
Appendix D – Other Supporting Information

D.2 Delta Simons Phase 1 Environmental Assessment, Nov 2020 (Report Reference 15-0754.07)



Phase I Environmental Assessment

Langstone Technology Park, Havant, PO9 1SA

Presented to Havant S.a.r.l

Issued: November 2020

Delta-Simons Project No. 15-0754.07



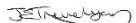
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Report Details

Client	Havant S.a.r.l
Report Title	Phase I Environmental Assessment
Site Address	Langstone Technology Park, Havant, PO9 1SA
Project No.	15-0754.07
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Quality Assurance

Issue No.	Status	Issue Date	Comments	Author	Technical Review	Authorised
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About us

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Executive Summary

Site Use & Surrounding Area	The Site is occupied by a science park comprising a number of interlinked commercial offices and light industrial properties, with car parking, access roads and limited landscaping. The Site is located in a mixed commercial and residential area.
Environmental Setting	The Site is considered to be of a moderate environmental sensitivity given: the presence of Secondary A Aquifers (which comprises some cohesive deposits) over a Principal Aquifer; the proximity of the Mill Stream; the presence of statutory designated ecological sites downstream of the Site (Chichester and Langstone harbour); and the mixed commercial, light industrial and residential use of the surrounding area.
Contamination Potential	While chemical storage, diesel back-up generators and electrical substations were previously identified on-Site, the Site appeared well managed and no significant potential contamination concerns were noted associated with the current Site use. The Site was predominantly unoccupied until the development of a sewage works in the north-east by 1909. By 1973, the sewage works was no longer present, and the Site had been redeveloped into an IBM computer products manufacturer. Since the 1970's, some redevelopment has occurred on-Site, though the main buildings have largely remained unchanged. Potentially contaminative uses associated with the computer manufactory include previous 'wet' processes in B1000, diesel powered boilers in the area of the current gas boiler systems (B3000), an effluent treatment and chemical storage area in the area of B22, and effluent treatment and former chemical storage in the area of B41 and B42. Also, a former pollution incident was reported to have occurred in the 1980's, however, no further details are known. Based on the recent available information, two hotspots of hydrocarbon contamination have been identified with recommendations for off-Site removal, and it was considered for the areas investigated basic gas protection measures should be installed.
Contaminant Linkage Assessment & Land Contamination Conclusions	Delta-Simons has completed a land contamination risk assessment based upon available information. Information has indicated that significant widespread contamination is unlikely to be present. However, localised contamination was recently identified at the Site, which it has been recommended to be remediated (excavated) and given the historical use of the Site, the potential for further localised contamination to be present is possible. It is, therefore, considered that the risk of significant possible contaminant linkages to exist is low to moderate for a continued use and for the proposed redevelopment.
Key Land Contamination Recommendations	No further works are considered to be required for land contamination purposes in the context of an ongoing use. A number of recommendations have been provided associated with the proposed development in Section 4.1.
Overall Land Contamination Statement of Risk	On the basis of available information, Delta-Simons considers that with regard to potential land contamination issues and associated environmental liabilities, in its current use or future redevelopment, the Site represents an overall investment opportunity with a Low to Moderate risk.

Flood Risk Advisory	Based on the information reviewed, the majority of the Site is not located within an area considered to be of an elevated risk of fluvial flooding. Several areas of the Site are shown to be at potential risk of surface water flooding, however, no associated issues were reported on-Site with the exception of minor water ingress at Building 1000. Available information indicates that flooding events have occurred at the Site associated with surcharging of the foul system, however, it is understood that a non-return valve was installed at the Site. Whilst a Flood Risk Assessment is available for the current development proposals, it is likely that a further assessment and drainage strategy will be required to support the proposed redevelopment of the Client's masterplan.
This is intended as a summary only. Further detail and limitations of the assessment is provided within the main body of the Report.	

Table of Contents

1.0 INTRODUCTION.....	1
1.1 Appointment.....	1
1.2 Context & Purpose	1
1.3 Scope of Works	1
1.4 Limitations.....	1
2.0 SITE CONTEXT & DATA REVIEW	2
2.1 Site Information.....	2
2.2 Environmental Setting	5
2.3 Historical Use of the Site & Surrounding Area	7
2.4 Environmental Database Review	8
2.5 Planning Review	10
2.6 Regulatory Authority Consultation	11
2.7 Previous Reports	12
2.8 Flood Risk Advisory	15
3.0 LAND CONTAMINATION RISK	17
3.1 Introduction	17
3.2 Conceptual Site Model	17
3.3 Contaminant Linkage Assessment	17
4.0 CONCLUSIONS & RECOMMENDATIONS.....	20
4.1 Land Contamination/ Ground Conditions	20
4.2 Statement of Risk/Land Contamination Liability Assessment	20
4.3 Flood Risk Advisory	21
4.4 Other Redevelopment Considerations	21

Figures

Figure 1 Site Features Plan

Drawings

Drawing 1 Proposed Masterplan

Appendices

Appendix A Data Sources
Appendix B Limitations
Appendix C Site Photographs
Appendix D Historical Mapping
Appendix E Previous Landmark Envirocheck® Report
Appendix F Planning Information
Appendix G Regulatory Authority Information
Appendix H Previous Reports

1.0 Introduction

1.1 Appointment

Delta-Simons Environmental Consultants Limited ("Delta-Simons") was instructed by Havant S.a.r.l (the "Client") to carry out a Phase I Environmental Assessment of Langstone Technology Park, Havant, PO9 1SA (the "Site").

1.2 Context & Purpose

The aim of this assessment is to consider the potential for land contamination related liabilities to be present prior to the potential investment of the Site, and future redevelopment with several new buildings for the park.

1.3 Scope of Works

The scope of works undertaken for this assessment was:

- ▲ Review of the environmental setting of the Site, including the current use/ status of the Site and surrounding area, and review of the geology, hydrogeology and hydrology;
- ▲ Review of the historical activities of the Site and surrounding area;
- ▲ Review of regulatory database information relating to the Site;
- ▲ Review of the online planning records for the Site;
- ▲ Consult and review information from the Local Authority in relation to Part 2A of the Environmental Protection Act;
- ▲ Review of relevant third party reports relating to the Site or surrounding area;
- ▲ Develop an outline Conceptual Site Model and a qualitative assessment of the potential for land contamination related liabilities to be present; and
- ▲ Complete a review of the flood risk associated with the Site.

A list of the data sources consulted is provided in Appendix A.

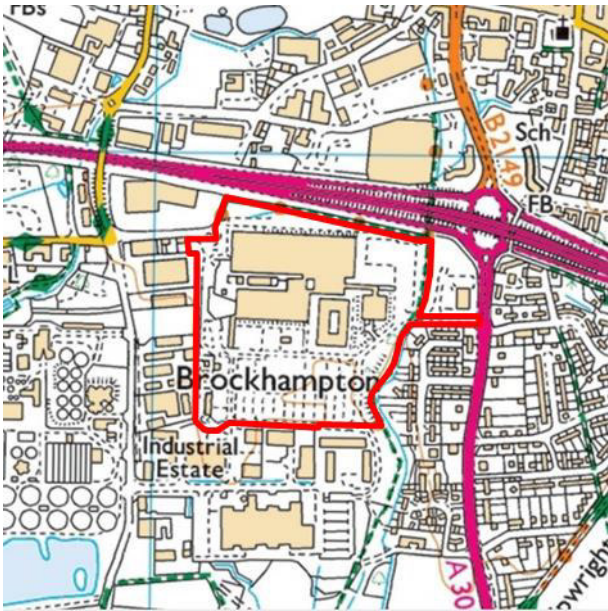
The scope of works did not include a Site reconnaissance; however, Delta-Simons have previously undertaken visits in 2015, 2018 and 2019.

1.4 Limitations

The standard limitations associated with this assessment are presented in Appendix B.

2.0 Site Context & Data Review

2.1 Site Information

 Contains OS data ©, Crown Copyright and Database Right (2020)		 Bing maps	
Site Location		Site Layout	
Co-ordinates	Centred approximately at National Grid Reference 471300, 105700.	Elevation	Approximately 4 to 8 m AOD
		Area	14.3 Ha
Site Location	The Site is located to the south-west of the junction of the A27 and A3023, in the Langstone area of Havant.		
Current Site Use	The Site is occupied by a science park comprising a number of interlinked commercial offices and light industrial buildings, with car parking in the south, east and north of the Site, hardstanding and access roads and landscaping confined to limited areas. A brief summary of the building uses is summarised below: ▲ Building 1000 (B1000) – predominantly offices (partly vacant) with some laboratories and a warehouse; ▲ Building 2000 (B22) – general maintenance store and water softening equipment; ▲ Building 3000 (B3000) – main plant room (including boilers and chillers); ▲ Building 4000 (B4000) – offices and canteen; ▲ Building 5000 (B5000) – data centre, offices and small electronics repair centre; ▲ Building 6000 (B6000) – main reception, offices and call centres; ▲ Building 7000 (B7000) – offices and laboratories; ▲ Building 41 (B41) – gym; ▲ Building 42 (B42) – electrical substation; and ▲ A nursery is also present in centre of the Site.		

Previous Site Reconnaissance	Delta-Simons has conducted Site visits on 29th July 2015, 27th April 2018 and 18th June 2019 as part previous assessments. A series of Site photographs from the walkovers are presented as Appendix C and a Site Plan showing the references to the main features is presented as Figure 1. Pertinent information that was observed or reported on-Site is summarised as follows: ▲ A large waste storage area and waste processing building (E and 1C, Figure 1) constructed in circa 2011 was present in western part of Site, comprising: two compactors for general, mixed recycling and cardboard waste, trade waste bins and wheelie bins. A large water tank and pump room was also located in this area. Two further waste storage areas comprising the same waste streams but also including feed waste were located adjacent to the backup generator by B4000 (1D, Figure 1) and within B4000 (1E, Figure 1) associated with food waste and banded waste cooking oil storage (spill kits were noted to be present). Dark staining was noted on the asphalt hardstanding in the vicinity of the waste cooking oil. A large cooking pot containing waste oil was also noted in this area without secondary containment. A Waste Electrical and Electronic Equipment (WEEE) bin and a fluorescent light bulb container were stored at ground level in B1000 (1F Figure 1); ▲ A diesel back-up generator with an associated banded 1,400 L capacity aboveground storage tank (AST) and a battery bank was located on an enclosed concrete platform between B3000 and B4000 (1D, Figure 1). No staining was noted beneath the external fill point or within the tank bund, however, minor staining was present beneath the generator unit. Spill kits were observed in this area. The Site representative stated that the AST was refilled manually using 200 L drums once per year. The bund was also fitted with a leak alarm; ▲ A tenant operated diesel-powered back-up generator with an associated approximate 6,000 L capacity AST was located adjacent to the west of B2000 (1G, Figure 1). The Site representative informed Delta-Simons of a small diesel leak, however, this was contained within the generator's transmitter box in 2018. The total amount of spilled oil was approximately 3 L; ▲ The Site representative stated that there were a further three tenant operated diesel-powered back-up generators located within B1000. However, no access was granted during the Site walkover; ▲ Two sprinkler pumps were located in B1000 (1F, Figure 1) of which one was electricity powered and one diesel powered. The diesel powered pump was connected by aboveground pipework to an approximate 1,000 L capacity AST situated in a bund. No hydrocarbon staining was noted within the bund or within the vicinity of the pipework and pump. The Site representative indicated that the AST was refilled manually from drums using a hand pump; ▲ Asbestos containing materials (ACMs) are common across the Site. An online, interactive register is held and asbestos signage is present in several areas. Envirochem were reportedly responsible for annual reinspection and asbestos removal at the Site. A secure ACMs store (assumed from maintenance activities) and fire extinguisher store was located within B1000 Area 3 (1F, Figure 1). ACMs are collected by a specialist contractor on an ad-hoc basis; ▲ A former chemical storage and processing area (V, Figure 1) was present in the south-west of the Site. Only concrete plinths and bunds remained, and no significant staining was observed. One of the bunds was reportedly undergoing infilling with construction materials (asphalt, concrete etc.). A former vehicle washdown area/catchment pit was present in this area, and an area of adjacent car parking was noted to be partially flooded; ▲ The area in the south-west (V, Figure 1) in 2015 was reportedly associated with a deionised water production plant and caustic storage area, in addition to an effluent treatment plant and buffer holding tanks. Used engines/ motors were noted to be stored on pallets externally in this area in 2015;
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	▲ In 2018, a newly landscaped area with a vent pipe (assumed associated with drainage) was located along the south-western Site boundary; ▲ A former gardener's store was present in the south-west (N, Figure 1); ▲ A secure drum store with several 200 L capacity drums containing substances marked as toxic organic solids, mixed agrochemicals and agrochemical washings (some provided with drip trays) was situated at ground floor level in the south-western area of B1000. A compressed gas cylinder store was also located in this area which included air, nitrogen, hydrogen and helium (F, Figure 1). A bunded 10,000 L capacity AST for diluted waste process fluid, associated with fertilizer application research, was additionally located in the area of the drum store; ▲ A waste pallet storage area and compactor were present to the west of B5000 (G, Figure 1); ▲ Gardening waste storage, a contractor parking area and former electricity substation were located to the south-west of B5000 (H, Figure 1); ▲ A total of 15 electrical plant rooms were present across the Site (including J, K and L, Figure 1), including substations, transformers and electrical switch gear. All appeared to be in good order and no spillages of transformer oils was noted, barring minor staining within a transformer bund to the east of B3000. During the walkover in 2018, Delta-Simons was informed by the Site representative that all PCBs had been removed and converted to silicone-based oils; ▲ A building (B22) in the north-west of the Site (M, Figure 1) was used as a general maintenance store and contained a brine tank, water softening tanks and rainwater tanks. Also, present were: two 200 L capacity drums containing switchgear insulating oil on a wooden pallet; two 200 L drums containing waste water and glycol mix; a small hazardous chemical store; battery store; paint locker; rock salt store; gardening equipment; and chemical store. Delta-Simons was informed by the Site representative that a former pH testing and deionising plant had been removed approximately 10 years ago. A disused waste process water treatment plant was also located in B22; ▲ During the 2015 walkover, the Site Facilities Manager stated that the area around B22 had been used by the former tenant (IBM) as a chemical store and processing area, with two remnant ASTs remaining in 2015. The former processes were understood to include air and chemical extraction systems, solvent recovery plant, carbon absorption tanks, and storage of hydrochloric acid, sodium hyperchloride, xylene, nitrogen and cyanide; ▲ B3000 (1H, Figure 1) contained three gas boilers, water treatment chemicals (zinc chloride, biocide, sodium nitrite and potassium hydroxide all provided with secondary containment) and three chillers; ▲ During the 2018 walkover, a small diesel spill from a vehicle was reported in the south-west of the southern car park area, which was reported to have been managed with spill kits. Also, empty cooking oil drums and an abandoned vehicle were identified next to the Mill Stream; ▲ In 2015, Delta-Simons was informed by the Facilities Manager that a pollution incident which required remediation works had occurred in 1984, however, no further details were available; ▲ A surface water pump house was present to the east of B6000 (O, Figure 1); ▲ According to a drainage plan provided for review on-Site, eight oil interceptors are present within the Site's surface water drainage system (including P & Q, Figure 1) which were reported to be inspected every six months and serviced/ emptied every 18 months. The Site representative indicated that surface water runoff from the eastern area of the Site discharges into the Mill Stream; and
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	▲ A discharge consent (Ref: 725513403, dated 13th July 2007) for the release of waste-water from the cooling tower system to the sewer is held on-Site. <i>While chemical storage, diesel back-up generators and electrical substations were present on-Site, the Site appeared well managed and no significant potential contamination concerns were noted associated with the current Site use. However, based on discussions with Site personnel and observations, potentially contaminative processes were undertaken on-Site associated with the former use, particularly in the south-west and in the central western area. A former pollution incident was also reported in the 1980's.</i>	
Current Surrounding Area	North	Landscaping and the A27 with a retail park beyond (including a petrol filling station).
	East	The Mill Stream with a hotel, restaurant and residential properties with gardens beyond.
	South	Endeavour Business Park comprising commercial office and distribution units.
	West	Commercial office, distribution and light manufacturing units with a sewage works beyond.
	<i>The surrounding land use is considered to represent a potential off-Site source of contamination.</i>	
Future Redevelopment	It is understood that the Client may undertake redevelopment of the Site in future. Planning permission has been granted for 'Part-demolition of Building 1000 and associated works; the erection of new flexible use industrial units; and a new parking layout with associated works' on 22nd July 2020 (reference: APP/19/00703). However, the current proposed masterplan includes additional redevelopment of the majority of the Site to include the demolition of several buildings and refurbishment of Buildings 4000 and 6000, with the addition of a multi-storey car park. A copy of the masterplan is provided as Drawing 1.	

2.2 Environmental Setting

Geology	From Geology Mapping within the Envirocheck® Report and information provided by the BGS, the Site is indicated as being predominantly underlain by superficial deposits of Alluvium comprising clay, silt, sand and gravel. River Terrace Deposits, comprising sand, silt and clay are shown in the north-western and south-western corners of the Site. A small area of Head Deposits, comprising clay and gravel, is shown in the south-west of the Site between the boundary of the Alluvium and Terrace Deposits. The underlying bedrock comprises the Lewes Nodular, Seaford, Newhaven, Culver and Portsdown Chalk Formations. An area of Made Ground is shown adjacent to the north-east of the Site. While no Made Ground is shown on-Site from available BGS mapping, given the development history, Made Ground would be anticipated to be present above the superficial deposits.
Specific Geology	During an investigation across the southern area of the Site in 2019, ground conditions identified comprised: ▲ Tarmac and sub-base, or grass and topsoil, underlain by Made Ground (granular deposits with brick, concrete and occasional pottery and slate or cohesive deposits with gravels including flint, concrete and occasional brick and chalk) to 3.1 metres below ground level (m bgl);

	▲ Superficial River Terrace/ Brickearth across the majority of the Site comprising silty, sandy gravelly Clay, with silty peat identified at one location to, and also clayey sandy gravel to 5.5 m bgl; ▲ Weathered Chalk bedrock comprising sandy gravelly clay or clayey sandy gravel with gravel comprising chalk and flints to 6.0 m bgl; over ▲ Chalk to a maximum depth of 24.9 m bgl. Fragments of organic material (including decaying wood, rootlets and grass) were also identified at three locations between 0.2 m and 3.1 m bgl.
Hydrogeology	The EA classifies the superficial deposits as Secondary A Aquifers and the Chalk as a Principal Aquifer. The EA data also indicates that the Site is not in a designated groundwater Source Protection Zone (SPZ), however, a SPZ 1 (inner zone) is located approximately 170 m to the north-east associated with two potable groundwater abstractions listed 460 m to the north and 710 m to the north-west. During a recent investigation, groundwater was identified within the superficial deposits between 2.1 and 2.8 m bgl rising to 2.0 and 2.5 m bgl. Within the two deeper locations, groundwater was identified at depths of 5.8 and 6.0 m bgl rising to 3.0 m bgl.
Hydrology	The Mill Stream is located adjacent to the east of the Site, which flows to the coast approximately 750 m to the south. According to the Envirocheck® Report, there are no licensed abstraction records from surface water located within 1 km of the Site.
Coal Mining	The Site is not located within an area that is potentially affected by coal mining activity.
Radon Gas	The Site lies within an area where less than 1% and 3-5 % are at or above the Public Health England recommended “action level” for radon. The Envirocheck® Report indicates that basic radon protective measures are necessary in the construction of new buildings or extensions at the Site.
Ecological Receptors	It is understood that there is a tree preservation order in place for the north-western area of the Site. It is understood from information provided within the Envirocheck® Report that the Chichester and Langstone Harbour, listed 315 m to the south and 459 m to the south east of the Site, is classed as: an Area of Outstanding Natural Beauty; a Ramsar Site; a Site of Special Scientific Interest; and a Special Protection Area.
Heritage Interest	According to historicengland.org.uk, the closest area of heritage interest is located approximately 95 m to the north-east of the Site associated with a Grade II Listed Building (Langstone Hotel). The Solent Maritime located 545 m south-west is also classified as a Special Area of Conservation.
Environmental Sensitivity	<i>The Site is considered to be of a moderate environmental sensitivity given: the presence of Secondary A Aquifers (which comprises some cohesive deposits) over a Principal Aquifer; the proximity of the Mill Stream; the presence of statutory designated ecological sites downstream of the Site (Chichester and Langstone harbour); and the mixed commercial, light industrial and residential use of the surrounding area.</i>

2.3 Historical Use of the Site & Surrounding Area

Approach	The historical development of the Site and surrounding area has been assessed through a review of available historical OS maps, Google Earth historical satellite imagery and other sources. A summary of the key historical Site uses and developments in the surrounding area is presented below. Copies of pertinent historical maps are included as Appendix D.
Historical Features On-Site	From the earliest available mapping dated 1867, the Site was predominantly in agricultural use with small unspecified buildings, watercourses, and an orchard partially located in the north-west. On 1897 mapping, an aqueduct and sluice were labelled along a watercourse in the south of the Site, subsequently labelled as a drain from 1953 mapping. By 1909 mapping, the north-east of the Site was developed with a sewage works with associated filter and sludge beds, and an engine house. Further development to both the sewage works and small buildings are noted between 1932 and 1969 mapping. From 1953 mapping, an allotment garden was labelled in the centre of the Site. From 1968 mapping, the entire Site had been redeveloped with a works and hardstanding in the centre of the Site. A separate building and an electricity substation were located in the south of the Site also at this time. It is noted that slopes are shown surrounding the majority of the buildings suggesting that Site levels were raised. Between 1984 and 1989 mapping, the Site was further developed to a layout largely consistent with the current format when the southern third of the Site was redeveloped with car parking removing the former structure in this area. Also, the south-west of the Site was occupied by several tanks, with further tanks and an electricity substation labelled in the west of the Site. A review of aerial imagery provided by Google Earth shows the Site in its contemporary layout between 1999 and current imagery, with the exception of minor reconfiguration of plant and buildings in the south-west of the Site and around B22.
Historical Information from other Sources	From internet searches, it is understood that the current Langstone Technology Park was formerly used by IBM as a computer products manufacturer (known as IBM Havant where many IBM computer products were made, such as disk files, mainframe computers, printers, ATMs, multiplexors and mid-range computers). In 1994, the Site began trading as Xyratex. A WSP 2005 assessment (discussed in Section 2.7) reported that the Site representative stated that B1000 was historically used for wet manufacturing processes. This included activities such as etching and substrate processes. The Site representative also reported to WSP that remediation in the form of decontamination of acid, arsenic and copper penetrated concrete was undertaken in 1998/ 1999 in B1000. This is reported to have involved the removal of concrete until it was proven that the remaining concrete was no longer contaminated. Effluents generated from B1000 were reported to be transferred to B41 (south-west corner of the Site) for treatment. After treatment processes were undertaken, the effluent was discharged from the Site via foul sewer. This discharge was reportedly regulated by a trade effluent discharge consent. The effluent treatment facilities were no longer operational in 2005 and had been partially decommissioned. It was also reported that B41 was historically used as a de-ionising water treatment plant. WSP indicated that B42 was reportedly formerly used for the storage of petroleum mixtures. A report produced by Campbell Reith Hill (discussed further in Section 2.7) suggests that the wider area was associated with decoy sites to draw German bombing raids away from areas such as Portsmouth during the Second World War.

Potentially Contaminative Historical Features Off-Site	Potential sources of contamination within 100 m of the Site include: ▲ Buildings associated with the wider sewage works located adjacent to the north of the Site between 1909 and circa 1969 mapping; ▲ Havant Mill (corn) located approximately 60 m to the north-east of the Site between 1867 and circa 1967 mapping; ▲ A works and plastics factory located approximately 25 m to the south-west of the Site from 1973 to the most recent map edition of 2015; ▲ A boatbuilding works/ unspecified works located approximately 50 m to the north-west of the Site from 1973. The unit was labelled as an unspecified works from 1993 and remains present; ▲ A pumping station with tank located approximately 25 m to the south-east of the Site from 1973 to circa 1993; ▲ A marine accessory works located approximately 60 m to the west of the Site from 1973. The unit increased in size by 1989 and was located 25 m west and the unit remains present; ▲ Industrial properties including factories, an electronics factory, an engineering works and a warehouse located approximately 80 m to the north of the Site from 1969 to circa 2006 when a large number of these were redeveloped as a superstore with a petrol filling station; and ▲ Further industrial units (including unspecified works, engineering works and factories) to the west from 1987 to the present. Within the wider area, pertinent features include Budd's Farm Sewage Works from approximately 125 m west from 1963. The works increased in size by 1969 and 1993, and remains present.
Unexploded Ordnance (UXO)	According to the Zetica risk map, the UXO risk at the Site is moderate. A Detailed Unexploded Ordnance Report by 1st Line Defence (DA8760-00, dated May 2019) has been identified for the Site. Overall, the report considered that there was a medium risk from German aerial delivered UXO and anti-craft UXO, with a low to medium risk from items of Allied Ordnance. A copy of the report is included within the Previous Reports as Appendix H.
Implications for Land Contamination Risk	<i>The historical uses of the Site, most notably the sewage works, computer manufacturing and ancillary processes, are considered to represent potential sources of contamination. Potential sources of contamination identified in the surrounding area include a mill, a sewage works, factories, an engineering works, a warehouse, a boatbuilding works/ works, a plastics factory, works, a pumping station with a tank and a petrol filling station.</i>

2.4 Environmental Database Review

Approach	The Landmark Envirocheck® Report provides a database of environmental information held by various bodies including the EA, Local Authority (LA), Health & Safety Executive (HSE) and the British Geological Survey (BGS) amongst others. A full copy of the Envirocheck® Report is provided in Appendix E and the most relevant information is summarised below.
Features On-Site	There are several relevant entries included within the Landmark Envirocheck® Report relating to the Site, summarised as follows: ▲ Four Discharge Consents (two noted to be 1 m off-Site; however, the operator names are consistent with the on-Site discharges) for the discharge of 'other matter-surface water' into a freshwater river, first granted in April 1978. The Site

	representative previously informed Delta-Simons that a discharge consent for the release of wastewater from the cooling towers into the sewers is held on-Site; ▲ Two revoked Integrated Pollution Controls associated with Adflex Solutions Ltd for processes involving halogens within the chemical industry. The permit, dated 1997, is assumed to be associated with a former operator at the Site; ▲ A Part B Permit (formerly Local Authority Pollution Prevention and Control) was granted to Teleplan and White Electronics in June 2013. From an internet search this is understood to be associated with the assembly of hard disk drive testers; ▲ A Licensed Waste Management Facility associated with Teleplan and White Electronics relating to a WEEE treatment facility in the west. The licence was issued in June 2013; ▲ Several areas of potentially infilled land which appear to be associated with the former drainage ditch network; and ▲ Three Contemporary Trade Directory Entries for a printers', general engineers and computer manufacturer.
Potentially Contaminative Features Off-Site	Pertinent entries in the Landmark Envirocheck® Report located within 100 m of the Site includes: ▲ Four Part B Permits associated with the coating of metal and plastic, and for the respraying of road vehicles; ▲ Two Pollution Incidents to Controlled Waters located 80 m east (minor incident) associated with the release of oils to a stream in 1995 and 95 m north-east (significant incident) associated with diesel in the stream from vehicle washing and de-waxing in January 1997; ▲ Four Registered Radioactive Substances located 45 m and 90 m north-west for the disposal of radioactive waste; and ▲ Thirty-three Contemporary Trade Directory Entries, which includes: tool design and manufacture; domestic appliance servicing; air conditioning; cleaning services; engineers (general, precision and aviation); spraying (paint & coatings); garage services (body builders and repairs); crane hire and sales; electronic component manufacture; and marine electrical services. Within the wider area, pertinent entries include: ▲ A Historical Landfill located 190 m to the south-west of the Site that was licensed to accept wastes types including household; no dates are provided; ▲ A Local Authority Recorded Landfill Site located 210 m to the south-west of the Site that was licensed to accept household, acid and commercial waste until December 1965; ▲ A Fuel Station Entry and Part B Permit associated with a petrol station located 140-150 m north of the Site; and ▲ A obsolete Fuel Station Entry located 140 m to the west of the Site.
Implications for Land Contamination Risk	<i>The former chemical processes and waste management facility are considered to represent potential on-Site sources of contamination. Whilst entries within the immediate vicinity of the Site have been identified, they are considered to represent limited potential sources of off-Site contamination.</i>

2.5 Planning Review

On-line Planning Portal	Havant Borough Council	Date Accessed	19/10/2020
Findings	From a review of the Council's online planning database, a large number of applications have been identified for the Site. These include a number of extensions, new car parking areas, new buildings, the creation of ditches and culverts, and for the installation of infrastructure (including a fume cupboard, waste compactor, back-up generators and cooling units) between the early 1990s and 2013. Pertinent applications identified include the following: ▲ <u>APP/10/00272</u> – 'Demolition of existing steel-clad building and two portacabins to make way for a single storey timber framed building to house a 52 place nursery school'. This application was granted consent in September dated 2010. No contaminated land conditions were set. ▲ <u>APP/13/00411</u> – 'Extension of standby generator room to accommodate attenuating louver for installation of additional generator unit and installation of 6 Liebert and 3 Excool roof mounted cooling units'. This application was granted consent in June 2013; and ▲ <u>APP/15/00484</u> – 'Change of use from store to gym facility of B41'. This application was granted consent in July 2015. Whilst no contaminated land planning conditions were set, correspondence with the Environmental Control Officer dated July 2015, which included a Site inspection, indicated that while the potential for contamination could not be ruled out, the officer was satisfied that the change of use could go ahead without the need for intrusive ground investigation. However, this was caveated to say that should the area be redeveloped, the potential contamination risks should be further assessed. An Envirochem laboratory analysis report is provided which appears to relate to effluent in the area. The context of the testing is not clear and appears for waste disposal. The contaminant levels are generally low; ▲ <u>APP/19/00296</u> – 'Erection of a new building entrance structure, reception lobby refurbishment and associated hard and soft landscaping works (Building 6000)'. This application was granted consent in May 2019. No contaminated land conditions were set; ▲ <u>APP/19/00297</u> – 'Proposed alteration to the existing east facing elevation to accommodate a new entrance threshold and associated external works (Building 6000)'. This application was granted consent in June 2019. No contaminated land conditions were set; ▲ <u>GEN/19/00354</u> – 'EIA Screening Opinion - Erection of new industrial units and rationalisation of south car park, demolition of part of the northernmost building with new elevation on the remaining part of the building, new screen on adjacent building and extension to existing car park'. No documentation was available to view on the online planning portal. This application was decided in May 2019, however, there is no information to confirm whether an EIA was undertaken; and ▲ <u>APP/19/00703</u> – 'Part-demolition of Building 1000 and associated works; the erection of new flexible use industrial units; and a new parking layout with associated works to layout and access and felling of two trees subject to a Tree Preservation Order (Norway Maples)'. The application was granted in July 2020. As part of the application a Preliminary Risk Assessment (19-0687.01) by Delta-Simons was submitted, and information from the Environmental Control Officer indicates that the Council were in agreement of the recommendation for intrusive investigation. Subsequently, a contaminated land condition was imposed as Condition 9 and		

	required: an intrusive investigation (Part 1), and if required the submission of an appropriate remediation strategy (Part 2) and verification plan (Part 3). Copies of the relevant documentation is provided as Appendix F.
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2.6 Regulatory Authority Consultation

Local Authority – Part 2A	From correspondence in August 2015 with the Contaminated Land Officer (CLO) at Havant Borough Council, the CLO confirmed that the Site is not considered to be a priority for inspection under Part 2A of the EPA 1990. During a subsequent telephone conversation as part of a 2018 assessment and email exchange in 2020, the CLO confirmed that the Site's status under Part 2A remains unchanged.
Local Authority – Additional Comments	The CLO confirmed in August 2015 that the former uses of the science park were associated with manufacturing, research and development and waste processing activities. Potential sources of contamination identified by the CLO include on-Site transformers, boiler house, UPS facilities, fuel stores, flammables storage and sealed drainage systems with the majority concentrated in the south-west of the Site. The CLO noted in August 2015 that they had undertaken a visit to the south-western corner of the Site (associated with planning application APP/15/00484). No comments in relation to significant concerns were identified at that time. Whilst the CLO identified potential sources of contamination from diesel fuel and 'flammables' likely to be toluene BTEX and possible plasticisers (phthalate, vinyl chloride), the CLO noted that given the good management practices, provision and condition of containment and the lack of staining or spillages, the risk of contaminant release was considered to be low. The CLO also noted that the Council is aware of three separate reports associated with the Site, however, it was not known if these were in the public domain: ▲ Travers Morgan, dated 1993; ▲ Structural Soils Ltd, dated 1995; and ▲ GVA Grimley, dated 1999. As part of the 2018 enquiry, the CLO issued several reports relating to the Site or nearby land, which are discussed in Section 2.7. A copy of the previous and current Regulatory Authority response is included as Appendix G.
Building Control	The WSP 2005 report (discussed in Section 2.7) references consultation with the Building Control Officer at Havant Borough Council. The Officer is reported to have informed WSP that the Site was raised above ground level thereby reducing the possibility for flooding. The Officer is reported to have commented that they were unaware of any significant ground stability issues within the area. However, they were aware that part of the subject Site had been built with piled foundations. WSP reported that the Officer was unaware of any ground gas problems in relation to the historical use of the Site or from current neighbouring site activities. Additionally, WSP reported that the Officer was not aware of any flooding issues in the immediate area of the Site, although the Officer did confirm that the 'Langstone Mill Stream' adjacent the Site boundary was known to be susceptible to partial flooding further inland.

2.7 Previous Reports

List of Reports	Delta-Simons has obtained the following reports relating to the Site and wider area: ▲ Ground Investigation Report, IBM, Langstone Road by Soils Limited dated April 1994 (extracts only and relates to land off Site to the south); ▲ Wetland Study by Symonds Travis Morgan dated April 1997 (relates to land off-Site to the south); ▲ Contamination Assessment Report by Campbell Reith Hill dated May 2001 (relates to land off-Site to the south); ▲ Site Investigation Report by STATS dated October 2003 (relates to the north-west of the Site); ▲ Phase I Environmental Audit by WSP dated September 2004 (relates to the entire Site); ▲ Geo-Environmental Appraisal Report by Clancy Consulting, dated October 2019 (relates to the north-east and south of the Site; and ▲ Supplementary Site Investigation by Clancy Consulting, dated September 2020 (relates to the north-east and south of the Site). Copies of the reports are provided in Appendix H.
Soils Limited Ground Investigation (1994)	The available information comprises extracts only, with no Site plan or context of the assessment, however, the following was reported: ▲ Significant contamination was not identified in soil samples; ▲ Facial coliforms were identified in a groundwater sample (indicated to likely be associated with an 'offsite' sewage works or damaged foul pipe); ▲ No putrescible materials that could give rise to hazardous gases was encountered; ▲ A landfill site was located to the west; ▲ No significantly elevated ground gases were recorded; and ▲ Piles or ground improvement was recommended.
Symonds Travis Morgan Wetland Study (1997)	The report relates to land to the south and presents a detailed hydrogeological study associated with the then proposed development to the south of the Site. While the majority of the information is irrelevant to this assessment, a plan in the report confirms that the above Soils Limited Ground Investigation relates to land off-Site to the south of the Site.
Campbell Reith Hill Contamination Assessment (2001)	The report relates to land off-Site to the south and indicates the following pertinent information: ▲ Previous investigations are reported to have identified that historically sewage sludge spreading may have taken place. One of these investigations reported elevated levels of mercury concentrations in the drainage ditches and waters adjoining the site. The spreading of sewage sludge and a historical nearby plating works were identified as possible sources. No recordable concentrations of mercury were however identified in the soils by the following investigation; and ▲ Slightly elevated concentrations of polycyclic aromatic hydrocarbons (PAH) and arsenic were recorded in soils and sediment from drainage ditches, however, they were below the adopted screening criteria.

STATS Site Investigation Report (2003)	The report relates to the north-western area of the Site in relation to a proposed new paved car park and roundabout (which does not appear to have been taken forward). The assessment comprised a desk study and ground investigation comprising the excavation of 13 trial pits and 8 dynamic cone penetration tests (to generate CBR values). No exploratory hole plan is provided. Pertinent points are summarised as follows: ▲ A sub-surface concrete tank was uncovered which was presumed to be related to the sewage works that were present on the Site. The tank was found to be in-filled with a clayey sand containing many whole bricks and occasional metalwork; ▲ Elevated copper and zinc were recorded, although below Delta-Simons screening values, and all other soil contamination was below the screening criteria adopted by STATS. No groundwater analysis was conducted; ▲ Geotechnical hazards reported included shrinkable clay soils, compressible soils, obstructions, Made Ground and silt rich soils; ▲ Aggressive Chemical Environment for Concrete (ACEC) Classification is AC-1s with a Design Sulphate Class of DS-1 was reported. STATS suggested that a design CBR value of 6% could be adopted; and ▲ STATS considered the Site fell into the "moderately low subsidence risk" category relating to potential chalk dissolution and states that Edmund's database of known natural and man-made chalk solution features illustrates there are no such features in the immediate vicinity of the Site.
WSP Phase I (2005)	The report was undertaken in the context of the proposed investment purchase of the Site. Potentially contaminative activities identified during a Site walkover were limited to the storage of diesel fuel in two above ground storage tanks (with a total capacity of 3,000 litres) and the storage of waste materials. No significant issues were identified associated with the current use of the Site. The following third-party reports were also reviewed by WSP as part of the assessment (not seen by Delta-Simons): ▲ A 1999 Environmental Monitoring Program undertaken by CASELLA Ltd. The report detailed results of effluent monitoring, industrial emissions monitoring, groundwater monitoring, surface water monitoring and building fabric monitoring. It was stated that the report reviewed a number of intrusive and non-intrusive investigations, which identified potential issues associated with: low concentrations of toluene and purgeable hydrocarbons from effluent monitoring for B2000; groundwater contamination associated with chlorinated solvents; and copper contamination within a concrete slab. It was noted by WSP that the effluent treatment facility had been decommissioned, that the identified groundwater contamination was outside of the Site boundary and that the concrete slab had been remediated; ▲ A 1999 Initial Ground Investigation by Soil Consultants Limited (reported to have been associated with the northern area of the Site), which was stated to have identified potential issues associated with elevated levels of cadmium within two boreholes, and elevated levels of arsenic, lead, copper, zinc and mercury within a single borehole, however, it was noted by WSP that the soil guidance values used for comparison at that time were no longer applicable; and ▲ A 2004 Addendum, Site Investigation Report undertaken by STATS. It was stated that the report identified potential issues associated with elevated levels of ground gas within Made Ground. It was noted that the report was based on a single monitoring event and did not record flow rate. It is also suggested that Batelle UK Limited and Havant International Limited had an outstanding intrusive investigation report for the north-west area of the Site, with intrusive

	boreholes placed west of B1000 to assess groundwater and other ground environmental factors. This report has not been seen by Delta-Simons. WSP concluded that based upon the information and intrusive investigations reviewed, no significant contamination issues had been identified for the continued commercial use of the Site. However, it was noted that the potential presence of residual contamination, which may require remediation in the event of redevelopment could not be discounted. It was considered that the Site represented a low/ medium environmental risk.
Geo-Environmental Appraisal (2019)	Clancy undertook an intrusive investigation in July 2019 across the north-eastern and southern areas of the Site to support the demolition and redevelopment works detailed in planning application APP/19/00703. The report also includes limited discussion of the UXO Report discussed above in Section 2.3. Investigation works at the Site included the advancement of eight window sampler boreholes to 5.5 m bgl, four hand trial pits to 1.4 m bgl, four cable percussive boreholes to 24.9 m bgl and the excavation of two trial pits for soakaway testing purposes. Visual and olfactory evidence of hydrocarbon contamination was identified at two locations (WS2 & WS5) between 1.0 to 1.6 m and 2.5 to 3.5 m, respectively. From nine samples of Made Ground and six samples of natural soils, no elevated levels (in comparison to Site Screening Values (SSV)) of inorganic contaminants for a commercial/ industrial end use were identified. In regard to organic determinands, elevated levels of hydrocarbons (aliphatic C10-12, C12-16 & Aromatic C12-16) were identified at WS2 and WS5 noted to be above 'Water Screening Values'. It is noted that from a review of the values, these fall below Delta-Simons soil Generic Assessment Criteria (GAC) for a commercial/ industrial use; however, exceed GAC values for potable water. It was noted by Clancy that no elevated levels of hydrocarbons were identified from samples taken from 3.9 m bgl. Clancy noted that WS2 was located in an area of former waste storage and existing substation, with WS5 located adjacent to historical tanks in the west which were considered to likely be the source of contamination. From four rounds of gas monitoring, carbon dioxide levels were identified up to 7.2 % v/v with a maximum flow rate of 0.7 l/hr. No elevated levels of methane were identified. The Site was considered to represent a Characteristic Situation 1; however, given the level of carbon dioxide (above 5 %), depth and nature of the Made Ground, and presence of peat in the area, Clancy recommended for the Site to be raised to a Characteristic Situation 2. Overall, the following recommendations were provided: ▲ Additional investigations in the area of WS2 and WS5 to delineate the identified hydrocarbon contamination with regards to controlled waters; ▲ Preparation of a remediation strategy following delineation; ▲ The installation of gas protection measures in line with CS2 within new units with independent verification; and ▲ The consideration of UXO during future excavations with the potential for supervision by an EOD engineer to brief and support site personnel.
Supplementary Investigation (2020)	Clancy undertook a supplementary investigation across the south of the Site in July 2020. The report also makes note of two letter reports by Clancy Consulting from September 2019 (10/1425/002) and June 2020 (10/1425/003), which have not been seen by Delta-Simons; however, information from these was noted to be included within the report. Further works at the Site included the advancement of two cable percussive boreholes to 20.0 m bgl, and twenty-five window sample boreholes to 4.5 m bgl.

	Ground conditions identified Made Ground (consistent with the material identified in 2019) to 1.1 m bgl. Visual and olfactory evidence of contamination was identified at one location. From three samples of Made Ground and twenty-four samples of natural ground, a slight exceedance of perylene was identified at one location; however, given the very low value and relatively low volatility, this was not considered to represent a significant risk to future Site users. Total petroleum hydrocarbon (TPH) compounds were recorded in Made Ground in excess of solubility limits at two hotspot locations along with a number of elevated volatile organic compounds (VOC) and semi-volatile organic compounds (SVOC). From six groundwater samples, slight exceedances of lead and nickel were identified at one location, along with marginally elevated total PAH (maximum of 0.96 µg/l) and TPH (maximum of 283 µg/l); however, the concentrations were not considered to be significantly elevated. It was noted by Clancy that no elevated source of PAHs was identified within soils, and it was considered that this was representative of either an off-Site source or on-Site source which had not yet been identified. Based on testing it was considered that the majority of Made Ground and natural soils would be suitable for disposal as non-hazardous waste with localised TPH impacted soils requiring disposal to a hazardous waste landfill. Overall recommendations for the proposed development included the following: ▲ Development of a Remediation Method Statement; ▲ Development of a Materials Management Plan if Site won soils are proposed for re-use on-Site; ▲ Excavation and removal of identified contamination hotspots in the vicinity of WS2 and WS5 with subsequent inspection and verification of excavation works; ▲ Implementation of a watching brief for previously unidentified soil contamination during the groundworks; ▲ Collection and laboratory analysis of soil samples from finished formation level across the Site to verify that residual contaminant concentrations are below guidance values; and ▲ Provision of a Verification Report to assist with discharge of planning conditions relating to contaminated land.
Implications for Land Contamination Risk	<i>Several ground investigation reports appear to have been produced for the Site, a number of which have not been seen by Delta-Simons. Based on the recent available information, two hotspots of hydrocarbon contamination have been identified with recommendations for off-Site removal, and it was considered for the areas investigated basic gas protection measures should be installed.</i>
Implications for Redevelopment	<i>Considering the recent investigations only covered areas in the north-east and south, and the proposed development covers the majority of the Site, further intrusive investigation is recommended.</i>

2.8 Flood Risk Advisory

Initial Flood Risk Review	A review of mapping provided by the EA indicates that whilst the majority of the Site is not located within an area at risk of flooding from rivers or the sea, a small area of the access road is shown to be at medium risk of fluvial flooding from Mill Stream. Anecdotal information previously provided from a Site representative indicates that this small area of the access road does not have a history of flooding.
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	The EA Long-Term Flood Risk Map (Surface Water) indicates the majority of the Site largely to be at very low risk from surface water flooding. There are localised areas of low risk, small areas of medium risk (around the boundary of Building 5000 and the south-west corner of Building 7000), and an isolated pocket of high risk associated with a localised topographical depression south of Building 1000. During previous Site visits, Delta-Simons was informed that all surface water from the car parking passes through interceptors and a surface water pumping station in the east of the Site, prior to discharge into the Mill Stream. It was also noted that water ingress occasionally occurs within a electrical switch room located within Building 1000 following intense rainfall with evidence of sandbags and flood barrier observed at the entrance. The Site is located within an area considered to be at potential susceptibility from groundwater flooding; however, no incidents of groundwater flooding have previously been highlighted. Delta-Simons has previously reviewed a Foul Water Flood Risk Assessment produced by Atkins in 2008 (2008 FRA) which highlighted an incident of historic foul water sewer flooding in 2008 due to surcharge of the foul water system. The 2008 FRA also recommended several mitigation measures to prevent flooding associated with the foul water systems on-Site. Information provided to Delta-Simons in 2019 indicates that a non-return valve was installed near Building 7000, which is likely to reduce the risk of sewer flooding at the Site. It should be noted that all the flood maps are <u>indicative</u> only.
Clancy Consulting Flood Risk Assessment and SUDS Strategy (2019)	A FRA and SUDS strategy was produced for the Site in 2019 associated with the proposed reconfiguration of Building 1000, addition of car parking and redevelopment of the south-western area of the Site. Overall, it was considered that the development area was at low risk of flooding (from all sources) with the proposed drainage to attenuate flows from impermeable areas to current run off rates through underground geocellular tanks, oversized pipes, permeable paving and flow control devices. Two letter reports by Clancy have also been identified from August and October 2019 which further discuss the potential flood risk at the Site following comments from the EA. The letter reports note that a flood defence (embankment) is present to the east of the Site which comprises a crest height of approximately 2 m above the modelled river level (including 20% climate change) which would therefore provide suitable protection from potential flood events.
Implications for Flood Risk	<i>Based on the information reviewed, the majority of the Site is not located within an area considered to be of an elevated risk of fluvial flooding. Whilst a small area of the access road in the east of the Site is shown to be at moderate risk of flooding associated with the Mill Stream, this is understood to be protected by an embankment.</i> <i>Several areas of the Site are shown to be at potential risk of surface water flooding, however, no associated issues were reported on-Site with the exception of minor water ingress at Building 1000.</i> <i>Available information indicates that flooding events have occurred at the Site associated with surcharging of the foul system, however, it is understood that a non-return valve was installed at the Site.</i>
Implications for Redevelopment	<i>Whilst a Flood Risk Assessment is available for the current development proposals, it is likely that a further assessment and drainage strategy will be required to support the proposed redevelopment of the Client's masterplan.</i>

3.0 Land Contamination Risk

3.1 Introduction

A Conceptual Site Model (CSM) represents the relationships between contaminant sources, pathways and receptors, to support the identification and assessment of Possible Contaminant Linkages (PCL).

Where PCL are identified, a preliminary risk assessment is undertaken to assess the likelihood that each possible linkage exists and to determine whether these pose potentially unacceptable risks to identified receptors and require further assessment. Where this linkage is of a form that subsequently leads to the potential for land being identified as 'contaminated land' under the terms of Part 2A of the Environmental Protection Act 1990, the linkage is termed a significant contaminant linkage.

At the preliminary risk assessment stage, which is typically based upon desk study information and Site reconnaissance, the decision on whether a PCL poses a potentially unacceptable risk is based upon professional judgement. The significance of the PCL will also be determined dependant on the context of the land use and the purpose of the assessment.

Assessing risks from land contamination underpins the suitable for use approach adopted under Part 2A of the Environmental Protection Act 1990 and its associated regulatory regime.

3.2 Conceptual Site Model

The Site is occupied by a science park comprising a number of interlinked commercial offices and light industrial properties, with car parking in the south, east and north of the Site, hardstanding and access roads, and landscaping confined to limited areas. While chemical storage, diesel back-up generators and electrical substations were previously identified on-Site, the Site appeared well managed and no significant potential contamination concerns were noted associated with the current Site use.

The Site was predominantly unoccupied until the development of a sewage works in the north-east by 1909. By 1973, the sewage works was no longer present, and the Site had been redeveloped into an IBM computer products manufacturer. Since the 1970's, some redevelopment has occurred on-Site, though the main buildings have largely remained unchanged. Potentially contaminative uses associated with the computer manufactory include previous 'wet' processes in B1000, diesel powered boilers in the area of the current gas boiler systems (B3000), an effluent treatment and chemical storage area in the area of B22, and effluent treatment and former chemical storage in the area of B41 and B42. Also, a former pollution incident was reported to have occurred in the 1980's, however, no further details are known.

Potential sources of contamination identified in the surrounding area include a mill, a sewage works, factories, an engineering works, a warehouse, a boatbuilding works/ works, a plastics factory, works, a pumping station with a tank and a petrol filling station.

The Site is considered to be of a moderate environmental sensitivity given: the presence of Secondary A Aquifers (which comprises some cohesive deposits) over a Principal Aquifer; the proximity of the Mill Stream; the presence of statutory designated ecological sites downstream of the Site (Chichester and Langstone harbour); and the mixed commercial, light industrial and residential use of the surrounding area.

Based on the recent available information, two hotspots of hydrocarbon contamination have been identified with recommendations for off-Site removal, and it was considered for the areas investigated basic gas protection measures should be installed.

3.3 Contaminant Linkage Assessment

Based on the information reviewed within this Report, the following preliminary risk assessment table has been formulated, which identifies all PCL in the context of the Sites proposed redevelopment.

Risk definitions used for the following assessment are provided as follows:

- ▲ Low risk – Low likelihood and either no or mild severity. Negligible/ unlikely contaminated land situation. Either no action recommended, or possible action during changes in conditions;

- ▲ Moderate risk – Likely probability and medium severity. Plausible contaminated land situation. Possible action recommended following further risk assessment; and
- ▲ High risk – High likelihood and severe severity. Likely or demonstrable contaminated land situation. Action (possibly urgent) recommended.

Contaminant Linkage Assessment				
Source(s)	Pathway(s)	Receptor(s)	Risk Rating	Justification & Mitigation (if required)
Potentially contaminated soils and/or groundwater located beneath the Site.	Direct contact/ ingestion and inhalation of dust and vapours.	Site users.	Low Risk	Whilst the presence of further localised contamination is possible, given the Site is to be predominately covered by buildings and hardstanding, which will significantly constrain the associated pathways, the risk is considered to be low.
	Direct contact, ingestion and inhalation of dust and vapours.	Maintenance workers during any future sub-surface works at the Site.	Moderate Risk	Site workers may become exposed to localised contaminated soils and shallow groundwater during intrusive groundworks undertaken at the Site. Safe working practices should be undertaken and appropriate Personal Protective Equipment (PPE) should be used that will reduce the risk to low.
	Leaching of contaminants and vertical migration.	Groundwater beneath the Site.	Low to Moderate Risk	Previous investigations across the southern area of the Site have identified localised contamination and the potential for further localised contamination to be present is possible. Also, there is the potential for contaminants to be mobilised during construction works, and in the absence of Site-wide available information, the risk is considered to be low to moderate.
	Permeation of hydrocarbons through plastic pipe work.	Water supply pipes.	Low to Moderate Risk	Hydrocarbons, especially aromatics and chlorinated solvents are known to permeate plastic pipes, particularly when encountered at high concentrations. Whilst widespread hydrocarbon contamination was not previously identified, the proposed redevelopment may introduce water supply pipes to potentially localised areas of contamination. Upgraded water supply pipes may be required in order to reduce this risk to low.
	Lateral migration through any groundwater beneath the Site.	Off-Site receptors (neighbouring properties/ users and nearby surface water).	Low to Moderate Risk	The Mill Stream is located adjacent to the east of the Site and available information indicates that groundwater will be present at shallow depth. While the buildings and hardstanding across the majority of the Site will limit potential contaminant migration, the construction activities may mobilise contaminants. Therefore, the risk to off-Site receptors is also considered to be low to moderate.
Ground gas.	Vertical and lateral migration of ground gases.	Site users & the buildings on-Site.	Low to Moderate Risk	Based on the available information, slightly elevated levels of carbon dioxide were previously identified in the southern and north-eastern areas of the Site in line with Characteristic Situation 2. The Site is also partially located within an intermediate radon gas area. Based on the proposed development, basic gas protection measures are likely to be required in any new buildings.
Potentially contaminated soil and groundwater from off-Site sources.	Lateral migration and subsequent inhalation.	Groundwater beneath the Site and future Site users.	Low Risk	Whilst potential off-Site sources of contamination have been identified, given the proposed use of the Site, which will be predominantly covered by buildings and hardstanding, the risk to Site users is considerably reduced. Overall, the risk is considered to be low.

4.0 Conclusions & Recommendations

4.1 Land Contamination/ Ground Conditions

Risk Assessment Summary/ Conclusions	Delta-Simons has completed a land contamination risk assessment based upon available information. Information has indicated that significant widespread contamination is unlikely to be present. However, localised contamination was recently identified at the Site, which it has been recommended to be remediated (excavated) and given the historical use of the Site, the potential for further localised contamination to be present is possible. It is, therefore, considered that the risk of significant possible contaminant linkages to exist is low to moderate for a continued use and for the proposed redevelopment.
Recommendations – Ongoing Use	No further works are considered to be required for land contamination purposes in the context of an ongoing use.
Recommendations – Future Redevelopment	Given that a future redevelopment of the Site is proposed that covers a wider area than originally investigated, it is expected that the regulatory bodies will require a further intrusive investigation, under the planning process. In the first instance, it is recommended that an up to date Preliminary Risk Assessment is completed and submitted along with any future planning application. Following an updated Preliminary Risk Assessment and Ground Investigation, a Detailed Quantitative Risk Assessment (DQRA) may be required in order to confirm whether any remedial works are required and in order to derive Site-specific remediation targets. Following a DRQA, localised remedial works is possible. Also, additional costs could be incurred by: any ground materials requiring off-Site disposal; the upgrading of water supply pipes; the provision of ground gas/ radon protection measures; and importing clean/ certified topsoil in any areas of future landscaping. Ground conditions are variable with deeper areas of Made Ground and relic foundations from historical structures. Ground improvement and/ or a piled foundation solution are likely to be required, which costs should be considered. It is also prudent to further consider the potential for encountering UXO during future groundworks. Any ground workers who are required to perform sub-surface work at the Site should be made aware of the possibility of encountering localised contamination. Therefore, good standards of personal hygiene should be observed with appropriate levels of PPE provided and utilised and toolbox talks given to contractors prior to the commencement of works.

4.2 Statement of Risk/Land Contamination Liability Assessment

This Assessment considers both perceived and actual risks using the contaminant linkage concept, with the principal measure of risk being whether significant harm (to people, animals, property (including buildings, cattle etc.), or statutory ecological receptors) or pollution of controlled waters (surface water bodies, aquifers, coastal waters, or territorial waters) is being caused, or whether there is a significant possibility of such harm being caused.

The overall risk classification, based on the source-pathway-receptor principle, adopted for this preliminary assessment, is defined as follows:

- ▲ Low risk – issue unlikely to present a liability or cost;
- ▲ Moderate risk – issue may present a liability or cost, but these may be limited; and

▲ High risk – likely that significant liabilities and/or costs exist.

Regulatory Action under Part 2A, EPR or EDR	There is considered to be a Low risk of enforcement action by the regulatory authorities under Part 2A of the Environmental Protection Act 1990, the Environmental Permitting Regulations 2016 or the Environmental Damage Regulations 2015, whilst the Site remains in its current use. However, it should be noted that appropriate works (including additional intrusive investigation) will be required in order to support the future development proposals.
Third Party Liability	The potential for legal action by surrounding landowners based on the potential for contamination to migrate off-Site and result in private or statutory nuisance is considered to be Low .
Investment/Asset Impact	Delta-Simons considers there to be a Low to Moderate risk of impact on the value of the Site from significant contamination issues, in the context of the Site remaining in its current use or for the proposed redevelopment.
Overall Statement of Risk	On the basis of available information, Delta-Simons considers that with regard to potential soil and groundwater contamination issues and associated environmental liabilities, the Site represents an investment opportunity with a Low to Moderate overall risk status in the context of its current use and proposed redevelopment.

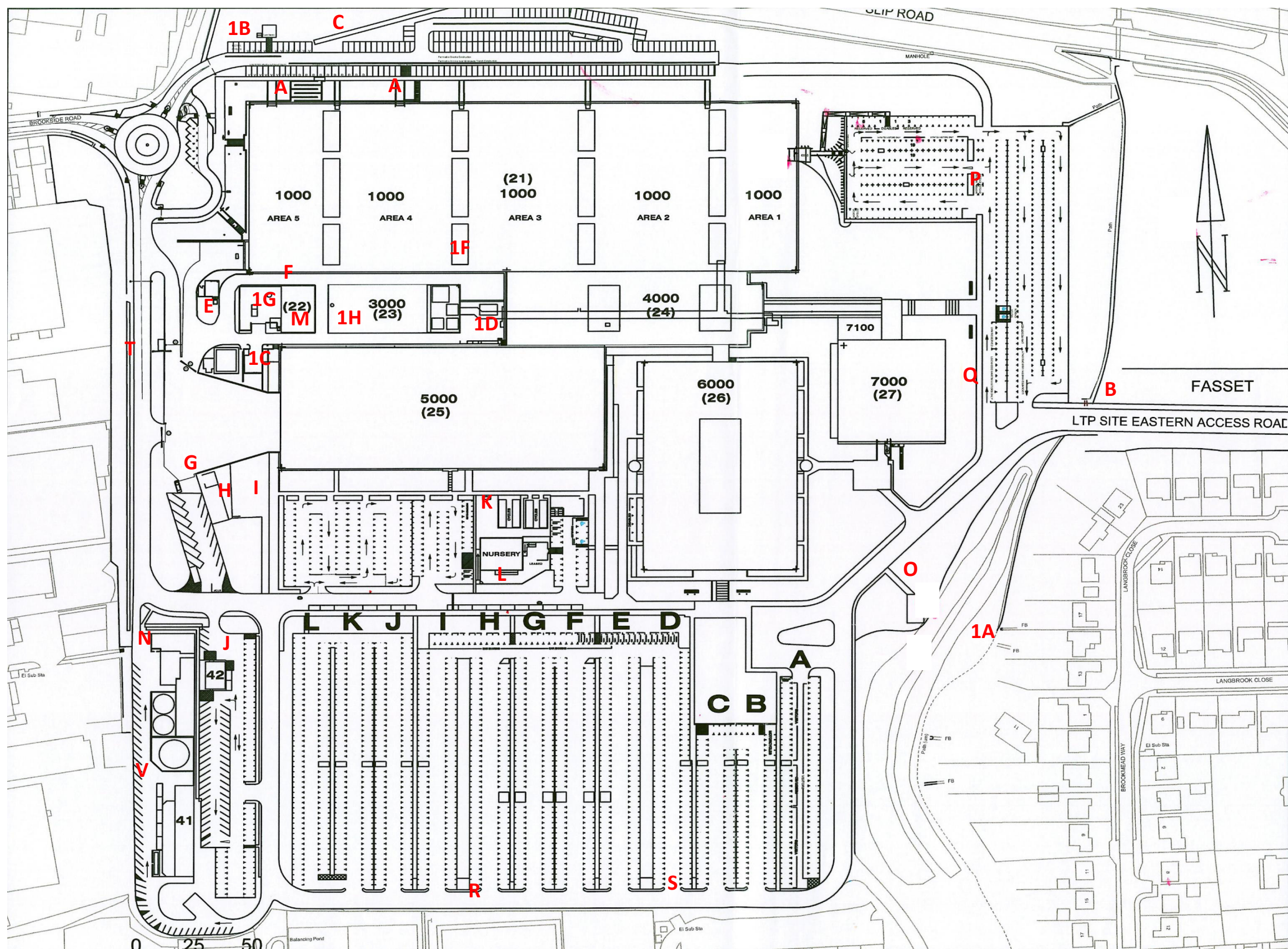
4.3 Flood Risk Advisory

Conclusions & Recommendations	Based on the information reviewed, the majority of the Site is not located within an area considered to be of an elevated risk of fluvial flooding. Several areas of the Site are shown to be at potential risk of surface water flooding, however, no associated issues were reported on-Site with the exception of minor water ingress at Building 1000. Available information indicates that flooding events have occurred at the Site associated with surcharging of the foul system, however, it is understood that a non-return valve was installed at the Site. Whilst a Flood Risk Assessment is available for the current development proposals, it is likely that a further assessment and drainage strategy will be required to support the proposed redevelopment of the Client's masterplan.
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4.4 Other Redevelopment Considerations

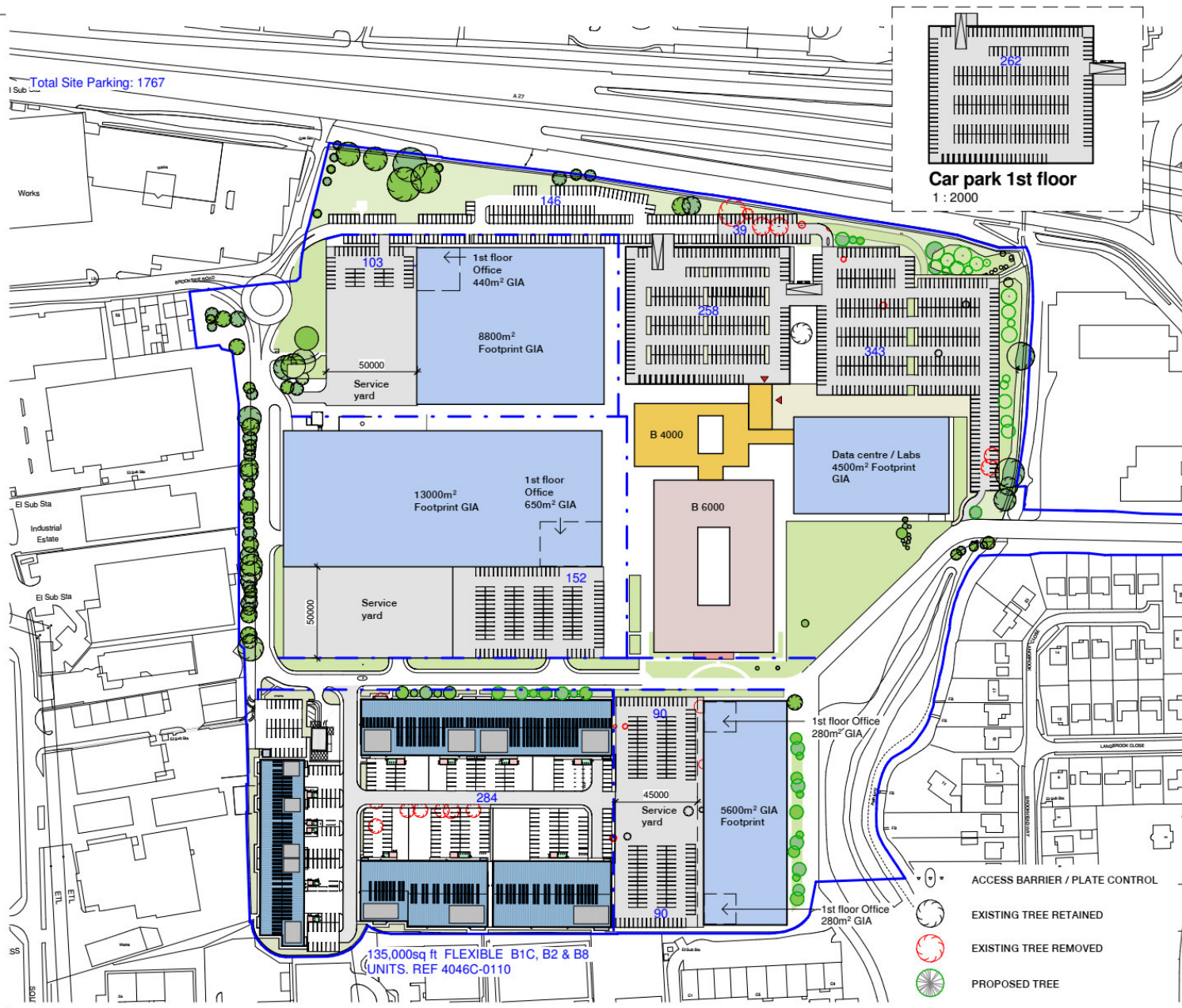
Recommendations	Additional environmental surveys were completed and submitted to the Local Planning Authority to support the previous proposed development works, which included those associated with ecology, heritage, air quality, noise and sustainability (BREEAM). These are all likely to require updating for any future planning re-submission.
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Figure 1 – Site Features Plan



Project No. 15-0574.02 	Title Langstone Technology Park Figure 1 - Site Features Plan	Scale NTS	Date 07-May-18
			Drawn: KH Checked: SJB

Drawing 1 – Proposed Masterplan



Notes

This drawing may be scaled for the purposes of Planning applications, Land Registry and for Legal plans where the scale bar is used, and where it is verified that the drawing is an original or an accurate copy. It may not be scaled for construction purposes.

Always refer to figured dimensions. All dimensions are to be checked on site. Discrepancies and/or ambiguities between this drawing and information given elsewhere must be reported immediately to this office for clarification before proceeding. All drawings are to be read in conjunction with the specification and all works to be carried out in accordance with latest British Standards / Codes of Practice.

A 15.05.20 LI Updated following client comments

Rev	Date	Init	Notes	Checked



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SCALE 1:2000
m

Client

Drawing Originator

AWW inspired environments

London - 106 Weston Street London SE1 3QB 020 7160 6000
Bristol - Rivergate House, Bristol, BS1 6LD 0117 923 2636
Plymouth - East Quay House, Plymouth, PL4 0HX 01782 281 282
RIBA Chartered Practice www.aww-uk.com

Project Title
Langstone Technology Park

Drawing Title
Future Masterplan

Scale	Chest	Drawn	Checked	Date
1 : 2000	A3	LI	LI	13.05.20

Status	Project No.
PRELIMINARY	4046
Drawing Reference	Revision
0170	A

Plan provided by Client