



e3p

Phase I Geoenvironmental Site Assessment
Huyton Asphalt Ltd, Lees Road, Knowsley

Reference: 15-277-R1-2
Date: September 2022



PHASE I GEOENVIRONMENTAL SITE ASSESSMENT

Huyton Asphalt Ltd
Lees Road
Knowsley
L33 7SE

Prepared for:
Alan Johnston Partnership



Report Ref: 15-277-R1-2
Date Issued: September 2022

E3P

Taylor Road
Trafford Park
Urmston
Manchester
M41 7JQ

+ 44 (0) 161 707 9612
<https://e3p.co.uk>

Registered in England
CRN: 08725262

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DATE	20/10/2021	10 September 2022	
PREPARED BY	G Haigh	M. Dimes	
QUALIFICATIONS	BSc, MSc	BSc (Hons)	
CHECKED BY	J Sheridan	J Sheridan	
QUALIFICATIONS	MeSci, FGS	MeSci, FGS	
AUTHORISED BY	S Cox	S Cox	
QUALIFICATIONS	BSc (Hons), FGS, PIEMA, MIEEnvSci, Cenv	BSc (Hons), FGS, PIEMA, MIEEnvSci, Cenv	



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EXECUTIVE SUMMARY

Site Address	Huyton Asphalt Ltd, Lees Road, Knowsley, Liverpool, L33 7SA.	
Grid Reference	E 342864, N 398580	
Site Area	0.69 Ha.	
Proposed Development	AJP intend to demolish existing structure in the east to be replaced with a new block along with an extension to an existing on-site garage located adjacent to the southern boundary, with associated parking.	
Current Site Use	The subject site is a roughly rectangular shaped parcel of land located to the east of Lees Road and is currently vacant/disused. The site is divided into two sectors by wire mesh fencing. The northern sector is occupied by a former garage, with the southern sector occupied by an office building and storage yard. The external area is used for storage of materials including paving slabs, stones and road ramps. Old tyres are also stored to the rear (east) of the garage building. Rectict floor slabs are present in the centre of the site, and in the north west, where structures have been demolished. Demolition rubble is still present/exposed at the ground surface, containing inclusions of brick, concrete, plastic and rebar. Decommissioned utility connections remain in-situ. Bunds of presumed demolition material were present along the western half of the southern boundary, which had become overgrown with self seeded vegetation.	
Site History	A review of the pertinent Ordnance Survey mapping and Envirocheck reports suggests the site was occupied by undeveloped agricultural fields until pre 1940. From 1940-1947 the site was occupied by a Royal Ordnance (munitions) Factory and ancillary structures. The site was included as part of the larger Knowsley Industrial Park development, and a canning factory was built on the site Pre 1960. The site remained relatively unchanged until Pre 1968 when the canning factory was expanded. The site remained largely unchanged until Pre 2018 when the canning factory was demolished. The remaining buildings were used commercially as office and a garage s until Pre 2021.	
Environmental Setting	Drift Geology	Shirdley Hill Sand Formation - SAND
	Bedrock Geology	Sherwood Sandstone Group, Chester Formation - SANDSTONE.
	Faults	The nearest geological fault is located greater than 1 km east of the site trending roughly north to south.
	Hydrogeology	Principal bedrock aquifer and Secondary A superficial aquifer. Site is located withing a Zone 3 – Total Catchment source protection zone. Closest groundwater abstraction 316 m away.
	Flood Risk	Unaffected by flooding from rivers.



Utility Locations	Statutory plans together with a full utility survey have been reviewed. The following utilities have been identified: A gas governor is present in the north west of the site, housed within a small outbuilding. Medium pressure gas mains enter from Lees Road. A 300 mm diameter vitreous clay foul sewer drain is present in the west of the site running parallel to Lees Road. An electricity substation is present in the south of the site; HV cables run along the southern boundary and LV cables enter from Lees Road and connect to the on-site buildings. Decommissioned routes are shown in the centre of the site. Several other drainage and electricity networks are identified across the western half of the site. The survey in the east of the site is limited due to stockpiles and material storage.
Landfill Sites and Ground Gases	No landfill sites (current or historic) are located within 250 m of the site. The site has undergone some historic development and ground working, the Made Ground associated with the historic development may produce hazardous ground gases such as methane and carbon dioxide.
Radon	Less than 1% of houses above the 'Action Level' – no special precautions required.
Coal Mining/Land Stability	The site is not located within a coal mining reporting area.
Hazardous Installations	No above-ground storage tanks (ASTs) or underground storage tanks (USTs) were observed at the site during the preliminary site walkover. Due to the previous uses of the site (including a garage/vehicle maintenance workshop), it is likely that hazardous materials storage will have occurred on the site. Substances may include fuels, lubricants, paints and varnishes.
Initial Conceptual Site Model	Contaminant Sources ✿ Made Ground associated with several phases of development including part of larger munitions factory, canning factory, garage etc and its location in a large area of BGS mapped Made Ground – Heavy metals, Polycyclic Aromatic Hydrocarbons (PAHs), and Asbestos Containing Material (ACM), ground gas (carbon dioxide and methane) ✿ By-products of ammunition manufacturing - tar residues/coal tars, boiler ash, flue dust and clinker, oxides, oils, along with toxic explosive compounds of nitroglycerine, nitroguanidine and Trinitrotoluene (TNT) ✿ Electrical substation – Poly Chlorinated Biphenyls (PCBs) ✿ Garage and potential fuel / lubricant storage – Total Petroleum Hydrocarbons (TPHs), Semi/Volatile Organic Compounds (S/VOCs), BTEX compounds ✿ Waste ACM Storage in the north east of site.



	Pathways ☼ Direct contact and ingestion ☼ Volatilisation/indoor explosion ☼ Vapour inhalation ☼ Dust inhalation Receptors ☼ Future site users (proposed commercial end-users and construction workers) ☼ Buildings (proposed commercial unit) ☼ Underlying aquifers (Principal bedrock, Secondary A superficial)
Conclusion	Risks from soil contamination to construction workers are currently considered moderate given the industrial history of the site, however, the risks to future commercial site users are considerably reduced given the likelihood that the site will be covered by hardstanding (no pollutant linkage). Potential sources of mobile contamination (TPH/VOCs) have been identified on site and there is the potential for vertical migration of mobile contaminants through the underlying granular drift to the Principal Aquifer within the bedrock. The site is located within a SPZ 3 (Total Catchment) and the closest active abstraction point is located 361 m west. There are no surface water courses within close proximity that may be influenced by lateral migration of contamination from the subject site. The overall risk to controlled waters is concluded to be moderate. There are no landfills or significant infilled features identified within 250 m of the site. However, the site is within an area of mapped artificial ground and deep Made Ground is anticipated which may be a source of ground gas. Risks from ground gas are considered low given the reduced exposure and sensitivity of the receptor.
Recommendations	An intrusive ground investigation is recommended at the site in order to confirm ground conditions, undertaken chemical analysis and a human health and controlled waters risk assessment and to provide a conceptual foundation design.



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DRAWING LIST

15-277-001 - Site Location Plan
15-277-002 - Proposed Development Plan
15-277-003 - Historical Features Plan
15-277-004 - Site Features Plan



1. INTRODUCTION

1.1. BACKGROUND

E3P Ltd has been commissioned by Alan Johnston Partnership Ltd (AJP) on behalf of their client) to undertake a Phase I Geoenvironmental Site Assessment for the land off Lees Road, Knowsley Industrial Park, L33 7SE (formerly Huyton Asphalts Ltd).

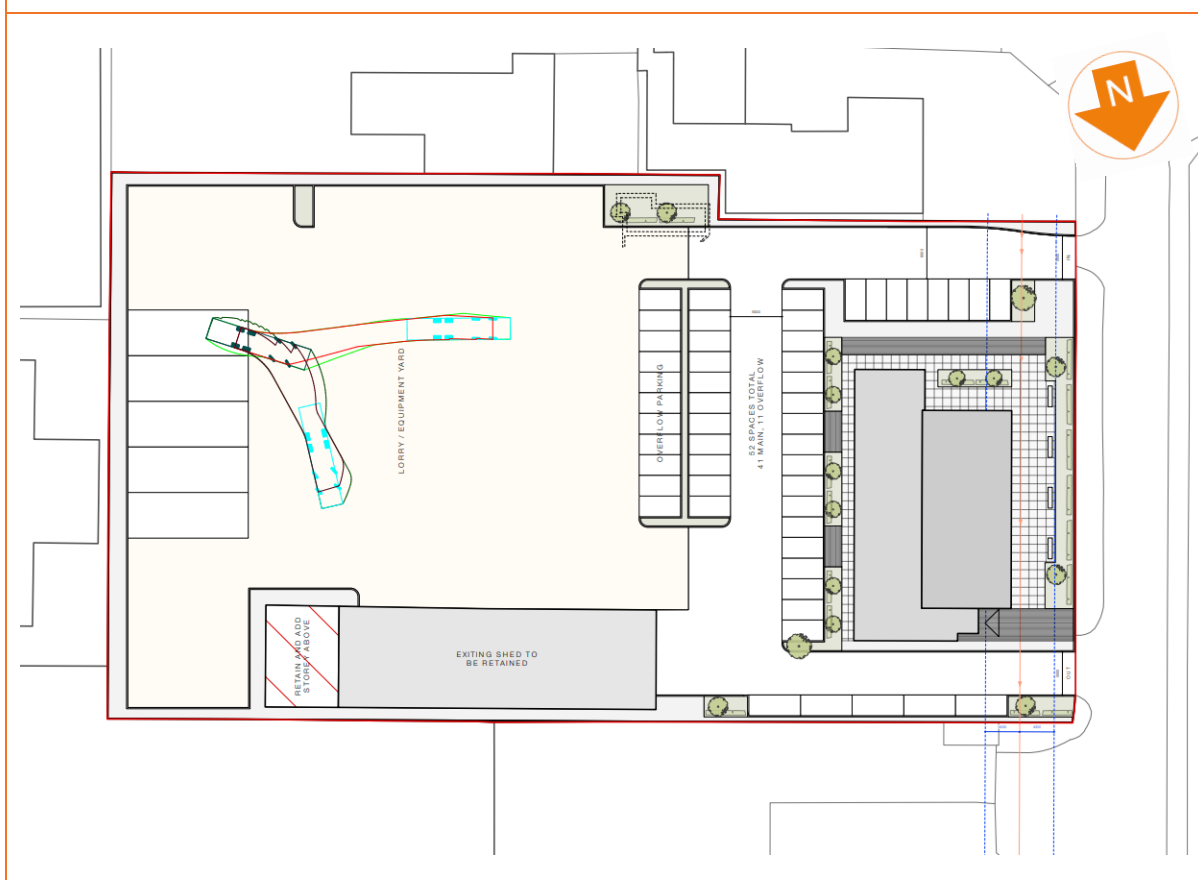
This report is required to determine potential contaminated land liabilities and geotechnical constraints as part of a proposed site redevelopment

1.2. PROPOSED DEVELOPMENT

AJP intend to demolish the existing office structure in the east of the site to be replaced by a new block along with an extension to the existing on-site garage located adjacent to the southern boundary with associated parking. Drawing 15-277-002 (Appendix III) identifies the proposed development layout.

A snapshot of the proposed development layout is indicated in Figure 1.1.

FIGURE 1.1 SNAPSHOT OF PROPOSED DEVELOPMENT



1.3. OBJECTIVES

- ✿ The objectives of the geoenvironmental investigation are as follows:
- ✿ Review historical plans, geology, hydrogeology, site sensitivity, floodplain issues, mining records and any local authority information available in order to complete a desk study in line with Environment Agency (EA) document Land Contamination: Risk Management (LC:RM) (2019)
- ✿ Assess the implications of any potential environmental risks, liabilities and development constraints associated with the site in relation to the future use of the site and in relation to off-site receptors.
- ✿ Assess the desk-study information and, where possible, provide preliminary recommendations in relation to foundations, pavement construction and floor slabs.
- ✿ Provide recommendations regarding future works required and undertake a preliminary pre-construction cost appraisal.

1.4. SOURCES OF INFORMATION

Background information was sought from the following sources:

- ✿ Envirocheck Search;
- ✿ Historical mapping dated 1867 to 2021. A selection of historical maps are reproduced in Appendix V;
- ✿ On-line planning records held by Knowsley Council;
- ✿ Consultations with representatives of Knowsley Council;
- ✿ Magic Map Groundwater Vulnerability Map;
- ✿ Radon: Guidance on protective measures for new buildings (BRE Document BR 211, 2007);
- ✿ British Geological Survey Map;
- ✿ Groundsure IO database;
- ✿ <https://zeticauxo.com/downloads-and-resources/risk-maps/>; and,
- ✿ <https://flood-map-for-planning.service.gov.uk>.

1.5. LIMITATIONS

The limitations of this report are presented in Appendix I.



1.6. CONFIDENTIALITY

E3P has prepared this report solely for the use of the client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from E3P; a charge may be levied against such approval.

1.7. RISK CLASSIFICATION

E3P has utilised the available data to classify the site on the basis of its likely contaminated land liability and potential for geotechnical constraints in relation to the site development. The risk classification definitions are summarised in Table 1.1.

TABLE 1.1 RISK CLASSIFICATION

RISK	DEFINITION
Low	There are unlikely to be significant contaminated land liabilities/geotechnical constraints associated with the property.
Low Moderate	There are unlikely to be significant contaminated land liabilities/geotechnical constraints associated with the property with regard to the proposed use. However, minor issues may require further consideration in the event of future redevelopment of the site.
Moderate	Some potential contaminated land liabilities/geotechnical constraints are likely to affect the property as a result of historical and/or current activities. The risks identified are unlikely to pose an immediate significant issue but the purchaser/developer may wish to make further enquiries of the vendor or undertake further environmental improvements. Redevelopment of the site will likely require further site investigation.
Moderate High	Some potentially significant contaminated land liabilities/geotechnical constraints have been identified at the property that require further assessment, including intrusive ground investigations.
High	Significant potential contaminated land liabilities/geotechnical constraints have been identified at the property. Further assessment including intrusive ground investigation will be required to determine to level of risk and associated liability.



2. SITE SETTING

2.1. SITE DETAILS

Site Address	Huyton Asphalt Ltd, Land off Lees Road, Knowsley, Merseyside, L33 7SE.
National Grid Reference	E 342864, N 398580.
Site Area	0.69 Ha.

All acronyms used within this report are defined in the Glossary presented in Appendix II.

A site location plans presented in Appendix III as Drawing 15-277-001.

2.2. CURRENT SITE USE

E3P has undertaken a site walkover of the entire site and a description of the key findings is summarised in Table 2.1.

TABLE 2.1 SITE DESCRIPTION

Occupancy/Use	The subject site is a roughly rectangular shaped parcel of land located to the east of Lees Road and is currently vacant/disused. The site is divided into two sectors by wire mesh fencing. The northern sector is occupied by a former garage, with the southern sector occupied by an office building and storage yard. The external area is used for storage of materials including paving slabs, stones and road ramps. Old tyres are also stored to the rear (east) of the garage building. Rectict floor slabs are present in the centre of the site, and in the north west, where structures have been demolished. Demolition rubble is still present/exposed at the ground surface, containing inclusions of brick, concrete, plastic and rebar. Decommissioned utility connections remain in-situ. Bunds of presumed demolition material were present along the western half of the southern boundary, which had become overgrown with self seeded vegetation.	
Surface Cover (%)	Buildings	10%
	Hardstand	85%
	Soft Cover	5%
Structures	The site is predominantly covered by hardstanding with three structures present, a large garage and small gas governor outbuilding adjacent to the northern boundary, a two-storey office adjacent to the western boundary, and a small outbuilding adjacent to the southern boundary. The office structure is a brick building in relatively good state of repair. The former garage appears somewhat dilapidated, and it is evident that former extensions to the building have been demolished, leaving bare brickwork exposed.	



Access	Access to the site can be gained from two gates on Lees Road, one in the south and one in the north.
Slope	The western half of the site sits at an elevation of circa 40 m AOD. There is a slight level change in the centre of the site and the east of the site is circa 41 m AOD.
Retaining Structures	The land to the south of the site appears to be at a slightly higher level, although inspection of this level change was obstructed by the bund of material along the southern boundary. A low retaining wall may be present.
Vegetation/Ecology	The northeast and southeast, and southwest corners of the site contain large areas of self seeded vegetation, with vegetation also emerging through cracks in the concrete hardstanding. Invasive species were not directly observed but it is possible that these may be present and it is recommended that an ecological survey be carried out to confirm.
Hazardous Material Storage	No above-ground storage tanks (ASTs) or underground storage tanks (USTs) were observed at the site during the preliminary site walkover. Due to the previous uses of the site (including a garage/vehicle maintenance workshop), it is likely that hazardous materials storage will have occurred on the site. Substances may include fuels, lubricants, paints and varnished.
Asbestos-Containing Material (ACM)	Evidence of potential ACM was observed as cement roof panelling on the garage building. Given the age of the on-site structures (pre-2000 construction), ACM is likely to be present within the building fabric. Large bags of ACM cement board / cladding / panelling were also present in the northeast corner of the site, likely removed prior to the demolition of the former structures. Evidence of a previous pre demolition asbestos survey was found in the form of pipe labels in the demolition rubble in the centre of the site. A pre-demolition asbestos survey will be required within all existing buildings within the site boundary.
Polychlorinated Biphenyls (PCBs)	There is a secondary electric substation in the small outbuilding in the south of the site.
Waste Storage	ACM waste was found in the northeast corner of the site – potential risk associated with movement/disposal of ACMs. Large stockpiles of tyres are also present on-site, together with bunds of demolition rubble.
Utilities	Statutory plans together with a full utility survey have been reviewed. The following utilities have been identified: A gas governor is present in the north west of the site, housed within a small outbuilding. Medium pressure gas mains enter from Lees Road. A 300 mm diameter vitreous clay foul sewer drain is present in the west of the site running parallel to Lees Road.



	An electricity substation is present in the south of the site; HV cables run along the southern boundary and LV cables enter from Lees Road and connect to the on-site buildings. Decommissioned routes are shown in the centre of the site. Several other drainage and electricity networks are identified across the western half of the site. The survey in the east of the site is limited due to stockpiles and material storage.
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2.3. SURROUNDING AREA

The surrounding area land uses are summarised in Table 2.2.

TABLE 2.2 SURROUNDING LAND USES

DIRECTION	LAND USE
North	Storage units (Self Storage) / Knowsley Industrial Park
East	Duke Utility Solutions / Knowsley Industrial Park
South	Equipment Tool Centre / Knowsley Industrial Park
West	Henry Diaper & Co. with tanks / Knowsley Industrial Park



3. SITE HISTORY

3.1. ON-SITE HISTORICAL DEVELOPMENT

A review of historical mapping and historical aerial imagery pertinent to the site is summarised in Table 3.1. In addition, historical site features are presented on Drawing No 15-277-003 in Appendix III.

TABLE 3.1 HISTORICAL DEVELOPMENT

MAP EDITION	HISTORICAL LAND USE	HISTORICAL MAP EXCERPT
1867 1:2,500	The site lies across several undeveloped agricultural fields that are divided by field boundaries and trees. The land is associated with Lees House Farm to the south.	
1893 1:2,500	Trees are no longer shown.	

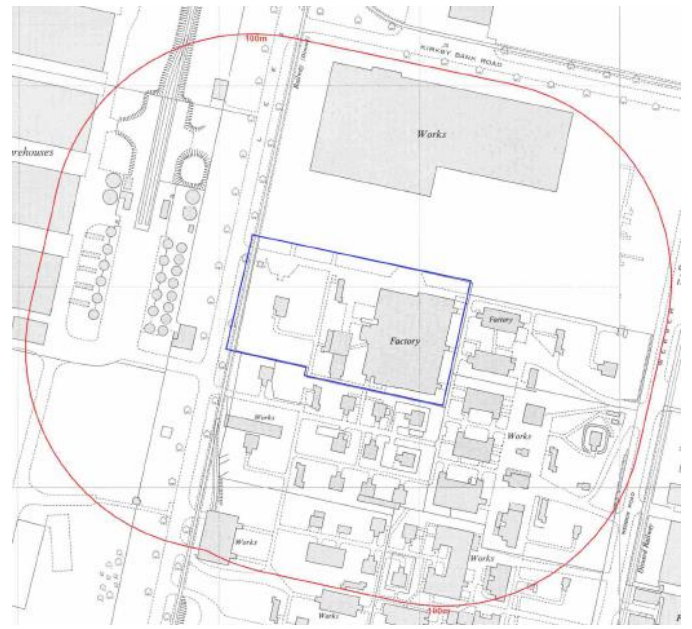


MAP EDITION	HISTORICAL LAND USE	HISTORICAL MAP EXCERPT
1908 1:2,500	There are no significant changes to the site.	
1927 1:2,500	There are no significant changes to the site.	

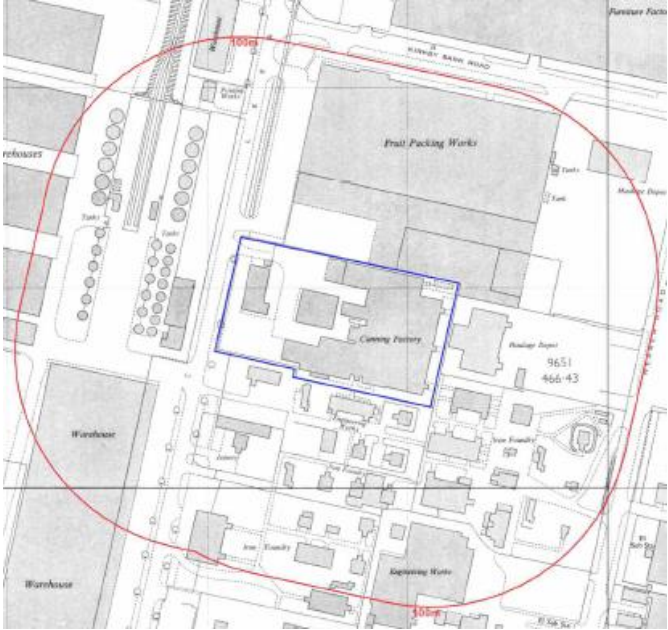
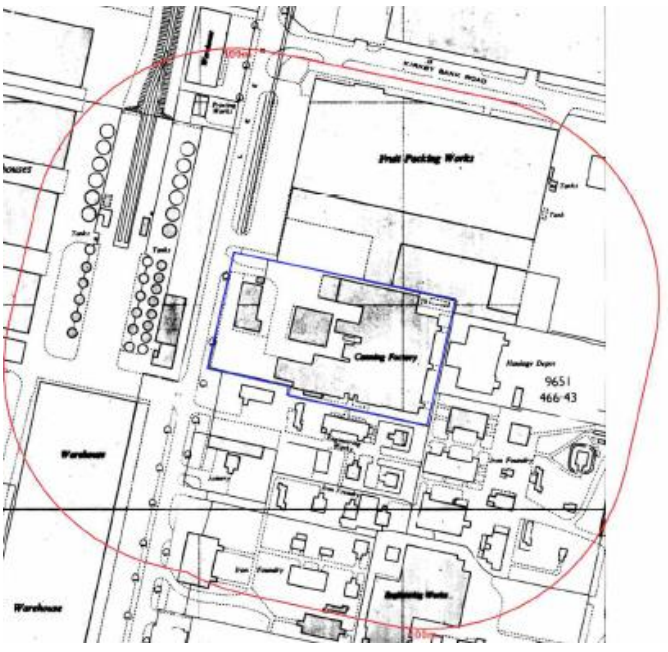


MAP EDITION	HISTORICAL LAND USE	HISTORICAL MAP EXCERPT
1938 1:10,560	There are no significant changes to the site.	
1956 1:10,560	The site is now located within Kirkby Industrial Park. Farm buildings to the south have been removed and multiple new structures now occupy the site. Structures appear to represent a camp with shelters/barracks. Map is labelled 1956 but looks to show army camp layout that was present from 1940 to around 1948. Anecdotal Information: Plate 01 shows aerial image of the site.	



MAP EDITION	HISTORICAL LAND USE	HISTORICAL MAP EXCERPT
1960 1:2,500	Large factory and multiple smaller surrounding buildings are present on site.	
1961 1:1,250	There are no significant changes to the site.	



MAP EDITION	HISTORICAL LAND USE	HISTORICAL MAP EXCERPT
1968 1:2,500	Canning factory has been expanded to the west. The smaller buildings in the centre and west of the site have been removed and replaced by larger buildings. The building in the west of the site appears to represent the structure still present.	
1971 1:2,500	There are no significant changes to the site.	





MAP EDITION	HISTORICAL LAND USE	HISTORICAL MAP EXCERPT
1994 1:1,250	There are no significant changes to the site.	
Google Aerial 2000	The aerial image appears to show the site in the same configuration as the previous map. There appears to be a storage area in the centre of the site, with carparking in the west.	



MAP EDITION	HISTORICAL LAND USE	HISTORICAL MAP EXCERPT
2003 1:1,250	There are no significant changes to the site.	
2010 1:10,000	There are no significant changes to the site.	



MAP EDITION	HISTORICAL LAND USE	HISTORICAL MAP EXCERPT
Google Aerial 2018	The aerial image shows the majority of structures to have been demolished, with only one building remaining in the west of the site and another adjacent the northern boundary. This is consistent with the current site layout.	
2021 1:10,000	The map shows slight changes to the main building (demolition of a central portion) however google aerial imagery (see above) shows most of the canning factory was demolished between 2016-2018.	



3.2. OFF-SITE HISTORICAL DEVELOPMENT

A review of potentially contaminative uses identified on historical Ordnance Survey maps within a 250 m radius of the site is summarised in Table 3.2.

TABLE 3.2 SURROUNDING HISTORICAL DEVELOPMENT

SURROUNDING FEATURE	DISTANCE	DATES	DIRECTION
Unspecified commercial / industrial (Warehouses / Factories)	11 – 200 m	Pre 1960 – Present	N / E/ S / W
Unspecified tanks	27 – 68 m	Pre 1960 – Present	West
Unspecified ground workings	84 m	Pre 1890	North
Sewage tanks Then: no longer marked / removed	152 – 239 m	Pre 1960 – Pre 1988	Northwest
Unspecified pits	246 m	Pre 1907 – 1938	South
Haulage Depot & Tanks	10 m	Pre 1967 – Pre 1986	North / East
Iron Foundries and Engineering Works Then: no longer marked	0 – 100 m	Pre 1967 – Pre 1866	South

3.3. PLANNING HISTORY

E3P has undertaken a review of online planning records held by Knowsley Metropolitan Borough Council and the following applications have been found:

 17/00397/FUL (Withdrawn)

Description: Change of use from office space (use class B1A) to cafe, together with infill extension to side, alterations to doors and windows on 3 no. elevations (including new entrance door), installation of cycle rack and new footpath.

 74/08794/HIST (Granted)

Description: Use of premises as education and training centre

3.4. ANECDOTAL INFORMATION

A web-based search of the subject site has recovered the following photographs, courtesy of Britain From Above:



PLATE 01 – KNOWSLEY INDUSTRIAL PARK, KIRKBY, 1947

An aerial image depicting the area that is now Knowsley Industrial Park post WWII. At the time named ROF Kirkby, the area was used as a munitions factory between September 1940 and March 1946, where it produced approximately 10% of WWII ammunition.



The Kirkby Industrial Estate around Lees Road, Kirkby, 1952



Information directly from: http://www.disused-stations.org.uk/k/kirkby_royal_ordnance_factory/



By the second half of the 1930s the British government had recognised the serious threat to national security from Nazi Germany and a re-armament began. Authorisation was given for the construction of a munitions factory on rural land at Kirkby. Britain entered the Second World War on 3 September 1939 and work began on the Kirkby site at the end of that year. A complex of a thousand buildings was laid out which included 18 miles of road and 23 miles of railway.

Information directly from: <https://www.liverpoolecho.co.uk/news/liverpool-news/how-one-merseyside-town-played-18733250>

ROF Kirkby employed up to 20,000 people from across the region and on the site could be found an administrative building, an engineering machine shop, a tailor's shop, a treatment room, chemical laboratories, a loading bay, a canteen and more.

In post-war years, Liverpool City Council bought the site for industrial development and Kirkby Industrial Estate was later born.

Expansion through 1950s and 1960s saw Kirkby Industrial Estate become one of the largest in the country, which played a key role in the development of the town - and by the early 1970s, the estate employed over 26,000 people.

3.5. PREVIOUS REPORTS

No previous reports have been made available to E3P.



4. ENVIRONMENTAL SETTING

4.1. GEOLOGY AND HYDROGEOLOGY

The British Geological Survey (BGS) map (Sheet 84) for the site, (1:50,000, Solid and Drift editions) and online records indicate the site is underlain by the geological sequence presented in Table 4.1.

TABLE 4.1 SUMMARY OF UNDERLYING GEOLOGY

GEOLOGICAL UNIT	CLASSIFICATION	DESCRIPTION	AQUIFER CLASSIFICATION
Artificial	N/A	Made Ground	N/A
Drift	Shirdley Hill Sand Formation	SAND	Secondary A aquifer
Solid	Chester Formation	SANDSTONE	Principal

TABLE 4.2 SUMMARY OF BGS BOREHOLE RECORDS

LOCATION	DEPTH	MADE GROUND	DRIFT	SOLID
120 m NE SJ49NW1143	5 m	2.6 m	CLAY and SAND 2.6-5.0 m	Not encountered
125 m S SJ49NW580	3 m	Not encountered	CLAY and SAND >3.0 m	Not encountered
130 m NE SJ49NW1142	3 m	0.4 m	CLAY and SAND 0.4-3.0 m	Not encountered
140 m NW SJ49NW1053	8.6 m	0.5 m	SAND and CLAY <4.25 m	SANDSTONE and MUDSTONE >4.25 m
180 m NW SJ49NW1052	7.3 m	Not encountered	SAND and CLAY <2.7 m	Weak SANDSTONE >2.7 m
185 m S SJ49NW1122	5.4 m	1.2 m	CLAY >3.0 m	Very weak SANDSTONE >2.8 m
250 m W SJ49NW2030	81 m	Not encountered	CLAY 0.3-4.0 m	SANDSTONE >4.0 m
255 m W SJ49NW1394	106 m	Not encountered	SAND 0.0-10.0 m	SANDSTONE 10 m

The Envirocheck report indicates that the site is located within a Source Protection Zone 3 – Total Catchment.

There are no active groundwater, surface water or potable water abstractions within 250 m of the site.

The closest active abstraction point is a groundwater abstraction borehole located 361 m west at Liverpool Football Club & Athletic Grounds Ltd, used for spray irrigation.

The nearest active surface water abstraction is located 1418 m north east of the site at Berry Bros Farm, also for spray irrigation, and the nearest potable water abstraction point is located 483 m east at Baker Hughes Ltd from a direct groundwater source, used for Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services.



4.2. NATURAL LANDFORM AND GEOMORPHOLOGY

The site is located in an area of mapped Artificial (Made Ground) and known military land. Anecdotal information suggests the area hosted a large underground magazine (place within which ammunition or other explosive material is stored). Shelters and bunkers are also visible on historical mapping. With this in mind, it is likely that significant alteration to the topography may have occurred, together with levelling to accommodate the wider industrial estate and on-site canning factory.

It is therefore possible that the historical phases of development will have resulted in a greater thicknesses of Made Ground overlying the natural aeolian sands in the area.

Surface LiDAR was unavailable for review at the time of writing.

4.3. GEOTECHNICAL DATA

Geotechnical data presented within a commercially available environmental database is summarised in Table 4.3.

TABLE 4.3 SUMMARY OF GEOTECHNICAL DATA

HAZARD	DESIGNATION
Shrink-Swell Clay	Very low risk
Landslides	Very low risk
Ground Dissolution	Negligible
Compressible Ground	Very low risk
Collapsible Deposits	Very low risk
Running Sand	Very low to low risk

4.4. COAL MINING

The Coal Authority does not record the site as being in with a coal mining reporting area.

4.5. RADON RISK POTENTIAL

The Envirocheck report indicates the site is situated in an area where less than 1% of homes are above the "Action Level" and that the BGS reports that full radon protective measures are not necessary in the construction of new dwellings or extensions.

4.6. PRELIMINARY GEOTECHNICAL ASSESSMENT

Based on the desk-study information, the following geotechnical assessment has been made:

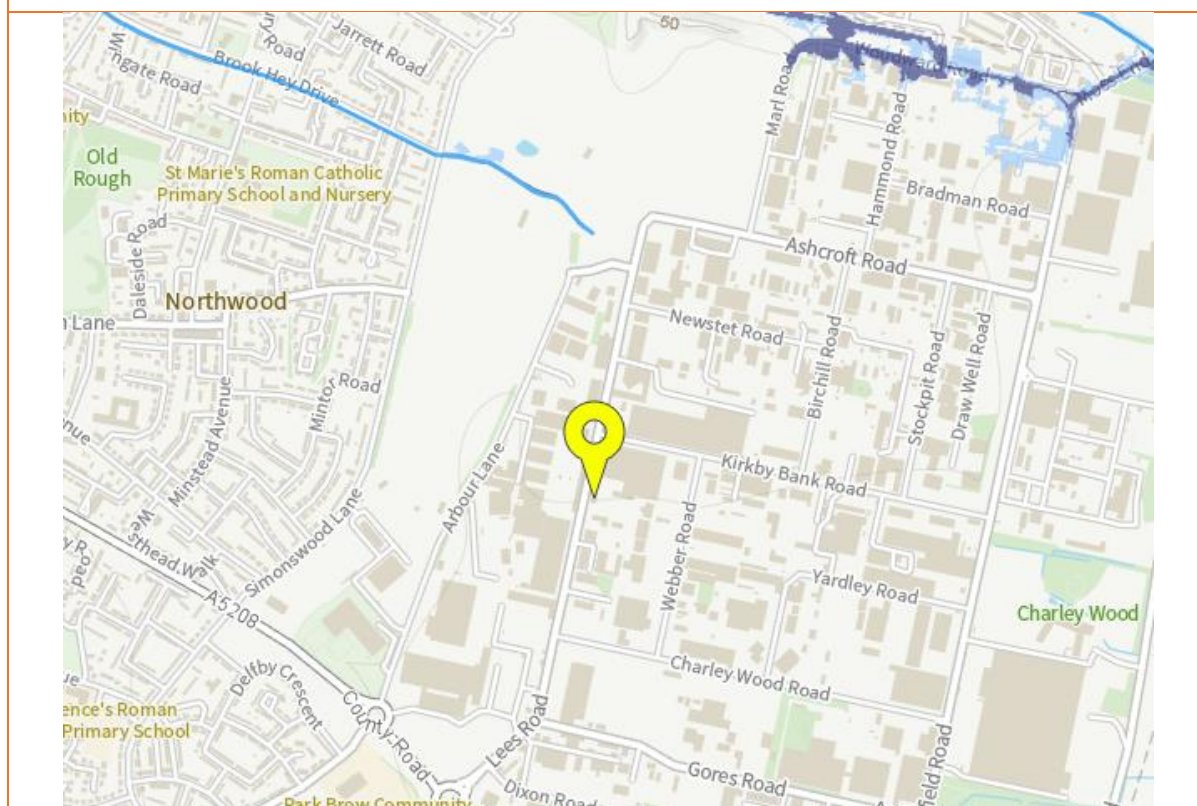


- ✚ Borehole data shows varying thicknesses of Made Ground across the surrounding area and given the history of the site, deep Made Ground should be anticipated.
- ✚ The existing office building in the east of the site will require demolition, with all relict foundations grubbing out, prior to the construction of the proposed development.
- ✚ A dense network of services is present on the site, including decommissioned in-situ connections that will require grubbing out.
- ✚ A gas governor is present in the north west of the site and a medium pressure gas main enters the site from Lees Road. This feature may preclude the adoption of piled foundations/VSC treatment.

4.7. HYDROLOGY

The site is predominantly located within a currently defined "Flood Risk Zone 1"; defined as land assessed as having less than 1 in 1,000 annual probability of river or sea flooding (< 0.1%), and as such is considered to be unaffected by river flooding. In addition, the Envirocheck report states there is a limited potential for groundwater flooding to occur at the site. The Environment Agency (EA) Flood Risk Map for the site is presented as Figure 4.1.

FIGURE 4.1 EA FLOOD RISK MAP



Source - <https://flood-map-for-planning.service.gov.uk/>

4.8. INDUSTRIAL LAND USES

The site has been part of an industrial park since circa pre-1955 and was formerly occupied by a canning factory and automotive garage. Nearby current / recent potentially contaminative industrial land uses within 100 m of the site are summarised in Table 4.4.



TABLE 4.4 SUMMARY OF CURRENT INDUSTRIAL LAND USES

SURROUNDING FEATURE	DISTANCE	DIRECTION
Vehicle Repair, Testing and Servicing	13 m	Southeast
Tanks	30 – 40 m	West
Gas Governor	87 m	South

4.9. SENSITIVE LAND USES

No environmentally sensitive land uses have been identified within 250 m of the site.

4.10. SITE SENSITIVITY ASSESSMENT

The site is assessed to be located within a “Moderate / High” sensitivity setting as discussed within Table 4.9.

TABLE 4.5 SITE SENSITIVITY ASSESSMENT

SENSITIVITY PROFILE	DISCUSSION	RATING
Groundwater Source Protection Zone or Drinking Water Safeguard Zone	The site is located within a SPZ 3 (Total Catchment) Groundwater Source Protection Zone.	High
Distance to the Closest Groundwater Abstraction Point	There are no active groundwater, surface water or potable water abstractions within 250 m of the site. The closest active abstraction point is a groundwater abstraction borehole located 361 m west at Liverpool Football Club & Athletic Grounds Ltd, used for spray irrigation.	Moderate
Aquifer Classification in Superficial Drift Deposits	Secondary A aquifer	Moderate
Aquifer Classification in Bedrock	Principal aquifer, overlain by aeolian sands. Borehole data in the surrounding area indicates clayey soil bands in excess of 1.0 m thick that have the potential to act as a baffle.	High
Is the Site Underlain by Low-Permeability Drift to Depths in Excess of 10 m?	Boreholes within 250 m of the site suggest rockhead (sandstone and mudstone) may be present at circa 5-10 m bgl. Geological mapping indicates the site is underlain by aeolian Shirdley Hill Sands which would likely be highly permeable. Sand deposits may facilitate the vertical migration of mobile phase contaminants towards the underlying Principal bedrock aquifer.	High
Is the Site Located Within 50 m of a Surface Watercourse?	No surface watercourse is located within 50 m of the site.	Low



Huyton Asphalt, Lees Road, Knowsley Industrial Park

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SENSITIVITY PROFILE	DISCUSSION	RATING
Sensitive Land Uses	The site is in an industrial setting.	Low
OVERALL SITE ENVIRONMENTAL SENSITIVITY		Moderate / High



5. CONSULTATIONS

5.1. CONTAMINATED LAND OFFICER

E3P contacted the environmental health department at Oldham Council who have been unable to respond within the reporting timescales. Upon receipt of the search information, E3P will issue any pertinent information and/or use the information to inform the development of any intrusive investigation proposals.

5.2. LANDFILL SITES AND WASTE TREATMENT SITES

There are no active or historical landfill sites located within 250 m of the site boundary.

There are four historical waste sites located within 250 m, the closest being 26 m south of the site for recycling of tyres/plastics (2015).

There is a waste license registered to the site, for a physical treatment facility, which expired in 2003.

5.3. REGULATORY DATABASE

The information summarised in Table 5.1 has been obtained from a commercially available environmental database. The summary table only includes records from within 250 m of the subject site and not otherwise detailed in the report.

TABLE 5.1 SUMMARY OF ENVIRONMENTAL DATA

RECORD	ENTRIES WITHIN 250 m	DETAILS
Contaminated Land Register Entries and Notices	0	None Identified
Authorised Industrial Processes (IPC/IPPC/LAPPC)	6	IPC 96 m South East – Igm International Ltd – Manufacture and use of organic chemicals – Issued 09/07/1999, now revoked. 173 m East –Rentokil Ltd – Manufacture and use of organic chemicals – Issued 24/11/1998, now superseded. 199 m East –Rentokil Ltd – Pesticide production – Issued 24/11/1998, now superseded. LAPPC 154 m North – Orion Paints – Part B License for printing (revoked) – Enforcement Notified 1994 186 m South West – First Choice Concrete – Part B License for use of bulk cement (current) – No Enforcements notified



RECORD	ENTRIES WITHIN 250 m	DETAILS
		232 m South – North West Fencing – Part B License for use of bulk cement (revoked) – No Enforcements Notified
Fuel Stations Entries	0	None Identified
Licensed Radioactive Substances	0	None Identified
Discharge Consents	0	None Identified
Pollution Incidents	4	53 m East – Pollutant: Specific Waste Materials – Land and Air Impact: Category 3 (Minor) – 02/10/2001 93 m North – Pollutant: Inorganic Chemicals/Products – Air Impact: Category 3 (Minor) – 03/05/2001 201 m East – Pollutant: Specific Waste Materials – Land and Air Impact: Category 3 (Minor) – 10/04/2003 224 m West – Pollutant: Inert Materials and Wastes – Land Impact: Category 3 (Minor) – 09/12/2002
Consents Issued Under the Planning (Hazardous Substances) Act 1990	3	24 m North West - Henry Diapers - Application for the Storage of Category 2 (toxics), Category 3 (oxidising) And Category 6 (flammable) Substances - No Enforcement Notified 140 m South East - New Alta Gas Ltd - No Enforcement Notified 141 m East – Rentokil Initial PLC -Deemed consent for the storage of LPG - No Enforcement Notified
Control of Major Accident Hazard (COMAH) Sites	2	Historical NIHHS (on-site) - Mersey Gas, Orchard Works, Webber Road, Knowsley Industrial Park North, Liverpool, LS33 7SW Historical NIHHS 240 m east - Alta Gas Plc, Orchard Works, Webber Road, Knowsley Ind Park North, Liverpool, L33 7SW

5.1. UNEXPLODED ORDNANCE

The regional unexploded bomb risk map from Zetica (2014) indicates that the site is in an area at low risk from possible unexploded ordnance (UXO) resulting from the Second World War. However, a Luftwaffe target is identified to the east of the site, and it is known that the site historically formed part of a military munitions factory.

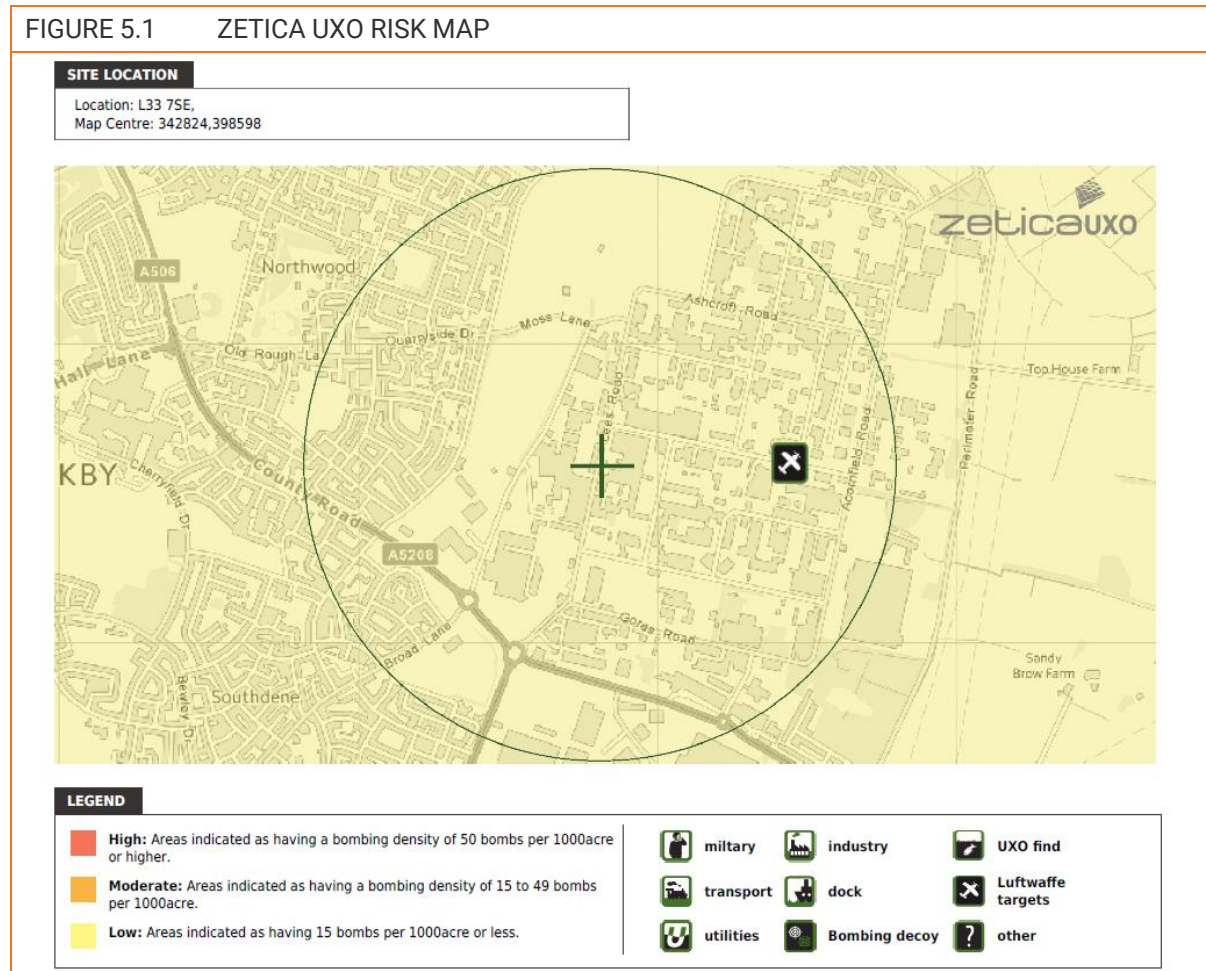


Given the absence of mapping during war time and the post war mapping showing the site and surrounding area to have been completely redeveloped, it is unknown if bombing or potential explosion may have occurred (albeit not reported). Furthermore, there exists a possibility of on-site disposal/burial of shells/ammunition, however remote.

It may therefore be prudent to commission a specialist preliminary UXO risk assessment to thoroughly assess the risk.

The Zetica UXO Risk Map is presented as Figure 5.1.

FIGURE 5.1 ZETICA UXO RISK MAP



Source - <https://zeticauxo.com/downloads-and-resources/risk-maps/>



5.2. INITIAL CONCEPTUAL SITE MODEL

In accordance with EA LCRM (2019) and BSI 10175 (Code of Practice for Investigation of Potentially Contaminated Land), E3P has developed an initial conceptual site model (CSM) to identify potential contamination sources, migration pathways and receptors within the study area. This is summarised within Table 5.1.

ON-SITE SOURCES OF CONTAMINATION

The following potential on-site sources of contamination have been identified:

- ✳ Made Ground associated with several phases of development including part of larger munitions factory, canning factory, garage etc and its location in a large area of BGS mapped Made Ground – Heavy metals, Polycyclic Aromatic Hydrocarbons (PAHs), and Asbestos Containing Material (ACM), ground gas (carbon dioxide and methane)
- ✳ By-products of ammunition manufacturing - tar residues/coal tars, boiler ash, flue dust and clinker, oxides, oils, along with toxic explosive compounds of nitro glycerine, nitroguanidine and Trinitrotoluene (TNT)
- ✳ Electrical substation – Poly Chlorinated Biphenyls (PCBs)
- ✳ Garage and potential fuel / lubricant storage – Total Petroleum Hydrocarbons (TPHs), Semi/Volatile Organic Compounds (S/VOCs), BTEX compounds Waste ACM Storage in the north east of site.

OFF-SITE SOURCES OF CONTAMINATION

The following potential off-site source of contamination have been identified:

- ✳ Made Ground associated with historical land uses and ammunition manufacturing – ground gas (CO₂ / CH₄)
- ✳ Industrial land uses (including tanks within 100 m of the site) – mobile contaminants e.g. PAHs, TPHs, VOCs



5.3. CONCEPTUAL SITE MODEL

Following the completion of the intrusive site investigation, chemical analysis and risk assessment, the conceptual model shown in Table 8.14 has been prepared for the site.

TABLE 5.1 CONCEPTUAL MODEL

POLLUTANT LINKAGE	CONTAMINANT (SOURCE)	PATHWAY	RECEPTOR	PROBABILITY	CURRENT RISK	RESIDUAL RISK AFTER MITIGATION
PL1 PL2	Heavy Metals, non-volatile PAH, PCBs (Made Ground)	Dermal contact. Dermal contact and ingestion.	Future site users. Construction workers. Off-site receptors.	Likely	High	LOW
Discussion: Made Ground deposits are present at the site and are associated with the former military/munitions manufacturing and construction of the Knowsley Industrial Park and the demolition of historical buildings. Made Ground is a potential source of heavy metals and non-volatile PAHs which may pose risk to human health (future site users, construction workers) via dermal contact and soil ingestion pathways. Made Ground may also include by-products of associated processes, such as possible tar residues/coal tars, boiler ash, flue dust and clinker. The sites past usage as an ammunition manufacturing facility may have added contaminants that may include oxides and oils, along with toxic explosive compounds of: nitro glycerine, nitroguanidine and Trinitrotoluene (TNT). PCBs are anticipated to be present on site, albeit highly localised, associated with an electricity substation present in the south, constructed pre 2000. PCBs are generally of very low mobility and as such any impact is likely to be highly localised. A short term risk is potentially posed to construction workers though dermal contact and soil ingestion and these risk may be mitigated though the use of appropriate PPE (e.g. gloves) and through the maintenance of good personal hygiene (e.g. washing hands before eating). Future site usage will remain industrial and will therefore remain covered by hardstanding thereby removing the exposure pathway.						



POLLUTANT LINKAGE	CONTAMINANT (SOURCE)	PATHWAY	RECEPTOR	PROBABILITY	CURRENT RISK	RESIDUAL RISK AFTER MITIGATION
Recommendation: Intrusive ground investigation to determine the presence and extent of Made Ground and to allow human health risk assessment for commercial end-use. Risks to end users are significantly reduced where hardstanding will be present as there is no risk of direct contact. In soft landscaping areas, a 300 mm cover system will likely be required to mitigate the risk to site users and maintenance workers.						
PL3	ACM (Existing Structures / Made Ground / ACM waste storage)	Inhalation of dust.	Future site users. Buildings. Off-site land users.	Likely	High	LOW
Assessment: Storage of waste ACM was observed in the northeast corner of the site, likely removed from former on-site structures prior to demolition. ACM roof panels were also observed on the garage building in the north of the site. Due to the age of the historical buildings on site, asbestos may have been used within the building fabric. Any Made Ground deposits associated with the demolition of the former buildings may therefore contain loose asbestos fibres and even ACM fragments.						
Recommendation: Intrusive investigation should include asbestos screen and quantification. Risks to end users are significantly reduced where hardstanding will be present as there is no risk of direct contact. In soft landscaping areas, a suitable cover system will likely be required to mitigate the risk to site users and maintenance workers.						
PL4	Volatile hydrocarbons, solvents, antifreeze, paint (Made Ground, Garage)	Inhalation of vapours. Migration through permeable strata and preferential pathways.	Future site users. Construction workers. Off-site receptors.	Likely	Moderate	To be determined



POLLUTANT LINKAGE	CONTAMINANT (SOURCE)	PATHWAY	RECEPTOR	PROBABILITY	CURRENT RISK	RESIDUAL RISK AFTER MITIGATION
Assessment: Past use as a garage suggests there may have been fuels storage tanks on site which may act as a potential source of hydrocarbon compounds/volatile compounds. Leaks and spills may have resulted in contamination of underlying soils if tanks were not appropriately banded/stored. Other compounds associated with a garage including solvents, antifreeze and paints may be present on site. Hydrocarbon compounds may also be present in any partial Made Ground deposits. Volatile VOCs and TPH compounds pose a potential risk to commercial end-users via volatilisation to indoor air. Recommendation: Intrusive investigation required including screening with a photo ionisation detector where visual / olfactory evidence of contamination is observed, and should also include gas monitoring. Any impacted soils around the garage or in the Made Ground will require delineation and removal off-site or placing in an area of future low sensitivity. Current hardstanding and garage structure already utilised as cover for potential hydrocarbon compound leakages.						
PL4 PL5	Methane, carbon dioxide (Made Ground)	Inhalation of gas. Migration through permeable strata and preferential pathways. Explosion in confined spaces.	Future site users. Construction workers. Buildings. Off-site land users.	Low likelihood	Moderate	LOW
Assessment: Anticipated Made Ground deposits may act as a potential source of carbon dioxide and methane which have associated asphyxiation and explosive risks. Recommendation: Intrusive ground investigation with ground gas monitoring. Should a ground gas risk be identified to end users, the risks can be mitigated through the adoption of suitable control measures within the building construction using guidance presented within CIRIA 665 (Assessing Risk Posed by Hazardous Ground Gases to Buildings) and BS8485 (Code of Practice for the Characterisation and Remediation from Ground Gas in Affected Developments). Allowance for CS2 protection measures recommended as a precaution.						



POLLUTANT LINKAGE	CONTAMINANT (SOURCE)	PATHWAY	RECEPTOR	PROBABILITY	CURRENT RISK	RESIDUAL RISK AFTER MITIGATION
PL5	Mobile contaminants such as metals, PAHs, hydrocarbons, volatile compounds (Made Ground, garage)	Surface runoff. Migration through permeable strata and preferential pathways. Perched waters migration.	Groundwater (Principal and Secondary A aquifer).	Likely	Moderate/High	LOW
Assessment: Potential sources of mobile contamination have been identified on site. Leakages/spillages of mobile contamination are considered possible from the former on-site garage and surrounding modern industrial use with vehicles and storage tanks. The Made Ground beneath the site may therefore contain residual hydrocarbon and volatile organic compound impact. There is the potential for vertical migration of mobile contaminants through the underlying granular drift to the Principal Aquifer within the bedrock. The site is located within a SPZ 3 (Total Catchment) Groundwater Source Protection Zone, however, there are no active groundwater, surface water or potable water abstractions within 250 m of the site. The closest active abstraction point is a groundwater abstraction borehole located 361 m west at Liverpool Football Club & Athletic Grounds Ltd, used for spray irrigation (reduced sensitivity). There are no surface water courses within close proximity that may be influenced by lateral migration of contamination from the subject site. Recommendation: Sampling of groundwater and surface water required as part of an intrusive investigation. This will inform a detailed controlled waters risk assessment.						
PL6	Sulphate (potential ash within Made Ground)	Sulphate attack on concrete.	Building structure.	Likely	Moderate/Low	LOW
Assessment: There is potential for reduced (acidic) pH and elevated sulphate within Made Ground deposits, which may result in corrosion of buried concrete within the proposed development.						



POLLUTANT LINKAGE	CONTAMINANT (SOURCE)	PATHWAY	RECEPTOR	PROBABILITY	CURRENT RISK	RESIDUAL RISK AFTER MITIGATION
Recommendation: Assessment must be undertaken to confirm the levels of pH and sulphate within the underlying strata and in particular any Made Ground deposits so that a concrete classification can be determined.						
PL7	Organic contaminants such as PAH / TPH / VOC (Made Ground, garage)	Ingestion of tainted water supply.	Future site users. Water pipes.	Low likelihood	Moderate	LOW
Assessment: Made Ground is anticipated to depths >2.0 m on the site based on the site history and available geological resources. Sources of PAH / TPH / VOC contamination have been identified on the site, and as such there is potential for corrosive contamination presented at water pipeline depth.						
Recommendation: Allowance for barrier pipes recommended. Intrusive investigation required to confirm the above assessment.						
PL8	Phytotoxic contaminants (Made Ground)	Direct Contact (plant uptake).	Flora.	Likely	Low	LOW
Assessment: Likely probability as contamination considered possible, which may be taken up by flora in soft landscaping/gardens.						
Recommendation: Intrusive investigation with chemical analysis will be required.						

Notes:

Main exposure pathways: PL1 = soil ingestion, PL2 = dermal contact and ingestion, PL3 = dust inhalation; PL4 = Vapour/Gas Inhalation; PL5 = Vertical / Lateral Migration; PL6 = Corrosion of concrete; PL7=Tainting of water supply; PL8 = Uptake by plants;



6. CONCLUSIONS AND RECOMMENDATIONS

6.1. SITE SUMMARY

Current Site Use Site Sensitivity	The site is located within the Knowsley Industrial Estate. There are no sensitive land uses recorded at the site or within the immediate locality which may influence a continued industrial land use. the site is however located within a SPZ3 – Total Catchment
Current Site Use	The subject site is a roughly rectangular shaped parcel of land located to the east of Lees Road and is currently vacant/disused. The site is divided into two sectors by wire mesh fencing. The northern sector is occupied by a former garage, with the southern sector occupied by an office building and storage yard. The external area is used for storage of materials including paving slabs, stones and road ramps. Old tyres are also stored to the rear (east) of the garage building. Rectict floor slabs are present in the centre of the site, and in the north west, where structures have been demolished. Demolition rubble is still present/exposed at the ground surface, containing inclusions of brick, concrete, plastic and rebar. Decommissioned utility connections remain in-situ. Bunds of presumed demolition material were present along the western half of the southern boundary, which had become overgrown with self seeded vegetation.
Historical Site Use	A review of the pertinent Ordnance Survey mapping and Envirocheck reports suggests the site was occupied by undeveloped agricultural fields until pre 1940. From 1940-1947 the site was occupied by a Royal Ordnance (munitions) Factory and ancillary structures. The site was included as part of the larger Knowsley Industrial Park development, and a canning factory was built on the site Pre 1960. The site remained relatively unchanged until Pre 1968 when the canning factory was expanded. The site remained largely unchanged until Pre 2018 when the canning factory was demolished. The remaining buildings were used commercially as office and a garage s until Pre 2021.



6.2. CONTAMINATED LAND ASSESSMENT

Human Health	The following potential on-site sources of contamination have been identified: ✳ Made Ground associated with several phases of development including part of larger munitions factory, canning factory, garage etc and its location in a large area of BGS mapped Made Ground – Heavy metals, Polycyclic Aromatic Hydrocarbons (PAHs), and Asbestos Containing Material (ACM), ground gas (carbon dioxide and methane) ✳ By-products of ammunition manufacturing - tar residues/coal tars, boiler ash, flue dust and clinker, oxides, oils, along with toxic explosive compounds of nitroglycerine, nitroguanidine and Trinitrotoluene (TNT) ✳ Electrical substation – Poly Chlorinated Biphenyls (PCBs) ✳ Garage and potential fuel / lubricant storage – Total Petroleum Hydrocarbons (TPHs), Semi/Volatile Organic Compounds (S/VOCs), BTEX compounds Risks from soil contamination to construction workers are currently considered moderate given the industrial history of the site, however, the risks to future commercial site users are considerably reduced given the likelihood that the site will be covered by hardstanding (no pollutant linkage).
Controlled Waters	Potential sources of mobile contamination have been identified on site. Leakages/spillages of mobile contamination are considered possible from the former on-site garage and surrounding modern industrial use with vehicles and storage tanks. The Made Ground beneath the site may therefore contain residual hydrocarbon and volatile organic compound impact. There is the potential for vertical migration of mobile contaminants through the underlying granular drift to the Principal Aquifer within the bedrock. The site is located within a SPZ 3 (Total Catchment), however, there are no active groundwater, surface water or potable water abstractions within 250 m of the site. The closest active abstraction point is a groundwater abstraction borehole located 361 m west at Liverpool Football Club & Athletic Grounds Ltd, used for spray irrigation (reduced sensitivity). There are no surface water courses within close proximity that may be influenced by lateral migration of contamination from the subject site. The overall risk to controlled waters is considered to be moderate.
Ground Gas	There are no landfills or significant infilled features identified within 250 m of the site. However, the site is within an area of mapped artificial ground and deep Made Ground is anticipated which may be a source of ground gas.



	Risks from ground gas are considered low given the reduced exposure and sensitivity of the receptor.
Potable Water	Made Ground is anticipated to depths >2.0 m on the site based on the site history and available geological resources. Sources of PAH / TPH / VOC contamination have been identified on the site, and as such there is potential for corrosive contamination presented at water pipeline depth.

6.3. COAL MINING

Coal Mining	A review of BGS and Coal Authority mapping and reports suggest the site is not located within a coal mining reporting area. The risk from coal mining related subsidence is therefore negligible. will pose a low risk to any future development with regards to historical mine workings.
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6.4. GEOTECHNICAL ASSESSMENT

Geological	BGS records suggest the site is underlain by artificial (made ground), superficial aeolian sands, and sandstone bedrock. Deep Made Ground should therefore be anticipated.
Civil and Structural	Relict sub-structures and services associated with historical development will require excavation in full to facilitate the construction of the proposed plans. A medium pressure gas main enters the north west of the site. Construction in close proximity will require appropriate mitigation/consideration to ensure protection of the service. Piling/VSC may not be feasible.
Abnormal Foundations	Should the anticipated Made Ground deposits exceed 2.5 m in depth, there may be a requirement for engineered foundations.

END OF REPORT



APPENDIX I

LIMITATIONS

1. This report and its findings should be considered in relation to the terms of reference and objectives agreed between E3P and the client as indicated in Section 1.3.
2. For the work, reliance has been placed on publicly available data obtained from the sources identified. The information is not necessarily exhaustive and further information relevant to the site may be available from other sources. When using the information it has been assumed it is correct. No attempt has been made to verify the information.
3. This report has been produced in accordance with current UK policy and legislative requirements for land and groundwater contamination which are enforced by the local authority and the Environment Agency. Liabilities associated with land contamination are complex and requires advice from legal professionals.
4. During the site walkover, reasonable effort has been made to obtain an overview of the site conditions. However, during the site walkover, no attempt has been made to enter areas of the site that are unsafe or present a risk to health and safety, are locked, barricaded, overgrown, or the location of the area has not been made known or accessible.
5. Access considerations, the presence of services and the activities being carried out on the site limited the locations where sampling locations could be installed and the techniques that could be used.
6. Site sensitivity assessments have been made based on available information at the time of writing and are ultimately for the decision of the regulatory authorities.
7. Where mention has been made to the identification of Japanese Knotweed and other invasive plant species and asbestos or asbestos-containing materials, this is for indicative purposes only and do not constitute or replace full and proper surveys.
8. The executive summary, conclusions and recommendations sections of the report provide an overview and guidance only and should not be specifically relied upon without considering the context of the report in full.
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10. New information, revised practices or changes in legislation may necessitate the re-interpretation of the report, in whole or in part.



APPENDIX II

GLOSSARY

TERMS

ACM	Asbestos-containing material	MMP	Materials management plan
ADS	Acoustic design statement	ND	Not detected
AST	Above-ground storage tank	NDP	Nuclear density probe
BGS	British Geological Survey	NMP	Noise management plan
BSI	British Standards Institute	NPSE	Noise policy statement for England
BTEX	Benzene, toluene, ethylbenzene, xylenes	NR	Not recorded
CA	Coal Authority	PAH	Polycyclic aromatic hydrocarbon
CBR	California bearing ratio	PCB	Polychlorinated biphenyl
CIEH	Chartered Institute of Environmental Health	PI	Plasticity index
CIRIA	Construction Industry Research Association	PID	Photo ionisation detector
CLEA	Contaminated land exposure assessment	POS	Public open space
CML	Council of Mortgage Lenders	PPE	Personnel protective equipment
CoC	Contaminants of concern	ProPG	Professional practice guidance
CSM	Conceptual site model	QA	Quality assurance
DNAPL	Dense non-aqueous phase liquid (chlorinated solvents, PCB)	SGV	Soil guideline value
DWS	Drinking water standard	SPH	Separate-phase hydrocarbon
EA	Environment Agency	SPT	Standard penetration test
EQS	Environmental quality standard	SVOC	Semi-volatile organic compound
FFL	Finished floor level	TPH	Total and speciated petroleum hydrocarbon
GAC	General assessment criteria	TPH CWG	Total Petroleum Hydrocarbon (Criteria Working Group)
GL	Ground level	UKWIR	United Kingdom Water Infrastructure Risk
GSV	Gas screening value	UST	Underground storage tank
HCV	Health criteria value	VCC	Vibro-concrete column
ICSM	Initial conceptual site model	VOC	Volatile organic compound
LEL	Lower explosive limit	VRSC	Vibro-replacement stone columns
LMRL	Lower method reporting limit	VSC	Vibro-stone columns
LNAPL	Light non-aqueous phase liquid (petrol, diesel, kerosene)	WHO	World Health Organisation
MCV	Moisture condition value	WRAP	Waste and Resources Action Programme



Huyton Asphalt, Lees Road, Knowsley Industrial Park

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September 2022

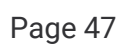
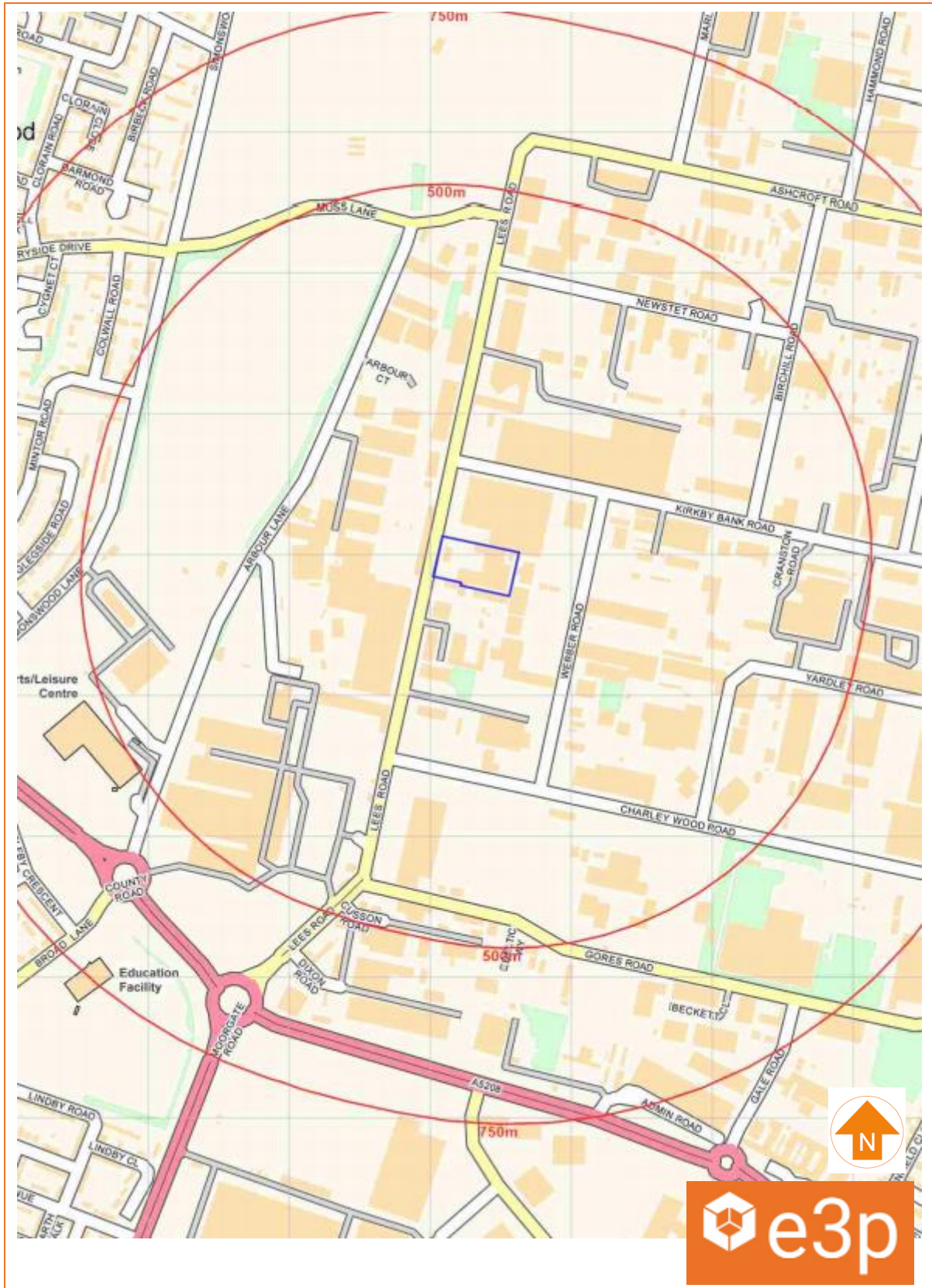
MIBK	Methyl isobutyl ketone	WTE	Water table elevation
m	Metres	ppm	Parts per million
km	Kilometres	mg/m³	Milligram per metre cubed
% v/v	Percent volume in air	m bgl bgl	Metres below ground level
mb	Millibars (atmospheric pressure)	m bcl	Metre below cover level
l/hr	Litres per hour	mAOD	Metres above ordnance datum (sea level)
µg/l	Micrograms per litre (parts per billion)	kN/m²	Kilonewtons per metre squared
ppb	Parts per billion	µm	Micrometre
mg/kg	Milligrams per kilogram (parts per million)	SSRT	Site Specific Remediation Target
PSD	Particle Size Distribution	DD	Dry Density
CL:AIRE	Contaminated Land: Applications in Real Environments	Mc	Moisture Content
ρ	Bulk Density	GPR	Ground Penetrating Radar
NDP	Nuclear Density Probe	FFL	Finished Floor Level
LEL	Lower Explosive Limit	UKWIR	UK Water Industry Research
CIRIA	Construction Industry Research and Information Association	LOD	Limit of Detection

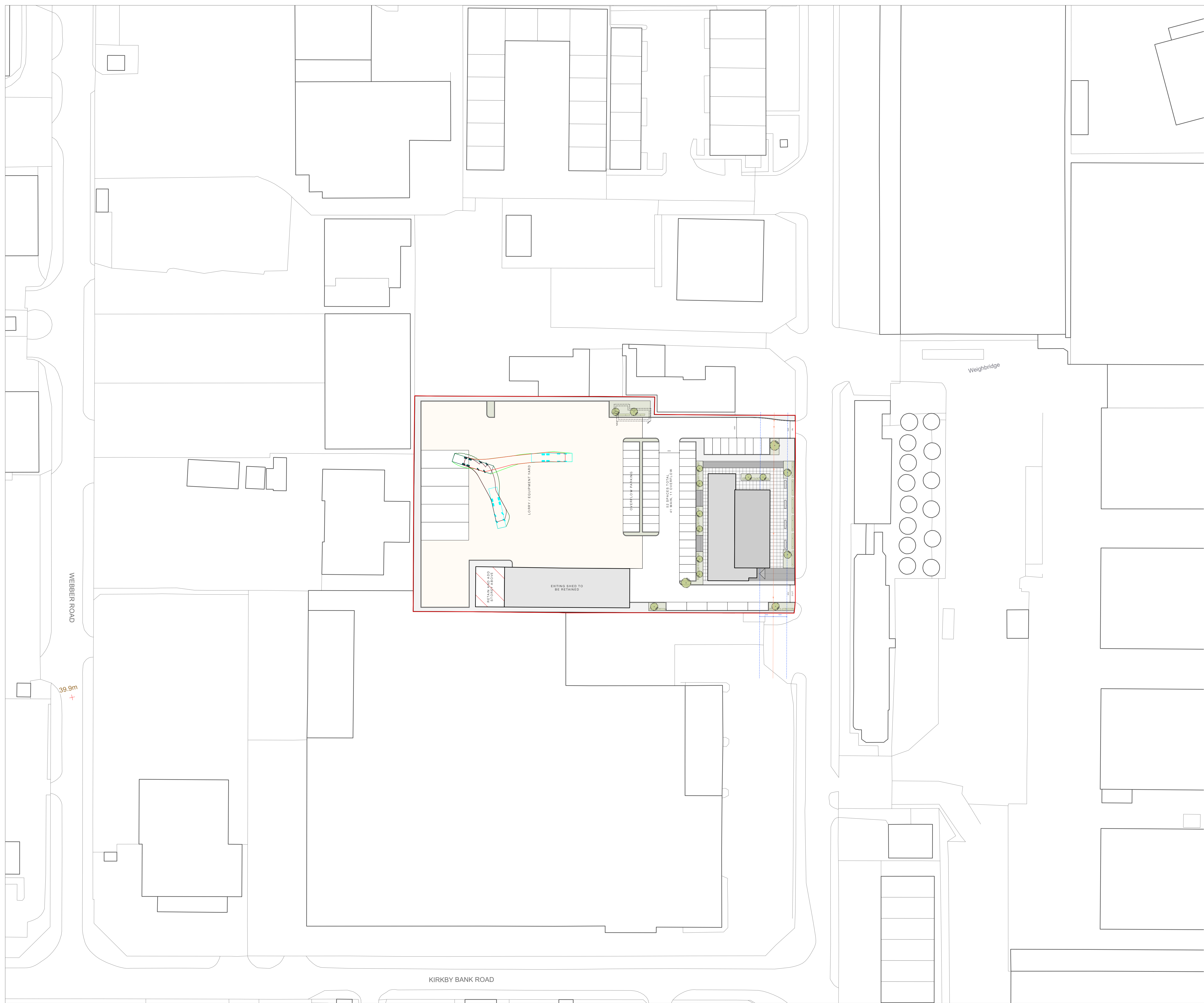


APPENDIX III

DRAWINGS

DRAWING 15-277-001 – SITE LOCATION PLAN





REVISION NOTES		
Revision	Date	Description
A	12/05/2022	Status update to construction and adjustment to border. General design updates.

Additional Notes
Do not scale from this drawing.
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All dimensions on this drawing are shown in millimeters unless stated otherwise.
All dimensions and levels on this drawing are to be checked by the contractor and any discrepancies must be reported back to the architect prior to the commencement of works.
Drawings to be read in conjunction with all Architects Specifications.
Please refer to M+E drawings for all Mechanical and Electrical information.
Please refer to SE Drawings for all Structural, Connection and Underground Details.

ISSUED FOR:

CONSTRUCTION

DK-Architects

26 Old Haymarket

Liverpool

L1 6ER

T 0151 231 1209

E mail@dk-architects.com

F 0151 227 2053

W www.dk-architects.com

Job:

Client:

Drawing Title:

Date:

Drawing no:

Scale:

Drawn:

1310

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Site Plan Proposed

09/02/22

102

revision: A

1:500 @ A1

TL





Historical Features

- Former Track (Pre 1867 - Pre 1960)
- Former Field Boundary (Pre 1867 - Pre 1960)
- Former Buildings (Pre 1960 - Pre 1968)
- Former Building Extension (Pre 1968 - Present)
- Former Road (Pre 1960 - Pre 1960)

Notes:

P1	REVB	27.10.2021	EB	JS
P1	REVA	25.10.2021	HM	GH
Phase	Issue	Date	Drawn	Checked

Client:

AJP

Job Title:

Lees Road,
Knowsley

Job No:

15-277

Drawing No:

003

Date:

26.10.2021

Scale:

NTS

Drawing Title:

Historical Features
Plan



Environmental Engineering
Partnership Ltd
Taylor Road, Trafford Park
Urmston, Manchester, M41 7JQ
Tel: 0161 707 9612
E-mail: info@e3p.co.uk
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Site Features Vegetation Utility Trench Scars Site Entrance Building Containing Electricity Substation Building Trailer & Cherry Picker Tyres Building Containing Gas Mains / Infrastructure Asbestos Waste Bin Storage Demolition Rubble Relict Floor Slabs Building Material Storage Mesh Fence	Notes:					Client: AJP	Job No: 15-277	Date: 26.10.2021	e3p Environmental Engineering Partnership Ltd Taylor Road, Trafford Park Urmston, Manchester, M41 7JQ Tel: 0161 707 9612 E-mail: info@e3p.co.uk Website: www.e3p.co.uk
							Drawing No: 004	Scale: NTS	
						Job Title: Lees Road, Knowsley	Drawing Title: Site Features Plan		
	P1 P1 Phase	REVB REVA Issue	26.10.2021 25.10.2021 Date	EB HM Drawn	JS GH Checked	The client must not amend any drawing, design or other intellectual property produced by E3P Ltd without permission in writing from E3P Ltd in advance of any amendments being made. In the event that such written permission is not obtained in advance of the amendments being made, E3P Ltd shall not be liable for any damage and/or losses occurring as a result of the amended drawing, design or intellectual property.			

APPENDIX IV

PHOTOGRAPHS

PLATE 1 ELECTRICITY SUBSTATION - BUILDING ON SOUTHERN BOUNDARY LOOKING SE



PLATE 2 BAGS CONTAINING ACM WASTE - NORTHEAST CORNER LOOKING NE



PLATE 3 TYRE WASTE - NORTHEAST CORNER LOOKING NE



PLATE 4 TYRE WASTE AND DEMOLITION RUBBLE - SOUTHEAST CORNER LOOKING SE



PLATE 5 VIEW NORTHWEST - ACM ON UPPER GARAGE, DEMOLITION RELATED MADE
GROUND MIDDLE LEFT OF PHOTO (GRASSY AREA)



APPENDIX V

HISTORICAL MAPS