



Preliminary Risk Assessment

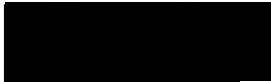
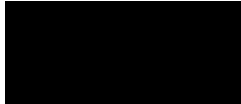
Hillington Park SPZ
Glasgow
Scotland, UK

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Date:
February 2014

Project or Issue Number:
UK19-19567

Contract No:	UK19-19567
Issue:	02
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Date:	February 2014

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Version Control Record				
Issue	Description of Status	Date	Reviewer Initials	Author Initials
A	Draft Issue to Client	16 th January 2014	DS	MS / EB
1	First Issue to Client	3 rd February 2014	DS	MS / EB
2	Second Issue to Client	4 th February 2014	DS	MS / EB

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Executive Summary

ENVIRON UK Limited (ENVIRON) has been instructed by Terence O'Rourke on behalf of MEPC plc to undertake a Preliminary Risk Assessment for Hillington Park, Glasgow, in the context of the framework of Environment Agency's Model Procedures for the Management of Land Contamination (CLR11).

Historically, the Hillington Park site was in agricultural use until the late 1930s when construction of the Hillington Industrial Estate commenced, and continued until the majority of the site had been developed by the mid-1950s. The site lies across two local authority areas: Renfrewshire and Glasgow City Councils. The site has been occupied by engineering works / factories, printing, tar works, transit depots and railway lines, chemical works, tube works, asbestos works etc. Historical mapping also indicates two potential areas of refuse deposition, whilst information provided by Renfrewshire Council and Glasgow Council identifies the presence of underground storage tanks. In addition, the north western corner of the site formed part of the airfield serving the former Renfrew Airport, which was variously used for military as well as commercial purposes from World War I until closure in the mid-1960s.

Currently, the 199-hectare estate is occupied by over 500 individual companies employing approximately 6,500 people. The activities are varied, but generally comprise commercial / light industrial activities including precision engineering; logistics; metal fabrication and warehousing, as well as vehicle repair / garage services; petrol and fuel retail; solvent based coating activities and printing.

Potentially contaminative activities in the area surrounding Hillington Park have historically included railway lines; brick works and associated quarry/extraction areas (potentially infilled); saw mills and industrial activities on land associated with the King George V Dock; the military and commercial use of the former Renfrew Airport; and former scrap yards. Current potentially contaminating activities in the surrounding area include an aggregate recycling centre; timber and waste management sites; industrial premises on Cardonald Park including the Trinity Mirror printing works; Diageo's Shieldhall whisky bottling plant; and a petrol filling station.

The site is not situated in a particularly sensitive location with respect to groundwater resources given the absence of known abstractions. The site is also considered to be situated in a location of relatively low sensitivity with respect to surface water resources due to the distance from the River Clyde, although surface water drains on-site and the culverted Mill Burn are potentially vulnerable.

Previous site investigations have been undertaken on Hillington Park, including a Phase II investigation by ENVIRON in November 2000 across a substantial section of Hillington Industrial Estate. The results of these have been generally consistent, with localised contamination of metals and hydrocarbons largely confined to upper Made Ground and shallow soils, and localised contamination of shallow groundwater suggesting that sources are neither significant nor widespread. Natural strata have typically been unaffected, and where elevated soil gas levels have been encountered, these have been attributed to natural organic rich alluvial deposits, rather than infilling or waste deposition.

Whilst the area of the site falling within the boundary of Renfrewshire Council has been included within the Council's Contaminated Land Strategy under Part 2a of the Environmental Protection Act 1990, the site is not considered a high priority and no premises

within the site have been determined as Contaminated Land. Renfrewshire Council and Glasgow City Council will, unless indicated otherwise, address the potential for on-site contamination through the planning process as individual plots come forward for development. Developers will therefore be required to demonstrate that the site is/will be suitable for its future intended use.

In summary, whilst the site has a potential for contamination arising from historic and recent industrial uses, the site's environmental sensitivity is considered to be relatively low and site investigation results obtained by ENVIRON and others have not indicated levels of contamination or soil gas likely to pose a significant constraint to future development in those areas which have been subject to intrusive investigation. However, due to the size of the site and the incomplete records of historical uses, the potential for undiscovered areas of contamination to be present remains, particularly in parts of the site either not known to have been investigated, or for which no reports are currently available.

Of the area covered by the SPZ, the part of the site referred to as M8 Frontage (east) is considered to have a lower potential for contamination when compared to the remainder of the site, having remained undeveloped. It is therefore proposed that, apart from the need to undertake additional gas monitoring to identify suitable gas protection measures, this area does not require further assessment with respect to contaminated land.

1 Introduction

1.1 Background

ENVIRON UK Limited (ENVIRON) has been instructed by Terence O'Rourke Ltd on behalf of MEPC plc to undertake a Preliminary Risk Assessment for Hillington Park, Glasgow (the 'subject site'). This assessment has been completed in the context of the Environment Agency's Model Procedures for the Management of Land Contamination (CLR 11).

ENVIRON understands that MEPC is the majority landowner at Hillington Park and are in the process of preparing a Masterplan for the area known as Project Hillington. The aim of the Masterplan is to establish a framework for the further development of the Hillington Park to increase the level of employment land and introduce a greater range of ancillary and complementary uses.

Alongside Project Hillington, MEPC is in discussion with the local authorities responsible for the area of Hillington Park; Renfrewshire Council and Glasgow City Council, to establish a Simplified Planning Zone (SPZ) for Hillington Park. Terence O'Rourke Ltd has been instructed by MEPC to help coordinate the input into the SPZ process.

A feasibility study carried out by MEPC concluded that Hillington has the right ingredients for designation as an SPZ. In particular, the estate is strategically located on the western edge of Glasgow with excellent road and public transport connection. The estate is already home to over 500 companies employing 6,500 people and covers in total some 199 hectares.

1.2 Simplified Planning Zones

Simplified Planning Zones (SPZ's) are areas in which local planning authorities encourage development by granting planning permission for the types of development specified in the zone without the need for subsequent individual planning permissions.

The Hillington Park SPZ will simplify planning control to give greater flexibility for businesses to develop new premises and facilities or adapt existing premises, whilst maintaining a successful and diverse mix of employment generating uses. The SPZ is seen as a key marketing tool in encouraging new investment in the estate helping to retain existing businesses, speeding up decision making and giving certainty over permitted development parameters.

At present Hillington Park offers in the region of 432,000 m² of existing floor-space in total (420,000 m² of which is employment floor-space) and existing planning consent for circa 53,000 m² of additional employment land. The proposal at this stage in terms of development is to increase the level of employment land at the park by 10-15%, including a greater range of ancillary or complementary uses, such as small-scale retail and improved leisure facilities.

Hillington Park is situated within the boundaries of both Renfrewshire Council and Glasgow City Council.

1.3 Previous Reports

On behalf of MEPC, URS Corporation Ltd., undertook a site investigation of the M8 Frontage area between Hillington Industrial estate and the M8 motorway in 2007. In 2008 ENVIRON undertook a Phase I Environmental Review of 83 hectares (Ha) of the Hillington Industrial Estate on behalf of MEPC, although this excluded the former Rolls Royce factory area and

eastern and western parts of the Hillington Industrial Estate. In 2012, ENVIRON provided MEPC with a Phase I Environmental Assessment of a premises at 500 Hillington Road within the Hillington Industrial Park site.

1.4 Objectives

ENVIRON's overall approach for this Preliminary Risk Assessment was to assess the potential for ground contamination in order to identify potential environmental constraints with respect to the on-going use and future development of Hillington Park. Specifically, the aim of this technical assessment is to complete a preliminary risk assessment in the context of the framework of CLR11, by considering the potential for soil and groundwater contamination, from current and historical uses on and off-site, to assess potential risks to sensitive receptors such as site users and controlled waters.

In preparing this report reference to the following documents has been made:

- Model Procedures for the Management of Land Contamination (Contaminated Land Report, CLR 11), Environment Agency (September 2004);
- Guiding Principles for Land Contamination, Environment Agency (March 2010);
- Planning Advice Note (PAN) 33 - Development of Contaminated Land;
- Contaminated Land Strategy 2010 - 2015, Renfrewshire Council (May 2010); and
- Strategy for the Inspection of Contaminated Land in Glasgow, 3rd Edition, Glasgow City Council (2010).

1.5 Scope and Limitation

The scope of the Preliminary Risk Assessment has included the following:

- Examination of historical, recent and current Ordnance Survey plans to identify activities which might have led to contamination of soil or groundwater (for example, from manufacturing processes, from storage activities or waste disposal practices) both on the subject site and on adjacent sites;
- Examination of published records and plans on the shallow and deep geology and hydrogeology of the site to assess the vulnerability and sensitivity of groundwater and surface water resources to contamination, if present, and the possible direction of movement off site, if mobile;
- Search of a proprietary database of environmental permits, records and incidents at the site and surrounding area;
- Written enquiries of the two Local Authority Environmental Health Departments to obtain information on environmental conditions, incidents and known contamination risks and on the Local Authority's Contaminated Land Strategy; and
- Written enquiries of the Local Authorities' Petroleum Officers to determine if records exist of above ground or below ground licensed (petrol) storage facilities.

No site walk-over inspection or sampling or analysis of soils, waters or other materials has been carried out as part of the Preliminary Risk Assessment.

2 Site Description & Setting

2.1 Site Location

The site covers approximately 199 hectares incorporating Hillington Industrial Estate, which is situated approximately 7 miles west of Glasgow City Centre adjacent to J26 of the M8 motorway. The National Grid Reference (NGR) for the approximate centre of the site is 251850, 665536 and a site location plan is presented as Figure 1 in Annex A.

2.2 Site Setting

Surrounding uses are as follows:

- North: The M8 motorway and Junction 26 beyond which are residential properties;
- East: The M8 motorway to the north east, with a Tarmac aggregate recycling centre and industrial and warehouse units occupied by Volvo Truck & Bus, Accident Exchange, Unipart Automotive and Trinity Mirror (printing) to the east and south east on Cardonald Park. Beyond these lies the continuation of the M8 motorway and residential properties;
- South: A railway line beyond which lies the Penilee and Hillington residential areas; and
- West: Undeveloped land together with agricultural fields and a cemetery at North Arkleston.

The nearest residential properties lie within 50m, to the immediate south of Hillington Park and to the immediate north of the M8 motorway.

2.3 Site Description

Hillington Park is an extensive mixed-use industrial business park, which extends to approximately 432,000 m² of office and industrial accommodation plus a range of other uses. The park is home to over 500 organisations with over 6,500 employees directly engaged in manufacturing, distribution, technology and the service sectors.

The site is bisected by Hillingdon Road which runs along a north/south axis, subdividing the site into a larger western area which occupies approximately two-thirds of the site and a smaller eastern area occupying the remaining one-third.

The office, retail and light industrial units range in age from the late 1930s to the early 2000s, as well as several vacant development sites and the former Rolls Royce factory for which a master plan, Project Hillington, is currently being developed. The buildings are of varying sizes but largely comprise office space to the front with warehousing/production to the rear. The buildings occupy the majority of the site area, whilst the remaining areas comprise tarmac and concrete hardstanding (car parking and loading/unloading areas), interspersed with development plots including a large development plot located along the northern boundary of the site referred to as the M8 Frontage as well as the former Rolls Royce factory.

The topography of the site is relatively flat with some evidence of levelling having occurred in areas.

Figure 2 in Annex A shows the site layout.

3 Historical & Regulatory Information

3.1 Map History

ENVIRON has undertaken a review of historical mapping and aerial imagery (where available) obtained from a proprietary environmental database (GroundSure) which is summarised below. Selected historical maps are presented in Annex B.

3.1.1 The Site

For the purposes of this assessment, Hillington Park has been divided into the following areas:

- **Eastern Area** - this area includes land to the east of Hillington Road.
- **Western Area** - comprising two-thirds of the park, this area includes land to the west of Hillington Road which bisects the site.

A review of historical mapping indicates that the entire Hillington Park site was in agricultural use as farmland until the late 1930s when construction of Hillington Industrial Estate commenced on the Western Area, later extended in both easterly and westerly directions during the 1940s / 50s.

Eastern Area

The earliest map edition of 1857-58 shows the Eastern Area of the site to be greenfield land used for agricultural purposes, with a farm, North Cardonald, and Mossland Cottage shown within the site along Hillington Road, which defines the western boundary of this area.

The area remained undeveloped until mapping from 1956 shows the presence of extensive railway sidings and warehouses associated with Deanside Transit Depot and other industrial buildings including an Engineering Works and the Gregart Works.

By the mid-1970s additional industrial buildings have been developed and are referred to on the maps as Factories and Works. A section of railway sidings is now identified as having been dismantled.

Mapping from 1987 shows that further development has occurred in the northern part of this area and towards the south eastern corner, along Johnstone Avenue. By 2002, a number of commercial / industrial buildings have been added, infilling areas previously undeveloped.

Mapping from 2012 shows little change apart from the construction of a large commercial building (500 Hillington Rd.) in the northernmost corner of the area.

Western Area

Similar to the Eastern Area, the earliest map edition of 1857-58 shows the Western Area of the site to be greenfield land used for agricultural purposes, with a number of farms: North Hillington; North Mosslands; South Mosslands; and Bogside dispersed within the area.

The map edition of 1938 shows industrial development, referred to as Scottish Industrial Estate (later Hillington Industrial Estate), in the south eastern corner of the area along Hillington Road, with the construction of several rows of industrial units of mixed use. Uses of note included acetylene and oxygen gas works, chemical works (small), several engineering works, print works, tar bitumen works, steel metal works and various food and textile factories. In addition a non-ferrous Tube Works is shown to be present in the south

western corner of this area, along with two unidentified units associated with rectangular tanks and a sludge bed. The rest of the site was otherwise undeveloped.

By 1956, extensive further development had taken place across much of the area, with only the northernmost part remaining undeveloped or occupied by nurseries and a sports ground. Amongst the numerous industrial activities listed, are a number of non-ferrous metal foundries, various engineering and light engineering works (located within the area occupied by Rolls Royce), a Training Centre (Ministry of Labour and National Service). A timber and fireproofing works lay to the south. A small refuse heap is shown to the immediate east of the tube works and a metal pipe works had been constructed to the west of Hillington Road. Several additional small units were present in the central area of the site (many unlabelled or marked as works). Potentially contaminating industries indicated on mapping from this period include the following:

- An Asbestos factory;
- A lubricating oil blending factory;
- A bleach factory;
- Printing works;
- Plastic works;
- A brass foundry;
- A paint factory;
- A rubber factory;
- Food and drinks factories; and
- A lead trap works.

The 1956 mapping also indicates that the course of Mill Burn had been diverted and possibly culverted beneath the north western corner of the site, and that this area formed part of the airfield for Renfrew Airport with part of the runway on the site; by the 1970s this was no longer present.

Few subsequent changes were seen during the 1960s and 1970s, other than the appearance of several electricity sub-stations around the site, a Works in the north western corner and a Packaging Depot along the western boundary.

By the 1990s a shopping area had been constructed in the central area of the site, and by 1995, the training centre had become an employment rehabilitation centre.

No noteworthy changes in activities or configuration were observed in subsequent mapping up to 2012.

3.1.2 The Surrounding Area

The surrounding area was in agricultural use, interspersed with scattered individual residential properties. The Glasgow and Paisley Joint Railway running along the southern boundary of the site and the Renfrew branch along the eastern boundary from at least the mid-1800s. The surrounding area has experienced considerable development from the earliest available maps to date, as detailed below.

1895-1896: Two brick works and associated extraction / quarry areas along the southern and south eastern boundary of the site and an old shaft are shown.

1911-1914: Seafield Engineering Works and Penilee Works (including tanks) are shown on the southern boundary of the site. East: Dock Saw Mill and Shieldhall Cooperative Works are located.

1911-1916: Shieldhall Saw Mill is shown to the east of the site.

1934: Renfrew Road to the north of the site.

1937: Residential development has occurred to the south of the site. Additional railway sidings and King George V Docks are shown to the east of the site. A golf course is shown to the north of the site.

1956: North of the site Renfrew airport is shown whilst to the south the residential development of Penilee has appeared.

1966-1976: Further road development is shown to the north of the site.

1987: Additional residential development and a large building labelled Bonded Warehouse is shown to the north of the site.

3.2 Environmental Database Records

The following information has been obtained from a review of Groundsure environmental database records procured by ENVIRON in December 2013 relating to the site and surrounding land. According to these records:

- There are no sites determined as Contaminated Land under Part 2a of the Environmental Protection Act (EPA) 1990 on, or within 500m of the site.
- There are no Scottish Environment Protection Agency (SEPA) recorded landfill sites on, or within 500m of the site.
- There are two historical refuse tip areas that would pre-date SEPA records. These were identified on 1969 mapping in the eastern site and are listed by the database as GroundSure recorded landfill sites. There are a further three such refuse tip areas identified from mapping within 1km of the site, between 700 and 850m to the north of the site.
- There are eight SEPA Waste Sites recorded on-site and a further two within 500m of the site. The eight on-site records relate to:
 - Three records for 6 Queensberry Avenue, Transfer Station / End of life vehicle (ELV) storage and treatment, taking clinical waste;
 - Two recorded for Barrie Road, Transfer Station, taking 'Unspecified Waste' and 'Asbestos Waste Only';
 - 23-29 Kelvin Avenue, Transfer Station taking 'Unspecified Waste';
 - Breval Technical Services Ltd, 37 Watt Road, Mobile Plant taking 'Unspecified Waste'; and
 - Mobile Plant taking 'unspecified waste'.

The two off-site records relate to 339 Bogmoor Road taking unspecified waste, located 215m north east of the site and Govan Transfer Station located 347m north east of the site receiving household, commercial, industrial and bonded asbestos arising from households;

- There are three recorded Historical Waste Sites located on-site and a further five within 500m of the site. The three on site relate to: 'Vehicle, Repairs and Recycling Centre', 'Recycling/de-manufacturing Facility' – WEEE recycling de-manufacturing facility and 'Office, Workshop and Waste Management';
- According to the current industrial sites data there are 281 records for the site. These include:
 - Catering and non-specified food products, distribution and haulage, general manufacturing, construction completion services, air and water filtration, vehicle repair, testing and servicing, general construction supplies, vehicle hire and rental, electrical and electronic engineers, service industry equipment repairs, building component suppliers, access equipment, precision engineers, work wear, electronic equipment, signs, tools including machine shops, pumps and compressors, industrial repairs and servicing, packaging, electrical features, glass, rubber and silicones and plastics, vehicle recovery and breakdown services, curtains and blinds, tanks (generic), furniture, vehicle parts and accessories, published goods, fireplaces and mantelpieces, electrical features (electrical sub stations), gas features, unspecified works or factories, container and storage, recycling, reclamation and disposal, metalworkers including blacksmiths, metal manufacturers, fabricators and stockholders, railway stations, junctions and halts, measurement and inspection equipment, civil and industrial engineers, vehicle cleaning services, airline and airline services, petrol and fuel stations, abrasive products and grinding equipment, radar and telecommunication equipment, lubricants and lubricating equipment
- There is one Part A Pollution Prevention Control permits recorded on the site listed to 3M United Kingdom Plc for coating activities, printing and textile treatment solvent emissions. There is a further Part A Pollution Prevention Control Permit within 500m of the site listed to Princes Soft Drinks, Weaverthorpe Road, 495m to the north east for the treatment of animal and vegetable matter and food industries.
- There are three Part B Pollution Prevention Control permits recorded on site; two are held by: Barrhead Sanitaryware Ltd for the manufacture of Vitreous china sanitary ware, and one by Jet Filling Station for unloading of petrol at a service station.
- There are two fuel stations located on site and a further one within 500m. The two on-site are for Hillington Service Station (Gulf), 266 Sandwood Road and Shell Hillington, Hillington Road.
- The site lies within a known coal mining affected area as defined by the coal authority - 'study site is located within the specified search distance of an identified mining area'.
- There are three records of non-coal mining areas on site, with the assessment of likelihood of highly unlikely to rare.
- No records of high pressure oil and gas pipelines within 500m of the site have been identified.

In addition to the above results from the Groundsure environmental database search, previous database searches by ENVIRON for premises on Hillington Industrial Estate have identified the following additional records:

- Four Registered Radioactive Substance authorisations have been recorded as held by the Makro Cash & Carry on Hillingdon Road for the keeping and use of closed sources, Preussag Fire Protection at 32 Hepburn Road for the keeping and use of closed sources (two entries), and Rolls Royce Ltd for the keeping and use of mobile radioactive sources. The status of these authorisations was not given; and
- There are no active Control of Major Accident Hazards (COMAH) Sites recorded on-site. A lower tier COMAH site is operated by Diageo Scotland Ltd (Shieldhall) approximately 250m to the north of the site.

3.3 Regulatory Authority Enquiries

3.3.1 Local Authority Environmental Health Department

Renfrewshire Council

In reply to ENVIRON's enquiry, the Contaminated Land Officer of Renfrewshire Council provided the following response on 24th January 2014 in relation to the western part of the site that falls within the Renfrewshire Council area:

- As with a large number of sites in Renfrewshire that have a history of potentially contaminative former use(s), the site has been included within the Council's Contaminated Land Strategy, which the Council is required to prepare in accordance with its inspection duties under Part 2a of the EPA 1990. However, the Council can confirm that the site is not considered high priority, and there are currently no plans to commence any action in relation to Part 2a;
- The Council retains copies of site investigations and associated correspondence in support of a number of planning applications (03/1059/PP, 04/0764/PP, 06/0116/PP, 07/0775/PP, 07/0952/PP, 07/1060/PP and 08/0698/PP, 12/0299/PP and 13/0114/PP). In addition the Council's Community Resources hold voluntary remediation reports prepared by Halcrow Group Ltd for the area along Buccleuch Avenue, Cameron Street, Arrol Street and Lothian Street (NGR: 251420, 665410). These areas are located within the former Rolls Royce factory area;
- There are no recorded landfills within the site area or within the 250m buffer. There were however areas of infilled ground distributed across the site which are shown on Maps 1 to 4 (refer to Annex C of this report);
- The Council holds records of disused fuel storage tanks at 12 locations distributed across the site, as shown on Map 5 (refer to Annex C of this report);
- The site, and area within 100m, is indicated by the Health Protection Authority not to be within a Radon Affected Area;
- The Gordon Avenue (Hillington) Litter Control Area was designated in 2010 and is still in force. Three notices have been issued in relation to refuse and construction noise in 1997 and 1998 along Gordon Avenue, Napier Road and Hillington Road / M8; these are no longer valid. The Council also holds records of a variety of nuisance complaints relating to fly-tipping, noise, refuse, chemical and foul smells, dust, fumes and black smoke between 2003 and 2013, for which the complaints have been resolved. In addition complaints concerning rats have been recorded at most roads within the industrial estate since 2004 to the present day; and
- There are no known private water supplies within 2km of the site.

Glasgow City Council

In reply to ENVIRON's enquiry, the Contaminated Land Officer of Glasgow City Council provided the following response on 16th January 2014 in relation to the eastern part of the site that falls within the Glasgow City Council (GCC) area:

- The site has not been identified for inspection or further review under the Council's Contaminated Land Strategy (or other Part 2a of the EPA 1990 undertaking). The site was open land until the first units on the industrial estate were established in the 1950s. There were extensive railway sidings on the extreme northern edge of the site, and these factors don't indicate a high likelihood of extensive contamination that would pose a risk to human health.
- There are no known contamination issues associated with the site or in the immediate vicinity.
- An intrusive investigation was undertaken on a small area of the site, in the area of former railway sidings used by Tarmac for soil storage (site planning reference is 05/03993/Dc). The Council cannot provide a copy but the summary record shows that there were no risks to human health from the site. The investigation established that site services required protection from ground conditions. In addition, gas Monitoring was carried out in 1997 on land to the immediate south east of the site but no records of this investigation could be provided.
- There are no former landfills within 250m of the site within the GCC area.
- No elevated radon gas levels have been found in this area of the city. The high resolution BGS dataset for the GCC area shows this site to be in the lowest risk band, which is a 0-1% chance of elevated radon levels being found.
- There has been one complaint within the area of interest in the GCC area. This related to Tarmac Lorries leaving mud and dust on the surrounding roads, which was causing a nuisance to other businesses. An Environmental Health Officer arranged for Tarmac to carry out regular road sweeping and this resolved the complaint.
- There are no private water supplies within the GCC area. SEPA may have records of other groundwater abstraction points for industrial use.
- It should be noted that the groundwater under Glasgow is generally of poor quality due to historic factors and is therefore of limited use without extensive pre-treatment.

3.3.2 Petroleum Licensing AuthorityRenfrewshire Council

In reply to ENVIRON's enquiry, the Petroleum Officer (Trading Standards) of Renfrewshire Council provided the following response on 20th January 2014 in relation to disused petroleum spirit storage tanks on the western part of the site that falls within the Renfrewshire Council area:

- The Department holds the following records of disused underground petroleum spirit storage tanks:

Company Name	Address	Tank Status
Sportsworks Limited	Atholl Avenue	1 x 500 Gallon, gas freed 1972

Scottish Development Agency	Barrie Road	2 x 1,000 Gallon, gas freed 1984
L. Sterne & Co Ltd	Carlyle Avenue	1 x 2,100 Gallon, gas freed 1967
Block 53	Kelvin Road	1 x 2,000 Gallon, gas freed 1988
Skillcentre	Queen Elizabeth Avenue	1 x 500 Gallon, gas freed 1980
Danish Bacon Company	Denmark House, Watt Road	1 x 500 Gallon, gas freed 1966
Andrew Charles Mitchell	447 Hillington Road	1 x 500 Gallon, pressure tested 1956
Shell	Hillington Road	2 x 33,000 Litres, 3 x 22,000 Litres - Live site
Peter Vardy	500 Hillington Road	2 x 5,400 Litres - Live site

- The Department records do not show that the above tanks were removed, and therefore it must be assumed that the tanks remain in-situ and may now be in a dangerous condition. Where the site is live, any further tanks details should be obtained from the site owners; and
- If other underground tanks were present on the site that never contained petroleum spirit (e.g. gas oil, DERV etc.) the Department will hold no record of them.

Glasgow City Council

In reply to ENVIRON's enquiry, the Trading Standards Officer of Glasgow City Council provided the following response on 24th January 2014 in relation to the eastern part of the site that falls within the GCC area:

- No. 412 Hillington Road (Ault and Wiborg - Five 5,000 gallon double compartment USTs were installed in June 1950 and nine of the ten tank compartments were subsequently degassed and water filled on 15th August 1983. One 1,000 gallon double compartment UST was also installed in June 1950 and subsequently degassed on 21st September 1982, although it cannot be confirmed whether these were filled or removed;
- No. 4 Colquhoun Avenue - Two 6,000 gallon USTs, one of which was installed in 1983 and degassed (presumably decommissioned) on 17th June 1998. The second UST was used for diesel storage and no records are held on file for this tank; and
- Hillington Service Station, 2 Carnegie Road, Glasgow - Current petroleum storage at this site. Further information can be only provided with a letter of consent from the current Licensee.

In addition to the records above, the Department has also noted tanks recorded at Deanside Transport Depot (Clyde Navigation Trust) on historic maps. No records of petroleum storage at this site are held.

3.3.3 Scottish Environment Protection Agency (SEPA)

In response to ENVIRON's enquiries, SEPA provided the following information:

- SEPA holds no record of any formal authorisation level groundwater or surface water abstractions within a 1km radius of the centre of the site.

3.4 Current Potential Contamination Sources

3.4.1 On-site

The site is currently occupied by over 500 companies with activities including vehicle repair / garage services; waste recycling, reclamation, transfer and disposal; works and factories; metal fabricators; vehicle cleaning; petrol and fuel stations; solvent coating activities; commercial cleaning services; logistics; oil companies / lubricants; precision engineering; and printing.

Bulk oil and chemical storage also takes place on site at a number of locations both above and belowground, including two petrol filling stations. However, no significant incidents or contamination issues have been reported in connection with current activities. The presence of bulk storage installations including underground tanks and pipework represents a potential for contamination. The potential for such contamination (if present) to migrate beneath the site would be dependent on the underlying geological conditions, which are discussed in Section 4.

3.4.2 Off-site

The site surroundings are a combination of residential areas, car show rooms and food outlets to the north and south of the site, separated by the M8 motorway and railway line, respectively. Land to the west is undeveloped and consequently nearby potentially contaminative uses are primarily to the east of the site. Potentially contaminative nearby activities include the following:

- Railway line located immediately adjacent to the southern site boundary;
- Tarmac aggregate recycling centre within 50m of the site's eastern boundary and timber related premises and waste management sites further east along Bogmoor Road;
- Industrial and warehouse premises on Cardonald Park to the south east including the Trinity Mirror printing works;
- Diageo Shieldhall whisky bottling plant located 250m to the north east; and
- A petrol filling station located to the 394m to the north.

3.5 Historical Potential for Ground Contamination

3.5.1 On-site

There are a number of identified historical activities on the site that had the potential to contaminate soil and/or groundwater. From the late 1930s onwards the site was developed for industrial activities that comprised numerous engineering works, factories, printing, tar works, transit depots, chemical works, asbestos works, waste management sites etc. The tipping of refuse also appears to have occurred on small areas to the east of Hillington Road near the on-site railway sidings and in the south western corner of the site near the former

Tube Works. Furthermore, the north western corner of the site formed part of the airfield for Renfrew Airport, which was later decommissioned as a commercial airport in 1966. Whilst it appears that this relatively small area was a peripheral part of the airfield, the airport was originally built as a military airfield during World War I and was later occupied by the RAF during World War II.

Overall, there is a potential for contamination at the site arising from its longstanding industrial use and the associated potential for the past presence of recorded and unrecorded above and underground storage tanks. The Councils' responses have identified disused fuel storage tanks and petroleum USTs for which records are held. The military associated use of the north western corner should also be noted, particularly in relation to the potential for unrecorded waste tipping in this area, which was common practice on peripheral areas of military sites, and unexploded munitions and ordnance. As with any UK defence related site, some information is unavailable, not recorded or incomplete for security and/or other reasons.

3.5.2 Off-site

Site surroundings have been predominantly agricultural from the earliest maps, with gradual industrial and residential development from 1895 onwards. Potentially contaminative historic activities have included the following:

- Railways (Renfrew and Shieldhall branch lines) along and to the east of the site's eastern boundary which have since been dismantled, and the Glasgow & Paisley Railway running along the site's southern boundary;
- Historic brick works and associated quarry/extraction areas (potentially infilled) to the immediate south and south east of the site;
- Saw mills and industrial activities on land to the immediate east associated with the King George V Dock to the north east of the site;
- The military and commercial use of Renfrew Airport to the immediate northwest of the site between WWI and the mid-1960s; and
- Three former scrap yards located within 50m to the east of the site up until the mid-1990s.

4 Environmental Setting

Desk-based research of the local geology, hydrogeology and hydrology was carried out in order to establish the potential for migration of contamination onto or away from the site, and to assess the sensitivity and vulnerability of the site's setting with respect to surface water, groundwater and ecological resources.

Information was obtained from a number of sources, including:

- Examination of published geological maps produced by the British Geological Survey (BGS);
- The Groundwater Vulnerability Map of Scotland (BGS, 1:625,000, 1995) and The Hydrogeological Map of Scotland (BGS, 1:625,000, 1988);
- Regulatory Authority websites including SEPA (<http://gis.sepa.org.uk/rbmp/>) and Scottish Natural Heritage (SNH) (<http://www.snh.gov.uk/publications-data-and-research/snhi-information-service/>); and
- Proprietary environmental database procured by ENVIRON (Groundsure).

4.1 Geology and Hydrogeology

According to the 1:50,000 BGS map (Glasgow sheet 30), the majority of the site is underlain by Quaternary alluvium, higher terraces, drift deposits comprising sands and gravels. In the Western Area of the site, the south eastern corner and south western corners are underlain by Glaciomarine deposits that comprise intertidal and subtidal clay and silt, whilst an area along the southern boundary is underlain by Glacial Diamictons, a till with boulders and stones in a hard to stiff sandy silty clay matrix. In the Eastern Area of the site, the southern part is also underlain by Glaciomarine deposits comprising intertidal and subtidal clay, with the rest underlain by Alluvium. Environmental Geology Maps of the area identify the Hillington Industrial Estate as being underlain by between 5m and 30m of drift deposits generally increasing in thickness from south to north across the estate.

Geological mapping shows that the route of the M8 motorway to the immediate north of the site is built on made ground.

Beneath the drift deposits, the underlying solid geology comprises two Carboniferous formations; the Limestone Coal Formation across the central and eastern sections of Hillington Park and the Lower Limestone Formation in the western section of the site. The former comprises mainly mudstones in its lower part and mainly sandstones in the upper sections with seams of coal and ironstone also present. The Lower Limestone Formation comprises predominantly mudstone with siltstones and sandstones as well as thin limestones and seams of coal. The two formations are divided by a narrow outcrop of the Top Hosie Limestone trending approximately north east to south west close to Huntley Road.

The Kilsyth Coking Coal and the Lower Garscadden Ironstone seams both trending approximately north east to south west run parallel and cross the south eastern corner of the site boundary.

According to information provided by Groundsure, the site is not within a Radon Affected Area, as less than 1% of properties are above the Action Level. Accordingly, no radon protective measures are necessary.

The Groundwater Vulnerability Map of Scotland classifies the site's superficial deposits as being moderately permeable, characterised by variable permeability alluvial deposits. These deposits are further described by the Hydrogeological Map of Scotland (BGS, 1:625,000, 1988) as a concealed aquifer with limited or local potential.

Previous investigations (by URS and ENVIRON) indicate that shallow groundwater typically lies between 1 and 2m below ground level (bgl) in the general area, and that the general direction of flow is towards the River Clyde in a north / north easterly direction.

The solid Limestone Coal and the Lower Limestone Formations have been identified as a potentially highly productive aquifer of limited extent, in which flow is predominantly within cracks and fissures.

The Groundwater Vulnerability Map of Scotland (1:625,000, 1995) classifies the area as moderately vulnerable so that groundwater resources in the area may be important for local supplies and for supplying base flow to rivers.

The regional aquifer unit underlying the site, the Paisley and Rutherglen bedrock and localised sand and gravel aquifers, has been delineated by SEPA and extends to an area of 219 km². In accordance with the Water Framework Directive (WFD), the aquifer has been classified as Poor quality, with Poor groundwater chemistry and a Good quantity of groundwater in the aquifer. No targets for improvement in quality have been set by SEPA in river basin planning cycles up to 2027, given that the identified pressures on the aquifer are diffuse sources of pollution resulting from historical chemical production in the wider Clyde river basin area, and associated with the historical mining and quarrying of coal.

SEPA hold no record of formal authorisation level abstractions within the area, although should the abstracted volume fall within the General Binding Rules (GBR) threshold volume, SEPA would have no record of the abstraction.

4.2 Hydrology

The nearest water course to the site is the Mill Burn which is understood to be culverted beneath the north western corner of the site. In addition a number of drains exist on the eastern site area to the south of Deanside Road and east of Johnstone Avenue. The tidal and estuarine River Clyde is located approximately 1 km north east of the site; the King George V Dock is located approximately 300 m north east of the site.

The River Clyde (Inner Clyde Estuary) is classified by SEPA along this stretch as a heavily modified transitional water body of Moderate Ecological Potential; this classification is made up of a chemical status of Pass and ecological status of Bad. A number of pressures have been identified on the water body, including point source pollutants from sewage disposal and air transportation industry (Glasgow airport), diffuse source pollution resulting from mixed farming, and morphological alterations to the river.

SEPA's Indicative River and Coastal Flood Map shows areas of Scotland that are estimated to be at risk of flooding from rivers or the sea on the basis of a 1 in 200 year event (i.e. a 0.5% or greater probability of flooding in any given year). The Indicative River and Coastal Flood Map has been developed to identify strategic issues associated with flood planning and management, and does not take into consideration the risk of pluvial or groundwater flooding. The area in which the site is located is not identified on the map as being at risk of flooding from rivers or the sea (i.e. it has less than a 0.5% (1 in 200) probability of being flooded in any given year).

SEPA hold no records of surface water abstractions within the site area.

4.3 Ecological receptors

There are no statutory protected ecological areas within 1km of the site.

The Inner Clyde Estuary, approximately 5 km downstream of the stretch of the Clyde located closest to the site, is a designated Site of Special Scientific Interest (SSSI), Special Protection Area (SPA) and Ramsar site on the basis of aggregations of non-breeding birds including redshank and the saltmarsh.

4.4 Environmental Sensitivity and Vulnerability

The areas of the site underlain by variably permeable Alluvium drift deposits are considered to more sensitive with respect to groundwater resources, than those areas of the site underlain by low permeability Glaciomarine deposits and glacial till. Whilst the sand and gravel alluvial deposits would be expected to allow lateral and downward migration of mobile contaminants, if present, into shallow groundwater, there are no known groundwater abstractions within close proximity.

From a surface water resource perspective, the site is not considered to be located within a particularly sensitive location, although the culverted Mill Burn and a number of drains are present on the site and therefore potentially vulnerable.

There are no statutory designated areas of ecological sensitivity or vulnerability.

5 Previous Reports

The following reports have been available or provided to ENVIRON for review:

- Site Investigation Report - M8 Frontage, URS Corporation Ltd, February 2007.
- Phase I Environmental Review - Hillington Industrial Estate, ENVIRON UK Ltd, August 2008.
- Phase I Environmental Assessment - 500 Hillington Road, ENVIRON UK Ltd, October 2012.

Site Investigation Report - M8 Frontage, URS, February 2007

The report was commissioned by MEPC to consider likely constraints in respect of ground conditions and contamination for the proposed commercial development of an area of land lying between Hillington Industrial Estate and the M8. The report sought to determine overall ground conditions in relation to soil and groundwater contamination, foundation design, earthworks and development potential.

The investigation, found the site area to be undeveloped and unoccupied open ground covered by marshy grassland, and comprised a preliminary environmental risk assessment followed by an intrusive ground investigation during which 30 trial pits and 8 boreholes were excavated to a maximum depth of 33m bgl and installed for groundwater and soil gas monitoring. During the work in-situ geotechnical testing was completed.

Ground conditions encountered 0.4m of topsoil over Made Ground (sandy gravelly clay and clayey sand with fragments of porcelain, glass, ash, fireclay, metal, bitumen, plastic, shale, brick and concrete) to a maximum depth of 1.7m bgl. Beneath this lay peat in a number of locations and alluvium which was found across the site to a maximum depth of 25.3m bgl. This in turn was underlain by Glacial Till encountered between depths of 20.55m bgl and 26.40m bgl and bedrock comprising mudstone / sandstone cobbles and boulders.

Groundwater was found to be high at the site and typically encountered between 0.7m and 0.9m bgl.

Limited gas monitoring recorded methane concentrations below 1% by volume in air and carbon dioxide concentrations in excess of 1.5%, up to a maximum of 3.6% by volume in air. A maximum gas emission flow rate of 6.5l/h was recorded.

Analysis of 6 made ground soil samples and 3 natural soil samples against a general metals and organics suite identified that all chemical determinands were below the URS Tier 1 (human health) screening criteria for a commercial/industrial end-use apart from an isolated low pH value in one natural sample. In addition, elevated aromatic hydrocarbon fractions were recorded in five made ground samples in relation to a risk to the water environment. Leachability results also recorded all concentrations below respective criteria, apart from one arsenic concentration from a sample obtained from made ground and one nickel value from a sample obtained from natural ground.

Groundwater analysis results recorded all contaminants at concentrations below respective screening criteria, apart from four total petroleum hydrocarbon (TPH) concentrations, one lead concentration, one nickel concentration and one pH value.

Based on these results, the report concluded that suitable measures to mitigate potential human health risks include capping for site occupants, and appropriate PPE for construction workers. To address risks to water pipes, these should be constructed of wrapped iron or PE/AL/PE (polyurethane/aluminium/polyurethane). Leachate testing was reported to

suggest metal contaminants present within the site are not readily leachable. With respect to groundwaters, the marginally elevated TPH concentrations were attributed to leaching from the made ground deposits and it was suggested that capping of the site would help to limit the potential for leaching. To address potential gas risks, URS recommended that further gas monitoring be undertaken prior to identifying the appropriate gas protection measures that would need to be installed. It is not known by ENVIRON whether this was implemented.

Overall it was summarised that assuming the remedial measure were incorporated, the site was considered suitable for its intended commercial development without the requirement for any treatment and/or removal of soils or groundwater.

Phase I Environmental Review - Hillington Industrial Estate, ENVIRON UK Ltd, August 2008

The Phase 1 report was commissioned by MEPC to assess general site conditions and potential risks to site users or the environment on 83 hectare area of the Hillington Industrial Estate.

It was reported that the site area had been used as a multi-tenanted industrial estate since the 1930s, with a wide range of uses over that period. Historically, potentially contaminative uses have included numerous engineering works, factories, a chemical works, print works and an asbestos factory. In addition an area of refuse tipping on an area of the site to the east of Hillington Road was identified from historic mapping. Current uses were also identified as varied but generally of a light industrial nature.

Consultation undertaken at the time with the regulatory authorities indicated that the site area was included by both councils on their list of potentially contaminated land, but that no timescales had been set for inspection and the site had not been designated as Contaminated Land under Part 2a of the Environmental Protection Act 1990.

A site inspection by ENVIRON identified many of the older buildings were noted to have asbestos roofs and that several ASTs and USTs were noted on-site; many units had some chemical or fuel storage areas. The majority of the storage facilities were noted to be in good condition with little or no staining visible.

During the course of the Phase 1, ENVIRON reviewed approximately 30 reports made available for premises within the site, including an investigation undertaken by ENVIRON in 2000. Whilst the reports were of variable age, and hence variable quality in relation to modern site investigation standards, the combined reports provided a consistent view on the general ground conditions. Overall, the previous investigations encountered a thin layer of ash containing Made Ground across the site which contained slightly elevated concentrations of various contaminants including copper, nickel, zinc, lead, TPH and Polyaromatic Hydrocarbons (PAHs). Soil gas monitoring typically recorded slightly elevated levels of carbon dioxide and in some locations methane. Given these findings, passive gas protection measures were recommended, where elevated soil gas readings were detected. Contamination was not found to be significant or widespread across the site.

The report concluded that there was clearly potential for contamination throughout the site, with some areas having higher contamination risk uses, and that it was not possible to clearly identify every high risk land use which has operated on site.

Based on the findings of the review, it was considered unlikely that there was a risk to the site users or to the environment in general, whilst the site remained in its current usage. ENVIRON also considered that any remedial actions or requirements, would be typical for

“brownfield sites”, when considered across the estate as a whole. It was, however, acknowledged that there may be individual sites/plots, so far not fully investigated, which may have specific issues and for which remedial works may be more extensive, but that this could only be sensibly assessed as individual plots come forward for redevelopment.

Phase I Environmental Assessment - 500 Hillington Road, ENVIRON UK Ltd, October 2012

This was commissioned by MEPC to assess potential contamination risks at 500 Hillington Road in the north eastern corner of Hillington Park.

Based on the findings of the site visit and results of historical and environmental database searches, the report concluded that no potentially significant sources of contamination were identified on-site. Several potentially significant sources of ground or groundwater contamination were identified on the surrounding Hillington Industrial Estate, including a UST of unknown status 20m to the south of the site, such that a potential impact to site conditions could not be ruled out.

Regulatory consultations confirmed that the site had not been identified as contaminated land under Part 2a of the EPA 1990, and whilst the site was included within the Council's Contaminated Land Inspection Strategy, the Council had no intentions to take further action.

The report concluded that the risk of significant contamination being present or posing a risk to site users or other sensitive receptors was low whilst the site remains in its current configuration and use. It was, however, noted (based on the regulator's response) that if the site were to be redeveloped under a planning consent, further assessment of ground contamination risks may be necessary to demonstrate that the site is/will be suitable for its future intended use.

ENVIRON Comments

Based on these reports, it is ENVIRON's view there is clearly potential for contamination from the historical engineering, manufacturing and industrial uses of the Hillington Park site for a prolonged period. Given the limited historical information available and the size of the site, it is impracticable to fully characterise the site in a single environmental site investigation. However, there have been numerous site investigations which together provide a reasonable level of site coverage, and help to characterise general site conditions. These investigations have indicated that contamination levels were generally less than might be reasonably anticipated, given the site history.

In terms of environmental investigations; the strategy has been to investigate and install and take appropriate precautions as sites come forward for redevelopment. Various reports have been prepared for individual plots, and all give a similar picture. The site appears a typical brownfield site, with localised areas of contamination, primarily metals such as copper, nickel, zinc and lead and hydrocarbons (e.g. TPH and PAHs) generally confined to Made Ground and shallow soils, and shallow groundwater in a few locations (e.g. across the Eastern Area of the site). In addition, low levels of soil gas have been recorded and this may be attributable to natural organic alluvial soils, rather than anthropogenic activities. However, due to the size of the site, and the absence of full historical details, there is a residual possibility of undiscovered areas of more significant contamination, or contamination not typically associated with industrial sites or the activities known to have occurred, on those areas of the site not investigated to date.

6 Qualitative Risk Assessment

6.1 Regulatory Background

Land contamination is regulated in Scotland under several regimes. The principal legislation and policies of relevance include:

- Part 2a of the Environmental Protection Act (EPA) 1990;
- Contaminated Land (Scotland) Regulations 2000;
- Water Environment and Water Services (Scotland) Act 2003;
- Water Environment (Controlled Activities) (Scotland) Regulations 2011; and
- The Water Resources Act (Scotland) 2013.

Legislation and guidance on the assessment of contaminated sites is provided under Part 2a of the EPA 1990, as introduced by Section 57 of the Environment Act 1995. This came into effect in Scotland on July 14th, 2000 as The Contaminated Land (Scotland) Regulations 2000. These regulations were subsequently amended with the provision of the Contaminated Land Regulations Amendment 2005.

6.2 Conceptual Model

In line with the statutory guidance, an initial assessment of the presence of a potential pollutant linkage has been made qualitatively by the development of a generic conceptual site model (CSM) covering Hillington Park as a whole.

The CSM is a representation of the hypothesised relationships between potential contaminant sources, pathways and receptors. Potentially significant pollutant linkages are identified through the development of the CSM, and on this basis, potentially significant risks may be identified. The CSM is intended to inform the SPZ and is not intended to provide sufficient information for specific developments on individual plots.

The conceptual site model, based on this environmental assessment, is presented in Table 6.1 overleaf.

Table 6.1: Generic Conceptual Model			
Potential Contamination Sources	Potential Pathways	Potential Receptors	Potential pollutant linkage?
Contamination associated with former / historical activities at the site (e.g. engineering works, factories, printing, tar works, transit depots, chemical works, asbestos works etc., bulk fuel storage tanks, waste deposition) and current commercial / industrial activities, as well as former military related activities in the north westernmost corner.	Inhalation and dermal contact	Site workers during development, site users	✓
	Leaching of contaminants in Made Ground and soil (if present) into shallow groundwater	Groundwater	✓
	Migration of contaminants (if present) via groundwater present in the underlying Made Ground and alluvial deposits.	Damage to third party land	✓
		Surface Waters (On-site drains, Mill Burn and Clyde River)	✓
	Chemical / aggressive attack	Building materials and services	✓
	Accumulation of potentially explosive gases / vapours	Building materials and services, site users	✓
	Detonation of unexploded munitions / ordnance	Site workers during development, building materials and services, site users	✓
Contaminated perched / shallow groundwater in localised areas (Due to variable ground conditions shallow groundwater may not all be in hydraulic continuity)	Migration of contaminants (if present) via groundwater present in the underlying Made Ground and alluvial deposits	Site workers during development	✓
	Accumulation of potentially explosive gases	Building materials and services, site users	✓
Organic rich alluvial deposits (including peat)	Accumulation of potentially explosive soil gases	Building materials and services, site users	✓
Off-site past and present commercial and industrial and historic military uses within the immediate surroundings.	On-site migration of contaminants and subsequent inhalation and dermal contact.	Site workers during development phase, site users	✓
	On-site migration of potentially explosive soil gases and subsequent accumulation.	Building materials and services, site users	✓

7 Conclusions

The current and historical activities undertaken across the site have the potential for contamination of soil and groundwater. From the late 1930s onwards the land to the west of Hillington Road (Western Area for the purposes of this assessment) was developed for industrial use engineering works / factories, printing, tar works, transit depots, chemical works, tube works, asbestos works etc. Deposition of refuse near the former tube works is also known to have occurred and a number of disused fuel tanks and petroleum USTs are known to have existed. In addition, the north western corner was part of the airfield serving Renfrew Airport, which was used for military as well as commercial purposes prior to closure in the mid-1960s.

The Western Area is currently occupied by tenants with activities including:

- Vehicle repair / garage services;
- Waste recycling, reclamation, transfer and disposal;
- Works and factories; metal fabricators;
- Vehicle cleaning;
- Petrol and fuel retail;
- Solvent coating activities;
- Commercial cleaning services;
- Logistics;
- Oil companies / lubricants;
- Precision engineering; and
- Printing.

The historical development and industrial use of the land east of Hillington Road (Eastern Area) is similar to that of the Western Area. Recorded historical activities in this part of the site include:

- A transit depot and associated railway sidings;
- A railway line later dismantled;
- Engineering works and factories;
- Furniture manufacture (Gregart);
- Refrigerator manufacture (Sternette); and
- Warehousing.

In addition refuse was historically deposited in a couple of small areas near to the railway sidings and a number of petroleum USTs are known to have existed. As such the Eastern Area's potential for contamination arising from its former activities is considered to be similar to that of the Western Area.

The Eastern Area is currently occupied by companies with activities similar to those within the Western Area.

Potentially contaminative activities in the surrounding area have included railway lines; brick works and associated quarry/extraction areas (potentially infilled); saw mills and industrial activities on land associated with the King George V Dock; the military and commercial use of Renfrew Airport; and former scrap yards.

Current activities within the vicinity with the potential to cause contamination include an aggregate recycling centre; timber and waste management sites; industrial premises on Cardonald Park including the Trinity Mirror printing works; Diageo's Shieldhall whisky bottling plant; and a petrol filling station.

In general, the site is underlain by a relatively thin layer of Made Ground, beneath which are Alluvium and Glaciomarine drift deposits up to 30m thick and Carboniferous solid deposits. Groundwater is present locally, typically at shallow depths of 1-2m bgl perched above low permeability deposits. The site is not considered to be situated in a particularly sensitive location with respect to groundwater resources given the absence of known abstractions.

The site is also considered to be situated in a relatively low sensitivity location with respect to surface water resources due to the distance from the River Clyde, although the existence of surface water drains on-site and the potential presence of the culverted Mill Burn mean that surface waters are potentially vulnerable particularly along the eastern and north western periphery of the site.

No premises within the site have been determined as Contaminated Land under Part 2a of the Environmental Protection Act 1990. Renfrewshire Council considers that the majority of the site (i.e. that within their boundary) requires further inspection under their Contaminated Land Strategy, albeit the site is not considered a high priority and there are no plans to commence any action under Part 2a, whilst Glasgow City Council has indicated that the eastern part within their boundary has not been identified for inspection or further review under its Contaminated Land Strategy. The councils will, unless indicated otherwise, typically address contaminated land issues through the planning process, where developers will be required to demonstrate that the site is/will be suitable for its future intended use.

Various site investigations have been undertaken, including a Phase II investigation by ENVIRON in November 2000 across a substantial section of Hillington Industrial Estate. Other known investigations have largely been in relation to individual development proposals. While these investigations are necessarily limited in terms of geographical coverage, and the scope of investigations and analyses are in some cases not in line with current standards, the available results are generally consistent and can be summarised as follows:

- Soil contamination has not been found to be widespread across the site, and elevated, not severe, concentrations of contaminants (metals and hydrocarbons) are typically confined to the Made Ground and shallow soil, with little evidence of an impact to underlying natural strata;
- There is limited and localised contamination of groundwater (e.g. TPHs across parts of the eastern site area), which suggests that sources of contamination are neither significant nor widespread; and
- No significant sources of soil gas have been identified, and where elevated soil gas levels have been encountered, these have been attributed to natural organic rich alluvial deposits.

Overall, the investigation results obtained by ENVIRON and others indicate only modest contamination in those areas which have been subject to intrusive investigation. The groundwater is of low to moderate sensitivity and there is no evidence of significant soil or groundwater contamination from available information. Occasional "hot spots" of metals and hydrocarbons in soils have been identified on the site, at generally modest concentrations.

These elevated concentrations were typically identified in the (shallow) made ground, with underlying natural materials remaining relatively uncontaminated.

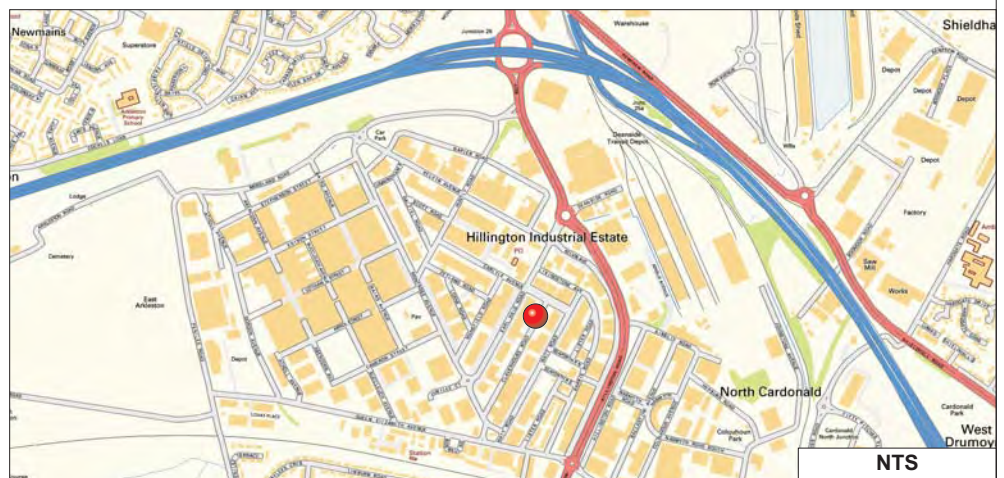
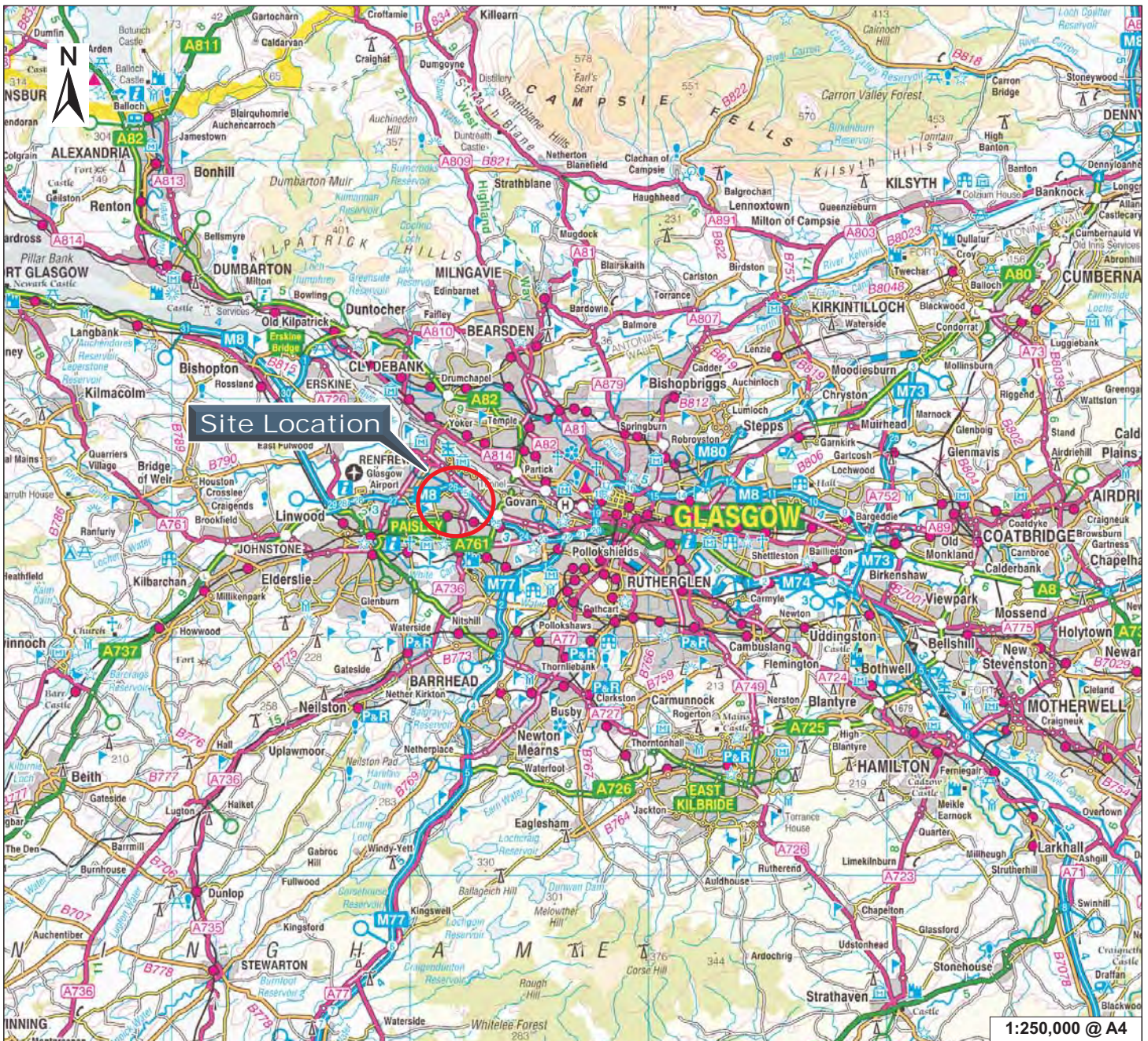
In summary, whilst the site has a potential for contamination arising from historical and recent industrial uses, site investigation results obtained by ENVIRON and others have not indicated levels of contamination likely to pose a significant constraint to future development in those areas which have been subject to intrusive investigation. Furthermore, where necessary the measures proposed to mitigate elevated soil gas levels have typically been passive gas protection measures. Due to the size of the site and the incomplete records of historical uses, there is the potential for undiscovered areas of contamination to be present, particularly in parts of the site that are either not known to have been investigated, or for which no reports are currently available (e.g. the former Rolls Royce factory).

Of the area covered by the SPZ, the M8 Frontage (east) is considered to have a reduced potential for contamination when compared to the rest of the site, given that the area has remained undeveloped. It is therefore proposed that apart from the need to undertake additional gas monitoring to identify suitable gas protection measures, this area does not require further assessment with respect to contaminated land.

Annex A: Figures

Figure 1: Site Location

Figure 2: Site Boundary and Layout

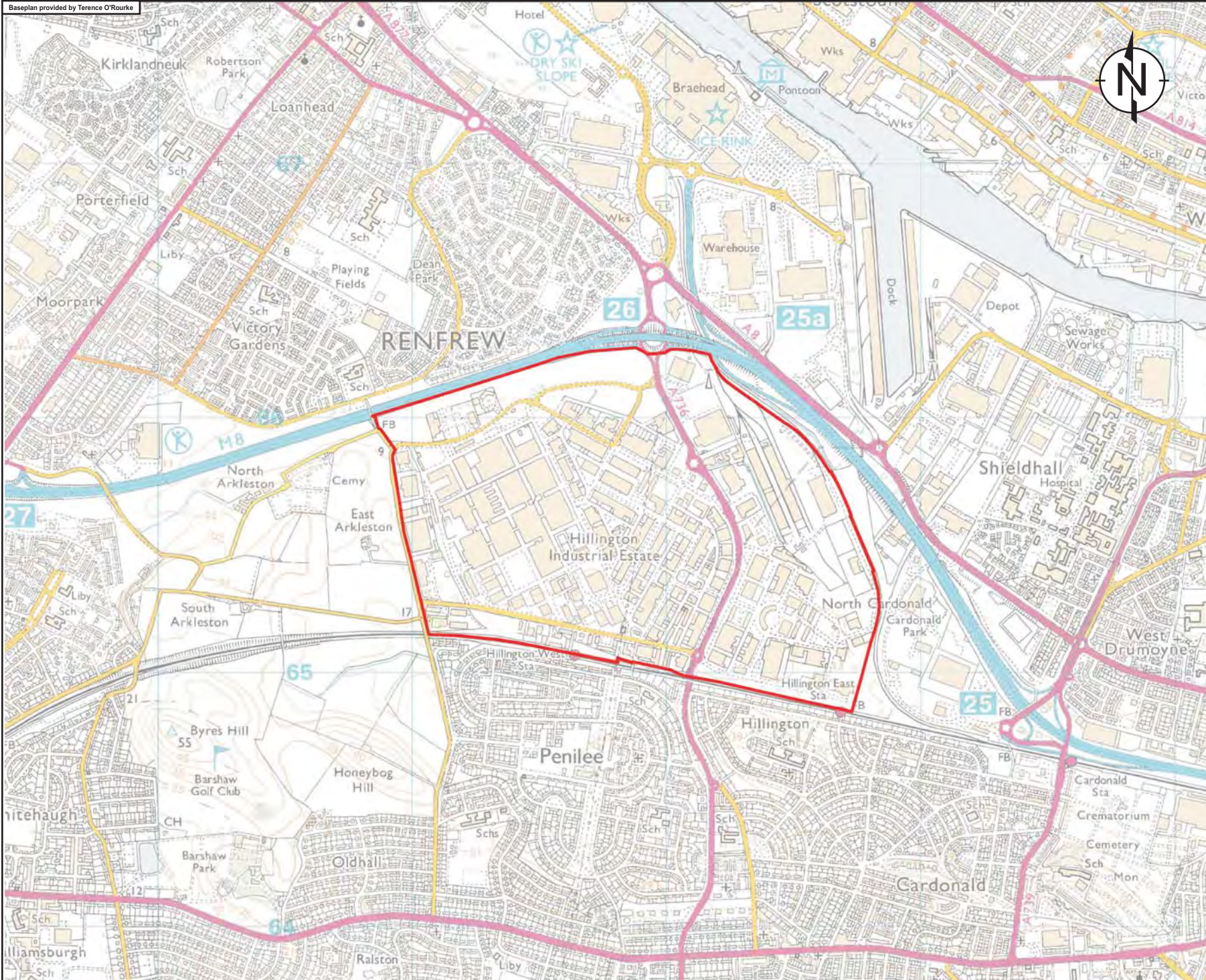


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Title	Figure 1: Site Location
Site	Hillington Park Glasgow

Client	MEPC		
Project No.	UK1919567	Issue	1
Date	January 2014	Drawn by	JoM

Baseplan provided by Terence O'Rourke



Key
— Site Boundary

Title **Figure 2: Site Layout**

Project No. UK1919567

Site **Hillington Park, Glasgow**

Client MEPC

Date January 2014

Scale NTS

Issue 1 Drawn by JoM

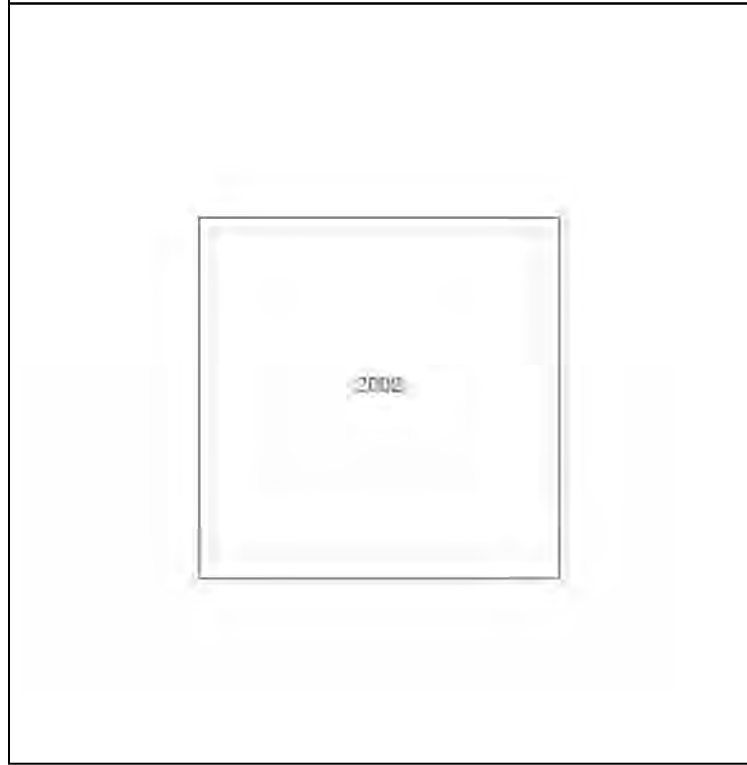
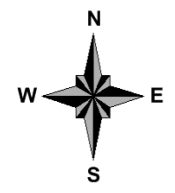


Annex B: Selected Historical Maps

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 Hillington Industrial Park,

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Report Ref: GS-1218073
Grid Ref: 251850, 666536

Map Name: 1:10,000 Raster
Map date: 2002
Scale: 1:10,000
Printed at: 1:10,000



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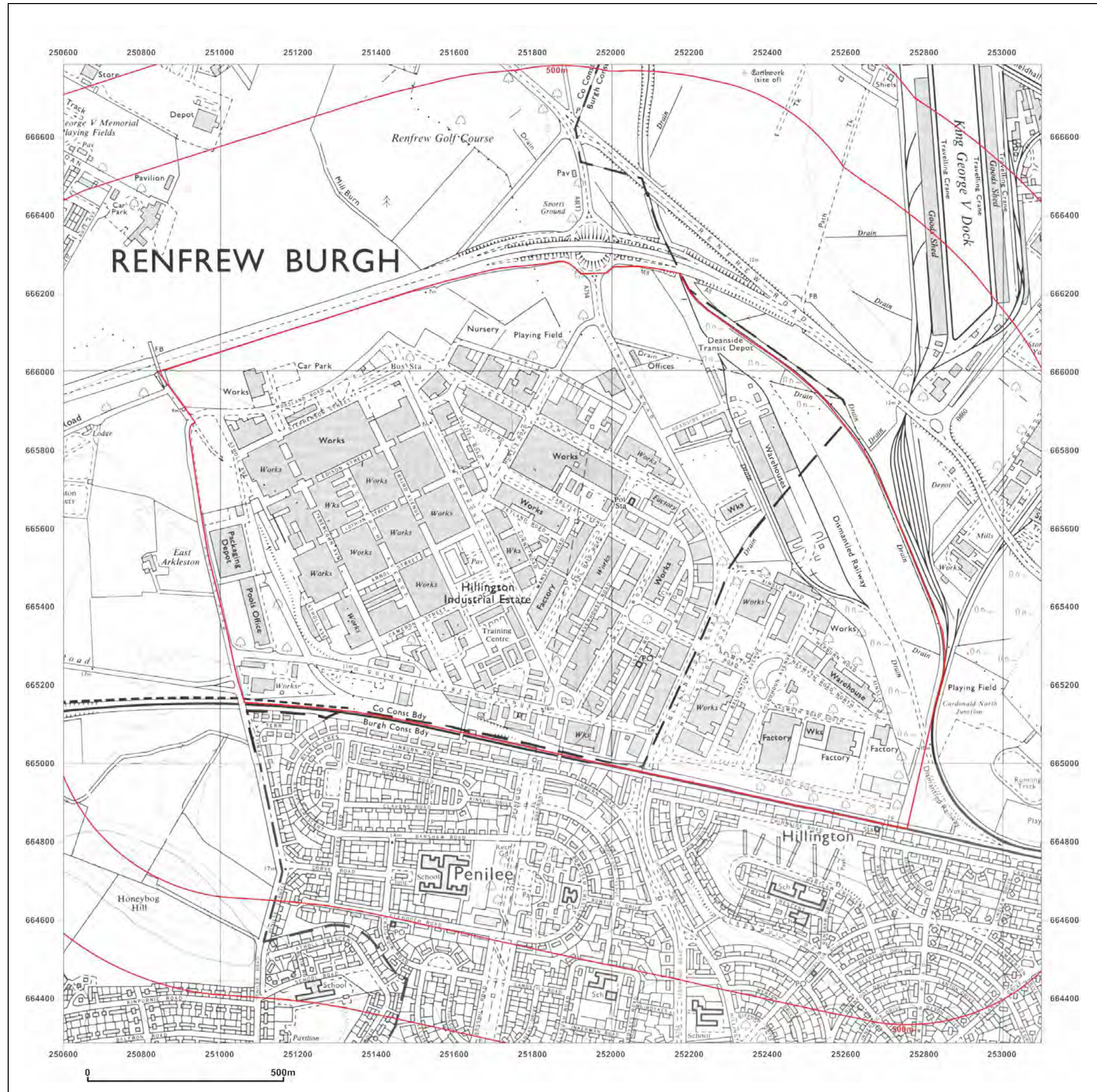
Produced by
 GroundSure Environmental Insight
 T: 08444 159000
 E: info@groundsure.com
 W: www.groundsure.com

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Production date: 16 December 2013

To view map legend click here [Legend](#)

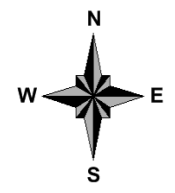




Site Details:
 Hillington Industrial Park,

Client Ref: UK1919567_PO01_EM
Report Ref: GS-1218073
Grid Ref: 251850, 665536

Map Name: National Grid
Map date: 1973-1976
Scale: 1:10,000
Printed at: 1:10,000



Surveyed 1973
 Revised 1973
 Edition N/A
 Copyright N/A
 Levelled N/A

Surveyed 1975
 Revised 1976
 Edition N/A
 Copyright N/A
 Levelled N/A

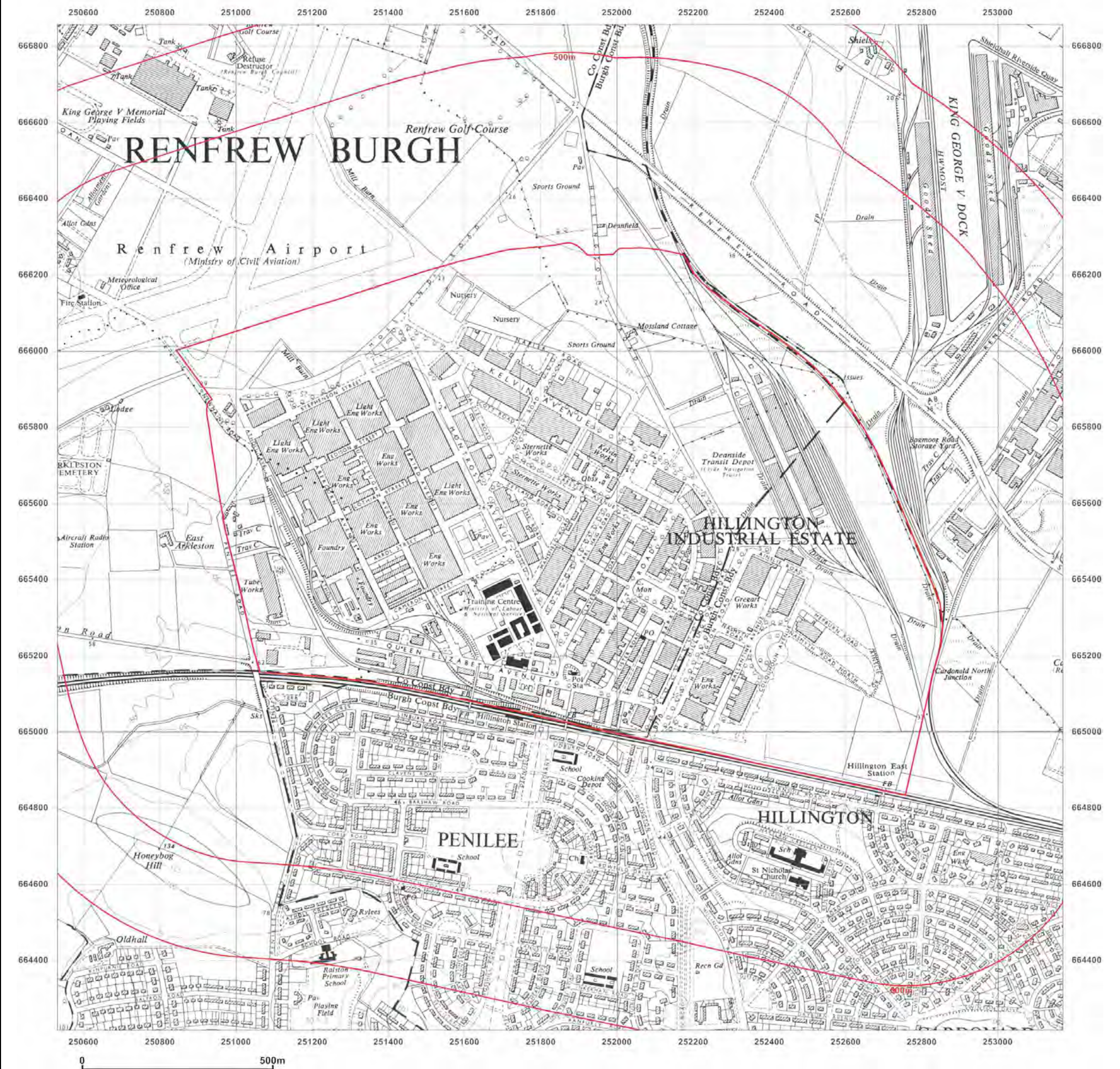


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Production date: 16 December 2013

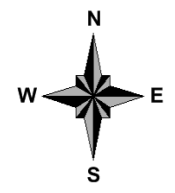
To view map legend click here [Legend](#)



Site Details:
Hillington Industrial Park,

Client Ref: UK1919567_PO01_EM
Report Ref: GS-1218073
Grid Ref: 251850, 665536

Map Name: Provisional
Map date: 1956
Scale: 1:10,560
Printed at: 1:10,560



Surveyed 1956
Revised 1956
Edition N/A
Copyright N/A
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Surveyed 1956
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Site Details:
 Hillington Industrial Park,

Client Ref: UK1919567_PO01_EM
Report Ref: GS-1218073
Grid Ref: 251850, 665536

Map Name: County Series
Map date: 1938-1939
Scale: 1:10,560
Printed at: 1:10,560



Surveyed 1857 Revised 1939 Edition N/A Copyright N/A Levelled N/A
Surveyed 1857 Revised 1938 Edition N/A Copyright N/A Levelled N/A

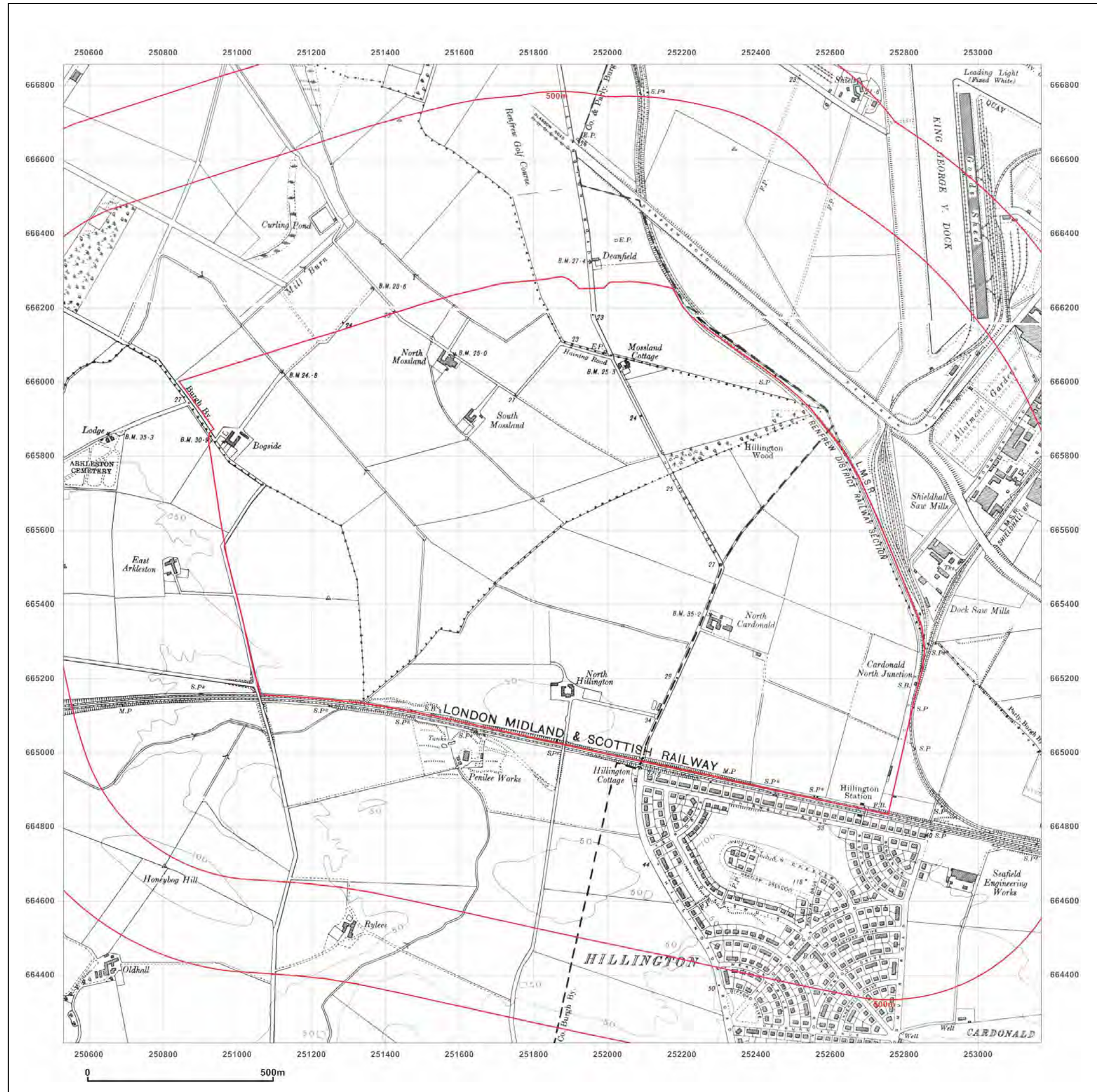
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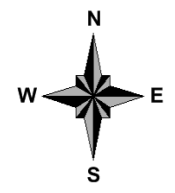
To view map legend click here [Legend](#)



Site Details:
 Hillington Industrial Park,

Client Ref: UK1919567_PO01_EM
Report Ref: GS-1218073
Grid Ref: 251850, 665536

Map Name: County Series
Map date: 1934
Scale: 1:10,560
Printed at: 1:10,560



Surveyed 1861
 Revised 1934
 Edition N/A
 Copyright N/A
 Levelled N/A

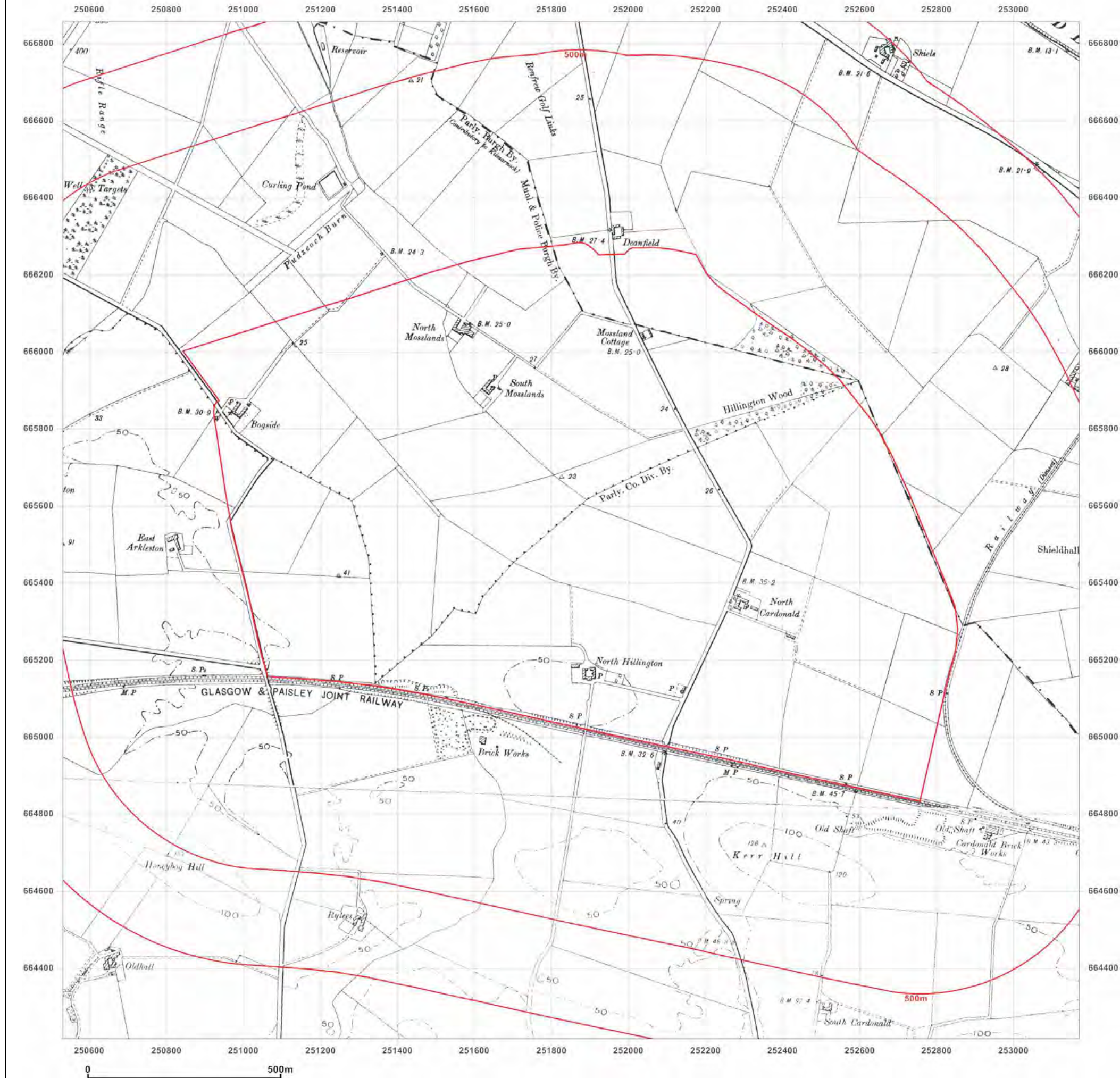
Surveyed 1858
 Revised 1934
 Edition N/A
 Copyright N/A
 Levelled N/A

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Production date: 16 December 2013

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Site Details:

Hillington Industrial Park,

Client Ref: UK1919567_PO01_EM
Report Ref: GS-1218073
Grid Ref: 251850, 665536

Map Name: County Series

Map date: 1895-1896

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1857
 Revised 1895
 Edition N/A
 Copyright N/A
 Levelled N/A

Surveyed 1858
 Revised 1896
 Edition N/A
 Copyright N/A
 Levelled N/A



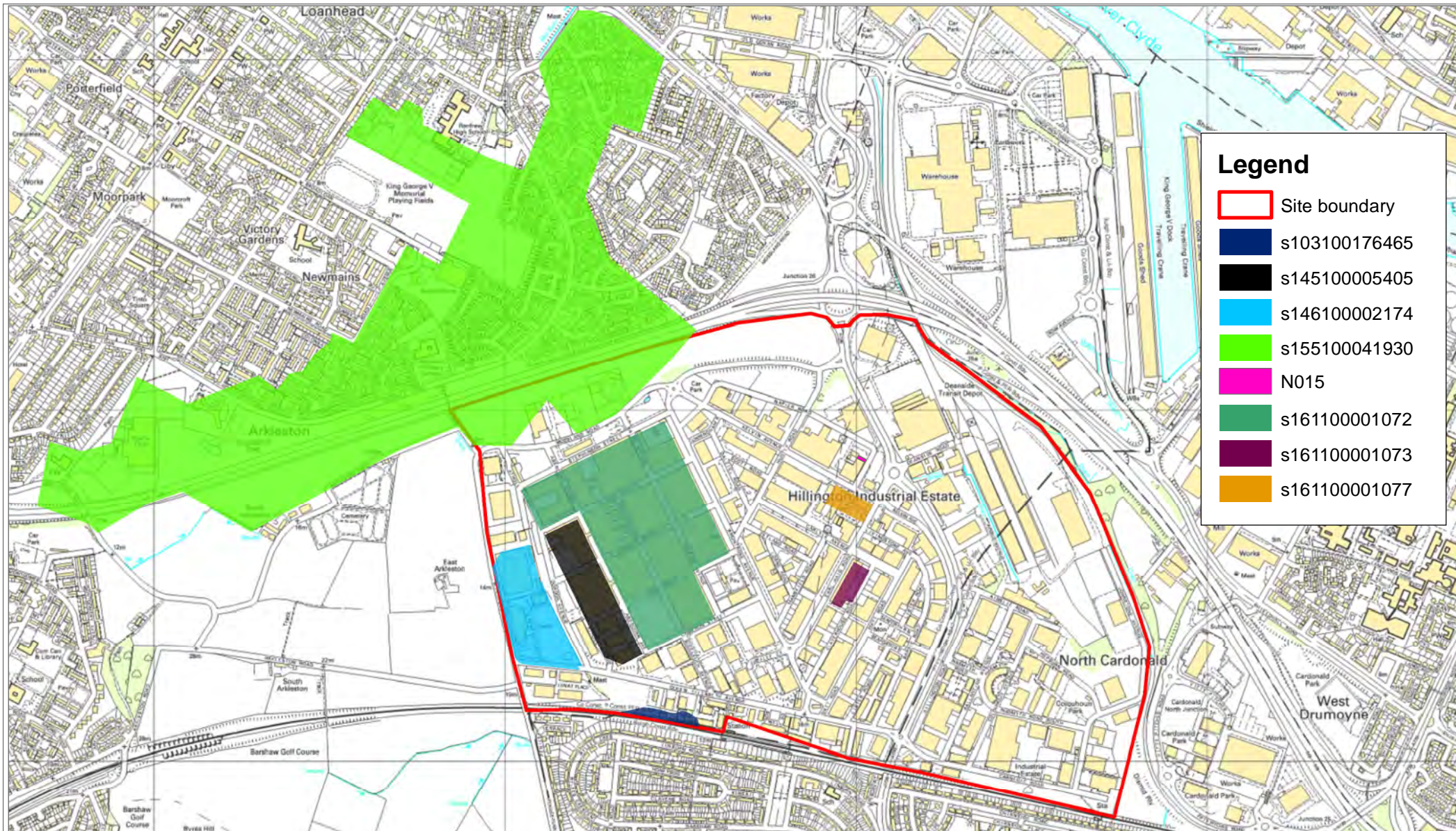
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Production date: 16 December 2013

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Annex C: Renfrewshire Council Maps



Legend

- Site boundary
- s103100176465
- s145100005405
- s146100002174
- s155100041930
- N015
- s161100001072
- s161100001073
- s161100001077

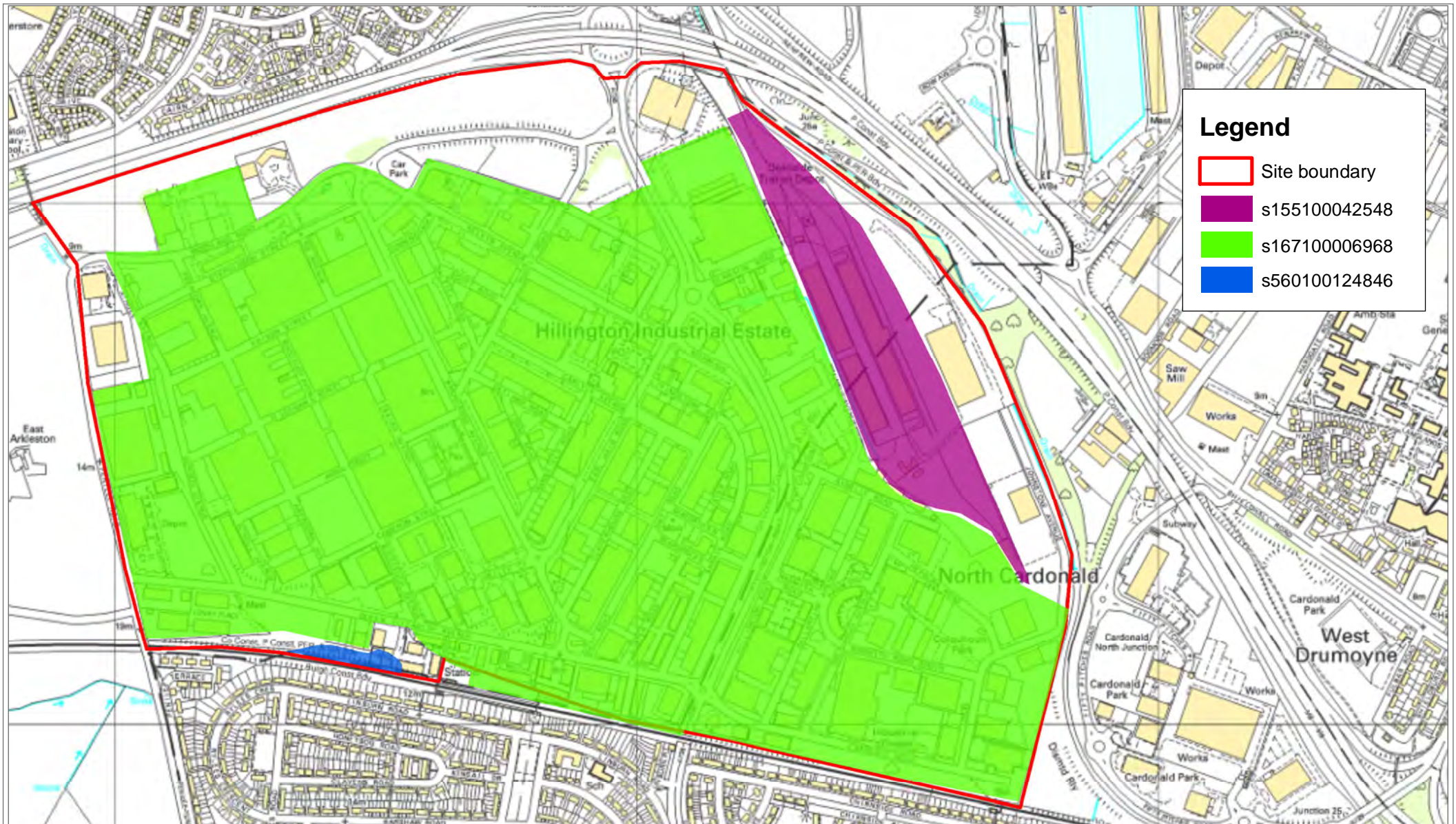
Map 1 - Hillington Industrial Estate



1:15,000

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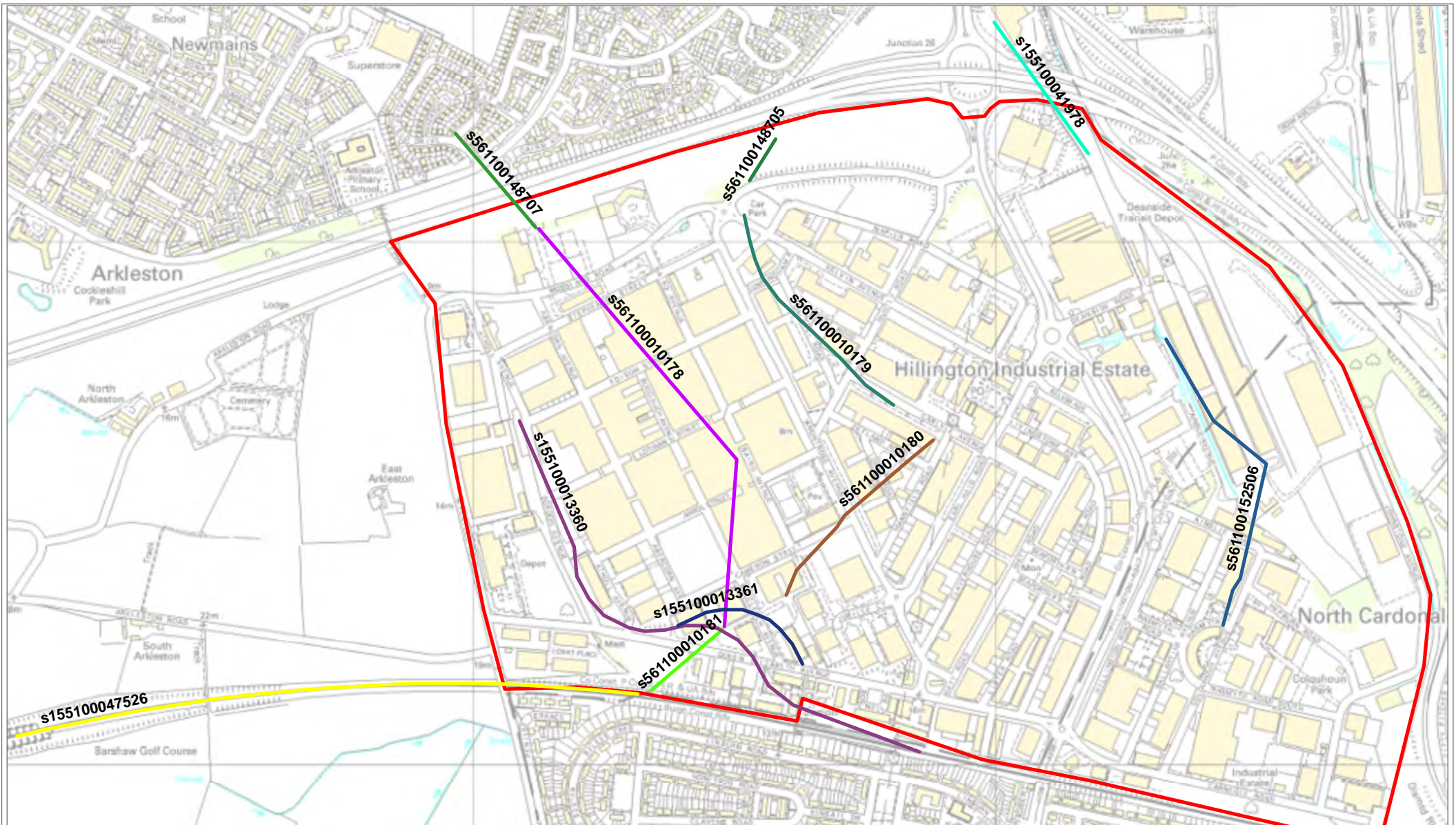
Map 2 - Hillington Industrial Estate



1:10,000

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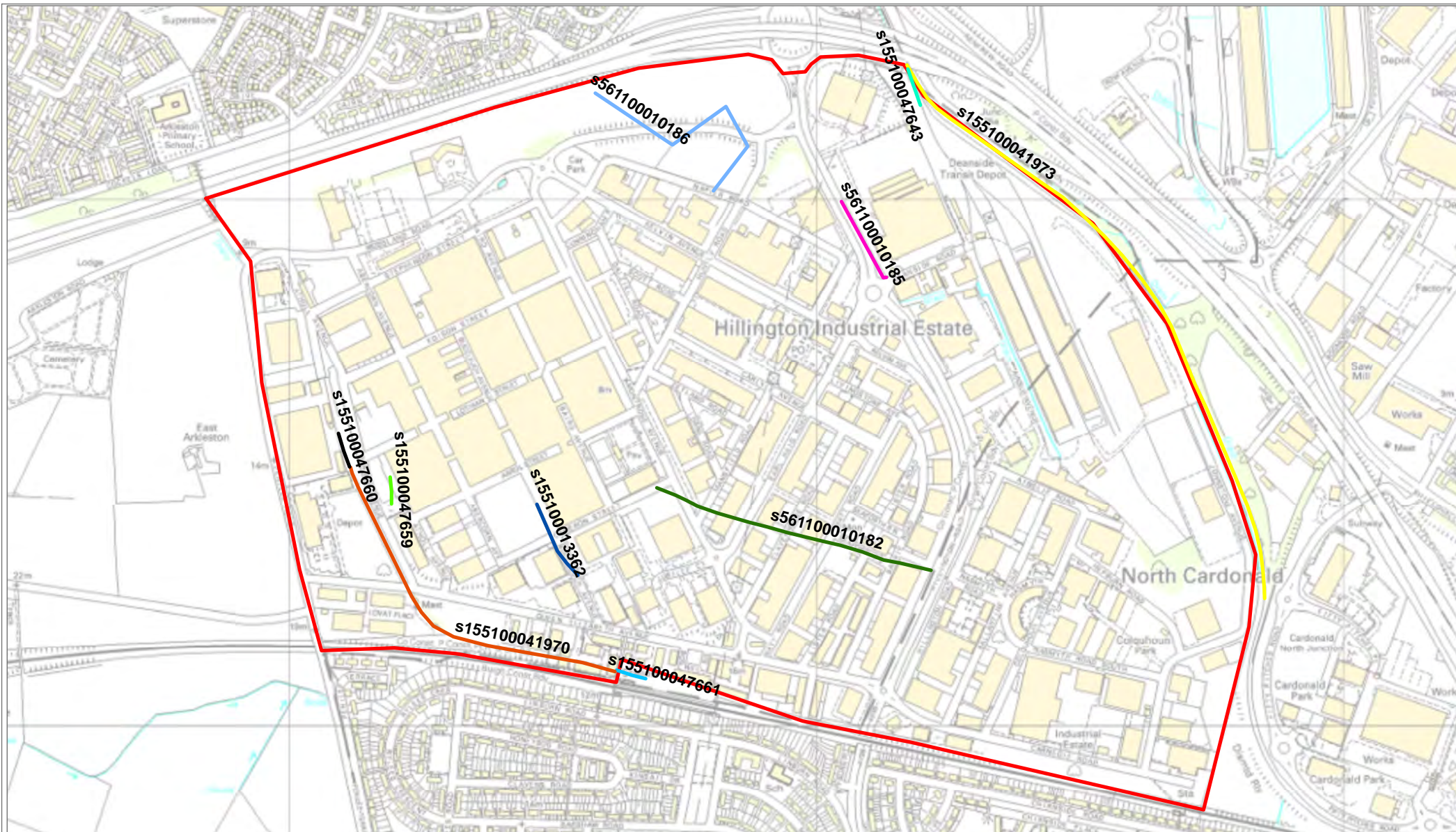
Map 3 - Hillington Industrial Estate



1:10,000

Notes: Site boundary shown in red.

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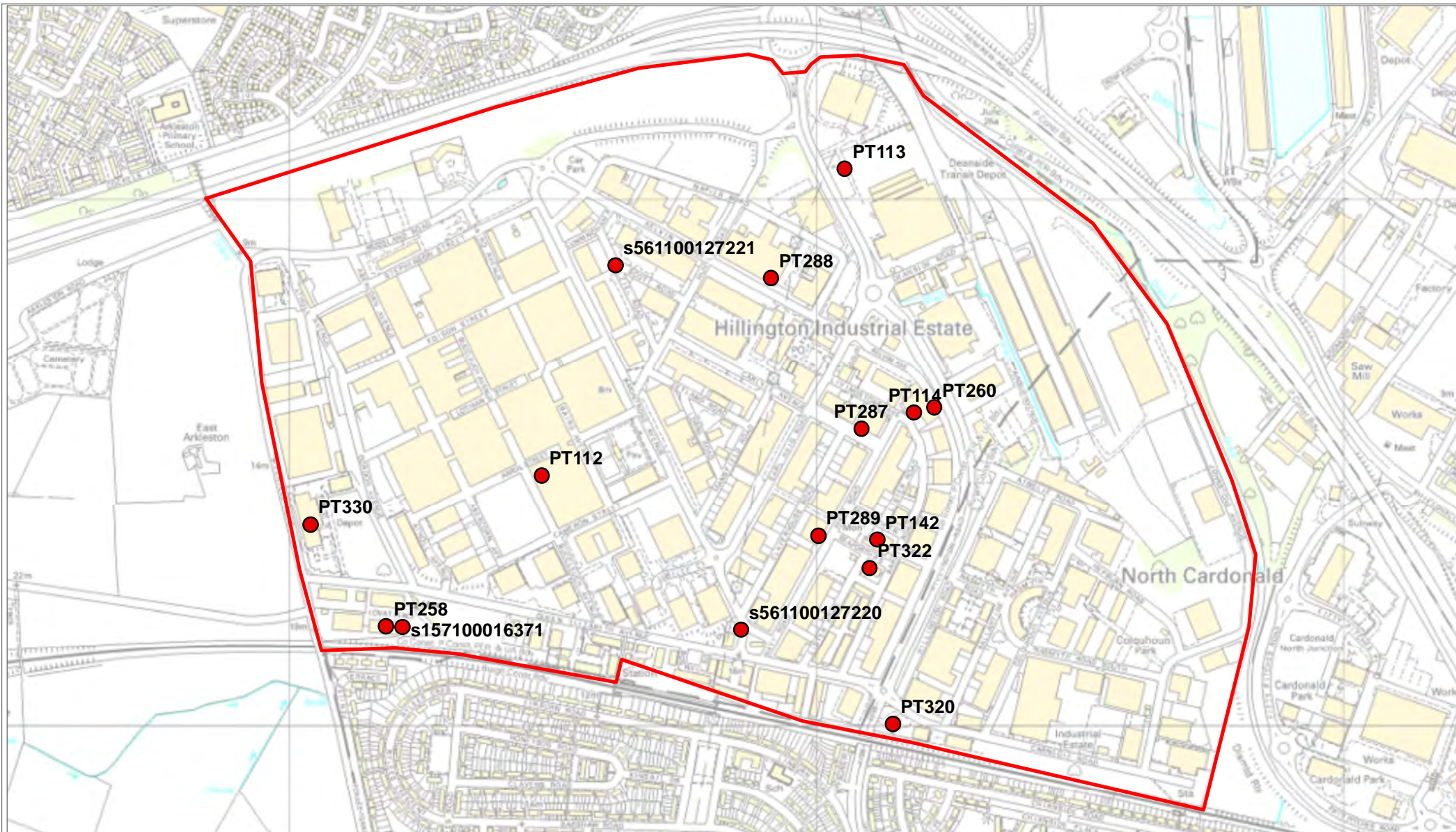
Map 4 - Hillington Industrial Estate



1:10,000

Notes: Site boundary shown in red.

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Map 5 - Hillington Industrial Estate

Notes: Site boundary shown in red.



1:10,000

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