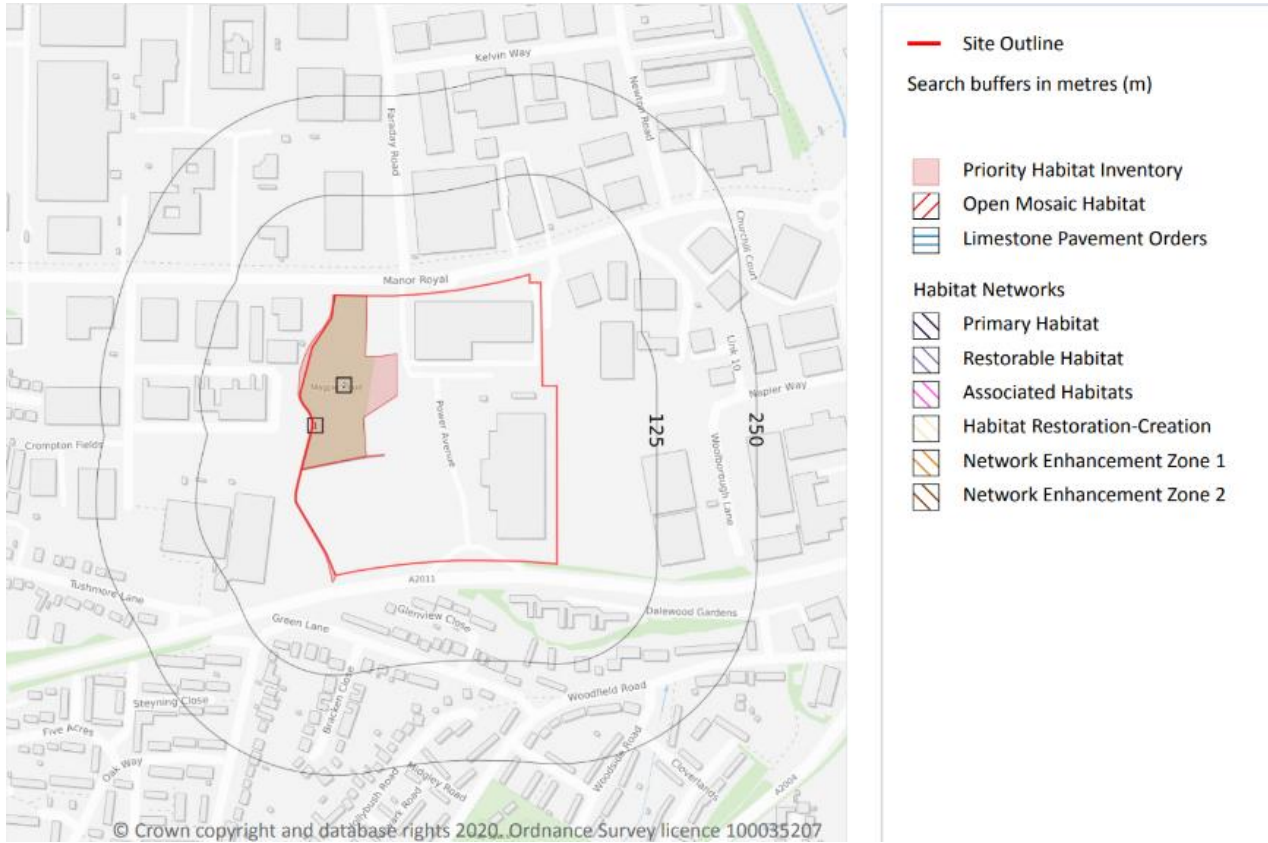


Figure 8: Habitat Designations Map



- Site Outline
- Search buffers in metres (m)
- Priority Habitat Inventory
- Open Mosaic Habitat
- Limestone Pavement Orders
- Habitat Networks
- Primary Habitat
- Restorable Habitat
- Associated Habitats
- Habitat Restoration-Creation
- Network Enhancement Zone 1
- Network Enhancement Zone 2

About EcoAct

Together with our clients, we act to put climate and nature centre stage to drive sustainable corporate transformation within planetary boundaries.

EcoAct is an international sustainability consultancy and project developer with 18+ years of industry experience and 360+ climate experts globally. Founded in France in 2005, the company now spans three continents with offices in Paris, London, Barcelona, New York, Montreal, Munich, Milan and Kenya.

EcoAct's core purpose is to lead the way in developing sustainable business solutions that deliver true value for both climate and client. Data is the cornerstone of our consulting practice, supported by our dedicated Climate Data Analytics and Research & Innovation teams.

At EcoAct we are driven by a shared purpose to make a difference. To help businesses implement positive change in response to climate and environmental sustainability challenges, whilst also driving commercial performance.

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