CANARY WHARF
GROUP PLC

NQ.PA.28

North Quay
Ground Contamination Desk Study and Risk Assessment

Arup
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Contents

Executive Summary

Canary Wharf (North Quay) Ltd ("the Applicant") are submitting applications for Outline Planning Permission (OPP) and Listed Building Consent (LBC) to enable the redevelopment of the North Quay Site, Aspen Way, London ("the Site").

The Site is located in the north of the Isle of Dogs, within the administrative boundary of the London Borough of Tower Hamlets (LBTH), at Canary Wharf. The Site is bounded by Canary Wharf Crossrail Station to the south, Aspen Way (A1261) to the north, Hertsmere Road to the west and Billingsgate Market to the east. The West India Quay Docklands Light Railway (DLR) station and Delta Junction are located on the western side of the Site and the Site also incorporates parts of North Dock, Upper Bank Street and Aspen Way.

This report presents a ground contamination desk study compiling relevant available information relating to the application Site.

The Proposed Development of the Site involves demolition of existing buildings and structures and the erection of buildings and basements comprising business floorspace, hotel/serviced apartments, residential, co-living, student housing, retail, community and leisure and sui generis uses with associated infrastructure, parking and servicing space, public realm, highways and access works.

Most public open space will comprise hard cover or soft landscaping over the basement. However, some soft landscaping is expected in the north and northwest of the Site at grade over residual soils.

This report presents a review of historical mapping, environmental setting and sensitivity, and information from two phases of ground investigation. The results have been used to inform a ground contamination risk assessment which considers details of the Proposed Development.

The investigations identified generally low levels of soil and groundwater contamination which are not considered to present an unacceptable risk to human health or controlled waters, assuming risk management procedures are implemented during construction. Sporadic but low levels of asbestos have been identified in the Made Ground. The adoption of good industry construction practices and enhanced measures for controlling works with asbestos in soils are required.

The Proposed Development includes a basement across much of the Site to a maximum potential depth of -18mAOD. The Indicative Scheme, which demonstrates one interpretation of the Specified Development Parameters, incorporates a basement to a depth of -4.65m AOD.. The existing data suggests that most of the Made Ground soils might be classified as non-hazardous waste for disposal purposes with a proportion as inert waste. Some pockets of hazardous materials may be present locally. The presence of low levels of asbestos makes the likelihood of Made Ground materials being classified as inert as low. A summary of the risk assessment is presented in the table below.

Table A Summary of risk assessment

Receptor	Risk characterisation
Construction workers, neighbours and visitors during construction	Low to moderate (due to potential asbestos exposure) Appropriate risk management measures will reduce the risk to very low
Site users (residents, employees and visitors) during operation	Very low
Maintenance workers during operation (exposure in the event of excavations)	Low (assuming risk management)
Groundwater during construction	Very low
Groundwater during operation	Very low
Surface water during operation	Very low
Proposed landscaping	Very low

The existing phases of ground contamination investigation provide reasonable coverage over most of the Site area and sufficient information to inform the contamination assessment and status of the Site prior to development.

Testing of soils in the northwest (beneath the elevated DLR) is more limited than elsewhere, but the Site history and other information does not suggest that different conditions would be encountered in this relatively small area. The Proposed Development in this area will comprise vehicle access roads to basement car parking and external landscaping including soft landscaping. Recommendations for the management of risk during development is provided in section 7.4 and those measures are considered sufficient for areas with less testing.

It would be prudent to undertake some confirmatory soil testing in the north and north west of the Site prior to ground works to confirm health and safety procedures and waste classification. The testing might be limited to shallow soils, in the zone of proposed excavations, and will also inform the requirement for clean cover soils in areas of soft landscaping.

As there will be a significant amount of excavation for the basement, resulting in a large amount of waste disposal (or offsite recycling), some additional investigation might be considered on a voluntary basis prior to construction to better inform the classification of arisings. While there are two phases of investigation on the Site, the more detailed of those investigations is dated from 2001. The proportion of existing testing compared to likely volume of excavated material is low. It is not unusual for such a 'dig plan' to be undertaken by a contractor prior to excavation to allow a detailed pre-classification of arisings.

The report presents recommendations related to the development phase including for a watching brief, clean soil layers and marker sheets in landscaped areas, a foundation works risk assessment and the approach to verification during development.

Abbreviations

ACM	Asbestos containing material
ALARP	As low as reasonably practicable
Arup	Ove Arup & Partners Ltd
BTEX	Benzene, toluene, ethylbenzene and xylene
CAR	Control of Asbestos Regulations
CDM	Construction Design and Management Regulations
CFA	Continuous flight auger
CH_4	Methane
CO_2	Carbon dioxide
COMAH	Control of Major Accident Hazards
CRT	Canal and River Trust
CS	Characteristic situation
CWCL	Canary Wharf Contractors Ltd
CWG	Criteria working group
DLR	Docklands Light Railway
DOC	Dissolved organic carbon
DWS	Drinking water standards
EQS	Environmental quality standards
FES	Foundation and Exploration Services
FWRA	Foundation works risk assessment
GAC	Generic assessment criteria
GIA	Gross internal area
GSV	Gas screening value
H_2S	Hydrogen sulphide
Ha	hectares
HP	Hazard property
IPC	Integrated Pollution Control
IPCC	Integrated Pollution Prevention Control
JIWG	Joint Industry Working Group
LBC	Listed Building Consent
LBTH	London Borough of Tower Hamlets
LNR	Local Nature Reserve
mAOD	Metres above ordnance datum
m bgl	Metres below ground level
MCERTS	Environment Agency of England and Wales Monitoring Certification Scheme
NIHHS	Notifications of Installations Handling Hazardous Substances
NNR	National Nature Reserve
NQ	North Quay
O_2	Oxygen
OPA	Outline Planning Application
OPP	Outline Planning Permission
OS	Ordnance Survey
PAH	Polyaromatic hydrocarbons
PCB	Polychlorinated biphenyls
PLA	Port of London Authority
PTAL	Public Transport Accessibility Level
RMA	Reserved Matters Applications
RTD	River Terrace Deposits
SAC	Special Area of Conservation
SINC	Site of Importance for Nature Conservation
SOM	Soil organic matter
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
SSL	Structural slab level
TDS	Total dissolved solids
TOC	Total organic carbon
TPH	Total petroleum hydrocarbons

UKAS	United Kingdom Accreditation Service
UKWIR	UK Water Industry Research
USEPA	United States Environmental Protection Agency
VOC	Volatile organic compound
WAC	Waste acceptance criteria
WFD	Water Framework Directive
WHO	World Health Organisation
WQS	Water Quality Standard

1. Introduction

1.1 Overview

Canary Wharf (North Quay) ("the Applicant") are submitting applications for Outline Planning Application (OPA) and Listed Building Consent (LBC) to enable redevelopment of the Aspen Way, London ("the Site").

Two separate applications are being submitted for the works. The applications will seek permission for:

- Application NQ.1: Outline Planning Application (all matters reserved) - Application for the mixed-use redevelopment of the Site comprising demolition of existing buildings and structures and the erection of buildings comprising business floorspace, hotel/serviced apartments, residential, co-living, student housing, retail, community and leisure and sui generis uses with associated infrastructure, parking and servicing space, public realm, highways and access works.
- Application NQ.2: Listed Building Consent - Application to stabilise listed quay wall and any associated/necessary remedial works as well as demolition of the false quay in connection with Application NQ.1.

The description of the Proposed Development is as follows:

Application for outline planning permission (all matters reserved) for the redevelopment of the North Quay site for mixed use comprising:

- *Demolition of existing buildings and structures;*
- *Erection of buildings and construction of basements;*
- *The following uses:*
    - *Business floorspace (B1)*
    - *Hotel/Serviced Apartments (C1)*
    - *Residential (C3)*
    - *Co-Living (C4/Sui Generis)*
    - *Student Housing (Sui Generis)*
    - *Retail (A1-A5)*
    - *Community and Leisure (D1 and D2)*
    - *Other Sui Generis Uses*
- *Associated infrastructure, including a new deck over part of the existing dock;*
- *Creation of streets, open spaces, hard and soft landscaping and public realm;*
- *Creation of new vehicular accesses and associated works to Aspen Way, Upper Bank Street, Hertsmere Road and underneath Delta Junction;*

- *Connections to the Aspen Way Footbridge and Crossrail Place (Canary Wharf Crossrail Station);*
- *Car, motorcycle, bicycle parking spaces, servicing;*
- *Utilities including energy centres and electricity substation(s); and*
- *·Other minor works incidental to the proposed development.*

The Outline Planning Application ("OPA") includes three Control Documents which define the Specified Parameters for the Proposed Development. These Control Documents are – (1) the Development Specification; (2) the Parameter Plans; and (3) the Design Guidelines.

At the time of making the OPA, the Applicant is unable to determine exactly how much of the Proposed Development is likely to come forward in which land use and for this reason the OPA is made for ranges of floorspace within each proposed land use category. These ranges ensure that the Proposed Development must deliver a quantum of development within each land use within the range that has been specified.

The Parameter Plans indicate which Development Zones may be suitable for which use and therefore manage where the proposed uses could arrive on the OPA Site. The Parameter Plans also identify features such as maximum building heights; areas of public realm; and access and circulation routes. The Parameter Plans are set up to provide a level of flexibility for the detailed design of the scheme at a later date which will need to be approved by the local planning authority through subsequent Reserved Matters Applications ("RMAs").

1.2 Report objectives

The objectives of this report are to identify and assess the existing information relating to ground conditions, environmental setting and development constraints as they relate to ground contamination. This is intended to support the OPA and LBC. The report will specifically:

- Provide a review of past and current uses of the and the surrounding area, discussing the environmental setting and nature of potentially contaminative sources to establish a conceptual Site model;
- Discuss the findings of a Site reconnaissance;
- Describe the ground investigations undertaken on the Site and present the ground conditions and level of ground contamination on the Site;
- Undertake a generic quantitative risk assessment of the contamination based on the results of the ground investigations taking into consideration the form of the Proposed Development; and
- Provide recommendations regarding the implications of the findings for the development of the Site.

1.3 Information sources

A number of contamination related reports have been prepared for the Site, comprising multiple phases of desk studies and ground investigations. The latest contamination assessment was presented in August 2016 and was submitted pursuant to planning conditions for the extant permission on Site. The main reports prepared for the Site are listed below:

- Arup (August 2016), North Quay, Ground Contamination Assessment [1];
- Environ (March 2003), North Quay Environmental Statement, Chapter 12 Soil Environment and Land Contamination [2];
- Arup (August 2002), North Quay and Great Wharf, Geotechnical Interpretative Report [3];

- Arup (December 2001), North Quay and Great Wharf, Further Desk Study [4];
- Arup (August 2001) North Quay False Quay and Banana Wall, Desk Study [5]; and
- Arup (April 2001) Shed 35, North Quay Desk Study [6].

In addition, further investigation and assessment of ground and contamination conditions in the adjacent North Dock has been carried out for the Canary Wharf Crossrail Station, immediately to the south of the Site, assessed by Arup in January 2009 [7].

Several phases of ground investigation have been carried out on the Site, of which two have included ground contamination testing of soils, groundwater and ground gas. The information is presented in the following factual reports:

- Concept Site Investigations (August 2016) [8]; and
- Foundation and Exploration Services (FES) (February 2001) [9].

It is understood that there have been no significant changes to the use of the Site and no new contamination sources since the 2016 investigation.

The following ground investigations were carried out for geotechnical design purposes, with the information used to inform ground conditions in this report:

- Ground conditions at the North Quay Site (Foundation and Exploration Services 1990) [10]
- Ground conditions at the North Quay Site (Soil Consultants 1988) [11]

An environmental search report (Groundsure report) has been obtained for the Site in 2020 (ref: GS-734108), which contains historical Ordnance Survey (OS) and other mapping and environmental data. The Groundsure report is included in Appendix A.

1.4 Limitations

This report has been produced by Arup for use by the Applicant in connection with the Proposed Development of the North Quay Site. It is not intended for and should not be relied upon by any third party except as provided for in Arup's agreement with the Applicant.

Arup has based this report on the sources detailed within the report text and believes them to be reliable but cannot and does not guarantee the authenticity or reliability of third-party information. Notwithstanding the efforts made by the professional team in undertaking this assessment, it is possible that ground conditions other than that potentially indicated by this report may exist at the Site.

This report does not present a survey or assessment of the location, condition or liabilities associated with hazardous materials in the building fabric such as (but not limited to) asbestos containing materials or lead. This report has been prepared based on current legislation, statutory requirements, planning policy and industry good practice prevalent at the time of writing. Any subsequent changes or new guidance may require the findings, conclusions and recommendations made in this report to be reassessed in the light of the circumstances.

2. Site description

2.1 Site description

The Site is located in the north of the Isle of Dogs, within the administrative boundary of the London Borough of Tower Hamlets (LBTH) at Canary Wharf. The National Grid Reference at the approximate centre of the Site is E537632, N180540. The Site location is indicated on Figure 1.

The Site is 3.28 hectares (ha) in area. Currently the Site comprises mostly cleared land, being previously used as a construction laydown Site for the Canary Wharf Crossrail Station. There are some temporary uses currently onsite, including the LBTH Employment and Training Services, WorkPath employment centre and advertising structures.

A Grade I Listed brick dock wall (Banana Wall) exists below the surface of part of the Site, which originally formed the dockside until it was extended over to the south.

Existing access to the Site for vehicles is from Upper Bank Street to the east and Hertsmere Road to the west, which both link to Aspen Way. The Site is not currently accessible to the public, however pedestrian routes are located on each side of the Site (Aspen Way, Hertsmere Road, Upper Bank Street, and the western part of the dockside to the south). The Aspen Way footbridge which leads to Poplar also lands on the southern side of Aspen Way.

The Site is highly accessible by public transport. The West India Quay DLR station is located on the Site with piled viaducts which run across the site. The Poplar DLR station is accessed directly from the Aspen Way Footbridge and the Canary Wharf Crossrail Station is located immediately to the south of the Site, beyond which are the Canary Wharf underground and DLR stations. The Site's Public Transport Accessibility Level (PTAL) varies from 5 ('very good') to 6a ('excellent'), with improved PTAL closer to Upper Bank Street. The score is expected to improve to 6a across the entire Site by 2021 owing to the planned opening of the Crossrail Station.

Beyond the Site, 1 West India Quay (the Marriot Hotel (107mAOD) and residential building (41mAOD)) are located to the west, adjacent to the DLR tracks. Beyond these, along Hertsmere Road is a cinema, museum, shops, restaurants and other leisure facilities, forming part of the West India Quay Centre.

Billingsgate Market is located to the east of the Site, on the opposite side of Upper Bank Street. Billingsgate Market is identified as a Site Allocation (4.2: Billingsgate Market) for redevelopment in LB Tower Hamlets Local Plan.

To the north of the Site on the other side of Aspen Way are the Tower Hamlets College and The Workhouse leisure facility. They comprise part of a Site Allocation (4.1: Aspen Way) for redevelopment in LB Tower Hamlets Local Plan. In close proximity to these there are lower rise residential properties (some with shops beneath them) as well as the Poplar Recreation Ground.

Beyond the Crossrail station and Crossrail Pace to the south of the Site is the Canary Wharf commercial area, with buildings closest to the Proposed Development including the HSBC (200mAOD), Bank of America and One Canada Square buildings (235mAOD).

The ground surface within the application Site is predominately at an elevation of approximately +5 metres above ordnance datum (mAOD) with levels ranging from +3.3mAOD to +6.5mAOD. The North Quay dock wall, towards the south boundary edge is at approximately +5.3mAOD.

2.2 Listed building works

Towards the south of the Site, the edge of the dock is defined by a quay wall known as the Banana Wall. The brickwork has a profile and counterfort buttresses, on a gravel bed. The Banana Wall was constructed between 1800-1802 and was Listed Grade I in 1983.

Extending from the southern side of the Banana Wall is a False Quay which consists of concrete slab supported on concrete filled cylinder piles extending into the River Terrace Deposits (RTD) beneath the dock. The average North Dock water level is +4.19mAOD and is controlled by the Port of London Authority (PLA). The full impounded level is +4.23 mAOD.

The Proposed Development will span over the Banana Wall with piles on either side of the wall providing support to the new structures. The new structures will leave a void or compressible material above to avoid permanent loading of the wall. The adjacent existing false quay deck will be removed. The excavation of the basement may require stabilisation works to be undertaken to ensure there are no impacts to the Banana Wall. Remedial works to the Banana Wall will also be undertaken if required.

2.3 Environmental reconnaissance

An environmental reconnaissance survey of the Site was carried out on 26 July 2016. The layout of the Site and key Site features at this time are shown on Figure 2. At this time, six temporary construction Site offices and sheds were in the south western and eastern areas of the Site. The rest of the Site was used for storage of equipment and materials for Canary Wharf Contractors Limited (CWCL). Some façade mock-ups were constructed in the north eastern area for use on other projects. Site hoarding runs around the perimeter of the Site to prevent public access. Most of the Site was generally covered with hard standing concrete, asphalt or granular hard fill. Areas of rough vegetation are present locally in the north of the Site.

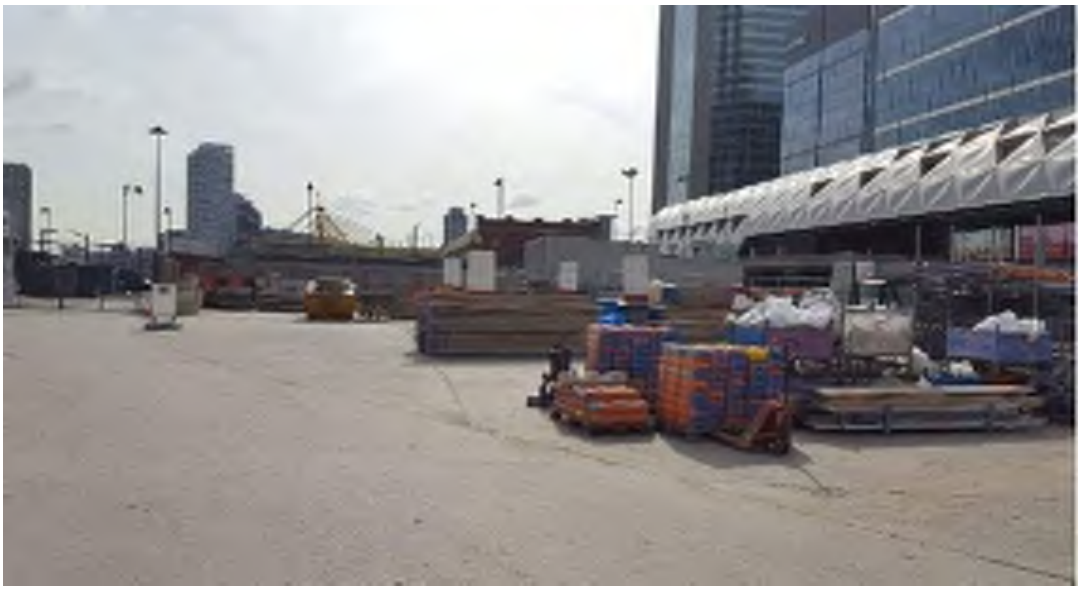
It is understood that there have been no significant changes to the use of the Site, and no new contamination sources since the 2016 reconnaissance.

A selection of photographs of the features identified onsite taken during the environmental reconnaissance survey are provided in Table 1.

Table 1 Site photographs and description (2016)

Site photographs and description
1. The Site is used for storage of construction materials and equipment. This included localised small-scale stockpiles of crushed concrete. During the reconnaissance survey the Site was generally observed to be well set out and controlled.


Site photographs and description



Site photographs and description

2. A number of skips were located onsite. Materials appeared to be well segregated and controlled onsite.

3. An above ground fully contained mobile fuel storage tank was present on the Site. The operations appeared to be organised and well managed.

Site photographs and description

4. A series of dewatering wells are present on the Site. These are used to maintain a reduced head of groundwater in the lower aquifer, to facilitate development on the wider Canary Wharf estate.

2.4 **Proposed Development**

Canary Wharf (North Quay) Ltd (“the Applicant”) are submitting applications for Outline Planning Permission ("OPP") and Listed Building Consent ("LBC") to enable the redevelopment of the North Quay site, Aspen Way, London (“the Site”). Two separate applications are being submitted, as follows:

- Application NQ.1: Outline Planning Application (all matters reserved) (”OPA”) - Application for the mixed-use redevelopment of the Site comprising demolition of existing buildings and structures and the erection of buildings comprising business floorspace, hotel/ serviced apartments, residential, co-living, student housing, retail, community and leisure and sui generis uses with associated infrastructure, parking and servicing space, public realm, highways and access works; and

- Application NQ.2: Listed Building Consent (“LBCA”) - Application to stabilise listed quay wall and any associated/ necessary remedial works as well as demolition of the false quay in connection with Application NQ.1.

Together the development proposed under Applications NQ.1 and NQ.2 are referred to as the “Proposed Development”.

At the time of making the OPA, the Applicant is unable to determine exactly how much of the Proposed Development is likely to come forward in which land use. For this reason, the description of development provides the Applicant with flexibility as to the uses that could be undertaken on the Site.

However, in order to ensure that the level of flexibility is appropriately restricted, the OPA seeks approval for three Control Documents which describe the principal components of the Proposed

Development, define the parameters for the Proposed Development (the "Specified Parameters") and control how the Proposed Development will come forward in future. They provide the parameters, design principles and controls that will guide future reserved matters applications (“RMAs”). These Control Documents are – (1) the Development Specification; (2) the Parameter Plans; and (3) the Design Guidelines:

- The Development Specification sets out the type and quantity of development that could be provided across the Site (including setting a maximum floorspace across the Site);

- The Parameter Plans set the parameters associated with the scale, layout, access and circulation and distribution of uses classes and public space for the Proposed Development. They also establish the Development Zones and Development Plots across the Site; and

- The Design Guidelines set the design principles and controls for future development.

Together, these documents set out the information required to allow the impacts of the Proposed Development to be identified with sufficient certainty as future RMAs will be required to demonstrate compliance with the Specified Parameters and controls in these Control Documents.

The Parameter Plan for land uses below ground (drawing: NQMP-PP-003) provides a maximum extent for a basement which covers most of the Site to a maximum potential depth of -18mOD. In the Indicative Scheme the structural slab level (SSL) of basement level B1 is at +1.55mAOD and the SSL of B2 is at -2.80mAOD (with a slab below this level). Locally beneath some areas of public open space, the SSL of the basement in the Indicative Scheme will be at -4.65mAOD (as show on the general arrangement section drawings).

The basement walls will be thick secant pile perimeter walls which run approximately 5m from the northern Site boundary; along the western edge of Upper Bank Street to the east, approximately 30m north of the Banana Wall to the south and up to 15m east of the DLR viaduct on the west of the Site. Basement areas may be used for retail, business, community or leisure uses or for ancillary plant, servicing areas, car and cycle parking, storage areas, energy centres and electricity substations.

The building development footprint will cover most of the Site at ground level. Proposed levels are +6.2 mAOD across most of the Site which represents an increase in elevation from current levels. The level outside the building footprint will drop gently in the east to +6.0 mAOD where it connects with the existing level of Upper Bank Street. The levels along the Quayside along the southern boundary will be +5.8 m AOD. Site levels along the northern boundary with Aspen Way will remain at between +4.0 mAOD and +4.6mAOD, gently falling from the from east to west.

A minimum area of 0.4ha of public open space is proposed across the Site and open spaces will comprise squares, plazas and gardens. Landscaping is proposed within these areas and includes soft planting, trees and hard landscaping. Most of the soft landscaping will be above basement levels, except for 'The Delta' beneath the existing DLR viaduct in the northwest, and 'Aspen Way Gardens' along the northern boundary of the Site. This is shown on the Indicative Scheme general arrangement plan for ground floor level (drawing: 19141-00-07-100).

New vehicle and pedestrian routes through the Site will connect the Proposed Development to the surrounding area.

2.5 Environmental setting

Information on the environmental setting of the Site has been obtained from the historical reports detailed in Section 1.3, through review of Environment Agency [12] and DEFRA [13] online databases and the 2020 Groundsure report, included as Appendix A. A summary of the environmental setting is presented in the following subsections for the Site, as defined in Figure 1.

2.5.1 Environmentally sensitive areas

The adjacent North Dock is a Site of Importance for Nature Conservation (SINC). The Groundsure report confirms that there are no nationally designated ecological receptors such as Sites of Special Scientific Interest (SSSI), Special Areas of Conservation (SAC), National Nature Reserves (NNR), Local Nature Reserves (LNR), Special Protection Areas (SPA), RAMSAR sites or Marine Conservation Zones on or within 500m of the Site. A LNR is indicated approximately 1km to the west of the Site, associated with Russia Dock Woodland.

The Site is situated in an intermediate probability radon area, as between 1% and 3% of homes are above the action level. No radon protective measures are required in the construction of new dwellings based on the British Geological Survey, National Geoscience Information Service and Public Health England.

2.5.2 Hydrogeology and hydrology

The groundwater regime is identified as comprising an upper and lower aquifer, separated by the Clay layers of the Lambeth Group, which acts as an aquitard. The upper aquifer comprises the River Terrace Deposits (RTD), with the lower aquifer indicated to comprise the lower granular beds of the Lambeth Group (Reading and Upnor Formation), Thanet Sand and Chalk.

The RTD is classified as a Secondary A aquifer. The Lambeth Group and Thanet Sands are classified as Secondary A aquifers. The Chalk deposits at depth are regionally classified as a Principal aquifer. The Lambeth, Thanet and Chalk are generally considered to be in hydraulic continuity and termed the basal sands aquifer (lower aquifer).

The Site is not located within a groundwater source protection zone (SPZ).

The Site is in the northern edge of North Quay (formerly West India Import Dock). The dock water level data received from the Canal and River Trust (CRT) has been reviewed and range between approximately +4.55mAOD and +3.95mAOD in the docks between 2012 and 2014; the average water level is +4.19mAOD.

London is protected by statutory flood defence levels along the River Thames which are maintained by the Environment Agency. The dock water level is maintained by tidal recharging from the Thames by the Harbourmaster dock entrance. The statutory flood defence level applicable to the Isle of Dogs is +5.23mAOD. This is the physical level the walls have to be constructed to in order to provide an appropriate level of flood protection.

2.5.3 Groundwater dewatering

It is known that the water level in the lower aquifer has historically been artificially depressed because of dewatering and levels are understood to be rising. Dewatering of the lower aquifer started in August 2008 to facilitate construction of Canary Wharf Crossrail Station. The dock water within the station box cofferdam was drained by mid-March 2010. Water was returned to the station box cofferdam area in November 2011 leaving the lower aquifer dewatering to continue.

Further dewatering has occurred since July 2013 to facilitate the Cross Passage 13 (CP13) construction to the south east of North Quay. The lower aquifer level is shown to be influenced by dewatering from the wells installed onsite (shown on Figure 2). Groundwater levels have been determined based on current information at the Site however due to completion of dewatering for Crossrail in early November 2016.

Prior to switching off the dewatering in early November 2016 the piezometers in the Thanet Sand were recorded "dry" and the piezometers within the Chalk recorded water levels between -43.0mAOD and -42.6mAOD on 18 October 2016. This information indicated that beneath North Quay the groundwater level of the lower aquifer was around -42 to -43mAOD (as at 18 October 2016). Pumping stopped at wells CRW1, CRW2, and CRW4 (located onsite), and CRW10 and CRW11 (offsite) on 01 November 2016. Recent readings indicate lower aquifer is now recovering and measured at around -32mAOD on 28 November 2016, less than a month after pumping stopped at five wells.

Dewatering at basement level for the Marriot Hotel, which is 100m to the west of the Site, may affect the levels in the upper aquifer. More drawdown is expected on the west side of the Site closer to the Marriot.

2.5.4 Environmental permitting and registers

The Site is not recorded on the Local Authority's Contaminated Land Register of sites designated under Part 2a of the Environmental Protection Act 1990.

There are no historical Integrated Pollution Control (IPC) authorisations or Integrated Pollution Prevention Control (IPPC) permits within 500m of the Site. One pollution incident to controlled waters is identified within 250m of the Site, relating to a category 3 minor approximately 14m west of the Site from soils and clay.

There are currently no registered landfill sites, Control of Major Accident Hazards (COMAH), Notifications of Installations Handling Hazardous Substances (NIHHS) or historical or licensed industrial activities identified by the Groundsure report on or within 500m of the Site.

There are three records of Part B installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 for petrol vapour recovery (historical permit, 380m west) and dry cleaning (current permits, 445m and 495m west). There is one historical landfill (Poplar Dock) located approximately 370m east of the Site and one historical waste site located 90m east (Billingsgate Market recycling building). There is one licensed waste site 275m south east for mobile plant treatment. There is one waste exemption onsite for storage of waste in secure containers, storage of waste in a secure place and use of waste in construction. The potential for contamination at the Site due to these activities is negligible due to the small scale and/ or distance from the Site.

The environmental data search identifies no significant recent industrial land uses on or within 250m of the Site. Current onsite industrial uses comprise the West India Quay DLR station in the west, an electricity substation in the north east and moorings and unloading facilities. The closest offsite recent industrial land uses relate to mooring and unloading facilities, travelling cranes, stone quarrying and preparation, vehicle hire, food products and electricity substations.

Former garages were located approximately 370m to the west and 430m to the north of Site. There are no former or active fuel station sites within 500m.

2.6 Site history

Development on the Site had occurred by 1822, comprising nine bonded warehouses and a landing shed. Roads were located on the northern side of the warehouses, with the Blackwall Railway (and sidings) to the north. Terraced housing with gardens, fronting on to Poplar High Street, and a larger building labelled the Poplar Union Workhouse were present to the north (offsite) from before the 1860s. By 1896 the London and Blackwall Railway had been developed extensively with additional railway lines to the north. The area was subject to aerial bombing during World War Two. From the 1950s the former workhouse was labelled as a Supplies Depot (LCC) and had been cleared by the late 1960s. The removal of the warehouses from the Site appears to have been undertaken from the 1970s to the early 1990s.

During the 1990s and 2000s the Site was used as a car park. A small substation was present in the centre of the Site from 1989 and several small electricity substations are noted to the north (offsite). By the early 1990s the rail tracks to the north were replaced by the DLR and the Aspen Way pedestrian footbridge had been constructed.

More recently the Site has been used as storage and construction compounds for adjacent developments and the Canary Wharf Crossrail Station.

A more detailed review of the Site history is presented in the following subsections.

2.6.1 Pre-dock land use

During the middle Ages, the Isle of Dogs is reputedly the area where the King's hunting dogs were kept. This suggests that, as early as the fourteenth or fifteenth century, it was drained and protected from flooding.

Available information shows little further development in the area until the start of the nineteenth century.

The 1588 map was drawn to show defences of the Thames in 1588. This shows the area of Ile of Dogges (Isle of Dogs) prior to any development. The area is denoted as Saunders Nesse which means fore-shore of Saunders. Part of Gascoyne's 1703 plan of the Isle of Dogs and Blackwall, which is the earliest accurate map of the area prior to any development, shows the area called the Hamlet of Poplar and there was a path running north-south in the area. The 1746 John Rocque Map shows the development of Poplar Township and several roads and paths formed in the general area.

2.6.2 Dock construction

In 1799 work started on the construction of the West India Import Docks, the northern part of which is known as North Dock. It was officially opened in 1802 as the first dock on the Isle of Dogs. The Banana Wall, comprising a concave shaped brick dock wall lined with puddle clay, was constructed to retain the surrounding wharves. The area behind the wall was backfilled with gravel, which was likely to have been excavated during construction of the docks.

A series of nine warehouses and link buildings were subsequently constructed along the north of the dock by 1822. Warehouses three to six were located on the Site and are indicated by Goad Insurance Plans to have stored dry products such as rice and wood. Later aerial photographs indicate warehouse buildings on the Site to have had a basement below quay level.

The London and Blackwall railway was located to the north of the Site by 1837. Between 1912 and 1915 the False Quay was constructed over the dock to extend the quay working area. New wooden transit sheds were subsequently erected, spanning the False Quay and the Banana Wall.

2.6.3 During and post-World War Two

Records indicate that during World War Two the area was bombed extensively. The warehouses on the north side of the dock were partly destroyed, although the False Quay and transit sheds appear not to have been significantly damaged.

In the 1960s and 1970s the dock and associated industries were closed. The Site was cleared, and basements backfilled and paved over to form a car park.

In October 1981 the Isle of Dogs was made into an Enterprise Zone and the area started a period of regeneration. Between 1984 and 1992 the remaining dockside buildings on the north side of the Import Dock were demolished and the cranes removed.

2.6.4 Recent history

Prior to 2002 the Site was in informal use as a lorry park and holding area, with a similar mix of surfacing reported as can be currently observed on Site.

Since around 2002 the Site was used as a compound and materials storage area for the various developments that have taken place to the south of the Site, including Crossrail Place and Wood Wharf.

2.7 Conceptual site model

2.7.1 Potential for contamination

Based on the results of the desk-based assessment, including a review of the Site history, environmental setting and the results of the historical phases of ground investigation, several potential sources of contamination have been identified on the Site as presented in Table 2.

Table 2 Potential sources of ground contamination

Potential source of contamination	Potential Contaminants
Dockside activities: The Site has been used for warehousing of typically dry goods (rice, wood and coconuts are mentioned on insurance plans) and not heavily contaminating. There may have been fuel or similar storage on Site (for instance for heating and power).	Metals, inorganic compounds, asbestos, coal, coke, ash, hydrocarbons
Railway sidings for coal storage and distribution of goods (limited to the north and offsite areas)	Coal, coke, ash, hydrocarbons (from spills and leaks), asbestos, herbicides (from weed control processes).
Made Ground and fill, associated with backfill behind the dock wall during construction (floodplain gravel) and fill originated from demolition materials.	Made Ground materials may comprise a range of contaminants such as metals, sulphates, petroleum hydrocarbons and asbestos. A range of metals and metalloids may be present in dredgings, such as lead, zinc, cadmium, copper, chromium, tin and arsenic. Made Ground may be a potential source of hazardous ground gases such as methane, hydrogen sulphide and carbon dioxide.
Dock sediment (in North Dock)	Metal and hydrocarbon contamination of dock sediments is not uncommon since many metals and some hydrocarbons (especially those denser than water) are insoluble in the aquatic environment and tend to be associated with deposited solids. Dock sediments can contain hydrocarbon products and inorganics as a result of spillages or run-off from neighbouring industries.
Natural organic Alluvium and peat	Pockets of peat have been encountered in the Alluvium beneath the Site, which may be a natural source of methane and carbon dioxide.

2.8 Potential receptors

The following potential receptors have been identified during and after development:

1. Site workers during construction, particularly during the excavation of the basement and other groundworks;

2. surrounding neighbours during the groundworks at the Site;

3. Site users during operation of the development, comprising residential and commercial user and the general public;

4. maintenance workers after completion of the development;

5. groundwater during and after the construction of the development (the Chalk principal aquifer and the RTD secondary A aquifer);

6. surface water in the neighbouring dock (SINC) during and after the construction of the development and the River Thames;

7. building materials and services; and

8. landscaping flora.

2.8.1 Plausible pollutant linkages

The plausible pollutant linkages (PPL) from the contamination sources identified on the Site and in the surrounding area, taking into consideration the Proposed Development, are outlined in Table 3.

Table 3 Plausible pollutant linkages

Pathways	Receptors	PPL
Human health during construction		
Ingestion of soils and dust, dermal contact with soils and dust	Site construction workers & visitors	YES Between construction workers and potentially contaminated soils or groundwater during the basement excavation works and general groundworks, and from potentially contaminated dock sediment from pile arisings.
Inhalation of gas and vapours		YES Between ground gases and vapours arising from volatile contaminants in the soil and groundwater and workers (predominantly ground workers) entering confined spaces, such as excavations.
Ingestion of dust, dermal contact with dust or inhalation of dust	Site neighbours and general public	YES Between potentially contaminated soils disturbed during construction and neighbours due to fugitive dust, particularly during the basement excavation works.
Human health during operation		
Ingestion of soils and dust, dermal contact with soils and dust or inhalation of dust	Future Site workers and residents	YES (limited) The basement will extend beneath most of the Site area and external areas will predominantly comprise hard landscaping. Soft landscaping at ground level is anticipated in the area beneath the DLR viaduct in the northwest and west of the Site and tree planting is proposed along the northern and eastern Site boundaries. Elsewhere areas of soft landscaping will be above basement level. Landscaping will be formed of imported landscaping soils.
Inhalation of vapour/ ground gas		YES (limited) It is anticipated that the Made Ground and Alluvium will be removed from beneath the buildings by the basement excavation, although some Alluvium may

Pathways	Receptors	PPL
originating from land-based sources		remain locally depending on the excavation depth. Ground gas sources will be limited to relatively small residual areas beneath the buildings around the edge of the basement.
Controlled waters during construction		
Vertical and lateral infiltration and dispersion	RTD secondary aquifer	YES (limited) A secant pile wall will be constructed in advance of the basement excavation which will form a groundwater cut-off in the upper aquifer.
Creation of preferential pathways, with downward groundwater migration	Chalk principal aquifer	YES (limited) The piling works will penetrate through the Lambeth Clay separating the upper and lower aquifers. Appropriate design and controls to the piling operations will need to be implemented.
Controlled waters during operation		
Vertical and lateral leaching, infiltration and dispersion	RTD secondary aquifer	YES (limited) Most of the Site area will be occupied by the basement which will have removed the Made Ground soils. External areas beyond the basement will predominantly be hard standing, however some soft landscaping at ground level is anticipated beneath the DLR viaduct (west and northwest) and along the northern and eastern boundary of the Site.
	Chalk principal aquifer	NO On completion of the development, no potential pollutant pathways to the aquifer will exist.
Vertical and lateral leaching, infiltration and dispersion Surface water runoff	Surface waters (dock water)	YES (limited) Groundwater levels in the RTD and dock water levels are distinct, indicating limited hydraulic connectivity. Surface water runoff to the adjacent North Dock could occur but is expected to be through clean materials. The runoff will be controlled by the drainage systems.
Other		
Uptake of phytotoxic contaminants	Flora	YES (limited) Soft landscaping at ground level is anticipated beneath the DLR viaduct (north west) and along the northern and eastern boundaries. Soft landscaping will be formed using appropriately specified imported landscaping soils. An appropriate thickness of soils will be required.
Direct contact	Building materials and utilities	YES (although controllable with appropriate design) During operation a plausible pollutant linkage exists between buildings materials and potentially aggressive soils and groundwater. Building materials normally identified as being at risk on contaminated Sites are concrete, plastic and metals, and potable water supply pipes.

3. Geology and ground conditions

3.1 Ground investigations

The ground contamination investigation of the Site has been undertaken in two phases, initially in 2001, with a supplementary investigation undertaken in 2016. The scope of the investigations was designed taking into consideration the historical uses and potential sources of contamination identified following desk-based assessment. The overall coverage constitutes a main investigation of the Site, in accordance with BS 10175 [14]. The exploratory hole location plan undertaken for contamination purposes from the 2001 and 2016 ground investigations is shown on Figure 3. Further historical exploratory holes have been undertaken on the Site to inform the ground conditions and geotechnical design, as discussed in Section 3.2.

The scope of the investigations as it relates to contamination are presented in the following subsections. The ground conditions the chemical data and monitoring are considered as a single Site wide dataset in Section 4.

3.1.1 FES 2001

The 2001 FES investigation comprised 11 boreholes and 12 trial pits, providing exploratory holes at a spacing in the order of approximately 10m to 50m across the Site. 37 soil samples were analysed for a suite of commonly occurring chemical determinands including, metals and metalloids, total phenol, total polyaromatic hydrocarbons (PAH), total petroleum hydrocarbons (TPH), and asbestos screen. In addition, two samples of dock silt from the area of the false quay were selected for analysis.

Seven groundwater samples taken from four standpipes. Two standpipes (BH514 and BH517) had response zones in the RTD and two (BH516 and BH520) had response zones to capture perched groundwater in the Made Ground and Alluvium. Groundwater samples were analysed for a range of determinands including: metals and metalloids, general inorganics, phenols, speciated PAH, and TPH. Chemical laboratory analysis was undertaken by City Analytical Services PLC.

Four rounds of gas monitoring were carried out in three standpipes (BH511, BH516 and BH520) with response zones in the Made Ground and Alluvium. The standpipes were constructed with a double valve and suspended tube system allowing recirculation of gases within the standpipe and readings from both the top and the bottom of the standpipe.

3.1.2 Concept 2016

The 2016 Concept investigation was designed to supplement the 2001 contamination investigation, filling in gaps in the coverage of the Site and to benchmark the conditions previously recorded against current standards. The objectives of the investigation were to:

- confirm levels and thicknesses of the shallow stratigraphy;
- investigate the potential presence of contamination at the Site to current laboratory test standards;
- confirm groundwater levels within the RTD and obtain groundwater samples for laboratory analysis to current laboratory test standards; and
- obtain further information to confirm the ground gas regime in Made Ground soils.

The scope of the investigation comprised the following:

- Two light cable percussive boreholes (BH801A and BH802) were drilled to depths of 14m and 13.6 metres below ground level (m bgl) to prove the full thickness of the RTD; with groundwater monitoring standpipes installed with response zones in the RTD.
- Six windowless sample boreholes (WS804, WS805 to WS809) were drilled to depths of 4m bgl. Two further windowless holes were attempted in the southeast of the Site

(WS804 and WS810), however, these were terminated at 0.4m bgl due to the presence of thick concrete that could not be penetrated. Ground gas monitoring standpipes were installed within the made ground in four of the windowless boreholes.

- Groundwater samples were recovered on one occasion from each of the standpipes installed within the RTD (BH801A and BH802) on 28 July 2016.

- Gas monitoring was carried out on four occasions between 28th July and 9th August 2016, from each of standpipes installed within the made ground (WS803, WS806, WS808 and WS809). The standpipes were constructed with a double valve and suspended tube system allowing recirculation of gases within the standpipe and readings from both the top and the bottom of the standpipe.

- The monitoring comprised measurement of the concentrations of volatile compounds, methane, carbon dioxide, hydrogen sulphide and oxygen, the borehole flow rate and atmospheric conditions.

- Soil samples for contamination analysis were obtained from all exploratory holes at regular intervals to be representative of the ground conditions. All samples were screened on Site using a photoionization detector (PID) to screen for the potential presence of volatile organic compounds.

Selected soil samples were scheduled for chemical analysis by Arup, which were representative of the soil types encountered. 25 soil samples were selected, of which 23 were from variable depths within the Made Ground, with three of these samples from the underlying natural strata including one sample of the Alluvium and two samples of the RTD.

The analysis was conducted by i2 Analytical Services (i2), to UKAS and MCERTS accredited methods. The number of soil, soil leachability and groundwater samples and the determinands analysed are presented in the following tables.

Table 4 Analysis of soil samples

Suite of determinands (number of soil samples analysed)	
Suite E1: General (25 samples)	
Antimony, arsenic, beryllium, boron (water soluble), cadmium, chromium (total), copper, lead, mercury, nickel, selenium, vanadium, zinc, cyanide (total), pH, phenol (total) and total organic carbon (TOC)	
Suite E2: Asbestos (22 samples)	
Asbestos presence and identification	Asbestos quantification (where present) in accordance with the method described in HSG248
Suite E3: TPH (25 samples)	
Speciated total petroleum hydrocarbons (TPH) by GC-FID with aliphatic/aromatic0 class separation with criteria working group (CWG) banding	
Suite E4: PAH & BTEX (25 samples)	
Polycyclic aromatic hydrocarbons (PAH) (US EPA16)	Benzene, toluene, ethyl benzene, m,p-xylene and o-xylene
Suite E5: PCB (25 samples)	
Polychlorinated biphenyls (PCB) (speciated WHO12)	

Suite of determinands (number of soil samples analysed)
Suite E6: Herbicides (13 samples)
Triazine herbicides, phenoxy acid herbicides and glyphosphate

Leachability testing was undertaken in line with BS EN 12457 Part 2 on 20 soil samples (17 Made Ground, one Alluvium and two RTD). The test was undertaken on a single stage extraction at liquid / solid ratios of 10:1 (reported in mg/l and mg/kg). The results indicate the general leachability of inorganic contaminants in soil and are also in the assessment of soils in relation to waste acceptance criteria (WAC). The determinands tested for are presented in Table 5.

Table 5 Soil leachability analysis

Suite of determinants (number of samples analysed)
Suite I: Leachability (20 samples)
Antimony, arsenic, barium, cadmium, chloride, chromium, copper, fluoride, lead, mercury, molybdenum, nickel, selenium, sulphate, zinc, phenol index and total dissolved solids (TDS), dissolved organic carbon (DOC)

Groundwater was analysed for the range of determinants as detailed in Table 6.

Table 6 Analysis of groundwater samples

Suite of determinants (number of groundwater samples analysed)	
Suite F1: General (2 samples)	
pH, hardness, antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, zinc, vanadium, ammoniacal nitrogen, chloride, cyanide (total), total phenols, DOC, calcium and manganese	
Suite F2: TPH (2 samples)	
Speciated TPH by GC-FID with aliphatic/aromatic class separation with Criteria Working Group (CWG) banding	
Suite F3: PAH & BTEX (2 samples)	
PAH (US EPA16) by GCMS	Benzene, toluene, ethyl benzene, m,p-xylene, o-xylene
Suite F4: PCB (2 samples)	
PCB (7 or 12 congeners)	
Suite F5: Herbicides (2 samples)	
Triazine herbicides, phenoxy acid herbicides and glyphosphate	

3.2 Stratigraphy

Geological sections have been produced which show the stratigraphy across the Site and are shown in Figure 4. The sections are based on all historical ground investigation undertaken on the Site, not just the exploratory holes subject to contamination sampling and monitoring (as shown in Figure 3). The stratigraphy has been determined from interpretation from historical borehole information at the Site is summarised below:

Table 7 Site stratigraphy

Stratum	Reduced level of top of stratum (mAOD)	Thickness of stratum north of Banana Wall (m)	Thickness of stratum under False Quay (m)
Made Ground	+3.3 to +6.5 (*)	1.6 to 6.7	0.15 to 0.46
Dock sediment (incl. clay lining)	-4.5 to +1.3 (**)	-	0.1 to 5.5
Alluvium	-0.8 to +2.0 (*)	0.0 to 5.6	-
River Terrace Deposits	-6.7 to -0.1 (*) -5.9 to -4.9 (**)	3.4 to 8.6	0.0 to 6.2
London Clay	-9.0 to -3.8	0.0 to 5.6	-
Harwich Formation	-9.5 to -4.7	0.0 to 7.1	0.0 to 6.3
Lambeth Clay	-13.8 to -5.7	3.6 to 13.8	5.1 to 9.5
Lambeth Sand	-17.3 to -14.2	1.0 to 5.2	0.0 to 3.9
Thanet Sand	-24.0 to -19.0	12.1 to 17.0	15.2 to 16.6
Chalk	-38.6 to -35.6	28.7	33.7
Notes: (*) north of Banana Wall (**) False Quay south of Banana Wall			

3.3 Strata Descriptions

A summary of the material descriptions of the strata at the Site is given below. This has been based on historical borehole information, the Arup 2002 Geotechnical Interpretive Report and Site records made during the 2016 ground investigation. More detailed description of the stratigraphy are included in the factual ground investigation reports.

3.3.1 Made Ground

The Made Ground is generally found to be the thickest in the centre of the Site (up to 6.7m). The properties of the Made Ground are variable, with a wide range of grading, from a slightly sandy medium coarse gravel to a sandy clay. Brick, concrete fragments and cobbles were encountered in the Made Ground. The surface layer is typically a gravelly material, with local areas of tarmacadam, flint cobbles and/ or concrete. In addition, brick, clinker, ash, plastic, timber and glass were identified.

The Made Ground encountered at depth typically comprised brown, dark brown and grey brown sandy gravels and sandy gravelly clays, with variable amounts of flint, brick, concrete, ash, clinker, chalk and timber. Typically, ash, clinker and concrete were slightly more common at shallower depths, with flint and brick predominating at depth. During previous ground investigations, organic clay pockets, possibly reflecting reworked alluvium, were also encountered at depth. In WS808, in the west of the Site, a layer of asphalt fragments was encountered, with a hydrocarbon odour detected locally beneath these materials. The sample containing evidence of contamination was selected for chemical analysis and is considered further in Section 4.2.

3.3.2 Dock sediment

The Dock sediment is the accumulation of the settlement of suspended particles from the dock water, material from rainwater runoff and detritus from the wharf or dumped off the ships over the years.

The dock sediment represents the top of the dock bed. The material is described as very soft black slightly sandy silt with strong petrochemical odour and contains varying proportions of brick, metal, concrete and wood fragments and gravel. The clay lining for the dock is also grouped as this material.

3.3.3 Alluvium

The Alluvium appears to be a continuous layer, which has been removed locally for the construction of the old warehouses and the dock. The top level of the stratum is variable and it is difficult to differentiate between the in-situ Alluvium stratum and the reworked Alluvium within the Made Ground that was placed as backfill. The Alluvium was typically encountered at thicknesses of between 0.4m and 3.1m, with no alluvium encountered in the vicinity of the dock and former basements on the Site.

The Alluvium is typically described soft to firm multi-coloured slightly sandy Clay, however the historical FES 1990 investigation suggest that the Alluvium was firm to stiff or stiff in some localities. Occasional pockets of soft amorphous peat up to 100mm thick, silty sand or gravel and localised plant remains were also noted within the Alluvium.

The total organic carbon (TOC) content of Alluvium samples taken in the 2001 site investigation varies from 0.6% to 17% of the dry mass, showing a slight trend to increase with depth. The average organic content for the samples tested is 6.4%.

3.3.4 River Terrace Deposits

In the dock, River Terrace Deposits were only encountered south of the False Quay in a small number of boreholes in the western part of the Site. In this area the River Terrace Deposits are generally directly below the Dock Silt with thicknesses between 3 and 4m. It is likely that the excavation for the dock construction removed most of the River Terrace Deposits south of the Banana Wall. North of the Banana Wall the surface level of the River Terrace Deposits are almost planar across the Site.

The stratum is generally described as a medium dense to dense sandy to very sandy gravel or sand and gravel with some occasional silty, clayey horizons.

The particle size distribution for the River Terrace Deposits samples taken from historical reports confirms that the material is principally a very sandy, fine to coarse gravel.

3.3.5 London Clay Formation

London Clay is typically located in the eastern and north eastern portion of the Site and found to underlie the River Terrace Deposits as a thin layer less than 5m thick.

The London Clay encountered at North Quay comprises stiff to very stiff fissured grey and brown mottled silty clay, however test results indicate a sandy clay.

Frequent partings and lenses of silt are present throughout the deposit. Fissuring is typical of an over consolidated clay in which vertical stresses due to overburden were greater in the geological past than at present. Removal of overlying deposits by erosion causes stress relief and development of fissuring.

3.3.6 Harwich Formation

Harwich Formation was encountered in boreholes on the eastern and south eastern part of the Site and is found to underlie the London Clay or River Terrace Deposits. Where deep excavation has occurred, the deposits lie directly below the Dock sediment.

The stratum is generally described as very dense sandy flint gravel with occasional silty and clayey horizons. The gravel is well rounded and has a characteristic black colour. Occasional limestone and shell fragments and Siltstone and Sandstone layers are also present in this material. In some historical investigations (such as the FES 1990 report) Harwich Formation has been classed as London Clay.

3.3.7 Lambeth Group

The Lambeth Clay was encountered in all boreholes underlying either the Thames Formation (Harwich and London Clay) or the River Terrace Deposits where erosion of the former has occurred.

The stratum is generally described as a stiff to very stiff fissured clay with varying degree of sand and silt content and occasional beds of shell fragments throughout the stratum to a medium dense to dense clayey gravely sand.

The Lambeth Sand (Reading and Upnor Formation) was encountered in all boreholes underlying the Lambeth Clay.

The Lambeth Sand comprises interbedded layers of clay, silt, sand and gravel. The general trend across the Site is a top layer described as stiff to very stiff mottled green brown sandy to very sandy clay with shell fragments. The sand and gravel content increase with depth and at depth the formation is generally described as a dense to very dense grey green brown sand and rounded flint gravel, locally very silty and clayey.

3.3.8 Thanet Sand Formation

The Thanet Sand Formation was encountered underlying the Reading and Upnor Formations. The Thanet Sand appears to be generally dipping from the south west to the north east with a change in elevation of approximately 4m across the Site. The thickness of the Thanet Sand Formation varies across the Site between 15 to 20m and is described as a silty sand.

The basal beds of the Thanet Sand Formation generally consist of a layer of flint gravel referred to as the Bull Head Beds. The thickness of the Bull Head Beds varies between 0.2 and 0.8m and is generally described as a very dense, grey silty fine sand.

3.3.9 Chalk

The Chalk is shown to generally dip from the south west to the north east by approximately 4m across the Site. The Chalk is known to consist of a fissured, weak rock, weathered at its surface to a remoulded material containing lumps of intact rock. The rock consists mainly of fine grained, calcareous material. The Chalk contains abundant flints, and these can occur randomly, in layers or as infill to fissures.

Borehole logs describe the material generally as weak to moderately strong weathered chalk with fractures generally closely to moderately spaced. Bedding planes have been shown to dip at 5 to 10 degrees.

3.4 Groundwater conditions

All standpipes installed in the Made Ground remained dry over the monitoring undertaken between 28 July and 9 August 2016.

The groundwater levels in the upper aquifer (RTD) monitored in standpipes during the 2001 and 2016 ground investigation are summarised in Table 8.

Table 8 Groundwater monitoring data

Borehole	Response zone stratum	Monitoring duration	Range of groundwater levels (mAOD)
BH517	RTD	19.09.2001 – 15.01.2002	+0.33 to +1.12
BH519	RTD	14.09.2001 – 15.01.2002	+0.38 to +1.18
BH521	RTD	10.10.2001 – 09.01.2002	+0.30 to +1.02
BH801A	RTD	28.07.2016 – 09.08.2016	+0.51 to +0.57
BH802	RTD	28.07.2016 – 09.08.2016	+0.45 to +0.60

During the 2016 investigation groundwater levels in the upper aquifer were recorded slightly deeper than the 2001 investigation at approximately +0.45mAOD to +0.6mAOD. The groundwater levels are substantially below typical dock water levels.

Recorded groundwater levels in the lower aquifer were at approximately -26.5mAOD in 2001. The lower aquifer has been subject to dewatering activities, which were completed in the area in November 2016. The groundwater level was around -42mAOD to -43mAOD (as at 18/10/2016), reaching -32mAOD at the end of November 2016. The lower aquifer has recovered by approximately 10m within one month following completion of dewatering.

In the long term, assuming no dewatering is carried out in the Canary Wharf area, the level of the lower aquifer may rise to as high as +1mAOD at North Quay.

3.5 Evidence of contamination

A detailed inspection and onsite logging of the soil arisings was undertaken during the phases of ground investigation. Visual evidence of potential contamination was limited to the presence of variable amounts of ash, clinker, concrete, metals and plastic.

Olfactory evidence of potential contamination, comprised a hydrocarbon odour, was encountered in exploratory hole WS808 in the Made Ground between 2.2m and 2.7m bgl. The odour was associated with a clayey gravel layer which contained fragments of asphalt. The corresponding volatile content of the material, measured onsite using a PID, was recorded at 3.6ppm which is very low.

The PID headspace monitoring of soil samples recorded consistently very low levels of volatile compounds within all samples taken during the 2016 ground investigation.

Concentrations of volatile organic compounds (VOC) in the samples taken onsite were measured between 0ppm and 3.6ppm.

4. Ground contamination data evaluation

4.1 Methodology summary

4.1.1 Human Health

The evaluation of ground investigation data has been carried out in accordance with the risk assessment methodology outlined in Appendix B (Section B1), which describes the background and context of the assessment and defines the criteria used to assess soils, groundwater and ground gas.

Arup has derived generic assessment criteria (GAC) using CLEA 1.07 software. Input data for the toxicological effects, physical characteristics and contaminant fate and transport parameters for the determinands have been taken from sources published by the Environment Agency and other sources (including LQM/CIEH [15] and CL: AIRE [16].

The Site will comprise a mixed use residential, commercial and retail development. In the Indicative Scheme a two-level basement is proposed across the majority of the Site extending to a level of - 2.80mAOD and locally to a level of -4.65mAOD (with a slab below this level) This basement excavation will remove the Made Ground, the majority of the Alluvium and some RTD, with the formation level expected on the RTD or locally on the London Clay. If the basement extends to -18mAOD (maximum depth defined by the parameter plans), all of the Made Ground and Alluvium and most of the RTD will be removed. The basement will may be used for retail, business, community or leisure uses or for ancillary plant, servicing areas, car and cycle parking, storage areas, energy centres and electricity substations. Residential properties will not be located in the basement or at ground floor level.

Most areas of soft landscaping will be over the basement level and will be formed of imported landscaping soils. Areas of soft landscaping are also proposed outside the basement in the northwest and west of the Site beneath the DLR viaducts and tree planting is proposed along the northern and eastern Site boundaries.

The perimeter wall of the basement will be formed from a secant pile wall which will be constructed from a piling platform at the existing ground level. It is envisaged that the buildings will require piled foundations, in the form of a mixture of continuous flight auger (CFA) piles and large diameter bored piles, ranging from 20m to 35m in length. Most of the piles will be installed from within the basement excavation. Supporting marine piles will be required beneath the new marine deck, likely in the form of rotary piles. The new piles to support the marine deck will be constructed by installing a steel casing into the dock bed to a depth of approximately 6 to 8m below the dock bed level. The pile will then be drilled using a rotary piling rig to the design depth.

Taking into consideration the proposed form of development the soil data has been compared against generic assessment criteria for a commercial end use development. This reflects the proposed use of the basement and lower levels of the buildings. However, comment is also made with respect to how the results compare against criteria for public open space (near residential) land use. This scenario considers areas of landscaping (predominantly grassed areas) adjacent to high density housing and models the exposure to a female child (most sensitive receptor). It assumes that the proximity to the place of residence will allow tracking back of soil to occur. A soil organic matter (SOM) content of 1% has been considered in the derivation of GAC used in this assessment.

This assessment has been undertaken to benchmark the level of contamination in the soil. Values above the GAC do not necessarily represent an unacceptable risk to human health, rather further consideration or assessment is required depending on the way the material is reused.

There are no published generic assessment criteria for asbestos in soils in the UK. Works with asbestos, including asbestos in soils, is regulated under the Control of Asbestos Regulations (CAR) 2012. The soil testing results have been assessed using multiple lines of evidence as to the potential significance during and after construction based on the latest guidance in CAR-

SOIL™ [17] and CIRIA C733 [18]. In the first instance the presence of asbestos has been flagged for initial assessment.

Asbestos in soil quantity descriptions provided in this assessment have been determined in line with the values provided within the CAR SOIL Joint Industry Working Group (JIWG) Decision Support Tool [19] as shown below:

- Large quantity: >0.1%w/w
- Moderate Quantity: >0.05 to <0.1% w/w
- Low quantity: >0.01 to <0.05%w/w
- Very low quantity <0.001 to 0.01% w/w

4.1.2 Controlled waters

Assessment of risks to water resources is completed in general accordance with the Environment Agency (2017) Groundwater Protection guides [20] for England and Wales. Groundwater results have been screened against Water Quality Standards (WQS), based on the sensitivity and use of each aquifer. The assessment criteria for controlled waters is set out in Appendix B.

Initially environmental quality standards (EQS) for freshwater have been used. Where there are not available, drinking water standards (DWS), the World Health Organisation (WHO) guidelines and United States Environmental Protection Agency (USEPA) standards have been adopted.

Summary tables of the results from the 2001 and 2016 ground investigation and relevant assessment criteria (human health and controlled waters) used in the assessment are provided in Appendix C1 (soil), Appendix C2 (groundwater) and Appendix C3 (soil leachate). Results more than the relevant screening criteria are highlighted in the relevant table. Results above the assessment criteria do not necessarily represent an unacceptable risk, rather a more detailed assessment is required.

4.1.3 Ground gas

The following guidance on the assessment of ground gas has been used in the assessment:

- CIRIA 2007 Report C665 Assessing risks posed by hazardous ground gases to buildings [21];
- BS 8485 (2019) Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings [22]; and
- Card, Wilson and Haines (2009) Ground gas handbook [23].

The above references describe a process of deriving gas screening values (GSV) for hazardous ground gases. The process uses both gas concentrations and borehole flow rates to define a range of characteristic situations (CS1 to CS6) based on borehole gas emission flow rate and concentration of methane and carbon dioxide. The GSV is calculated by multiplying the borehole flow rate (litres per hour) by the gas concentration.

4.2 Human health data evaluation

4.2.1 Soil data

The exploratory hole locations from the 2001 and 2016 ground investigations are shown on Figure 3.

The results of chemical testing onsite indicate generally very low levels of soil contamination, with all of the test results below the assessment criteria for a commercial land use. For further

context the results are also mostly below public open space criteria except for locally higher concentrations of lead in five samples (up to 1100mg/kg in the shallow Made Ground at WS803) and arsenic in one sample (210mg/kg in the shallow Made Ground at TP621). Elevated total PAH concentrations were recorded in two of 31 samples (up to 1000mg/kg in the deeper Made Ground at BH516) and concentrations of individual PAHs (benzo(b)fluoranthene, benzo(a)pyrene and dibenz(ah)anthracene) were recorded above public open space criteria in up to three of 25 samples (in the deeper Made Ground).

Evidence of hydrocarbon odours were detected in the Made Ground of WS808, in the west of the Site, associated with asphalt fragments in the Made Ground. The results of the soils testing revealed detectable but low concentrations of PAH and TPH in the sample, which were significantly below assessment criteria for a commercial land use.

Low levels of asbestos were identified in four of the 22 samples tested from the Made Ground during the 2016 investigation. The identified asbestos comprised loose fibres of chrysotile and anthophyllite, with concentrations recorded as being less than 0.001%. The positive laboratory test results are summarised in Table 9.

Table 9 Summary of positive laboratory asbestos detections

Location	Depth (mbgl)	Asbestos Type	Laboratory Comment	Concentration (%w/w)
BH802	1.3	Chrysotile	Loose Fibres	<0.001%
WS803	1.7	Chrysotile	Loose Fibres	<0.001%
WS805	1.7	Chrysotile	Loose Fibres	<0.001%
WS809	1.5	Anthophyllite	Loose Fibres	<0.001%

No fragments of asbestos containing material (ACM) are reported to have been encountered during either the 2001 or 2016 investigations. Considering the prevalence of demolition materials within the made ground and fibres encountered to date, it is possible that further asbestos and ACMs may be present elsewhere within the made ground.

Whilst the 2001 investigation did not detect any evidence of asbestos, it is possible that asbestos may have been present but could not be identified based upon the testing methodologies adopted at that time. Laboratory testing for asbestos has improved significantly in the last ten years and the requirements for accredited methods have been tightened.

4.3 Ground gas

The Made Ground and Alluvium are regarded as gas generating strata on the Site and gas monitoring from standpipes with response zones within these strata has been undertaken. Testing of the Made Ground and Alluvium has identified a generally low total organic carbon (TOC) content (less than 1.5% in 23 samples).

Three standpipes, within response zones in the Made Ground and Alluvium were monitoring for ground gas on four occasions in 2001, except for BH511 which was monitored on one occasion. A further four gas standpipes were installed in 2016 and monitored on four occasions.

Gas monitoring was undertaken during a range of atmospheric pressure conditions, including during falling trends, although typically during higher pressure conditions. Generally low concentrations of hazardous ground gases were measured. Concentrations of methane (CH_4) and hydrogen sulphide (H_2S) were consistently below the detection limit of the gas analyser. Carbon dioxide (CO_2) ranged from <0.1% to 8.2%v/v (with concentrations more than 5%v/v recorded on three occasions within BH520). Oxygen (O_2) concentrations were typically close to normal atmospheric conditions, although significantly depleted oxygen concentrations were noted in standpipes WS806 and WS808 installed in the Made Ground. Concentrations of volatile organic compounds (VOCs) were very low, ranging from 0ppm to 0.3ppm. Gas flows

were typically less than 0.1l/hr, with the maximum flow rate of 0.5l/hr measured in BH520. Table 10 presents a summary of the gas monitoring results.

Table 10 Summary of ground gas monitoring results

Stand-pipe	Response Zone	Flow (l/hr)	CO_2 (%v/v)	CH_4 (%v/v)	O_2 (%v/v)	H_2S (ppm)	VOC (ppm)
2001							
BH511	MG & AL	-0.1	1.1 to 1.2	<0.1	17.3	<0.1	
BH516	MG & AL	-0.9 to 0.2	<0.1 to 1.7	<0.1	17.6 to 20.8	<0.1	
BH520	MG & AL	-1.4 to 0.5	0.4 to 8.2	<0.1	10.6 to 20.3	<0.1	
2016							
WS803	MG	<0.1	0.4 to 4.3	<0.1	13.8 to 20.6	<0.1	<0.1 to 0.1
WS806	MG	<0.1	0.1 to 5.0	<0.1	2.0 to 15.5	<0.1	<0.1 to 0.2
WS808	MG	<0.1	0.1 to 3.0	<0.1	5.3 to 20.7	<0.1	<0.1 to 0.3
WS809	MG & AL	<0.1	0.8 to 2.3	<0.1	12.9 to 15.0	<0.1	<0.1 to 0.1

A maximum gas screening value (GSV) of 0.041 l/hr has been calculated based upon the available results. This is derived using the maximum recorded peak concentration of 8.2%v/v carbon dioxide and a worst case potential positive flow of 0.5l/hr. This equates to gas characteristic situation (CS) of 1. A CS1 classification is indicative of a very low risk, typical of natural soils of low organic content and typical Made Ground, where no special gas protective measures are required in the design of the building. Concentration of carbon dioxide were measured exceeding 5% in standpipe BH520 (in the north eastern corner of the Site) and as such in accordance with Guidance [21] consideration should be given to a CS2 (low risk classification).

Further assessment of the gas monitoring results is presented in the risk assessment in Section 5.

4.4 Controlled waters data evaluation

4.4.1 Leachability test results

The leachability test results from the 2016 ground investigation are presented and screened against the controlled waters assessment criteria in Appendix C3. The results are summarised in Table 11.

Table 11 Summary of soil leachability results screened against water quality standards

			2016 Concept GI			
Determinant[1]	**WQS[2]**	**Units**	**Number**	**Minimum**	**Maximum**	**Above WQS**
Antimony	5	ug/l	20	<1.7	43	10
Cadmium	0.25	ug/l	20	<0.1	0.4	2
Chromium	4.7	ug/l	20	<0.4	7.3	3
Copper	11	ug/l	20	<0.7	23	7
Lead	3.8	ug/l	20	<1	110	12
Selenium	10	ug/l	20	<0.4	16	2
Zinc	23	ug/l	20	<4	67	2

[1] Screening criteria for copper, manganese, nickel and zinc adjusted for bioavailability using M- BAT tool

[2] Refer to section 4.1.2 and Appendix B and C for details of WQS

The results indicate the potential for both the made ground and natural soils on the Site to leach concentrations of a number of metals including antimony, arsenic, cadmium, chromium, copper, lead, selenium and zinc. Further assessment is provided in the risk assessment later in this report.

4.4.2 Groundwater test results

The groundwater test results from the 2016 and 2001 ground investigations are presented and screened against the controlled waters assessment criteria in Appendix C2. The samples were collected from boreholes with installations in the Made Ground/ Alluvium or RTD. The results are summarised, compared alongside the maximum and minimum results, in Table 12.

Table 12 Summary of groundwater results screened against water quality standards

Determinant[1]	**No. of tests**	**Concentration (µg/l)**		**WQS[2] (µg/l)**	**Number of samples > WQS**
		Minimum	**Maximum**		
Chloride	9	45,000	1,300,000	250,000	6
Cyanide (total)	9	<10	60	1	1/9[3]
Ammoniacal nitrogen	9	850	6500	300	9
Cadmium	9	<0.02	<0.5	0.25	0/7[3]
Chromium	9	<0.2	5.62	4.7	1
Copper	9	1.4	21	11	3
Lead	9	<0.2	<10	3.8	0/7[3]
Manganese	2	100	280	123	1
Mercury	9	0.13	<0.2	1	2/9[3]

Determinant[1]	No. of tests	Concentration (µg/l)		WQS[2] (µg/l)	Number of samples > WQS
		Minimum	Maximum		
Nickel	9	4.3	<10	4	2/9[3]
Selenium	9	<2	23	10	2
Zinc	9	1.3	30	23	1
Phenols	9	<10	120	7.7	2/9[3]
TPH (C6 to C40)	7	12	75	10	7
Anthracene	9	<0.01	<2.0	0.1	0/7[3]
Fluoranthene	9	<0.01	<2.0	0.0063	0/9[3]
Benzo(a)pyrene	9	<0.01	<2.0	0.00017	0/9[3]
2,4 Dichlorophenoxyacetic acid (2,4 D)	2	<0.02	9.8	0.3	1

[1] Screening criteria for copper, manganese, nickel and zinc adjusted for bioavailability using M- BAT tool

[2] Refer to section 4.1.2 and Appendix B and C for details of WQS

[3] Limit of detection exceeds WQS

The results of the 2016 groundwater testing indicate generally very low levels of contamination with slightly elevated ammoniacal nitrogen and metal levels, with concentrations of phenols and some PAHs close to or slightly above screening levels. The results of the 2001 investigation recorded marginally higher levels of groundwater contamination than the 2016 investigation, with some further metals identified to be slightly elevated. Most notably, low levels of TPH were consistently recorded during the 2001 investigation but were not detected during the 2016 works. The limit of detection achieved during the 2001 works was above the WQS for some determinands, such as PAHs. This was typical at the time and detection limits have reduced in the last 15 years.

4.4.3 Dock sediment

Sediment testing was carried out as part of the 2001 investigation, with extensive further testing carried out near the Site as part of the Canary Wharf Crossrail investigation in 2009. 34 samples of dock sediment samples were tested as part of the 2009 assessment. The 2009 investigation compared dock sediment concentrations to human health screening values and reviewed potential leachability against environmental quality standards.

It is not proposed to substantially disturb the sediments during construction. Some piles are proposed to support the development over the dock. Construction workers may come into contact with the sediments during handling of arisings. The 2009 report stated the results for all metals, inorganics and speciated hydrocarbons were well below the GAC for a commercial end use. This is discussed further in the risk assessment later in this report.

5. Risk assessment

5.1 Background

The potential risks to human health and environmental receptors have been considered in accordance with the current UK approach to contaminated land assessment taking into consideration the available information on the construction and operational phases of the development.

The method for risk evaluation has been based on a qualitative assessment taking into consideration the magnitude of the potential severity of the risk as well as the probability of the risk occurring. The risk characterisations provided below have been assessed in a scale from very high to very low based on the CIRIA guidance C552 [24]. A summary of each risk classification is provided in Table 13. The risk assessment methodology is described in Appendix B.

Table 13 Risk classifications

Risk classification	Description of risk
Very high	There is a high probability that severe harm could arise to a designated receptor from an identified hazard, or there is evidence that severe harm to a designated receptor is currently happening. The risk, if realised, is likely to result in substantial liability. Remediation is likely to be required.
High	Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substation liability. Remedial works may be necessary in the short term and are likely over the longer term.
Moderate	It is possible that harm could arise to a receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild. Some remedial works may be required in the longer term.
Low	It is possible that harm could arise to a receptor from an identified hazard but it is likely that this harm, if realised, would typically be mild.
Very low	There is a low possibility that harm could arise to a receptor. In the event of such harm being realised the consequence would at worst be mild.

5.2 Human health

5.2.1 During construction

A potential plausible pollutant linkage exists between contamination within soils and construction workers. In addition, human receptors on neighbouring land (including pedestrians) may be exposed from inhalation of dust during groundworks, including the piling operations and the basement excavation.

The analyses of soil samples indicate generally very low concentrations of most chemical determinands which would not be regarded as posing an acute risk to construction workers.

However, low levels of loose asbestos fibres were identified in Made Ground. The older investigation did not detect asbestos; however, it is possible that asbestos may have been present but could not be identified based upon the testing methodologies adopted at that time. The recent investigation was limited to filling gaps and confirming the previous results. Low

levels of asbestos (<0.001%w/w) were detected in four of 22 samples using a microscopic analysis. There is a possibility for further asbestos in soils to be identified on the Site.

In addition to appropriate PPE and site hygiene procedures it is recommended that specific precautions are taken to reduce potential exposure to asbestos fibres in accordance with the principle of 'as low as reasonably practicable' (ALARP) and in accordance with CAR 2012 [25] and CIRIA C733 [18]. A recent guide was published by CL:AIRE on the interpretation of CAR for managing and working with asbestos in soils CAR-SOIL™ [17] and should be followed. This will include (but not limited to) good control of dust, materials and stockpile management, specialist input during works and verification monitoring.

The dock sediment in North Dock was analysed as part of the 2001 investigation and was extensively tested and assessed in the vicinity as part of the 2009 Canary Wharf Crossrail Station contamination assessment. Any interaction with the dock sediment is anticipated to be limited to dealing with pile arisings.

It is considered that the risk to human health receptors during the works without mitigation would be generally low increasing to moderate due to the low concentrations of asbestos and potential for other ACMs to be present elsewhere in the Made Ground. Appropriate risk management measures will reduce the risk of harm to human health receptors to very low. These measures will also manage risk from other potential contaminants onsite.

No contamination investigation has been carried out in the northwest of the Site beneath the DLR viaduct. A vehicle access road and open space called 'The Delta' (including soft landscaping) is proposed in the north western area. To the north, 'Aspen Way Gardens' proposed comprising pedestrian and cycle routes and landscaping. The desk-based information indicates similar past and recent land uses in this area and recommendations on risk management made in this report will likely be sufficient. Additional investigations may be prudent prior to development to confirm the status of these soils (Section 7.2).

The risk management procedures with respect to asbestos and other contaminants are described in the remediation strategy in Section 7.

5.2.2 During operation

The Made Ground and Alluvium are indicative of strata with a low to very low gas generation potential which are unlikely to result in significant emissions. The underlying RTD and London Clay have negligible gas generation potential. The monitoring concludes that the ground gas regime is low to very low risk.

On completion of the Proposed Development the building footprint will occupy most of the Site. Made Ground will remain outside of the basement around the perimeter of the Site.

In the Indicative Scheme, a basement is proposed extending to a level of - 2.80mAOD and locally to -4.65mAOD. This basement excavation will remove the Made Ground and most of the Alluvium (low to very low risk ground gas sources) with formation level expected predominantly in the RTD. Small amounts of Alluvium may remain locally below formation level. The maximum potential depth of the basement defined in the parameter plans of -18mAOD would remove all Made Ground and Alluvium and most of the RTD, with formation level predominantly in the London Clay.

Considering the low to very low risk gas regime and the proposed form of development, which includes an inherent level of gas protection, incorporating thick concrete walls and basement floor slab, the risk from hazardous ground gases and vapour on the Site is very low. No special gas protective measures are required in the design of the building.

If a basement is not constructed, Made Ground and Alluvium will remain beneath the buildings. The type of construction, incorporating thick concrete floor slabs, will offer some inherent gas protection and the use of the ground floor will be commercial (low sensitivity). It is considered that the risk from ground gases in this scenario is very low, however it is recommended that a review of the detailed design is undertaken to confirm this assessment if no basement is proposed.

Most of the soft landscaping will be above structure or basement levels. Small areas of soft landscaping and tree planting outside of the basement footprint are proposed in the north, with larger areas in the northwest. There is a potential for ground contamination, including presence of asbestos, in these areas which should be noted within the future Site management plan with procedure implemented for future intrusive works that may penetrate the hard standing, and specific mitigation employed in areas of soft landscaping. Providing that appropriate measures are implemented including clean cover and marker sheets if necessary, the risk of harm to human health is very low.

Further details on the risk management procedures are provided in the remediation strategy in Section 7.

5.3 Controlled waters

The available test results indicate generally low levels of contamination within the groundwater beneath the Site within the RTD upper aquifer. The results of the leachability testing indicate the potential for inorganic determinands to leach from the Made Ground. If a basement is excavated, The Made Ground will be removed from the majority of the Site to accommodate the basement excavation, with small residual areas expected to remain along the north, west and eastern boundaries, predominately beneath hard landscaping. A secant pile wall will be implemented to facilitate the basement excavation forming a groundwater cut off in the RTD (upper) aquifer.

The lower aquifer is overlain by the relatively low permeability Lambeth Group clay, and two distinct groundwater tables are present.

There is a potential for run-off to the dock during earthworks, piling creating pathways for the downward migration of contamination to the lower aquifer or piling within the dock basin to disturb limited sediment, resulting in local water quality impacts. Implementation of construction management controls and good industry practice on pollution prevention should be adopted.

Piling is proposed in the North Dock which will incorporate permanent casing keyed into the Lambeth Group. The risk of pollution to the deep aquifer from piling is very low for this technique. The piling method should ensure high quality construction of piles, and implementation of construction management controls and good industry practice on pollution prevention. Providing appropriate measures are taken during construction, the risks to controlled waters is very low.

5.4 Building materials

Construction materials including piled foundations and buried services will be in direct contact with the soil beneath the Site.

Based on the typically low concentration of organic contaminants in the soil, it is considered that the setting of buried concrete from the contamination is not likely to be significantly impacted by contamination. There is, however, a potential that localised levels of contamination may present a degree of risk to water supply pipes. Pipe materials will be selected in line with the requirements of the Water Authority and relevant guidance such as provided by UKWIR [26].

Assessment of buried concrete to aggressive ground conditions is outside the scope of the current report, however, it is considered that any risks identified can be appropriately mitigated through the design of buried concrete in accordance with BRE Special Digest 1 [27].

5.5 Landscaping

There is a potential linkage between residual contamination in the soil and proposed landscaping. Soft landscaping will consist of imported growing soils. Assuming a sufficient thickness of certified imported soils is provided and appropriately managed, the risk to plants in the proposed landscaping is very low.

6. Preliminary waste assessment

6.1 Background and methodology

The framework for hazardous waste assessment and the methodology and background for the current assessment are outlined in Appendix B.

This section provides a preliminary waste classification of the materials represented by the laboratory data obtained from the 2001 and 2016 investigations. The final classification of the materials will depend on where it was excavated from and how it is handled and treated onsite.

6.2 Hazardous waste

A preliminary review of the available test results from the 2001 and 2016 ground investigations has been carried out to provide an indication of the potential for hazardous waste to be generated on the Site. In the Indicative Scheme, approximately 142,000m^3 of material is anticipated to be removed during bulk excavation for the basement and pile arisings will also be generated during piling works.

The assessment of the existing data indicates that the majority of samples are unlikely to be classified as hazardous waste.

One Made Ground sample recorded concentrations of lead (>1000mg/kg) which may result in the material being classified as hazardous.

Where concentrations of TPH (>EC6 to EC40) are recorded above the limit of detection, the material may be classified as potentially hazardous due to the hazard property HP3: flammable. However, given the absence of a free draining liquid phase, WM3 states that this hazard property can be discounted. Total petroleum hydrocarbons were recorded above 1000mg/kg in three Made Ground samples which may classify the material has hazardous due to HP7: carcinogenic and HP11: mutagenic. WM3 states that if the concentration of benzo(a)pyrene is less than 0.01% of the concentration of TPH, the waste is not carcinogenic or mutagenic. Since the concentration of individual PAHs was not measured in 2001, this sample is conservatively assumed to be hazardous. The benzo(a)pyrene concentrations in the one of two samples from 2016 were greater than 0.01% of the TPH concentrations and is therefore classified as hazardous.

Three samples recorded elevated zinc concentrations which would result in a hazardous waste classification is present as zinc chromate. Hexavalent chromium was not measured during the investigations, although concentrations of total chromium were generally low. Therefore, these samples are likely to be considered hazardous based on the concentrations of zinc.

One Made Ground sample from 2016 recorded a pH of greater than 11.5, however, this is likely due to fragments of concrete in the sample.

Overall the frequency of samples classified as hazardous is relatively low i.e. four samples out of 62 tested (about 6%).

The Environment Agency considers wastes with fragments of asbestos or ACMs that would be visible to the naked eye by a competent person, to be classified as hazardous where the asbestos content within the fragments is greater than 0.1%v/v, unless such materials are segregated and removed.

The concentrations of asbestos recorded within the soils on the Site are below the hazardous waste threshold of 0.1%v/v. No visually obvious fragments of ACMs were reported in the borehole logs or in the samples where asbestos was identified.

If ACMs are encountered during the works, then these will be classified as hazardous waste and should be segregated where feasible to do so. If it is not possible to segregate visible ACM fragments, then the whole load or stockpile or material is likely to be classified as hazardous waste.

6.3 Non-hazardous and inert waste

Twenty soil samples from the 2016 investigation were submitted for waste acceptance criteria (WAC) leachate testing. The 2001 investigation did not include this type of testing as it was not implemented nationally at that time. Appendix C3 summarises the data comprising 17 Made Ground samples, two RTD samples and one sample of alluvium. The results indicate generally low concentrations of leachable materials, which are below the inert waste acceptance criteria leachate thresholds except for:

- Slightly elevated lead in two samples of made ground;
- Elevated antimony in nine samples of made ground and one sample of RTD; and
- Slightly elevated selenium in one sample of made ground and one sample of RTD.

Based upon the available chemical test results, the concentrations of BTEX, TOC, PCBs and mineral oil (TPH) and PAH within most of the tested Made Ground samples are sufficiently low for the samples to be accepted as inert waste. Approximately 20% of the samples, however, appear to contain levels of mineral oil (in this case represented by TPH) that would preclude the materials from being inert waste.

Based upon the above, it may be possible to classify a proportion of Made Ground as inert waste (for instance the testing indicated 30% of samples might be classed that way). Materials that are not classified as hazardous or inert, would be classified as non- hazardous. It is therefore considered that the majority of Made Ground would be likely to be classified as non-hazardous, with a proportion of inert and hazardous materials. Further segregation and sorting may increase the amount of inert although the presence of low levels of asbestos fibres will need to be considered and may limit the success of that process.

Natural materials, if separately excavated and segregated, are usually classified as inert without testing, provided that any soils are free from contamination and organic material. It is possible that any excess soils containing alluvium may not meet the inert classification due to the potentially elevated organic material.

6.4 Disposal of water

The disposal of water, for example groundwater or rainwater accumulating in excavations, to ground, foul or surface water drainage or via vacuum tanker will be subject to the necessary approvals, including any permits, licences or consents.

If it is required, the contractor will be responsible for any water control, including dewatering and any associated testing to allow disposal.

7. Conclusions and recommendations

7.1 Conclusions

This report sets out a desk-based appraisal of the North Quay Site and describes the phases of ground contamination investigation undertaken on the Site in 2001 and 2016. It is understood that there have been no significant changes to the use of the Site and no new contamination sources since the 2016 reconnaissance and investigation. The extent of investigation is considered sufficient to appropriately characterise the ground contamination issues with regard to current use of the Site and the Proposed Development.

The results of the investigations identified levels of soil and groundwater contamination which is not considered to present an unacceptable risk to human health or controlled waters assuming risk management procedures are implemented during construction. Sporadic but low levels of asbestos (below the quantification limit of 0.001%) have been identified in the Made Ground which is not untypical in the urban environment. The adoption of good industry construction practices and some enhanced measures for controlling works with asbestos in soils would be required.

No additional mitigation to the Proposed Development is required in relation to ground gas or vapour. The risk from ground gas and vapour is very low based on the form of construction (i.e. concrete slabs or hardstanding across most of the Site) and the assessment of the ground gas regime. If no basement is proposed it is recommended that a review of the detailed design is undertaken to confirm the very low risk.

The chemical dataset for the Site indicates that most of Made Ground are likely to be classified as non-hazardous for waste disposal, with some inert with a degree of good materials management and segregation. Some pockets of hazardous waste may be present locally due to elevated concentrations of petroleum hydrocarbons or lead. The presence of asbestos in the Made Ground makes it less likely that the materials will be classified as inert and may restrict some potential offsite uses. Segregation of any visible ACMs (if encountered) to prevent bulk soils from being classified as hazardous should be carried out. Natural soils below the Made Ground would normally be considered as inert, but, for instance, higher organic carbon in the Alluvium might prevent some of that soil being classed as inert.

A summary of the risk assessment is presented in Table 14.

Table 14 Summary of risk assessment

Receptor	Risk characterisation
Construction workers, neighbours and visitors during construction	Low to Moderate (due to potential asbestos exposure) Appropriate risk management measures will reduce the risk to very low (see Section 7.4)
Site users (residents, employees and visitors) during operation	Very low
Maintenance workers during operation	Low (due to potential exposure in the event of future excavations)
Groundwater during construction	Very low
Groundwater during operation	Very low
Surface water during operation	Very low
Proposed landscaping	Very low

7.2 Recommendations for additional investigation

The existing phases of ground investigation relating to ground contamination provide reasonable coverage over most of the Site area and gives sufficient information to inform the contamination assessment and mitigation.

Testing of soils in the north and north west is more limited than elsewhere but the Site history and other information does not suggest that different conditions would be encountered in this relatively small area. Recommendations for the management of risk during development is provided in section 7.4 below and those measures are likely sufficient for areas with less testing.

The proposed areas of public realm in the northwest area ('The Delta') and along the northern boundary ('Aspen Way Gardens') will comprise external landscaping, including soft landscaping, at ground level which is more sensitive than elsewhere. It is recommended to undertake some confirmatory testing in the northwest prior to ground works to confirm the health and safety procedures, inform the requirement for clean cover of soils in areas of soft landscaping, and for waste management. That testing might be limited to soil testing over the proposed depth of excavations.

While there are two phases of investigation on the Site which provide a good indication of ground conditions, the more detailed phase is old, dating from 2001. The proportion of testing compared to volume of excavated material (waste) in the Indicative Scheme is low when considering the typical frequency that might be required by a landfill or a recycling centre. For the basement excavation area, additional testing might be considered on a voluntary basis to assist in classifying soils for disposal and inform on the extent of asbestos in soils. It is not unusual for a contractor to complete testing prior to excavation as part of a detailed 'dig plan' to pre-classify soils prior to disposal or recycling offsite.

7.3 Remediation strategy

No significant contamination of the soil or groundwater has been established that would require a specific phase of remediation of soil or groundwater. The following sections set out the recommended mitigation and control measures to be implemented to control risks during construction.

7.3.1 Site safety and control

The works should therefore be carried out under appropriate site management protocols that will prevent the creation of dust and site run-off, including appropriate PPE and hygiene facilities, control of arisings and good site housekeeping. Confined spaces best practice should be adopted as standard, which can appropriately control the identified risks from ground gas during construction.

The following should be taken into account during development, in particular as a result of the identified presence of asbestos:

- The creation of dust should be prevented and hence prevent fibre inhalation onsite and dust emissions from the works;
- The requirements described in CAR 2012 [25] and CIRIA C733 [18] should be followed where applicable. A recent guide was published by CL:AIRE referred to as Interpretation for managing and working with asbestos in soils CAR-SOIL™ [17], which is currently the most authoritative guide on the topic and should be followed. CAR-SOIL™ confirms that all work with asbestos in soil should be carried out under a 'plan of work' and defines the contents of that plan, this will also identify if the works with asbestos will be licensed, notifiable non-licensed work or non-licensed work and what notifications and health surveillance is required;
- Should pieces of ACM or asbestos hotspots be encountered, these should be segregated, stored and disposed of where practical to do so;

- air monitoring should be considered during the works to confirm the absence of respirable fibres above the CAR 2012 action levels. If the works will take place adjacent to occupied areas a lower detection limit (than used for occupational monitoring) for air monitoring at the boundary, may be appropriate (this is a recommendation from CIRIA C733);

- Sufficient hygiene units and PPE should be provided for the works. Suitably competent personnel should advise on and supervise the works and all staff should be briefed on the working methods; and

- Services, utilities, and soft and hard landscaping areas that may require future maintenance should be provided with a marker sheet, denoting the potential presence of asbestos below the marker sheet, and sufficient cover clean backfill, such that the potential for future exposure is limited. Such measures and residual risks should be recorded within the Health and Safety File, for ready reference by future stakeholders.

7.3.2 Contamination watching brief

A watching brief should be maintained during the works for the presence of contamination, including hydrocarbons and ACM (although it should be noted that the results reported for this Site would not be visible to the naked eye). The watching brief should be documented, reported on during progress meetings and compiled in the verification reports.

Where it is necessary to sample and test soils for waste classification purposes, verification or for dealing with unexpected contamination, this will need to be undertaken in an appropriate manner by suitably experienced and qualified staff. Soil testing should be accredited to MCERTS and UKAS standards, where available. All such activities should be recorded and reported on.

The contractor should prepare a method statement detailing how unexpected contamination will be dealt with should be encountered during the works. This should include their proposed approach to testing and assessment of materials as appropriate, and precautions to ensure that no cross contamination of materials or exposure of construction workers, adjacent land users or the environment to any suspect materials occurs.

7.3.3 Cover layers

The development includes soft landscaped areas proposed above existing Made Ground, in the northwest and west of the Site ('The Delta'). Sporadic low levels of asbestos may be present within the Made Ground onsite. The concentrations were all below detection limit (<0.001%) and loose fibres were present. Soft landscaping should include a suitable thickness of soils. It would also be good practice to include a marker layer below the clean soils such that during future maintenance works there is a clear distinct layer between clean imported soils and residual soils below. Testing in this area may inform a more efficient and suitably protective strategy regarding the depth of fill and requirement for the marker layer. If it is required (due to asbestos) then it should be recorded in the maintenance manual so that further maintenance workers are aware of the implications of working below the marker layer and can take appropriate measures.

Tree planting is proposed along pedestrian and vehicular routes, some of which (Aspen Way Gardens along the northern boundary) may be above existing Made Ground. A suitable depth of clean imported soils is required in these areas (typically 1000 to 1100mm).

7.3.4 Foundation works risk assessment

The risk to controlled waters from piling is very low. A foundation works risk assessment (FWRA) should be undertaken for the proposed piling works.

The risks from piling to the dock water quality and shallow aquifer are expected to be low. Considering the likely technique proposed, and providing that general good practice is followed, the likely degree of disturbance of dock sediment arising from the proposed driving of piles will be small and localised and associated effects on surface water very low and short term.

7.3.5 Import of material

Material will be imported onto Site, which is likely to consist of:

- Topsoil and subsoil, to be placed in soft landscaping areas within the development structure;
- "Product" material, such as concrete and "virgin" quarry materials which may include drainage shingle, bedding sands and road or pavement aggregates.

A management strategy for the import of material should be documented in method statement, and include the following:

- Prior to any import, review the supplier's certificates, including chemical test results where/if available;
- Upon arrival of material at Site, undertake a visual inspection to ensure that the material is free from any obvious contamination and is consistent with the expected material. If suspect material is identified, any lorry loads should either be rejected or chemically treated prior to incorporation into the development;

Onsite stockpile or in-situ validation chemical testing:

- Verification of topsoil, subsoil and any imported or Site won "recycled" materials, on a frequency of one sample every 50m^3. Samples will be tested for a suite of chemical determinants including metals, speciated TPH and PAH and asbestos and the results compared against appropriate assessment criteria, such as those used in Appendix C. The frequency and suite of testing may be subject to review, for example, based on Local Authority requirements or volume and consistency of source.
- On Site testing of "product" material is not anticipated to be required, unless in comprises recycled material.

7.4 Verification reporting

A brief verification report should be prepared following completion of the works to demonstrate that the requirements of the remediation strategy and verification plan have been achieved. The report should be produced by the contractor in line with the requirements of the Environment Agency's (2019) Land contamination: risk management guidance [29].

The report may include, but not necessarily be limited to, the following information:

- Details of parties involved, and a summary of the works carried out, including method of works, health and safety and environmental control measures implemented, and photographs of key stages of the groundworks;
- Records of the watching brief undertaken, for example during excavations and piling, including any ground contamination encountered and how it was dealt with;
- Descriptions of asbestos control measures and relevant CAR 2012 assessment, including any air monitoring carried out to demonstrate the control measures were adequate;
- Record the depth of clean topsoil and subsoil and location of marker layer if required.
- Validation of imported soils, including volumes and material sources and chemical testing, where appropriate, with assessment against import/re-use criteria;
- Waste management details and records, such as volumes, destinations, waste disposal licence and permit details (e.g. hazardous waste registration, haulage contractors and disposal sites), laboratory results for waste classification and summary

of waste disposal records, including conveyance tickets and evidence of compliance with relevant waste regulations;

- Details of any outstanding actions and Site constraints and how these will be addressed, including maintenance plan; and

- Description of final Site conditions.

The verification report should form part of the Health and Safety File in accordance with the Construction Design and Management (CDM) Regulations 2015 and the development operations & maintenance (O&M) manual or maintenance plan. This is to allow occupiers/owners to address any residual ground contamination risks associated with future operations and maintenance.

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[3] Arup (August 2002), North Quay and Great Wharf Bridge Road Geotechnical Interpretive Report, for Canary Wharf Contractors Ltd

[4] Arup (December 2001), North Quay and Great Wharf Road Bridge Desk Study, for Canary Wharf Contractors Ltd

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[7] Arup (January 2009) Canary Wharf Crossrail Station, Ground Contamination Risk Assessment. Document Ref: 61101-RP088. For Canary Wharf Contractors Ltd.

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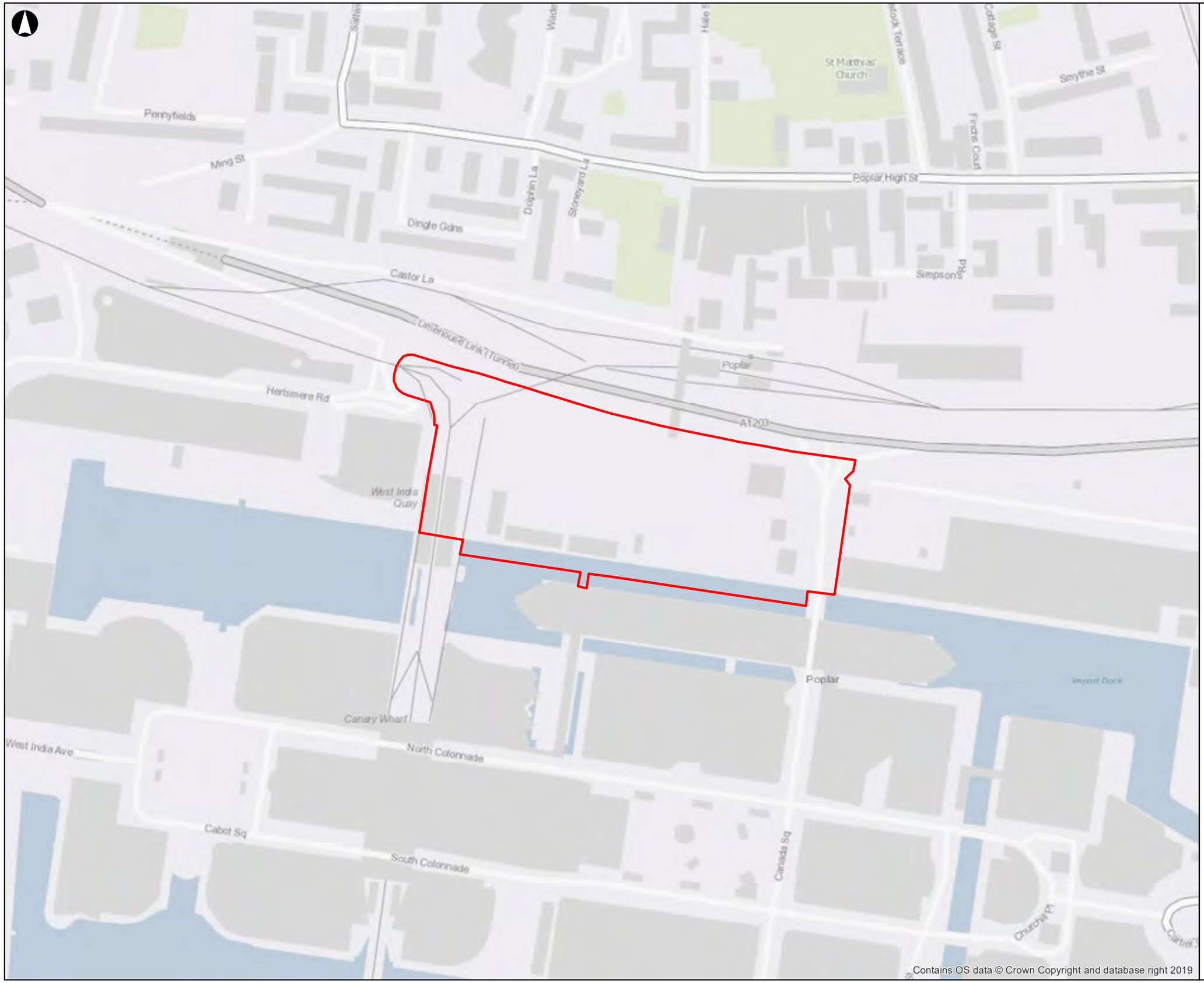
A3



Legend

Site Boundary

Issue	Date	By	Chkd	Appd
F3	2020-04-03	CN	JW	CB

Metres
0 30 60 120

ARUP

13 Fitzroy Street
London W1T 4BQ
Tel +44 20 7636 1531 Fax +44 20 7580 3924
www.arup.com

Client

Canary Wharf (North Quay) Ltd

Job Title

North Quay, London
Ground Contamination Desk Study

Site Location Plan

Scale at A3

1:2,500

Job No	Drawing Status
250169-00	**For Issue**

Figure No	Issue
1	**F3**

03/04/2020 16:46:34

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A3

Legend

Site Boundary

Abstraction Well

Above Ground Fuel Tank

03/04/2020 16:45:09

F3	2020-04-03	CN	JW	CB
Issue	Date	By	Chkd	Appd

Metres

0 12.5 25 50

ARUP

13 Fitzroy Street
London W1T 4BQ
Tel +44 20 7636 1531 Fax +44 20 7580 3924
www.arup.com

Client

Canary Wharf (North Quay) Ltd

Job Title

North Quay, London
Ground Contamination Desk Study

Site Layout (2016)

Scale at A3

1:1,000

Job No **250169-00**

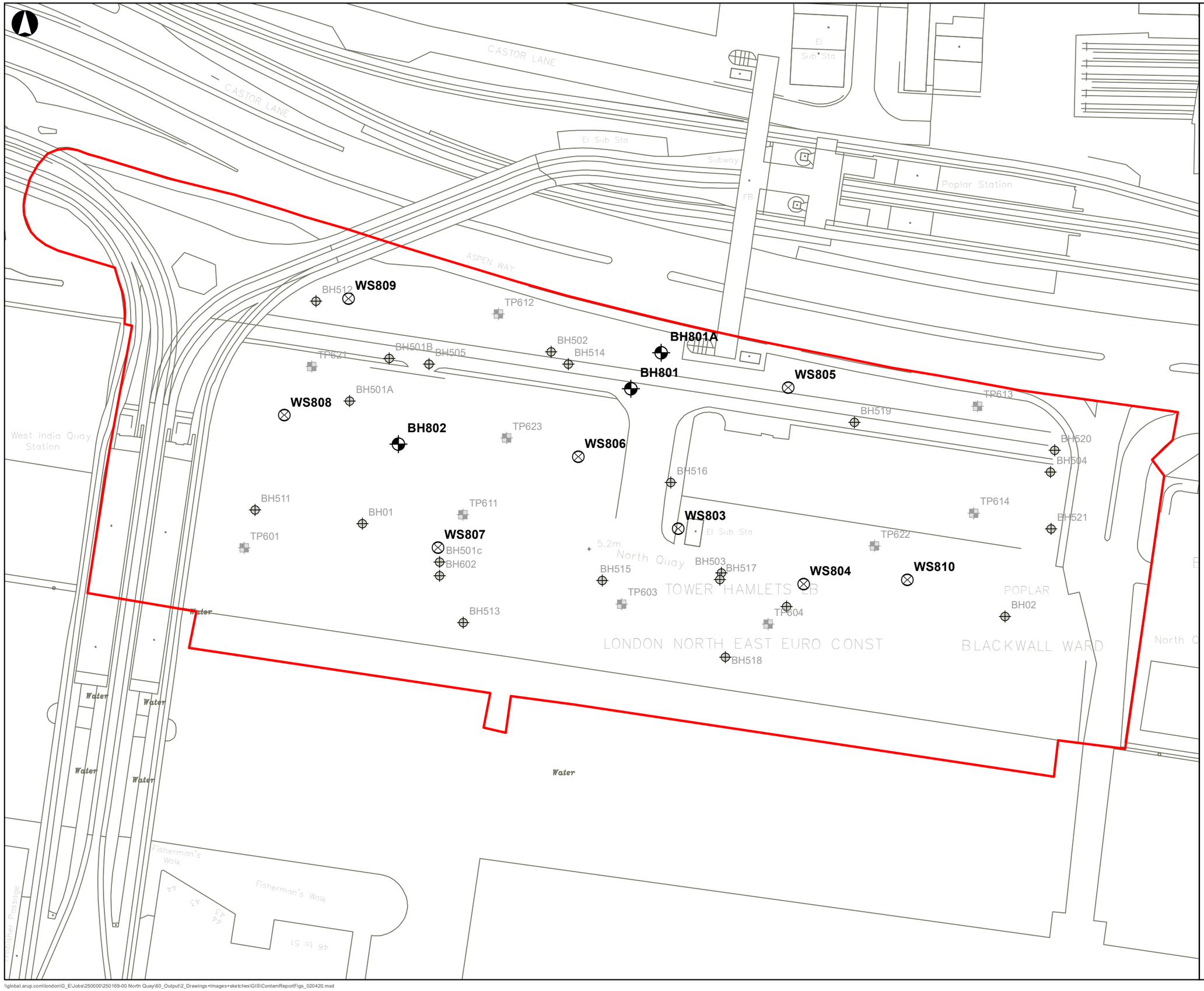
Drawing Status **For Issue**

Figure No **2**

Issue **F3**

\\global.arup.com\london\G_E\Jobs\250000\250169-00 North Quay\60_Output\2_Drawings+Images+sketches\GIS\ContamReportFigs_020420.mxd

A3



Legend

- Site Boundary

Concept 2016 GI

- Borehole
- Window Sample

FES 2001 GI

- Borehole
- Trial Pit

Issue	Date	By	Chkd	Appd
F3	2020-04-03	CN	JW	CB

Metres
0 12.5 25 50

ARUP

13 Fitzroy Street
London W1T 4BQ
Tel +44 20 7636 1531 Fax +44 20 7580 3924
www.arup.com

Client

Canary Wharf (North Quay) Ltd

Job Title

North Quay, London
Ground Contamination Desk Study

Exploratory Hole Location Plan

Scale at A3

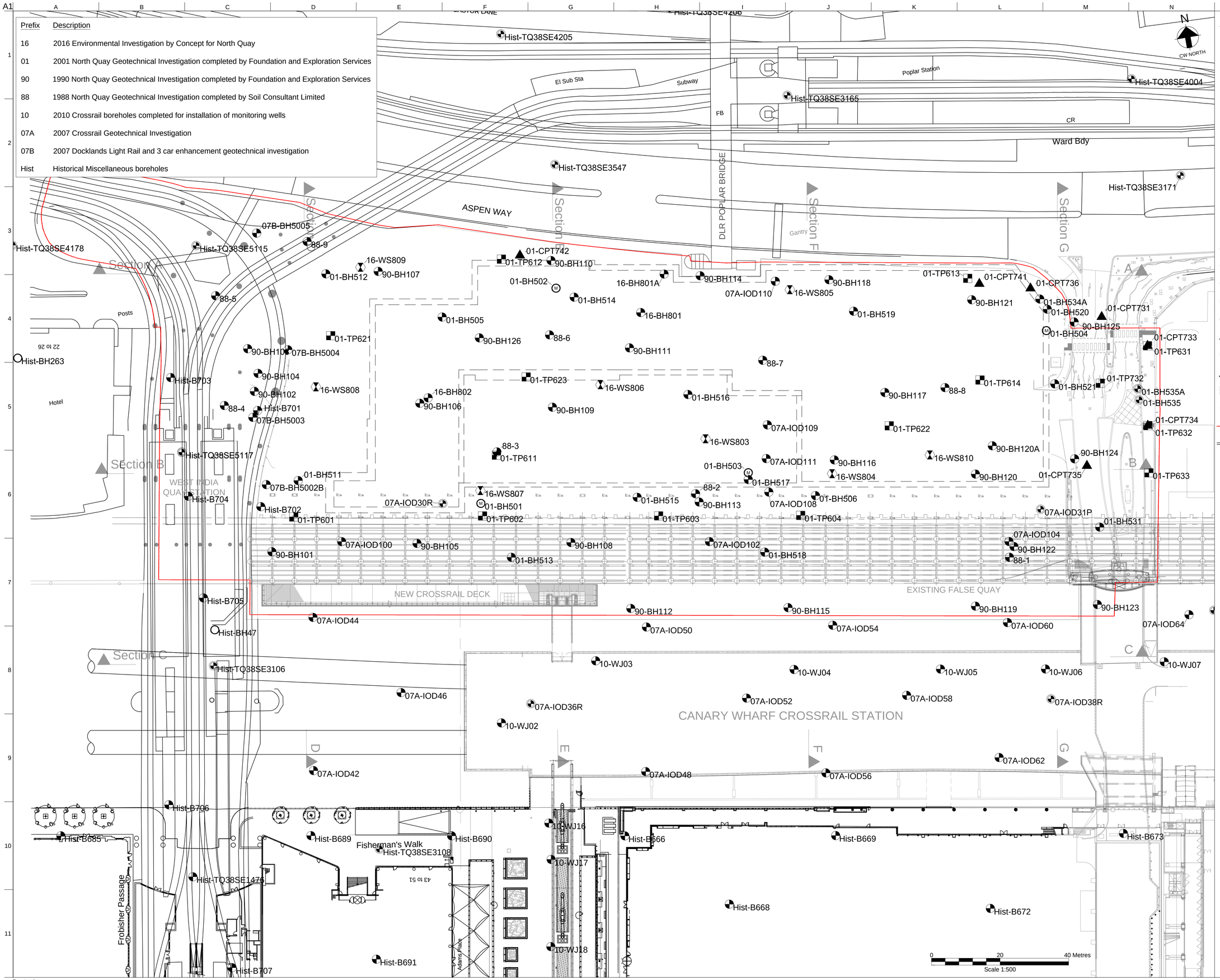
1:1,000

Job No	Drawing Status
250169-00	**For Issue**

Figure No	Issue
3	**F3**

03/04/2020 16:45:41

Prefix	Description
16	2016 Environmental Investigation by Concept for North Quay
01	2001 North Quay Geotechnical Investigation completed by Foundation and Exploration Services
90	1990 North Quay Geotechnical Investigation completed by Foundation and Exploration Services
88	1988 North Quay Geotechnical Investigation completed by Soil Consultant Limited
10	2010 Crossrail boreholes completed for installation of monitoring wells
07A	2007 Crossrail Geotechnical Investigation
07B	2007 Docklands Light Rail and 3 car enhancement geotechnical investigation
Hist	Historical Miscellaneous boreholes



NOTES:

1. For geological sections refer to Figures 4.5 to 4.11.
2. For details of exploratory holes refer to relevant factual ground investigation report.

KEY:

- Cable Percussion (shell and auger)
- Cable Percussion + Rotary Core
- Menard Pressuremeter Borehole
- Borehole (unknown type)
- Dynamic Probe sampling
- Rotary core
- Static Cone Penetration Test (CPT)
- Trial pit/trench
- Window sample
- Site Boundary
- Proposed basement outline

Rev	Date	By	Chkd	Appd
02	19/12/16	BM	GM	CB

Basement outline updated from Waterman drawing number: STR-AL-04-POD-LB2-01, Rev5, 16/12/2016

01	02/12/16	BM	GM	CB

Basement outline updated from Waterman drawing number: STR-AL-04-POD-LB2-01, Rev3, 17/11/2016

00	26/09/16	BM	GM	CB

For Information

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London W1T 4BQ
Tel +44(0)20 7636 1531 Fax +44(0)20 7580 3924
www.arup.com

Client
Canary Wharf (North Quay) Ltd.

Job Title
North Quay Development

Drawing Title
Existing Exploratory Hole Location Plan

Scale at A1 1:500

Discipline Geotechnical

Job No **250169**

Drawing Status **For Information**

Drawing No **Figure 4.1**

Rev **02**

DISTANCE ALONG BASELINE (m)

REDUCED LEVEL (mOD)

Level - L00(SSL +6.20mOD)

Level - LB1(SSL +1.55mOD)

Level - LB2(SSL -2.80mOD)

Source data status: of holes
Database check status : Full check (A) = 0% Partial/selective check (B) = 0% Minimum check (C) = 0% Unchecked (U) = 100% of holes

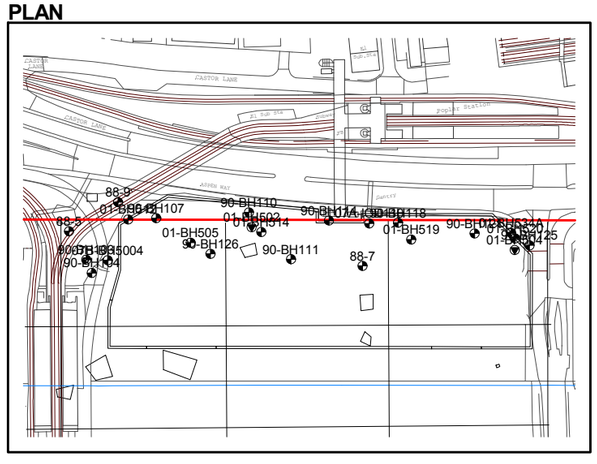
SCALE 1:444V 1:833H @ A3L

LEGEND

Hole offset is +ve to the RIGHT of the baseline

HoleID (Offset)

PLAN



- Void / air [VOID]
- Water [WATER]
- Dock silt [DST]
- Made Ground [MG]
- Alluvium [ALV]
- River Terrace Deposits [RTD]
- London Clay [LC]
- Harwich Formation [HAR]
- Lambeth Group [LMG]
- Thanet Sand [TS]
- Chalk [CHK]
- No Recovery [NR]

- Fill (MADE GROUND)
- CLAY
- Sandy GRAVEL
- Silty sandy gravelly CLAY
- SAND
- CHALK
- Gravelly SAND
- GRAVEL
- SILT
- LIMESTONE
- NO RECOVERY
- SAND and GRAVEL

- MUDSTONE
- Silty sandy CLAY
- Clayey silty GRAVEL
- Silty Clay
- Clayey PEAT
- Organic SILT
- Sandy gravelly CLAY
- Sandy CLAY
- Clayey SAND
- Silty SAND
- Organic CLAY
- Clayey silty SAND

NORTH QUAY
GEOLOGICAL CROSS SECTION A

250169-00

FIGURE 4.2

<<DrawingFileSpec>>

DISTANCE ALONG BASELINE (m)

REDUCED LEVEL (mOD)

Level - L00(SSL +6.20mOD)
Level - LB1(SSL +1.55mOD)
Level - LB2(SSL -2.80mOD)

88-4 (-19.8) 07B-BH5003 (-16.3) 90-BH102 (-23.9) 07B-BH5002B (3.4) 90-BH104 (-29.1) 01-BH511 (2.2) 07A-IOD100 (20.1) 90-BH106 (-20.2) 07A-IOD30R (9.1) 01-BH501 (9.1) 88-3 (-5.9) 01-BH513 (24.9) 90-BH109 (-18.9) 90-BH108 (20.6) 01-BH515 (7.5) 01-BH516 (-22.4) 88-2 (6.6) 90-BH113 (9.0) 07A-IOD102 (20.6) 01-BH503 (0.5) 01-BH517 (2.5) 01-BH518 (23.7) 07A-IOD111 (-3.6) 01-BH506 (7.3) 90-BH116 (-3.1) 90-BH117 (-22.7) 88-8 (-24.1) 90-BH120 (1.2) 90-BH120A (-7.0) 07A-IOD104 (20.0) 88-1 (25.5) 07A-IOD31R (11.6) 01-BH521 (25.0) 90-BH124 (-3.1) 01-BH531 (17.0)

SCALE 1:444V 1:833H @ A3L

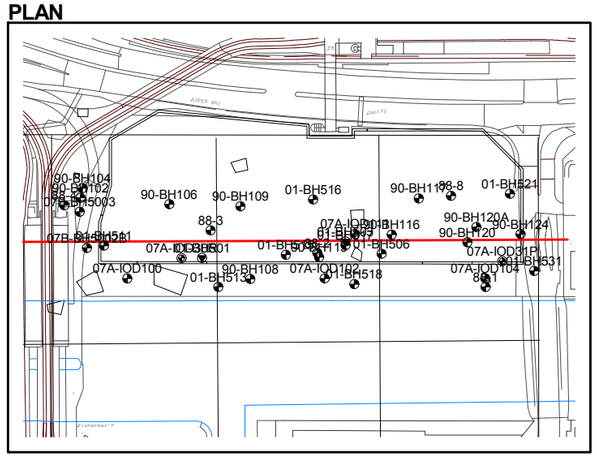
Source data status: of holes
Database check status: Full check (A) = 28% Partial/selective check (B) = 6% Minimum check (C) = 0% Unchecked (U) = 69% of holes

LEGEND

Hole offset is +ve to the RIGHT of the baseline

HoleID (Offset)

PLAN



- Void / air [VOID]
- Water [WATER]
- Dock silt [DST]
- Made Ground [MG]
- Alluvium [ALV]
- River Terrace Deposits [RTD]
- London Clay [LC]
- Harwich Formation [HAR]
- Lambeth Group [LMG]
- Thanet Sand [TS]
- Chalk [CHK]
- No Recovery [NR]

- Fill (MADE GROUND)
- Sandy organic CLAY
- Sandy CLAY
- Clayey SAND
- Gravelly CLAY
- SAND
- Silty SAND
- CHALK
- Clayey GRAVEL
- GRAVEL
- CLAY
- SILT

- SAND and GRAVEL
- NO RECOVERY
- MUDSTONE
- CONCRETE
- Void/Air
- Sandy GRAVEL
- Silty sandy CLAY
- Clayey sandy GRAVEL
- Gravelly SAND
- Silty Clay
- Silty peaty CLAY

NORTH QUAY
GEOLOGICAL CROSS SECTION B

250169-00

FIGURE 4.3

<<DrawingFileSpec>>

DISTANCE ALONG BASELINE (m)

REDUCED LEVEL (mOD)

Level - L00(SSL +5.80mOD)

07A-IOD44 (-13.4)
07A-IOD46 (8.7)
10-WJ02 (17.8)
07A-IOD36R (12.3)
10-WJ03 (0.0)
90-BH112 (-15.2)
07A-IOD50 (-9.8)
07A-IOD52 (11.2)
90-BH115 (-15.1)
10-WJ04 (3.0)
07A-IOD54 (-9.9)
07A-IOD58 (10.8)
10-WJ05 (3.2)
90-BH119 (-15.1)
07A-IOD60 (-10.2)
10-WJ06 (3.4)
07A-IOD38R (12.2)
90-BH123 (-15.3)

Source data status: FINAL= 60% RE records = 28% of holes
Database check status: Full check (A) = 72% Partial/selective check (B) = 0% Minimum check (C) = 0% Unchecked (U) = 28% of holes

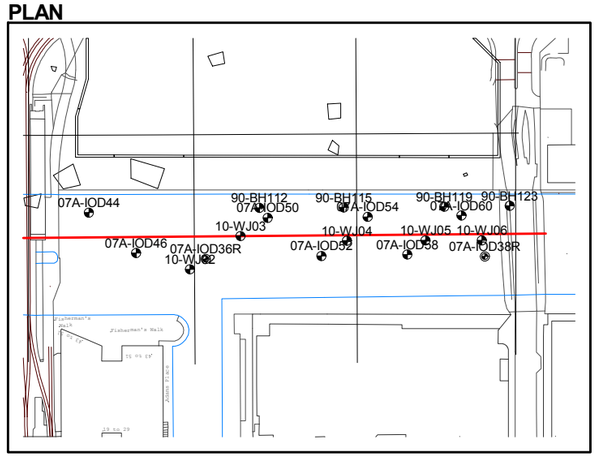
SCALE 1:444V 1:833H @ A3L

LEGEND

Hole offset is +ve to the RIGHT of the baseline

HoleID (Offset)

PLAN



- Void / air [VOID]
- Water [WATER]
- Dock silt [DST]
- Made Ground [MG]
- Alluvium [ALV]
- River Terrace Deposits [RTD]
- London Clay [LC]
- Harwich Formation [HAR]
- Lambeth Group [LMG]
- Thanet Sand [TS]
- Chalk [CHK]
- No Recovery [NR]

- Clayey SILT
- GRAVEL
- Gravelly SAND
- CLAY
- Sandy CLAY
- Clayey SAND
- NO RECOVERY
- Silty SAND
- CHALK
- Fill (MADE GROUND)
- Sandy GRAVEL
- Silty sandy CLAY

- Sandy SILT
- SAND and GRAVEL
- Sandy gravelly CLAY
- Silty gravelly CLAY
- SANDSTONE
- Silty Clay
- Gravelly SILT
- SILT
- Silty GRAVEL
- Gravelly CLAY
- Clayey silty GRAVEL

NORTH QUAY
GEOLOGICAL CROSS SECTION C

250169-00

FIGURE 4.4

<<DrawingFileSpec>>

DISTANCE ALONG BASELINE (m)

REDUCED LEVEL (mOD)

Level - L00(SSL+6.20mOD)
Level - LB1(SSL+1.55mOD)
Level - LB2(SSL-2.80mOD)

88-5 (-4.4)
07B-BH5004 (-25.5)
90-BH104 (-16.8)
Hist-B703 (8.7)
16-WS808 (-33.0)
90-BH102 (-15.7)
88-4 (-7.0)
Hist-B701 (-16.7)
07B-BH5003 (15.3)
01-BH511 (-28.5)
07B-BH5002B (-19.2)
Hist-B704 (3.5)
Hist-B702 (-17.6)
07A-IOD100 (-41.2)
90-BH101 (-20.8)
07A-IOD44 (-32.8)
Hist-BH47 (-4.2)
Dock
07A-IOD42 (-33.0)
Hist-B706 (9.2)
Hist-B688 (-32.2)
Hist-B685 (-0.7)
Hist-B689 (-32.2)
Hist-TQ38SE1476 (2.2)

Source data status: FINAL = 8% of holes
Database check status: Full check (A) = 24% Partial/selective check (B) = 24% Minimum check (C) = 0% Unchecked (U) = 52% of holes

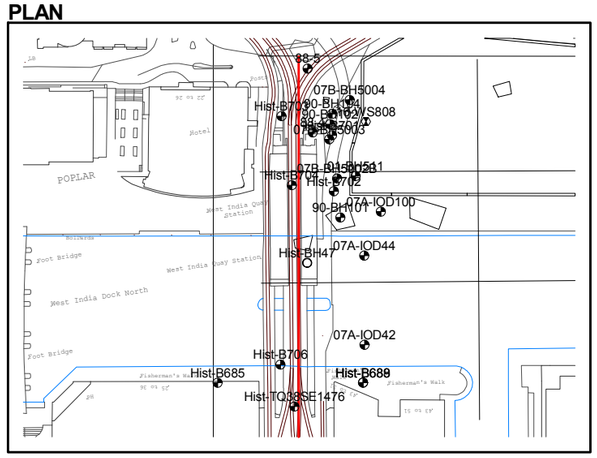
SCALE 1:444V 1:556H @ A3L

LEGEND

Hole offset is +ve to the RIGHT of the baseline

HoleID
(Offset)

PLAN



- Void / air [VOID]
- Water [WATER]
- Dock silt [DST]
- Made Ground [MG]
- Alluvium [ALV]
- River Terrace Deposits [RTD]
- London Clay [LC]
- Harwich Formation [HAR]
- Lambeth Group [LMG]
- Thanet Sand [TS]
- Chalk [CHK]
- No Recovery [NR]
- Fill (MADE GROUND)
- CLAY
- GRAVEL
- SAND
- CHALK
- CONCRETE
- NO RECOVERY
- Sandy GRAVEL
- Gravelly SAND
- SAND and GRAVEL
- Silty gravelly SAND
- Clayey SAND
- Sandy CLAY
- Silty sandy CLAY
- Sandy SILT
- Silty Clay
- Sandy gravelly CLAY
- Made Ground - Asphalt
- Clayey sandy GRAVEL
- Silty SAND
- Silty gravelly CLAY
- Bouldery CLAY
- Clayey silty SAND
- Sandy clayey SILT

NORTH QUAY
GEOLOGICAL CROSS SECTION D

250169-00

FIGURE 4.5

<<DrawingFileSpec>>

DISTANCE ALONG BASELINE (m)

REDUCED LEVEL (mOD)

Level - L00(SSL+6.20mOD

Level - LB1(SSL+1.55mOD)

Level - LB2(SSL-2.80mOD)

Dock

Source data status: FINAL= 6% RE records = 22% of holes
Database check status: Full check (A) = 22% Partial/selective check (B) = 0% Minimum check (C) = 0% Unchecked (U) = 78% of holes

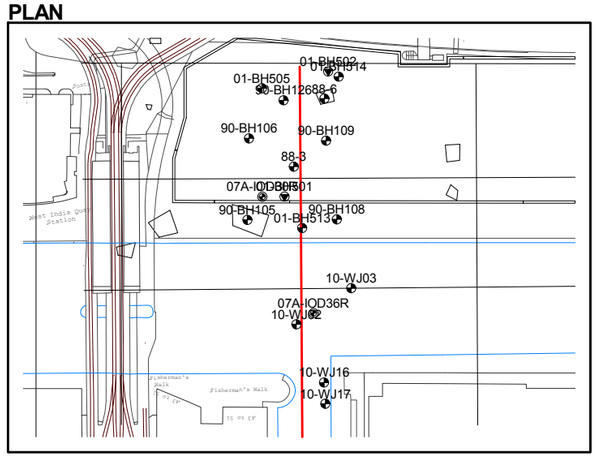
SCALE 1:444V 1:556H @ A3L

LEGEND

Hole offset is +ve to the RIGHT of the baseline

HoleID (Offset)

PLAN



- Void / air [VOID]
- Water [WATER]
- Dock silt [DST]
- Made Ground [MG]
- Alluvium [ALV]
- River Terrace Deposits [RTD]
- London Clay [LC]
- Harwich Formation [HAR]
- Lambeth Group [LMG]
- Thanet Sand [TS]
- Chalk [CHK]
- No Recovery [NR]

- Fill (MADE GROUND)
- Sandy organic CLAY
- Sandy CLAY
- Clayey SAND
- Gravelly CLAY
- SAND
- Silty SAND
- CHALK
- CLAY
- Sandy GRAVEL
- Silty sandy gravelly CLAY
- GRAVEL

- SILT
- LIMESTONE
- NO RECOVERY
- SAND and GRAVEL
- MUDSTONE
- Gravelly SAND
- Clayey SILT
- Gravelly SILT
- Silty Clay
- Silty GRAVEL

NORTH QUAY
GEOLOGICAL CROSS SECTION E

250169-00

FIGURE 4.6

<<DrawingFileSpec>>

DISTANCE ALONG BASELINE (m)

REDUCED LEVEL (mOD)

0 20 40 60 80 100 120 140 160 180 200

10 0 -10 -20 -30 -40 -50 -60 -70

07A-IOD110 (10.3) 90-BH118 (5.4) 01-BH519 (-12.5) 88-7 (14.0) 90-BH117 (-21.5) 07A-IOD109 (12.8) 07A-IOD111 (13.2) 90-BH116 (-6.7) 01-BH503 (18.4) 01-BH517 (13.4) 07A-IOD108 (12.5) 01-BH506 (-1.1) 07A-IOD102 (29.9) 01-BH518 (13.7) Dock 90-BH115 (7.0) 07A-IOD54 (-6.0) 10-WJ04 (5.4) 07A-IOD58 (-27.5) 07A-IOD52 (19.2) 07A-IOD56 (-3.8)

Level - L00(SSL+6.20mOD)

Level - LB1(SSL+1.55mOD)

Level - LB2(SSL-2.80mOD)

Source data status: FINAL= 20% RE records = 5% of holes
Database check status: Full check (A) = 35% Partial/selective check (B) = 10% Minimum check (C) = 0% Unchecked (U) = 55% of holes

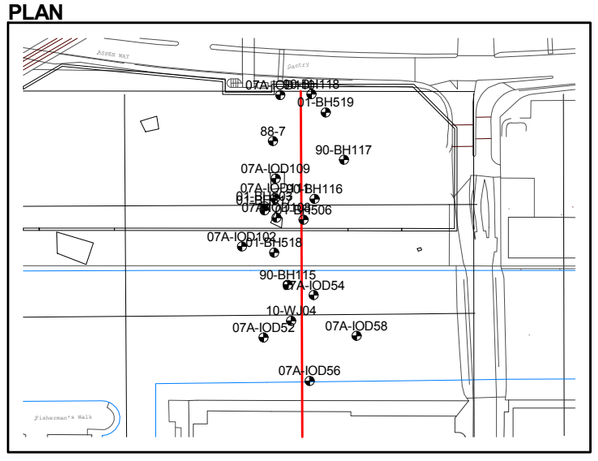
SCALE 1:444V 1:556H @ A3L

LEGEND

Hole offset is +ve to the RIGHT of the baseline

HoleID (Offset)

PLAN



- Void / air [VOID]
- Water [WATER]
- Dock silt [DST]
- Made Ground [MG]
- Alluvium [ALV]
- River Terrace Deposits [RTD]
- London Clay [LC]
- Harwich Formation [HAR]
- Lambeth Group [LMG]
- Thanet Sand [TS]
- Chalk [CHK]
- No Recovery [NR]
- Fill (MADE GROUND)
- Clayey GRAVEL
- Gravelly CLAY
- Clayey SAND
- SAND
- CHALK
- GRAVEL
- CLAY
- SILT
- SAND and GRAVEL
- MUDSTONE
- NO RECOVERY
- CONCRETE
- Sandy GRAVEL
- Silty Clay
- Clayey PEAT
- Organic SILT
- Silty peaty CLAY
- Gravelly SAND
- Sandy SILT
- Clayey SILT
- Sandy gravelly CLAY
- Silty gravelly CLAY
- SANDSTONE

NORTH QUAY
GEOLOGICAL CROSS SECTION F

250169-00

FIGURE 4.7

<<DrawingFileSpec>>

DISTANCE ALONG BASELINE (m)

REDUCED LEVEL (mOD)

Level - L00 (SSL+6.20mOD)

Level - LB1 (SSL+1.55mOD)

Level - LB2 (SSL-2.80mOD)

Dock

01-BH534A (19.8) (39.7)
90-BH121 (17.7)
01-BH520 (9.9)
90-BH125 (17.9)
01-BH504
01-BH521 (15.5)
88-8 (47.5)
01-BH535 (9.1)
90-BH120A (33.8)
90-BH124 (9.8)
90-BH120 (38.7)
07A-IOD31P (19.7)
01-BH531 (2.4)
07A-IOD104 (29.0)
90-BH122 (27.5)
88-1 (28.8)
90-BH123 (3.2)
90-BH119 (38.8)
07A-IOD84R (-30.8)
07A-IOD64 (-23.5)
07A-IOD60 (29.4)
10-WJ08 (-34.7)
10-WJ07 (-16.0)
10-WJ06 (39.9)
07A-IOD66 (-45.3)
07A-IOD38R (16.8)
07A-IOD62 (31.9)
Hist-B673 (-4.3)

Source data status: FINAL = 21%, RE records = 14% of holes
Database check status: Full check (A) = 48%, Partial/selective check (B) = 3%, Minimum check (C) = 0%, Unchecked (U) = 48% of holes

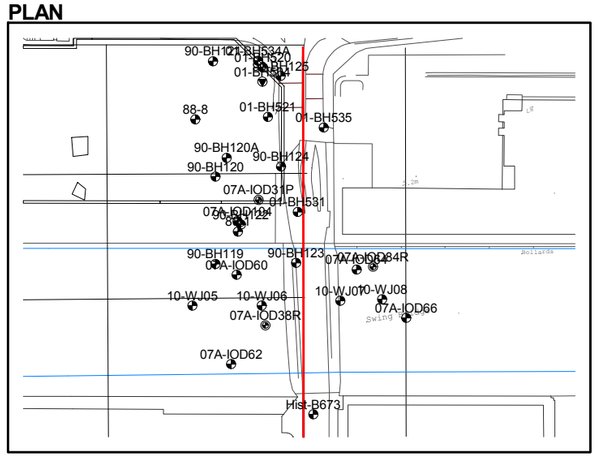
SCALE 1:444V 1:556H @ A3L

LEGEND

Hole offset is +ve to the RIGHT of the baseline

HoleID (Offset)

PLAN



- Void / air [VOID]
- Water [WATER]
- Dock silt [DST]
- Made Ground [MG]
- Alluvium [ALV]
- River Terrace Deposits [RTD]
- London Clay [LC]
- Harwich Formation [HAR]
- Lambeth Group [LMG]
- Bullhead Beds [BUB]
- Thanet Sand [TS]
- Chalk [CHK]

- Fill (MADE GROUND)
- CLAY
- Sandy GRAVEL
- Silty sandy gravelly CLAY
- Gravelly SAND
- SAND
- CHALK
- GRAVEL
- MUDSTONE
- SILT
- CONCRETE
- Void/Air

- Silty sandy CLAY
- Clayey sandy GRAVEL
- Silty SAND
- Sandy CLAY
- Gravelly CLAY
- Clayey silty GRAVEL
- Sandy gravelly CLAY
- SAND and GRAVEL
- Silty gravelly CLAY
- Clayey SAND
- NO RECOVERY

NORTH QUAY
GEOLOGICAL CROSS SECTION G

250169-00

FIGURE 4.8

<<DrawingFileSpec>>

Appendix A

Groundsure report

Groundsure
LOCATION INTELLIGENCE

Enviro+Geo Insight

NORTH QUAY, ASPEN WAY, LONDON, E14,

Order Details

Date: 09/04/2020

Your ref: 250169-00

Our Ref: GS-6734108

Client: Ove Arup & Partners International Ltd

Site Details

Location: 537625 180539

Area: 3.23 ha

Authority: London Borough of Tower Hamlets

Contact us with any questions at:
info@groundsure.com
08444 159 000

Summary of findings

Page	Section	Past land use	On site	0-50m	50-250m	250-500m	500-2000m
14	1.1	Historical industrial land uses	41	18	85	184	-
26	1.2	Historical tanks	0	1	11	29	-
28	1.3	Historical energy features	1	3	20	27	-
30	1.4	Historical petrol stations	0	0	0	0	-
31	1.5	Historical garages	0	0	0	3	-
31	1.6	Historical military land	0	0	0	0	-
Page	Section	Past land use - un-grouped	On site	0-50m	50-250m	250-500m	500-2000m
32	2.1	Historical industrial land uses	55	25	112	266	-
49	2.2	Historical tanks	0	1	28	78	-
53	2.3	Historical energy features	7	16	71	124	-
61	2.4	Historical petrol stations	0	0	0	0	-
61	2.5	Historical garages	0	0	0	3	-
Page	Section	Waste and landfill	On site	0-50m	50-250m	250-500m	500-2000m
63	3.1	Active or recent landfill	0	0	0	0	-
63	3.2	Historical landfill (BGS records)	0	0	0	0	-
64	3.3	Historical landfill (LA/mapping records)	0	0	0	0	-
64	3.4	Historical landfill (EA/NRW records)	0	0	0	1	-
64	3.5	Historical waste sites	0	0	1	0	-
65	3.6	Licensed waste sites	0	0	0	1	-
65	3.7	Waste exemptions	3	0	4	11	-
Page	Section	Current industrial land use	On site	0-50m	50-250m	250-500m	500-2000m
68	4.1	Recent industrial land uses	3	6	54	-	-
73	4.2	Current or recent petrol stations	0	0	0	0	-
73	4.3	Electricity cables	0	0	0	0	-
73	4.4	Gas pipelines	0	0	0	0	-
73	4.5	Sites determined as Contaminated Land	0	0	0	0	-

73	4.6	Control of Major Accident Hazards (COMAH)	0	0	0	0	-
74	4.7	Regulated explosive sites	0	0	0	0	-
74	4.8	Hazardous substance storage/usage	0	0	0	0	-
74	4.9	Historical licensed industrial activities (IPC)	0	0	0	0	-
74	4.10	Licensed industrial activities (Part A(1))	0	0	0	0	-
74	**4.11**	**Licensed pollutant release (Part A(2)/B)**	0	0	0	3	-
75	4.12	Radioactive Substance Authorisations	0	0	0	0	-
75	**4.13**	**Licensed Discharges to controlled waters**	1	0	0	8	-
77	4.14	Pollutant release to surface waters (Red List)	0	0	0	0	-
77	**4.15**	**Pollutant release to public sewer**	0	0	0	1	-
77	**4.16**	**List 1 Dangerous Substances**	0	0	0	3	-
78	4.17	List 2 Dangerous Substances	0	0	0	0	-
78	**4.18**	**Pollution Incidents (EA/NRW)**	0	1	0	3	-
78	4.19	Pollution inventory substances	0	0	0	0	-
79	4.20	Pollution inventory waste transfers	0	0	0	0	-
79	4.21	Pollution inventory radioactive waste	0	0	0	0	-

Page	Section	Hydrogeology	On site	0-50m	50-250m	250-500m	500-2000m
80	**5.1**	**Superficial aquifer**	Identified (within 500m)				
82	**5.2**	**Bedrock aquifer**	Identified (within 500m)				
84	**5.3**	**Groundwater vulnerability**	Identified (within 50m)				
85	5.4	Groundwater vulnerability- soluble rock risk	None (within 0m)				
85	**5.5**	**Groundwater vulnerability- local information**	Identified (within 0m)				
86	**5.6**	**Groundwater abstractions**	0	0	0	0	45
97	5.7	Surface water abstractions	0	0	0	0	0
97	**5.8**	**Potable abstractions**	0	0	0	0	8
99	5.9	Source Protection Zones	0	0	0	0	-
99	5.10	Source Protection Zones (confined aquifer)	0	0	0	0	-

Page	Section	Hydrology	On site	0-50m	50-250m	250-500m	500-2000m
100	6.1	Water Network (OS MasterMap)	0	0	0	-	-

100	**6.2**	**Surface water features**	1	4	4	-	-
101	**6.3**	**WFD Surface water body catchments**	1	-	-	-	-
101	6.4	WFD Surface water bodies	0	0	0	-	-
101	6.5	WFD Groundwater bodies	0	-	-	-	-
Page	Section	River and coastal flooding	On site	0-50m	50-250m	250-500m	500-2000m
102	**7.1**	**Risk of Flooding from Rivers and Sea (RoFRaS)**	High (within 50m)				
103	**7.2**	**Historical Flood Events**	1	0	1	-	-
103	7.3	Flood Defences	0	0	0	-	-
103	**7.4**	**Areas Benefiting from Flood Defences**	1	0	0	-	-
104	7.5	Flood Storage Areas	0	0	0	-	-
105	**7.6**	**Flood Zone 2**	Identified (within 50m)				
106	**7.7**	**Flood Zone 3**	Identified (within 50m)				
Page	Section	Surface water flooding					
107	**8.1**	**Surface water flooding**	1 in 30 year, Greater than 1.0m (within 50m)				
Page	Section	Groundwater flooding					
109	**9.1**	**Groundwater flooding**	Moderate (within 50m)				
Page	Section	Environmental designations	On site	0-50m	50-250m	250-500m	500-2000m
110	10.1	Sites of Special Scientific Interest (SSSI)	0	0	0	0	0
111	10.2	Conserved wetland sites (Ramsar sites)	0	0	0	0	0
111	10.3	Special Areas of Conservation (SAC)	0	0	0	0	0
111	10.4	Special Protection Areas (SPA)	0	0	0	0	0
111	10.5	National Nature Reserves (NNR)	0	0	0	0	0
112	**10.6**	**Local Nature Reserves (LNR)**	0	0	0	0	9
112	10.7	Designated Ancient Woodland	0	0	0	0	0
112	10.8	Biosphere Reserves	0	0	0	0	0
113	10.9	Forest Parks	0	0	0	0	0
113	10.10	Marine Conservation Zones	0	0	0	0	0
113	10.11	Green Belt	0	0	0	0	0
113	10.12	Proposed Ramsar sites	0	0	0	0	0

113	10.13	Possible Special Areas of Conservation (pSAC)	0	0	0	0	0
114	10.14	Potential Special Protection Areas (pSPA)	0	0	0	0	0
114	10.15	Nitrate Sensitive Areas	0	0	0	0	0
114	**10.16**	**Nitrate Vulnerable Zones**	0	0	0	0	1
115	**10.17**	**SSSI Impact Risk Zones**	1	-	-	-	-
116	10.18	SSSI Units	0	0	0	0	0
Page	Section	Visual and cultural designations	On site	0-50m	50-250m	250-500m	500-2000m
117	11.1	World Heritage Sites	0	0	0	-	-
118	11.2	Area of Outstanding Natural Beauty	0	0	0	-	-
118	11.3	National Parks	0	0	0	-	-
118	**11.4**	**Listed Buildings**	1	0	10	-	-
119	**11.5**	**Conservation Areas**	0	0	2	-	-
120	11.6	Scheduled Ancient Monuments	0	0	0	-	-
120	11.7	Registered Parks and Gardens	0	0	0	-	-
Page	Section	Agricultural designations	On site	0-50m	50-250m	250-500m	500-2000m
121	**12.1**	**Agricultural Land Classification**	Urban (within 250m)				
122	12.2	Open Access Land	0	0	0	-	-
122	12.3	Tree Felling Licences	0	0	0	-	-
122	12.4	Environmental Stewardship Schemes	0	0	0	-	-
122	12.5	Countryside Stewardship Schemes	0	0	0	-	-
Page	Section	Habitat designations	On site	0-50m	50-250m	250-500m	500-2000m
123	13.1	Priority Habitat Inventory	0	0	0	-	-
123	13.2	Habitat Networks	0	0	0	-	-
123	13.3	Open Mosaic Habitat	0	0	0	-	-
123	13.4	Limestone Pavement Orders	0	0	0	-	-
Page	Section	Geology 1:10,000 scale	On site	0-50m	50-250m	250-500m	500-2000m
124	**14.1**	**10k Availability**	Identified (within 500m)				
125	**14.2**	**Artificial and made ground (10k)**	0	2	0	5	-
127	**14.3**	**Superficial geology (10k)**	1	0	2	2	-

128	14.4	Landslip (10k)	0	0	0	0	-
129	**14.5**	**Bedrock geology (10k)**	2	0	0	1	-
130	14.6	Bedrock faults and other linear features (10k)	0	0	0	0	-
Page	Section	Geology 1:50,000 scale	On site	0-50m	50-250m	250-500m	500-2000m
131	**15.1**	**50k Availability**	Identified (within 500m)				
132	**15.2**	**Artificial and made ground (50k)**	1	4	2	6	-
133	**15.3**	**Artificial ground permeability (50k)**	0	2	-	-	-
134	**15.4**	**Superficial geology (50k)**	1	0	2	2	-
135	**15.5**	**Superficial permeability (50k)**	Identified (within 50m)				
135	15.6	Landslip (50k)	0	0	0	0	-
135	15.7	Landslip permeability (50k)	None (within 50m)				
136	**15.8**	**Bedrock geology (50k)**	2	0	0	1	-
137	**15.9**	**Bedrock permeability (50k)**	Identified (within 50m)				
137	15.10	Bedrock faults and other linear features (50k)	0	0	0	0	-
Page	Section	Boreholes	On site	0-50m	50-250m	250-500m	500-2000m
138	**16.1**	**BGS Boreholes**	50	79	307	-	-
Page	Section	Natural ground subsidence					
155	**17.1**	**Shrink swell clays**	Moderate (within 50m)				
156	**17.2**	**Running sands**	Low (within 50m)				
158	**17.3**	**Compressible deposits**	High (within 50m)				
160	**17.4**	**Collapsible deposits**	Negligible (within 50m)				
161	**17.5**	**Landslides**	Very low (within 50m)				
162	**17.6**	**Ground dissolution of soluble rocks**	Negligible (within 50m)				
Page	Section	Mining, ground workings and natural cavities	On site	0-50m	50-250m	250-500m	500-2000m
164	**18.1**	**Natural cavities**	0	0	1	0	-
165	18.2	BritPits	0	0	0	0	-
165	**18.3**	**Surface ground workings**	29	0	37	-	-
167	**18.4**	**Underground workings**	0	0	0	0	13
168	18.5	Historical Mineral Planning Areas	0	0	0	0	-

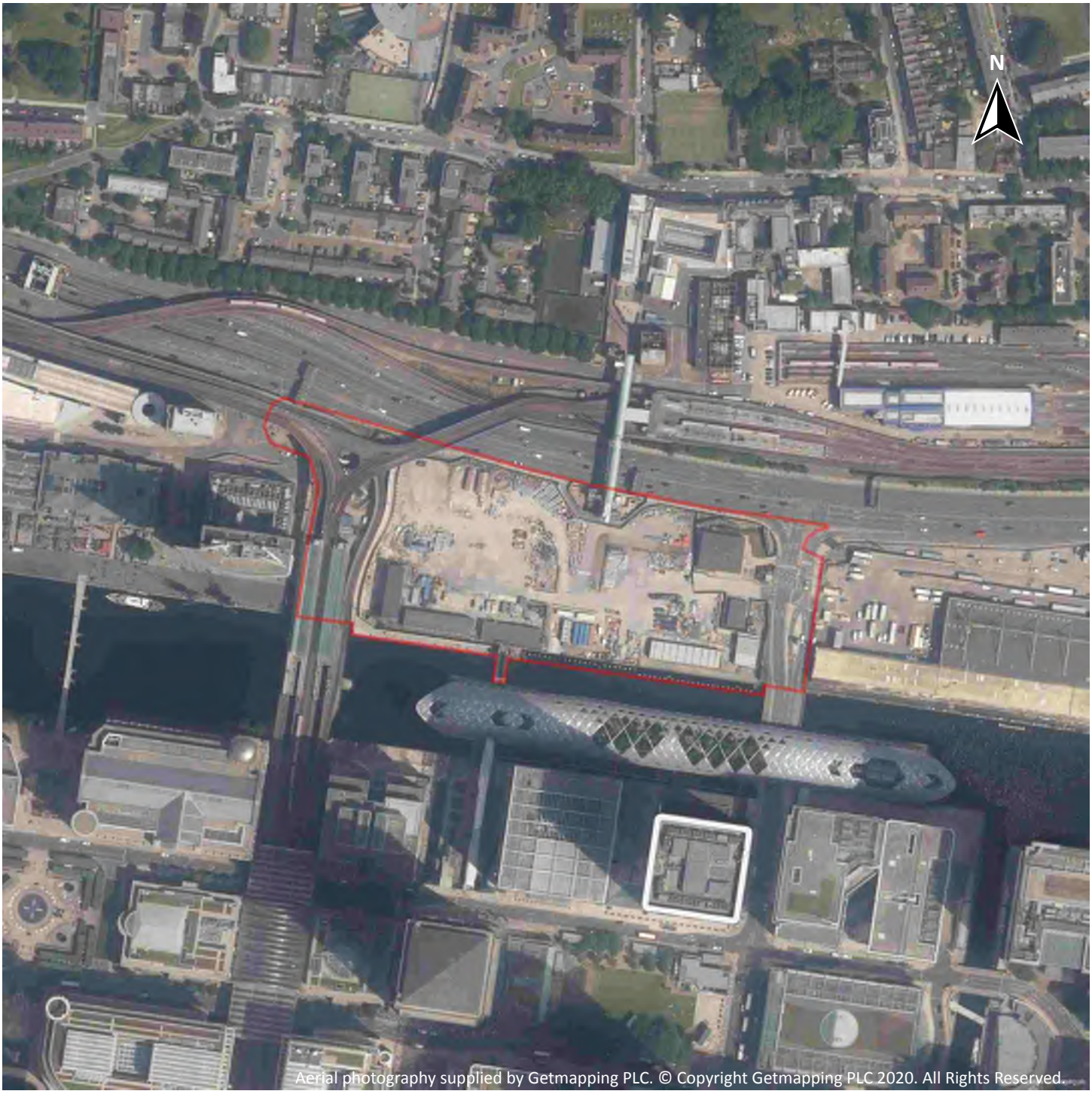
168	18.6	Non-coal mining	0	0	0	0	0
169	18.7	Mining cavities	0	0	0	0	0
169	**18.8**	**JPB mining areas**	Identified (within 0m)				
169	18.9	Coal mining	None (within 0m)				
169	18.10	Brine areas	None (within 0m)				
170	18.11	Gypsum areas	None (within 0m)				
170	18.12	Tin mining	None (within 0m)				
170	18.13	Clay mining	None (within 0m)				

Page	Section	Radon	
171	**19.1**	**Radon**	Between 1% and 3% (within 0m)

Page	Section	Soil chemistry	On site	0-50m	50-250m	250-500m	500-2000m
173	**20.1**	**BGS Estimated Background Soil Chemistry**	7	0	-	-	-
173	**20.2**	**BGS Estimated Urban Soil Chemistry**	10	6	-	-	-
174	20.3	BGS Measured Urban Soil Chemistry	0	0	-	-	-

Page	Section	Railway infrastructure and projects	On site	0-50m	50-250m	250-500m	500-2000m
175	**21.1**	**Underground railways (London)**	1	0	0	-	-
176	21.2	Underground railways (Non-London)	0	0	0	-	-
176	21.3	Railway tunnels	0	0	0	-	-
176	**21.4**	**Historical railway and tunnel features**	21	22	82	-	-
181	21.5	Royal Mail tunnels	0	0	0	-	-
181	**21.6**	**Historical railways**	2	2	0	-	-
181	**21.7**	**Railways**	16	15	45	-	-
184	**21.8**	**Crossrail 1**	0	2	0	0	-
185	21.9	Crossrail 2	0	0	0	0	-
185	21.10	HS2	0	0	0	0	-

Recent aerial photograph



Capture Date: 29/06/2019

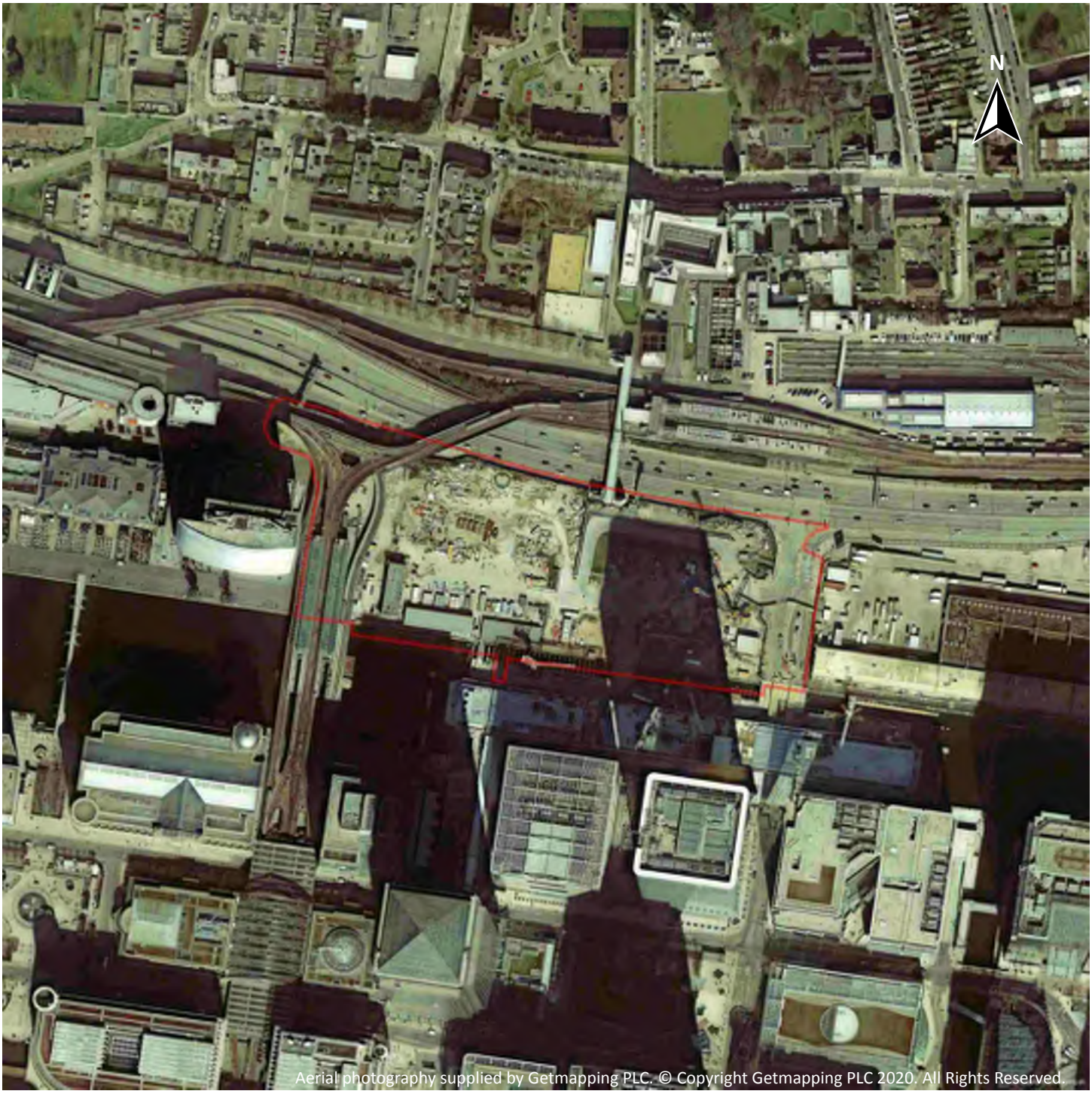
Site Area: 3.23ha

Recent site history - 2015 aerial photograph

Capture Date: 07/06/2015

Site Area: 3.23ha

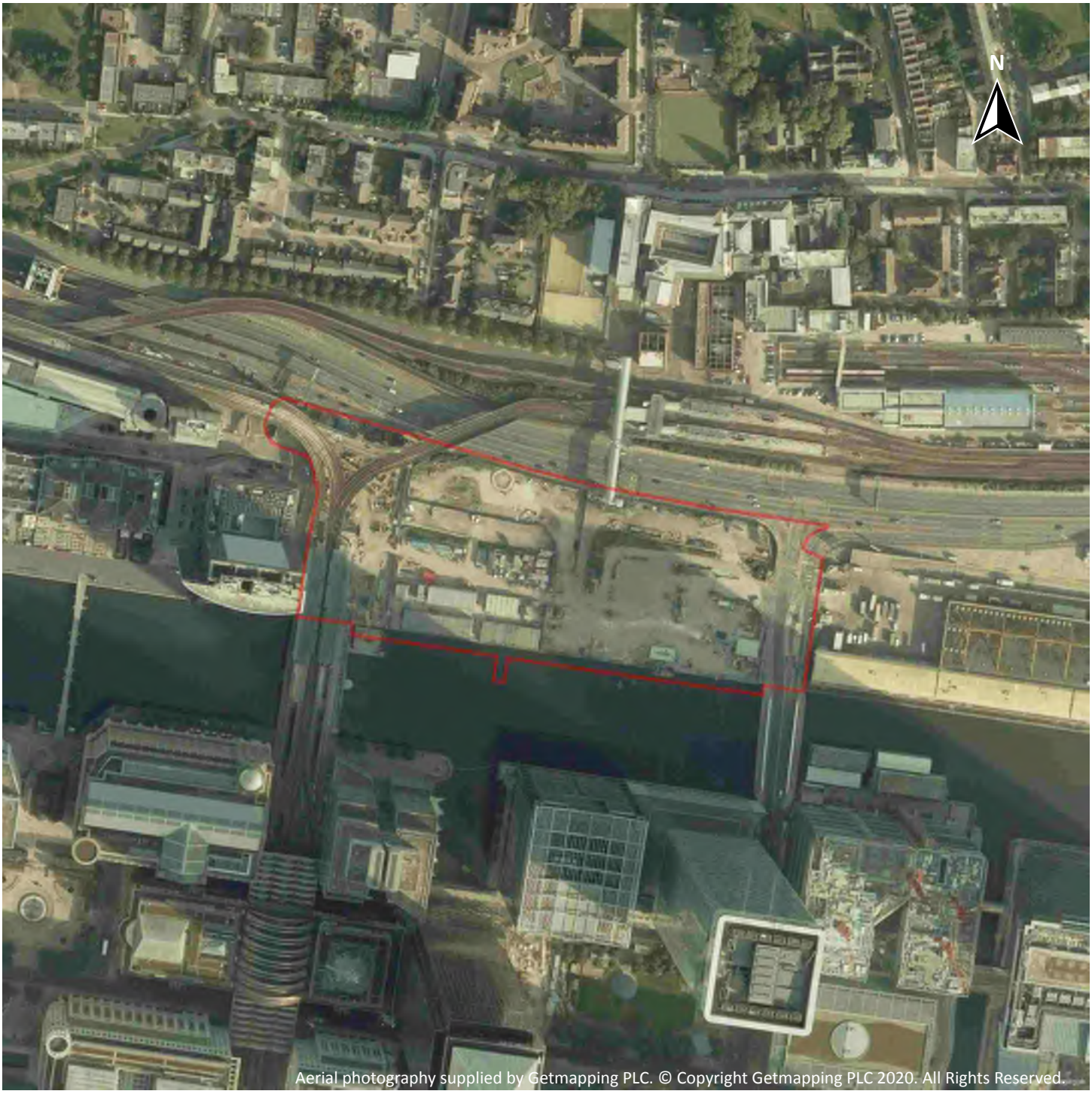
Recent site history - 2013 aerial photograph



Capture Date: 20/04/2013

Site Area: 3.23ha

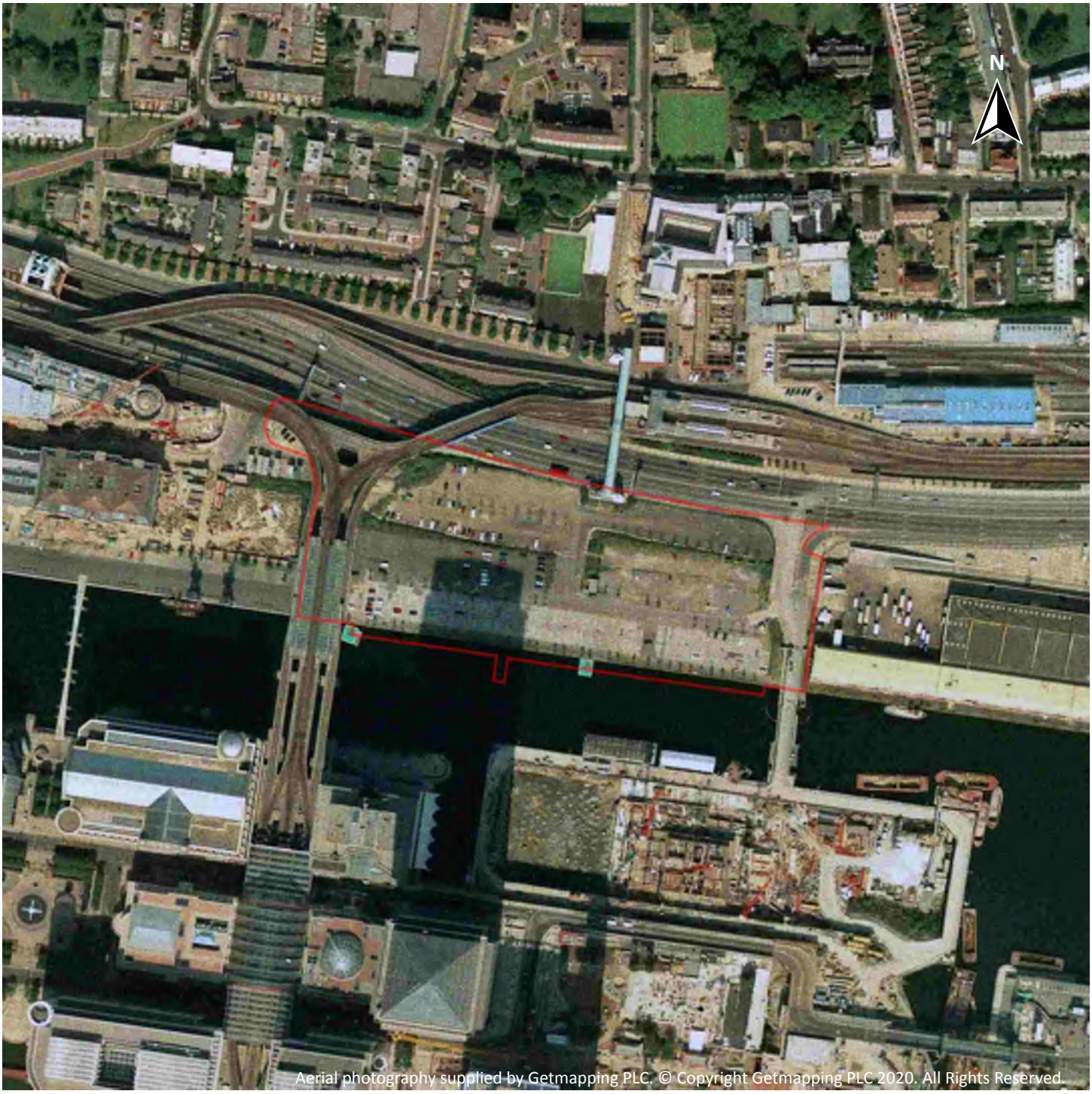
Recent site history - 2008 aerial photograph



Capture Date: 21/09/2008

Site Area: 3.23ha

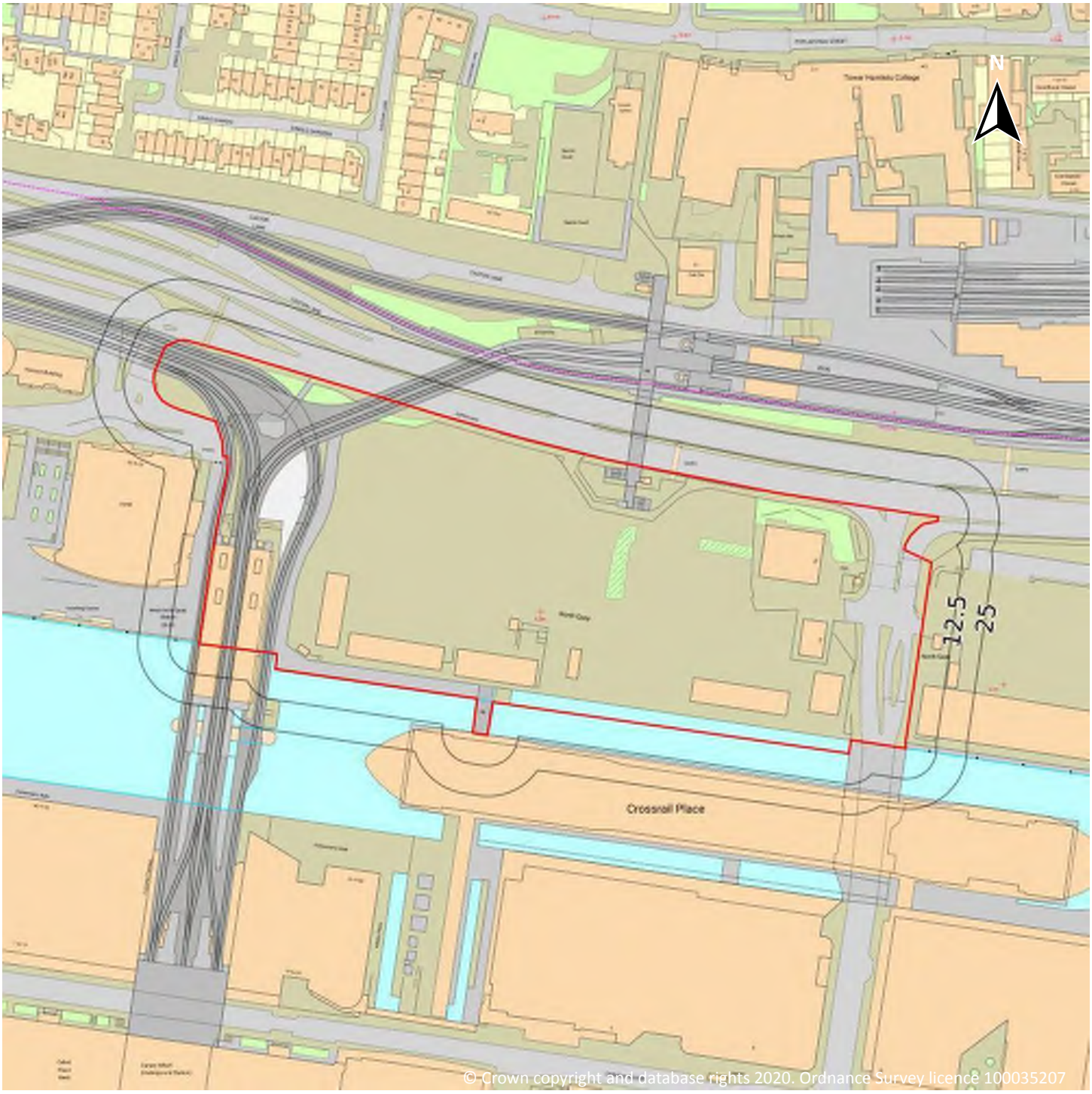
Recent site history - 1999 aerial photograph



Capture Date: 04/09/1999

Site Area: 3.23ha

OS MasterMap site plan



Site Area: 3.23ha

1 Past land use

Site Outline

Search buffers in metres (m)

Historical industrial land uses

Historical tanks

Historical energy features

Historical garages

1.1 Historical industrial land uses

Records within 500m	328

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 1:10,560 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 14**

ID	Location	Land use	Dates present	Group ID
1	**On site**	**Unspecified Warehouses**	**1920**	**2179312**

ID	Location	Land use	Dates present	Group ID
2	On site	Docks	1938	2206300
3	On site	Dock	1894 - 1994	2216682
4	On site	Quay	1989	2265250
5	On site	Dock	1894	2265707
6	On site	Dock	1894 - 1989	2268162
7	On site	Quay	1920	2290741
A	On site	Railway Sidings	1894 - 1898	2172693
A	On site	Dock	1894	2271994
A	On site	Dock Station	1894	2274659
B	On site	Railway Sidings	1894	2123463
B	On site	Import Dock	1896	2146420
B	On site	Unspecified Dock	1867	2168920
B	On site	Unspecified Warehouse	1938	2173336
B	On site	Railway Sidings	1955	2183339
B	On site	Docks	1920	2208137
B	On site	Dock	1894	2212151
B	On site	Railway Sidings	1973	2216348
B	On site	Railway Sidings	1920	2220132
B	On site	Railway Sidings	1894	2238105
B	On site	Dock	1867	2238808
B	On site	Unspecified Docks	1896 - 1898	2244891
B	On site	Unspecified Dock	1899	2252195
B	On site	Railway Sidings	1965	2253307
B	On site	Railway Sidings	1949	2279320
B	On site	Railway Sidings	1894	2293765
C	On site	Railway Building	1920	2149449
C	On site	Unspecified Warehouse	1920 - 1938	2186954
C	On site	Quay	1938	2198275

ID	Location	Land use	Dates present	Group ID
C	**On site**	**Quay**	**1955**	**2198882**
C	**On site**	**Docks**	**1965**	**2215138**
C	**On site**	**Unspecified Warehouses**	**1973 - 1989**	**2223546**
D	**On site**	**Unspecified Warehouse**	**1938**	**2138591**
D	**On site**	**Quay**	**1973 - 1981**	**2198881**
D	**On site**	**Railway Station**	**1989 - 1994**	**2253695**
D	**On site**	**Unspecified Warehouses**	**1920**	**2286995**
D	**On site**	**Unspecified Warehouses**	**1955**	**2288963**
E	**On site**	**Railway Sidings**	**1938**	**2207465**
E	**On site**	**Dock**	**1994**	**2288148**
F	**On site**	**Railway Sidings**	**1981**	**2211725**
G	**On site**	**Unspecified Ground Workings**	**1898 - 1899**	**2262234**
H	0m N	Railway Sidings	1867	2197495
B	1m N	Railway Sidings	1898 - 1899	2258878
8	2m W	Unspecified Warehouses	1989	2272071
B	4m E	Unspecified Warehouse	1938	2138602
H	7m N	Railway Sidings	1867	2240832
B	8m E	Unspecified Warehouses	1920	2250224
B	9m N	Goods Station	1898	2176559
B	12m NE	Railway Sidings	1898	2291344
H	12m N	Railway Sidings	1898	2226904
B	16m NE	Railway Sidings	1899	2213640
B	16m NE	Railway Sidings	1899	2238642
F	18m N	Railway Sidings	1989 - 1994	2204374
I	32m N	Railway Station	1989	2152686
I	35m N	Unspecified Workhouse	1894 - 1898	2281342
I	36m N	Unspecified Workhouse	1894	2273088
I	38m N	Unspecified Workhouse	1894	2228207

ID	Location	Land use	Dates present	Group ID
I	43m N	Unspecified Workhouse	1899	2287119
I	46m N	Unspecified Workhouse	1920	2199036
J	60m W	Unspecified Warehouse	1973 - 1994	2197875
9	60m S	Quay	1949 - 1955	2246331
F	60m NE	Unspecified Depot	1989 - 1994	2244195
J	72m W	Railway Sidings	1938	2168842
J	72m W	Railway Sidings	1920	2168843
K	75m W	Dock	1882 - 1994	2288146
J	75m W	Railway Sidings	1894	2188561
G	76m NW	Railway Building	1894	2149470
I	91m N	Unspecified Workhouse	1867	2293842
I	101m N	Workhouse	1898	2128982
J	106m NW	Iron Works	1882	2272477
10	108m SW	Unspecified Wharf	1989	2259693
L	108m S	Railway Sidings	1981	2258877
I	108m N	Union Workhouse	1867	2162319
A	115m S	Import Dock	1896	2146418
A	117m S	Unspecified Dock	1899	2239222
A	117m S	Unspecified Warehouses	1920	2142542
A	117m S	Dock	1867 - 1938	2238807
A	117m S	Quay	1920	2272776
M	117m NW	Iron Works	1898	2229402
A	119m S	Unspecified Dock	1898	2220621
B	119m E	Railway Building	1867	2229886
B	120m E	Railway Building	1894	2271254
A	120m S	Unspecified Dock	1867	2248301
A	122m S	Unspecified Warehouse	1938	2138592
A	122m S	Quay	1938	2270554

ID	Location	Land use	Dates present	Group ID
B	124m E	Railway Building	1920	2285193
B	126m E	Railway Building	1896	2223596
L	126m S	Railway Station	1994	2152685
11	129m SW	Quay	1955	2262443
B	129m E	Railway Building	1949	2284393
L	137m S	Unspecified Wharf	1994	2239631
K	137m SW	Unspecified Wharf	1955 - 1981	2243604
O	147m S	Railway Sidings	1894	2180969
O	148m S	Railway Sidings	1920	2230652
O	151m S	Railway Sidings	1899	2185910
O	151m S	Railway Sidings	1899	2186669
O	151m S	Railway Sidings	1894	2215493
O	152m S	Railway Sidings	1898	2226477
O	154m S	Railway Sidings	1894	2272855
L	156m S	Dock	1949	2276751
B	160m E	Railway Building	1894	2149451
O	164m S	Unspecified Shed	1920	2140948
A	180m S	Railway Sidings	1894	2208484
A	182m S	Railway Sidings	1894	2192620
Q	184m S	Quay	1938	2280952
O	187m SE	Unspecified Wharf	1938	2186995
J	190m W	Railway Station	1949	2184214
R	191m SE	Railway Sidings	1955 - 1973	2258879
J	192m W	Railway Station	1920 - 1938	2230855
J	192m W	Dock Station	1899	2196862
J	192m W	Dock Station	1899	2231148
A	195m S	Railway Sidings	1894	2247255
A	195m S	Railway Sidings	1899	2183597

ID	Location	Land use	Dates present	Group ID
A	195m S	Railway Sidings	1899	2258934
Q	195m S	Unspecified Warehouses	1955	2198506
Q	195m S	Unspecified Warehouses	1973	2241414
J	196m W	Dock Station	1898	2223790
A	196m S	Unspecified Warehouse	1920 - 1938	2281800
A	197m S	Railway Sidings	1898	2184094
J	199m W	Railway Station	1898	2152684
12	202m SW	Quay	1955	2286634
O	209m SE	Timber Sheds	1955	2164224
J	210m W	Railway Station	1894	2222622
L	210m SW	Unspecified Warehouses	1920	2224708
J	210m W	Dock Station	1894	2175485
O	210m S	Unspecified Wharf	1920	2194154
J	211m W	Dock Station	1894	2189171
O	212m SE	Timber Shed	1973 - 1981	2271198
J	213m W	Railway Station	1882	2173562
J	213m W	Dock Station	1894	2189413
L	215m SW	Unspecified Warehouse	1938	2138593
K	216m SW	Unspecified Tank	1994	2155135
B	216m E	Railway Station	1894	2229296
B	217m E	Railway Station	1938	2171443
B	218m E	Railway Building	1894	2222869
Q	220m S	Quay	1920	2260373
B	224m E	Railway Building	1920	2273079
B	225m E	Junction Station	1894	2141975
B	228m E	Railway Buildings	1949	2280828
B	233m E	Railway Building	1894	2149469
S	239m E	Unspecified Commercial/Industrial	1955 - 1965	2291834

ID	Location	Land use	Dates present	Group ID
B	244m E	Railway Buildings	1894	2163572
O	248m S	Unspecified Wharf	1949	2276878
13	249m S	Quay	1920	2266730
14	252m W	Quay	1994	2282557
T	254m E	Store Depot	1938	2151629
B	257m E	Goods Station	1867	2234303
15	258m W	Unspecified Yard	1994	2157890
B	259m E	Railway Buildings	1894	2186712
B	260m E	Railway Building	1973	2200774
B	263m E	Railway Building	1949	2194012
B	265m E	Railway Building	1949	2149457
T	271m E	Store Depot	1920	2151630
T	273m E	Unspecified Depot	1949	2147250
U	276m E	Unspecified Commercial/Industrial	1898	2295272
S	283m E	Docks	1949 - 1955	2221010
V	284m S	Docks	1894	2168954
V	284m S	Docks	1894	2168955
B	289m NE	Railway Building	1894	2204227
T	289m SE	Railway Sidings	1898	2207981
B	290m NE	Railway Building	1894	2149471
W	291m S	Dock	1867 - 1994	2238806
T	292m SE	Railway Sidings	1899	2230753
T	292m SE	Railway Sidings	1899	2268655
X	294m W	Police Station	1973 - 1981	2240744
B	295m E	Railway Sidings	1898	2172688
Y	295m SW	Quay	1955	2179946
B	296m NE	Railway Building	1973 - 1981	2197529
Y	297m SW	Quay	1989	2294253

ID	Location	Land use	Dates present	Group ID
B	304m NE	Railway Building	1949	2216996
S	312m E	Dock	1867 - 1994	2288149
S	316m E	Dock	1894	2263043
Z	316m S	Quays	1989 - 1994	2202528
AA	317m SW	Dock	1898	2253696
AB	318m W	Basin	1898	2164529
Y	329m SW	Unspecified Quay	1899	2179576
AA	329m SW	Unspecified Dock	1899	2275687
R	329m SE	Quay	1949	2253135
V	331m SW	Docks	1938	2275724
AC	333m SW	Quay	1994	2204377
Y	333m SW	Unspecified Quay	1898	2199499
AD	333m SW	Unspecified Dock	1898	2290936
AE	334m NE	Railway Sidings	1949	2199858
AF	338m S	Export Dock	1896	2128895
17	339m S	Railway Sidings	1894	2262355
AE	339m NE	Railway Sidings	1867	2270909
R	340m S	Railway Sidings	1920	2168836
W	340m S	Quay	1920	2276289
H	340m E	Goods Sheds	1920	2166527
AD	341m S	Railway Sidings	1981	2215118
H	342m E	Goods Shed	1938 - 1949	2212466
AD	342m S	Quay	1949	2248261
R	344m S	Unspecified Dock	1867	2259360
Z	344m S	Quay	1938	2288987
S	345m E	Docks	1894	2237025
AH	349m NE	Railway Building	1949	2149472
AI	350m SE	Basin	1898	2293464

ID	Location	Land use	Dates present	Group ID
AE	352m NE	Railway Sidings	1898	2294466
AI	352m SE	Basin	1896	2230081
AI	353m SE	Basin	1899	2204588
AI	353m SE	Docks	1965	2185832
AD	353m S	Unspecified Warehouses	1973 - 1981	2236520
AJ	356m S	Quays	1994	2139537
R	356m SE	Timber Sheds	1955	2289751
U	356m E	Railway Buildings	1867	2163573
AI	358m SE	Dock Basin	1867	2151239
R	359m SE	Railway Sidings	1949	2220830
R	360m SE	Timber Sheds	1898	2189873
R	360m SE	Railway Sidings	1898	2224505
AK	360m SE	Unspecified Dock	1898	2244805
R	361m SE	Railway Sidings	1899	2205508
R	361m SE	Railway Sidings	1899	2221827
R	361m SE	Timber Sheds	1899	2261160
AK	361m SE	Unspecified Dock	1899	2246191
R	362m SE	Quay	1920	2291638
R	362m SE	Railway Sidings	1896	2176169
AB	362m W	Unspecified Commercial/Industrial	1955	2130989
AJ	363m S	Quay	1955	2194257
AD	365m SW	Railway Station	1989 - 1994	2174048
AE	365m NE	Railway Sidings	1898	2269266
W	366m S	Quay	1920	2218615
R	368m SE	Unspecified Wharf	1981	2221303
AL	369m E	Railway Building	1949	2149458
R	372m SE	Timber Sheds	1894	2172666
R	374m SE	Timber Sheds	1896	2280060

ID	Location	Land use	Dates present	Group ID
R	374m SE	Timber Sheds	1894	2183996
R	375m SE	Timber Shed	1938 - 1949	2196869
R	377m SE	Timber Shed	1920	2193219
AJ	377m S	Quay	1955	2268302
R	378m SE	Unspecified Dock	1896	2197147
Y	378m SW	Quay	1894	2284311
U	382m E	Railway Building	1894	2149467
AF	382m S	Railway Sidings	1899	2260920
AF	382m S	Railway Sidings	1899	2265349
AB	382m SW	Lead Works	1894	2294056
AL	382m E	Unspecified Depot	1965	2221839
18	383m S	Quay	1949	2203414
AF	384m S	Railway Sidings	1898	2273988
AL	392m E	Unspecified Depot	1973 - 1981	2208279
AJ	398m S	Railway Sidings	1920	2168840
AJ	399m S	Railway Sidings	1894	2178088
R	401m S	Unspecified Wharf	1989	2232908
AB	402m SW	Docks	1898	2189442
AK	403m SE	Railway Sidings	1949	2278611
21	407m N	Fire Station	1973 - 1994	2186455
AB	410m SW	Wharf and Lead Works	1898 - 1899	2280730
AM	412m SE	Dock	1867 - 1955	2288150
AB	412m SW	Iron Works	1955	2152569
AB	412m SW	Unspecified Works	1965 - 1989	2176439
23	412m S	Quay	1920 - 1994	2284271
AK	413m SE	Unspecified Warehouse	1994	2138594
AB	414m SW	Wharf and Lead Works	1894	2256237
AN	414m E	Quay	1949	2227985

ID	Location	Land use	Dates present	Group ID
U	415m E	Railway Sidings	1898	2206838
AB	416m SW	Unspecified Docks	1899	2183872
AB	417m SW	Unspecified Docks	1898	2176276
AB	417m SW	Wharf and Lead Works	1894	2170272
AO	417m NE	Grave Yard	1867	2185263
AB	417m SW	Docks	1894	2205057
R	417m SE	Railway Sidings	1981	2198787
R	417m S	Unspecified Warehouses	1973	2142541
AO	418m NE	Grave Yard	1867	2267429
AB	419m SW	Unspecified Wharf	1994	2195952
R	422m S	Railway Building	1894	2149450
AB	422m SW	Dock	1949	2288147
AE	423m NE	Railway Station	1894 - 1896	2212800
AN	424m E	Quay	1938	2244218
AE	424m NE	Railway Station	1920 - 1949	2180528
AE	426m NE	Railway Station	1867	2229968
R	426m SE	Timber Sheds	1894 - 1896	2179746
AE	426m NE	Railway Station	1894	2193874
AB	427m SW	Docks	1894	2178825
AO	428m NE	Grave Yard	1898	2202045
AE	428m NE	Railway Station	1894	2240700
R	428m SE	Timber Shed	1938 - 1949	2281987
AE	428m NE	Railway Station	1894	2207933
R	430m SE	Timber Shed	1920	2219759
AE	431m NE	Railway Station	1898 - 1899	2283812
R	431m S	Timber Shed	1955	2166539
AB	431m SW	Railway Sidings	1920 - 1938	2195905
S	437m E	Railway Building	1949	2149454

ID	Location	Land use	Dates present	Group ID
AB	438m SW	Dock	1949	2203953
AB	440m SW	Dock	1882	2293876
AN	440m E	Quay	1920	2188870
AB	441m SW	Dock	1920 - 1938	2189374
S	443m E	Railway Building	1973	2149456
AB	443m SW	Dock	1920 - 1938	2237911
AK	448m SE	Unspecified Warehouses	1989	2142548
25	449m NW	Railway Station	1989 - 1994	2233826
V	450m SW	Quay	1989	2212924
AQ	451m NW	Police Station	1973 - 1994	2265694
AB	453m W	Unspecified Wharf	1894	2182875
AB	454m W	Unspecified Wharf	1894	2192387
R	455m SE	Railway Sidings	1949	2275654
AE	455m NE	Railway Station	1989 - 1994	2261437
R	460m SE	Unspecified Wharf	1973	2221518
AU	460m S	Dock	1979	2169102
AU	460m S	Dock	1973	2169103
26	462m S	Dock	1948	2216683
AK	465m SE	Railway Sidings	1899	2186730
AK	465m SE	Railway Sidings	1899	2227620
AK	465m SE	Railway Sidings	1898	2215060
AV	466m W	Unspecified Wharf	1973 - 1981	2195951
R	468m SE	Dock Station	1894	2276158
AB	468m SW	Dock	1882	2275121
R	471m SE	Railway Station	1894	2239808
R	472m SE	Dock Station	1896	2269565
AV	472m W	Unspecified Dock	1898	2167844
AV	473m W	Unspecified Foundry	1894	2249472

ID	Location	Land use	Dates present	Group ID
R	474m SE	Railway Station	1894	2247800
R	474m SE	Railway Station	1898 - 1899	2172356
27	475m S	Timber Dock	1898	2162781
R	476m SE	Railway Station	1920	2262600
AB	476m SW	Dry Dock	1955	2141062
AU	480m S	Unspecified Dock	1867	2251283
AB	482m SW	Dock	1920 - 1938	2287132
AK	487m SE	Dock	1973 - 1981	2190620
AB	488m SW	Unspecified Tank	1973 - 1981	2288022
AV	493m W	Unspecified Foundry	1898 - 1899	2279101
28	494m E	Railway Building	1894	2149468
S	496m E	Railway Building	1973	2149455
AV	496m W	Unspecified Foundry	1894	2228189
AW	496m N	Cuttings	1894	2237215
AW	496m NE	Cuttings	1867	2201528
AB	497m SW	Dock	1949	2271328
AB	497m SW	Docks	1882 - 1894	2220821
AM	498m SE	Timber Sheds	1894	2170064
AW	498m N	Cuttings	1894	2213670

This data is sourced from Ordnance Survey / Groundsure.

1.2 Historical tanks

Records within 500m	**41**

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 14**

ID	Location	Land use	Dates present	Group ID
I	49m N	Unspecified Tank	1993	366865
I	67m N	Unspecified Tank	1916	365380
I	83m N	Unspecified Tank	1869	365379
I	93m N	Unspecified Tank	1869	366867
I	121m N	Tanks	1916	376657
B	156m E	Tanks	1985 - 1997	390621
K	201m SW	Unspecified Tank	1992 - 1996	385951
K	218m SW	Unspecified Tank	1992 - 1996	393501
K	223m SW	Unspecified Tank	1992 - 1996	398600
K	227m SW	Unspecified Tank	1992 - 1996	392194
K	248m SW	Unspecified Tank	1992 - 1996	383376
B	249m NE	Unspecified Tank	1950	366866
J	268m W	Unspecified Tank	1997	384196
J	268m W	Unspecified Tank	1993	390795
J	268m W	Unspecified Tank	1996	392791
J	268m W	Unspecified Tank	1993	398981
J	268m W	Unspecified Tank	1999	399626
J	268m W	Unspecified Tank	1992	408533
J	269m W	Unspecified Tank	1963	382891
J	270m W	Unspecified Tank	1991	402188
J	270m W	Unspecified Tank	1983	381068
J	270m W	Unspecified Tank	1984	389297
J	270m W	Unspecified Tank	1991	404429
B	279m E	Unspecified Tank	1950	399983
X	317m W	Unspecified Tank	1950 - 1999	383044
B	319m NE	Unspecified Tank	1950	387063
B	320m NE	Unspecified Tank	1990 - 1998	400166
X	320m W	Unspecified Tank	1896	399851

ID	Location	Land use	Dates present	Group ID
B	322m NE	Unspecified Tank	1916	366868
X	325m W	Unspecified Tank	1896	365418
X	325m W	Unspecified Tank	1916	365371
X	329m W	Unspecified Tank	1916	365372
R	368m SE	Unspecified Tank	1991 - 1998	403021
20	394m N	Unspecified Tank	1951	365373
AB	431m W	Unspecified Tank	1992 - 1996	408860
AB	439m W	Unspecified Tank	1992 - 1996	402873
AE	443m NE	Unspecified Tank	1991 - 1997	385149
AB	453m W	Unspecified Tank	1992 - 1996	407708
AB	461m W	Unspecified Tank	1992 - 1996	409386
AB	474m SW	Unspecified Tank	1949 - 1951	387156
AB	491m SW	Unspecified Tank	1965 - 1987	394532

This data is sourced from Ordnance Survey / Groundsure.

1.3 Historical energy features

Records within 500m	**51**

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 14**

ID	Location	Land use	Dates present	Group ID
C	**On site**	**Electricity Substation**	**1989 - 1997**	**284276**
I	39m N	Electricity Substation	1989 - 1997	261816
I	43m N	Electricity Substation	1991 - 1992	270331
D	47m W	Electricity Substation	1963 - 1996	291254
I	73m N	Electricity Substation	1991	258716

ID	Location	Land use	Dates present	Group ID
I	73m N	Electricity Substation	1992 - 1997	284570
I	76m N	Electricity Substation	1992	283376
I	78m N	Electricity Substation	1993 - 1997	273167
I	86m N	Electricity Substation	1989	268216
I	108m N	Electricity Substation	1991	253167
I	108m N	Electricity Substation	1991	255783
N	129m N	Electricity Substation	1950 - 1997	262192
N	129m N	Electricity Substation	1950 - 1991	283057
I	135m N	Electricity Substation	1989 - 1991	280272
B	146m E	Electricity Substation	1985 - 1998	285061
J	147m W	Electricity Substation	1963	272287
J	147m W	Electricity Substation	1970	276451
J	148m W	Electricity Substation	1984	279986
M	149m NW	Electricity Substation	1970	269262
M	149m NW	Electricity Substation	1963	284487
M	152m NW	Electricity Substation	1983 - 1999	287464
P	177m NE	Electricity Substation	1989 - 1991	292351
P	179m NE	Electricity Substation	1992 - 1997	270639
J	212m NW	Electricity Substation	1963 - 1999	266727
16	278m N	Electricity Substation	1963 - 1999	290976
AG	349m W	Electricity Substation	1992 - 1999	266595
AC	349m SW	Electricity Substation	1987 - 1996	266866
AG	350m W	Electricity Substation	1983 - 1991	277381
AH	356m NE	Electricity Substation	1991	245551
19	389m W	Electricity Substation	1963 - 1991	280937
AE	401m NE	Electricity Substation	1989 - 1997	275538
22	408m NW	Electricity Substation	1963 - 1999	262701
AJ	413m SW	Electricity Substation	1987 - 1996	268947

ID	Location	Land use	Dates present	Group ID
AP	421m W	Electricity Substation	1984 - 1991	281362
AP	422m W	Electricity Substation	1970 - 1983	265286
AP	422m W	Electricity Substation	1963	259504
AQ	431m NW	Electricity Substation	1963 - 1999	259037
AB	432m SW	Electricity Substation	1981 - 1987	288050
AR	434m NE	Electricity Substation	1971	255498
AR	439m NE	Electricity Substation	1991 - 1998	258861
AR	440m NE	Electricity Substation	1981 - 1991	289754
AE	443m NE	Electricity Substation	1989 - 1991	279799
AS	444m N	Electricity Substation	1954 - 1992	289317
AT	445m N	Electricity Substation	1951 - 1991	266672
AS	445m N	Electricity Substation	1954	260188
AT	445m N	Electricity Substation	1954 - 1994	292467
AB	465m SW	Electricity Substation	1981 - 1987	282866
S	472m E	Electricity Substation	1971 - 1981	284355
R	477m SE	Electricity Substation	1989 - 1991	274149
R	479m SE	Electricity Substation	1998	278342
AV	486m W	Electricity Substation	1971	245547

This data is sourced from Ordnance Survey / Groundsure.

1.4 Historical petrol stations

Records within 500m	**0**

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

1.5 Historical garages

Records within 500m	3

Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 14**

ID	Location	Land use	Dates present	Group ID
AB	366m W	Garage	1951	73497
24	431m N	Garage	1947	73508
AB	483m W	Barge Repair Shed	1971	73958

This data is sourced from Ordnance Survey / Groundsure.

1.6 Historical military land

Records within 500m	0

Areas of military land digitised from multiple sources including the National Archives, local records, MOD records and verified other sources, intelligently grouped into contiguous features.

This data is sourced from Ordnance Survey / Groundsure / other sources.

2 Past land use - un-grouped

Site Outline

Search buffers in metres (m)

Historical industrial land uses

Historical tanks

Historical energy features

Historical garages

2.1 Historical industrial land uses

Records within 500m	458

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 10,560 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 32**

ID	Location	Land Use	Date	Group ID
1	**On site**	**Dock**	**1894**	**2265707**
2	**On site**	**Unspecified Warehouses**	**1920**	**2179312**
3	**On site**	**Quay**	**1920**	**2290741**

ID	Location	Land Use	Date	Group ID
4	On site	Dock	1994	2216682
5	On site	Quay	1989	2265250
6	On site	Docks	1938	2206300
A	On site	Dock	1894	2271994
A	On site	Railway Sidings	1894	2172693
A	On site	Dock Station	1894	2274659
A	On site	Railway Sidings	1896	2172693
B	On site	Unspecified Warehouse	1938	2186954
B	On site	Unspecified Warehouses	1989	2223546
B	On site	Dock	1989	2268162
B	On site	Unspecified Warehouses	1973	2223546
B	On site	Dock	1973	2268162
B	On site	Docks	1965	2215138
B	On site	Unspecified Warehouse	1920	2186954
B	On site	Railway Building	1920	2149449
B	On site	Unspecified Warehouses	1981	2223546
B	On site	Dock	1981	2268162
B	On site	Dock	1955	2268162
B	On site	Dock	1949	2268162
B	On site	Quay	1938	2198275
B	On site	Quay	1955	2198882
C	On site	Railway Sidings	1938	2207465
C	On site	Dock	1994	2288148
D	On site	Unspecified Warehouse	1938	2138591
D	On site	Railway Station	1989	2253695
D	On site	Quay	1973	2198881
D	On site	Unspecified Warehouses	1920	2286995
D	On site	Railway Station	1994	2253695

ID	Location	Land Use	Date	Group ID
D	**On site**	**Quay**	**1981**	**2198881**
D	**On site**	**Unspecified Warehouses**	**1955**	**2288963**
E	**On site**	**Railway Sidings**	**1894**	**2123463**
E	**On site**	**Unspecified Warehouse**	**1938**	**2173336**
E	**On site**	**Railway Sidings**	**1894**	**2238105**
E	**On site**	**Railway Sidings**	**1973**	**2216348**
E	**On site**	**Railway Sidings**	**1965**	**2253307**
E	**On site**	**Railway Sidings**	**1920**	**2220132**
E	**On site**	**Docks**	**1920**	**2208137**
E	**On site**	**Railway Sidings**	**1894**	**2293765**
E	**On site**	**Dock**	**1867**	**2238808**
E	**On site**	**Railway Sidings**	**1955**	**2183339**
E	**On site**	**Railway Sidings**	**1949**	**2279320**
E	**On site**	**Dock**	**1894**	**2212151**
E	**On site**	**Dock**	**1898**	**2268162**
E	**On site**	**Unspecified Dock**	**1867**	**2168920**
E	**On site**	**Import Dock**	**1896**	**2146420**
E	**On site**	**Unspecified Dock**	**1899**	**2252195**
E	**On site**	**Unspecified Dock**	**1899**	**2252195**
E	**On site**	**Unspecified Docks**	**1898**	**2244891**
F	**On site**	**Railway Sidings**	**1981**	**2211725**
G	**On site**	**Unspecified Ground Workings**	**1899**	**2262234**
G	**On site**	**Unspecified Ground Workings**	**1899**	**2262234**
G	**On site**	**Unspecified Ground Workings**	**1898**	**2262234**
H	0m N	Railway Sidings	1867	2197495
E	1m N	Railway Sidings	1898	2258878
7	2m W	Unspecified Warehouses	1989	2272071
E	4m E	Unspecified Warehouse	1938	2138602

ID	Location	Land Use	Date	Group ID
E	4m N	Railway Sidings	1899	2258878
E	4m N	Railway Sidings	1899	2258878
H	7m N	Railway Sidings	1867	2240832
E	8m E	Unspecified Warehouses	1920	2250224
E	9m N	Goods Station	1898	2176559
E	12m NE	Railway Sidings	1898	2291344
H	12m N	Railway Sidings	1898	2226904
E	16m NE	Railway Sidings	1899	2213640
E	16m NE	Railway Sidings	1899	2238642
F	18m N	Railway Sidings	1994	2204374
F	25m N	Railway Sidings	1989	2204374
I	32m N	Railway Station	1989	2152686
I	35m N	Unspecified Workhouse	1894	2281342
I	36m N	Unspecified Workhouse	1894	2273088
I	37m N	Unspecified Workhouse	1894	2273088
I	38m N	Unspecified Workhouse	1894	2228207
I	40m N	Unspecified Workhouse	1898	2281342
I	42m N	Unspecified Workhouse	1896	2281342
I	43m N	Unspecified Workhouse	1899	2287119
I	43m N	Unspecified Workhouse	1899	2287119
I	46m N	Unspecified Workhouse	1920	2199036
J	60m W	Unspecified Warehouse	1989	2197875
J	60m W	Unspecified Warehouse	1994	2197875
8	60m S	Quay	1955	2246331
F	60m NE	Unspecified Depot	1994	2244195
J	61m W	Unspecified Warehouse	1973	2197875
J	61m W	Unspecified Warehouse	1981	2197875
F	62m NE	Unspecified Depot	1989	2244195

ID	Location	Land Use	Date	Group ID
J	72m W	Railway Sidings	1938	2168842
J	72m W	Railway Sidings	1920	2168843
9	75m W	Dock	1938	2288146
J	75m W	Railway Sidings	1894	2188561
G	76m NW	Railway Building	1894	2149470
K	76m W	Dock	1894	2288146
10	90m W	Dock	1882	2288146
I	91m N	Unspecified Workhouse	1867	2293842
I	101m N	Workhouse	1898	2128982
J	106m NW	Iron Works	1882	2272477
11	108m SW	Unspecified Wharf	1989	2259693
L	108m S	Railway Sidings	1981	2258877
I	108m N	Union Workhouse	1867	2162319
A	114m S	Dock	1898	2216682
A	115m S	Import Dock	1896	2146418
A	116m S	Quay	1949	2246331
A	117m S	Unspecified Dock	1899	2239222
A	117m S	Unspecified Dock	1899	2239222
A	117m S	Unspecified Warehouses	1920	2142542
A	117m S	Quay	1920	2272776
A	117m S	Dock	1920	2238807
M	117m NW	Iron Works	1898	2229402
A	119m S	Dock	1894	2288146
A	119m S	Unspecified Dock	1898	2220621
E	119m E	Railway Building	1867	2229886
E	120m E	Railway Building	1894	2271254
A	120m S	Dock	1894	2216682
A	120m S	Unspecified Dock	1867	2248301

ID	Location	Land Use	Date	Group ID
A	122m S	Dock	1867	2238807
A	122m S	Quay	1938	2270554
A	122m S	Unspecified Warehouse	1938	2138592
E	124m E	Railway Building	1920	2285193
E	126m E	Railway Building	1896	2223596
L	126m S	Railway Station	1994	2152685
O	129m SW	Quay	1955	2262443
E	129m E	Railway Building	1949	2284393
L	137m S	Unspecified Wharf	1994	2239631
O	137m SW	Unspecified Wharf	1973	2243604
O	137m SW	Unspecified Wharf	1965	2243604
O	137m SW	Unspecified Wharf	1981	2243604
O	137m SW	Unspecified Wharf	1955	2243604
A	147m S	Railway Sidings	1894	2180969
A	148m S	Railway Sidings	1920	2230652
O	150m SW	Dock	1938	2238807
A	151m S	Railway Sidings	1894	2215493
A	151m S	Railway Sidings	1899	2185910
A	151m S	Railway Sidings	1899	2186669
A	152m S	Railway Sidings	1898	2226477
A	154m S	Railway Sidings	1894	2272855
O	156m SW	Dock	1894	2288146
L	156m S	Dock	1949	2276751
E	160m E	Railway Building	1894	2149451
A	164m S	Unspecified Shed	1920	2140948
12	178m W	Quay	1955	2262443
A	180m S	Railway Sidings	1894	2208484
A	182m S	Railway Sidings	1894	2192620

ID	Location	Land Use	Date	Group ID
Q	184m S	Quay	1938	2280952
A	187m SE	Unspecified Wharf	1938	2186995
J	190m W	Railway Station	1949	2184214
A	190m SE	Dock	1994	2288146
R	191m SE	Railway Sidings	1973	2258879
R	191m SE	Railway Sidings	1965	2258879
R	191m SE	Railway Sidings	1955	2258879
J	192m W	Railway Station	1938	2230855
J	192m W	Dock Station	1899	2196862
J	192m W	Dock Station	1899	2231148
J	194m W	Railway Station	1920	2230855
A	195m S	Railway Sidings	1894	2247255
A	195m S	Railway Sidings	1899	2258934
A	195m S	Railway Sidings	1899	2183597
Q	195m S	Unspecified Warehouses	1973	2241414
Q	195m S	Unspecified Warehouses	1955	2198506
J	196m W	Dock Station	1898	2223790
A	196m S	Unspecified Warehouse	1920	2281800
A	197m S	Railway Sidings	1898	2184094
J	199m W	Railway Station	1898	2152684
A	201m S	Unspecified Warehouse	1938	2281800
S	202m SW	Quay	1955	2286634
A	209m SE	Timber Sheds	1955	2164224
J	210m W	Railway Station	1894	2222622
L	210m SW	Unspecified Warehouses	1920	2224708
A	210m S	Unspecified Wharf	1920	2194154
J	210m W	Dock Station	1894	2175485
J	211m W	Dock Station	1894	2189171

ID	Location	Land Use	Date	Group ID
S	211m S	Dock	1994	2288146
A	212m SE	Timber Shed	1973	2271198
A	212m SE	Timber Shed	1981	2271198
J	213m W	Dock Station	1894	2189413
J	213m W	Railway Station	1882	2173562
L	215m SW	Unspecified Warehouse	1938	2138593
O	216m SW	Unspecified Tank	1994	2155135
E	216m E	Railway Station	1894	2229296
E	217m E	Railway Station	1938	2171443
E	218m E	Railway Building	1894	2222869
E	219m E	Railway Building	1894	2222869
Q	220m S	Quay	1920	2260373
E	224m E	Railway Building	1920	2273079
E	225m E	Junction Station	1894	2141975
E	228m E	Railway Buildings	1949	2280828
E	233m E	Railway Building	1894	2149469
T	239m E	Unspecified Commercial/Industrial	1965	2291834
T	239m E	Unspecified Commercial/Industrial	1955	2291834
E	244m E	Railway Buildings	1894	2163572
A	248m S	Unspecified Wharf	1949	2276878
U	249m S	Quay	1920	2266730
U	250m S	Dock	1882	2288146
K	252m W	Quay	1994	2282557
V	254m E	Store Depot	1938	2151629
E	257m E	Goods Station	1867	2234303
13	258m W	Unspecified Yard	1994	2157890
E	259m E	Railway Buildings	1894	2186712
E	260m E	Railway Building	1973	2200774

ID	Location	Land Use	Date	Group ID
E	263m E	Railway Building	1949	2194012
E	265m E	Railway Building	1949	2149457
V	271m E	Store Depot	1920	2151630
V	273m E	Unspecified Depot	1949	2147250
T	273m NE	Unspecified Docks	1896	2244891
W	276m E	Unspecified Commercial/Industrial	1898	2295272
T	283m E	Docks	1955	2221010
Y	284m S	Docks	1894	2168955
E	289m NE	Railway Building	1894	2204227
V	289m SE	Railway Sidings	1898	2207981
E	290m NE	Railway Building	1894	2149471
Z	291m S	Dock	1994	2238806
V	292m SE	Railway Sidings	1899	2268655
V	292m SE	Railway Sidings	1899	2230753
K	294m W	Police Station	1973	2240744
K	294m W	Police Station	1981	2240744
AA	294m S	Dock	1867	2238806
E	295m E	Railway Sidings	1898	2172688
AB	295m SW	Quay	1955	2179946
E	296m NE	Railway Building	1973	2197529
E	296m NE	Railway Building	1981	2197529
AB	297m SW	Quay	1989	2294253
E	304m NE	Railway Building	1949	2216996
T	309m E	Docks	1949	2221010
AC	311m S	Dock	1894	2268162
T	312m E	Dock	1867	2288149
T	316m E	Dock	1894	2263043
AD	316m S	Quays	1989	2202528

ID	Location	Land Use	Date	Group ID
AD	316m S	Quays	1994	2202528
AC	317m SW	Dock	1898	2253696
Y	318m W	Basin	1898	2164529
AB	329m SW	Unspecified Quay	1899	2179576
AB	329m SW	Unspecified Quay	1899	2179576
AC	329m SW	Unspecified Dock	1899	2275687
AC	329m SW	Unspecified Dock	1899	2275687
R	329m SE	Quay	1949	2253135
Z	330m S	Dock	1949	2238806
AE	331m SW	Docks	1938	2275724
AF	333m SW	Quay	1994	2204377
Z	333m SW	Unspecified Dock	1898	2290936
AB	333m SW	Unspecified Quay	1898	2199499
AG	334m NE	Railway Sidings	1949	2199858
Z	337m S	Dock	1989	2288146
Z	337m S	Dock	1973	2288146
Z	337m S	Dock	1965	2288146
Z	337m S	Dock	1981	2288146
Z	337m S	Dock	1955	2288146
AH	338m S	Export Dock	1896	2128895
AI	339m S	Railway Sidings	1894	2262355
AG	339m NE	Railway Sidings	1867	2270909
R	340m S	Railway Sidings	1920	2168836
R	340m S	Dock	1920	2238806
AA	340m S	Quay	1920	2276289
H	340m E	Goods Sheds	1920	2166527
Z	341m S	Railway Sidings	1981	2215118
AA	342m S	Dock	1894	2288146

ID	Location	Land Use	Date	Group ID
H	342m E	Goods Shed	1949	2212466
Z	342m S	Quay	1949	2248261
H	343m E	Goods Shed	1938	2212466
R	344m S	Unspecified Dock	1867	2259360
AD	344m S	Quay	1938	2288987
T	345m E	Docks	1894	2237025
R	349m SE	Dock	1994	2288146
AK	349m NE	Railway Building	1949	2149472
AL	350m SE	Basin	1898	2293464
AG	352m NE	Railway Sidings	1898	2294466
AL	352m SE	Basin	1896	2230081
AL	353m SE	Basin	1899	2204588
AL	353m SE	Basin	1899	2204588
AL	353m SE	Docks	1965	2185832
Z	353m S	Unspecified Warehouses	1973	2236520
Z	353m S	Unspecified Warehouses	1981	2236520
Z	356m S	Quays	1994	2139537
R	356m SE	Timber Sheds	1955	2289751
W	356m E	Railway Buildings	1867	2163573
AL	358m SE	Dock Basin	1867	2151239
AM	359m SE	Railway Sidings	1894	2172693
R	359m SE	Railway Sidings	1949	2220830
R	360m SE	Timber Sheds	1898	2189873
R	360m SE	Railway Sidings	1898	2224505
AN	360m SE	Unspecified Dock	1898	2244805
R	361m SE	Timber Sheds	1899	2261160
R	361m SE	Railway Sidings	1899	2205508
R	361m SE	Timber Sheds	1899	2261160

ID	Location	Land Use	Date	Group ID
R	361m SE	Railway Sidings	1899	2221827
AN	361m SE	Unspecified Dock	1899	2246191
AN	361m SE	Unspecified Dock	1899	2246191
R	362m SE	Quay	1920	2291638
R	362m SE	Railway Sidings	1896	2176169
Y	362m W	Unspecified Commercial/Industrial	1955	2130989
Z	363m S	Quay	1955	2194257
Z	365m SW	Railway Station	1989	2174048
Z	365m SW	Railway Station	1994	2174048
AG	365m NE	Railway Sidings	1898	2269266
AA	366m S	Quay	1920	2218615
R	368m SE	Unspecified Wharf	1981	2221303
AO	369m E	Railway Building	1949	2149458
R	372m SE	Timber Sheds	1894	2172666
R	374m SE	Timber Sheds	1894	2172666
R	374m SE	Timber Sheds	1896	2280060
R	374m SE	Timber Sheds	1894	2183996
R	375m SE	Timber Shed	1949	2196869
T	375m E	Dock	1989	2288149
T	375m E	Dock	1981	2288149
R	375m SE	Timber Sheds	1894	2172666
T	376m E	Dock	1973	2288149
R	377m SE	Timber Shed	1920	2193219
Z	377m S	Quay	1955	2268302
R	378m SE	Timber Shed	1938	2196869
R	378m SE	Unspecified Dock	1896	2197147
AB	378m SW	Quay	1894	2284311
W	382m E	Railway Building	1894	2149467

ID	Location	Land Use	Date	Group ID
AH	382m S	Railway Sidings	1899	2260920
AH	382m S	Railway Sidings	1899	2265349
Y	382m SW	Lead Works	1894	2294056
AO	382m E	Unspecified Depot	1965	2221839
14	383m S	Quay	1949	2203414
AH	384m S	Railway Sidings	1898	2273988
AO	392m E	Unspecified Depot	1973	2208279
AO	392m E	Unspecified Depot	1981	2208279
Z	398m S	Railway Sidings	1920	2168840
Z	399m S	Railway Sidings	1894	2178088
R	401m S	Unspecified Wharf	1989	2232908
Y	402m SW	Docks	1898	2189442
AN	403m SE	Railway Sidings	1949	2278611
16	405m W	Dock	1894	2288146
AQ	405m W	Dock	1894	2288146
AR	407m N	Fire Station	1989	2186455
AR	407m N	Fire Station	1973	2186455
AR	407m N	Fire Station	1994	2186455
AR	407m N	Fire Station	1981	2186455
Y	410m SW	Wharf and Lead Works	1899	2280730
Y	410m SW	Wharf and Lead Works	1899	2280730
17	412m SE	Dock	1894	2288150
Y	412m SW	Unspecified Works	1989	2176439
Y	412m SW	Unspecified Works	1973	2176439
Y	412m SW	Unspecified Works	1965	2176439
Y	412m SW	Unspecified Works	1981	2176439
Y	412m SW	Iron Works	1955	2152569
T	412m E	Dock	1994	2288149

ID	Location	Land Use	Date	Group ID
AT	412m S	Quay	1920	2284271
AN	413m SE	Unspecified Warehouse	1994	2138594
Y	414m SW	Wharf and Lead Works	1894	2256237
AU	414m E	Quay	1949	2227985
W	415m E	Railway Sidings	1898	2206838
Y	416m SW	Unspecified Docks	1899	2183872
Y	416m SW	Unspecified Docks	1899	2183872
Y	417m SW	Wharf and Lead Works	1898	2280730
Y	417m SW	Unspecified Docks	1898	2176276
Y	417m SW	Wharf and Lead Works	1894	2170272
AV	417m NE	Grave Yard	1867	2185263
Y	417m SW	Docks	1894	2205057
R	417m SE	Railway Sidings	1981	2198787
R	417m S	Unspecified Warehouses	1973	2142541
AV	418m NE	Grave Yard	1867	2267429
Y	419m SW	Unspecified Wharf	1994	2195952
R	422m S	Railway Building	1894	2149450
Y	422m SW	Dock	1949	2288147
AG	423m NE	Railway Station	1894	2212800
AU	424m E	Quay	1938	2244218
AG	424m NE	Railway Station	1938	2180528
AG	426m NE	Railway Station	1867	2229968
R	426m SE	Timber Sheds	1894	2179746
AG	426m NE	Railway Station	1894	2193874
AG	427m NE	Railway Station	1867	2229968
Y	427m SW	Docks	1894	2178825
AV	428m NE	Grave Yard	1898	2202045
R	428m SE	Timber Sheds	1896	2179746

ID	Location	Land Use	Date	Group ID
AG	428m NE	Railway Station	1894	2240700
R	428m SE	Timber Shed	1949	2281987
AN	428m SE	Dock	1949	2238806
AG	428m NE	Railway Station	1894	2207933
R	429m SE	Timber Shed	1938	2281987
AG	430m NE	Railway Station	1920	2180528
Y	430m SW	Lead Works	1894	2294056
AG	430m NE	Railway Station	1896	2212800
R	430m SE	Timber Shed	1920	2219759
AG	431m NE	Railway Station	1899	2283812
AG	431m NE	Railway Station	1899	2283812
R	431m S	Timber Shed	1955	2166539
Y	431m SW	Railway Sidings	1938	2195905
Y	431m SW	Railway Sidings	1920	2195905
AT	434m S	Dock	1882	2288146
AG	434m NE	Railway Station	1898	2283812
AG	436m NE	Railway Station	1949	2180528
T	437m E	Railway Building	1949	2149454
Y	438m SW	Dock	1949	2203953
Y	440m SW	Dock	1882	2293876
AU	440m E	Quay	1920	2188870
Y	441m SW	Dock	1938	2189374
Y	441m SW	Dock	1920	2189374
T	443m E	Railway Building	1973	2149456
Y	443m SW	Dock	1938	2237911
Y	443m SW	Dock	1920	2237911
AN	448m SE	Unspecified Warehouses	1989	2142548
BB	449m NW	Railway Station	1989	2233826

ID	Location	Land Use	Date	Group ID
BB	449m NW	Railway Station	1994	2233826
AE	450m SW	Quay	1989	2212924
AX	451m NW	Police Station	1989	2265694
AX	451m NW	Police Station	1973	2265694
AX	451m NW	Police Station	1994	2265694
AX	451m NW	Police Station	1981	2265694
Y	453m W	Unspecified Wharf	1894	2182875
Y	454m W	Unspecified Wharf	1894	2192387
R	455m SE	Railway Sidings	1949	2275654
AG	455m NE	Railway Station	1989	2261437
AG	455m NE	Railway Station	1994	2261437
R	460m SE	Unspecified Wharf	1973	2221518
AI	460m S	Dock	1955	2238806
AN	460m SE	Dock	1955	2288150
AI	460m S	Dock	1973	2169103
AI	460m S	Dock	1967	2238806
AI	462m S	Dock	1948	2216683
AN	465m SE	Railway Sidings	1899	2186730
AN	465m SE	Railway Sidings	1899	2227620
AN	465m SE	Railway Sidings	1898	2215060
AQ	466m W	Unspecified Wharf	1973	2195951
AQ	466m W	Unspecified Wharf	1981	2195951
R	468m SE	Dock Station	1894	2276158
Y	468m SW	Dock	1882	2275121
R	471m SE	Railway Station	1894	2239808
R	472m SE	Dock Station	1896	2269565
AQ	472m W	Unspecified Dock	1898	2167844
R	473m SE	Railway Station	1894	2239808

ID	Location	Land Use	Date	Group ID
AQ	473m W	Unspecified Foundry	1894	2249472
R	474m SE	Railway Station	1894	2247800
AQ	474m W	Unspecified Foundry	1894	2249472
R	474m SE	Railway Station	1898	2172356
19	475m S	Timber Dock	1898	2162781
R	475m SE	Railway Station	1899	2172356
R	475m SE	Railway Station	1899	2172356
AQ	475m W	Dock	1938	2288146
AQ	475m W	Dock	1920	2288146
R	476m SE	Railway Station	1920	2262600
Y	476m SW	Dry Dock	1955	2141062
20	477m SW	Dock	1894	2271994
21	478m SW	Docks	1894	2168954
AM	480m S	Unspecified Dock	1867	2251283
AN	480m SE	Dock	1867	2288150
Y	482m SW	Dock	1920	2287132
Y	482m SW	Dock	1938	2287132
AN	487m SE	Dock	1973	2190620
AN	487m SE	Dock	1981	2190620
Y	488m SW	Unspecified Tank	1973	2288022
Y	488m SW	Unspecified Tank	1981	2288022
22	490m S	Dock	1898	2288150
AQ	493m W	Unspecified Foundry	1899	2279101
AQ	493m W	Unspecified Foundry	1899	2279101
23	494m E	Railway Building	1894	2149468
T	496m E	Railway Building	1973	2149455
AQ	496m W	Unspecified Foundry	1894	2228189
BC	496m N	Cuttings	1894	2237215

ID	Location	Land Use	Date	Group ID
BC	496m NE	Cuttings	1867	2201528
Y	497m SW	Dock	1949	2271328
Y	497m SW	Docks	1882	2220821
BC	498m N	Cuttings	1894	2213670
AN	498m SE	Dock	1894	2288150
AN	498m SE	Timber Sheds	1894	2170064
AQ	498m W	Unspecified Foundry	1898	2279101

This data is sourced from Ordnance Survey / Groundsure.

2.2 Historical tanks

Records within 500m	**107**

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 32**

ID	Location	Land Use	Date	Group ID
I	49m N	Unspecified Tank	1993	366865
I	67m N	Unspecified Tank	1916	365380
I	83m N	Unspecified Tank	1869	365379
I	93m N	Unspecified Tank	1869	366867
I	121m N	Tanks	1916	376657
E	156m E	Tanks	1997	390621
E	156m E	Tanks	1993	390621
E	156m E	Tanks	1994	390621
E	156m E	Tanks	1992	390621
E	162m E	Tanks	1989	390621
E	162m E	Tanks	1985	390621
E	162m E	Tanks	1991	390621
E	162m E	Tanks	1991	390621

ID	Location	Land Use	Date	Group ID
O	201m SW	Unspecified Tank	1996	385951
O	201m SW	Unspecified Tank	1993	385951
O	201m SW	Unspecified Tank	1992	385951
O	218m SW	Unspecified Tank	1996	393501
O	218m SW	Unspecified Tank	1993	393501
O	218m SW	Unspecified Tank	1992	393501
O	223m SW	Unspecified Tank	1996	398600
O	223m SW	Unspecified Tank	1993	398600
O	223m SW	Unspecified Tank	1992	398600
O	227m SW	Unspecified Tank	1996	392194
O	227m SW	Unspecified Tank	1993	392194
O	227m SW	Unspecified Tank	1992	392194
O	248m SW	Unspecified Tank	1996	383376
O	248m SW	Unspecified Tank	1993	383376
O	248m SW	Unspecified Tank	1992	383376
E	249m NE	Unspecified Tank	1950	366866
J	268m W	Unspecified Tank	1996	392791
J	268m W	Unspecified Tank	1997	384196
J	268m W	Unspecified Tank	1993	390795
J	268m W	Unspecified Tank	1993	398981
J	268m W	Unspecified Tank	1992	408533
J	268m W	Unspecified Tank	1999	399626
J	269m W	Unspecified Tank	1963	382891
J	270m W	Unspecified Tank	1984	389297
J	270m W	Unspecified Tank	1983	381068
J	270m W	Unspecified Tank	1991	404429
J	270m W	Unspecified Tank	1991	402188
E	279m E	Unspecified Tank	1950	399983

ID	Location	Land Use	Date	Group ID
E	279m E	Unspecified Tank	1950	399983
K	317m W	Unspecified Tank	1950	383044
K	317m W	Unspecified Tank	1950	383044
K	317m W	Unspecified Tank	1965	383044
K	317m W	Unspecified Tank	1996	383044
K	317m W	Unspecified Tank	1997	383044
K	317m W	Unspecified Tank	1993	383044
K	317m W	Unspecified Tank	1993	383044
K	317m W	Unspecified Tank	1992	383044
K	317m W	Unspecified Tank	1999	383044
K	317m W	Unspecified Tank	1963	383044
K	317m W	Unspecified Tank	1964	383044
K	317m W	Unspecified Tank	1970	383044
K	317m W	Unspecified Tank	1964	383044
K	317m W	Unspecified Tank	1950	383044
K	319m W	Unspecified Tank	1984	383044
K	319m W	Unspecified Tank	1983	383044
K	319m W	Unspecified Tank	1991	383044
K	319m W	Unspecified Tank	1991	383044
E	319m NE	Unspecified Tank	1950	387063
E	320m NE	Unspecified Tank	1950	387063
E	320m NE	Unspecified Tank	1994	400166
E	320m NE	Unspecified Tank	1993	400166
E	320m NE	Unspecified Tank	1992	400166
E	320m NE	Unspecified Tank	1992	400166
E	320m NE	Unspecified Tank	1998	400166
E	320m NE	Unspecified Tank	1991	400166
E	320m NE	Unspecified Tank	1991	400166

ID	Location	Land Use	Date	Group ID
E	320m NE	Unspecified Tank	1992	400166
K	320m W	Unspecified Tank	1896	399851
E	321m NE	Unspecified Tank	1990	400166
E	321m NE	Unspecified Tank	1991	400166
E	321m NE	Unspecified Tank	1991	400166
E	321m NE	Unspecified Tank	1991	400166
E	322m NE	Unspecified Tank	1916	366868
K	325m W	Unspecified Tank	1896	365418
K	325m W	Unspecified Tank	1916	365371
K	329m W	Unspecified Tank	1916	365372
R	368m SE	Unspecified Tank	1998	403021
R	369m SE	Unspecified Tank	1991	403021
15	394m N	Unspecified Tank	1951	365373
Y	431m W	Unspecified Tank	1996	408860
Y	431m W	Unspecified Tank	1993	408860
Y	431m W	Unspecified Tank	1992	408860
Y	439m W	Unspecified Tank	1996	402873
Y	439m W	Unspecified Tank	1993	402873
Y	439m W	Unspecified Tank	1992	402873
AG	443m NE	Unspecified Tank	1997	385149
AG	443m NE	Unspecified Tank	1993	385149
AG	443m NE	Unspecified Tank	1994	385149
AG	443m NE	Unspecified Tank	1992	385149
AG	444m NE	Unspecified Tank	1991	385149
Y	453m W	Unspecified Tank	1996	407708
Y	453m W	Unspecified Tank	1993	407708
Y	453m W	Unspecified Tank	1992	407708
Y	461m W	Unspecified Tank	1996	409386

ID	Location	Land Use	Date	Group ID
Y	461m W	Unspecified Tank	1993	409386
Y	461m W	Unspecified Tank	1992	409386
Y	474m SW	Unspecified Tank	1951	387156
Y	474m SW	Unspecified Tank	1949	387156
Y	474m SW	Unspecified Tank	1950	387156
Y	474m SW	Unspecified Tank	1950	387156
Y	491m SW	Unspecified Tank	1965	394532
Y	491m SW	Unspecified Tank	1981	394532
Y	491m SW	Unspecified Tank	1985	394532
Y	491m SW	Unspecified Tank	1987	394532

This data is sourced from Ordnance Survey / Groundsure.

2.3 Historical energy features

Records within 500m **218**

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 32**

ID	Location	Land Use	Date	Group ID
B	**On site**	**Electricity Substation**	**1989**	**284276**
B	**On site**	**Electricity Substation**	**1997**	**284276**
B	**On site**	**Electricity Substation**	**1993**	**284276**
B	**On site**	**Electricity Substation**	**1994**	**284276**
B	**On site**	**Electricity Substation**	**1991**	**284276**
B	**On site**	**Electricity Substation**	**1991**	**284276**
B	**On site**	**Electricity Substation**	**1992**	**284276**
I	39m N	Electricity Substation	1989	261816
I	39m N	Electricity Substation	1991	261816
I	40m N	Electricity Substation	1997	261816

ID	Location	Land Use	Date	Group ID
I	40m N	Electricity Substation	1993	261816
I	40m N	Electricity Substation	1994	261816
I	43m N	Electricity Substation	1992	270331
I	44m N	Electricity Substation	1991	270331
D	47m W	Electricity Substation	1996	291254
D	47m W	Electricity Substation	1993	291254
D	47m W	Electricity Substation	1993	291254
D	47m W	Electricity Substation	1992	291254
D	47m W	Electricity Substation	1963	291254
D	47m W	Electricity Substation	1984	291254
D	47m W	Electricity Substation	1983	291254
D	47m W	Electricity Substation	1991	291254
D	47m W	Electricity Substation	1991	291254
I	73m N	Electricity Substation	1991	258716
I	73m N	Electricity Substation	1991	258716
I	73m N	Electricity Substation	1997	284570
I	73m N	Electricity Substation	1993	284570
I	73m N	Electricity Substation	1994	284570
I	73m N	Electricity Substation	1992	284570
I	76m N	Electricity Substation	1992	283376
I	78m N	Electricity Substation	1997	273167
I	78m N	Electricity Substation	1993	273167
I	78m N	Electricity Substation	1994	273167
I	86m N	Electricity Substation	1989	268216
I	108m N	Electricity Substation	1991	253167
I	108m N	Electricity Substation	1991	255783
N	129m N	Electricity Substation	1989	262192
N	129m N	Electricity Substation	1950	283057

ID	Location	Land Use	Date	Group ID
N	129m N	Electricity Substation	1950	262192
N	129m N	Electricity Substation	1950	262192
N	129m N	Electricity Substation	1991	283057
N	129m N	Electricity Substation	1991	283057
N	130m N	Electricity Substation	1997	262192
N	130m N	Electricity Substation	1993	262192
N	130m N	Electricity Substation	1994	262192
N	130m N	Electricity Substation	1992	262192
I	135m N	Electricity Substation	1989	280272
I	136m N	Electricity Substation	1991	280272
E	146m E	Electricity Substation	1985	285061
E	146m E	Electricity Substation	1991	285061
E	146m E	Electricity Substation	1991	285061
E	146m E	Electricity Substation	1991	285061
E	146m E	Electricity Substation	1998	285061
E	146m E	Electricity Substation	1997	285061
E	146m E	Electricity Substation	1993	285061
E	146m E	Electricity Substation	1994	285061
E	146m E	Electricity Substation	1992	285061
J	147m W	Electricity Substation	1963	272287
J	147m W	Electricity Substation	1970	276451
E	147m E	Electricity Substation	1985	285061
E	147m E	Electricity Substation	1991	285061
E	147m E	Electricity Substation	1991	285061
J	148m W	Electricity Substation	1984	279986
M	149m NW	Electricity Substation	1963	284487
M	149m NW	Electricity Substation	1970	269262
M	152m NW	Electricity Substation	1996	287464

ID	Location	Land Use	Date	Group ID
M	152m NW	Electricity Substation	1997	287464
M	152m NW	Electricity Substation	1993	287464
M	152m NW	Electricity Substation	1993	287464
M	152m NW	Electricity Substation	1992	287464
M	152m NW	Electricity Substation	1999	287464
M	153m NW	Electricity Substation	1984	287464
M	153m NW	Electricity Substation	1983	287464
M	153m NW	Electricity Substation	1991	287464
M	153m NW	Electricity Substation	1991	287464
P	177m NE	Electricity Substation	1989	292351
P	177m NE	Electricity Substation	1991	292351
P	177m NE	Electricity Substation	1991	292351
P	179m NE	Electricity Substation	1997	270639
P	179m NE	Electricity Substation	1993	270639
P	179m NE	Electricity Substation	1994	270639
P	179m NE	Electricity Substation	1992	270639
J	212m NW	Electricity Substation	1996	266727
J	212m NW	Electricity Substation	1997	266727
J	212m NW	Electricity Substation	1993	266727
J	212m NW	Electricity Substation	1993	266727
J	212m NW	Electricity Substation	1992	266727
J	212m NW	Electricity Substation	1999	266727
J	213m NW	Electricity Substation	1963	266727
J	213m NW	Electricity Substation	1970	266727
J	214m NW	Electricity Substation	1984	266727
J	214m NW	Electricity Substation	1983	266727
J	214m NW	Electricity Substation	1991	266727
J	214m NW	Electricity Substation	1991	266727

ID	Location	Land Use	Date	Group ID
X	278m N	Electricity Substation	1996	290976
X	278m N	Electricity Substation	1997	290976
X	278m N	Electricity Substation	1993	290976
X	278m N	Electricity Substation	1993	290976
X	278m N	Electricity Substation	1992	290976
X	278m N	Electricity Substation	1999	290976
X	278m N	Electricity Substation	1984	290976
X	278m N	Electricity Substation	1983	290976
X	278m N	Electricity Substation	1991	290976
X	278m N	Electricity Substation	1991	290976
X	279m N	Electricity Substation	1963	290976
AJ	349m W	Electricity Substation	1996	266595
AJ	349m W	Electricity Substation	1997	266595
AJ	349m W	Electricity Substation	1993	266595
AJ	349m W	Electricity Substation	1993	266595
AJ	349m W	Electricity Substation	1992	266595
AJ	349m W	Electricity Substation	1999	266595
AF	349m SW	Electricity Substation	1996	266866
AF	349m SW	Electricity Substation	1993	266866
AF	349m SW	Electricity Substation	1992	266866
AF	349m SW	Electricity Substation	1987	266866
AF	349m SW	Electricity Substation	1991	266866
AF	349m SW	Electricity Substation	1991	266866
AF	349m SW	Electricity Substation	1991	266866
AJ	350m W	Electricity Substation	1983	277381
AJ	350m W	Electricity Substation	1991	277381
AJ	350m W	Electricity Substation	1991	277381
AK	356m NE	Electricity Substation	1991	245551

ID	Location	Land Use	Date	Group ID
AP	389m W	Electricity Substation	1963	280937
AP	389m W	Electricity Substation	1984	280937
AP	389m W	Electricity Substation	1991	280937
AP	390m W	Electricity Substation	1983	280937
AG	401m NE	Electricity Substation	1997	275538
AG	401m NE	Electricity Substation	1993	275538
AG	401m NE	Electricity Substation	1994	275538
AG	401m NE	Electricity Substation	1992	275538
AG	401m NE	Electricity Substation	1991	275538
AG	401m NE	Electricity Substation	1991	275538
AG	401m NE	Electricity Substation	1989	275538
AS	408m NW	Electricity Substation	1963	262701
AS	408m NW	Electricity Substation	1970	262701
AS	408m NW	Electricity Substation	1996	262701
AS	408m NW	Electricity Substation	1997	262701
AS	408m NW	Electricity Substation	1993	262701
AS	408m NW	Electricity Substation	1993	262701
AS	408m NW	Electricity Substation	1992	262701
AS	408m NW	Electricity Substation	1999	262701
AS	408m NW	Electricity Substation	1984	262701
AS	408m NW	Electricity Substation	1983	262701
AS	408m NW	Electricity Substation	1991	262701
AS	408m NW	Electricity Substation	1991	262701
Z	413m SW	Electricity Substation	1987	268947
Z	413m SW	Electricity Substation	1991	268947
Z	413m SW	Electricity Substation	1991	268947
Z	413m SW	Electricity Substation	1991	268947
Z	413m SW	Electricity Substation	1996	268947

ID	Location	Land Use	Date	Group ID
Z	413m SW	Electricity Substation	1993	268947
Z	413m SW	Electricity Substation	1992	268947
AW	421m W	Electricity Substation	1984	281362
AW	421m W	Electricity Substation	1991	281362
AW	422m W	Electricity Substation	1983	265286
AW	422m W	Electricity Substation	1963	259504
AW	422m W	Electricity Substation	1970	265286
AX	431m NW	Electricity Substation	1996	259037
AX	431m NW	Electricity Substation	1997	259037
AX	431m NW	Electricity Substation	1993	259037
AX	431m NW	Electricity Substation	1993	259037
AX	431m NW	Electricity Substation	1992	259037
AX	431m NW	Electricity Substation	1999	259037
AX	431m NW	Electricity Substation	1963	259037
AX	431m NW	Electricity Substation	1970	259037
Y	432m SW	Electricity Substation	1981	288050
Y	432m SW	Electricity Substation	1985	288050
Y	432m SW	Electricity Substation	1987	288050
AX	432m NW	Electricity Substation	1984	259037
AX	432m NW	Electricity Substation	1983	259037
AX	432m NW	Electricity Substation	1991	259037
AX	432m NW	Electricity Substation	1991	259037
AY	434m NE	Electricity Substation	1971	255498
AY	439m NE	Electricity Substation	1994	258861
AY	439m NE	Electricity Substation	1993	258861
AY	439m NE	Electricity Substation	1992	258861
AY	439m NE	Electricity Substation	1992	258861
AY	439m NE	Electricity Substation	1998	258861

ID	Location	Land Use	Date	Group ID
AY	439m NE	Electricity Substation	1991	258861
AY	439m NE	Electricity Substation	1991	258861
AY	439m NE	Electricity Substation	1992	258861
AY	440m NE	Electricity Substation	1981	289754
AY	440m NE	Electricity Substation	1990	289754
AY	440m NE	Electricity Substation	1991	289754
AY	440m NE	Electricity Substation	1991	289754
AY	440m NE	Electricity Substation	1991	289754
AG	443m NE	Electricity Substation	1989	279799
AZ	444m N	Electricity Substation	1992	289317
AG	444m NE	Electricity Substation	1991	279799
BA	445m N	Electricity Substation	1985	266672
BA	445m N	Electricity Substation	1990	266672
BA	445m N	Electricity Substation	1989	266672
BA	445m N	Electricity Substation	1991	266672
BA	445m N	Electricity Substation	1994	292467
AZ	445m N	Electricity Substation	1954	260188
AZ	445m N	Electricity Substation	1982	289317
AZ	445m N	Electricity Substation	1989	289317
AZ	445m N	Electricity Substation	1989	289317
AZ	445m N	Electricity Substation	1991	289317
BA	445m N	Electricity Substation	1968	266672
BA	445m N	Electricity Substation	1954	266672
AZ	445m N	Electricity Substation	1954	289317
BA	446m N	Electricity Substation	1974	292467
BA	446m N	Electricity Substation	1954	292467
BA	446m N	Electricity Substation	1968	292467
BA	446m N	Electricity Substation	1951	266672

ID	Location	Land Use	Date	Group ID
Y	465m SW	Electricity Substation	1981	282866
Y	465m SW	Electricity Substation	1985	282866
Y	465m SW	Electricity Substation	1987	282866
T	472m E	Electricity Substation	1981	284355
T	473m E	Electricity Substation	1971	284355
R	477m SE	Electricity Substation	1989	274149
R	477m SE	Electricity Substation	1989	274149
R	477m SE	Electricity Substation	1991	274149
R	477m SE	Electricity Substation	1991	274149
R	477m SE	Electricity Substation	1991	274149
R	479m SE	Electricity Substation	1998	278342
AQ	486m W	Electricity Substation	1971	245547

This data is sourced from Ordnance Survey / Groundsure.

2.4 Historical petrol stations

Records within 500m	0

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

2.5 Historical garages

Records within 500m	3

Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 32**

ID	Location	Land Use	Date	Group ID
Y	366m W	Garage	1951	73497

ID	Location	Land Use	Date	Group ID
18	431m N	Garage	1947	73508
Y	483m W	Barge Repair Shed	1971	73958

This data is sourced from Ordnance Survey / Groundsure.

3 Waste and landfill

Site Outline

Search buffers in metres (m)

Historical landfill (EA/NRW)

Historical waste sites

Licensed waste sites

Waste exemptions

3.1 Active or recent landfill

Records within 500m	0

Active or recently closed landfill sites under Environment Agency/Natural Resources Wales regulation.

This data is sourced from the Environment Agency and Natural Resources Wales.

3.2 Historical landfill (BGS records)

Records within 500m	0

Landfill sites identified on a survey carried out on behalf of the DoE in 1973. These sites may have been closed or operational at this time.

This data is sourced from the British Geological Survey.

3.3 Historical landfill (LA/mapping records)

Records within 500m	0

Landfill sites identified from Local Authority records and high detail historical mapping.

This data is sourced from the Ordnance Survey/Groundsure and Local Authority records.

3.4 Historical landfill (EA/NRW records)

Records within 500m	1

Known historical (closed) landfill sites (e.g. sites where there is no PPC permit or waste management licence currently in force). This includes sites that existed before the waste licensing regime and sites that have been licensed in the past but where a licence has been revoked, ceased to exist or surrendered and a certificate of completion has been issued.

Features are displayed on the Waste and landfill map on **page 63**

ID	Location	Details		
7	372m E	Site Address: Poplar Dock, Blackwall, Tower Hamlets, London Licence Holder Address: -	Waste Licence: - Site Reference: 8TH004, TOW004 Waste Type: - Environmental Permitting Regulations (Waste) Reference: - Licence Issue: - Licence Surrender: -	Operator: - Licence Holder: - First Recorded - Last Recorded: -

This data is sourced from the Environment Agency and Natural Resources Wales.

3.5 Historical waste sites

Records within 500m	1

Waste site records derived from Local Authority planning records and high detail historical mapping.

Features are displayed on the Waste and landfill map on **page 63**

ID	Location	Address	Further Details	Date
B	91m E	Site Address: Billingsgate Market, Trafalgar Way, LONDON, Central London, E14 5ST	Type of Site: Recycling Building Planning application reference: PA/09/00262 Description: Scheme comprises construction of a single storey lightweight steel building (6m x 7m x 4m in height) to cover recycling area. Construction - steel frame. An application (ref: PA/09/00262) for detailed planning permission was granted by Tower Hamlets L. A detailed planning application has been granted. Data source: Historic Planning Application Data Type: Point	01/09/2009

This data is sourced from Ordnance Survey/Groundsure and Local Authority records.

3.6 Licensed waste sites

Records within 500m **1**

Active or recently closed waste sites under Environment Agency/Natural Resources Wales regulation.

Features are displayed on the Waste and landfill map on **page 63**

ID	Location	Details		
4	275m SE	Site Name: Mobile Plant S R 2010 No11 Site Address: - Correspondence Address: -	Type of Site: Mobile plant treatment for soil 75,000 tpd Size: 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: BBC010 EPR reference: EA/EPR/BB3001GH/V002 Operator: Balfour Beatty Civil Engineering Limited Waste Management licence No: 105516 Annual Tonnage: 74999	Issue Date: 10/12/2013 Effective Date: - Modified:: 25/08/2016 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Modified

This data is sourced from the Environment Agency and Natural Resources Wales.

3.7 Waste exemptions

Records within 500m **18**

Activities involving the storage, treatment, use or disposal of waste that are exempt from needing a permit. Exemptions have specific limits and conditions that must be adhered to.

Features are displayed on the Waste and landfill map on **page 63**

ID	Location	Site	Reference	Category	Sub-Category	Description
A	**On site**	**ATCjv/Crossrail Systemwide C610 Contract North Quay Place Canary Wharf London E14 5GJ**	**EPR/VF0506NN/A001**	**Storing waste exemption**	**Non-Agricultural Waste Only**	**Storage of waste in secure containers**
A	**On site**	**ATCjv/Crossrail Systemwide C610 Contract North Quay Place Canary Wharf London E14 5GJ**	**EPR/VF0506NN/A001**	**Storing waste exemption**	**Non-Agricultural Waste Only**	**Storage of waste in a secure place**
A	**On site**	**ATCjv/Crossrail Systemwide C610 Contract North Quay Place Canary Wharf London E14 5GJ**	**EPR/VF0506NN/A001**	**Using waste exemption**	**Non-Agricultural Waste Only**	**Use of waste in construction**
1	101m S	5 Canada Square LONDON E14 5AQ	EPR/PF0502UG/A001	Treating waste exemption	Non-Agricultural Waste Only	Crushing waste fluorescent tubes
2	105m NE	CASTOR LANE, LONDON, E14 0BL	WEX084316	Storing waste exemption	Not on a farm	Storage of waste in a secure place
B	116m E	Billingsgate Market Superintendents Office 40 Poplar E14 5ST	EPR/AF0930JC/A001	Treating waste exemption	Non-Agricultural Waste Only	Crushing waste fluorescent tubes
3	206m W	CINEWORLD WEST INDIA QUAY, HERTSMERE ROAD , WEST INDIA QUAY , LONDON, E14 4AL	WEX110753	Storing waste exemption	Not on a farm	Storage of waste in a secure place
5	316m SE	5, CHURCHILL PLACE, LONDON, E14 5HU	WEX096531	Treating waste exemption	Not on a farm	Treatment of waste aerosol cans
6	357m E	Poplar Business Park Unit A1 Prestons Road LONDON E14 9RL	EPR/WF0005KP/A001	Using waste exemption	Non-Agricultural Waste Only	Use of waste in construction
C	416m E	Unit 2, Poplar Business Park, 10 Prestons Road, Poplar, E14 9RL	WEX160503	Storing waste exemption	Not on a Farm	Storage of waste in a secure place
C	416m E	Unit 2, Poplar Business Park, 10 Prestons Road, Poplar, E14 9RL	WEX160503	Storing waste exemption	Not on a Farm	Storage of waste in secure containers
C	450m E	UNIT C19, POPLAR BUSINESS PARK, PRESTONS ROAD, LONDON, E14 9RL	WEX144918	Treating waste exemption	Not on a farm	Sorting and de-naturing of controlled drugs for disposal
8	453m SE	-	WEX116282	Using waste exemption	Not on a farm	Use of waste in construction

ID	Location	Site	Reference	Category	Sub-Category	Description
D	478m NE	257 - 259 Poplar High Street, Poplar, London, E14 0BE	WEX176181	Treating waste exemption	Not on a farm	Sorting and de-naturing of controlled drugs for disposal
D	478m NE	257-259, Poplar High Street, London, E14 0BE	WEX008336	Treating waste exemption	Not on a farm	Sorting and de-naturing of controlled drugs for disposal
D	490m NE	257-259, POPLAR HIGH STREET, LONDON, E14 0BE	WEX100959	Storing waste exemption	Not on a farm	Storage of waste in secure containers
D	490m NE	257-259, POPLAR HIGH STREET, LONDON, E14 0BE	WEX100959	Storing waste exemption	Not on a farm	Storage of waste in a secure place
D	490m NE	257-259, POPLAR HIGH STREET, LONDON, E14 0BE	WEX100959	Treating waste exemption	Not on a farm	Sorting and de-naturing of controlled drugs for disposal

This data is sourced from the Environment Agency and Natural Resources Wales.

4 Current industrial land use

Site Outline

Search buffers in metres (m)

Recent industrial land uses

Licensed pollutant release (Part A(2)/B)

Licensed Discharges to controlled waters

Pollutant release to public sewer

List 1 Dangerous Substances

Pollution Incidents (EA/NRW)

4.1 Recent industrial land uses

Records within 250m	63

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on **page 68**

ID	Location	Company	Address	Activity	Category
1	**On site**	**North Quay**	**Greater London, E14**	**Moorings and Unloading Facilities**	**Water**

ID	Location	Company	Address	Activity	Category
A	**On site**	**West India Quay Station (Docklands Light Railway)**	**Greater London, E14**	**Tram, Metro and Light Railway Stations and Stops**	**Public Transport, Stations and Infrastructure**
B	**On site**	**Electricity Sub Station**	**Greater London, E14**	**Electrical Features**	**Infrastructure and Facilities**
B	2m E	North Quay	Greater London, E14	Moorings and Unloading Facilities	Water
C	5m N	Gantry	Greater London, E14	Travelling Cranes and Gantries	Industrial Features
A	15m W	West India Quay	Greater London, E14	Moorings and Unloading Facilities	Water
2	43m N	Electricity Sub Station	Greater London, E14	Electrical Features	Infrastructure and Facilities
A	43m SW	Stone Applications UK Ltd	Apartment 1604 26, Hertsmere Road, London, Greater London, E14 4EF	Stone Quarrying and Preparation	Extractive Industries
C	49m N	Poplar Station (Docklands Light Railway)	Greater London, E14	Tram, Metro and Light Railway Stations and Stops	Public Transport, Stations and Infrastructure
C	84m N	Electricity Sub Station	Greater London, E14	Electrical Features	Infrastructure and Facilities
3	93m S	Avanti Limousines	8, Canada Square, London, Greater London, E14 5EQ	Vehicle Hire and Rental	Hire Services
4	93m SE	Import Dock (West India Docks)	Greater London, E14	Moorings and Unloading Facilities	Water
D	98m NE	Depot	Greater London, E14	Container and Storage	Transport, Storage and Delivery
E	99m W	West India Dock North	Greater London, E14	Marine Equipment Including Boats and Ships	Industrial Products
C	102m N	Electricity Sub Station	Greater London, E14	Electrical Features	Infrastructure and Facilities
F	110m E	A Eames Ltd	Office 79 Billingsgate Market, Trafalgar Way, London, Greater London, E14 5ST	Packaging	Industrial Products

ID	Location	Company	Address	Activity	Category
F	110m E	Bob's Fish	Stand F1 Billingsgate Market, Trafalgar Way, London, Greater London, E14 5ST	Fish, Meat and Poultry Products	Foodstuffs
F	111m E	Micks Eel Supply Ltd	Office 56 Billingsgate Market, Trafalgar Way, London, Greater London, E14 5ST	Fish, Meat and Poultry Products	Foodstuffs
F	111m E	Viviers UK Ltd	Stand 16-18 Billingsgate Market, Trafalgar Way, London, Greater London, E14 5ST	Fish, Meat and Poultry Products	Foodstuffs
F	111m E	London Wholesale Fish Trade (Billingsgate) Ltd	Office 27 Billingsgate Market, Trafalgar Way, London, Greater London, E14 5ST	Fish, Meat and Poultry Products	Foodstuffs
F	111m E	Fawsitt Fish	Office 4 Billingsgate Market, Trafalgar Way, London, Greater London, E14 5ST	Fish, Meat and Poultry Products	Foodstuffs
F	111m E	John Stockwell Ltd	Billingsgate Market, Trafalgar Way, London, Greater London, E14 5ST	Fish, Meat and Poultry Products	Foodstuffs
F	111m E	C J Newnes & Partners	Shop 10 Billingsgate Market, Trafalgar Way, London, Greater London, E14 5SW	Fish, Meat and Poultry Products	Foodstuffs
F	111m E	Leleu & Morris Ltd	Billingsgate Market, Trafalgar Way, London, Greater London, E14 5ST	Fish, Meat and Poultry Products	Foodstuffs
F	111m E	Chamberlai n & Thelwell Ltd	Billingsgate Market, Trafalgar Way, London, Greater London, E14 5ST	Fish, Meat and Poultry Products	Foodstuffs
F	115m E	John Koch Ltd	Billingsgate Market, Trafalgar Way, London, Greater London, E14 5TN	Fish, Meat and Poultry Products	Foodstuffs
F	115m E	Wright Brothers Wholesale	Office 25 Billingsgate Market, Trafalgar Way, London, Greater London, E14 5ST	Fish, Meat and Poultry Products	Foodstuffs
F	115m E	Cyprus Fisheries Ltd	Office 83 Billingsgate Market, Trafalgar Way, London, Greater London, E14 5ST	Fish, Meat and Poultry Products	Foodstuffs
F	115m E	James Nash & Son Ltd	Office 22 Billingsgate Market, Trafalgar Way, London, Greater London, E14 5ST	Fish, Meat and Poultry Products	Foodstuffs
E	116m W	West India Dock North	Greater London, E14	Moorings and Unloading Facilities	Water
F	117m E	Wren & Hines Ltd	Office 49 Billingsgate Market, Trafalgar Way, London, Greater London, E14 5TN	Fish, Meat and Poultry Products	Foodstuffs
F	117m E	C & A Seafoods	Billingsgate Market, Trafalgar Way, London, Greater London, E14 5ST	Fish, Meat and Poultry Products	Foodstuffs

ID	Location	Company	Address	Activity	Category
F	117m E	Exotic Fish	Billingsgate Market, Trafalgar Way, London, Greater London, E14 5ST	Fish, Meat and Poultry Products	Foodstuffs
F	117m E	J Bennett Jnr London Ltd	Billingsgate Market, Trafalgar Way, London, Greater London, E14 5ST	Fish, Meat and Poultry Products	Foodstuffs
F	117m E	R & G Shellfish Ltd	Billingsgate Market, Trafalgar Way, London, Greater London, E14 5ST	Fish, Meat and Poultry Products	Foodstuffs
5	134m N	Electricity Sub Station	Greater London, E14	Electrical Features	Infrastructure and Facilities
F	137m E	Mooring Posts	Greater London, E14	Moorings and Unloading Facilities	Water
D	140m NE	Electricity Sub Station	Greater London, E14	Electrical Features	Infrastructure and Facilities
F	140m E	Seahawk Marine Foods Ltd	Office 71 Billingsgate Market, Trafalgar Way, London, Greater London, E14 5ST	Fish, Meat and Poultry Products	Foodstuffs
F	143m E	Electricity Sub Station	Greater London, E14	Electrical Features	Infrastructure and Facilities
F	145m E	Masters & Company Ltd	Q11 Billingsgate Market, Trafalgar Way, London, Greater London, E14 5SW	Fruit, Flower and Vegetable Growers	Farming
F	145m E	Billingsgate Market	Office 37-38 Billingsgate Market, Trafalgar Way, London, Greater London, E14 5ST	Fish, Meat and Poultry Products	Foodstuffs
F	145m E	Selsea Fish & Lobster Co Ltd	Office 60-61 Billingsgate Market, Trafalgar Way, London, Greater London, E14 5ST	Fish, Meat and Poultry Products	Foodstuffs
6	151m SW	North Quay	Greater London, E14	Moorings and Unloading Facilities	Water
7	157m NW	Electricity Sub Station	Greater London, E14	Electrical Features	Infrastructure and Facilities
G	163m E	Tank	Greater London, E14	Tanks (Generic)	Industrial Features
G	164m E	Tank	Greater London, E14	Tanks (Generic)	Industrial Features
H	166m S	Racing & Football Outlook	1, Canada Square, Canary Wharf, London, Greater London, E14 5AP	Published Goods	Industrial Products
H	166m S	The Wharf	1, Canada Square, London, Greater London, E14 5AP	Published Goods	Industrial Products

ID	Location	Company	Address	Activity	Category
H	166m S	The Sunday People	1, Canada Square, London, Greater London, E14 5AP	Published Goods	Industrial Products
I	173m S	Canary Wharf	Greater London, E14	Moorings and Unloading Facilities	Water
8	176m S	Lola's Cupcakes	Canary Wharf, 16-19 Canada Place, London, Greater London, E14 5EQ	Baking and Confectionery	Foodstuffs
D	181m NE	Electricity Sub Station	Greater London, E14	Electrical Features	Infrastructure and Facilities
9	190m S	Lola's Cupcakes	16-19, Canada Square, London, Greater London, E14 5EQ	Baking and Confectionery	Foodstuffs
10	207m SW	Canary Wharf	Greater London, E14	Moorings and Unloading Facilities	Water
I	212m S	Canary Wharf Station (Docklands Light Railway)	Greater London, E14	Tram, Metro and Light Railway Stations and Stops	Public Transport, Stations and Infrastructure
J	215m E	C T Homes & Company Ltd	Office 45-46 Billingsgate Market, Trafalgar Way, London, Greater London, E14 5ST	Fish, Meat and Poultry Products	Foodstuffs
J	216m E	Bard Seafood Internationa l	Billingsgate Market, Trafalgar Way, London, Greater London, E14 5ST	Fish, Meat and Poultry Products	Foodstuffs
11	216m NW	Electricity Sub Station	Greater London, E14	Electrical Features	Infrastructure and Facilities
12	232m SE	Wayfair Stores	1, Churchill Place, London, Greater London, E14 5HP	Office and Shop Equipment	Industrial Products
13	237m S	N Y K	Level 11, 25 Canada Square, London, Greater London, E14 5LQ	Distribution and Haulage	Transport, Storage and Delivery
14	244m N	Quick Fix Ltd	Flat 46 Leyland House, Hale Street, London, Greater London, E14 0BU	Electrical Equipment Repair and Servicing	Repair and Servicing
15	246m N	Electricity Sub Station	Greater London, E14	Electrical Features	Infrastructure and Facilities

This data is sourced from Ordnance Survey.

4.2 Current or recent petrol stations

Records within 500m	0

Open, closed, under development and obsolete petrol stations.

This data is sourced from Experian.

4.3 Electricity cables

Records within 500m	0

High voltage underground electricity transmission cables.

This data is sourced from National Grid.

4.4 Gas pipelines

Records within 500m	0

High pressure underground gas transmission pipelines.

This data is sourced from National Grid.

4.5 Sites determined as Contaminated Land

Records within 500m	0

Contaminated Land Register of sites designated under Part 2a of the Environmental Protection Act 1990.

This data is sourced from Local Authority records.

4.6 Control of Major Accident Hazards (COMAH)

Records within 500m	0

Control of Major Accident Hazards (COMAH) sites. This data includes upper and lower tier sites, and includes a historical archive of COMAH sites and Notification of Installations Handling Hazardous Substances (NIHHS) records.

This data is sourced from the Health and Safety Executive.

4.7 Regulated explosive sites

Records within 500m	0

Sites registered and licensed by the Health and Safety Executive under the Manufacture and Storage of Explosives Regulations 2005 (MSER). The last update to this data was in April 2011.

This data is sourced from the Health and Safety Executive.

4.8 Hazardous substance storage/usage

Records within 500m	0

Consents granted for a site to hold certain quantities of hazardous substances at or above defined limits in accordance with the Planning (Hazardous Substances) Regulations 2015.

This data is sourced from Local Authority records.

4.9 Historical licensed industrial activities (IPC)

Records within 500m	0

Integrated Pollution Control (IPC) records of substance releases to air, land and water. This data represents a historical archive as the IPC regime has been superseded.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.10 Licensed industrial activities (Part A(1))

Records within 500m	0

Records of Part A(1) installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 for the release of substances to the environment.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.11 Licensed pollutant release (Part A(2)/B)

Records within 500m	3

Records of Part A(2) and Part B installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 for the release of substances to the environment.

Features are displayed on the Current industrial land use map on **page 68**

ID	Location	Address	Details	
23	380m W	Star Service Station, A Division Of Texaco Ltd, 1 Westferry Circus, Canary Wharf, London, E14 4HA	Process: Petrol Vapour Recovery Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcement Notified Date of enforcement: No Enforcement Notified Comment: No Enforcement Notified
25	445m W	Milligan Street Trading Ltd, 112 Milligan Street, London, E14 8AS	Process: Dry Cleaning Status: Current Permit Permit Type: Part B	Enforcement: No Enforcement Notified Date of enforcement: No Enforcement Notified Comment: No Enforcement Notified
28	495m W	A Fresh Start Dry Cleaners, 49 Westferry Circus, Canary Wharf, London, E14 8RR	Process: Dry Cleaning Status: Current Permit Permit Type: Part B	Enforcement: No Enforcement Notified Date of enforcement: No Enforcement Notified Comment: No Enforcement Notified

This data is sourced from Local Authority records.

4.12 Radioactive Substance Authorisations

Records within 500m	**0**

Records of the storage, use, accumulation and disposal of radioactive substances regulated under the Radioactive Substances Act 1993.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.13 Licensed Discharges to controlled waters

Records within 500m	**9**

Discharges of treated or untreated effluent to controlled waters under the Water Resources Act 1991.

Features are displayed on the Current industrial land use map on **page 68**

ID	Location	Address	Details	
B	**On site**	**CANARY WHARF, ISLE OF DOGS, LONDON**	**Effluent Type: TRADE DISCHARGES - SITE DRAINAGE** **Permit Number: NPSWQD005586** **Permit Version: 1** **Receiving Water: BLACKWELL BASIN,WST INDIA DK N**	**Status: NEW CONSENT (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995)** **Issue date: 01/04/2009** **Effective Date: 01/04/2009** **Revocation Date: -**
16	250m E	CANARY WHARF, ISLE OF DOGS, LONDON	Effluent Type: TRADE DISCHARGES - SITE DRAINAGE Permit Number: NPSWQD005586 Permit Version: 1 Receiving Water: BLACKWELL BASIN,WST INDIA DK N	Status: NEW CONSENT (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995) Issue date: 01/04/2009 Effective Date: 01/04/2009 Revocation Date: -

ID	Location	Address	Details	
17	266m W	WEST QUAY,WEST INDIA DOCK,MARSH WAL, WEST QUAY WEST INDIA DOCK MARSH, WALL LONDON	Effluent Type: MISCELLANEOUS DISCHARGES - SURFACE WATER Permit Number: CTWC.2209 Permit Version: 1 Receiving Water: TIDL W.INDIA DOCK:TIDAL THAMES	Status: REVOKED - UNSPECIFIED Issue date: 01/03/1988 Effective Date: 01/03/1988 Revocation Date: 24/06/1991
20	327m SE	SITE B, EASTWOOD WHARF, WEST INDIA, SITE B EASTWOOD WHARF WEST IND, IA DOCK PRESTONS RD LONDON E14	Effluent Type: MISCELLANEOUS DISCHARGES - SURFACE WATER Permit Number: CTWC.1097 Permit Version: 1 Receiving Water: WEST INDIA DOCK	Status: REVOKED - UNSPECIFIED Issue date: 31/07/1986 Effective Date: 31/07/1986 Revocation Date: 20/06/1991
21	349m S	15/16 HERON QUAYS, MARSH WALL, LOND, 15/16 HERON QUAYS MARSH WALL L, ONDON E14 0XE	Effluent Type: TRADE DISCHARGES - COOLING WATER Permit Number: CTWC.1163 Permit Version: 1 Receiving Water: WEST INDIA DOCK	Status: REVOKED - UNSPECIFIED Issue date: 22/08/1986 Effective Date: 22/08/1986 Revocation Date: 17/06/1993
22	368m SE	CANARY WHARF, ISLE OF DOGS, LONDON	Effluent Type: TRADE DISCHARGES - SITE DRAINAGE Permit Number: NPSWQD005586 Permit Version: 1 Receiving Water: BLACKWELL BASIN,WST INDIA DK N	Status: NEW CONSENT (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995) Issue date: 01/04/2009 Effective Date: 01/04/2009 Revocation Date: -
24	408m S	GW DISPOSAL SYSTEM AT WOOD WHARF, HARBOUR QUARRY, PRESTONS ROAD, LONDON, E14 9SB	Effluent Type: MISCELLANEOUS DISCHARGES - MINE/GROUNDWATER AS RAISED Permit Number: EPREB3290DY Permit Version: 1 Receiving Water: CRT DOCK SYSTEM	Status: NEW ISSUED UNDER EPR 2010 Issue date: 01/06/2016 Effective Date: 01/06/2016 Revocation Date: -
26	465m S	THE INTERNATIONAL HOTEL, MARSH WALL, THE INTERNATIONAL HOTEL MARSH W, ALL LONDON	Effluent Type: TRADE DISCHARGES - COOLING WATER Permit Number: CATM.2983 Permit Version: 1 Receiving Water: WEST INDIA DOCK	Status: NEW CONSENT, BY APPLICATION (WRA 91, SECTION 88) Issue date: 15/08/1997 Effective Date: 15/08/1997 Revocation Date: -
27	471m SE	GW DISPOSAL SYSTEM AT WOOD WHARF, HARBOUR QUARRY, PRESTONS ROAD, LONDON, E14 9SB	Effluent Type: MISCELLANEOUS DISCHARGES - MINE/GROUNDWATER AS RAISED Permit Number: EPREB3290DY Permit Version: 1 Receiving Water: CRT DOCK SYSTEM	Status: NEW ISSUED UNDER EPR 2010 Issue date: 01/06/2016 Effective Date: 01/06/2016 Revocation Date: -

This data is sourced from the Environment Agency and Natural Resources Wales.

4.14 Pollutant release to surface waters (Red List)

Records within 500m	0

Discharges of specified substances under the Environmental Protection (Prescribed Processes and Substances) Regulations 1991.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.15 Pollutant release to public sewer

Records within 500m	1

Discharges of Special Category Effluents to the public sewer.

Features are displayed on the Current industrial land use map on **page 68**

ID	Location	Address	Details	
18	280m S	MCALPINE WAYSS AND FREYTAG-BACHY JOINT VENTURE, JUBILEE LINE EXTENSION, NORTH GREENWICH STATION SITE, GREENWICH, LONDON, E14 5ET	Permission reference: AM6528 Local Authority: LONDON BOROUGH OF GREENWICH First received date: 01/06/2001	Last received date: 01/01/2015 Status: DEAD (APPLICATION)

This data is sourced from the Environment Agency and Natural Resources Wales.

4.16 List 1 Dangerous Substances

Records within 500m	3

Discharges of substances identified on List I of European Directive E 2006/11/EC, and regulated under the Environmental Damage (Prevention and Remediation) Regulations 2015.

Features are displayed on the Current industrial land use map on **page 68**

ID	Location	Name	Status	Receiving Water	Authorised Substances
L	461m W	West Ferry Printers West Ferry Rd. London E14	Not Active	-	-
L	461m W	West Ferry Printers West Ferry Rd E14	Not Active	-	-
L	461m W	West Ferry Printers Limited, 235 West Ferry Road, London	Active	-	Mercury (other), Cadmium

This data is sourced from the Environment Agency and Natural Resources Wales.

4.17 List 2 Dangerous Substances

Records within 500m	0

Discharges of substances identified on List II of European Directive E 2006/11/EC, and regulated under the Environmental Damage (Prevention and Remediation) Regulations 2015.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.18 Pollution Incidents (EA/NRW)

Records within 500m	4

Records of substantiated pollution incidents. Since 2006 this data has only included category 1 (major) and 2 (significant) pollution incidents.

Features are displayed on the Current industrial land use map on **page 68**

ID	Location	Details	
A	14m W	Incident Date: 03/02/2003 Incident Identification: 134633 Pollutant: Inert Materials and Wastes Pollutant Description: Soils and Clay	Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)
19	312m SW	Incident Date: 28/07/2003 Incident Identification: 177070 Pollutant: Oils and Fuel Pollutant Description: Petrol	Water Impact: Category 3 (Minor) Land Impact: Category 3 (Minor) Air Impact: Category 3 (Minor)
K	385m S	Incident Date: 05/09/2002 Incident Identification: 106043 Pollutant: Oils and Fuel Pollutant Description: Gas and Fuel Oils	Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
K	394m S	Incident Date: 06/09/2002 Incident Identification: 106044 Pollutant: Inorganic Chemicals/Products Pollutant Description: Alkalis	Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)

This data is sourced from the Environment Agency and Natural Resources Wales.

4.19 Pollution inventory substances

Records within 500m	0

The pollution inventory (substances) includes reporting on annual emissions of certain regulated substances to air, controlled waters and land. A reporting threshold for each substance is also included. Where emissions fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.

4.20 Pollution inventory waste transfers

Records within 500m	0

The pollution inventory (waste transfers) includes reporting on annual transfers and recovery/disposal of controlled wastes from a site. A reporting threshold for each waste type is also included. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.

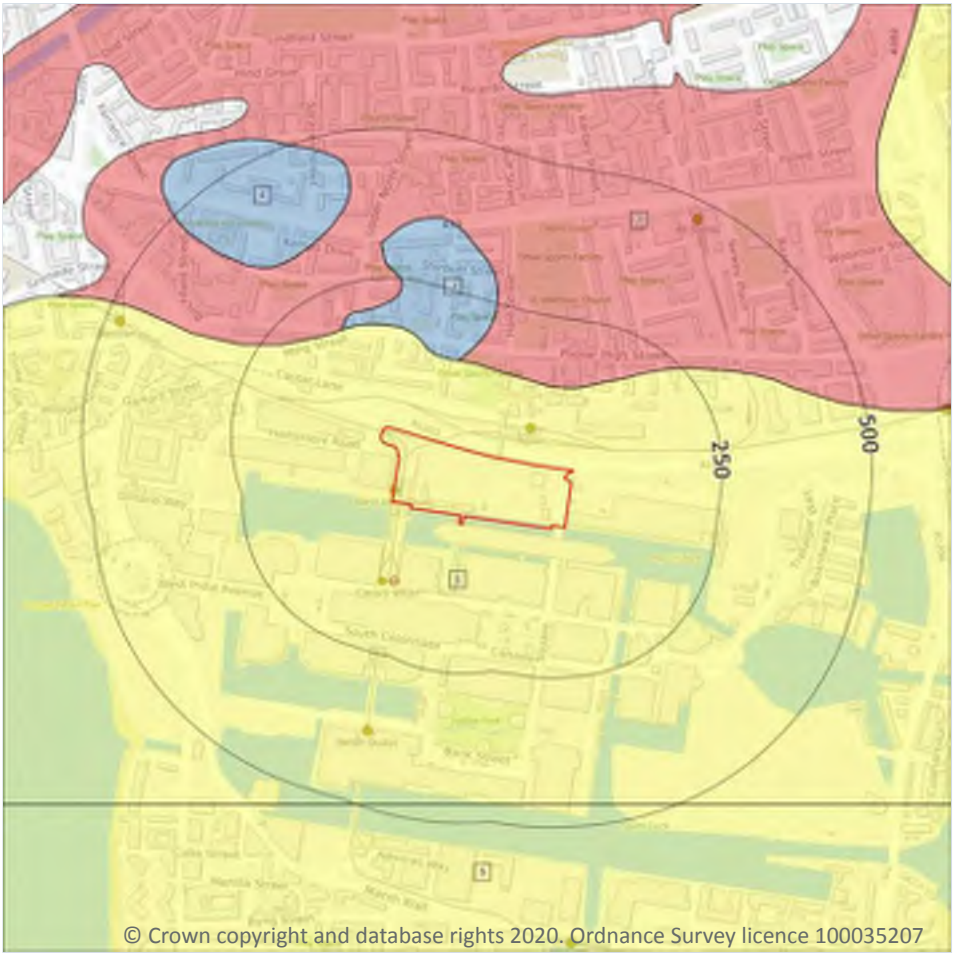
4.21 Pollution inventory radioactive waste

Records within 500m	0

The pollution inventory (radioactive wastes) includes reporting on annual releases of radioactive substances from a site, including the means of release. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.

5 Hydrogeology - Superficial aquifer



Site Outline

Search buffers in metres (m)

- Principal
- Secondary A
- Secondary B
- Secondary Undifferentiated
- Unproductive
- Unknown

5.1 Superficial aquifer

Records within 500m	5

Aquifer status of groundwater held within superficial geology.

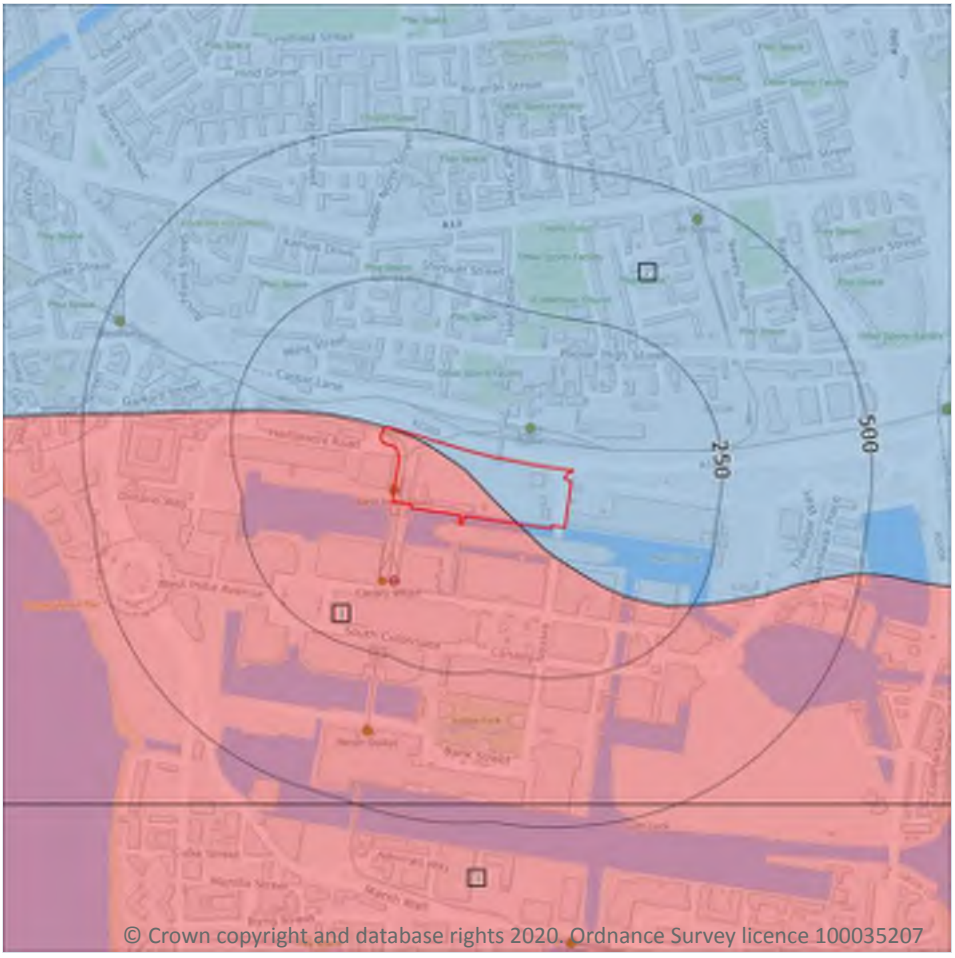
Features are displayed on the Hydrogeology map on **page 80**

ID	Location	Designation	Description
1	**On site**	**Secondary Undifferentiated**	**Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type**
2	134m N	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

ID	Location	Designation	Description
3	138m N	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow
4	323m NW	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow
5	461m S	Secondary Undifferentiated	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.

Bedrock aquifer



Site Outline

Search buffers in metres (m)

- Principal
- Secondary A
- Secondary B
- Secondary Undifferentiated
- Unproductive

5.2 Bedrock aquifer

Records within 500m	3

Aquifer status of groundwater held within bedrock geology.

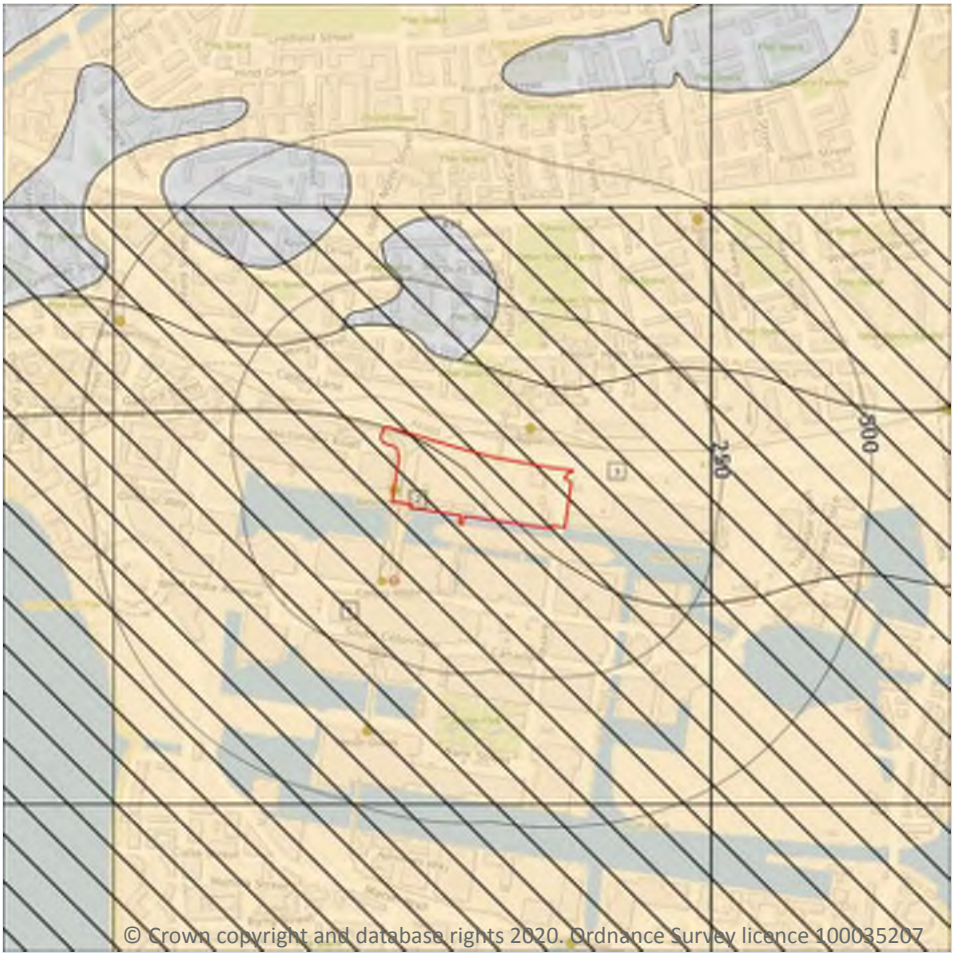
Features are displayed on the Bedrock aquifer map on **page 82**

ID	Location	Designation	Description
1	On site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
2	On site	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow

ID	Location	Designation	Description
3	461m S	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.

Groundwater vulnerability



Site Outline

Search buffers in metres (m)

Superficial vulnerability

- Principal superficial aquifer, high vulnerability
- Secondary superficial aquifer, high vulnerability
- Principal superficial aquifer, medium vulnerability
- Secondary superficial aquifer, medium vulnerability
- Principal superficial aquifer, low vulnerability
- Secondary superficial aquifer, low vulnerability

Bedrock vulnerability

- Principal bedrock aquifer, high vulnerability
- Secondary bedrock aquifer, high vulnerability
- Principal bedrock aquifer, medium vulnerability
- Secondary bedrock aquifer, medium vulnerability
- Principal bedrock aquifer, low vulnerability
- Secondary bedrock aquifer, low vulnerability

Other information

- Unproductive aquifer
- Soluble rock risk
- Local information

5.3 Groundwater vulnerability

Records within 50m	2

An assessment of the vulnerability of groundwater to a pollutant discharged at ground level based on the hydrological, geological, hydrogeological and soil properties within a one kilometre square grid. Groundwater vulnerability is described as High, Medium or Low as follows:

- High - Areas able to easily transmit pollution to groundwater. They are likely to be characterised by high leaching soils and the absence of low permeability superficial deposits.
- Medium - Intermediate between high and low vulnerability.
- Low - Areas that provide the greatest protection from pollution. They are likely to be characterised by low leaching soils and/or the presence of superficial deposits characterised by a low permeability.

Features are displayed on the Groundwater vulnerability map on **page 84**

ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
1	On site	Summary Classification: Secondary superficial aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: High Infiltration value: >70% Dilution value: 300-550mm/year	Vulnerability: High Aquifer type: Secondary Thickness: 3-10m Patchiness value: >90% Recharge potential: High	Vulnerability: Low Aquifer type: Secondary Flow mechanism: Mixed
3	On site	Summary Classification: Secondary superficial aquifer - High Vulnerability Combined classification: Unproductive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: High Infiltration value: >70% Dilution value: 300-550mm/year	Vulnerability: High Aquifer type: Secondary Thickness: 3-10m Patchiness value: >90% Recharge potential: High	Vulnerability: Unproductive Aquifer type: Unproductive Flow mechanism: Mixed

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.

5.4 Groundwater vulnerability- soluble rock risk

Records on site	0

This dataset identifies areas where solution features that enable rapid movement of a pollutant may be present within a 1km grid square.

This data is sourced from the British Geological Survey and the Environment Agency.

5.5 Groundwater vulnerability- local information

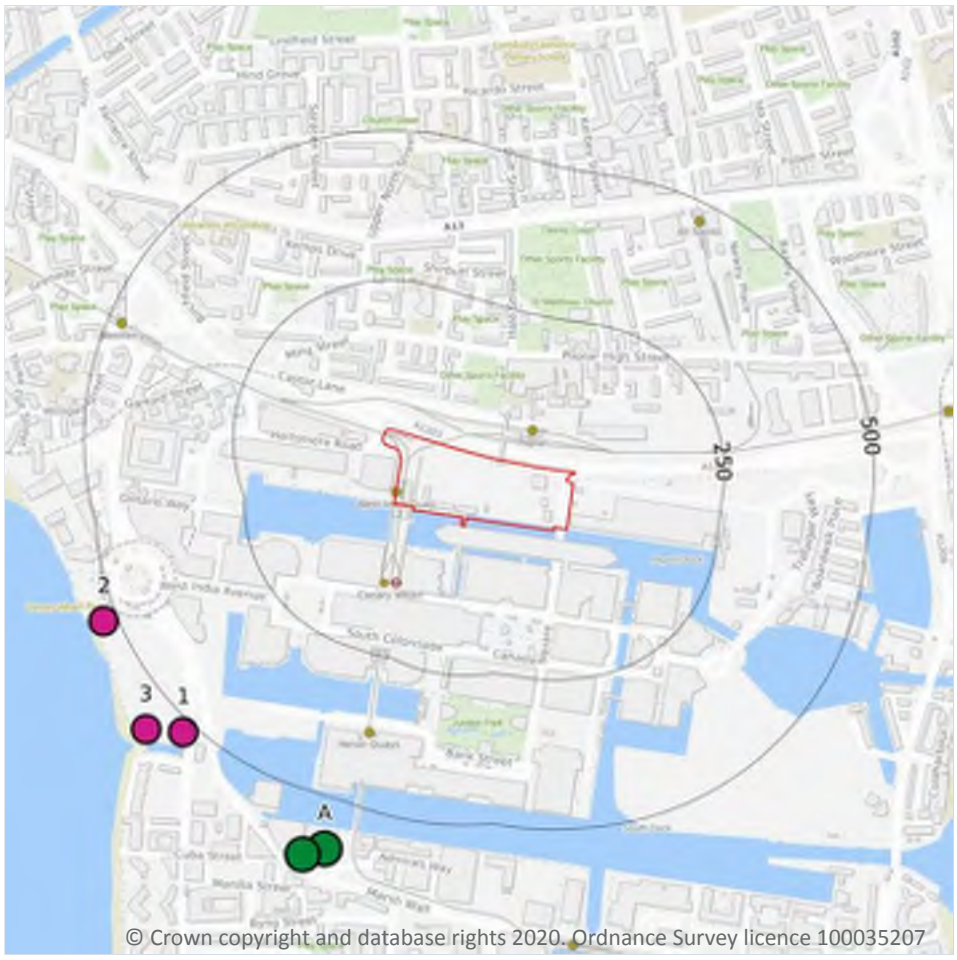
Records on site	1

This dataset identifies areas where additional local information affecting vulnerability is held by the Environment Agency. Further information can be obtained by contacting the Environment Agency local Area groundwater team through the Environment Agency National Customer Call Centre on 03798 506 506 or by email on enquiries@environment-agency.gov.uk.

ID	Summary	Additional information
2	Potentially increased vulnerability of the bedrock aquifer due to limited cover by superficial deposits	Removal of, or limited cover of, superficial deposits within the River Thames

This data is sourced from the British Geological Survey and the Environment Agency.

Abstractions and Source Protection Zones



Site Outline

Search buffers in metres (m)

- Source Protection Zone 1 — Inner catchment
- Source Protection Zone 2 — Outer catchment
- Source Protection Zone 3 — Total catchment
- Source Protection Zone 4 — Zone of Special Interest
- Source Protection Zone 1c — Inner catchment - confined aquifer
- Source Protection Zone 2c — Outer catchment - confined aquifer
- Source Protection Zone 3c — Total catchment - confined aquifer
- Drinking water abstraction licences
- Drinking water abstraction licences — Polygon features
- Drinking water abstraction licences — Linear features
- Groundwater abstraction licence (point)
- Groundwater abstraction licence (area)
- Groundwater abstraction licence (linear)
- Surface Water Abstractions (point)
- Surface Water Abstractions (area)
- Surface Water Abstractions (linear)

5.6 Groundwater abstractions

Records within 2000m	45

Licensed groundwater abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, between two points (line data) or a larger area.

Features are displayed on the Abstractions and Source Protection Zones map on **page 86**

ID	Location	Details	
1	518m SW	Status: Active Licence No: TH/039/0039/143 Details: Dewatering Direct Source: THAMES GROUNDWATER Point: BOREHOLE B AT WESTFERRY ROAD, CANARY WHARF Data Type: Point Name: W J Groundwater Limited Easting: 537114 Northing: 180125	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 30/09/2019 Expiry Date: 31/03/2025 Issue No: 1 Version Start Date: 30/09/2019 Version End Date: -
2	523m W	Status: Active Licence No: TH/039/0039/143 Details: Dewatering Direct Source: THAMES GROUNDWATER Point: BOREHOLE A AT WESTFERRY ROAD, CANARY WHARF Data Type: Point Name: W J Groundwater Limited Easting: 536981 Northing: 180310	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 30/09/2019 Expiry Date: 31/03/2025 Issue No: 1 Version Start Date: 30/09/2019 Version End Date: -
3	560m SW	Status: Active Licence No: TH/039/0039/143 Details: Dewatering Direct Source: THAMES GROUNDWATER Point: BOREHOLE C AT WESTFERRY ROAD, CANARY WHARF Data Type: Point Name: W J Groundwater Limited Easting: 537051 Northing: 180129	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 30/09/2019 Expiry Date: 31/03/2025 Issue No: 1 Version Start Date: 30/09/2019 Version End Date: -
A	584m S	Status: Historical Licence No: 28/39/39/0179 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: THAMES GROUNDWATER Point: THE INTERNATIONAL HOTEL, ISLE OF DOGS - BOREHOLE Data Type: Point Name: BRITTANIA INTERNATIONAL HOTELS LTD Easting: 537350 Northing: 179930	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 26/01/1998 Expiry Date: 31/12/2004 Issue No: 100 Version Start Date: 26/01/1998 Version End Date: -

ID	Location	Details	
A	584m S	Status: Historical Licence No: 28/39/39/0220 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: THAMES GROUNDWATER Point: THE INTERNATIONAL HOTEL, ISLE OF DOGS - BOREHOLE Data Type: Point Name: BRITANNIA HOTELS LIMITED Easting: 537350 Northing: 179930	Annual Volume (m^3): 78840 Max Daily Volume (m^3): 216 Original Application No: - Original Start Date: 09/10/2006 Expiry Date: 30/11/2007 Issue No: 1 Version Start Date: 09/10/2006 Version End Date: -
A	584m S	Status: Historical Licence No: 28/39/39/0234 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: THAMES GROUNDWATER Point: BRITANNIA INTERNATIONAL HOTEL, ISLE OF DOGS E14- BOREHOLE Data Type: Point Name: BRITANNIA HOTELS LIMITED Easting: 537350 Northing: 179930	Annual Volume (m^3): 78840 Max Daily Volume (m^3): 216 Original Application No: - Original Start Date: 30/04/2008 Expiry Date: 31/03/2013 Issue No: 1 Version Start Date: 30/04/2008 Version End Date: -
A	605m S	Status: Historical Licence No: TH/039/0039/077 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: THAMES GROUNDWATER Point: BRITANNIA INTERNATIONAL HOTEL, ISLE OF DOGS E14- BOREHOLE Data Type: Point Name: BRITANNIA HOTELS LIMITED Easting: 537313 Northing: 179919	Annual Volume (m^3): 78840 Max Daily Volume (m^3): 216 Original Application No: - Original Start Date: 14/10/2013 Expiry Date: 31/03/2019 Issue No: 1 Version Start Date: 14/10/2013 Version End Date: -
A	605m S	Status: Active Licence No: TH/039/0039/077/R01 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: THAMES GROUNDWATER Point: BRITANNIA INTERNATIONAL HOTEL, ISLE OF DOGS E14- BOREHOLE Data Type: Point Name: BRITANNIA HOTELS LIMITED Easting: 537313 Northing: 179919	Annual Volume (m^3): 78,840 Max Daily Volume (m^3): 216 Original Application No: - Original Start Date: 01/04/2019 Expiry Date: 31/03/2025 Issue No: 1 Version Start Date: 01/04/2019 Version End Date: -

ID	Location	Details	
-	1179m W	Status: Active Licence No: TH/039/0042/045 Details: Lake & Pond Throughflow Direct Source: THAMES GROUNDWATER Point: ABSTRACTION POINT B LAVENDER POND Data Type: Point Name: London Borough of Southwark Easting: 536288 Northing: 180399	Annual Volume (m^3): 15,000 Max Daily Volume (m^3): 60 Original Application No: - Original Start Date: 13/08/2018 Expiry Date: 31/03/2025 Issue No: 2 Version Start Date: 17/10/2019 Version End Date: -
-	1216m E	Status: Historical Licence No: 28/39/44/0042 Details: General use relating to Secondary Category (Medium Loss) Direct Source: THAMES GROUNDWATER Point: THE MILLENNIUM DOME BOREHOLE Data Type: Point Name: ENGLISH PARTNERSHIPS Easting: 538900 Northing: 180050	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 30/11/1999 Expiry Date: 31/12/2004 Issue No: 2 Version Start Date: 01/07/2001 Version End Date: -
-	1247m SE	Status: Historical Licence No: 28/39/44/0024 Details: Mineral Washing Direct Source: THAMES GROUNDWATER Point: 303 TUNNEL AVENUE, GREENWICH, - BOREHOLE 'A' Data Type: Point Name: BLACKWALL AGGREGATES LIMITED Easting: 538830 Northing: 179830	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 07/11/1988 Expiry Date: - Issue No: 101 Version Start Date: 11/01/2000 Version End Date: -
-	1275m SE	Status: Historical Licence No: 28/39/44/0025 Details: General use relating to Secondary Category (Medium Loss) Direct Source: THAMES GROUNDWATER Point: 303 TUNNEL AVENUE, GREENWICH, - BOREHOLE 'A' Data Type: Point Name: PIONEER WILLMENT CONCRETE LTD Easting: 538900 Northing: 179900	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 14/06/1991 Expiry Date: 31/12/2001 Issue No: 100 Version Start Date: 14/06/1991 Version End Date: -

ID	Location	Details	
-	1307m SE	Status: Historical Licence No: 28/39/44/0024 Details: Mineral Washing Direct Source: THAMES GROUNDWATER Point: 303 TUNNEL AVENUE, GREENWICH. Data Type: Point Name: BLACKWALL AGGREGATES LIMITED Easting: 538900 Northing: 179830	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 07/11/1988 Expiry Date: - Issue No: 101 Version Start Date: 11/01/2000 Version End Date: -
-	1307m SE	Status: Historical Licence No: 28/39/44/0046 Details: Process water Direct Source: THAMES GROUNDWATER Point: 303 TUNNEL AVENUE, GREENWICH. Data Type: Point Name: HANSON QUARRY PROD EUROPE LTD Easting: 538900 Northing: 179830	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 01/01/2002 Expiry Date: 31/03/2013 Issue No: 1 Version Start Date: 01/01/2002 Version End Date: -
-	1405m SW	Status: Historical Licence No: 28/39/42/0064 Details: Make-Up or Top Up Water Direct Source: THAMES GROUNDWATER Point: STAVE HILL ECOLOGY PARK, ROTHERHITHE - BOREHOLE Data Type: Point Name: THE TRUST FOR URBAN ECOLOGY Easting: 536180 Northing: 179940	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 19/11/2003 Expiry Date: 31/03/2013 Issue No: 1 Version Start Date: 19/11/2003 Version End Date: -
-	1405m SW	Status: Historical Licence No: 28/39/42/0064 Details: Make-Up or Top Up Water Direct Source: THAMES GROUNDWATER Point: STAVE HILL ECOLOGY PARK, ROTHERHITHE - BOREHOLE Data Type: Point Name: THE TRUST FOR URBAN ECOLOGY Easting: 536180 Northing: 179940	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 19/11/2003 Expiry Date: 31/03/2013 Issue No: 1 Version Start Date: 19/11/2003 Version End Date: -
-	1411m W	Status: Active Licence No: TH/039/0042/045 Details: Lake & Pond Throughflow Direct Source: THAMES GROUNDWATER Point: STAVE HILL ECOLOGY PARK BOREHOLE Data Type: Point Name: London Borough of Southwark Easting: 536154 Northing: 179986	Annual Volume (m^3): 15,000 Max Daily Volume (m^3): 60 Original Application No: - Original Start Date: 13/08/2018 Expiry Date: 31/03/2025 Issue No: 2 Version Start Date: 17/10/2019 Version End Date: -

ID	Location	Details	
-	1492m NE	Status: Active Licence No: 29/38/09/0162 Details: Make-Up Or Top Up Water Direct Source: THAMES GROUNDWATER Point: LIMMO PENINSULA Data Type: Point Name: LEE VALLEY REGIONAL PARK AUTHORITY Easting: 539130 Northing: 181170	Annual Volume (m^3): 30,000 Max Daily Volume (m^3): 146.40 Original Application No: - Original Start Date: 28/07/1997 Expiry Date: - Issue No: 101 Version Start Date: 09/08/2001 Version End Date: -
-	1564m E	Status: Historical Licence No: TH/038/0009/055 Details: Dewatering Direct Source: THAMES GROUNDWATER Point: TRINITY BUOY WHARF 10 Data Type: Point Name: Ballymore Construction Services Limited Easting: 539312 Northing: 180813	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 05/08/2019 Expiry Date: 31/12/2019 Issue No: 1 Version Start Date: 05/08/2019 Version End Date: -
-	1573m E	Status: Historical Licence No: TH/038/0009/055 Details: Dewatering Direct Source: THAMES GROUNDWATER Point: TRINITY BUOY WHARF 12 Data Type: Point Name: Ballymore Construction Services Limited Easting: 539317 Northing: 180842	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 05/08/2019 Expiry Date: 31/12/2019 Issue No: 1 Version Start Date: 05/08/2019 Version End Date: -
-	1583m E	Status: Historical Licence No: TH/038/0009/055 Details: Dewatering Direct Source: THAMES GROUNDWATER Point: TRINITY BUOY WHARF 9 Data Type: Point Name: Ballymore Construction Services Limited Easting: 539332 Northing: 180810	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 05/08/2019 Expiry Date: 31/12/2019 Issue No: 1 Version Start Date: 05/08/2019 Version End Date: -
-	1594m E	Status: Historical Licence No: TH/038/0009/055 Details: Dewatering Direct Source: THAMES GROUNDWATER Point: TRINITY BUOY WHARF 1 Data Type: Point Name: Ballymore Construction Services Limited Easting: 539340 Northing: 180828	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 05/08/2019 Expiry Date: 31/12/2019 Issue No: 1 Version Start Date: 05/08/2019 Version End Date: -

ID	Location	Details	
-	1600m E	Status: Historical Licence No: TH/038/0009/055 Details: Dewatering Direct Source: THAMES GROUNDWATER Point: TRINITY BUOY WHARF 8 Data Type: Point Name: Ballymore Construction Services Limited Easting: 539353 Northing: 180788	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 05/08/2019 Expiry Date: 31/12/2019 Issue No: 1 Version Start Date: 05/08/2019 Version End Date: -
-	1635m E	Status: Historical Licence No: TH/038/0009/055 Details: Dewatering Direct Source: THAMES GROUNDWATER Point: TRINITY BUOY WHARF 7 Data Type: Point Name: Ballymore Construction Services Limited Easting: 539389 Northing: 180780	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 05/08/2019 Expiry Date: 31/12/2019 Issue No: 1 Version Start Date: 05/08/2019 Version End Date: -
-	1643m E	Status: Historical Licence No: TH/038/0009/055 Details: Dewatering Direct Source: THAMES GROUNDWATER Point: TRINITY BUOY WHARF 2 Data Type: Point Name: Ballymore Construction Services Limited Easting: 539391 Northing: 180821	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 05/08/2019 Expiry Date: 31/12/2019 Issue No: 1 Version Start Date: 05/08/2019 Version End Date: -
-	1646m E	Status: Historical Licence No: TH/038/0009/055 Details: Dewatering Direct Source: THAMES GROUNDWATER Point: TRINITY BUOY WHARF 6 Data Type: Point Name: Ballymore Construction Services Limited Easting: 539401 Northing: 180777	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 05/08/2019 Expiry Date: 31/12/2019 Issue No: 1 Version Start Date: 05/08/2019 Version End Date: -
-	1657m E	Status: Historical Licence No: 28/39/44/0051 Details: Heat Pump Direct Source: THAMES GROUNDWATER Point: ABSTRACTION POINT 'B' - CHALK, GREEN PLACE, GREENWICH Data Type: Point Name: GREENWICH PENINSULA N0204 BLOCK A NOMINEE 1 & 2 LIMITED Easting: 539311 Northing: 179891	Annual Volume (m^3): 1,261,440 Max Daily Volume (m^3): 3456 Original Application No: - Original Start Date: 06/04/2009 Expiry Date: 31/03/2013 Issue No: 1 Version Start Date: 06/04/2009 Version End Date: -

ID	Location	Details	
-	1657m E	Status: Active Licence No: TH/039/0044/013 Details: Heat Pump Direct Source: THAMES GROUNDWATER Point: BOREHOLE B - GREENWICH Data Type: Point Name: WestInvest Gesellschaft fur Investmentfonds mbH Easting: 539311 Northing: 179891	Annual Volume (m^3): 1,261,440 Max Daily Volume (m^3): 3,456 Original Application No: - Original Start Date: 11/09/2013 Expiry Date: 31/03/2025 Issue No: 1 Version Start Date: 11/09/2013 Version End Date: -
-	1661m SE	Status: Active Licence No: 28/39/44/0047/R01 Details: Process Water Direct Source: THAMES GROUNDWATER Point: VICTORIA DEEP WATER TERMINAL GREENWICH SE10- BOREHOLE Data Type: Point Name: HANSON QUARRY PRODUCTS EUROPE LTD Easting: 538997 Northing: 179359	Annual Volume (m^3): 50,000 Max Daily Volume (m^3): 720 Original Application No: - Original Start Date: 25/04/2016 Expiry Date: 31/03/2028 Issue No: 1 Version Start Date: 25/04/2016 Version End Date: -
-	1667m E	Status: Historical Licence No: TH/038/0009/055 Details: Dewatering Direct Source: THAMES GROUNDWATER Point: TRINITY BUOY WHARF 3 Data Type: Point Name: Ballymore Construction Services Limited Easting: 539417 Northing: 180811	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 05/08/2019 Expiry Date: 31/12/2019 Issue No: 1 Version Start Date: 05/08/2019 Version End Date: -
-	1669m SE	Status: Historical Licence No: 28/39/44/0047 Details: Process Water Direct Source: THAMES GROUNDWATER Point: VICTORIA DEEP WATER TERMINAL GREENWICH SE10- BOREHOLE Data Type: Point Name: HANSON QUARRY PRODUCTS EUROPE LTD Easting: 539000 Northing: 179350	Annual Volume (m^3): 50000 Max Daily Volume (m^3): 720 Original Application No: - Original Start Date: 02/09/2004 Expiry Date: 31/03/2016 Issue No: 2 Version Start Date: 10/07/2014 Version End Date: -

ID	Location	Details	
-	1682m E	Status: Historical Licence No: 28/39/44/0051 Details: Heat Pump Direct Source: THAMES GROUNDWATER Point: ABSTRACTION POINT 'A' - CHALK, GREEN PLACE, GREENWICH Data Type: Point Name: GREENWICH PENINSULA N0204 BLOCK A NOMINEE 1 & 2 LIMITED Easting: 539329 Northing: 179866	Annual Volume (m^3): 1,261,440 Max Daily Volume (m^3): 3456 Original Application No: - Original Start Date: 06/04/2009 Expiry Date: 31/03/2013 Issue No: 1 Version Start Date: 06/04/2009 Version End Date: -
-	1682m E	Status: Active Licence No: TH/039/0044/013 Details: Heat Pump Direct Source: THAMES GROUNDWATER Point: BOREHOLE A - GREENWICH Data Type: Point Name: WestInvest Gesellschaft fur Investmentfonds mbH Easting: 539329 Northing: 179866	Annual Volume (m^3): 1,261,440 Max Daily Volume (m^3): 3,456 Original Application No: - Original Start Date: 11/09/2013 Expiry Date: 31/03/2025 Issue No: 1 Version Start Date: 11/09/2013 Version End Date: -
-	1689m E	Status: Historical Licence No: TH/038/0009/055 Details: Dewatering Direct Source: THAMES GROUNDWATER Point: TRINITY BUOY WHARF 5 Data Type: Point Name: Ballymore Construction Services Limited Easting: 539445 Northing: 180766	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 05/08/2019 Expiry Date: 31/12/2019 Issue No: 1 Version Start Date: 05/08/2019 Version End Date: -
-	1703m E	Status: Historical Licence No: TH/038/0009/055 Details: Dewatering Direct Source: THAMES GROUNDWATER Point: TRINITY BUOY WHARF 4 Data Type: Point Name: Ballymore Construction Services Limited Easting: 539454 Northing: 180805	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 05/08/2019 Expiry Date: 31/12/2019 Issue No: 1 Version Start Date: 05/08/2019 Version End Date: -
-	1747m NW	Status: Historical Licence No: 28/39/39/0214 Details: Horticultural Watering Direct Source: THAMES GROUNDWATER Point: MILE END PARK-BOREHOLE Data Type: Point Name: LONDON BOROUGH OF TOWER HAMLETS Easting: 536510 Northing: 182100	Annual Volume (m^3): 10330 Max Daily Volume (m^3): 48.8 Original Application No: - Original Start Date: 02/02/2005 Expiry Date: 31/03/2013 Issue No: 1 Version Start Date: 01/04/2008 Version End Date: -

ID	Location	Details	
-	1747m NW	Status: Historical Licence No: 28/39/39/0214 Details: Make-Up Or Top Up Water Direct Source: THAMES GROUNDWATER Point: MILE END PARK-BOREHOLE Data Type: Point Name: LONDON BOROUGH OF TOWER HAMLETS Easting: 536510 Northing: 182100	Annual Volume (m^3): 10330 Max Daily Volume (m^3): 48.8 Original Application No: - Original Start Date: 02/02/2005 Expiry Date: 31/03/2013 Issue No: 1 Version Start Date: 01/04/2008 Version End Date: -
-	1748m NW	Status: Historical Licence No: 28/39/39/0214 Details: Make-Up Or Top Up Water Direct Source: THAMES GROUNDWATER Point: MILE END PARK- BOREHOLE Data Type: Point Name: LONDON BOROUGH OF TOWER HAMLETS Easting: 536508 Northing: 182100	Annual Volume (m^3): 10330 Max Daily Volume (m^3): 49 Original Application No: - Original Start Date: 02/02/2005 Expiry Date: 31/03/2025 Issue No: 2 Version Start Date: 01/04/2013 Version End Date: -
-	1748m NW	Status: Historical Licence No: 28/39/39/0214 Details: Spray Irrigation - Direct Direct Source: THAMES GROUNDWATER Point: MILE END PARK- BOREHOLE Data Type: Point Name: LONDON BOROUGH OF TOWER HAMLETS Easting: 536508 Northing: 182100	Annual Volume (m^3): 10330 Max Daily Volume (m^3): 49 Original Application No: - Original Start Date: 02/02/2005 Expiry Date: 31/03/2025 Issue No: 2 Version Start Date: 01/04/2013 Version End Date: -
-	1748m NW	Status: Active Licence No: TH/039/0039/063 Details: Spray Irrigation - Direct Direct Source: THAMES GROUNDWATER Point: MILE END PARK-BOREHOLE Data Type: Point Name: LONDON BOROUGH OF TOWER HAMLETS Easting: 536508 Northing: 182100	Annual Volume (m^3): 10,330 Max Daily Volume (m^3): 49 Original Application No: - Original Start Date: 01/04/2013 Expiry Date: 31/03/2025 Issue No: 2 Version Start Date: 01/04/2013 Version End Date: -
-	1748m NW	Status: Active Licence No: TH/039/0039/063 Details: Make-Up Or Top Up Water Direct Source: THAMES GROUNDWATER Point: MILE END PARK-BOREHOLE Data Type: Point Name: LONDON BOROUGH OF TOWER HAMLETS Easting: 536508 Northing: 182100	Annual Volume (m^3): 10,330 Max Daily Volume (m^3): 49 Original Application No: - Original Start Date: 01/04/2013 Expiry Date: 31/03/2025 Issue No: 2 Version Start Date: 01/04/2013 Version End Date: -

ID	Location	Details	
-	1753m NW	Status: Historical Licence No: 28/39/39/0191 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: THAMES GROUNDWATER Point: BOREHOLE B AT MILE END PARK, LONDON Data Type: Point Name: THE MILE END PARK PARTNERSHIP Easting: 536500 Northing: 182100	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 23/06/1999 Expiry Date: 31/12/2004 Issue No: 100 Version Start Date: 23/06/1999 Version End Date: -
-	1753m NW	Status: Historical Licence No: 28/39/39/0191 Details: Water Bottling Direct Source: THAMES GROUNDWATER Point: BOREHOLE B AT MILE END PARK, LONDON Data Type: Point Name: THE MILE END PARK PARTNERSHIP Easting: 536500 Northing: 182100	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 23/06/1999 Expiry Date: 31/12/2004 Issue No: 100 Version Start Date: 23/06/1999 Version End Date: -
-	1803m SW	Status: Historical Licence No: 28/39/42/0073 Details: Process Water Direct Source: THAMES GROUNDWATER Point: 1 SURREY QUAYS ROAD, SE16 - BOREHOLE Data Type: Point Name: HARMSWORTH QUAYS PRINTING LIMITED Easting: 536026 Northing: 179420	Annual Volume (m^3): 72000 Max Daily Volume (m^3): 200 Original Application No: - Original Start Date: 04/08/2008 Expiry Date: 31/03/2013 Issue No: 1 Version Start Date: 04/08/2008 Version End Date: -
-	1803m SW	Status: Historical Licence No: 28/39/42/0073 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: THAMES GROUNDWATER Point: 1 SURREY QUAYS ROAD, SE16 - BOREHOLE Data Type: Point Name: HARMSWORTH QUAYS PRINTING LIMITED Easting: 536026 Northing: 179420	Annual Volume (m^3): 72000 Max Daily Volume (m^3): 200 Original Application No: - Original Start Date: 04/08/2008 Expiry Date: 31/03/2013 Issue No: 1 Version Start Date: 04/08/2008 Version End Date: -

This data is sourced from the Environment Agency and Natural Resources Wales.

5.7 Surface water abstractions

Records within 2000m	0

Licensed surface water abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, a stretch of watercourse or a larger area.

This data is sourced from the Environment Agency and Natural Resources Wales.

5.8 Potable abstractions

Records within 2000m	8

Licensed potable water abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, a stretch of watercourse or a larger area.

Features are displayed on the Abstractions and Source Protection Zones map on **page 86**

ID	Location	Details	
A	584m S	Status: Historical Licence No: 28/39/39/0179 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: THAMES GROUNDWATER Point: THE INTERNATIONAL HOTEL, ISLE OF DOGS - BOREHOLE Data Type: Point Name: BRITTANIA INTERNATIONAL HOTELS LTD Easting: 537350 Northing: 179930	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 26/01/1998 Expiry Date: 31/12/2004 Issue No: 100 Version Start Date: 26/01/1998 Version End Date: -
A	584m S	Status: Historical Licence No: 28/39/39/0220 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: THAMES GROUNDWATER Point: THE INTERNATIONAL HOTEL, ISLE OF DOGS - BOREHOLE Data Type: Point Name: BRITANNIA HOTELS LIMITED Easting: 537350 Northing: 179930	Annual Volume (m^3): 78840 Max Daily Volume (m^3): 216 Original Application No: - Original Start Date: 09/10/2006 Expiry Date: 30/11/2007 Issue No: 1 Version Start Date: 09/10/2006 Version End Date: -

ID	Location	Details	
A	584m S	Status: Historical Licence No: 28/39/39/0234 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: THAMES GROUNDWATER Point: BRITANNIA INTERNATIONAL HOTEL, ISLE OF DOGS E14- BOREHOLE Data Type: Point Name: BRITANNIA HOTELS LIMITED Easting: 537350 Northing: 179930	Annual Volume (m^3): 78840 Max Daily Volume (m^3): 216 Original Application No: - Original Start Date: 30/04/2008 Expiry Date: 31/03/2013 Issue No: 1 Version Start Date: 30/04/2008 Version End Date: -
A	605m S	Status: Historical Licence No: TH/039/0039/077 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: THAMES GROUNDWATER Point: BRITANNIA INTERNATIONAL HOTEL, ISLE OF DOGS E14- BOREHOLE Data Type: Point Name: BRITANNIA HOTELS LIMITED Easting: 537313 Northing: 179919	Annual Volume (m^3): 78840 Max Daily Volume (m^3): 216 Original Application No: - Original Start Date: 14/10/2013 Expiry Date: 31/03/2019 Issue No: 1 Version Start Date: 14/10/2013 Version End Date: -
A	605m S	Status: Active Licence No: TH/039/0039/077/R01 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: THAMES GROUNDWATER Point: BRITANNIA INTERNATIONAL HOTEL, ISLE OF DOGS E14- BOREHOLE Data Type: Point Name: BRITANNIA HOTELS LIMITED Easting: 537313 Northing: 179919	Annual Volume (m^3): 78,840 Max Daily Volume (m^3): 216 Original Application No: - Original Start Date: 01/04/2019 Expiry Date: 31/03/2025 Issue No: 1 Version Start Date: 01/04/2019 Version End Date: -
-	1753m NW	Status: Historical Licence No: 28/39/39/0191 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: THAMES GROUNDWATER Point: BOREHOLE B AT MILE END PARK, LONDON Data Type: Point Name: THE MILE END PARK PARTNERSHIP Easting: 536500 Northing: 182100	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 23/06/1999 Expiry Date: 31/12/2004 Issue No: 100 Version Start Date: 23/06/1999 Version End Date: -

ID	Location	Details	
-	1753m NW	Status: Historical Licence No: 28/39/39/0191 Details: Water Bottling Direct Source: THAMES GROUNDWATER Point: BOREHOLE B AT MILE END PARK, LONDON Data Type: Point Name: THE MILE END PARK PARTNERSHIP Easting: 536500 Northing: 182100	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 23/06/1999 Expiry Date: 31/12/2004 Issue No: 100 Version Start Date: 23/06/1999 Version End Date: -
-	1803m SW	Status: Historical Licence No: 28/39/42/0073 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: THAMES GROUNDWATER Point: 1 SURREY QUAYS ROAD, SE16 - BOREHOLE Data Type: Point Name: HARMSWORTH QUAYS PRINTING LIMITED Easting: 536026 Northing: 179420	Annual Volume (m^3): 72000 Max Daily Volume (m^3): 200 Original Application No: - Original Start Date: 04/08/2008 Expiry Date: 31/03/2013 Issue No: 1 Version Start Date: 04/08/2008 Version End Date: -

This data is sourced from the Environment Agency and Natural Resources Wales.

5.9 Source Protection Zones

Records within 500m	**0**

Source Protection Zones define the sensitivity of an area around a potable abstraction site to contamination.

This data is sourced from the Environment Agency and Natural Resources Wales.

5.10 Source Protection Zones (confined aquifer)

Records within 500m	**0**

Source Protection Zones in the confined aquifer define the sensitivity around a deep groundwater abstraction to contamination. A confined aquifer would normally be protected from contamination by overlying geology and is only considered a sensitive resource if deep excavation/drilling is taking place.

This data is sourced from the Environment Agency and Natural Resources Wales.

6 Hydrology

Site Outline

Search buffers in metres (m)

Water Network (OS MasterMap)

Surface water features (wider than 5m)

Surface water features (narrower than 5m)

WFD River, canal and surface water transfer water bodies

WFD Lake water bodies

WFD Transitional and coastal water bodies

WFD Surface water body catchments boundaries

WFD Groundwater body boundaries

6.1 Water Network (OS MasterMap)

Records within 250m	0

Detailed water network of Great Britain showing the flow and precise central course of every river, stream, lake and canal.

This data is sourced from the Ordnance Survey.

6.2 Surface water features

Records within 250m	9

Covering rivers, streams and lakes (some overlap with OS MasterMap Water Network data in previous section) but additionally covers smaller features such as ponds. Rivers and streams narrower than 5m are represented as a single line. Lakes, ponds and rivers or streams wider than 5m are represented as polygons.

Features are displayed on the Hydrology map on **page 100**

This data is sourced from the Ordnance Survey.

6.3 WFD Surface water body catchments

Records on site	1

The Water Framework Directive is an EU-led framework for the protection of inland surface waters, estuaries, coastal waters and groundwater through river basin-level management planning. In terms of surface water, these basins are broken down into smaller units known as management, operational and water body catchments.

Features are displayed on the Hydrology map on **page 100**

ID	Location	Type	Water body catchment	Water body ID	Operational catchment	Management catchment
3	**On site**	**Coastal Catchment**	**Not part of a river WB catchment**	**128**	**Land area part of London Management Catchment draining to the Tidal Thames**	**London**

This data is sourced from the Environment Agency and Natural Resources Wales.

6.4 WFD Surface water bodies

Records identified	0

Surface water bodies under the Directive may be rivers, lakes, estuary or coastal. To achieve the purpose of the Directive, environmental objectives have been set and are reported on for each water body. The progress towards delivery of the objectives is then reported on by the relevant competent authorities at the end of each six-year cycle. The river water body directly associated with the catchment listed in the previous section is detailed below, along with any lake, canal, coastal or artificial water body within 250m of the site. Click on the water body ID in the table to visit the EA Catchment Explorer to find out more about each water body listed.

This data is sourced from the Environment Agency and Natural Resources Wales.

6.5 WFD Groundwater bodies

Records on site	0

Groundwater bodies are also covered by the Directive and the same regime of objectives and reporting detailed in the previous section is in place. Click on the water body ID in the table to visit the EA Catchment Explorer to find out more about each groundwater body listed.

This data is sourced from the Environment Agency and Natural Resources Wales.

7 River and coastal flooding

Site Outline

Search buffers in metres (m)

Environment Agency river and coastal flooding:

- High
- Medium
- Low
- Very Low
- Historical Flood Events
- Areas Used for Flood Storage
- Areas Benefiting from Flood Defences
- Flood Defences

7.1 Risk of Flooding from Rivers and Sea (RoFRaS)

Records within 50m	8

The chance of flooding from rivers and/or the sea in any given year, based on cells of 50m. Each cell is allocated one of four flood risk categories, taking into account flood defences and their condition; Very low (less than 1 in 1000 chance in any given year), Low (less than 1 in 100 but greater than or equal to 1 in 1000 chance), Medium (less than 1 in 30 but greater than or equal to 1 in 100 chance) or High (greater than or equal to 1 in 30 chance).

Features are displayed on the River and coastal flooding map on **page 102**

Distance	RoFRaS flood risk
On site	**High**
0 - 50m	High

This data is sourced from the Environment Agency and Natural Resources Wales.

7.2 Historical Flood Events

Records within 250m	2

Records of historic flooding from rivers, the sea, groundwater and surface water. Records began in 1946 when predecessor bodies started collecting detailed information about flooding incidents, although limited details may be included on flooding incidents prior to this date. Takes into account the presence of defences, structures, and other infrastructure where they existed at the time of flooding, and includes flood extents that may have been affected by overtopping, breaches or blockages.

Features are displayed on the River and coastal flooding map on **page 102**

ID	Location	Event name	Date of flood	Flood source	Flood cause	Type of flood
5	**On site**	**Ttd_Feo_1928**	**1928-01-01 1928-12-31**	**Main river**	**Overtopping of defences**	**Tidal**
16	243m N	Ttd_Feo_1928	1928-01-01 1928-12-31	Main river	Overtopping of defences	Tidal

This data is sourced from the Environment Agency and Natural Resources Wales.

7.3 Flood Defences

Records within 250m	0

Records of flood defences owned, managed or inspected by the Environment Agency and Natural Resources Wales. Flood defences can be structures, buildings or parts of buildings. Typically these are earth banks, stone and concrete walls, or sheet-piling that is used to prevent or control the extent of flooding.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.4 Areas Benefiting from Flood Defences

Records within 250m	1

Areas that would benefit from the presence of flood defences in a 1 in 100 (1%) chance of flooding each year from rivers or 1 in 200 (0.5%) chance of flooding each year from the sea.

Features are displayed on the River and coastal flooding map on **page 102**

ID	Location	
2	**On site**	**Area benefiting from flood defences**

This data is sourced from the Environment Agency and Natural Resources Wales.

7.5 Flood Storage Areas

Records within 250m	0

Areas that act as a balancing reservoir, storage basin or balancing pond to attenuate an incoming flood peak to a flow level that can be accepted by the downstream channel or to delay the timing of a flood peak so that its volume is discharged over a longer period.

This data is sourced from the Environment Agency and Natural Resources Wales.

River and coastal flooding - Flood Zones

Site Outline

Search buffers in metres (m)

Flood zone 2

Flood zone 3

7.6 Flood Zone 2

Records within 50m	1

Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land between Flood Zone 3 (see next section) and the extent of the flooding from rivers or the sea with a 1 in 1000 (0.1%) chance of flooding each year.

Features are displayed on the River and coastal flooding map on **page 102**

Location	Type
On site	**Zone 2 - (Fluvial /Tidal Models)**

This data is sourced from the Environment Agency and Natural Resources Wales.

7.7 Flood Zone 3

Records within 50m	1

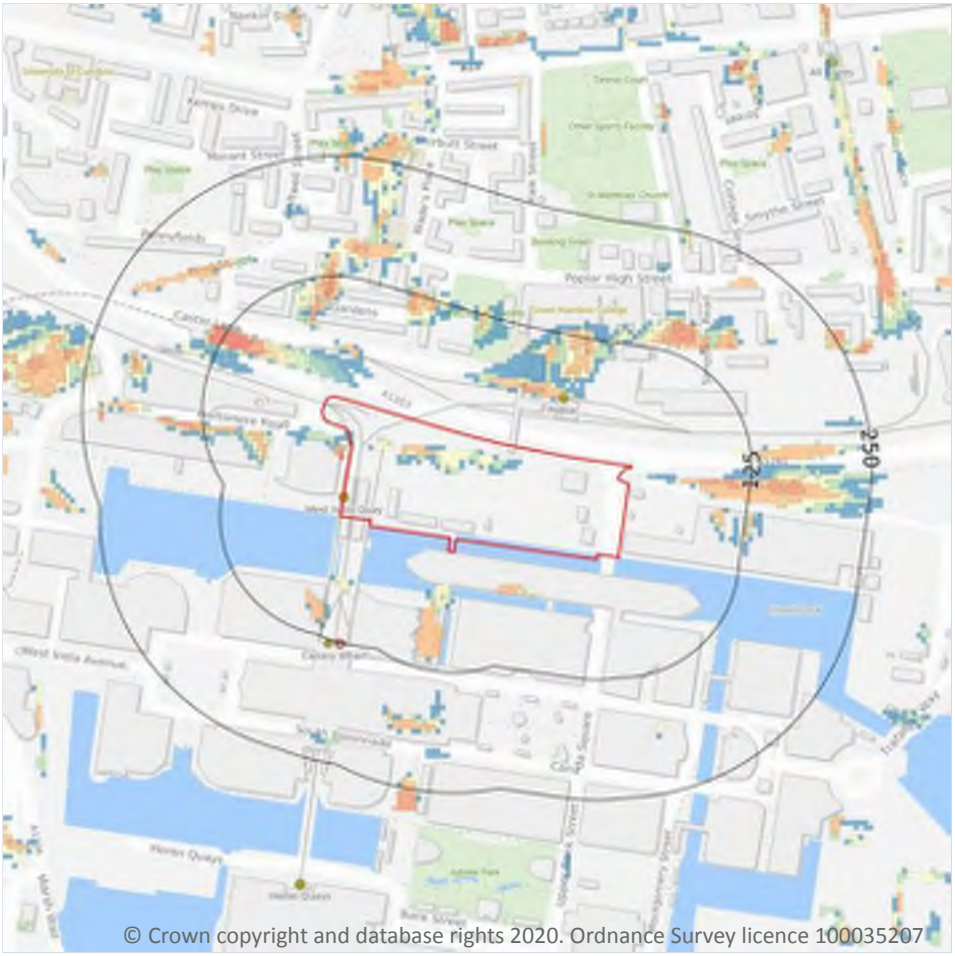
Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land with a 1 in 100 (1%) or greater chance of flooding each year from rivers or a 1 in 200 (0.5%) or greater chance of flooding each year from the sea.

Features are displayed on the River and coastal flooding map on **page 102**

Location	Type
On site	**Zone 3 - (Fluvial Models)**

This data is sourced from the Environment Agency and Natural Resources Wales.

8 Surface water flooding



Site Outline
Search buffers in metres (m)

1 in 1000 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 250 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 100 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 30 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

8.1 Surface water flooding

Highest risk on site	**1 in 30 year, 0.1m - 0.3m**
Highest risk within 50m	**1 in 30 year, Greater than 1.0m**

Ambiental Risk Analytics surface water (pluvial) FloodMap identifies areas likely to flood as a result of extreme rainfall events, i.e. land naturally vulnerable to surface water ponding or flooding. This data set was produced by simulating 1 in 30 year, 1 in 100 year, 1 in 250 year and 1 in 1,000 year rainfall events. Modern urban drainage systems are typically built to cope with rainfall events between 1 in 20 and 1 in 30 years, though some older ones may flood in a 1 in 5 year rainfall event.

Features are displayed on the Surface water flooding map on **page 107**

The data shown on the map and in the table above shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on a site.

The table below shows the maximum flood depths for a range of return periods for the site.

Return period	Maximum modelled depth
1 in 1000 year	Between 0.3m and 1.0m
1 in 250 year	Between 0.1m and 0.3m
1 in 100 year	Between 0.1m and 0.3m
1 in 30 year	Between 0.1m and 0.3m

This data is sourced from Ambiental Risk Analytics.

9 Groundwater flooding

Site Outline

Search buffers in metres (m)

High

Moderate - High

Moderate

Low

Negligible

9.1 Groundwater flooding

Highest risk on site	**Moderate**
Highest risk within 50m	**Moderate**

Groundwater flooding is caused by unusually high groundwater levels. It occurs when the water table rises above the ground surface or within underground structures such as basements or cellars. Groundwater flooding tends to exhibit a longer duration than surface water flooding, possibly lasting for weeks or months, and as a result it can cause significant damage to property. This risk assessment is based on a 1 in 100 year return period and a 5m Digital Terrain Model (DTM).

Features are displayed on the Groundwater flooding map on **page 109**

This data is sourced from Ambiental Risk Analytics.

10 Environmental designations

Site Outline

Search buffers in metres (m)

Local Nature Reserves (LNR)

10.1 Sites of Special Scientific Interest (SSSI)

Records within 2000m	0

Sites providing statutory protection for the best examples of UK flora, fauna, or geological or physiographical features. Originally notified under the National Parks and Access to the Countryside Act 1949, SSSIs were re-notified under the Wildlife and Countryside Act 1981. Improved provisions for the protection and management of SSSIs were introduced by the Countryside and Rights of Way Act 2000 (in England and Wales) and (in Scotland) by the Nature Conservation (Scotland) Act 2004 and the Wildlife and Natural Environment (Scotland) Act 2010.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.2 Conserved wetland sites (Ramsar sites)

Records within 2000m	0

Ramsar sites are designated under the Convention on Wetlands of International Importance, agreed in Ramsar, Iran, in 1971. They cover all aspects of wetland conservation and wise use, recognizing wetlands as ecosystems that are extremely important for biodiversity conservation in general and for the well-being of human communities. These sites cover a broad definition of wetland; marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, and even some marine areas.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.3 Special Areas of Conservation (SAC)

Records within 2000m	0

Areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.4 Special Protection Areas (SPA)

Records within 2000m	0

Sites classified by the UK Government under the EC Birds Directive, SPAs are areas of the most important habitat for rare (listed on Annex I to the Directive) and migratory birds within the European Union.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.5 National Nature Reserves (NNR)

Records within 2000m	0

Sites containing examples of some of the most important natural and semi-natural terrestrial and coastal ecosystems in Great Britain. They are managed to conserve their habitats, provide special opportunities for scientific study or to provide public recreation compatible with natural heritage interests.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.6 Local Nature Reserves (LNR)

Records within 2000m	9

Sites managed for nature conservation, and to provide opportunities for research and education, or simply enjoying and having contact with nature. They are declared by local authorities under the National Parks and Access to the Countryside Act 1949 after consultation with the relevant statutory nature conservation agency.

Features are displayed on the Environmental designations map on **page 110**

ID	Location	Name	Data source
1	1027m W	Russia Dock Woodland	Natural England
2	1114m W	Lavender Pond	Natural England
3	1332m NW	Ackroyd Drive	Natural England
A	1385m NW	Ackroyd Drive	Natural England
A	1412m NW	Ackroyd Drive	Natural England
-	1437m S	Mudchute Park Farm	Natural England
-	1441m N	Ackroyd Drive	Natural England
-	1511m N	Tower Hamlets Cemetery Park	Natural England
-	1780m SW	Russia Dock Woodland	Natural England

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.7 Designated Ancient Woodland

Records within 2000m	0

Ancient woodlands are classified as areas which have been wooded continuously since at least 1600 AD. This includes semi-natural woodland and plantations on ancient woodland sites. 'Wooded continuously' does not mean there is or has previously been continuous tree cover across the whole site, and not all trees within the woodland have to be old.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.8 Biosphere Reserves

Records within 2000m	0

Biosphere Reserves are internationally recognised by UNESCO as sites of excellence to balance conservation and socioeconomic development between nature and people. They are recognised under the Man and the Biosphere (MAB) Programme with the aim of promoting sustainable development founded on the work of the local community.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.9 Forest Parks

Records within 2000m	0

These are areas managed by the Forestry Commission designated on the basis of recreational, conservation or scenic interest.

This data is sourced from the Forestry Commission.

10.10 Marine Conservation Zones

Records within 2000m	0

A type of marine nature reserve in UK waters established under the Marine and Coastal Access Act (2009). They are designated with the aim to protect nationally important, rare or threatened habitats and species.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.11 Green Belt

Records within 2000m	0

Areas designated to prevent urban sprawl by keeping land permanently open.

This data is sourced from the Ministry of Housing, Communities and Local Government.

10.12 Proposed Ramsar sites

Records within 2000m	0

Ramsar sites are areas listed as a Wetland of International Importance under the Convention on Wetlands of International Importance especially as Waterfowl Habitat (the Ramsar Convention) 1971. The sites here supplied have a status of 'Proposed' having been identified for potential adoption under the framework.

This data is sourced from Natural England.

10.13 Possible Special Areas of Conservation (pSAC)

Records within 2000m	0

Special Areas of Conservation are areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive. Those sites supplied here are those with a status of 'Possible' having been identified for potential adoption under the framework.

This data is sourced from Natural England and Natural Resources Wales.

10.14 Potential Special Protection Areas (pSPA)

Records within 2000m	0

Special Protection Areas (SPAs) are areas designated (or 'classified') under the European Union Wild Birds Directive for the protection of nationally and internationally important populations of wild birds. Those sites supplied here are those with a status of 'Potential' having been identified for potential adoption under the framework.

This data is sourced from Natural England.

10.15 Nitrate Sensitive Areas

Records within 2000m	0

Areas where nitrate concentrations in drinking water sources exceeded or was at risk of exceeding the limit of 50 mg/l set by the 1980 EC Drinking Water Directive. Voluntary agricultural measures as a means of reducing the levels of nitrate were introduced by DEFRA as MAFF, with payments being made to farmers who complied. The scheme was started as a pilot in 1990 in ten areas, later implemented within 32 areas. The scheme was closed to further new entrants in 1998, although existing agreements continued for their full term. All Nitrate Sensitive Areas fell within the areas designated as Nitrate Vulnerable Zones (NVZs) in 1996 under the EC Nitrate Directive (91/676/EEC).

This data is sourced from Natural England.

10.16 Nitrate Vulnerable Zones

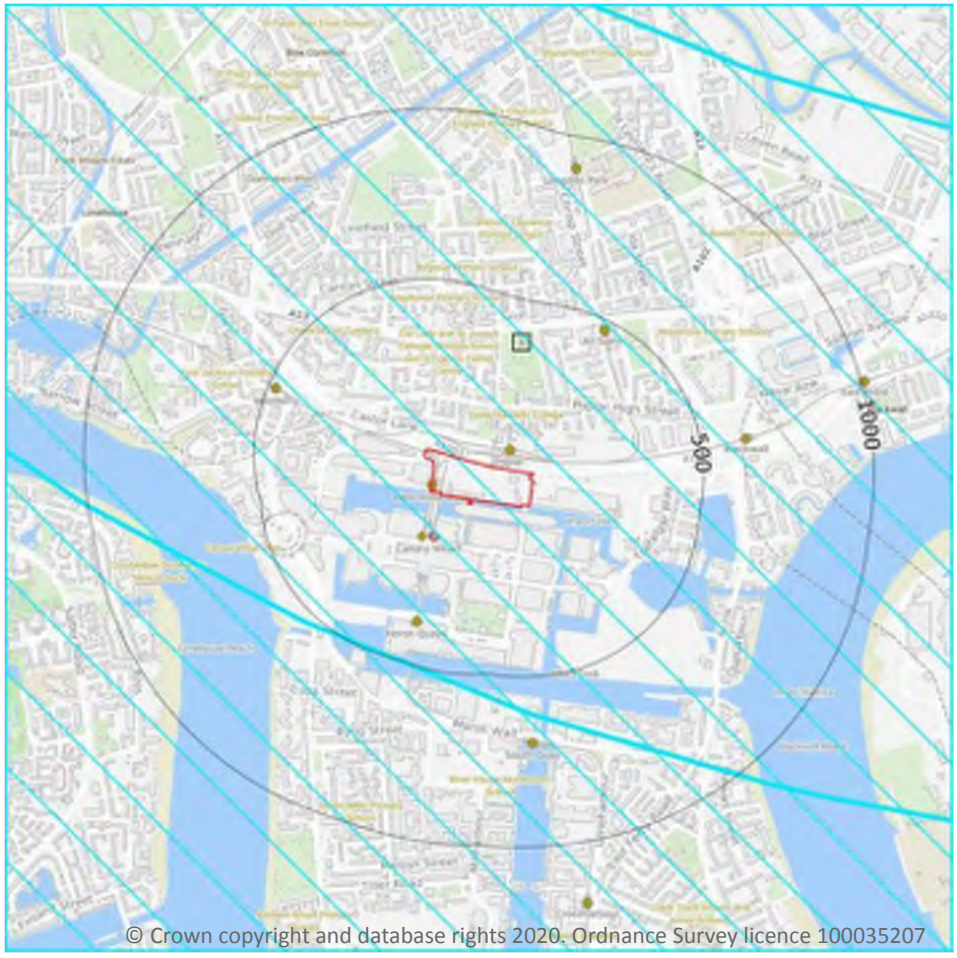
Records within 2000m	1

Areas at risk from agricultural nitrate pollution designated under the EC Nitrate Directive (91/676/EEC). These are areas of land that drain into waters polluted by nitrates. Farmers operating within these areas have to follow mandatory rules to tackle nitrate loss from agriculture.

Location	Name	Type	NVZ ID	Status
1342m N	LEE NVZ	Surface Water	S443	Existing

This data is sourced from Natural England and Natural Resources Wales.

SSSI Impact Zones and Units



Site Outline

Search buffers in metres (m)

SSSI Impact Risk Zones

SSSI Units

Not recorded

Favourable

Unfavourable - Recovering

Unfavourable - No change

Unfavourable - Declining

Partially destroyed

Destroyed

10.17 SSSI Impact Risk Zones

Records on site	1

Developed to allow rapid initial assessment of the potential risks to SSSIs posed by development proposals. They define zones around each SSSI which reflect the particular sensitivities of the features for which it is notified and indicate the types of development proposal which could potentially have adverse impacts.

Features are displayed on the SSSI Impact Zones and Units map on **page 115**

ID	Location	Type of developments requiring consultation
1	**On site**	**Infrastructure - Airports, helipads and other aviation proposals.** **Residential - Residential development of 100 units or more.** **Rural residential - Any residential development of 100 or more houses outside existing settlements/urban areas.** **Air pollution - Livestock & poultry units with floorspace > 500m², slurry lagoons > 4000m².** **Combustion - General combustion processes >50MW energy input. Incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion.** **Notes: For new residential development in this area a Habitats Regulations Assessment is required on the likely significant effects resulting from recreation on Epping Forest SAC.**

This data is sourced from Natural England.

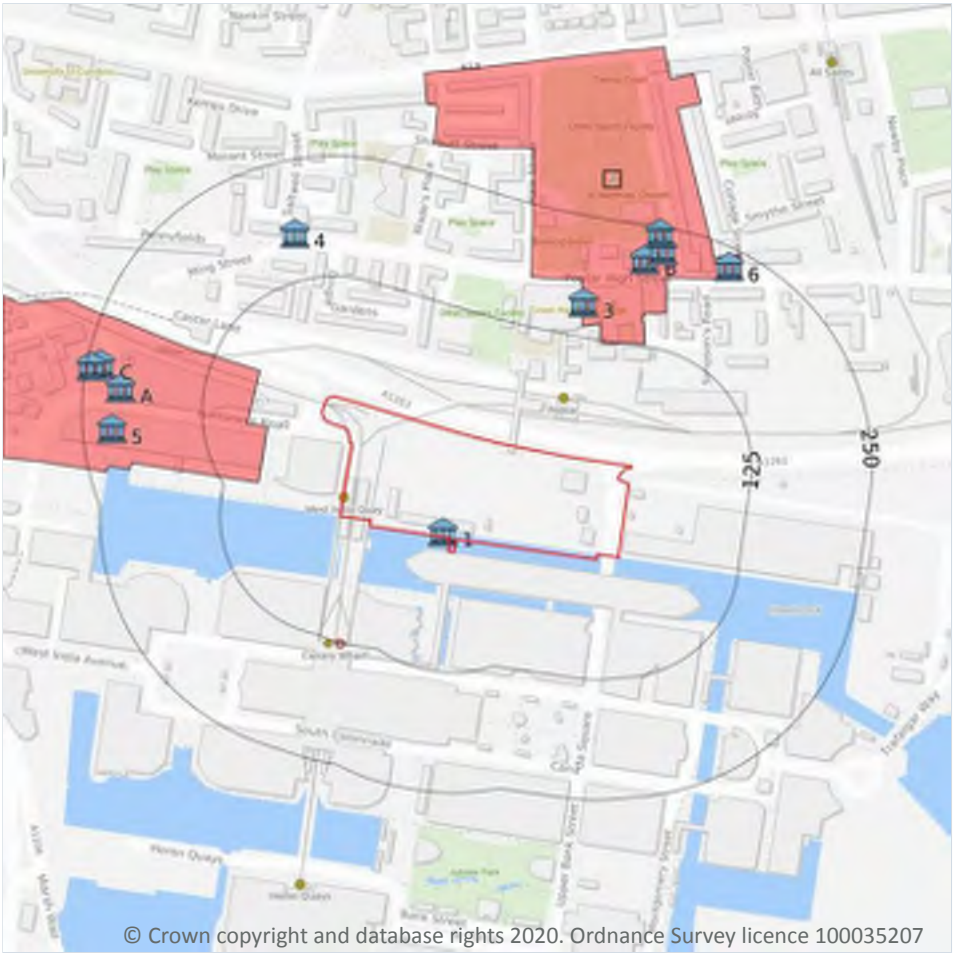
10.18 SSSI Units

Records within 2000m	**0**

Divisions of SSSIs used to record management and condition details. Units are the smallest areas for which Natural England gives a condition assessment, however, the size of units varies greatly depending on the types of management and the conservation interest.

This data is sourced from Natural England and Natural Resources Wales.

11 Visual and cultural designations



Site Outline

Search buffers in metres (m)

Listed buildings

Conservation areas

Conservation areas - no data

National Parks

Areas of Outstanding Natural Beauty

Registered parks and gardens

Scheduled Monuments

World Heritage Sites

11.1 World Heritage Sites

Records within 250m	0

Sites designated for their globally important cultural or natural interest requiring appropriate management and protection measures. World Heritage Sites are designated to meet the UK's commitments under the World Heritage Convention.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.2 Area of Outstanding Natural Beauty

Records within 250m	0

Areas of Outstanding Natural Beauty (AONB) are conservation areas, chosen because they represent 18% of the finest countryside. Each AONB has been designated for special attention because of the quality of their flora, fauna, historical and cultural associations, and/or scenic views. The National Parks and Access to the Countryside Act of 1949 created AONBs and the Countryside and Rights of Way Act, 2000 added further regulation and protection. There are likely to be restrictions to some developments within these areas.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

11.3 National Parks

Records within 250m	0

In England and Wales, the purpose of National Parks is to conserve and enhance landscapes within the countryside whilst promoting public enjoyment of them and having regard for the social and economic well-being of those living within them. In Scotland National Parks have the additional purpose of promoting the sustainable use of the natural resources of the area and the sustainable social and economic development of its communities. The National Parks and Access to the Countryside Act 1949 established the National Park designation in England and Wales, and The National Parks (Scotland) Act 2000 in Scotland.

This data is sourced from Natural England, Natural Resources Wales and the Scottish Government.

11.4 Listed Buildings

Records within 250m	11

Buildings listed for their special architectural or historical interest. Building control in the form of 'listed building consent' is required in order to make any changes to that building which might affect its special interest. Listed buildings are graded to indicate their relative importance, however building controls apply to all buildings equally, irrespective of their grade, and apply to the interior and exterior of the building in its entirety, together with any curtilage structures.

Features are displayed on the Visual and cultural designations map on **page 117**

ID	Location	Name	Grade	Reference Number	Listed date
1	**On site**	**Quay Walls, Copings And Butresses To Import Dock And Export Dock, Tower Hamlets, London, E14**	**I**	**1065783**	**01/07/1983**
3	160m N	Poplar Technical College, Tower Hamlets, London, E14	II	1260095	01/07/1983
4	174m N	Sign On Forecourt Of White Horse Public House, Tower Hamlets, London, E14	II	1065068	27/09/1973
A	211m W	Entrance Gates To West India Docks, Tower Hamlets, London, E14	II	1357508	19/07/1950

ID	Location	Name	Grade	Reference Number	Listed date
B	214m N	St Mattias's Vicarage, Tower Hamlets, London, E14	II	1357883	19/07/1950
5	220m W	Warehouses And General Offices At Western End Of North Quay, Tower Hamlets, London, E14	I	1242440	19/07/1950
B	226m N	Old Poplar Town Hall And Council Offices, Tower Hamlets, London, E14	II	1260135	01/07/1983
6	231m NE	Coroner's Court And Three Piers Immediately In Front, Tower Hamlets, London, E14	II	1065069	19/07/1950
C	235m W	Railings And Gatepiers To Former Excise Office, Tower Hamlets, London, E14	II	1357527	30/09/1981
B	244m N	Unidentified Body Stone Tomb West Of South East Gate, St Mattias, Tower Hamlets, London, E14	II	1065725	02/09/1991
C	245m W	Former Excise Office, Tower Hamlets, London, E14	II	1241686	30/09/1981

This data is sourced from English Heritage, Cadw and Historic Environment Scotland.

11.5 Conservation Areas

Records within 250m	**2**

Local planning authorities are obliged to designate as conservation areas any parts of their own area that are of special architectural or historic interest, the character and appearance of which it is desirable to preserve or enhance. Designation of a conservation area gives broader protection than the listing of individual buildings. All the features within the area, listed or otherwise, are recognised as part of its character. Conservation area designation is the means of recognising the importance of all factors and of ensuring that planning decisions address the quality of the landscape in its broadest sense.

Features are displayed on the Visual and cultural designations map on **page 117**

ID	Location	Name	District	Date of designation
A	59m W	West India Dock	Tower Hamlets	11/1982
2	122m N	St Matthias' Church	Tower Hamlets	02/1986

This data is sourced from English Heritage, Cadw and Historic Environment Scotland.

11.6 Scheduled Ancient Monuments

Records within 250m	0

A scheduled monument is an historic building or site that is included in the Schedule of Monuments kept by the Secretary of State for Digital, Culture, Media and Sport. The regime is set out in the Ancient Monuments and Archaeological Areas Act 1979. The Schedule of Monuments has c.20,000 entries and includes sites such as Roman remains, burial mounds, castles, bridges, earthworks, the remains of deserted villages and industrial sites. Monuments are not graded, but all are, by definition, considered to be of national importance.

This data is sourced from English Heritage, Cadw and Historic Environment Scotland.

11.7 Registered Parks and Gardens

Records within 250m	0

Parks and gardens assessed to be of particular interest and of special historic interest. The emphasis being on 'designed' landscapes, rather than on planting or botanical importance. Registration is a 'material consideration' in the planning process, meaning that planning authorities must consider the impact of any proposed development on the special character of the landscape.

This data is sourced from English Heritage, Cadw and Historic Environment Scotland.

12 Agricultural designations

Site Outline

Search buffers in metres (m)

- Grade 1 - excellent quality
- Grade 2 - very good quality
- Grade 3 - good to moderate quality
- Grade 3a - good quality
- Grade 3b - moderate quality
- Grade 4 - poor quality
- Grade 5 - very poor quality
- Non-agricultural land
- Urban land
- Exclusion land
- Tree felling licences
- Open Access land

12.1 Agricultural Land Classification

Records within 250m	1

Classification of the quality of agricultural land taking into consideration multiple factors including climate, physical geography and soil properties. It should be noted that the categories for the grading of agricultural land are not consistent across England, Wales and Scotland.

Features are displayed on the Agricultural designations map on **page 121**

ID	Location	Classification	Description
1	**On site**	**Urban**	-

This data is sourced from Natural England.

12.2 Open Access Land

Records within 250m	0

The Countryside and Rights of Way Act 2000 (CROW Act) gives a public right of access to land without having to use paths. Access land includes mountains, moors, heaths and downs that are privately owned. It also includes common land registered with the local council and some land around the England Coast Path. Generally permitted activities on access land are walking, running, watching wildlife and climbing.

This data is sourced from Natural England and Natural Resources Wales.

12.3 Tree Felling Licences

Records within 250m	0

Felling Licence Application (FLA) areas approved by Forestry Commission England. Anyone wishing to fell trees must ensure that a licence or permission under a grant scheme has been issued by the Forestry Commission before any felling is carried out or that one of the exceptions apply.

This data is sourced from the Forestry Commission.

12.4 Environmental Stewardship Schemes

Records within 250m	0

Environmental Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment.

This data is sourced from Natural England.

12.5 Countryside Stewardship Schemes

Records within 250m	0

Countryside Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment. Main objectives are to improve the farmed environment for wildlife and to reduce diffuse water pollution.

This data is sourced from Natural England.

13 Habitat designations

13.1 Priority Habitat Inventory

Records within 250m	0

Habitats of principal importance as named under Natural Environment and Rural Communities Act (2006) Section 41.

This data is sourced from Natural England.

13.2 Habitat Networks

Records within 250m	0

Habitat networks for 18 priority habitat networks (based primarily, but not exclusively, on the priority habitat inventory) and areas suitable for the expansion of networks through restoration and habitat creation.

This data is sourced from Natural England.

13.3 Open Mosaic Habitat

Records within 250m	0

Sites verified as Open Mosaic Habitat. Mosaic habitats are brownfield sites that are identified under the UK Biodiversity Action Plan as a priority habitat due to the habitat variation within a single site, supporting an array of invertebrates.

This data is sourced from Natural England.

13.4 Limestone Pavement Orders

Records within 250m	0

Limestone pavements are outcrops of limestone where the surface has been worn away by natural means over millennia. These rocks have the appearance of paving blocks, hence their name. Not only do they have geological interest, they also provide valuable habitats for wildlife. These habitats are threatened due to their removal for use in gardens and water features. Many limestone pavements have been designated as SSSIs which affords them some protection. In addition, Section 34 of the Wildlife and Countryside Act 1981 gave them additional protection via the creation of Limestone Pavement Orders, which made it a criminal offence to remove any part of the outcrop. The associated Limestone Pavement Priority Habitat is part of the UK Biodiversity Action Plan priority habitat in England.

This data is sourced from Natural England.

14 Geology 1:10,000 scale - Availability

Site Outline

Search buffers in metres (m)

Full coverage

Partial coverage

No coverage

14.1 10k Availability

Records within 500m	2

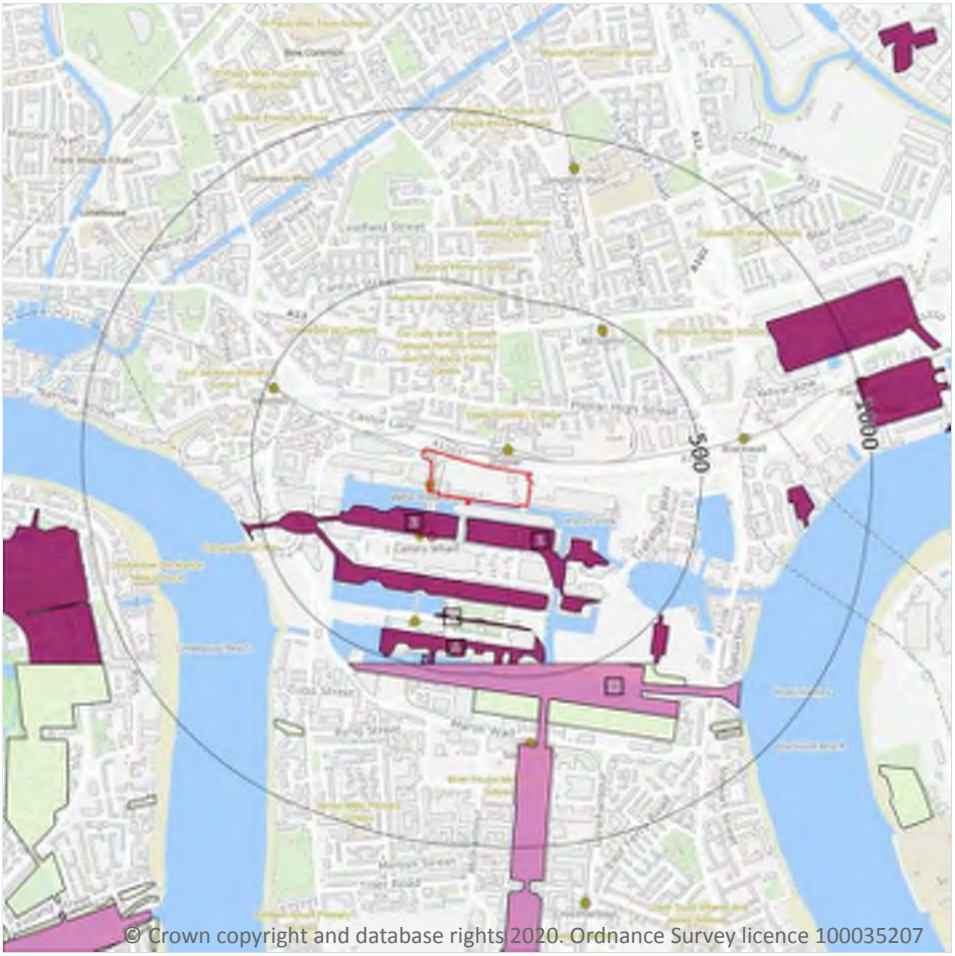
An indication on the coverage of 1:10,000 scale geology data for the site, the most detailed dataset provided by the British Geological Survey. Either 'Full', 'Partial' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:10,000 scale - Availability map on **page 124**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	**On site**	**Full**	**Full**	**Full**	**No coverage**	**TQ38SE**
2	461m S	Full	Full	Full	No coverage	TQ37NE

This data is sourced from the British Geological Survey.

Geology 1:10,000 scale - Artificial and made ground



Site Outline

Search buffers in metres (m)

- Reclaimed ground
- Made ground
- Worked ground
- Infilled ground
- Disturbed ground
- Landscaped ground

14.2 Artificial and made ground (10k)

Records within 500m **7**

Details of made, worked, infilled, disturbed and landscaped ground at 1:10,000 scale. Artificial ground can be associated with potentially contaminated material, unpredictable engineering conditions and instability.

Features are displayed on the Geology 1:10,000 scale - Artificial and made ground map on **page 125**

ID	Location	LEX Code	Description	Rock description
1	41m S	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
2	47m SW	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
3	325m S	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
A	384m S	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit

ID	Location	LEX Code	Description	Rock description
A	460m S	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
4	461m S	WGR-VOID	Worked Ground (Undivided)	Void
A	478m S	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit

This data is sourced from the British Geological Survey.

Geology 1:10,000 scale - Superficial

Site Outline

Search buffers in metres (m)

Landslip (10k)

Superficial geology (10k)
Please see table for more details.

14.3 Superficial geology (10k)

Records within 500m **5**

Superficial geological deposits at 1:10,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

Features are displayed on the Geology 1:10,000 scale - Superficial map on **page 127**

ID	Location	LEX Code	Description	Rock description
1	**On site**	**ALV-C**	**Alluvium - Clay (unlithified Deposits Coding Scheme)**	**Clay**
2	121m N	KPGR-XSV	Kempton Park Gravel Formation - Sand And Gravel	Sand And Gravel
3	125m N	LASI-Z	Langley Silt Member - Silt (unlithified Deposits Coding Scheme)	Silt

ID	Location	LEX Code	Description	Rock description
4	310m NW	LASI-Z	Langley Silt Member - Silt (unlithified Deposits Coding Scheme)	Silt
5	461m S	ALV-Z	Alluvium - Silt (unlithified Deposits Coding Scheme)	Silt

This data is sourced from the British Geological Survey.

14.4 Landslip (10k)

Records within 500m	0

Mass movement deposits on BGS geological maps at 1:10,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

This data is sourced from the British Geological Survey.

Geology 1:10,000 scale - Bedrock

Site Outline

Search buffers in metres (m)

Bedrock faults and other linear features (10k)

Bedrock geology (10k)
Please see table for more details.

14.5 Bedrock geology (10k)

Records within 500m **3**

Bedrock geology at 1:10,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:10,000 scale - Bedrock map on **page 129**

ID	Location	LEX Code	Description	Rock age
1	**On site**	**LC-CLAY**	**London Clay Formation - Clay**	**Eocene Epoch**
2	**On site**	**LMBE-CLAY**	**Lambeth Group - Clay**	**Paleocene Epoch**
3	461m S	LMBE-CLAY	Lambeth Group - Clay	Paleocene Epoch

This data is sourced from the British Geological Survey.

14.6 Bedrock faults and other linear features (10k)

Records within 500m	0

Linear features at the ground or bedrock surface at 1:10,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

This data is sourced from the British Geological Survey.

15 Geology 1:50,000 scale - Availability

Site Outline

Search buffers in metres (m)

Geological map tile

15.1 50k Availability

Records within 500m	2

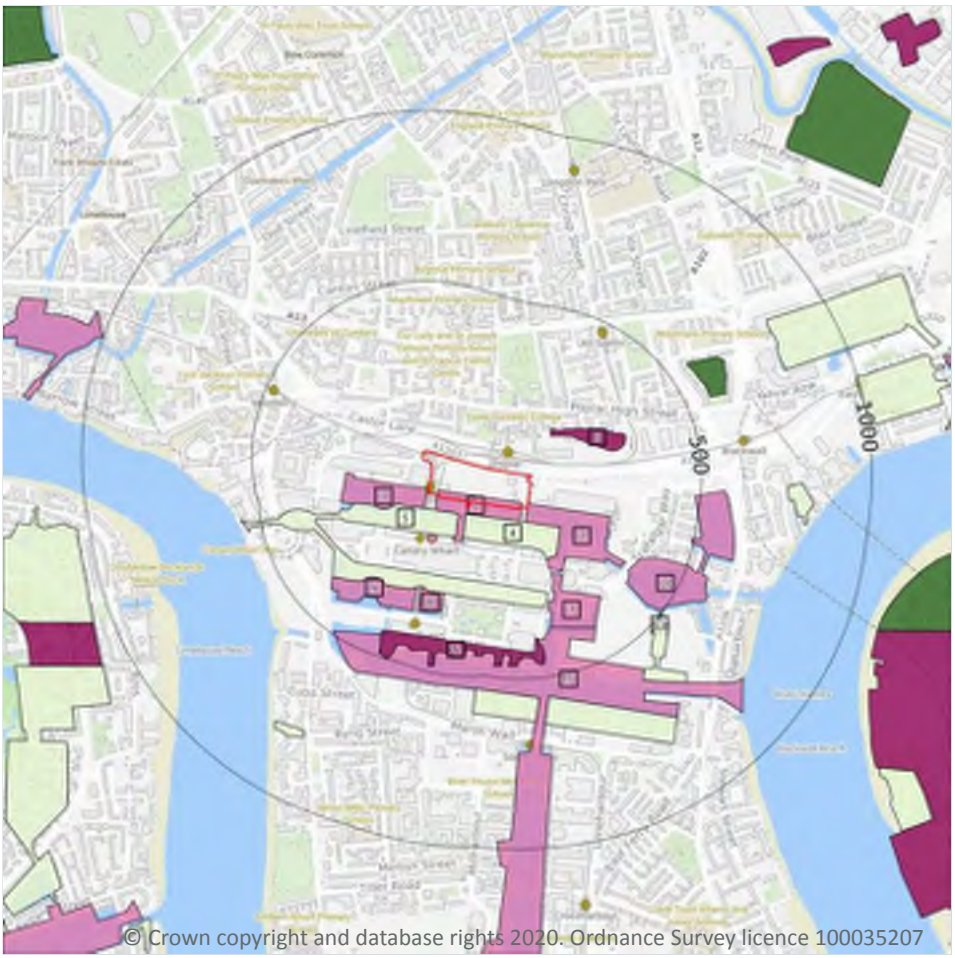
An indication on the coverage of 1:50,000 scale geology data for the site. Either 'Full' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:50,000 scale - Availability map on **page 131**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	**On site**	**Full**	**Full**	**Full**	**Full**	**EW256_north_london_v4**
2	347m S	Full	Full	Full	Full	EW270_south_london_v4

This data is sourced from the British Geological Survey.

Geology 1:50,000 scale - Artificial and made ground



Site Outline

Search buffers in metres (m)

- Made ground
- Worked ground
- Infilled ground
- Disturbed ground
- Landscaped ground

15.2 Artificial and made ground (50k)

Records within 500m **13**

Details of made, worked, infilled, disturbed and landscaped ground at 1:50,000 scale. Artificial ground can be associated with potentially contaminated material, unpredictable engineering conditions and instability.

Features are displayed on the Geology 1:50,000 scale - Artificial and made ground map on **page 132**

ID	Location	LEX Code	Description	Rock description
1	**On site**	**WGR-VOID**	**WORKED GROUND (UNDIVIDED)**	**VOID**
2	0m E	WGR-VOID	WORKED GROUND (UNDIVIDED)	VOID
3	6m W	WGR-VOID	WORKED GROUND (UNDIVIDED)	VOID
4	24m S	WMGR-ARTDP	INFILLED GROUND	ARTIFICIAL DEPOSIT

ID	Location	LEX Code	Description	Rock description
5	36m SW	WMGR-ARTDP	INFILLED GROUND	ARTIFICIAL DEPOSIT
6	129m NE	MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT
7	203m S	WGR-VOID	WORKED GROUND (UNDIVIDED)	VOID
8	265m S	WGR-VOID	WORKED GROUND (UNDIVIDED)	VOID
9	272m S	WGR-VOID	WORKED GROUND (UNDIVIDED)	VOID
10	350m SE	WGR-VOID	WORKED GROUND (UNDIVIDED)	VOID
11	357m S	WGR-VOID	WORKED GROUND (UNDIVIDED)	VOID
12	384m S	MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT
13	496m SE	WMGR-ARTDP	INFILLED GROUND	ARTIFICIAL DEPOSIT

This data is sourced from the British Geological Survey.

15.3 Artificial ground permeability (50k)

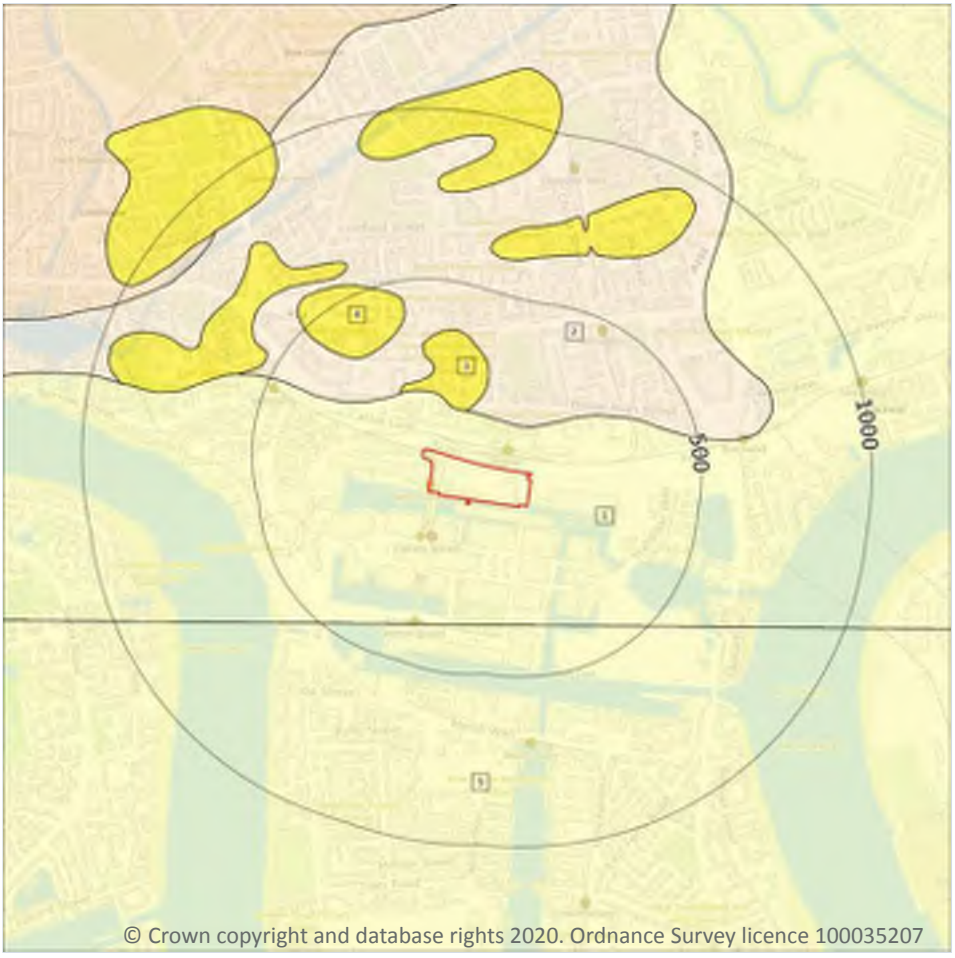
Records within 50m	**2**

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any artificial deposits (the zone between the land surface and the water table).

Location	Flow type	Maximum permeability	Minimum permeability
24m SE	Mixed	Very High	Low
36m SW	Mixed	Very High	Low

This data is sourced from the British Geological Survey.

Geology 1:50,000 scale - Superficial



Site Outline

Search buffers in metres (m)

Landslip (50k)

Superficial geology (50k)
Please see table for more details.

15.4 Superficial geology (50k)

Records within 500m **5**

Superficial geological deposits at 1:50,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

Features are displayed on the Geology 1:50,000 scale - Superficial map on **page 134**

ID	Location	LEX Code	Description	Rock description
1	**On site**	**ALV-XCZSP**	**ALLUVIUM**	**CLAY, SILT, SAND AND PEAT**
2	134m N	KPGR-XSV	KEMPTON PARK GRAVEL MEMBER	SAND AND GRAVEL
3	138m N	LASI-XCZ	LANGLEY SILT MEMBER	CLAY AND SILT
4	323m NW	LASI-XCZ	LANGLEY SILT MEMBER	CLAY AND SILT

ID	Location	LEX Code	Description	Rock description
5	347m S	ALV-XCZSP	ALLUVIUM	CLAY, SILT, SAND AND PEAT

This data is sourced from the British Geological Survey.

15.5 Superficial permeability (50k)

Records within 50m	1

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any superficial deposits (the zone between the land surface and the water table).

Location	Flow type	Maximum permeability	Minimum permeability
On site	**Intergranular**	**Moderate**	**Very Low**

This data is sourced from the British Geological Survey.

15.6 Landslip (50k)

Records within 500m	0

Mass movement deposits on BGS geological maps at 1:50,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

This data is sourced from the British Geological Survey.

15.7 Landslip permeability (50k)

Records within 50m	0

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any landslip deposits (the zone between the land surface and the water table).

This data is sourced from the British Geological Survey.

Geology 1:50,000 scale - Bedrock

Site Outline

Search buffers in metres (m)

Bedrock faults and other linear features (50k)

Bedrock geology (50k)
Please see table for more details.

15.8 Bedrock geology (50k)

Records within 500m **3**

Bedrock geology at 1:50,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 136**

ID	Location	LEX Code	Description	Rock age
1	**On site**	**LMBE-XCZS**	**LAMBETH GROUP - CLAY, SILT AND SAND**	**THANETIAN**
2	**On site**	**LC-XCZS**	**LONDON CLAY FORMATION - CLAY, SILT AND SAND**	**YPRESIAN**
3	347m S	LMBE-XCZS	LAMBETH GROUP - CLAY, SILT AND SAND	THANETIAN

This data is sourced from the British Geological Survey.

15.9 Bedrock permeability (50k)

Records within 50m	2

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of bedrock (the zone between the land surface and the water table).

Location	Flow type	Maximum permeability	Minimum permeability
On site	**Mixed**	**Moderate**	**Very Low**
On site	**Mixed**	**Moderate**	**Very Low**

This data is sourced from the British Geological Survey.

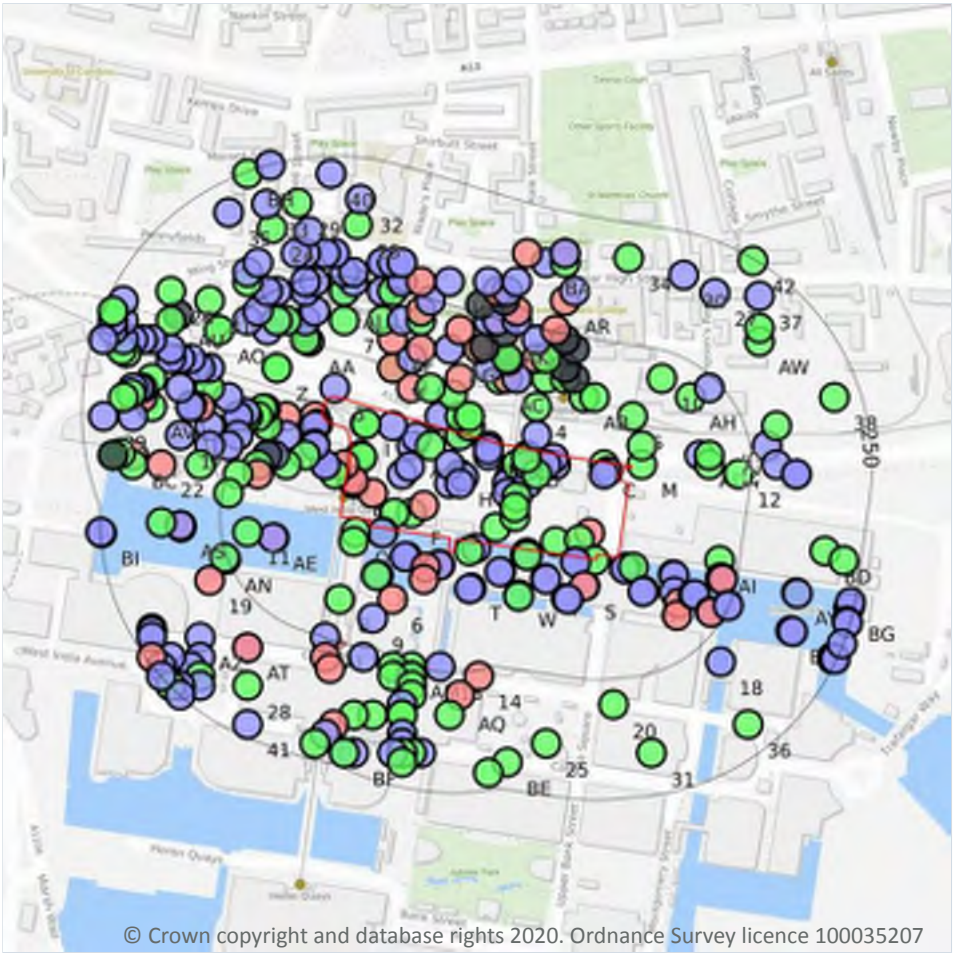
15.10 Bedrock faults and other linear features (50k)

Records within 500m	0

Linear features at the ground or bedrock surface at 1:50,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

This data is sourced from the British Geological Survey.

16 Boreholes



Site Outline

Search buffers in metres (m)

Confidential

0 - 10m

10 - 30m

30m+

Unknown

16.1 BGS Boreholes

Records within 250m	436

The Single Onshore Boreholes Index (SOBI); an index of over one million records of boreholes, shafts and wells from all forms of drilling and site investigation work held by the British Geological Survey. Covering onshore and nearshore boreholes dating back to at least 1790 and ranging from one to several thousand metres deep.

Features are displayed on the Boreholes map on **page 138**

ID	Location	Grid reference	Name	Length	Confidential	Web link
1	On site	537520 180600	E. Z. P. 5 TP 10	3.0	N	13600167
2	On site	537690 180480	WEST INDIA DOCKS BH4	14.48	N	1033377
A	On site	537540 180580	NORTH QUAY, POPLAR TP 5	3.0	N	13596706

ID	Location	Grid reference	Name	Length	Confidential	Web link
A	On site	537530 180550	NORTH QUAY, POPLAR TP 11	3.0	N	13596714
A	On site	537545 180588	NORTH QUAY WEST INDIA DOCK TP 5	3.0	N	13576622
A	On site	537560 180580	NORTH QUAY 4	15.0	N	13576302
A	On site	537538 180558	NORTH QUAY WEST INDIA DOCK TP 11	3.0	N	13576628
B	On site	537480 180540	LONDON DOCKLANDS RAILWAY TP 24	1.7	N	13600964
B	On site	537487 180570	DOCKLANDS RAILWAY 434	30.0	N	1034532
B	On site	537478 180545	DOCKLANDS RAILWAY 435	40.0	N	1034533
B	On site	537500 180530	WAREHOUSE 1 & 2 WEST INDIA DOCK 435	37.25	N	13681258
B	On site	537489 180568	LONDON DOCKLAND RAILWAY 434	30.0	N	18502736
B	On site	537480 180543	LONDON DOCKLAND RAILWAY 435	40.0	N	18502738
C	On site	537740 180560	NORTHERN DRAINAGE PHASE 1 [ISLE OF DOGS] PA3	15.0	N	13602678
C	On site	537744 180553	NORTH QUAY WEST INDIA DOCK TP 8	3.0	N	13576625
C	On site	537740 180550	NORTH QUAY, POPLAR TP 8	3.0	N	13596709
D	On site	537660 180570	NORTHERN DRAINAGE PHASE 1A 3	17.2	N	13602547
D	On site	537690 180560	E Z SEWER M15	9.5	N	13600124
D	On site	537642 180545	NORTH QUAY WEST INDIA DOCK TP 13	3.0	N	13576630
D	On site	537688 180567	NORTH QUAY WEST INDIA DOCK TP 7	3.0	N	13576624
D	On site	537660 180560	NORTH QUAY 6	1.2	N	13576307
D	On site	537640 180540	NORTH QUAY, POPLAR TP 13	3.0	N	13596717
D	On site	537650 180560	NORTHERN DRAINAGE PHASE 1A 2	16.0	N	13602546
D	On site	537680 180560	NORTH QUAY, POPLAR TP 7	3.0	N	13596708
D	On site	537660 180540	E. Z. P. 5 TP 9	3.9	N	13600165
D	On site	537640 180530	E. Z. P. 5 TP 13	4.0	N	13600175
D	On site	537660 180560	E Z ROADS PHASE 5 102	10.0	N	13600111
D	On site	537670 180550	E Z SEWER MS4	15.0	N	13600131
D	On site	537628 180495	Crossrail IOD102	13.8	N	20654182
D	On site	537648 180506	Crossrail IOD108	12.0	N	20654185
D	On site	537650 180526	Crossrail IOD109	15.0	N	20654186

ID	Location	Grid reference	Name	Length	Confidential	Web link
D	**On site**	**537648 180516**	**Crossrail IOD111**	**12.0**	**N**	**20654187**
D	**On site**	**537659 180567**	**Crossrail IOD110**	**15.0**	**N**	**20672211**
E	**On site**	**537620 180580**	**E. Z. P. 5 TP 8**	**4.0**	**N**	**13600164**
E	**On site**	**537620 180570**	**NORTH QUAY, POPLAR TP 6**	**0.75**	**N**	**13596707**
E	**On site**	**537620 180576**	**NORTH QUAY WEST INDIA DOCK TP 6**	**0.75**	**N**	**13576623**
F	**On site**	**537540 180510**	**WEST INDIA DOCKS NO.3**	**14.33**	**N**	**1033376**
F	**On site**	**537553 180517**	**CROSSRAIL BH IOD30R**	**70.0**	**N**	**19411610**
F	**On site**	**537522 180510**	**Crossrail IOD100**	**14.35**	**N**	**20654181**
G	**On site**	**537590 180590**	**E. Z. P. 5 TP 7**	**4.0**	**N**	**13600149**
G	**On site**	**537590 180590**	**E Z SEWER MS3C**	**16.25**	**N**	**13600127**
H	**On site**	**537590 180550**	**NORTH QUAY 5**	**15.5**	**N**	**13576304**
H	**On site**	**537580 180540**	**E. Z. P. 5 TP 12**	**2.0**	**N**	**13600173**
H	**On site**	**537594 180547**	**NORTH QUAY WEST INDIA DOCK TP 12**	**3.0**	**N**	**13576629**
H	**On site**	**537580 180560**	**E. Z. P. 5 TP 11**	**3.0**	**N**	**13600169**
H	**On site**	**537590 180540**	**NORTH QUAY, POPLAR TP 12**	**3.0**	**N**	**13596715**
I	**On site**	**537492 180602**	**DOCKLANDS RAILWAY 427**	**30.0**	**N**	**1034527**
I	**On site**	**537493 180602**	**LONDON DOCKLAND RAILWAY 427**	**30.0**	**N**	**18502734**
J	**On site**	**537725 180489**	**CROSSRAIL BH IOD31P**	**69.0**	**N**	**19411612**
J	**On site**	**537715 180482**	**Crossrail IOD104**	**11.8**	**N**	**20654183**
J	2m S	537730 180460	CANARY WHARF 11	22.0	N	13596773
K	4m S	537660 180468	Crossrail IOD55CPT	3.97	N	20654029
F	4m S	537511 180490	Crossrail IOD44	10.85	N	20653947
B	4m W	537470 180560	PORT EAST 105	45.0	N	14772376
K	5m S	537659 180467	Crossrail IOD55ACPT	3.5	N	20654027
F	5m S	537510 180489	Crossrail IOD45CPT	8.33	N	20653948
J	5m S	537711 180459	Crossrail IOD61CPT	1.35	N	20654036
K	6m S	537658 180466	Crossrail IOD55BCPT	4.08	N	20654028
J	6m S	537711 180458	Crossrail IOD60	1.5	N	20654035

ID	Location	Grid reference	Name	Length	Confidential	Web link
L	6m S	537607 180473	Crossrail IOD50	2.2	N	20672234
K	7m S	537660 180465	Crossrail IOD54	11.45	N	20654025
B	8m W	537440 180610	PORT EAST 103	45.0	N	14772371
B	9m SW	537443 180602	NORTH QUAY WEST INDIA DOCK TP 4	3.0	N	13576621
3	9m N	537460 180640	NORTHERN DRAINAGE PHASE 1 [ISLE OF DOGS] NDD1	10.0	N	13602684
G	10m N	537600 180600	POPLAR INSTITUTION, NO 1 (SEE TQ38/137M ALSO)	-2.0	N	1035292
G	10m N	537600 180600	POPLAR INSTITUTION	15.81	N	1035281
G	10m N	537600 180600	POPLAR INSTITUTION	15.63	N	1035283
G	10m N	537600 180600	POPLAR INSTITUTION	13.07	N	1035289
G	10m N	537600 180600	POPLAR INSTITUTION	17.22	N	1035282
G	10m N	537600 180600	POPLAR INSTITUTION	15.08	N	1035287
G	10m N	537600 180600	POPLAR INSTITUTION	14.78	N	1035286
G	10m N	537600 180600	POPLAR INSTITUTION	14.9	N	1035288
G	10m N	537600 180600	POPLAR INSTITUTION	19.12	N	1035280
G	10m N	537600 180600	POPLAR INSTITUTION, NO 2	106.68	N	1035265
G	10m N	537600 180600	POPLAR INSTITUTION	16.0	N	1035284
G	10m N	537600 180600	POPLAR INSTITUTION	15.2	N	1035285
G	10m N	537600 180600	POPLAR INSTITUTION	13.86	N	1035290
L	10m S	537600 180470	CANARY WHARF 7	21.5	N	13596765
G	11m N	537570 180610	E. Z. P. 5 TP 6	1.3	N	13600139
M	11m E	537780 180560	ASPEN WAY - ISLE OF DOGS 1	15.0	N	13594695
B	12m SW	537440 180600	NORTH QUAY, POPLAR TP 4	3.0	N	13596705
B	12m W	537460 180550	WAREHOUSE 1 & 2 WEST INDIA DOCK 1	14.73	N	13681161
N	13m SE	537764 180453	Crossrail IOD64	1.65	N	20654039
N	14m SE	537762 180451	Crossrail IOD65CPT	1.16	N	20654040
O	14m S	537482 180490	DOCKLANDS RAILWAY 436	30.0	N	1034534
D	15m N	537670 180590	E Z ROADS PHASE 5 TP A	3.3	N	13600098

ID	Location	Grid reference	Name	Length	Confidential	Web link
G	17m N	537590 180610	E Z SEWER M12	16.0	N	13600122
P	17m SW	537569 180456	Crossrail IOD37ACPT	7.8	N	20653934
P	17m SW	537570 180455	Crossrail IOD36R	65.0	N	20653933
P	17m SW	537569 180455	Crossrail IOD37CPT	2.99	N	20653935
N	18m SE	537771 180453	Crossrail IOD84R	22.34	N	20654114
G	19m N	537600 180610	NORTHERN DRAINAGE PHASE 1A 4	17.0	N	13602549
G	19m N	537600 180610	NORTHERN DRAINAGE PHASE 1A 5	17.1	N	13602550
O	24m SW	537480 180480	CANARY WHARF 6	22.2	N	13596763
B	24m W	537450 180560	WAREHOUSE 1 & 2 WEST INDIA DOCK TP 14	3.87	N	13681628
B	24m W	537450 180560	WAREHOUSE 1 & 2 WEST INDIA DOCK TP 15	4.5	N	13681644
M	24m NE	537780 180580	E Z ROADS PHASE 5 M16	15.0	N	13600116
B	26m SW	537440 180582	NORTH QUAY WEST INDIA DOCK TP 10	3.0	N	13576627
P	26m S	537535 180464	Crossrail IOD47CPT	1.27	N	20653950
P	26m S	537533 180464	Crossrail IOD46	1.5	N	20653949
Q	27m S	537679 180442	Crossrail IOD58	1.5	N	20654033
R	27m S	537633 180448	Crossrail IOD53CPT	2.02	N	20654024
R	27m S	537632 180448	Crossrail IOD52	1.8	N	20654023
Q	28m S	537680 180441	Crossrail IOD59CPT	1.79	N	20654034
B	28m SW	537440 180580	NORTH QUAY, POPLAR TP 10	3.0	N	13596712
P	29m SW	537555 180453	Crossrail IOD112R	37.9	N	20654188
S	29m S	537721 180434	Crossrail IOD39CPT	4.73	N	20653937
S	29m S	537720 180434	Crossrail IOD38R	65.1	N	20653936
G	31m N	537540 180640	STONEYARD LANE 13	40.0	N	14772428
G	37m N	537583 180633	DOCKLANDS RAILWAY 428	30.0	N	1034528
G	37m N	537560 180640	DLR BECKTON EXTENSION BH26	20.0	N	14287955
B	38m W	537410 180610	WAREHOUSE 1 & 2 WEST INDIA DOCK 426	30.48	N	13681230
P	38m SW	537553 180441	Crossrail IOD113R	37.8	N	20654189
T	41m SE	537602 180432	Crossrail IOD49CPT	5.62	N	20654022

ID	Location	Grid reference	Name	Length	Confidential	Web link
T	41m SE	537600 180431	Crossrail IOD48	4.45	N	20654021
B	42m SW	537430 180570	NORTH QUAY 3	15.0	N	13576299
B	43m SW	537410 180590	WAREHOUSE 1 & 2 WEST INDIA DOCK TP 11	6.0	N	13681612
U	43m SE	537782 180429	Crossrail IOD66	1.5	N	20654041
U	43m SE	537781 180428	Crossrail IOD67CPT	1.38	N	20654042
S	44m S	537701 180421	Crossrail IOD63CPT	3.37	N	20654038
4	45m N	537670 180620	E Z ROADS PHASE 5 101	17.1	N	13600109
V	45m N	537520 180660	E Z SEWER MS1	15.0	N	13600126
V	45m N	537520 180660	POPLAR UNION WORKHOUSE POPLAR	86.86	N	1032484
S	45m S	537703 180420	Crossrail IOD62	4.5	N	20654037
W	47m S	537652 180425	Crossrail IOD57CPT	8.01	N	20654031
X	48m S	537504 180446	Crossrail IOD43CPT	2.16	N	20653946
X	49m S	537506 180445	Crossrail IOD43ACPT	8.11	N	20653945
W	49m S	537652 180423	Crossrail IOD56	11.3	N	20654030
X	49m S	537504 180445	Crossrail IOD42	10.7	N	20653944
5	52m N	537770 180610	DLR BECKTON EXTENSION BH25/25A	20.0	N	14287953
G	55m N	537590 180650	STONEYARD LANE 14	44.5	N	14772429
B	59m W	537390 180600	PORT EAST 308	13.0	N	14772389
Y	59m E	537812 180446	Crossrail IOD68	2.0	N	20654044
B	60m W	537388 180618	LONDON DOCKLAND RAILWAY 426	30.0	N	18502732
V	60m N	537540 180670	STONEYARD LANE TP 4	3.2	N	14772444
Y	60m E	537813 180445	Crossrail IOD69CPT	1.82	N	20654097
Z	61m NW	537400 180660	LIMEHOUSE BASIN B2.18	16.0	N	13736888
Z	61m NW	537400 180660	LIMEHOUSE LINK ROAD STAGE 2 B2.18	16.0	N	13576029
B	61m SW	537410 180560	PORT EAST 307	13.2	N	14772388
AA	62m N	537434 180688	LIMEHOUSE LINK B27	-	Y	N/A
B	63m W	537385 180618	DOCKLANDS RAILWAY 426	30.0	N	1034526
AB	64m N	537720 180630	LONDON DOCKLANDS RAILWAY 429	30.0	N	13601025

ID	Location	Grid reference	Name	Length	Confidential	Web link
B	65m SW	537397 180570	NORTH QUAY WEST INDIA DOCK TP 9	3.0	N	13576626
AC	65m N	537632 180649	DOCKLANDS RAILWAY 429	30.0	N	1034529
AB	65m N	537730 180630	E Z SEWER DS 4	15.0	N	13600121
AA	66m NW	537430 180690	DLR BECKTON EXTENSION BH27	20.0	N	14287956
Y	67m SE	537813 180428	Crossrail IOD71CPT	4.2	N	20654099
B	68m W	537380 180610	NORTH QUAY 2	16.5	N	13576297
AC	68m N	537640 180650	STONEYARD LANE 15A	44.75	N	14772431
AC	70m N	537650 180650	STONEYARD LANE TP 7	4.3	N	14772447
B	71m SW	537390 180570	NORTH QUAY, POPLAR TP 9	3.0	N	13596711
B	71m SW	537390 180570	WEST INDIA WAREHOUSE 1	-	Y	N/A
6	72m S	537520 180420	CANARY WHARF 8	32.0	N	13596767
AD	72m E	537840 180570	E Z ROADS PHASE 5 TP B	3.3	N	13600099
V	72m N	537550 180680	STONEYARD LANE 9	40.0	N	14772424
AE	72m W	537397 180484	Crossrail IOD34R	34.2	N	20653930
AC	73m N	537620 180660	STONEYARD LANE TP 6	4.2	N	14772446
AE	73m W	537396 180484	Crossrail IOD35CPT	5.29	N	20653932
AF	73m N	537520 180690	STONEYARD LANE 12	40.0	N	14772427
AB	76m N	537680 180650	STONEYARD LANE SL3	15.45	N	13600419
B	78m W	537370 180610	PORT EAST 117	30.0	N	14772386
Y	78m SE	537818 180416	Crossrail IOD114R	36.05	N	20654190
B	79m W	537368 180614	NORTH QUAY WEST INDIA DOCK TP 3	3.0	N	13576619
7	80m N	537470 180710	DOLPHIN HOUSE 3	14.0	N	13576901
AB	80m N	537700 180650	STONEYARD LANE SL1	14.95	N	13600417
AG	81m N	537580 180680	STONEYARD LANE TP 3	2.3	N	14772443
AD	81m E	537850 180560	ASPEN WAY - ISLE OF DOGS 2	15.0	N	13594698
AB	82m N	537710 180650	L.D.D.C. ISLE OF DOGS 4	-	Y	N/A
AD	82m E	537850 180570	E Z ROADS PHASE 5 M17	15.0	N	13600117
8	82m SW	537465 180420	DOCKLANDS RAILWAY 437	30.0	N	1034535

ID	Location	Grid reference	Name	Length	Confidential	Web link
AA	84m N	537430 180710	DINGLE LANE POPLAR M	8.53	N	1035142
B	84m SW	537380 180560	PORT EAST 306	13.1	N	14772387
Y	85m SE	537816 180403	Crossrail IOD115R	36.3	N	20654242
AC	86m N	537641 180668	94094/STONEYARD LANE 3	-	Y	N/A
Y	86m SE	537833 180425	Crossrail IOD72	1.5	N	20654100
AC	87m N	537640 180670	E Z SEWER DS 2	15.0	N	13600119
B	88m W	537360 180610	NORTH QUAY, POPLAR TP 3	3.0	N	13596701
B	88m W	537360 180610	WAREHOUSE 1 & 2 WEST INDIA DOCK TP 1	3.16	N	13681279
Y	88m SE	537835 180425	Crossrail IOD73CPT	1.91	N	20654101
AC	89m N	537610 180680	STONEYARD LANE 10	44.5	N	14772425
AB	90m N	537700 180660	L.D.D.C. ISLE OF DOGS 3	-	Y	N/A
AF	90m N	537510 180710	DOLPHIN HOUSE 6	15.0	N	13576907
B	90m SW	537380 180550	PORT EAST 113	40.0	N	14772384
B	90m W	537360 180590	WAREHOUSE 1 & 2 WEST INDIA DOCK TP 2	3.7	N	13681308
AA	91m N	537440 180720	DINGLE LANE, POPLAR, M	8.0	N	1032861
AA	92m NW	537410 180710	DOLPHIN HOUSE 2	14.0	N	13576900
AC	93m N	537616 180682	94094/STONEYARD LANE 4	-	Y	N/A
AB	94m N	537670 180670	STONEYARD LANE 16	44.1	N	14772432
AH	94m NE	537830 180630	LONDON DOCKLANDS RAILWAY 431	30.0	N	13601026
9	94m S	537500 180400	IMPORT DOCK EAST INDIA DOCKS BLACKWALL	6.7	N	1032914
AA	95m NW	537390 180700	DINGLE LANE POPLAR L	7.62	N	1035141
AF	95m N	537530 180710	STONEYARD LANE TP 2	3.3	N	14772442
AB	96m N	537680 180670	STONEYARD LANE SL4	15.0	N	13600420
10	97m N	537800 180650	DOCKLANDS RAILWAY 431	30.0	N	1034530
AA	97m NW	537400 180710	DINGLE LANE, POPLAR, L	7.0	N	1032860
AA	97m NW	537400 180710	DOLPHIN HOUSE 1	14.0	N	13576899
11	97m W	537370 180490	CANARY WHARF 2	23.9	N	13596742
B	98m W	537350 180630	BRITISH TELECOM 5	3.3	N	13602965

ID	Location	Grid reference	Name	Length	Confidential	Web link
AF	101m N	537550 180710	E Z SEWER DS1	15.0	N	13600118
B	103m W	537350 180580	WAREHOUSE 1 & 2 WEST INDIA DOCK TP 3	3.85	N	13681326
AG	103m N	537590 180700	STONEYARD LANE 6	40.0	N	14772419
AI	104m E	537860 180460	WEST INDIA DOCKS BH5	13.94	N	1033378
B	107m SW	537360 180550	PORT EAST 112	25.0	N	14772383
AI	107m E	537861 180443	Crossrail IOD40RA	65.2	N	20653939
AI	107m E	537861 180442	Crossrail IOD41ACPT	2.87	N	20653940
AI	109m E	537862 180441	Crossrail IOD41CPT	3.64	N	20653943
AI	109m E	537863 180442	Crossrail IOD41BCPT	4.94	N	20653941
AI	110m E	537863 180441	Crossrail IOD40R	41.64	N	20653938
AJ	110m N	537470 180740	DOLPHIN HOUSE 4	1.6	N	13576903
AJ	110m N	537470 180740	DOLPHIN HOUSE 4A	14.5	N	13576905
Y	111m SE	537851 180407	Crossrail IOD70CPT	6.44	N	20654098
AF	111m N	537550 180720	STONEYARD LANE 8	40.2	N	14772422
AB	111m N	537710 180680	L.D.D.C. ISLE OF DOGS 2	-	Y	N/A
12	111m E	537880 180550	NORTHERN DRAINAGE PHASE 1 [ISLE OF DOGS] PA4	15.0	N	13602681
Y	112m SE	537852 180406	Crossrail IOD76R	35.65	N	20654104
AA	113m N	537430 180740	DINGLE LANE POPLAR TP Q	2.13	N	15948154
AB	113m N	537670 180690	STONEYARD LANE TP 1	3.8	N	14772441
AK	114m N	537637 180698	94094/STONEYARD LANE 2	-	Y	N/A
AH	115m NE	537850 180640	LONDON DOCKLANDS RAILWAY TP 21	3.0	N	13600961
AA	116m NW	537370 180710	DINGLE LANE POPLAR K	7.62	N	1035140
AA	117m NW	537380 180720	DINGLE LANE, POPLAR, K	7.0	N	1032859
B	118m W	537350 180530	WEST INDIA DOCK NO 2	14.0	N	1032688
B	118m W	537330 180600	WAREHOUSE 1 & 2 WEST INDIA DOCK TP 10	4.55	N	13681597
AF	119m N	537510 180740	DINGLE LANE POPLAR TP S	3.65	N	15948156
AB	119m N	537700 180690	L.D.D.C. ISLE OF DOGS 1	-	Y	N/A
13	120m S	537570 180350	CANARY WHARF TP 4	1.1	N	13596834

ID	Location	Grid reference	Name	Length	Confidential	Web link
B	120m W	537330 180640	BRITISH TELECOM 2B	16.0	N	13602962
AA	121m N	537440 180750	DINGLE LANE, POPLAR, H	7.0	N	1032857
AJ	121m N	537480 180750	DINGLE LANE POPLAR TP R	3.65	N	15948155
AK	121m N	537620 180710	STONEYARD LANE TP 12	3.0	N	14772452
AF	121m N	537520 180740	DOLPHIN HOUSE 5	15.0	N	13576906
B	122m W	537330 180580	WAREHOUSE 1 & 2 WEST INDIA DOCK TP 4	4.15	N	13681393
AA	123m N	537430 180750	DINGLE LANE POPLAR H	7.62	N	1035138
AF	123m N	537560 180730	STONEYARD LANE TP 8	3.25	N	14772448
AA	123m NW	537400 180740	DINGLE LANE, POPLAR, J	7.0	N	1032858
Y	124m SE	537869 180414	Crossrail IOD74	3.0	N	20654102
AK	124m N	537630 180710	STONEYARD LANE 17	45.1	N	14772433
AK	124m N	537630 180710	STONEYARD LANE TP 16	2.6	N	14772466
Y	124m SE	537869 180413	Crossrail IOD75CPT	2.7	N	20654103
B	125m W	537330 180660	DLR BECKTON EXTENSION TP14	2.7	N	14287996
AL	125m S	537450 180380	LONDON DOCKLANDS RAILWAY TP 25	2.3	N	13600965
AM	126m S	537540 180350	CANARY WHARF, WEST INDIA DOCKS P1	11.0	N	13680379
AB	127m N	537690 180700	STONEYARD LANE 11	44.5	N	14772426
AN	127m W	537347 180461	Crossrail IOD93CPT	6.5	N	20654175
B	128m W	537320 180620	PORT EAST 101	40.0	N	14772362
AN	128m W	537346 180463	Crossrail IOD92R	19.19	N	20654174
AA	128m NW	537390 180740	DINGLE LANE POPLAR J	7.62	N	1035139
AK	129m N	537650 180710	STONEYARD LANE TP 15	3.0	N	14772465
AJ	130m N	537470 180760	DINGLE LANE POPLAR D	7.62	N	1035134
AJ	131m N	537480 180760	DINGLE LANE, POPLAR, D	7.0	N	1032853
14	131m S	537610 180340	CANARY WHARF 10	31.5	N	13596771
AM	133m SW	537520 180350	CANARY WHARF, WEST INDIA DOCKS P5	10.5	N	13680389
AO	133m NW	537340 180700	LIMEHOUSE BASIN B2.17	22.0	N	13736887
AO	133m NW	537340 180700	LIMEHOUSE LINK ROAD STAGE 2 B2.17	22.0	N	13576028

ID	Location	Grid reference	Name	Length	Confidential	Web link
AF	134m N	537530 180750	DINGLE LANE POPLAR A	7.62	N	1035131
AF	134m N	537530 180750	DINGLE LANE, POPLAR, A	7.0	N	1032850
AK	134m N	537612 180726	94094/STONEYARD LANE 5	-	Y	N/A
B	135m W	537320 180660	DLR BECKTON EXTENSION TP15	2.6	N	14287998
AM	135m S	537540 180340	CANARY WHARF, WEST INDIA DOCKS P4	11.0	N	13680387
AM	135m S	537540 180340	CANARY WHARF, WEST INDIA DOCKS W1	12.45	N	13680372
AM	135m S	537540 180340	CANARY WHARF, WEST INDIA DOCKS P2	11.0	N	13680385
AM	135m S	537540 180340	CANARY WHARF CW9	15.0	N	13680365
15	136m S	537490 180360	CANARY WHARF TP 3	2.0	N	13596828
B	137m W	537311 180622	NORTH QUAY WEST INDIA DOCK TP 2	3.0	N	13576618
B	138m W	537320 180560	PORT EAST 111	30.0	N	14772382
B	138m W	537310 180620	NORTH QUAY, POPLAR TP 2	3.0	N	13596700
AK	138m N	537650 180720	STONEYARD LANE 3	46.0	N	14772414
AF	140m N	537550 180750	STONEYARD LANE 7	47.5	N	14772420
AM	142m SW	537520 180340	CANARY WHARF, WEST INDIA DOCKS P3	10.5	N	13680386
AP	143m E	537910 180580	E Z ROADS PHASE 5 TP C	2.0	N	13600100
AL	144m S	537450 180360	CANARY WHARF 9	31.8	N	13596769
AK	145m N	537637 180730	94094/STONEYARD LANE 1	-	Y	N/A
AM	145m S	537540 180330	CANARY WHARF, WEST INDIA DOCKS P6	10.5	N	13680391
AA	147m NW	537370 180750	SALTWELL STREET BH6	15.24	N	1033428
B	147m W	537310 180670	DLR BECKTON EXTENSION TP16	2.5	N	14287999
AF	147m N	537510 180770	DINGLE LANE POPLAR C	7.62	N	1035133
AF	147m N	537510 180770	DINGLE LANE, POPLAR, C	7.0	N	1032852
16	148m N	537580 180750	STONEYARD LANE TP 9	3.6	N	14772449
AQ	149m S	537590 180320	CANARY WHARF WEST INDIA DOCKS 2/2A	50.15	N	13576439
AJ	149m N	537460 180780	DINGLE LANE, POPLAR, E	7.0	N	1032854
AJ	149m N	537460 180780	DINGLE LANE POPLAR TP O	3.65	N	15948152
B	149m W	537300 180640	BRITISH TELECOM 4	3.2	N	13602964

ID	Location	Grid reference	Name	Length	Confidential	Web link
17	149m W	537300 180590	WAREHOUSE 1 & 2 WEST INDIA DOCK TP 9	1.7	N	13681583
AJ	149m N	537450 180780	DINGLE LANE POPLAR E	7.62	N	1035135
AF	150m N	537520 180770	DINGLE LANE POPLAR TP P	3.65	N	15948153
18	151m SE	537861 180355	Crossrail IOD77CPT	4.32	N	20654105
AP	151m E	537920 180560	ASPEN WAY - ISLE OF DOGS 3	5.5	N	13594700
19	151m SW	537330 180440	CANARY WHARF 3]	34.2	N	13596749
AJ	152m N	537430 180780	DINGLE LANE, POPLAR, F	7.0	N	1032855
20	152m S	537750 180310	CANARY WHARF CW14	15.2	N	13680370
AK	153m N	537630 180740	STONEYARD LANE 5	40.0	N	14772416
AF	153m N	537530 180770	DINGLE LANE POPLAR B	7.62	N	1035132
AF	153m N	537530 180770	DINGLE LANE, POPLAR, B	7.0	N	1032851
AL	154m S	537455 180348	DOCKLANDS RAILWAY 438	40.05	N	1034536
AJ	154m N	537420 180780	DINGLE LANE POPLAR F	7.62	N	1035136
AM	155m S	537540 180320	CANARY WHARF, WEST INDIA DOCKS P7	10.5	N	13680393
AK	155m N	537640 180740	STONEYARD LANE TP 11	4.4	N	14772451
AA	155m NW	537370 180760	DINGLE LANE POPLAR G	7.62	N	1035137
B	157m W	537300 180670	DLR BECKTON EXTENSION TP17	2.9	N	14288001
AP	157m E	537920 180600	DLR BECKTON EXTENSION BH24	22.0	N	14287946
AR	158m N	537700 180730	STONEYARD LANE 4	45.2	N	14772415
21	159m NW	537330 180730	SALTWELL STREET BH5	15.24	N	1033427
AA	159m NW	537380 180770	DINGLE LANE, POPLAR, G	7.0	N	1032856
AK	159m N	537620 180750	STONEYARD LANE TP 13	3.0	N	14772453
AS	165m W	537301 180497	Crossrail IOD33CPT	5.28	N	20653929
AS	165m W	537301 180495	Crossrail IOD32R	34.0	N	20653928
B	166m W	537290 180670	LONDON DOCKLANDS RAILWAY TP 22	3.0	N	13600962
AS	166m W	537300 180497	Crossrail IOD32A	3.0	N	20653927
AT	167m SW	537370 180370	CANARY WHARF WEST INDIA DOCKS TP 3	2.35	N	13576442
AT	167m SW	537370 180370	CANARY WHARF 5	31.5	N	13596762

ID	Location	Grid reference	Name	Length	Confidential	Web link
AM	167m S	537530 180310	CANARY WHARF, WEST INDIA DOCKS P8	10.0	N	13680394
AK	167m N	537650 180750	STONEYARD LANE TP 14	3.0	N	14772464
AQ	169m S	537580 180300	CANARY WHARF CW11	15.0	N	13680367
B	170m W	537290 180680	DLR BECKTON EXTENSION TP18	2.0	N	14288004
AR	170m N	537710 180740	STONEYARD LANE TP 10	3.9	N	14772450
AP	171m E	537940 180550	NORTHERN DRAINAGE PHASE 1A 1	7.5	N	13602543
AP	171m E	537940 180550	NORTHERN DRAINAGE PHASE 1A DW1	8.8	N	13602551
AP	171m E	537940 180550	NORTHERN DRAINAGE PHASE 1A DW2	8.8	N	13602552
AP	171m E	537940 180550	NORTHERN DRAINAGE PHASE 1A DW3	9.0	N	13602553
AJ	173m N	537434 180802	SALTWELL ST. EXTENSION, 15	9.14	N	1033492
22	175m W	537280 180560	PORT EAST 110	45.0	N	14772381
AM	176m S	537530 180300	CANARY WHARF, WEST INDIA DOCKS W2	12.0	N	13680373
AM	176m S	537530 180300	CANARY WHARF, WEST INDIA DOCKS P9	10.5	N	13680396
AM	176m S	537530 180300	CANARY WHARF, WEST INDIA DOCKS P10	10.5	N	13680397
AU	177m NW	537298 180716	LIMEHOUSE LINK B15	-	Y	N/A
AV	178m W	537270 180620	NORTH QUAY 1	16.0	N	13576293
23	180m N	537484 180809	SALTWELL ST. EXTENSION, 17	15.24	N	1033494
AV	181m W	537270 180650	BRITISH TELECOM 1	15.6	N	13602961
AU	182m NW	537290 180710	LIMEHOUSE LINK ROAD STAGE 1 B15	30.0	N	13575963
24	185m N	537395 180805	SALTWELL ST. EXTENSION, 13	15.24	N	1033490
AW	186m NE	537902 180688	POPLAR HIGH STREET, D	11.43	N	1032849
AS	186m W	537280 180500	CANARY WHARF 1	23.0	N	13596721
AX	187m SW	537500 180300	W INDIA DOCKS MILLWALL	13.72	N	1032686
AY	188m E	537940 180427	Crossrail IOD80	17.99	N	20654109
AV	188m W	537260 180630	WAREHOUSE 1 & 2 WEST INDIA DOCK TP 6	2.2	N	13681478
AV	188m W	537260 180630	PORT EAST 116	30.1	N	14772385
AV	189m W	537260 180640	WAREHOUSE 1 & 2 WEST INDIA DOCK TP 5	4.12	N	13681412
AY	189m E	537941 180426	Crossrail IOD81CPT	7.09	N	20654110

ID	Location	Grid reference	Name	Length	Confidential	Web link
B	192m W	537270 180690	LONDON DOCKLANDS RAILWAY TP 23	1.8	N	13600963
AV	193m W	537256 180640	NORTH QUAY WEST INDIA DOCK TP 1	3.0	N	13576616
AZ	193m SW	537320 180380	CANARY WHARF TP 2	2.1	N	13596820
BA	194m N	537680 180770	STONEYARD LANE TP 5	3.65	N	14772445
BB	194m SE	537934 180387	Crossrail IOD78	4.15	N	20654107
AM	196m S	537530 180280	CANARY WHARF, WEST INDIA DOCKS P11	9.5	N	13680399
AW	196m NE	537902 180702	POPLAR HIGH STREET, C	11.43	N	1032848
AX	196m SW	537480 180300	CANARY WHARF CW8	15.0	N	13680364
BB	196m SE	537936 180386	Crossrail IOD79CPT	5.02	N	20654108
25	197m S	537680 180270	CANARY WHARF CW13	15.0	N	13680369
26	197m NW	537290 180740	LIMEHOUSE BASIN B15	30.0	N	13736881
AV	198m W	537250 180610	WAREHOUSE 1 & 2 WEST INDIA DOCK TP 7	2.21	N	13681542
BA	198m N	537700 180770	STONEYARD LANE SL2	14.95	N	13600418
BA	199m N	537660 180780	STONEYARD LANE 2	40.0	N	14772413
AV	199m W	537250 180640	NORTH QUAY, POPLAR TP 1	3.0	N	13596697
27	200m NE	537856 180738	POPLAR HIGH STREET, A	9.6	N	1032846
AV	200m W	537248 180634	LONDON DOCKLAND RAILWAY PA1	25.0	N	18502740
28	201m SW	537370 180330	CANARY WHARF CW6	15.0	N	13680361
B	201m W	537260 180690	WEST INDIA DOCK ROAD 5	0.4	N	13680535
BC	202m W	537250 180570	PORT EAST 108	35.0	N	14772378
BC	204m W	537250 180560	PORT EAST 109	15.0	N	14772380
29	205m N	537422 180832	SALTWELL ST. EXTENSION, 14	17.07	N	1033491
AM	205m S	537530 180270	CANARY WHARF, WEST INDIA DOCKS P12	9.5	N	13680419
AM	205m S	537530 180270	CANARY WHARF, WEST INDIA DOCKS P13	10.0	N	13680427
30	206m N	537823 180757	HIGH ST (END OF WOODSTOCK RD) POPLAR	5.72	N	1032485
31	206m S	537790 180260	CANARY WHARF CW16	15.5	N	13680371
AZ	207m SW	537320 180360	MILLWALL-WEST INDIA DOCKS, HERONS WHARF TP 6	2.1	N	13680348
32	207m N	537487 180836	SALTWELL ST. EXTENSION, 18	9.14	N	1033495

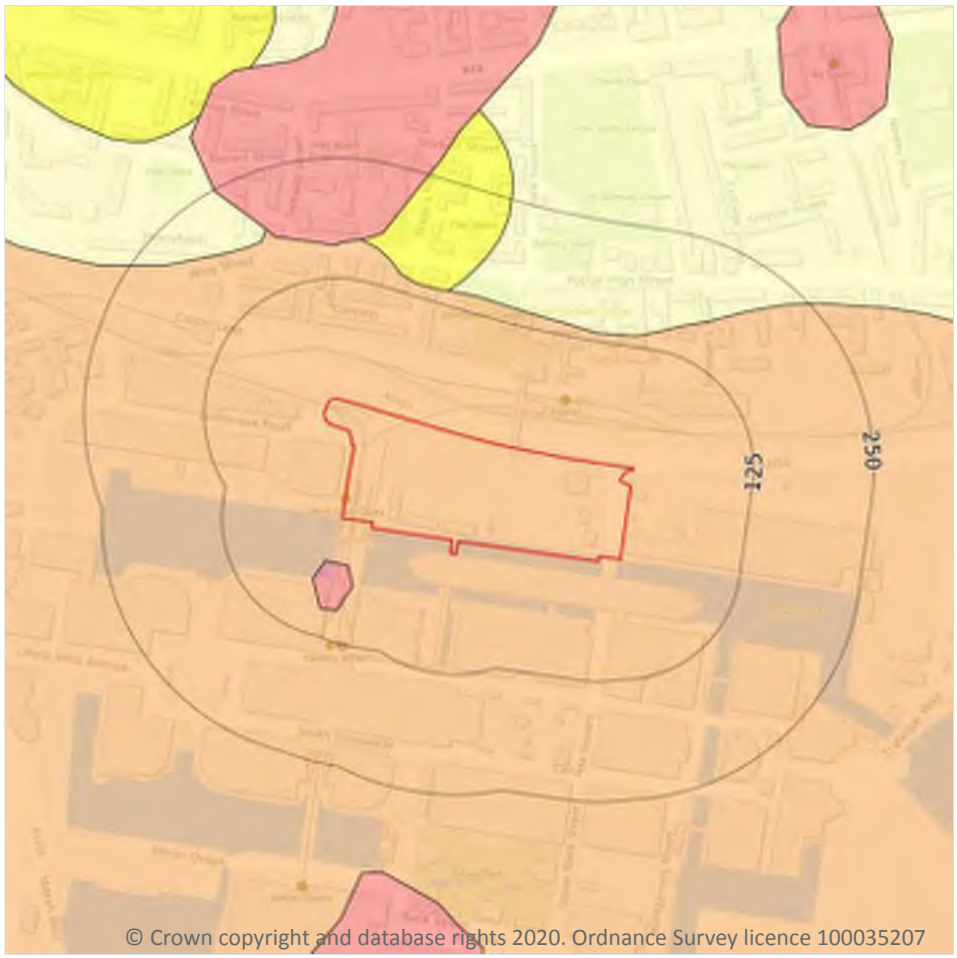
ID	Location	Grid reference	Name	Length	Confidential	Web link
BA	207m N	537700 180780	STONEYARD LANE 1	32.0	N	14772411
BA	207m N	537700 180780	STONEYARD LANE TP A	3.15	N	14772436
AV	208m W	537240 180630	POPLAR-ABBEY ROAD SEWER PA1	25.0	N	13576365
AX	209m S	537459 180290	DOCKLANDS RAILWAY 439	41.0	N	1034537
B	211m W	537250 180690	WEST INDIA DOCK ROAD 1	0.37	N	13680525
AM	212m S	537550 180260	CANARY WHARF, WEST INDIA DOCKS P15	10.0	N	13680441
BD	212m E	537970 180470	E Z SEWER M18	15.0	N	13600125
33	212m N	537389 180831	SALTWELL ST. EXTENSION, 12	9.14	N	1033489
B	213m W	537243 180676	LONDON DOCKLAND RAILWAY 425	30.0	N	18502725
AM	213m S	537540 180260	CANARY WHARF CW10	15.0	N	13680366
BC	213m W	537238 180572	LONDON DOCKLAND RAILWAY 618	14.05	N	18502743
34	214m N	537766 180775	POPLAR PLAYSCHOOL 1	15.0	N	13576631
AM	215m S	537530 180260	CANARY WHARF, WEST INDIA DOCKS P16	10.5	N	13680446
AM	215m S	537530 180260	CANARY WHARF, WEST INDIA DOCKS W3	13.35	N	13680377
B	218m W	537239 180679	DOCKLANDS RAILWAY 425	30.0	N	1034525
AM	218m S	537520 180260	CANARY WHARF, WEST INDIA DOCKS P14	9.0	N	13680434
35	219m NW	537350 180822	SALTWELL ST. EXTENSION, 10	9.14	N	1033487
36	219m SE	537890 180290	WEST INDIA DOCK NO.32	20.0	N	1032678
B	220m W	537240 180690	WEST INDIA DOCK ROAD 2	0.38	N	13680531
AZ	221m SW	537310 180350	MILLWALL-WEST INDIA DOCKS, HERONS WHARF TP 8	2.4	N	13680350
AX	221m S	537450 180280	LONDON DOCKLANDS RAILWAY TP 26	3.2	N	13600974
37	221m NE	537902 180735	POPLAR HIGH STREET, B	9.14	N	1032847
AZ	221m SW	537320 180340	MILLWALL-WEST INDIA DOCKS, HERONS WHARF 2	20.1	N	13680339
BC	222m W	537230 180570	WEST INDIA DOCK NO 1	14.0	N	1032687
BC	222m W	537230 180570	WEST INDIA WAREHOUSE 2A	-	Y	N/A
BE	222m S	537640 180250	CANARY WHARF CW12	15.0	N	13680368
38	223m E	537980 180630	DLR BECKTON EXTENSION BH23	19.5	N	14287944

ID	Location	Grid reference	Name	Length	Confidential	Web link
AM	225m S	537530 180250	CANARY WHARF, WEST INDIA DOCKS P17	11.5	N	13680454
B	227m W	537240 180710	LIMEHOUSE LINK ROAD STAGE 2 B2.16	0.6	N	13576025
39	228m W	537220 180610	WAREHOUSE 1 & 2 WEST INDIA DOCK TP 8	1.6	N	13681557
AZ	228m SW	537270 180389	Crossrail IOD106B	1.18	N	20672231
AZ	229m SW	537320 180330	MILLWALL-WEST INDIA DOCKS, HERONS WHARF TP 5	2.4	N	13680347
AZ	229m SW	537290 180360	MILLWALL-WEST INDIA DOCKS, HERONS WHARF TP 7	2.9	N	13680349
AZ	230m SW	537270 180386	Crossrail IOD106A	1.2	N	20672279
40	231m N	537456 180862	SALTWELL ST. EXTENSION, 16	9.45	N	1033493
BE	232m S	537620 180240	WEST INDIA DOCKS NO 50	14.0	N	1032685
BF	232m SW	537480 180260	CANARY WHARF WEST INDIA DOCKS TP 1	1.1	N	13576440
B	233m W	537230 180700	LIMEHOUSE LINK ROAD STAGE 2 B2.16A	0.5	N	13576026
BD	233m E	537990 180460	WEST INDIA DOCKS BH6	14.55	N	1033379
AX	233m S	537440 180270	CANARY WHARF CW7	15.0	N	13680363
AZ	233m SW	537270 180380	CANARY WHARF TP 1	1.4	N	13596814
B	235m NW	537240 180730	BRITISH TELECOM 3	3.15	N	13602963
BF	236m SW	537470 180260	WEST INDIA DOCK	-2.0	N	1032690
BF	236m SW	537470 180260	WEST INDIA DOCK NO 49	14.0	N	1032684
41	237m SW	537370 180290	CANARY WHARF WEST INDIA DOCKS TP 6	4.2	N	13576444
B	237m W	537230 180710	LONDON DOCKLANDS RAILWAY TP 64	0.8	N	13600999
B	239m W	537220 180690	WEST INDIA DOCK ROAD 3	0.38	N	13680533
B	240m W	537230 180720	LIMEHOUSE LINK ROAD STAGE 2 B2.16B	29.0	N	13576027
B	240m W	537230 180720	LIMEHOUSE BASIN B2.16B	29.0	N	13736886
AZ	242m SW	537300 180330	MILLWALL-WEST INDIA DOCKS, HERONS WHARF TP 9	2.1	N	13680351
AZ	243m SW	537280 180350	MILLWALL-WEST INDIA DOCKS, HERONS WHARF TP 3	2.2	N	13680345
AZ	245m SW	537270 180360	CANARY WHARF 4	32.0	N	13596756
BG	245m E	537995 180411	Crossrail IOD90	4.0	N	20654191

ID	Location	Grid reference	Name	Length	Confidential	Web link
BG	245m SE	537978 180360	Crossrail IOD83BCPT	7.81	N	20654112
BG	246m E	537996 180412	Crossrail IOD91ACPT	3.38	N	20654192
BG	246m E	537997 180417	Crossrail IOD91CPT	2.41	N	20654193
BG	246m SE	537978 180358	Crossrail IOD83ACPT	2.15	N	20654111
BG	246m E	537993 180397	Crossrail IOD88	3.5	N	20654120
BH	247m N	537370 180862	SALTWELL ST. EXTENSION, 9	21.34	N	1033486
BG	248m E	537994 180395	Crossrail IOD89CPT	3.1	N	20654121
42	248m NE	537895 180772	ST.MATHIAS ESTATE,POPLAR 1	18.29	N	1033420
BI	249m W	537218 180489	Crossrail IOD96	4.3	N	20654179
BG	249m SE	537981 180358	Crossrail IOD83CPT	1.67	N	20654113
BG	249m E	537988 180374	Crossrail IOD86	5.1	N	20654117
BH	249m N	537393 180871	SALTWELL ST. EXTENSION, 11	6.1	N	1033488
AZ	249m SW	537290 180330	CANARY WHARF CW4	3.5	N	13680357
AZ	249m SW	537290 180330	CANARY WHARF CW4A	15.0	N	13680358
AZ	249m SW	537300 180320	MILLWALL-WEST INDIA DOCKS, HERONS WHARF TP 4	1.1	N	13680346
AZ	249m SW	537280 180340	MILLWALL-WEST INDIA DOCKS, HERONS WHARF TP 2	2.3	N	13680344
BI	250m W	537217 180490	Crossrail IOD97CPT	5.65	N	20654180

This data is sourced from the British Geological Survey.

17 Natural ground subsidence - Shrink swell clays



Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

17.1 Shrink swell clays

Records within 50m	2

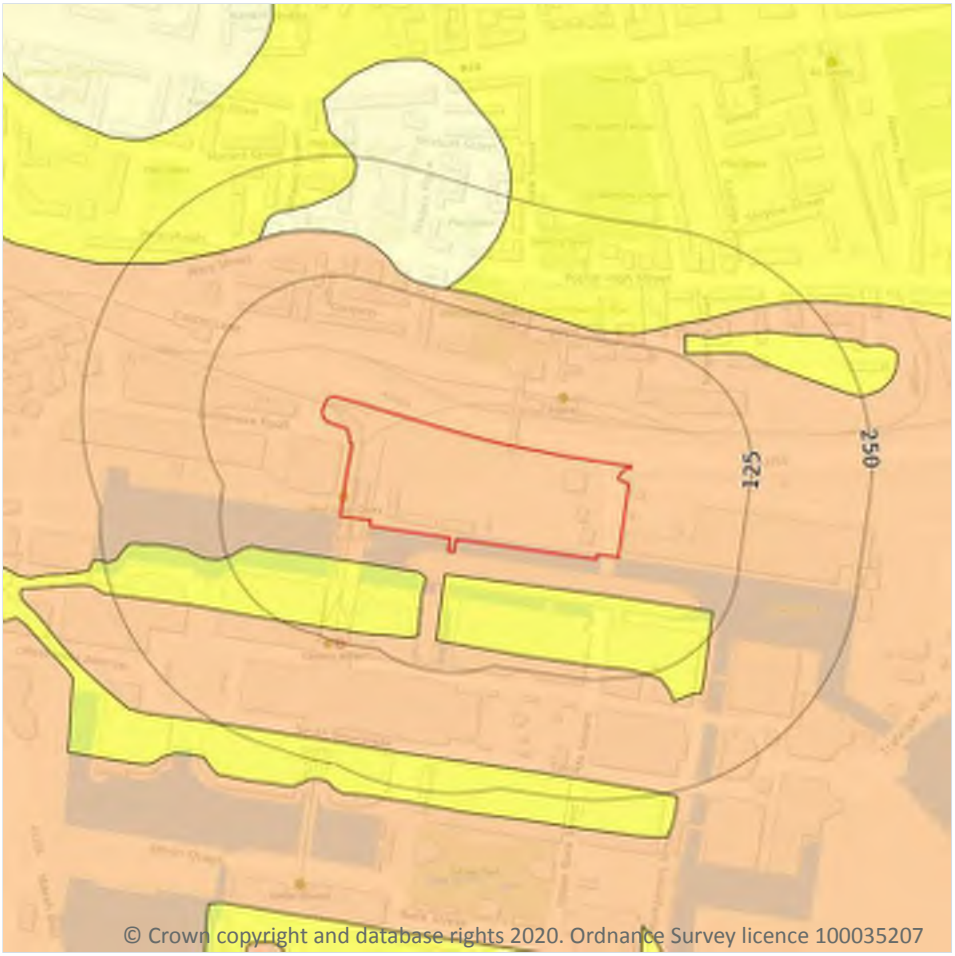
The potential hazard presented by soils that absorb water when wet (making them swell), and lose water as they dry (making them shrink). This shrink-swell behaviour is controlled by the type and amount of clay in the soil, and by seasonal changes in the soil moisture content (related to rainfall and local drainage).

Features are displayed on the Natural ground subsidence - Shrink swell clays map on **page 155**

Location	Hazard rating	Details
On site	**Low**	**Ground conditions predominantly medium plasticity.**
46m SW	Moderate	Ground conditions predominantly high plasticity.

This data is sourced from the British Geological Survey.

Natural ground subsidence - Running sands



Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

17.2 Running sands

Records within 50m	3

The potential hazard presented by rocks that can contain loosely-packed sandy layers that can become fluidised by water flowing through them. Such sands can 'run', removing support from overlying buildings and causing potential damage.

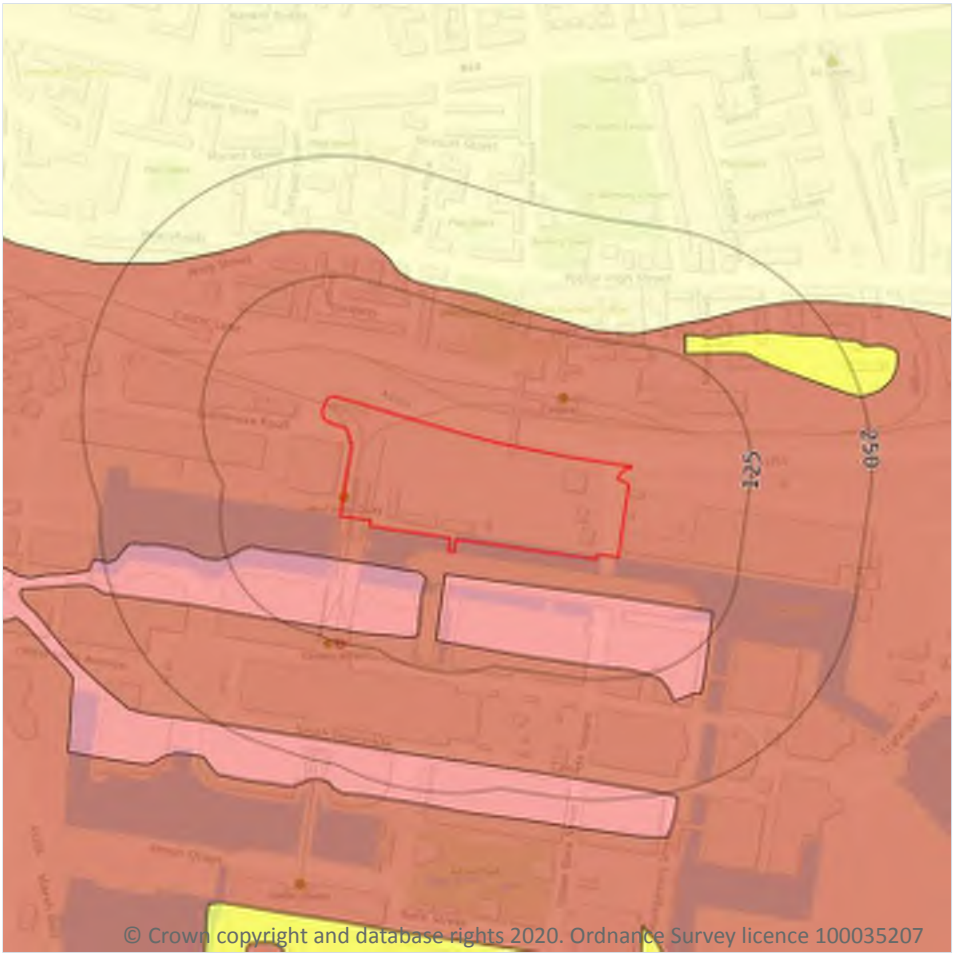
Features are displayed on the Natural ground subsidence - Running sands map on **page 156**

Location	Hazard rating	Details
On site	**Low**	**Running sand conditions may be present. Constraints may apply to land uses involving excavation or the addition or removal of water.**

Location	Hazard rating	Details
24m S	Very low	Running sand conditions are unlikely. No identified constraints on land use due to running conditions unless water table rises rapidly.
36m SW	Very low	Running sand conditions are unlikely. No identified constraints on land use due to running conditions unless water table rises rapidly.

This data is sourced from the British Geological Survey.

Natural ground subsidence - Compressible deposits



Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

17.3 Compressible deposits

Records within 50m	3

The potential hazard presented by types of ground that may contain layers of very soft materials like clay or peat and may compress if loaded by overlying structures, or if the groundwater level changes, potentially resulting in depression of the ground and disturbance of foundations.

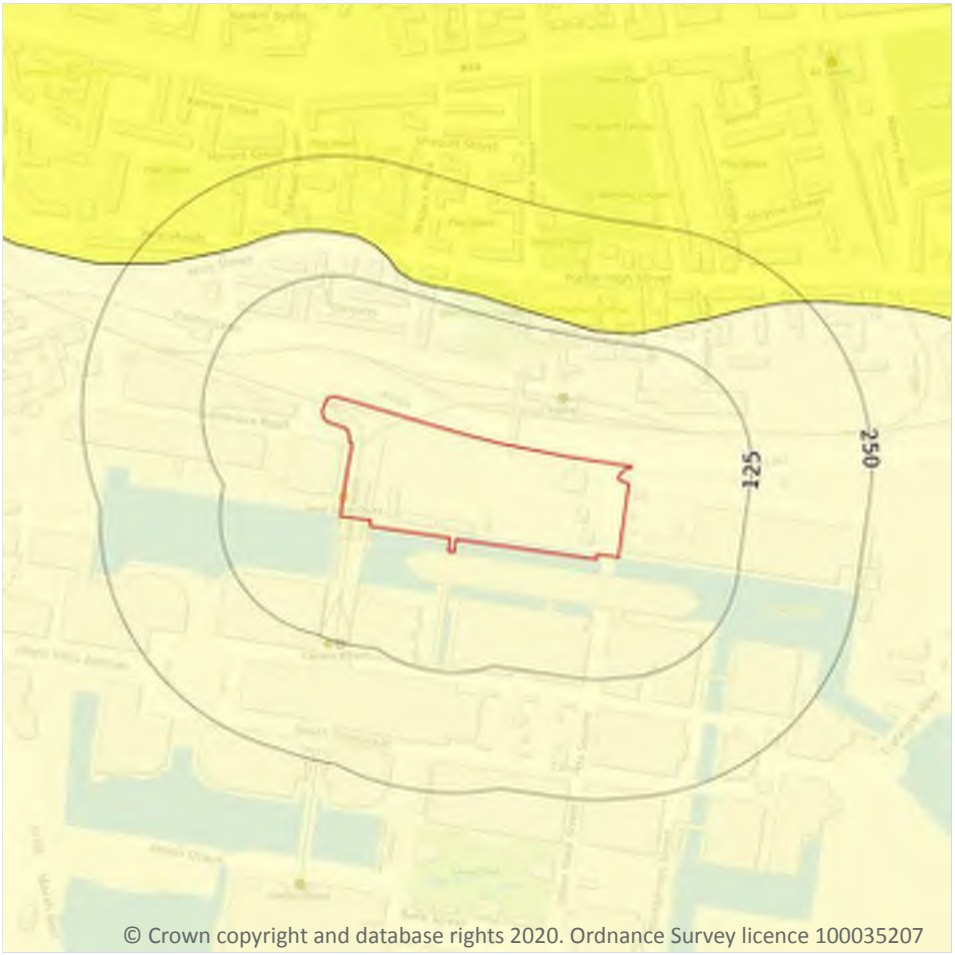
Features are displayed on the Natural ground subsidence - Compressible deposits map on **page 158**

Location	Hazard rating	Details
On site	**High**	**Highly compressible strata present. Significant constraint on land use depending on thickness.**
24m S	Moderate	Compressibility and uneven settlement hazards are probably present. Land use should consider specifically the compressibility and variability of the site.

Location	Hazard rating	Details
36m SW	Moderate	Compressibility and uneven settlement hazards are probably present. Land use should consider specifically the compressibility and variability of the site.

This data is sourced from the British Geological Survey.

Natural ground subsidence - Collapsible deposits



Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

17.4 Collapsible deposits

Records within 50m	**1**

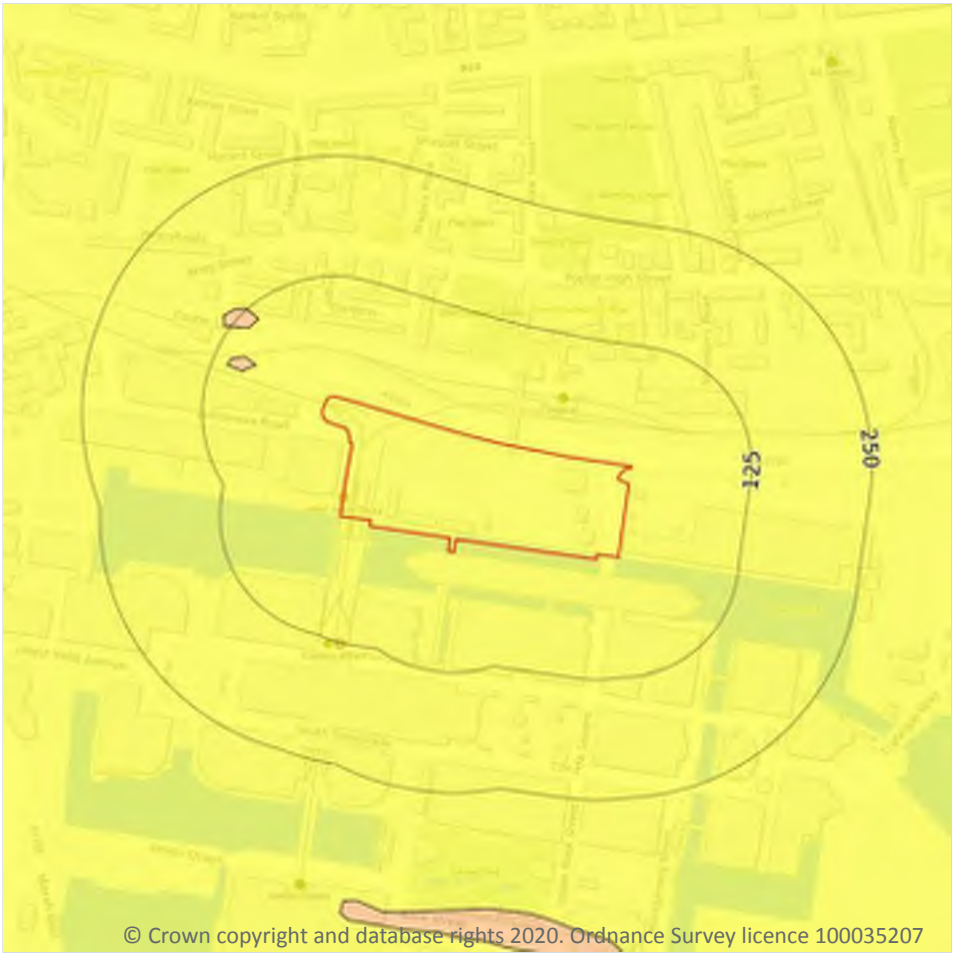
The potential hazard presented by natural deposits that could collapse when a load (such as a building) is placed on them or they become saturated with water.

Features are displayed on the Natural ground subsidence - Collapsible deposits map on **page 160**

Location	Hazard rating	Details
On site	**Negligible**	**Deposits with potential to collapse when loaded and saturated are believed not to be present.**

This data is sourced from the British Geological Survey.

Natural ground subsidence - Landslides



Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

17.5 Landslides

Records within 50m	1

The potential for landsliding (slope instability) to be a hazard assessed using 1:50,000 scale digital maps of superficial and bedrock deposits, combined with information from the BGS National Landslide Database and scientific and engineering reports.

Features are displayed on the Natural ground subsidence - Landslides map on **page 161**

Location	Hazard rating	Details
On site	**Very low**	**Slope instability problems are not likely to occur but consideration to potential problems of adjacent areas impacting on the site should always be considered.**

This data is sourced from the British Geological Survey.

Natural ground subsidence - Ground dissolution of soluble rocks

Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

17.6 Ground dissolution of soluble rocks

Records within 50m	1

The potential hazard presented by ground dissolution, which occurs when water passing through soluble rocks produces underground cavities and cave systems. These cavities reduce support to the ground above and can cause localised collapse of the overlying rocks and deposits.

Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on **page 162**

Location	Hazard rating	Details
On site	**Negligible**	**Soluble rocks are either not thought to be present within the ground, or not prone to dissolution. Dissolution features are unlikely to be present.**

This data is sourced from the British Geological Survey.

18 Mining, ground workings and natural cavities

Site Outline

Search buffers in metres (m)

Natural cavities (Area)

Natural cavities (Point)

BritPits

Surface ground workings

Underground workings

Historical Mineral Planning Areas

Mining Cavities

Non Coal Mining

Sporadic underground mining of restricted extent possible

Localised small scale underground mining possible

Small scale mining possible

Underground mining known or likely within or in close proximity

Underground mining known within or in very close proximity

18.1 Natural cavities

Records within 500m	1

Industry recognised national database of natural cavities. Sinkholes and caves are formed by the dissolution of soluble rock, such as chalk and limestone, gulls and fissures by cambering. Ground instability can result from movement of loose material contained within these cavities, often triggered by water.

Features are displayed on the Mining, ground workings and natural cavities map on **page 164**

ID	Location	Details	Source
17	196m SE	Type: Scour Hollows x 1 Superficial Geology: Alluvium Bedrock Geology: Chalk Group, Lambeth Group	Simple Bibliography: Confidential Full Bibliography: Confidential Confidentiality: Data source to remain anonymous, data can be used freely

This data is sourced from Peter Brett Associates (PBA).

18.2 BritPits

Records within 500m	0

BritPits (an abbreviation of British Pits) is a database maintained by the British Geological Survey of currently active and closed surface and underground mineral workings. Details of major mineral handling sites, such as wharfs and rail depots are also held in the database.

This data is sourced from the British Geological Survey.

18.3 Surface ground workings

Records within 250m	66

Historical land uses identified from Ordnance Survey mapping that involved ground excavation at the surface. These features may or may not have been subsequently backfilled.

Features are displayed on the Mining, ground workings and natural cavities map on **page 164**

ID	Location	Land Use	Year of mapping	Mapping scale
1	On site	Quay	1920	1:10560
2	On site	Docks	1920	1:10560
3	On site	Dock	1994	1:10000
4	On site	Dock	1994	1:10000
5	On site	Quay	1989	1:10000
6	On site	Dock	1898	1:10560
7	On site	Unspecified Dock	1867	1:10560
8	On site	Dock	1894	1:10560
9	On site	Docks	1938	1:10560
A	On site	Dock	1894	1:10560
A	On site	Unspecified Dock	1899	1:10560
A	On site	Unspecified Dock	1899	1:10560
A	On site	Unspecified Docks	1898	1:10560
B	On site	Dock	1894	1:10560
C	On site	Dock	1989	1:10000
C	On site	Dock	1973	1:10000

ID	Location	Land Use	Year of mapping	Mapping scale
C	**On site**	**Docks**	**1965**	**1:10560**
C	**On site**	**Dock**	**1981**	**1:10000**
C	**On site**	**Dock**	**1955**	**1:10560**
C	**On site**	**Dock**	**1949**	**1:10560**
C	**On site**	**Quay**	**1938**	**1:10560**
C	**On site**	**Quay**	**1955**	**1:10560**
D	**On site**	**Quay**	**1973**	**1:10000**
D	**On site**	**Quay**	**1981**	**1:10000**
E	**On site**	**Dock**	**1867**	**1:10560**
E	**On site**	**Import Dock**	**1896**	**1:10560**
F	**On site**	**Unspecified Ground Workings**	**1899**	**1:10560**
F	**On site**	**Unspecified Ground Workings**	**1899**	**1:10560**
F	**On site**	**Unspecified Ground Workings**	**1898**	**1:10560**
10	60m S	Quay	1955	1:10560
11	75m W	Dock	1938	1:10560
G	76m W	Dock	1894	1:10560
12	90m W	Dock	1882	1:10560
13	108m SW	Unspecified Wharf	1989	1:10000
H	114m S	Dock	1898	1:10560
I	115m S	Import Dock	1896	1:10560
J	116m S	Quay	1949	1:10560
H	117m S	Unspecified Dock	1899	1:10560
H	117m S	Unspecified Dock	1899	1:10560
I	117m S	Dock	1920	1:10560
J	117m S	Quay	1920	1:10560
I	119m S	Dock	1894	1:10560
H	119m S	Unspecified Dock	1898	1:10560
H	120m S	Dock	1894	1:10560

ID	Location	Land Use	Year of mapping	Mapping scale
I	120m S	Unspecified Dock	1867	1:10560
I	122m S	Dock	1867	1:10560
H	122m S	Quay	1938	1:10560
K	129m SW	Quay	1955	1:10560
14	137m S	Unspecified Wharf	1994	1:10000
K	137m SW	Unspecified Wharf	1973	1:10000
K	137m SW	Unspecified Wharf	1965	1:10560
K	137m SW	Unspecified Wharf	1981	1:10000
K	137m SW	Unspecified Wharf	1955	1:10560
K	150m SW	Dock	1938	1:10560
K	156m SW	Dock	1894	1:10560
15	156m S	Dock	1949	1:10560
16	178m W	Quay	1955	1:10560
L	184m S	Quay	1938	1:10560
M	187m SE	Unspecified Wharf	1938	1:10560
M	190m SE	Dock	1994	1:10000
N	202m SW	Quay	1955	1:10560
B	210m S	Unspecified Wharf	1920	1:10560
N	211m S	Dock	1994	1:10000
L	220m S	Quay	1920	1:10560
B	248m S	Unspecified Wharf	1949	1:10560
O	249m S	Quay	1920	1:10560

This is data is sourced from Ordnance Survey/Groundsure.

18.4 Underground workings

Records within 1000m	**13**

Historical land uses identified from Ordnance Survey mapping that indicate the presence of underground workings e.g. mine shafts.

Features are displayed on the Mining, ground workings and natural cavities map on **page 164**

ID	Location	Land Use	Year of mapping	Mapping scale
AX	600m E	Tunnel	1989	1:10000
AX	600m E	Tunnel	1973	1:10000
AX	600m E	Tunnel	1965	1:10560
AX	600m E	Tunnel	1994	1:10000
AX	600m E	Tunnel	1981	1:10000
AX	600m E	Tunnel	1955	1:10560
37	605m E	Tunnel	1915	1:10560
AX	608m E	Tunnel	1940	1:10560
-	701m E	Tunnel	1989	1:10000
-	701m E	Tunnel	1973	1:10000
-	701m E	Tunnel	1994	1:10000
-	701m E	Tunnel	1981	1:10000
-	765m E	Tunnel	1938	1:10560

This is data is sourced from Ordnance Survey/Groundsure.

18.5 Historical Mineral Planning Areas

Records within 500m	**0**

Boundaries of mineral planning permissions for England and Wales. This data was collated between the 1940s (and retrospectively to the 1930s) and the mid 1980s. The data includes permitted, withdrawn and refused permissions.

This data is sourced from the British Geological Survey.

18.6 Non-coal mining

Records within 1000m	**0**

The potential for historical non-coal mining to have affected an area. The assessment is drawn from expert knowledge and literature in addition to the digital geological map of Britain. Mineral commodities may be divided into seven general categories - vein minerals, chalk, oil shale, building stone, bedded ores, evaporites and 'other' commodities (including ball clay, jet, black marble, graphite and chert).

This data is sourced from the British Geological Survey.

18.7 Mining cavities

Records within 1000m	0

Industry recognised national database of mining cavities. Degraded mines may result in hazardous subsidence (crown holes). Climatic conditions and water escape can also trigger subsidence over mine entrances and workings.

This data is sourced from Peter Brett Associates (PBA).

18.8 JPB mining areas

Records on site	1

Areas which could be affected by former coal mining. This data includes some mine plans unavailable to the Coal Authority.

Location	Details
On site	**Whilst outside of an area where The Coal Authority have information on coal mining activities, Johnson Poole & Bloomer (JPB) have information such as mining plans and maps held within their archive of mining activities that have occurred within 1km of this property. Further details and a quote for services can be obtained by emailing this report to enquiries.gs@jpb.co.uk.**

This data is sourced from Johnson Poole and Bloomer.

18.9 Coal mining

Records on site	0

Areas which could be affected by past, current or future coal mining.

This data is sourced from the Coal Authority.

18.10 Brine areas

Records on site	0

The Cheshire Brine Compensation District indicates areas that may be affected by salt and brine extraction in Cheshire and where compensation would be available where damage from this mining has occurred. Damage from salt and brine mining can still occur outside this district, but no compensation will be available.

This data is sourced from the Cheshire Brine Subsidence Compensation Board.

18.11 Gypsum areas

Records on site	0

Generalised areas that may be affected by gypsum extraction.

This data is sourced from British Gypsum.

18.12 Tin mining

Records on site	0

Generalised areas that may be affected by historical tin mining.

This data is sourced from Mining Searches UK.

18.13 Clay mining

Records on site	0

Generalised areas that may be affected by kaolin and ball clay extraction.

This data is sourced from the Kaolin and Ball Clay Association (UK).

19 Radon

Site Outline

Search buffers in metres (m)

Greater than 30%

Between 10% and 30%

Between 5% and 10%

Between 3% and 5%

Between 1% and 3%

Less than 1%

19.1 Radon

Records on site	2

Estimated percentage of dwellings exceeding the Radon Action Level. This data is the highest resolution radon dataset available for the UK and is produced to a 75m level of accuracy to allow for geological data accuracy and a 'residential property' buffer. The findings of this section should supersede any estimations derived from the Indicative Atlas of Radon in Great Britain. The data was derived from both geological assessments and long term measurements of radon in more than 479,000 households.

Features are displayed on the Radon map on **page 171**

Location	Estimated properties affected	Radon Protection Measures required
On site	**Between 1% and 3%**	**None**
On site	**Less than 1%**	**None****

This data is sourced from the British Geological Survey and Public Health England.

20 Soil chemistry

20.1 BGS Estimated Background Soil Chemistry

Records within 50m	7

The estimated values provide the likely background concentration of the potentially harmful elements Arsenic, Cadmium, Chromium, Lead and Nickel in topsoil. The values are estimated primarily from rural topsoil data collected at a sample density of approximately 1 per 2 km^2. In areas where rural soil samples are not available, estimation is based on stream sediment data collected from small streams at a sampling density of 1 per 2.5 km^2; this is the case for most of Scotland, Wales and southern England. The stream sediment data are converted to soil-equivalent concentrations prior to the estimation.

Location	Arsenic	Bioaccessible Arsenic	Lead	Bioaccessible Lead	Cadmium	Chromium	Nickel
On site	**No data**	**No data**	**No data**	**No data**	**No data**	**No data**	**No data**
On site	**No data**	**No data**	**No data**	**No data**	**No data**	**No data**	**No data**
On site	**No data**	**No data**	**No data**	**No data**	**No data**	**No data**	**No data**
On site	**No data**	**No data**	**No data**	**No data**	**No data**	**No data**	**No data**
On site	**No data**	**No data**	**No data**	**No data**	**No data**	**No data**	**No data**
On site	**No data**	**No data**	**No data**	**No data**	**No data**	**No data**	**No data**
On site	**No data**	**No data**	**No data**	**No data**	**No data**	**No data**	**No data**

This data is sourced from the British Geological Survey.

20.2 BGS Estimated Urban Soil Chemistry

Records within 50m	16

Estimated topsoil chemistry of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc and bioaccessible Arsenic and Lead in 23 urban centres across Great Britain. These estimates are derived from interpolation of the measured urban topsoil data referred to above and provide information across each city between the measured sample locations (4 per km^2).

Location	Arsenic (mg/kg)	Bioaccessible Arsenic (mg/kg)	Lead (mg/kg)	Bioaccessible Lead (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Copper (mg/kg)	Nickel (mg/kg)	Tin (mg/kg)
On site	**17**	**3**	**38**	**26**	**0.4**	**46**	**13**	**15**	**4**
On site	**17**	**3**	**37**	**25**	**0.4**	**48**	**12**	**15**	**4**

Location	Arsenic (mg/kg)	Bioaccessible Arsenic (mg/kg)	Lead (mg/kg)	Bioaccessible Lead (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Copper (mg/kg)	Nickel (mg/kg)	Tin (mg/kg)
On site	**17**	**3**	**45**	**31**	**0.4**	**47**	**16**	**15**	**5**
On site	**20**	**3.5**	**19**	**13**	**0.4**	**40**	**6**	**13**	**2**
On site	**16**	**2.8**	**89**	**61**	**0.5**	**54**	**30**	**18**	**11**
On site	**17**	**3**	**54**	**37**	**0.4**	**49**	**25**	**15**	**6**
On site	**22**	**3.8**	**14**	**10**	**0.3**	**36**	**4**	**12**	**1**
On site	**20**	**3.5**	**20**	**14**	**0.3**	**39**	**8**	**13**	**2**
On site	**14**	**2.5**	**93**	**64**	**0.5**	**58**	**28**	**17**	**13**
On site	**18**	**3.2**	**37**	**25**	**0.3**	**46**	**24**	**14**	**4**
10m N	14	2.5	97	67	0.5	59	28	17	14
31m E	17	3	48	33	0.5	51	14	16	5
31m NE	15	2.6	77	53	0.4	55	23	16	11
39m E	18	3.2	32	22	0.5	48	11	15	3
47m NW	16	2.8	102	70	0.5	53	36	19	12
49m W	17	3	59	41	0.4	50	38	16	7

This data is sourced from the British Geological Survey.

20.3 BGS Measured Urban Soil Chemistry

Records within 50m	**0**

The locations and measured total concentrations (mg/kg) of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc in urban topsoil samples from 23 urban centres across Great Britain. These are collected at a sample density of 4 per km^2.

This data is sourced from the British Geological Survey.

21 Railway infrastructure and projects

Site Outline

Search buffers in metres (m)

- Crossrail 1 Stations
- Crossrail 1 Route
- Crossrail 1 Worksites
- Crossrail 2 Stations
- Crossrail 2 Route
- Crossrail 2 Worksites
- Crossrail 2 Safeguarding
- Crossrail 2 Headhouses
- Railway stations
- Active railways
- Active tunnels
- Abandoned railways
- Historic railways
- Historic tunnels
- Underground stations
- Underground Lines
- Royal Mail tunnels
- HS2 optimised route
- HS2 Stations
- HS2 Depots
- HS2 Surface Safeguarding
- HS2 Subsurface Safeguarding

21.1 Underground railways (London)

Records within 250m	1

Details of all active London Underground lines, including approximate tunnel roof depth and operational hours.

Features are displayed on the Railway infrastructure and projects map on **page 175**

Location	Line Name	Line Section	Track Type	Depth (m bgl)	Operational hours
On site	**Docklands Light Railway**	**Docklands Light Railway**	**Surface Track**	**0**	**Mon-Sat: Early 0530 Late 0030, Sun: Early 0700 Late 1130**

This data is sourced from publicly available information by Groundsure.

21.2 Underground railways (Non-London)

Records within 250m	0

Details of the Merseyrail system, the Tyne and Wear Metro and the Glasgow Subway. Not all parts of all systems are located underground. The data contains location information only and does not include a depth assessment.

This data is sourced from publicly available information by Groundsure.

21.3 Railway tunnels

Records within 250m	0

Railway tunnels taken from contemporary Ordnance Survey mapping.

This data is sourced from the Ordnance Survey.

21.4 Historical railway and tunnel features

Records within 250m	125

Railways and tunnels digitised from historical Ordnance Survey mapping as scales of 1:1,250, 1:2,500, 1:10,000 and 1:10,560.

Features are displayed on the Railway infrastructure and projects map on **page 175**

Location	Land Use	Year of mapping	Mapping scale
On site	**Railway Sidings**	**1962**	**1250**
On site	**Railway Sidings**	**1950**	**2500**
On site	**Railway Sidings**	**1964**	**1250**
On site	**Railway Sidings**	**1965**	**2500**
On site	**Railway Sidings**	**1970**	**1250**
On site	**Railway Sidings**	**1950**	**1250**
On site	**Railway Sidings**	**1896**	**2500**
On site	**Railway Sidings**	**1985**	**1250**
On site	**Railway Sidings**	**1992**	**1250**
On site	**Railway Sidings**	**1896**	**10560**
On site	**Railway**	**1916**	**-**
On site	**Railway**	**1890**	**-**

Location	Land Use	Year of mapping	Mapping scale
On site	**Railway Sidings**	**1894**	**10560**
On site	**Railway Sidings**	**1938**	**10560**
On site	**Railway Sidings**	**1896**	**10560**
On site	**Railway Sidings**	**1973**	**10000**
On site	**Railway Sidings**	**1965**	**10560**
On site	**Railway Sidings**	**1920**	**10560**
On site	**Railway Sidings**	**1981**	**10000**
On site	**Railway Sidings**	**1955**	**10560**
On site	**Railway Sidings**	**1949**	**10560**
0m N	Railway Sidings	1867	10560
1m N	Railway Sidings	1898	10560
1m N	Railway	1894	-
4m N	Railway Sidings	1899	10560
7m N	Railway Sidings	1970	1250
7m N	Railway Sidings	1867	10560
8m N	Railway Sidings	1963	1250
8m N	Railway Sidings	1916	2500
8m N	Railway Sidings	1896	2500
10m N	Railway Sidings	1869	2500
12m N	Railway Sidings	1872	10560
12m NE	Railway Sidings	1898	10560
16m NE	Railway Sidings	1899	10560
18m N	Railway	1869	-
18m N	Railway Sidings	1994	10000
25m N	Railway Sidings	1989	10000
27m N	Railway Sidings	1991	1250
28m N	Railway Sidings	1992	1250
36m N	Railway Sidings	1896	2500

Location	Land Use	Year of mapping	Mapping scale
37m N	Railway Sidings	1916	2500
40m N	Railway Sidings	1962	1250
40m N	Railway Sidings	1950	1250
57m NW	Railway Sidings	1896	2500
61m N	Railway Sidings	1978	-
64m NE	Railway Sidings	1993	1250
66m NE	Railway Sidings	1992	1250
66m W	Railway	1916	-
67m W	Railways	1916	-
67m W	Railway	1868	-
72m W	Railway Sidings	1896	2500
72m W	Railway Sidings	1938	10560
72m W	Railway Sidings	1920	10560
75m W	Railway Sidings	1894	10560
75m NW	Railway Sidings	1992	1250
76m W	Railway Sidings	1916	2500
77m N	Railway Sidings	1993	1250
77m W	Railway Sidings	1916	2500
78m N	Railway Sidings	1991	1250
79m N	Railway Sidings	1989	1250
79m W	Railway	1870	-
80m N	Railway Sidings	1997	1250
80m N	Railway Sidings	1994	1250
80m N	Railway Sidings	1992	1250
87m W	Railway	1893	-
93m N	Railway Sidings	1916	2500
108m S	Railway Sidings	1981	10000
113m S	Railway Sidings	1955	1250

Location	Land Use	Year of mapping	Mapping scale
117m S	Railway Sidings	1972	1250
128m S	Railway Sidings	1963	1250
129m S	Railway Sidings	1981	1250
142m SW	Railway Sidings	1949	1250
142m SW	Railway Sidings	1951	1250
147m S	Railway Sidings	1894	10560
148m S	Railway Sidings	1920	10560
151m S	Railway Sidings	1894	10560
151m S	Railway Sidings	1899	10560
152m S	Railway Sidings	1898	10560
153m S	Railway Sidings	1896	2500
154m S	Railway Sidings	1894	10560
157m NW	Tunnel	1996	1250
157m NW	Tunnel	1997	1250
157m NW	Tunnel	1993	1250
157m NW	Tunnel	1999	1250
167m NE	Railway Sidings	1896	2500
173m NE	Railway Sidings	1916	2500
180m S	Railway Sidings	1894	10560
182m S	Railway Sidings	1894	10560
188m S	Railway Sidings	1949	1250
188m E	Railway	1867	-
191m SE	Railway Sidings	1973	10000
191m SE	Railway Sidings	1965	10560
191m SE	Railway Sidings	1955	10560
193m E	Railway Sidings	1993	1250
195m S	Railway Sidings	1894	10560
195m E	Railway Sidings	1992	1250

Location	Land Use	Year of mapping	Mapping scale
195m S	Railway Sidings	1899	10560
197m S	Railway Sidings	1898	10560
203m SE	Railway Sidings	1950	2500
203m SE	Railway Sidings	1949	1250
231m E	Railway Sidings	1961	2500
231m E	Railway Sidings	1950	2500
232m E	Railway Sidings	1971	1250
233m SE	Railway Sidings	1955	1250
233m SE	Railway Sidings	1965	2500
235m E	Railway Sidings	1994	1250
235m E	Railway Sidings	1950	2500
235m E	Railway Sidings	1961	2500
235m E	Railway Sidings	1950	2500
235m E	Railway Sidings	1961	1250
235m E	Railway Sidings	1971	1250
235m E	Railway Sidings	1950	1250
235m E	Railway Sidings	1961	1250
235m E	Railway Sidings	1971	1250
235m E	Railway Sidings	1950	1250
236m E	Railway Sidings	1991	1250
236m E	Railway Sidings	1992	1250
236m E	Railway Sidings	1993	1250
236m E	Railway Sidings	1992	1250
236m E	Railway Sidings	1998	1250
238m SE	Railway Sidings	1949	1250
242m E	Railway Sidings	1991	1250
243m E	Railway Sidings	1991	1250
243m E	Railway Sidings	1992	1250

Location	Land Use	Year of mapping	Mapping scale
244m E	Railway Sidings	1981	1250

This data is sourced from Ordnance Survey/Groundsure.

21.5 Royal Mail tunnels

Records within 250m	0

The Post Office Railway, otherwise known as the Mail Rail, is an underground railway running through Central London from Paddington Head District Sorting Office to Whitechapel Eastern Head Sorting Office. The line is 10.5km long. The data includes details of the full extent of the tunnels, the depth of the tunnel, and the depth to track level.

This data is sourced from Groundsure/the Postal Museum.

21.6 Historical railways

Records within 250m	4

Former railway lines, including dismantled lines, abandoned lines, disused lines, historic railways and razed lines.

Features are displayed on the Railway infrastructure and projects map on **page 175**

Location	Description
On site	**Disused**
On site	**Disused**
34m N	Abandoned
42m N	Abandoned

This data is sourced from OpenStreetMap.

21.7 Railways

Records within 250m	76

Currently existing railway lines, including standard railways, narrow gauge, funicular, trams and light railways.

Features are displayed on the Railway infrastructure and projects map on **page 175**

Location	Name	Type
On site	**Docklands Light Railway**	**light_rail**

Location	Name	Type
On site	**Docklands Light Railway**	**light_rail**
On site	**Docklands Light Railway**	**light_rail**
On site	**Docklands Light Railway**	**light_rail**
On site	**Docklands Light Railway**	**light_rail**
On site	**Docklands Light Railway**	**light_rail**
On site	**Docklands Light Railway**	**light_rail**
On site	**Docklands Light Railway**	**light_rail**
On site	**Docklands Light Railway**	**light_rail**
On site	**Docklands Light Railway**	**light_rail**
On site	**Docklands Light Railway**	**light_rail**
On site	**Not given**	**Multi Track**
On site	**Not given**	**Single Track**
On site	**Not given**	**Single Track**
On site	**Not given**	**Multi Track**
On site	**Not given**	**Multi Track**
28m N	Docklands Light Railway	light_rail
29m N	Not given	Single Track
30m N	Not given	Single Track
32m N	Docklands Light Railway	light_rail
33m N	Not given	Single Track
40m N	Docklands Light Railway	light_rail
42m NE	Docklands Light Railway	light_rail
43m N	Docklands Light Railway	light_rail
44m W	Docklands Light Railway	light_rail
44m N	Docklands Light Railway	light_rail
44m N	Not given	Multi Track
46m N	Docklands Light Railway	light_rail
47m N	Not given	Multi Track

Location	Name	Type
48m N	Docklands Light Railway	light_rail
49m N	Docklands Light Railway	light_rail
55m NE	Docklands Light Railway	light_rail
71m SW	Docklands Light Railway	light_rail
71m SW	Docklands Light Railway	light_rail
72m SW	Docklands Light Railway	light_rail
72m SW	Docklands Light Railway	light_rail
74m NW	Docklands Light Railway	light_rail
75m NE	-	light_rail
79m N	-	light_rail
79m SW	Not given	Single Track
80m NE	-	light_rail
81m W	Docklands Light Railway	light_rail
83m N	-	light_rail
84m NE	Docklands Light Railway	light_rail
87m NE	-	light_rail
87m N	-	light_rail
91m NE	-	light_rail
92m N	-	light_rail
96m N	-	light_rail
109m E	-	light_rail
122m NE	-	light_rail
130m S	Docklands Light Railway	light_rail
132m S	Docklands Light Railway	light_rail
135m SW	Docklands Light Railway	light_rail
141m NE	-	light_rail
147m E	Docklands Light Railway	light_rail
148m E	-	light_rail

Location	Name	Type
153m S	Docklands Light Railway	light_rail
163m NE	-	light_rail
177m NE	-	light_rail
182m W	Not given	Multi Track
183m W	Docklands Light Railway	light_rail
183m W	Docklands Light Railway	light_rail
186m NE	-	light_rail
189m E	-	light_rail
198m E	DLR	light_rail
198m NE	-	light_rail
199m NE	-	light_rail
209m NE	-	light_rail
213m E	-	light_rail
214m S	Docklands Light Railway	light_rail
215m E	Not given	Multi Track
215m E	Not given	Multi Track
237m S	Docklands Light Railway	light_rail
237m S	Docklands Light Railway	light_rail
238m S	Not given	Multi Track

This data is sourced from Ordnance Survey and OpenStreetMap.

21.8 Crossrail 1

Records within 500m	**2**

The Crossrail railway project links 41 stations over 100 kilometres from Reading and Heathrow in the west, through underground sections in central London, to Shenfield and Abbey Wood in the east.

Features are displayed on the Railway infrastructure and projects map on **page 175**

Location	Route Type
10m S	Tunnel Alignment

Location	Route Type
29m S	Tunnel Alignment

This data is sourced from publicly available information by Groundsure.

21.9 Crossrail 2

Records within 500m	**0**

Crossrail 2 is a proposed railway linking the national rail networks in Surrey and Hertfordshire via an underground tunnel through London.

This data is sourced from publicly available information by Groundsure.

21.10 HS2

Records within 500m	**0**

HS2 is a proposed high speed rail network running from London to Manchester and Leeds via Birmingham. Main civils construction on Phase 1 (London to Birmingham) of the project began in 2019, and it is currently anticipated that this phase will be fully operational by 2026. Construction on Phase 2a (Birmingham to Crewe) is anticipated to commence in 2021, with the service fully operational by 2027. Construction on Phase 2b (Crewe to Manchester and Birmingham to Leeds) is scheduled to begin in 2023 and be operational by 2033.

This data is sourced from HS2 ltd.

Data providers

Groundsure works with respected data providers to bring you the most relevant and accurate information. To find out who they are and their areas of expertise see https://www.groundsure.com/sources-reference.

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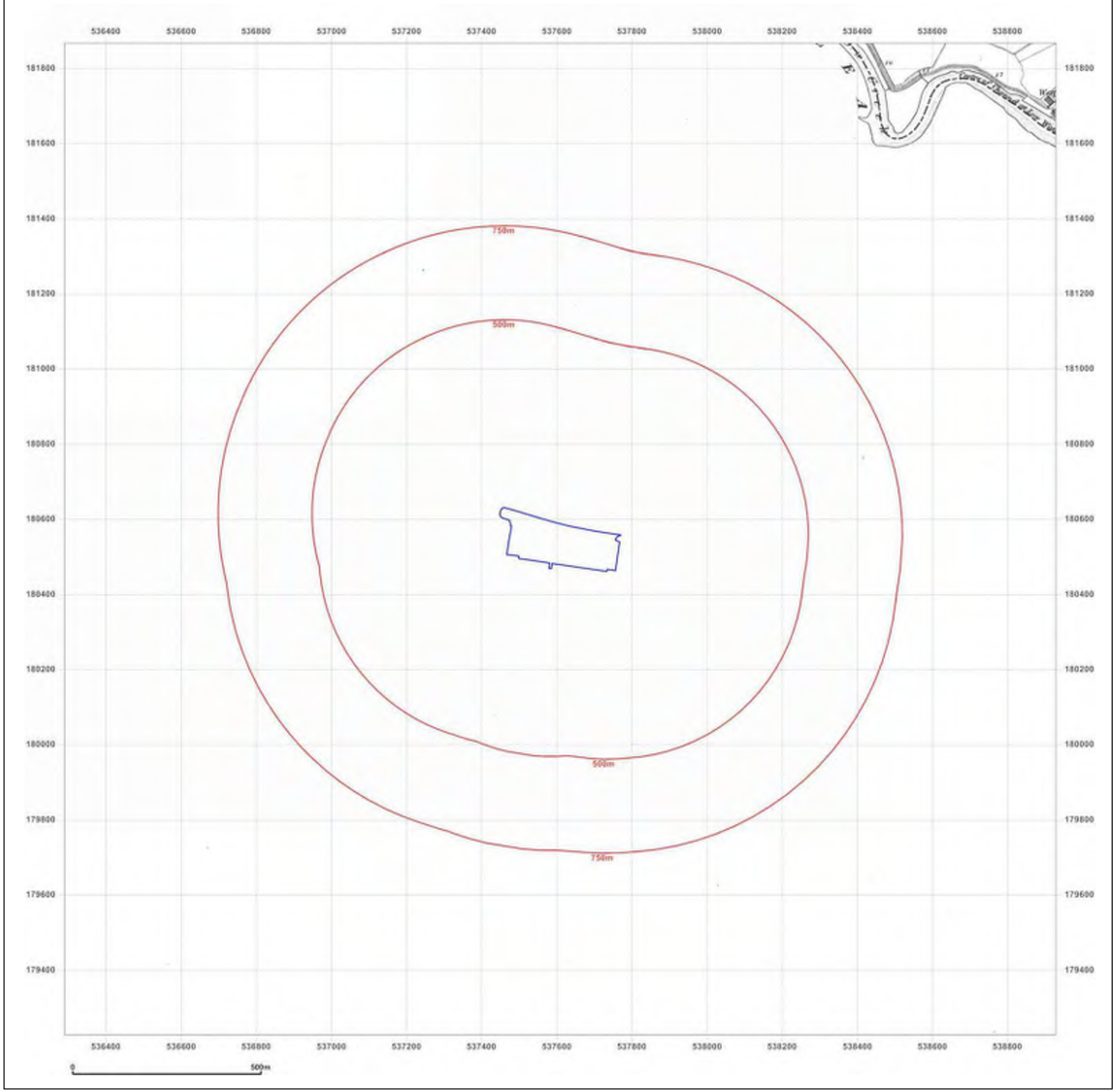


Groundsure INSIGHTS

Site Details:

NORTH QUAY, ASPEN WAY,
LONDON, E14

Client Ref: 250169-00
Report Ref: GS-6734107
Grid Ref: 537608, 180546

Map Name: County Series

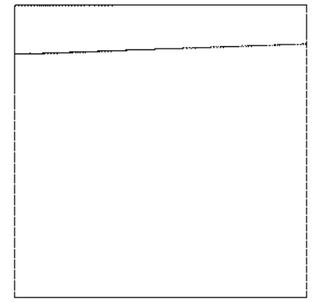
Map date: **1863-1867**

Scale: 1:10,560

Printed at: 1:10,560

N
W E
S

Surveyed 1863
Revised 1863
Edition N/A
Copyright N/A
Levelled N/A



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Map legend available at:
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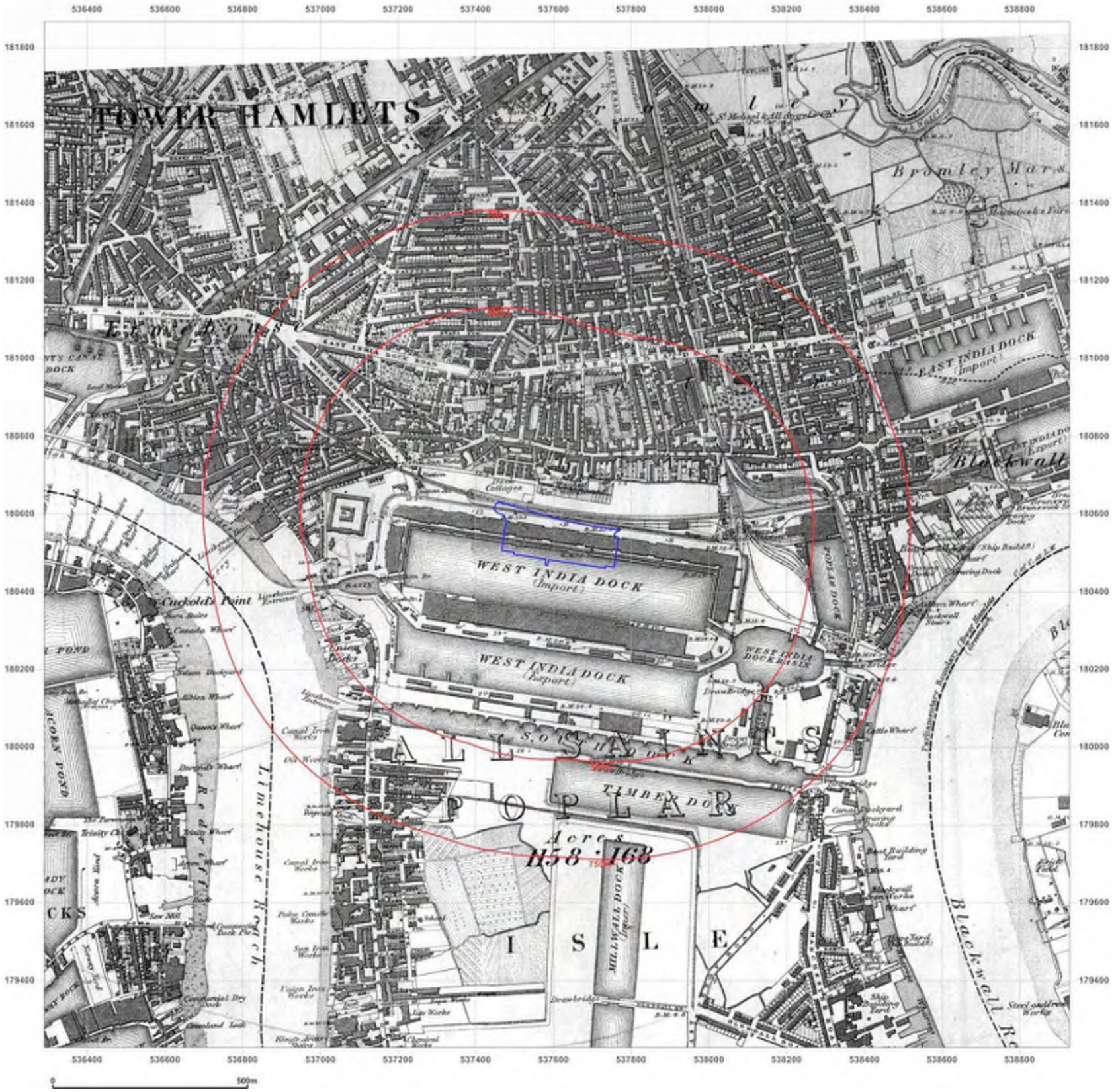


Groundsure INSIGHTS

Site Details:

NORTH QUAY, ASPEN WAY,
LONDON, E14

Client Ref: 250169-00
Report Ref: GS-6734107
Grid Ref: 537608, 180546

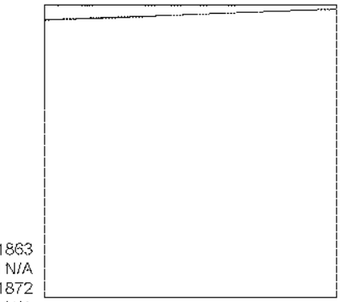
Map Name: County Series

Map date: **1872**

Scale: 1:10,560

Printed at: 1:10,560

N
W E
S



Surveyed 1863
Revised N/A
Edition 1872
Copyright N/A
Levelled N/A

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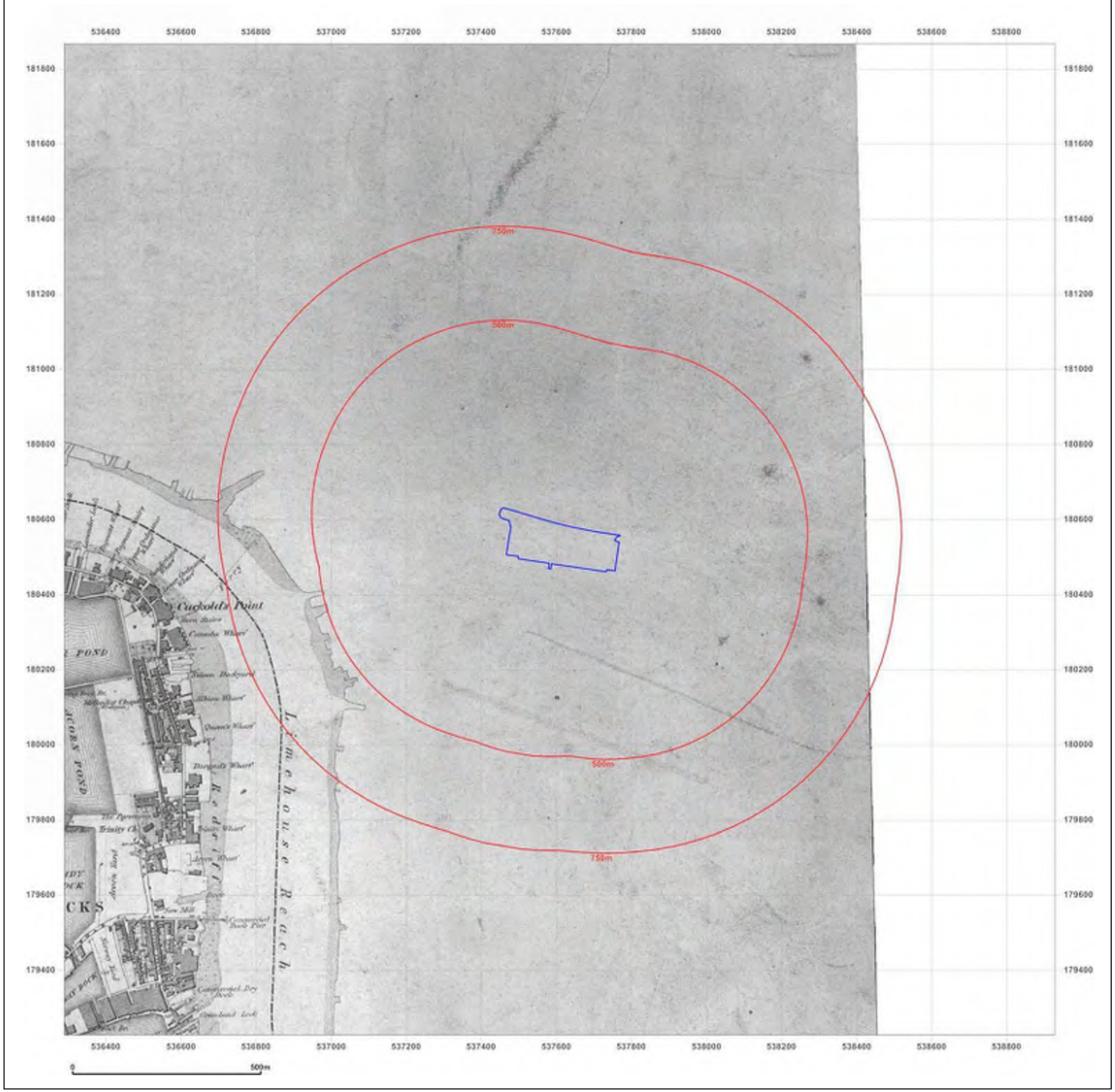


Groundsure INSIGHTS

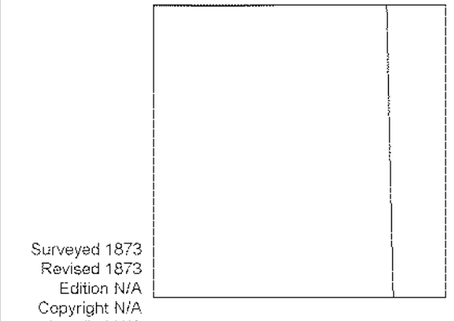
Site Details:

NORTH QUAY, ASPEN WAY,
LONDON, E14

Client Ref: 250169-00
Report Ref: GS-6734107
Grid Ref: 537608, 180546

Map Name: County Series
Map date: **1873**
Scale: 1:10,560
Printed at: 1:10,560

N
W E
S



Surveyed 1873
Revised 1873
Edition N/A
Copyright N/A
Levelled N/A

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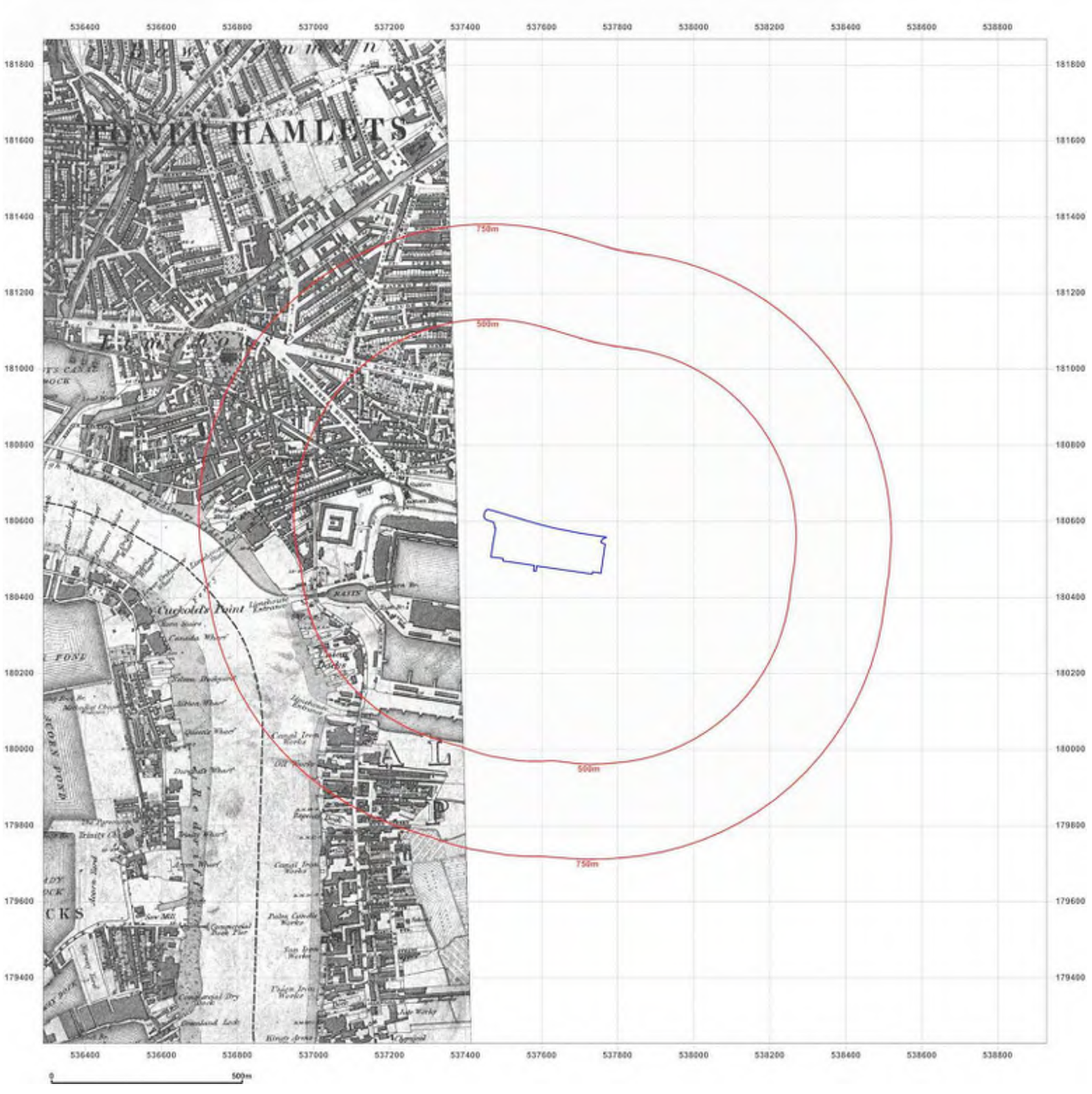


Groundsure INSIGHTS

Site Details:

NORTH QUAY, ASPEN WAY,
LONDON, E14

Client Ref: 250169-00
Report Ref: GS-6734107
Grid Ref: 537608, 180546

Map Name: County Series

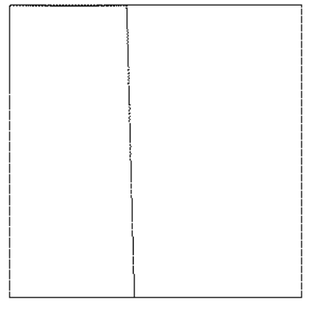
Map date: **1882**

Scale: 1:10,560

Printed at: 1:10,560

N
W E
S

Surveyed 1873
Revised 1873
Edition 1882
Copyright N/A
Levelled N/A



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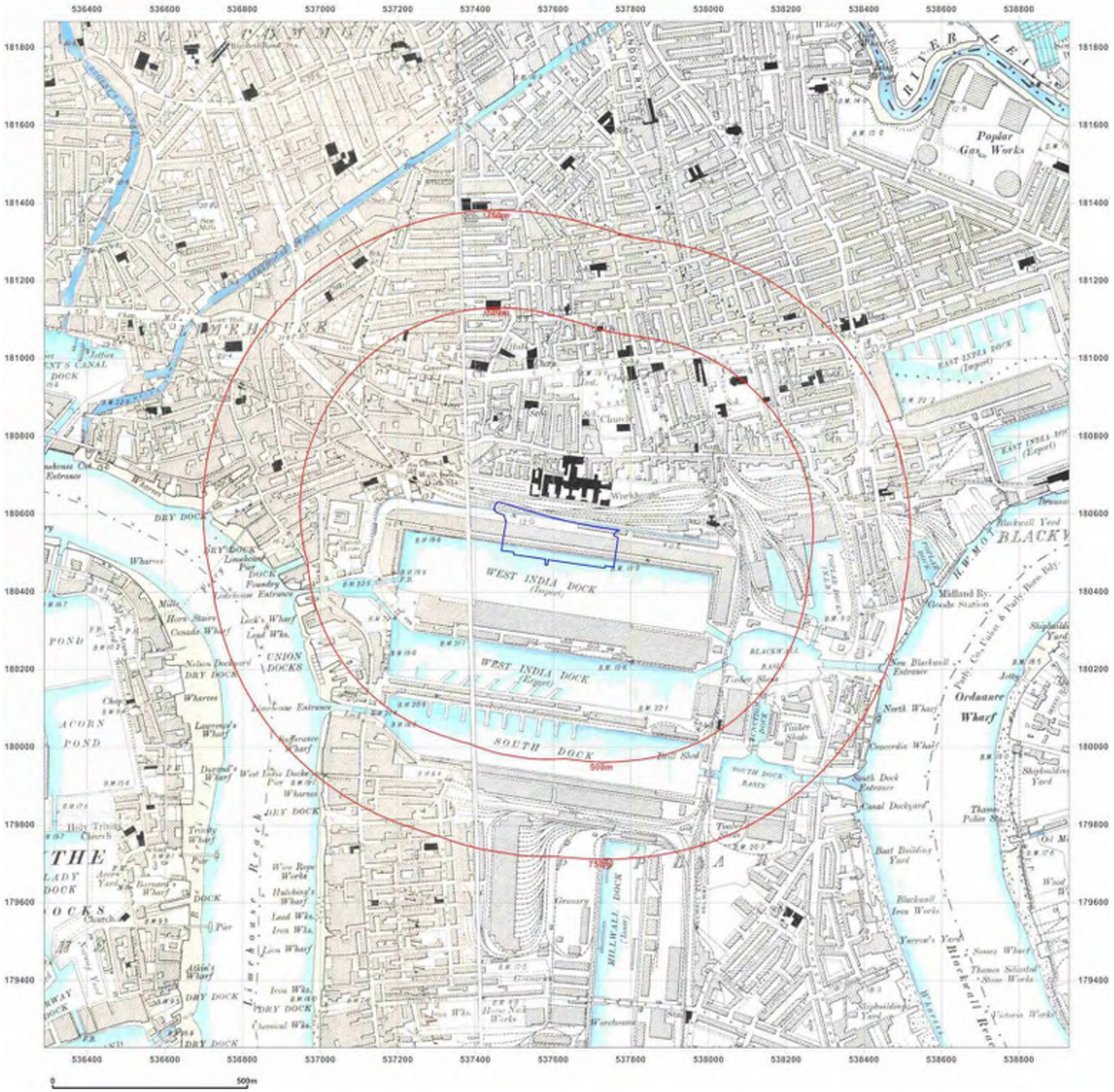


Groundsure INSIGHTS

Site Details:

NORTH QUAY, ASPEN WAY,
LONDON, E14

Client Ref: 250169-00
Report Ref: GS-6734107
Grid Ref: 537608, 180546

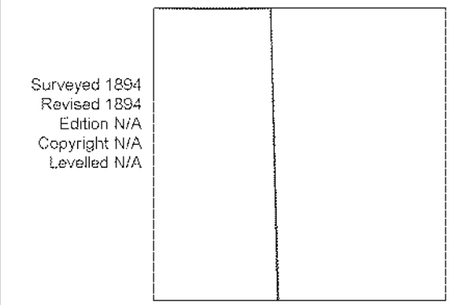
Map Name: County Series

Map date: **1894**

Scale: 1:10,560

Printed at: 1:10,560

N
W E
S



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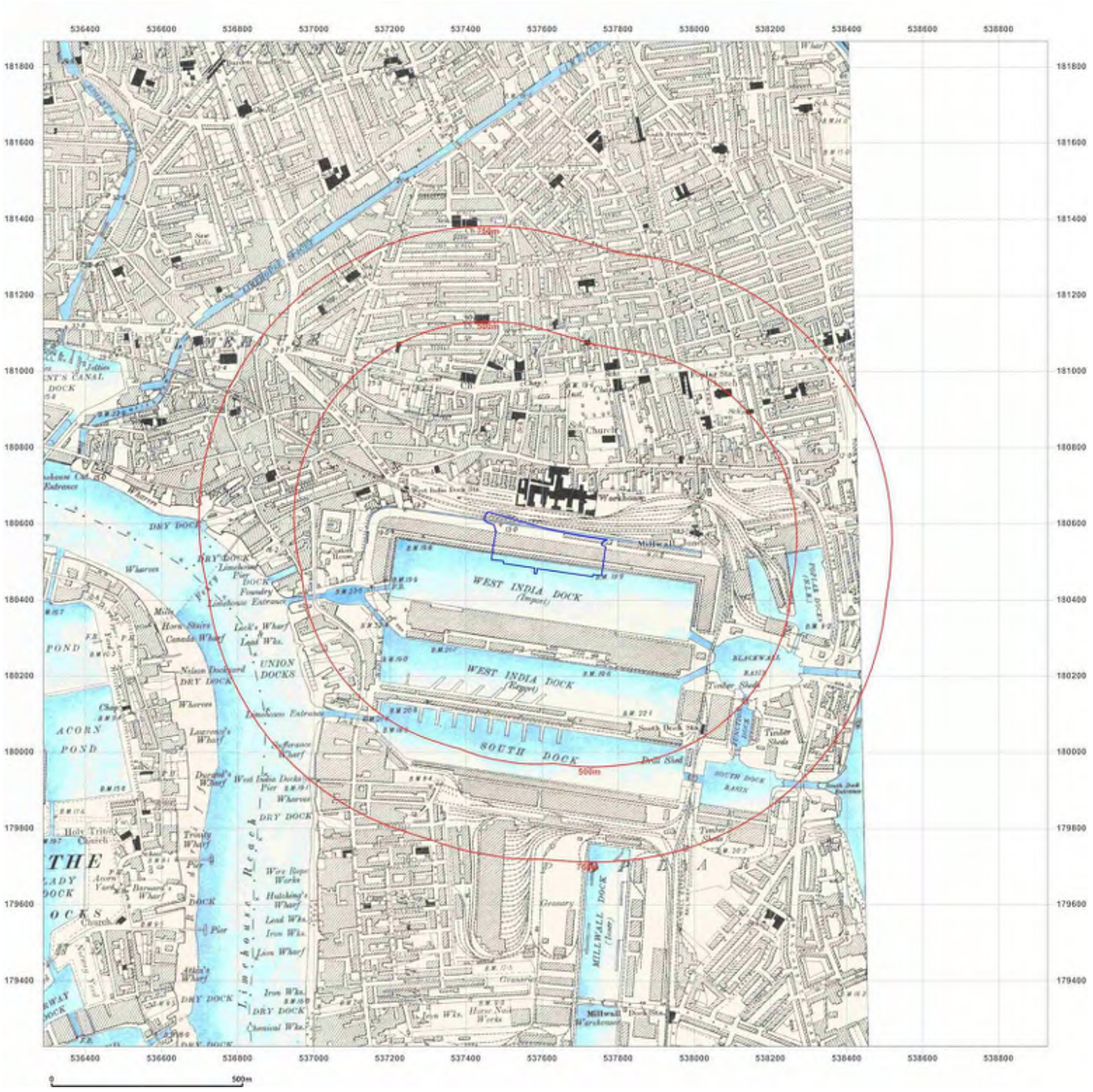

Groundsure INSIGHTS

Site Details:

NORTH QUAY, ASPEN WAY,
LONDON, E14

Client Ref: 250169-00
Report Ref: GS-6734107
Grid Ref: 537608, 180546

Map Name: County Series

Map date: **1894**

Scale: 1:10,560

Printed at: 1:10,560

N
W E
S

Surveyed 1894
Revised 1894
Edition N/A
Copyright N/A
Levelled N/A

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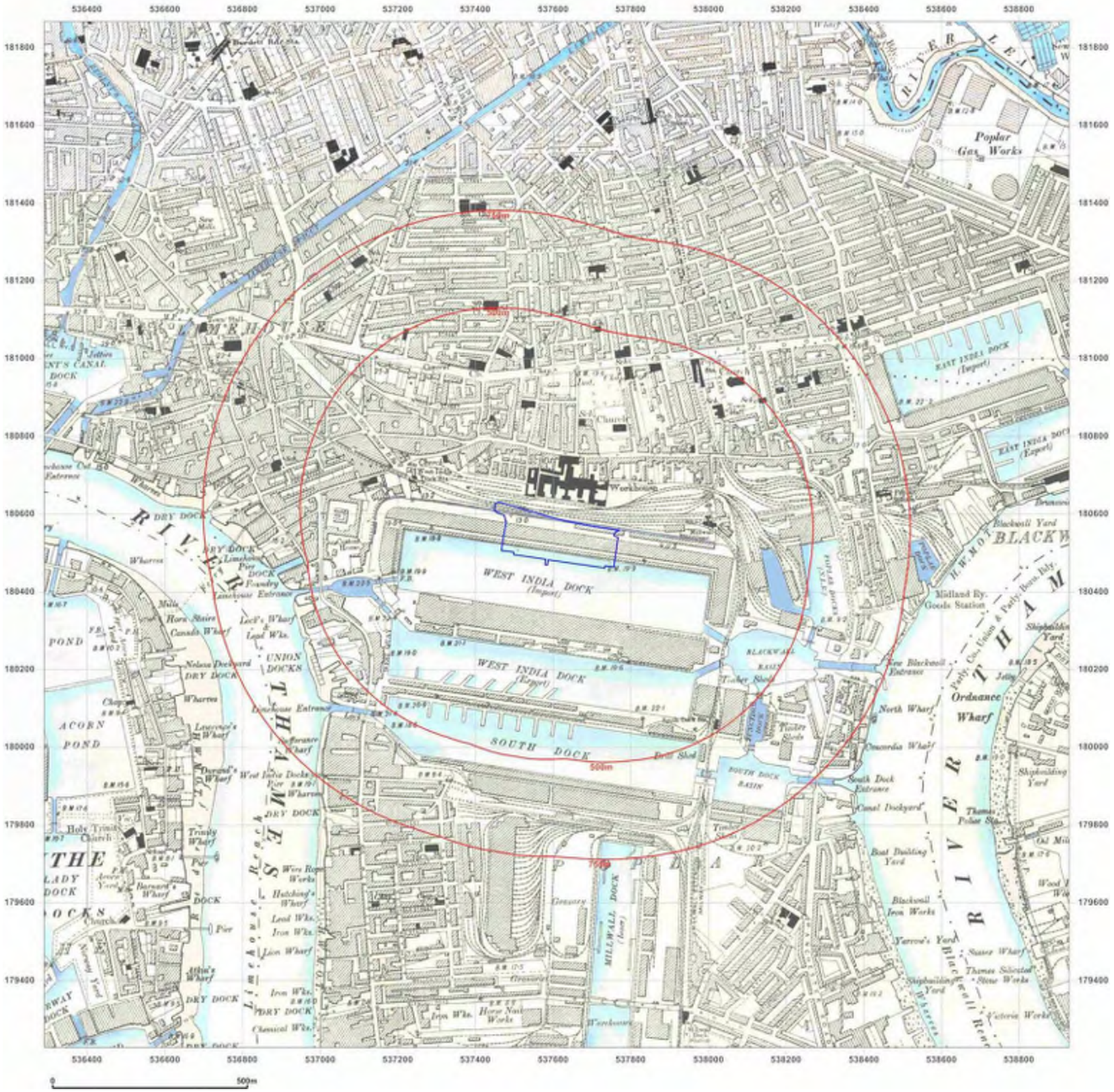

Groundsure INSIGHTS

Site Details:

NORTH QUAY, ASPEN WAY,
LONDON, E14

Client Ref: 250169-00
Report Ref: GS-6734107
Grid Ref: 537608, 180546

Map Name: County Series

Map date: **1894**

Scale: 1:10,560

Printed at: 1:10,560

N
W E
S

Surveyed 1866
Revised 1894
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1866
Revised 1894
Edition N/A
Copyright N/A
Levelled N/A

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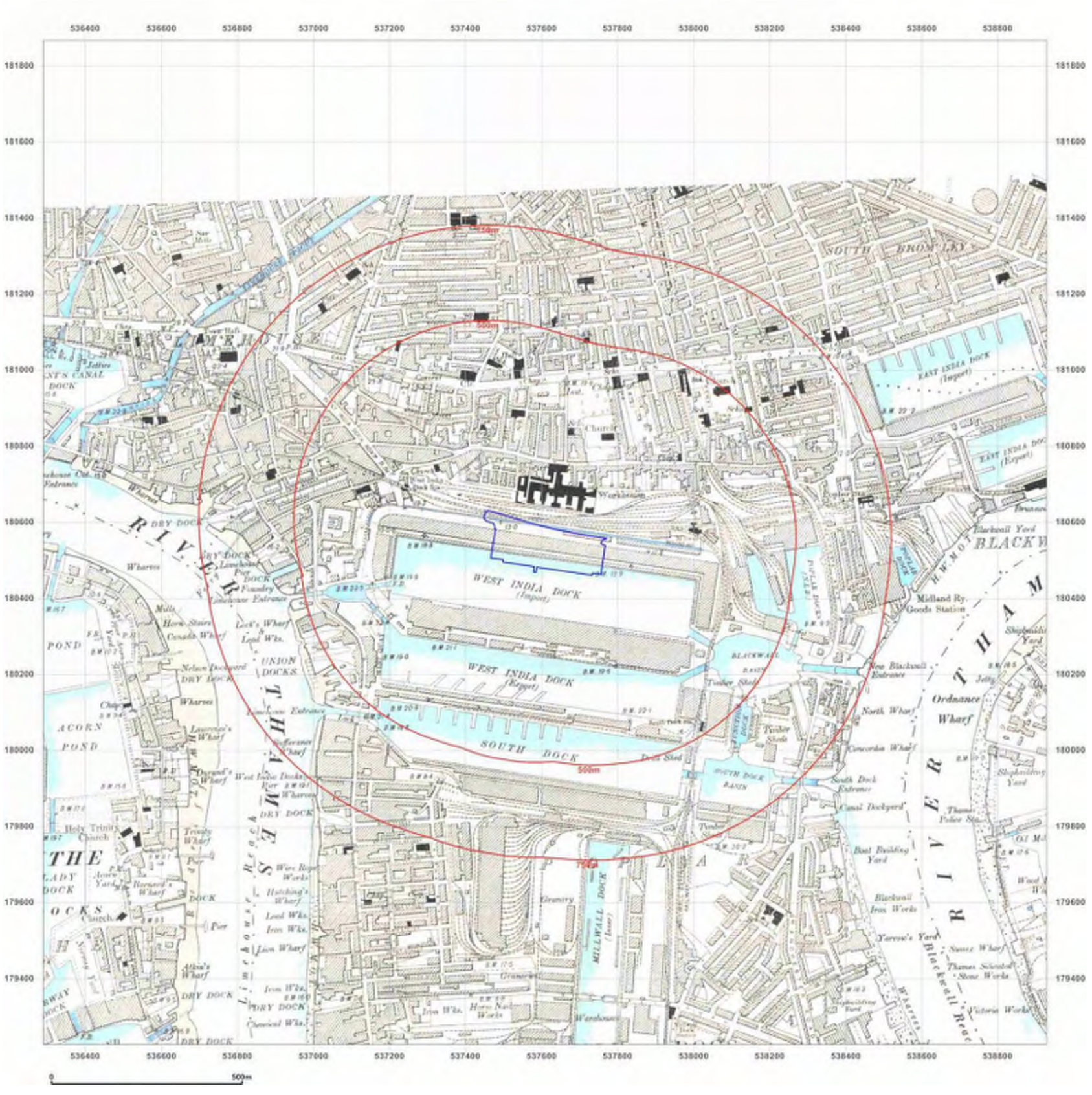

Groundsure INSIGHTS

Site Details:

NORTH QUAY, ASPEN WAY,
LONDON, E14

Client Ref: 250169-00
Report Ref: GS-6734107
Grid Ref: 537608, 180546

Map Name: County Series

Map date: **1894**

Scale: 1:10,560

Printed at: 1:10,560

N
W E
S

Surveyed 1866
Revised 1894
Edition N/A
Copyright N/A
Levelled N/A

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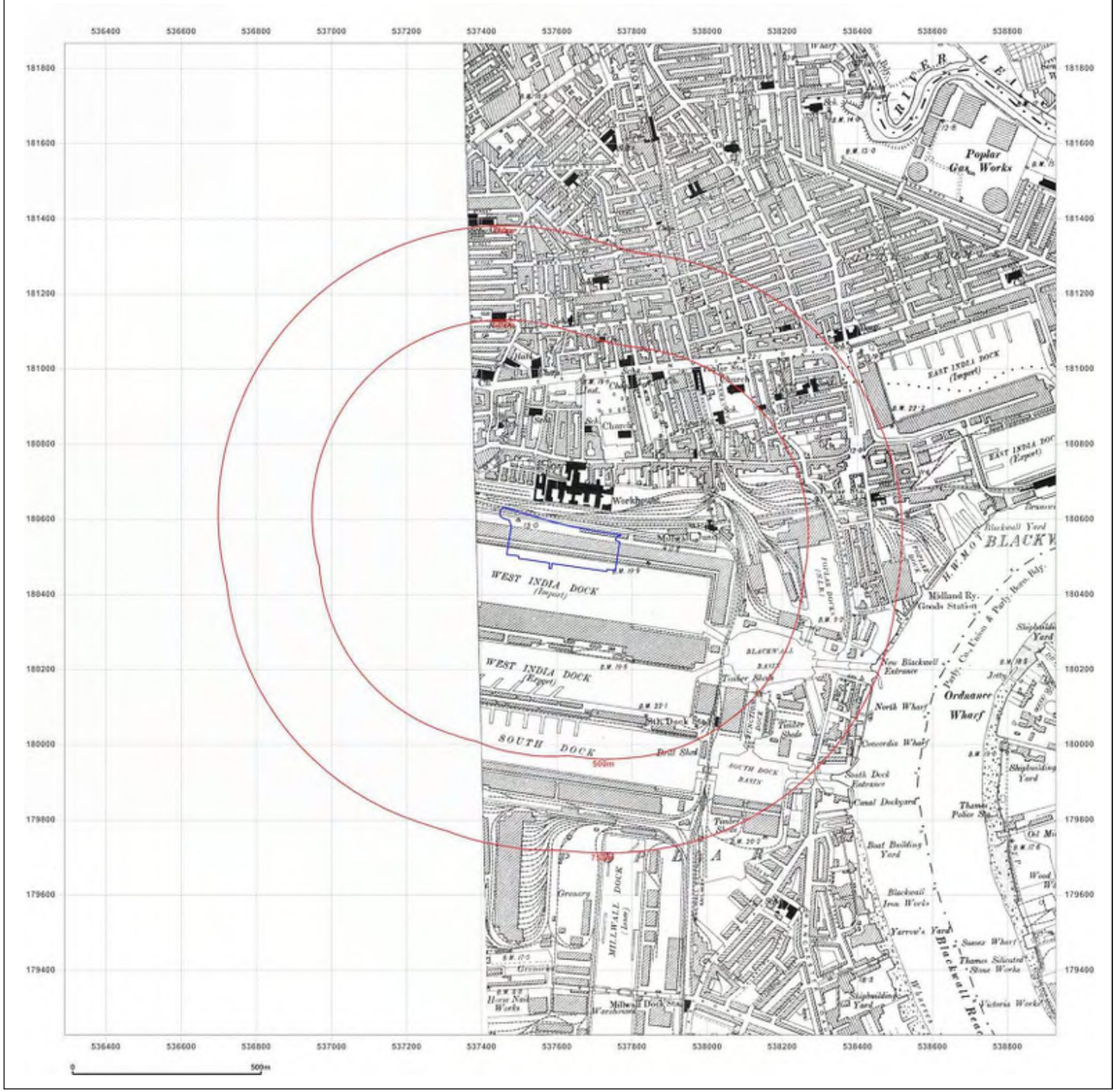


Groundsure INSIGHTS

Site Details:

NORTH QUAY, ASPEN WAY,
LONDON, E14

Client Ref: 250169-00
Report Ref: GS-6734107
Grid Ref: 537608, 180546

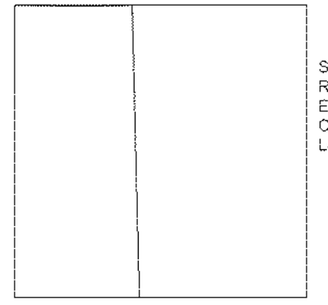
Map Name: County Series

Map date: **1896**

Scale: 1:10,560

Printed at: 1:10,560

N
W E
S



Surveyed 1870
Revised 1896
Edition N/A
Copyright N/A
Levelled N/A

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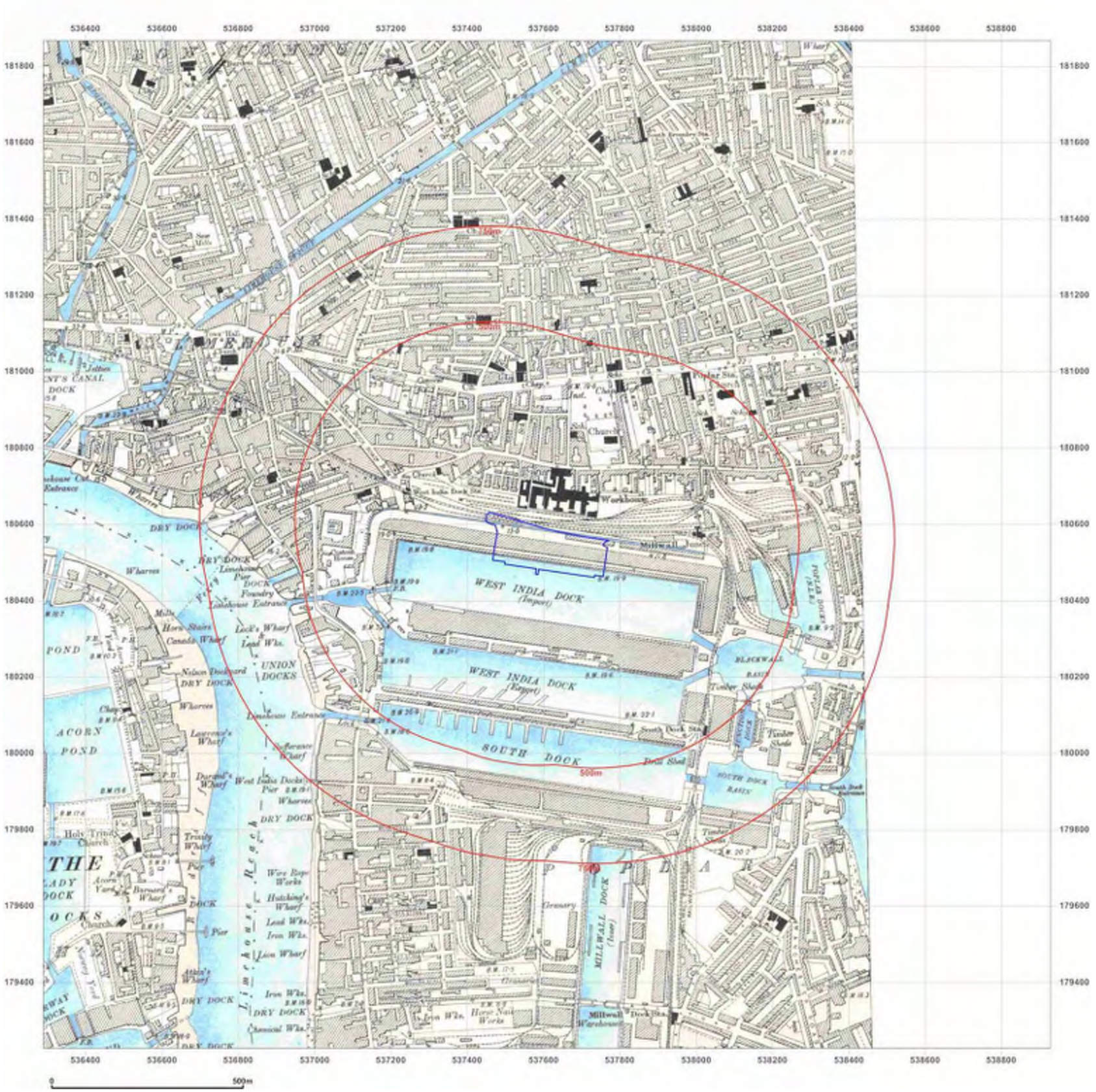


Groundsure INSIGHTS

Site Details:

NORTH QUAY, ASPEN WAY,
LONDON, E14

Client Ref: 250169-00
Report Ref: GS-6734107
Grid Ref: 537608, 180546

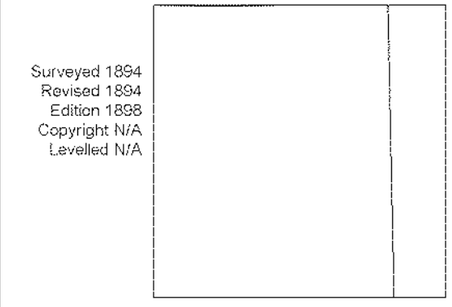
Map Name: County Series

Map date: **1898**

Scale: 1:10,560

Printed at: 1:10,560

N
W E
S



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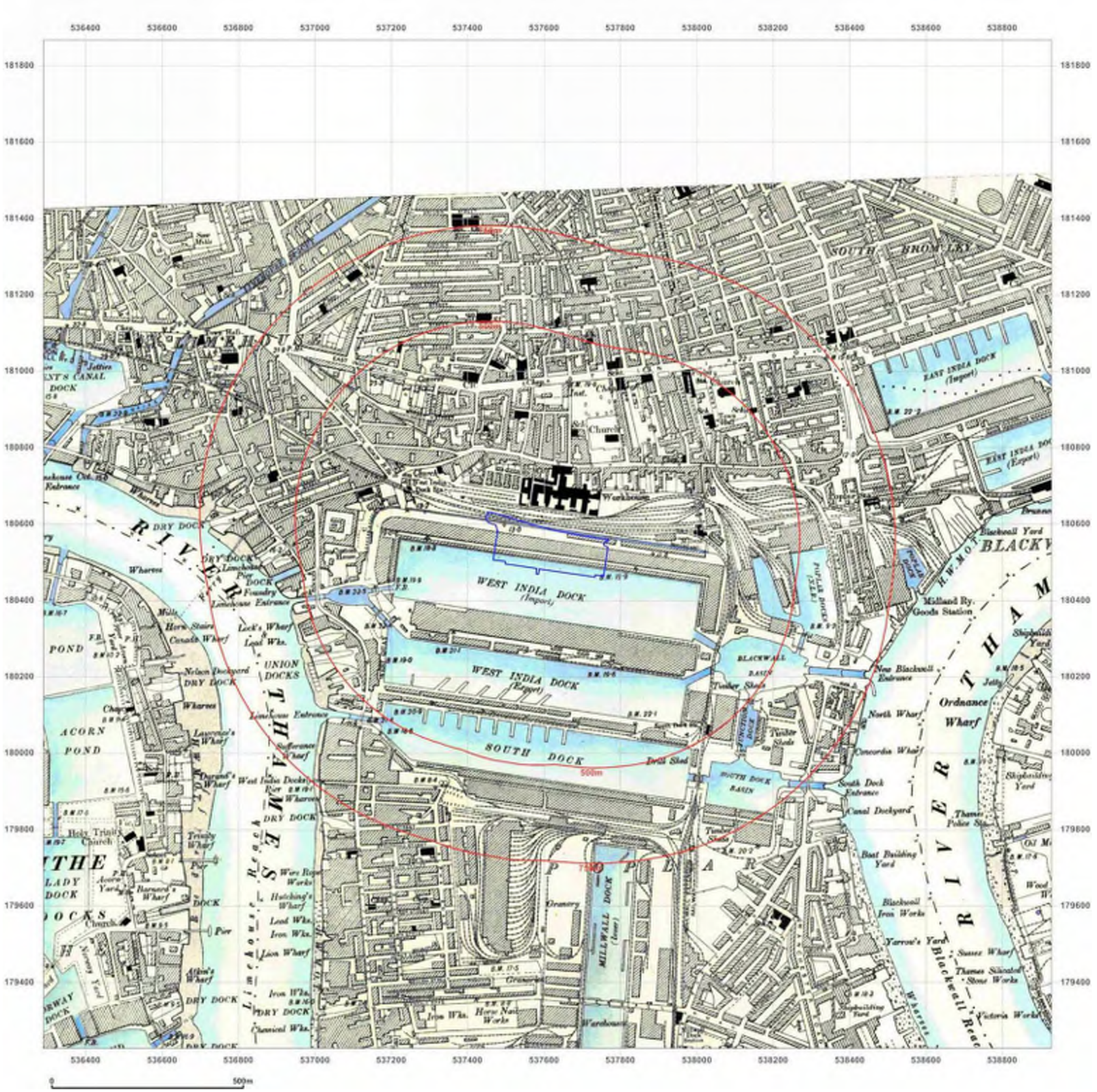

Groundsure INSIGHTS

Site Details:

NORTH QUAY, ASPEN WAY,
LONDON, E14

Client Ref: 250169-00
Report Ref: GS-6734107
Grid Ref: 537608, 180546

Map Name: County Series

Map date: **1899**

Scale: 1:10,560

Printed at: 1:10,560

N
W E
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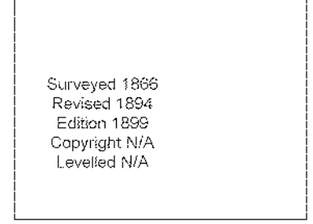

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Groundsure INSIGHTS

Site Details:

NORTH QUAY, ASPEN WAY,
LONDON, E14

Client Ref: 250169-00
Report Ref: GS-6734107
Grid Ref: 537608, 180546

Map Name: County Series

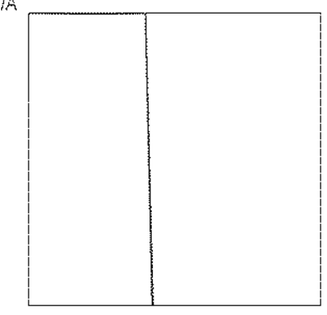
Map date: **1920**

Scale: 1:10,560

Printed at: 1:10,560

N
W E
S

Surveyed 1872
Revised 1919
Edition 1920
Copyright N/A
Levelled N/A



Surveyed 1872
Revised 1919
Edition 1920
Copyright N/A
Levelled N/A

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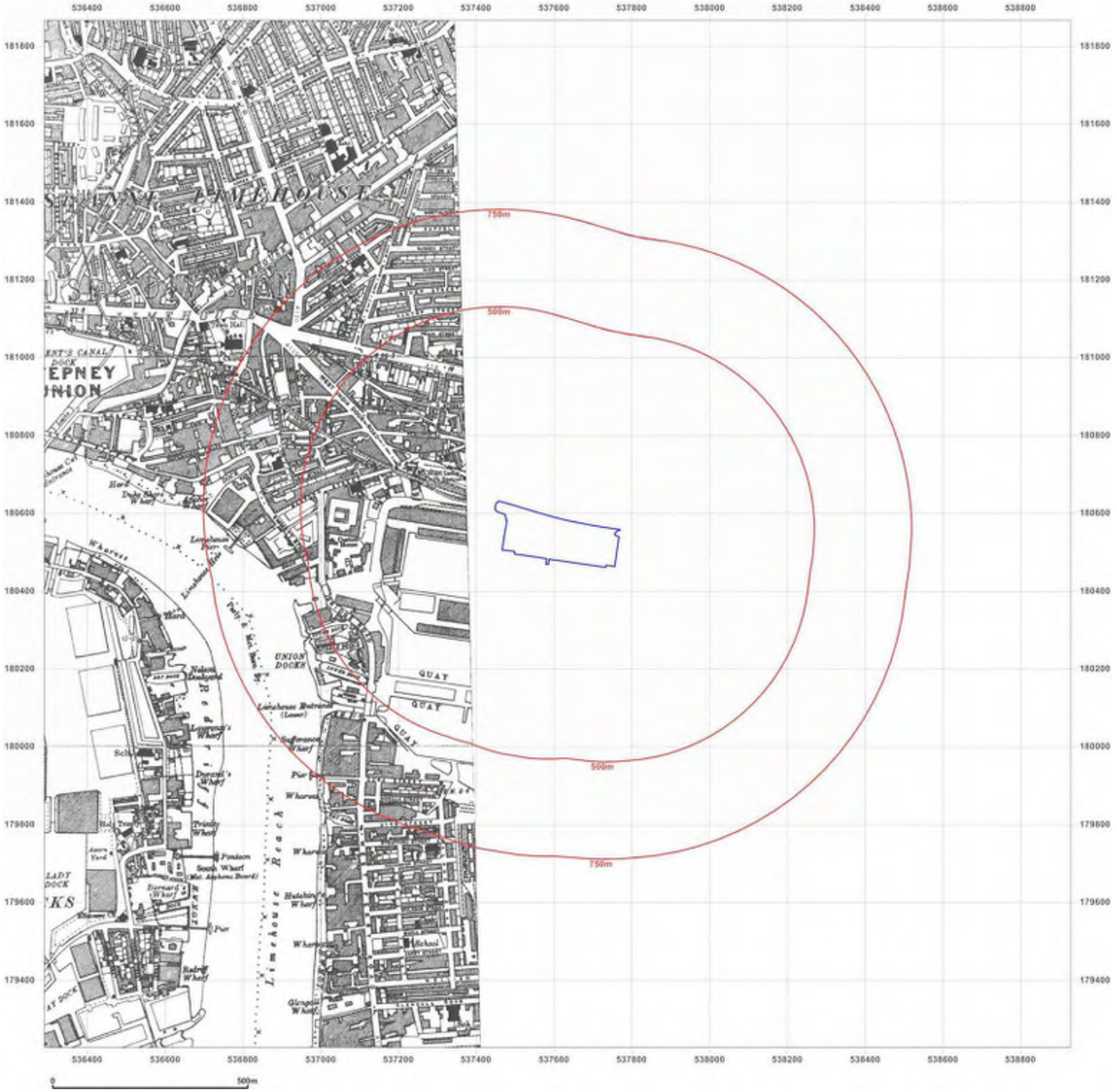


Groundsure INSIGHTS

Site Details:

NORTH QUAY, ASPEN WAY,
LONDON, E14

Client Ref: 250169-00
Report Ref: GS-6734107
Grid Ref: 537608, 180546

Map Name: County Series

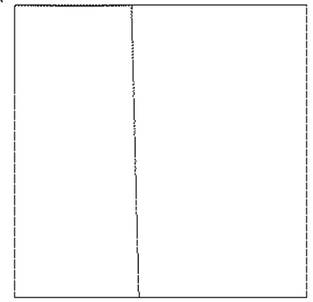
Map date: **1938**

Scale: 1:10,560

Printed at: 1:10,560

N
W E
S

Surveyed 1872
Revised 1938
Edition N/A
Copyright N/A
Levelled N/A



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Groundsure INSIGHTS

Site Details:

NORTH QUAY, ASPEN WAY,
LONDON, E14

Client Ref: 250169-00
Report Ref: GS-6734107
Grid Ref: 537608, 180546

Map Name: Provisional

Map date: **1948-1949**

Scale: 1:10,560

Printed at: 1:10,560

N
W E
S

Surveyed N/A
Revised 1949
Edition N/A
Copyright N/A
Levelled 1934

Surveyed 1940
Revised 1948
Edition N/A
Copyright N/A
Levelled 1935

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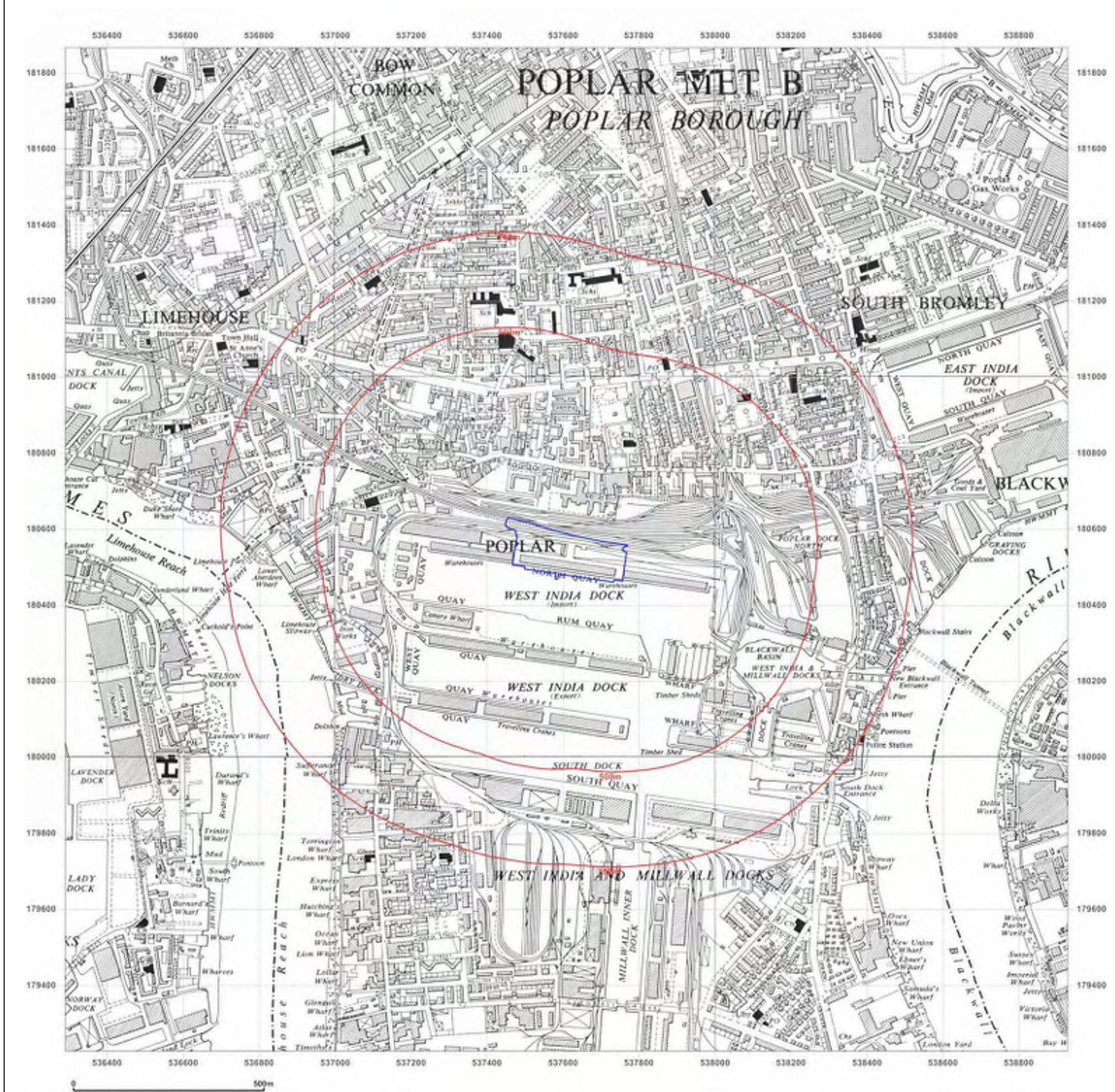

Groundsure INSIGHTS

Site Details:

NORTH QUAY, ASPEN WAY,
LONDON, E14

Client Ref: 250169-00
Report Ref: GS-6734107
Grid Ref: 537608, 180546

Map Name: Provisional

Map date: **1955**

Scale: 1:10,560

Printed at: 1:10,560

N
W E
S

Surveyed 1955
Revised 1955
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1955
Revised 1955
Edition N/A
Copyright N/A
Levelled N/A

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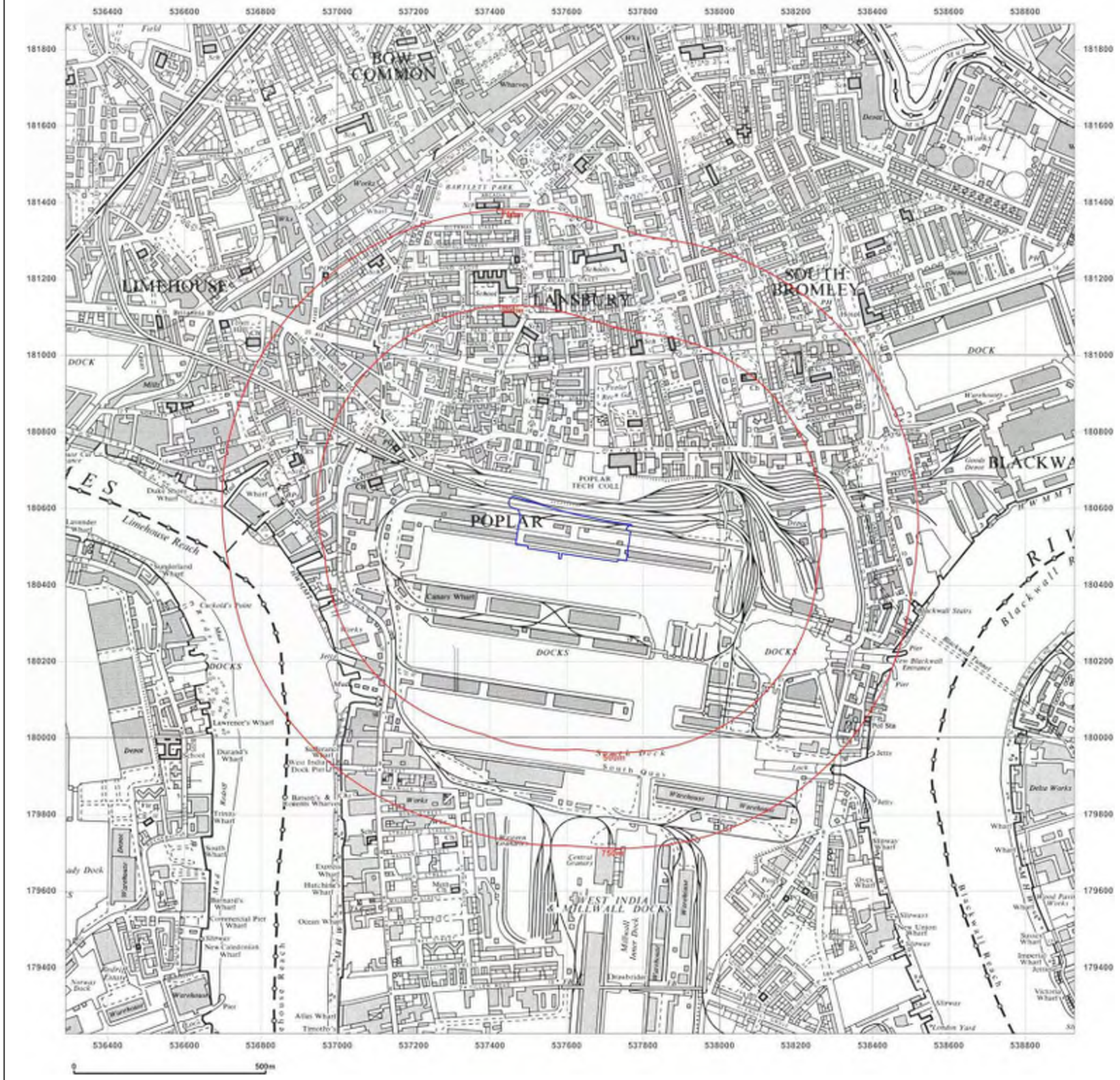

Groundsure INSIGHTS

Site Details:

NORTH QUAY, ASPEN WAY,
LONDON, E14

Client Ref: 250169-00
Report Ref: GS-6734107
Grid Ref: 537608, 180546

Map Name: Provisional

Map date: **1965-1967**

Scale: 1:10,560

Printed at: 1:10,560

N
W E
S

Surveyed 1965
Revised 1965
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1965
Revised 1967
Edition N/A
Copyright N/A
Levelled N/A

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Groundsure INSIGHTS

Site Details:

NORTH QUAY, ASPEN WAY,
LONDON, E14

Client Ref: 250169-00
Report Ref: GS-6734107
Grid Ref: 537608, 180546

Map Name: National Grid

Map date: **1973**

Scale: 1:10,000

Printed at: 1:10,000

N
W E
S

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

Surveyed 1972
Revised 1973
Edition N/A
Copyright N/A
Levelled N/A

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Groundsure INSIGHTS

Site Details:

NORTH QUAY, ASPEN WAY,
LONDON, E14

Client Ref: 250169-00
Report Ref: GS-6734107
Grid Ref: 537608, 180546

Map Name: National Grid

Map date: **1979-1981**

Scale: 1:10,000

Printed at: 1:10,000

N
W E
S

Surveyed 1981
Revised 1981
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1978
Revised 1979
Edition N/A
Copyright N/A
Levelled N/A

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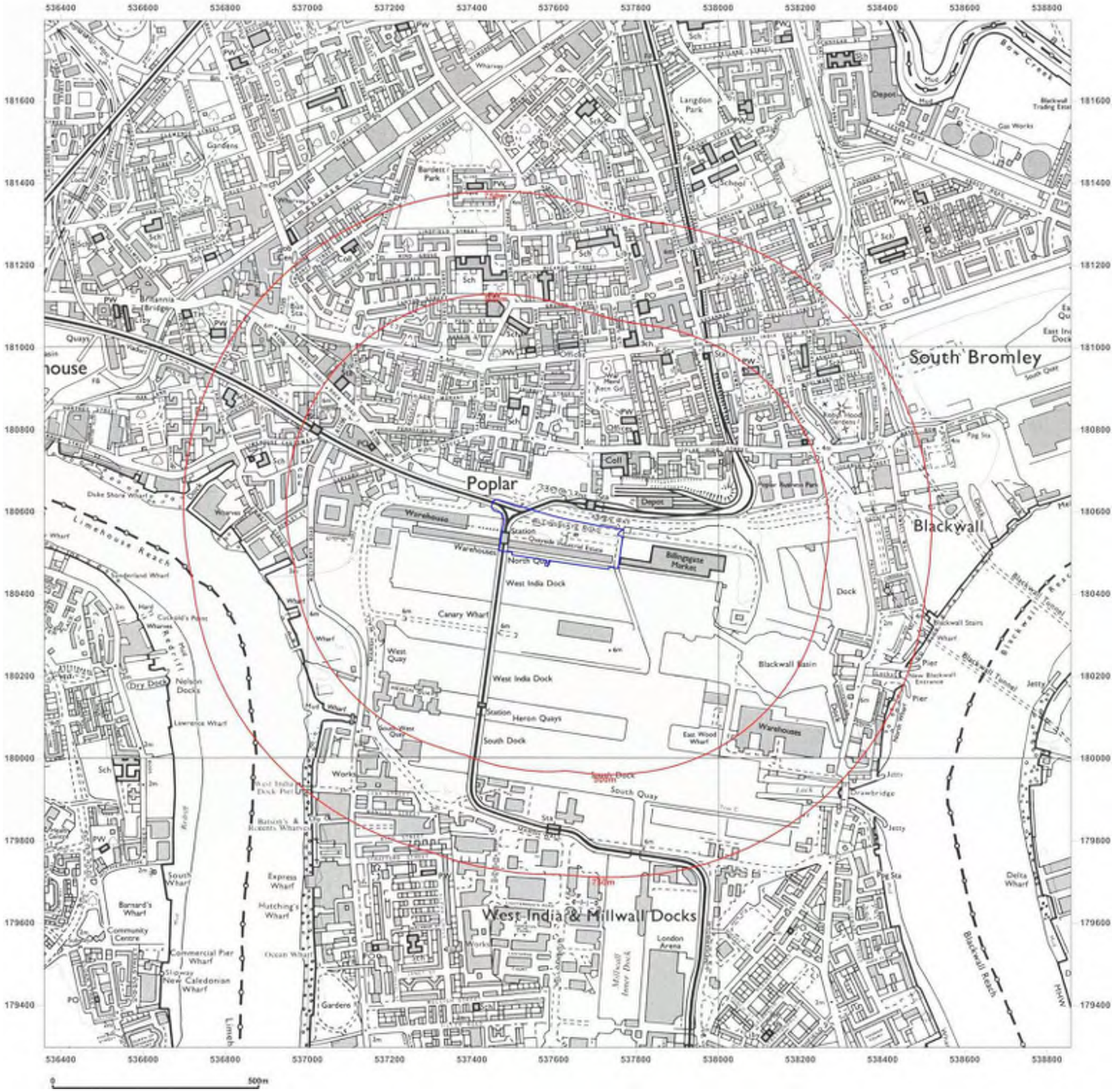

Groundsure INSIGHTS

Site Details:

NORTH QUAY, ASPEN WAY,
LONDON, E14

Client Ref: 250169-00
Report Ref: GS-6734107
Grid Ref: 537608, 180546

Map Name: National Grid

Map date: **1989**

Scale: 1:10,000

Printed at: 1:10,000

N
W E
S

Surveyed 1988
Revised 1989
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1988
Revised 1989
Edition N/A
Copyright N/A
Levelled N/A

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Groundsure INSIGHTS

Site Details:

NORTH QUAY, ASPEN WAY,
LONDON, E14

Client Ref: 250169-00
Report Ref: GS-6734107
Grid Ref: 537608, 180546

Map Name: National Grid

Map date: **1994**

Scale: 1:10,000

Printed at: 1:10,000

N
W E
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Surveyed 1988
Revised 1994
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1988
Revised 1994
Edition N/A
Copyright N/A
Levelled N/A

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Groundsure INSIGHTS

Site Details:

NORTH QUAY, ASPEN WAY,
LONDON, E14

Client Ref: 250169-00
Report Ref: GS-6734107
Grid Ref: 537608, 180546

Map Name: National Grid

Map date: **2001**

Scale: 1:10,000

Printed at: 1:10,000

N
W E
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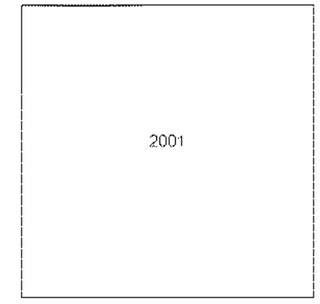

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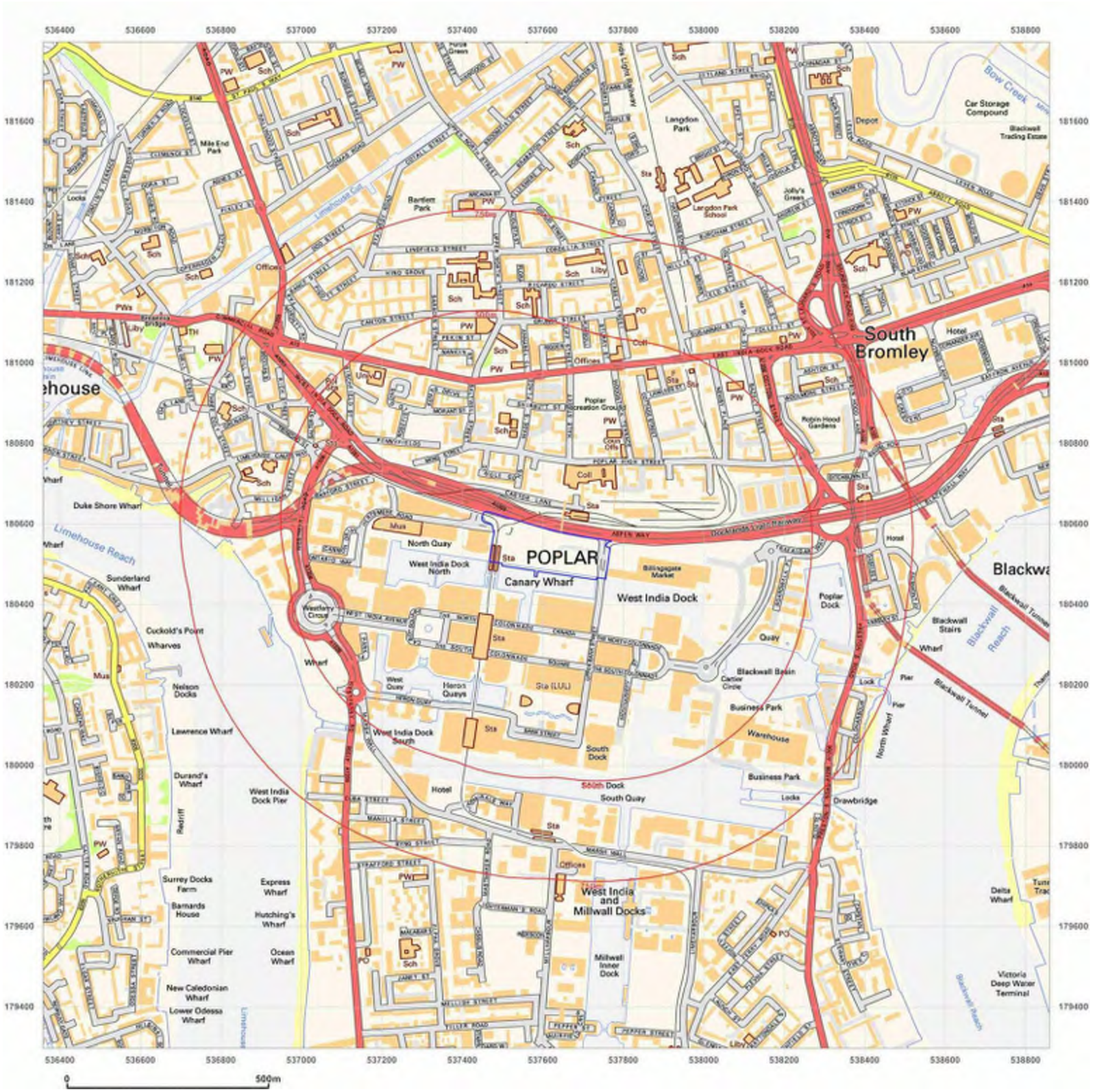

Groundsure INSIGHTS

Site Details:

NORTH QUAY, ASPEN WAY,
LONDON, E14

Client Ref: 250169-00
Report Ref: GS-6734107
Grid Ref: 537608, 180546

Map Name: National Grid

Map date: **2010**

Scale: 1:10,000

Printed at: 1:10,000

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W E
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2010

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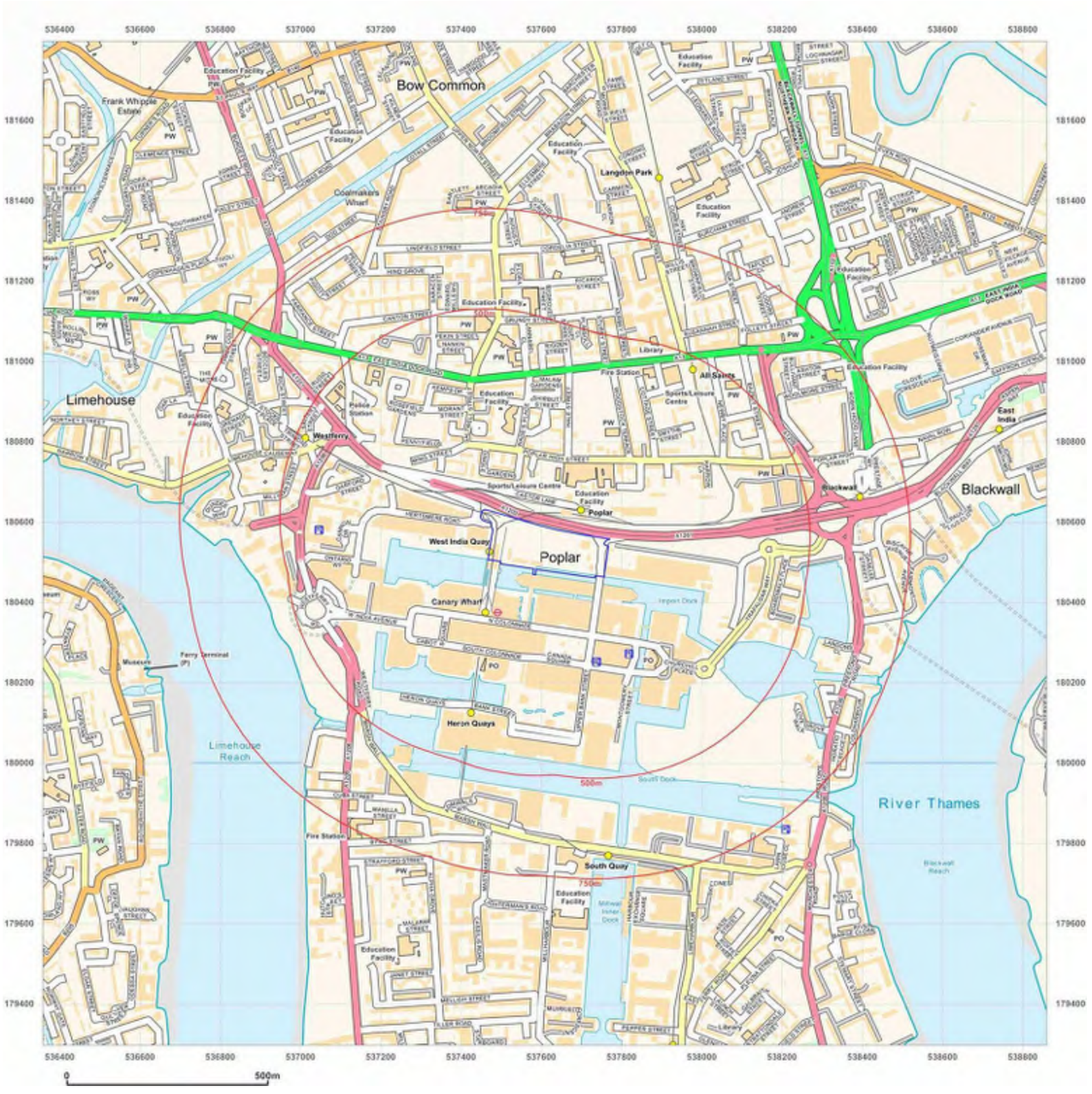

Groundsure INSIGHTS

Site Details:

NORTH QUAY, ASPEN WAY,
LONDON, E14

Client Ref: 250169-00
Report Ref: GS-6734107
Grid Ref: 537608, 180546

Map Name: National Grid
Map date: **2020**
Scale: 1:10,000
Printed at: 1:10,000

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2020

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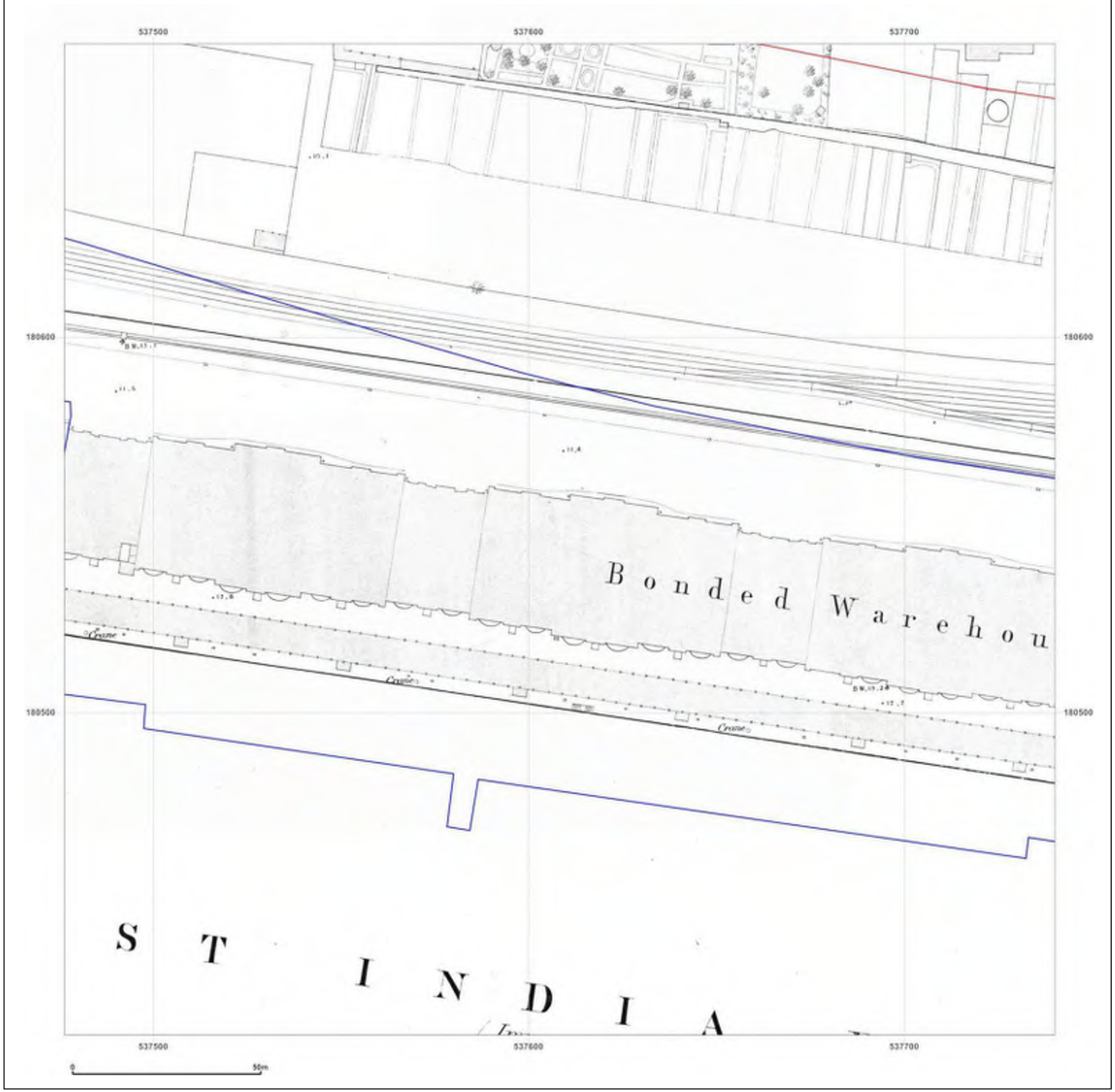
Production date: 09 April 2020

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



Groundsure INSIGHTS

Site Details:

NORTH QUAY, ASPEN WAY,
LONDON, E14

Client Ref: 250169-00
Report Ref: GS-6734107
Grid Ref: 537608, 180546

Map Name: 1056 Scale Town Plan
Map date: **1867**
Scale: 1:1,056
Printed at: 1:1,056

N
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Surveyed 1867
Revised N/A
Edition N/A
Copyright N/A
Levelled N/A

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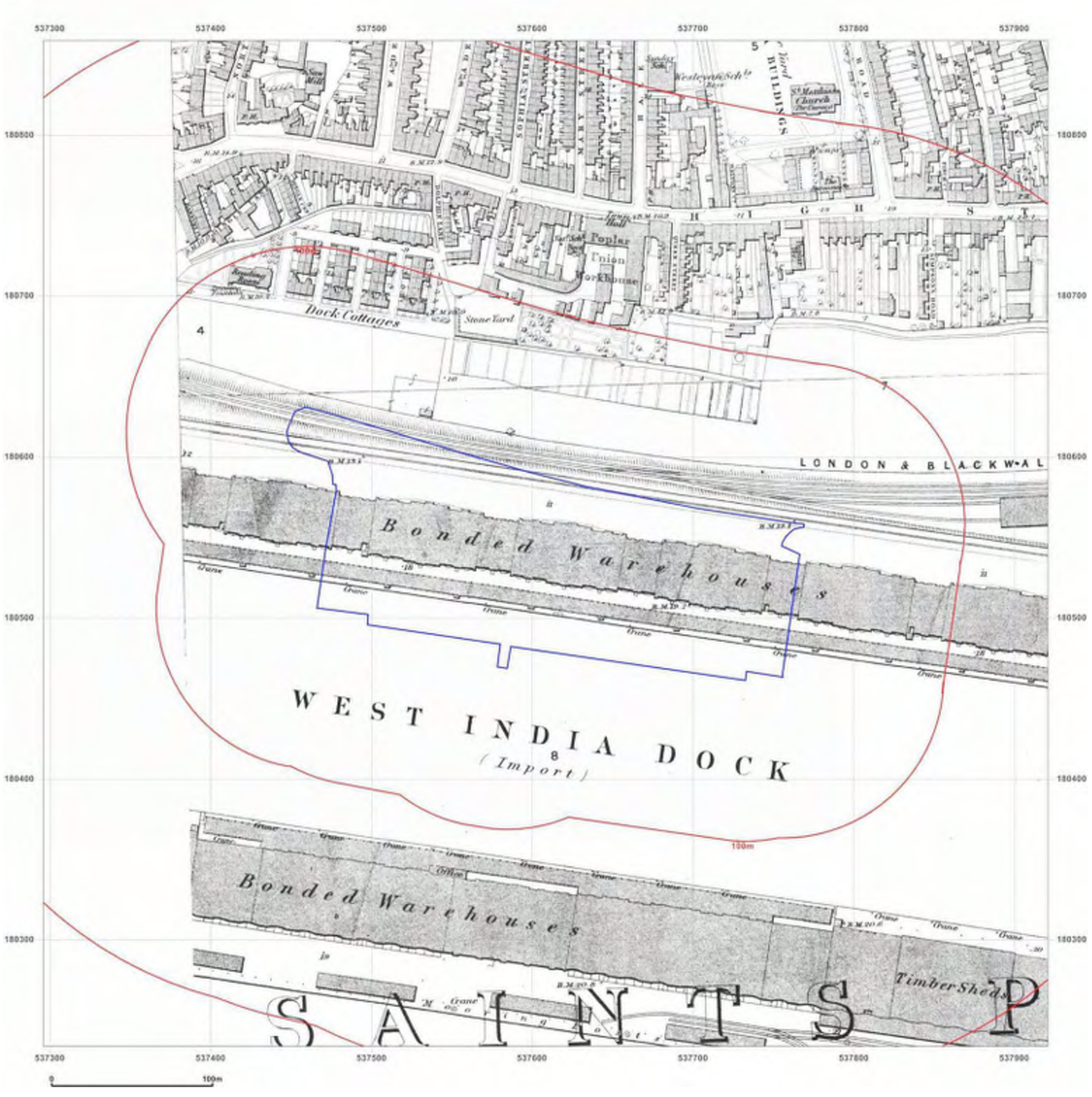
Production date: 09 April 2020

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



Groundsure INSIGHTS

Site Details:

NORTH QUAY, ASPEN WAY,
LONDON, E14

Client Ref: 250169-00
Report Ref: GS-6734107
Grid Ref: 537608, 180546

Map Name: County Series

Map date: **1869**

Scale: 1:2,500

Printed at: 1:2,500

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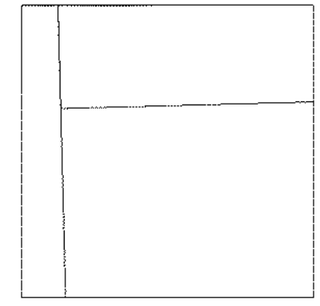

Surveyed 1867
Revised N/A
Edition 1869
Copyright N/A
Levelled N/A

Surveyed 1867
Revised N/A
Edition 1869
Copyright N/A
Levelled N/A

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Production date: 09 April 2020

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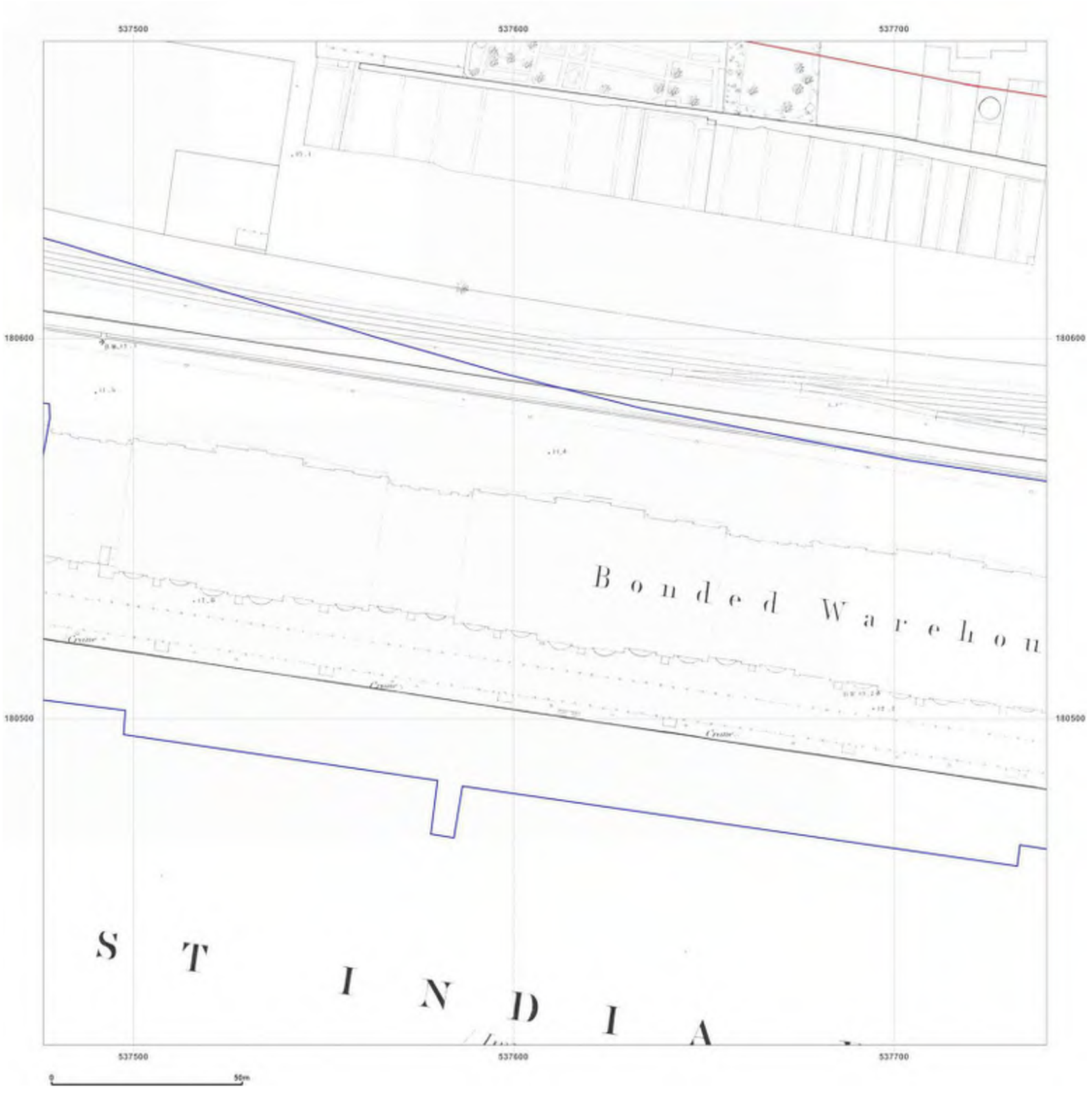

Groundsure INSIGHTS

Site Details:

NORTH QUAY, ASPEN WAY,
LONDON, E14

Client Ref: 250169-00
Report Ref: GS-6734107
Grid Ref: 537608, 180546

Map Name: 1056 Scale Town Plan

Map date: **1870**

Scale: 1:1,056

Printed at: 1:1,056

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Surveyed 1867
Revised N/A
Edition 1870
Copyright N/A
Levelled N/A

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Production date: 09 April 2020

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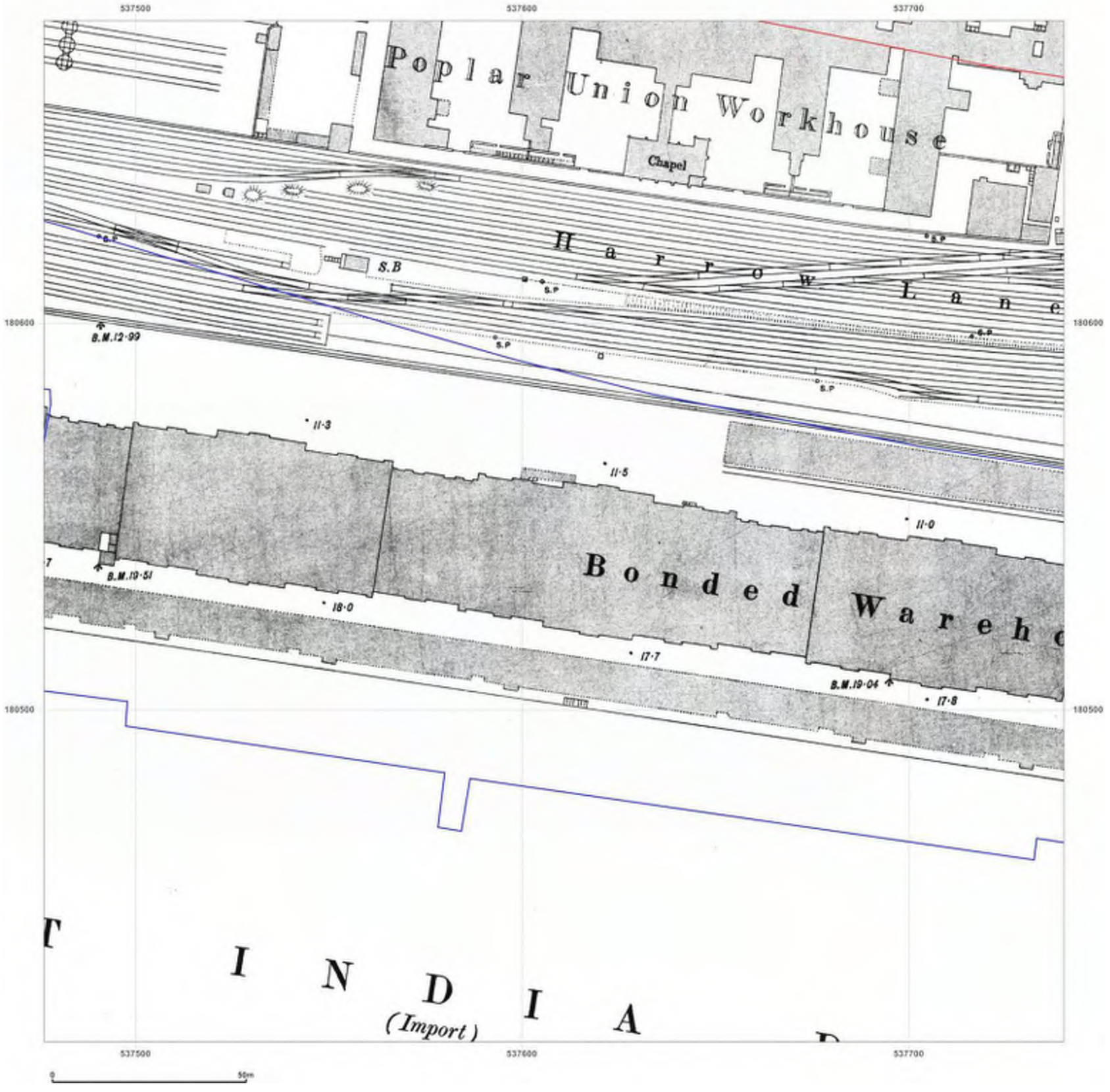

Groundsure INSIGHTS

Site Details:

NORTH QUAY, ASPEN WAY,
LONDON, E14

Client Ref: 250169-00
Report Ref: GS-6734107
Grid Ref: 537608, 180546

Map Name: 1056 Scale Town Plan

Map date: **1896**

Scale: 1:1,056

Printed at: 1:1,056

N
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Surveyed 1893
Revised N/A
Edition 1896
Copyright N/A
Levelled N/A

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Production date: 09 April 2020

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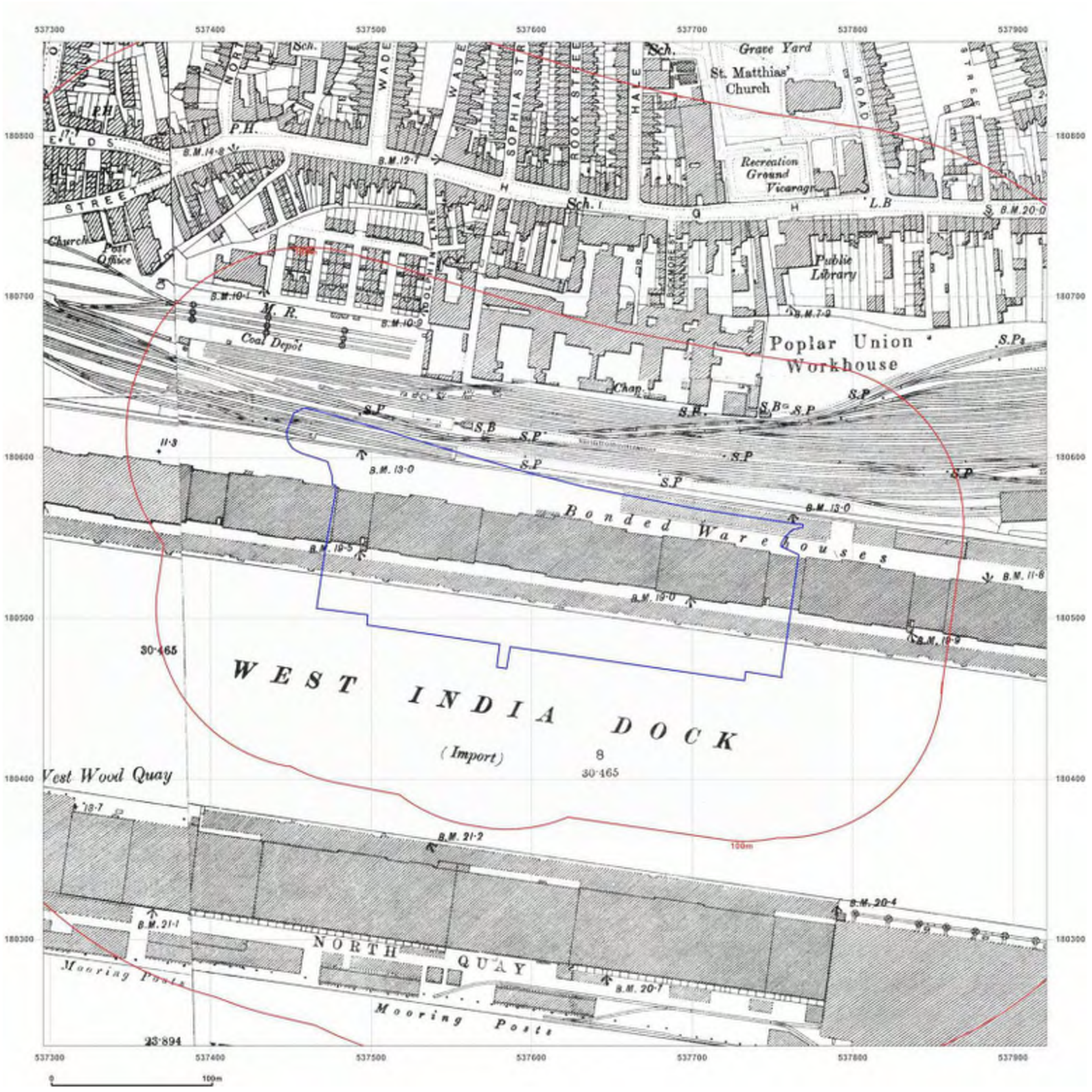

Groundsure INSIGHTS

Site Details:

NORTH QUAY, ASPEN WAY,
LONDON, E14

Client Ref: 250169-00
Report Ref: GS-6734107
Grid Ref: 537608, 180546

Map Name: County Series

Map date: **1896**

Scale: 1:2,500

Printed at: 1:2,500

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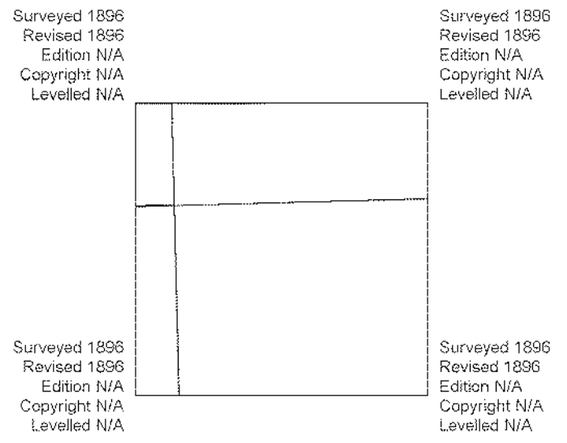

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Production date: 09 April 2020

Map legend available at:
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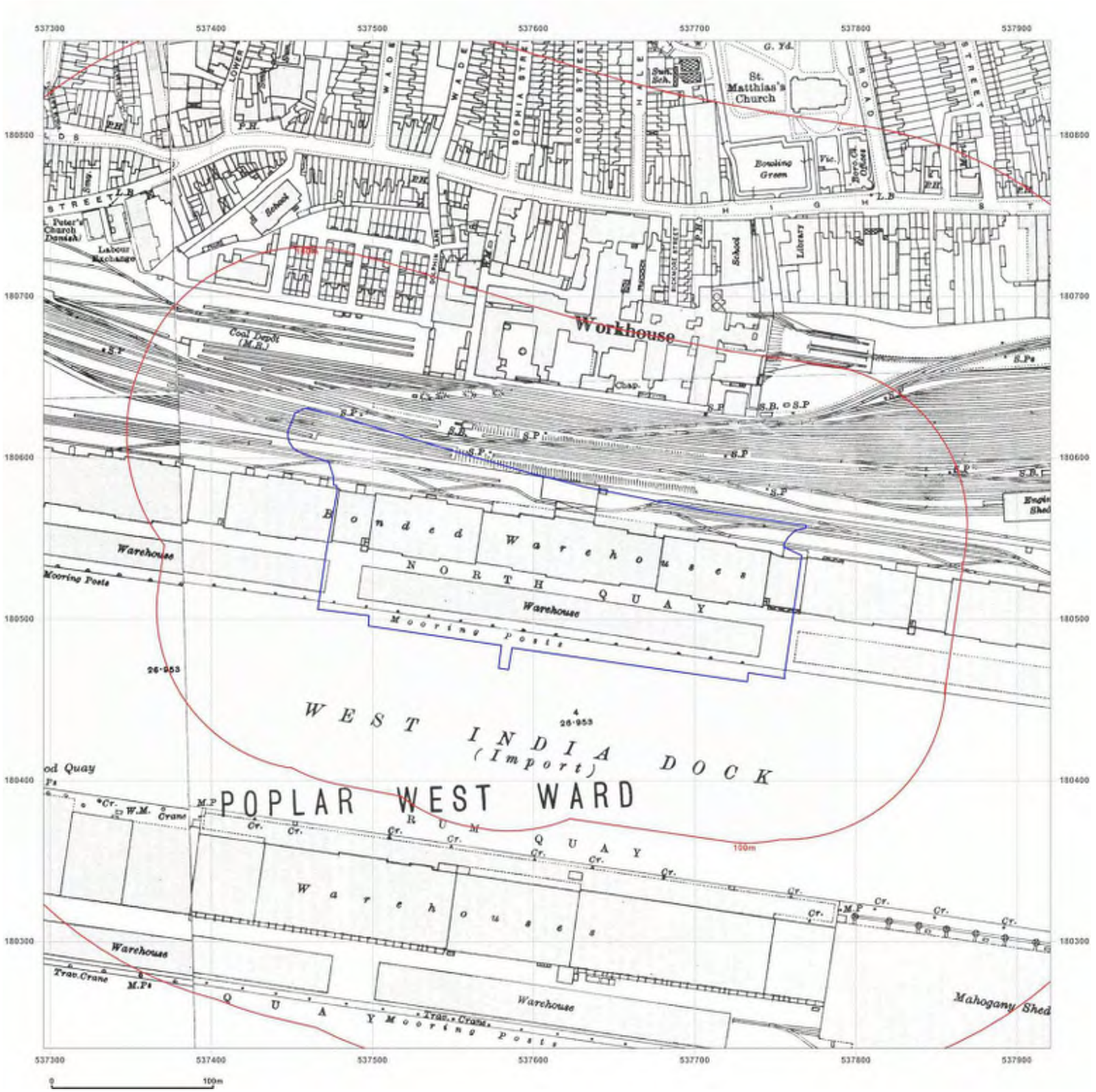

Groundsure INSIGHTS

Site Details:

NORTH QUAY, ASPEN WAY,
LONDON, E14

Client Ref: 250169-00
Report Ref: GS-6734107
Grid Ref: 537608, 180546

Map Name: County Series

Map date: **1916**

Scale: 1:2,500

Printed at: 1:2,500

N
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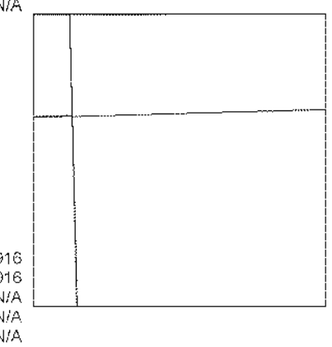
Surveyed 1916
Revised 1916
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1916
Revised 1916
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1916
Revised 1916
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1916
Revised 1916
Edition N/A
Copyright N/A
Levelled N/A

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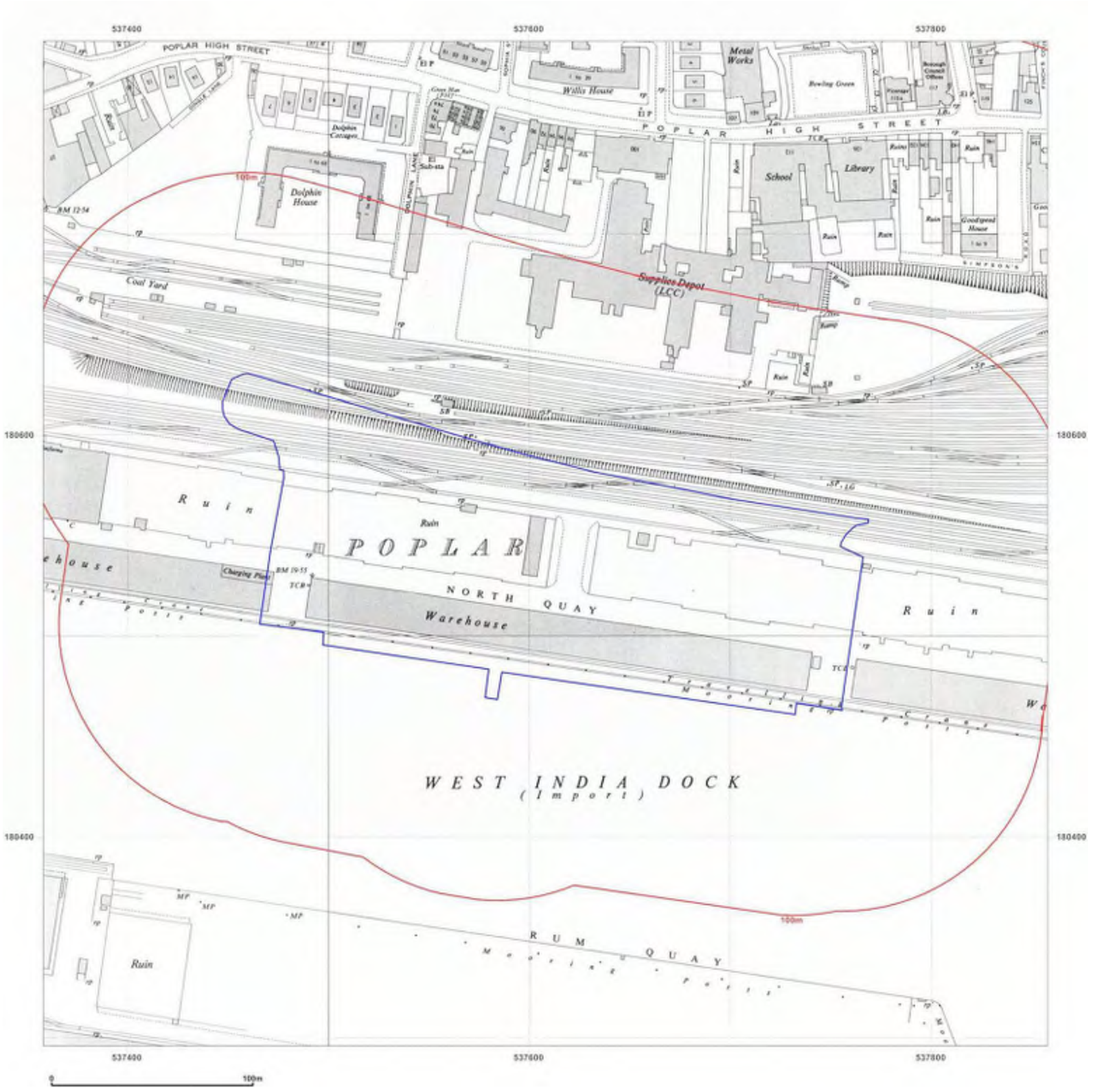

Groundsure INSIGHTS

Site Details:

NORTH QUAY, ASPEN WAY,
LONDON, E14

Client Ref: 250169-00
Report Ref: GS-6734107
Grid Ref: 537608, 180546

Map Name: National Grid

Map date: **1949-1950**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed 1950
Revised 1950
Edition N/A
Copyright N/A
Levelled 1934

Surveyed 1950
Revised 1950
Edition N/A
Copyright N/A
Levelled 1934

Surveyed 1949
Revised 1949
Edition N/A
Copyright N/A
Levelled 1934

Surveyed 1949
Revised 1949
Edition N/A
Copyright N/A
Levelled 1934

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Production date: 09 April 2020

Map legend available at:
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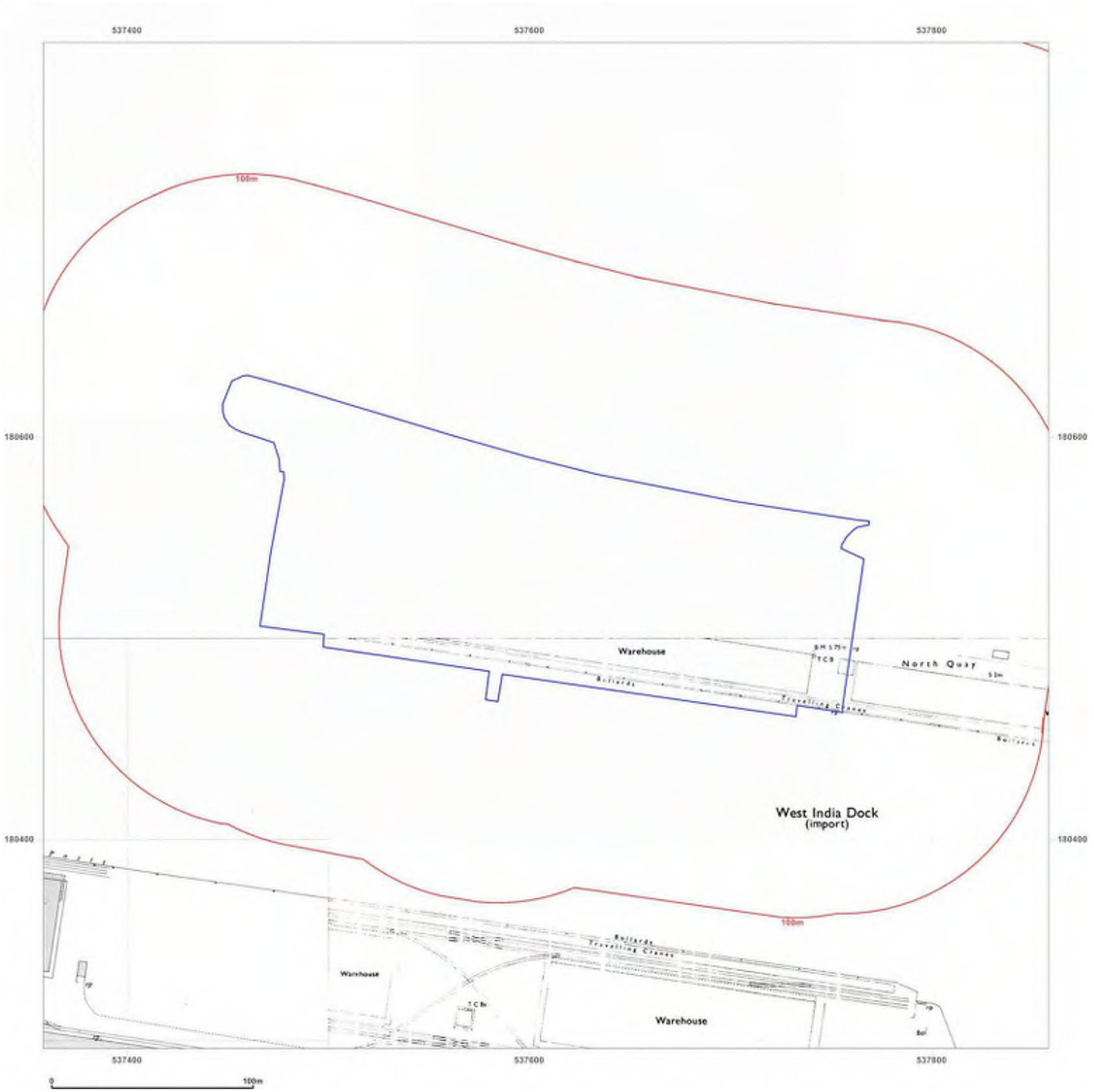

Groundsure INSIGHTS

Site Details:

NORTH QUAY, ASPEN WAY,
LONDON, E14

Client Ref: 250169-00
Report Ref: GS-6734107
Grid Ref: 537608, 180546

Map Name: National Grid

Map date: **1950-1951**

Scale: 1:1,250

Printed at: 1:2,000

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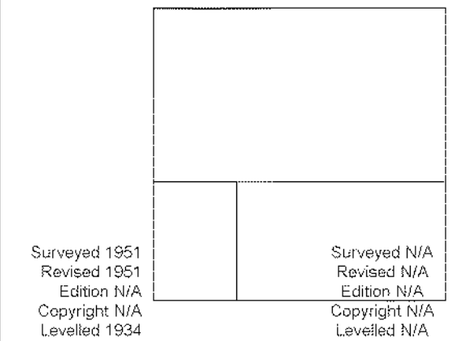

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Groundsure INSIGHTS

Site Details:

NORTH QUAY, ASPEN WAY,
LONDON, E14

Client Ref: 250169-00
Report Ref: GS-6734107
Grid Ref: 537608, 180546

Map Name: National Grid

Map date: **1951**

Scale: 1:2,500

Printed at: 1:2,500

N
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Surveyed N/A
Revised 1950
Edition 1951
Copyright N/A
Levelled 1934

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Production date: 09 April 2020

Map legend available at:
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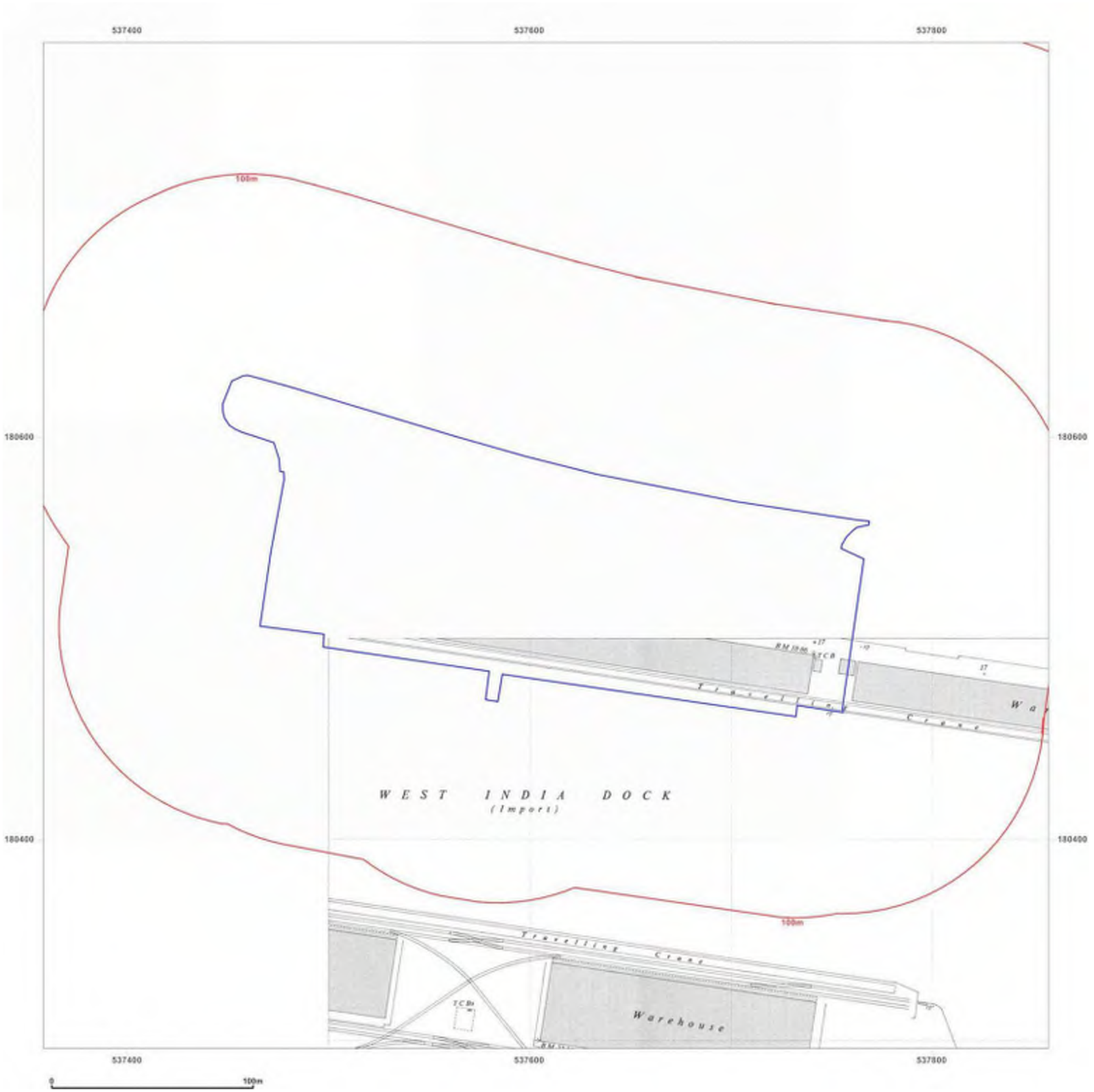

Groundsure INSIGHTS

Site Details:

NORTH QUAY, ASPEN WAY,
LONDON, E14

Client Ref: 250169-00
Report Ref: GS-6734107
Grid Ref: 537608, 180546

Map Name: National Grid
Map date: **1955**
Scale: 1:1,250
Printed at: 1:2,000

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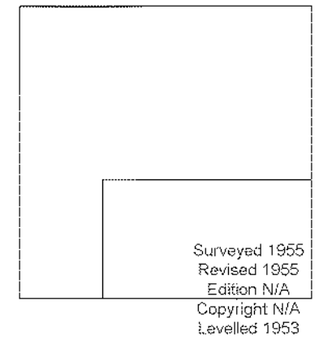

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Production date: 09 April 2020

Map legend available at:
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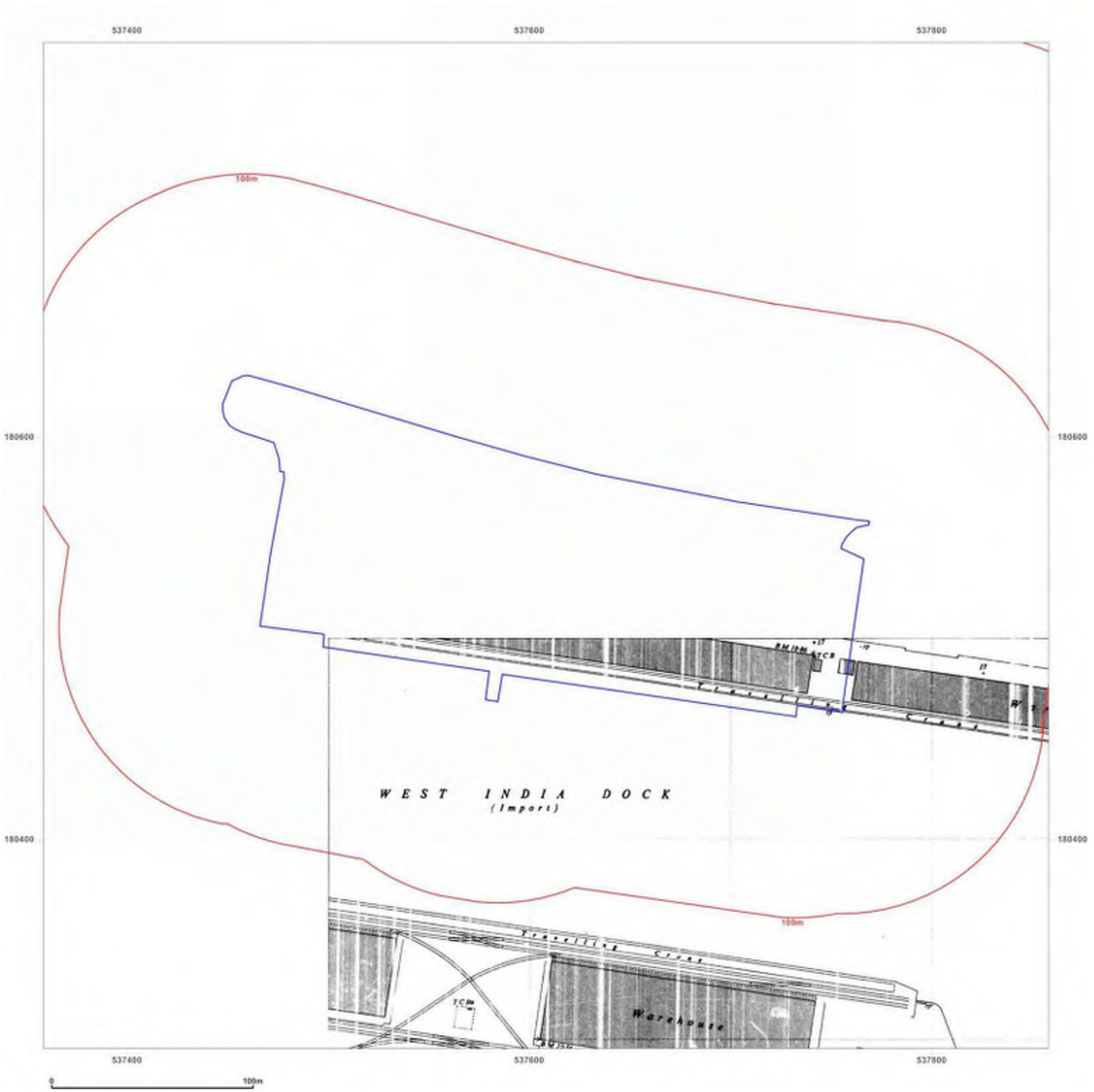

Groundsure INSIGHTS

Site Details:

NORTH QUAY, ASPEN WAY,
LONDON, E14

Client Ref: 250169-00
Report Ref: GS-6734107
Grid Ref: 537608, 180546

Map Name: National Grid
Map date: **1956**
Scale: 1:1,250
Printed at: 1:2,000

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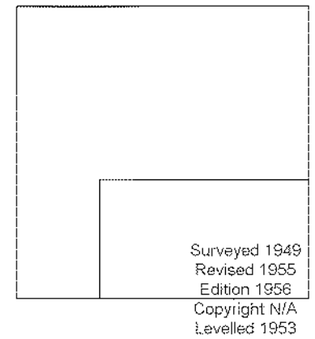

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Production date: 09 April 2020

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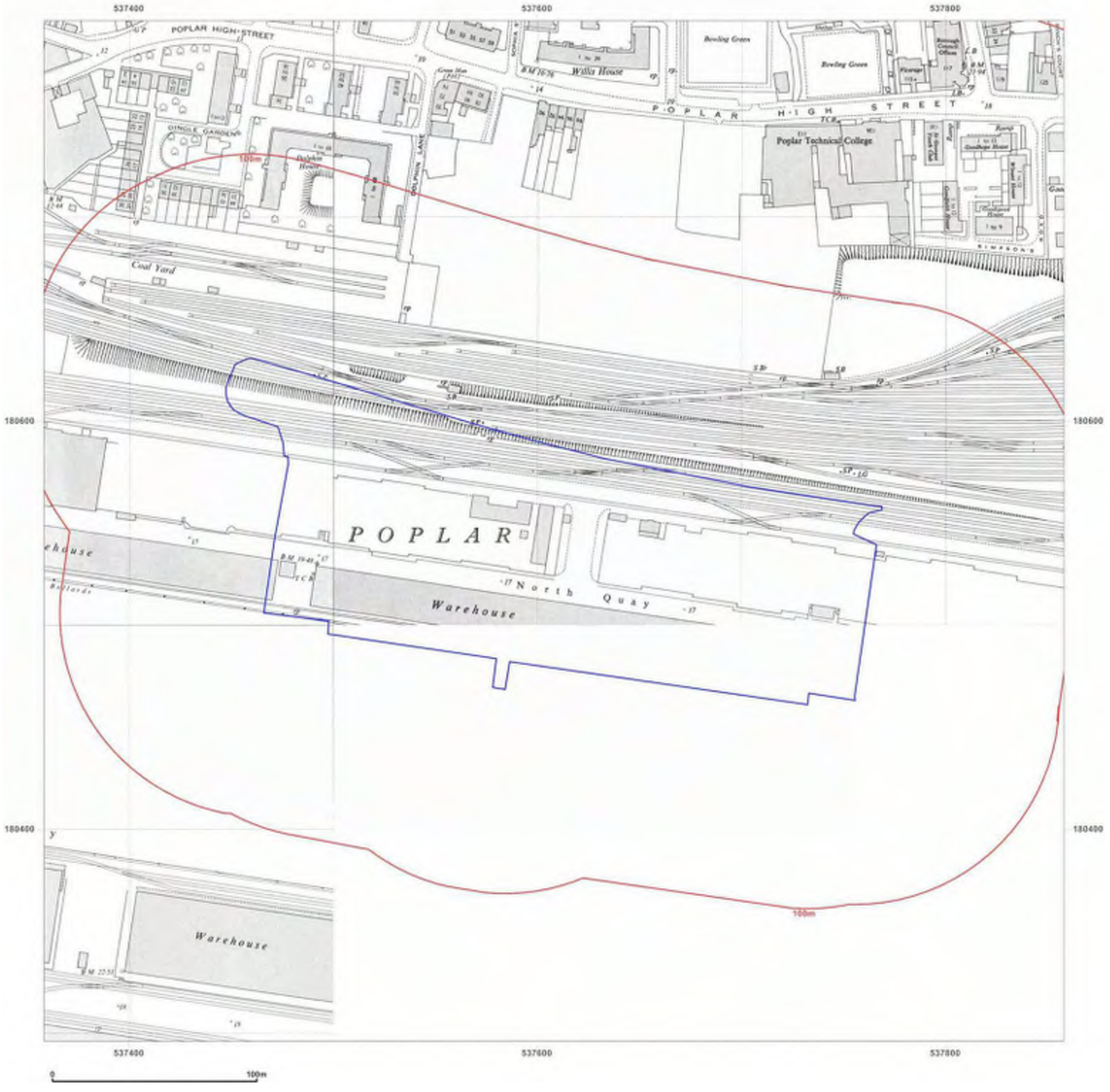

Groundsure INSIGHTS

Site Details:

NORTH QUAY, ASPEN WAY,
LONDON, E14

Client Ref: 250169-00
Report Ref: GS-6734107
Grid Ref: 537608, 180546

Map Name: National Grid

Map date: **1962-1964**

Scale: 1:1,250

Printed at: 1:2,000

N
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Surveyed 1950
Revised 1963
Edition N/A
Copyright 1964
Levelled 1953

Surveyed 1962
Revised 1962
Edition N/A
Copyright 1962
Levelled 1953

Surveyed 1949
Revised 1963
Edition N/A
Copyright 1963
Levelled 1953

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Groundsure INSIGHTS

Site Details:

NORTH QUAY, ASPEN WAY,
LONDON, E14

Client Ref: 250169-00
Report Ref: GS-6734107
Grid Ref: 537608, 180546

Map Name: National Grid

Map date: **1964**

Scale: 1:1,250

Printed at: 1:2,000

N
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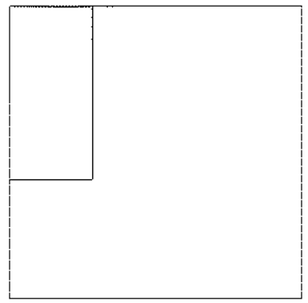
Surveyed 1963
Revised 1963
Edition N/A
Copyright 1964
Levelled 1953



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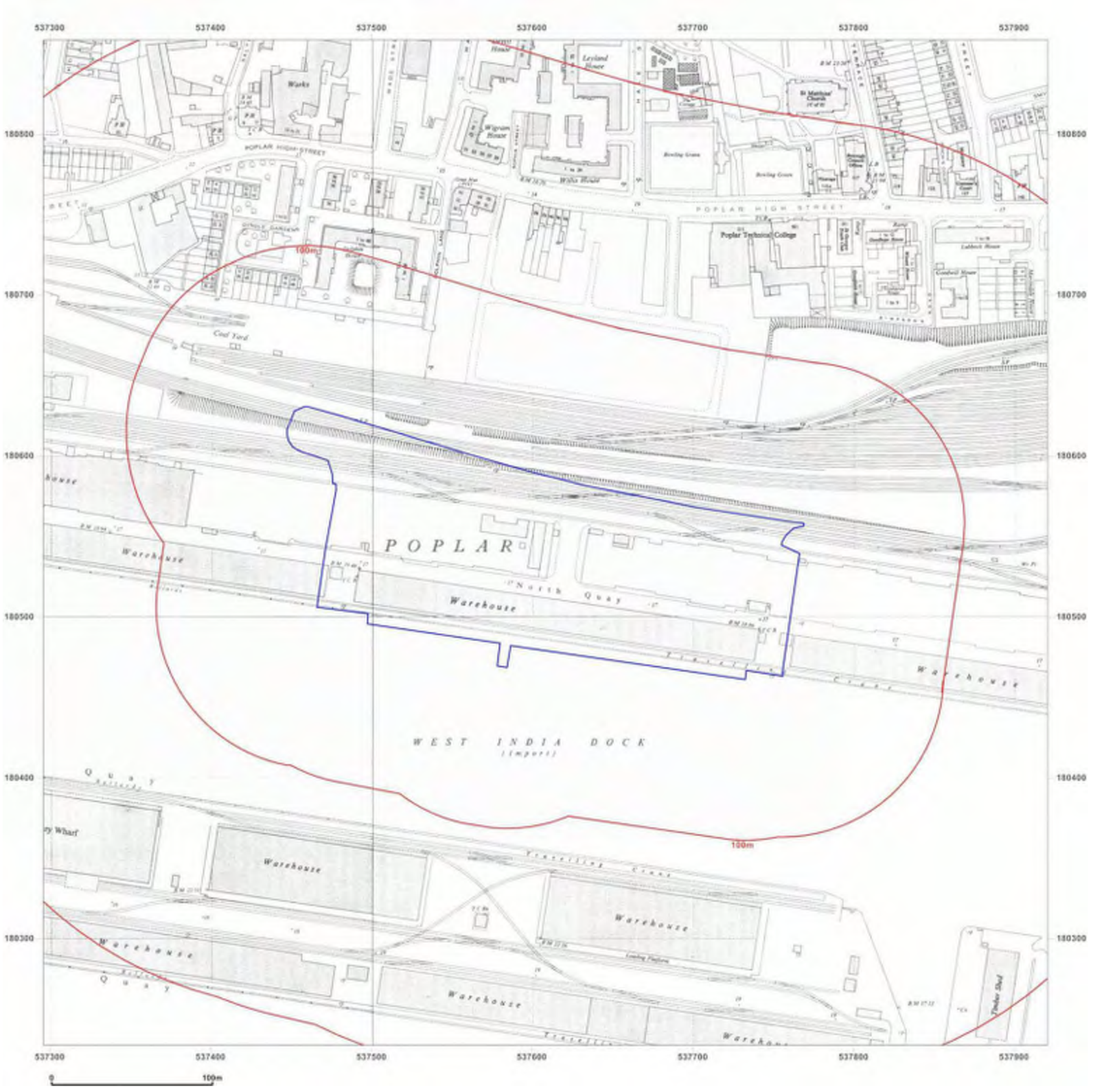

Groundsure INSIGHTS

Site Details:

NORTH QUAY, ASPEN WAY,
LONDON, E14

Client Ref: 250169-00
Report Ref: GS-6734107
Grid Ref: 537608, 180546

Map Name: National Grid

Map date: **1965**

Scale: 1:2,500

Printed at: 1:2,500

N
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Surveyed 1965
Revised 1965
Edition N/A
Copyright 1969
Levelled 1953

Powered by OS

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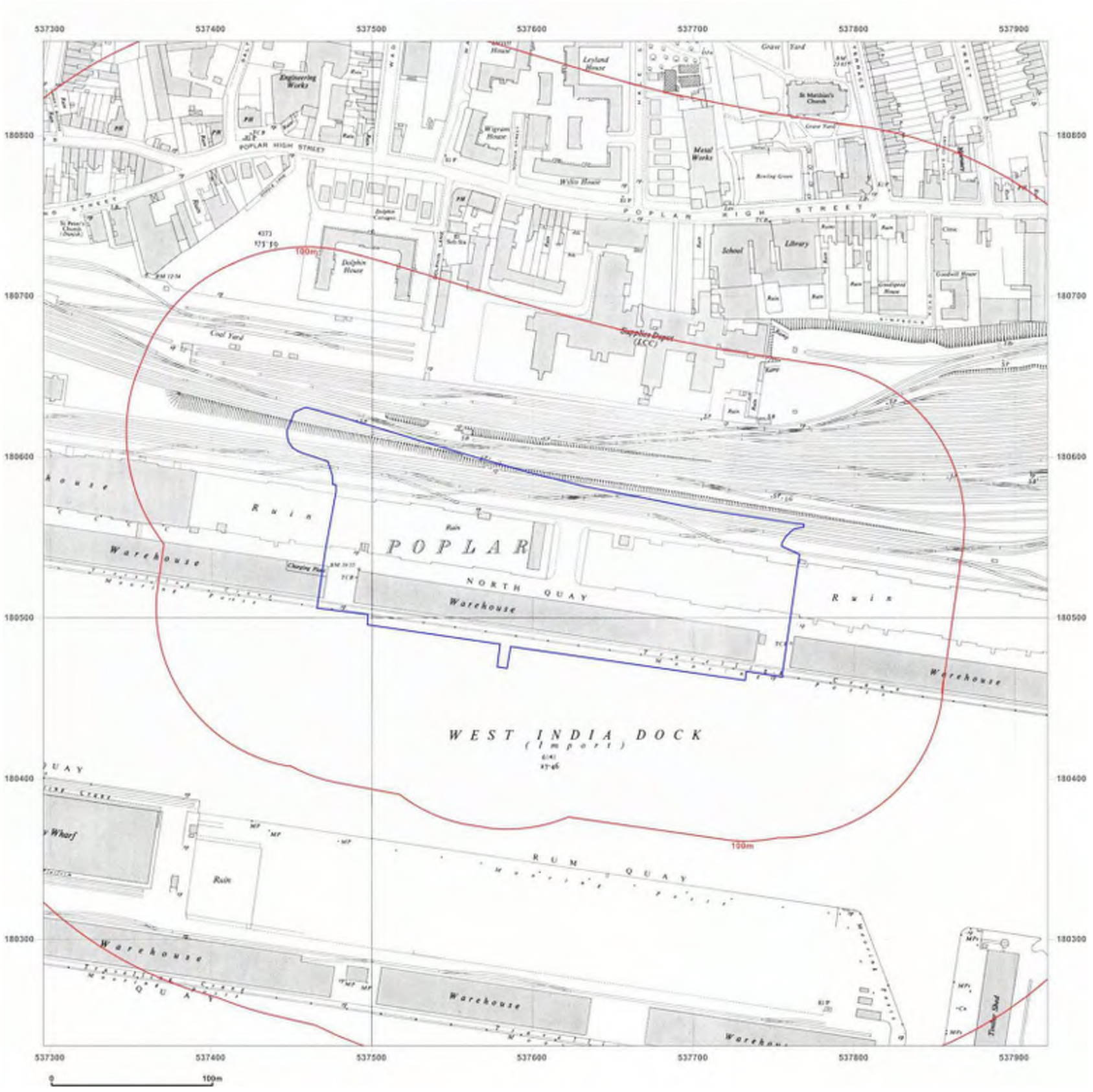

Groundsure INSIGHTS

Site Details:

NORTH QUAY, ASPEN WAY,
LONDON, E14

Client Ref: 250169-00
Report Ref: GS-6734107
Grid Ref: 537608, 180546

Map Name: National Grid

Map date: **1965**

Scale: 1:2,500

Printed at: 1:2,500

N
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Surveyed N/A
Revised 1965
Edition 1951
Copyright N/A
Levelled 1934

Powered by OS

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Production date: 09 April 2020

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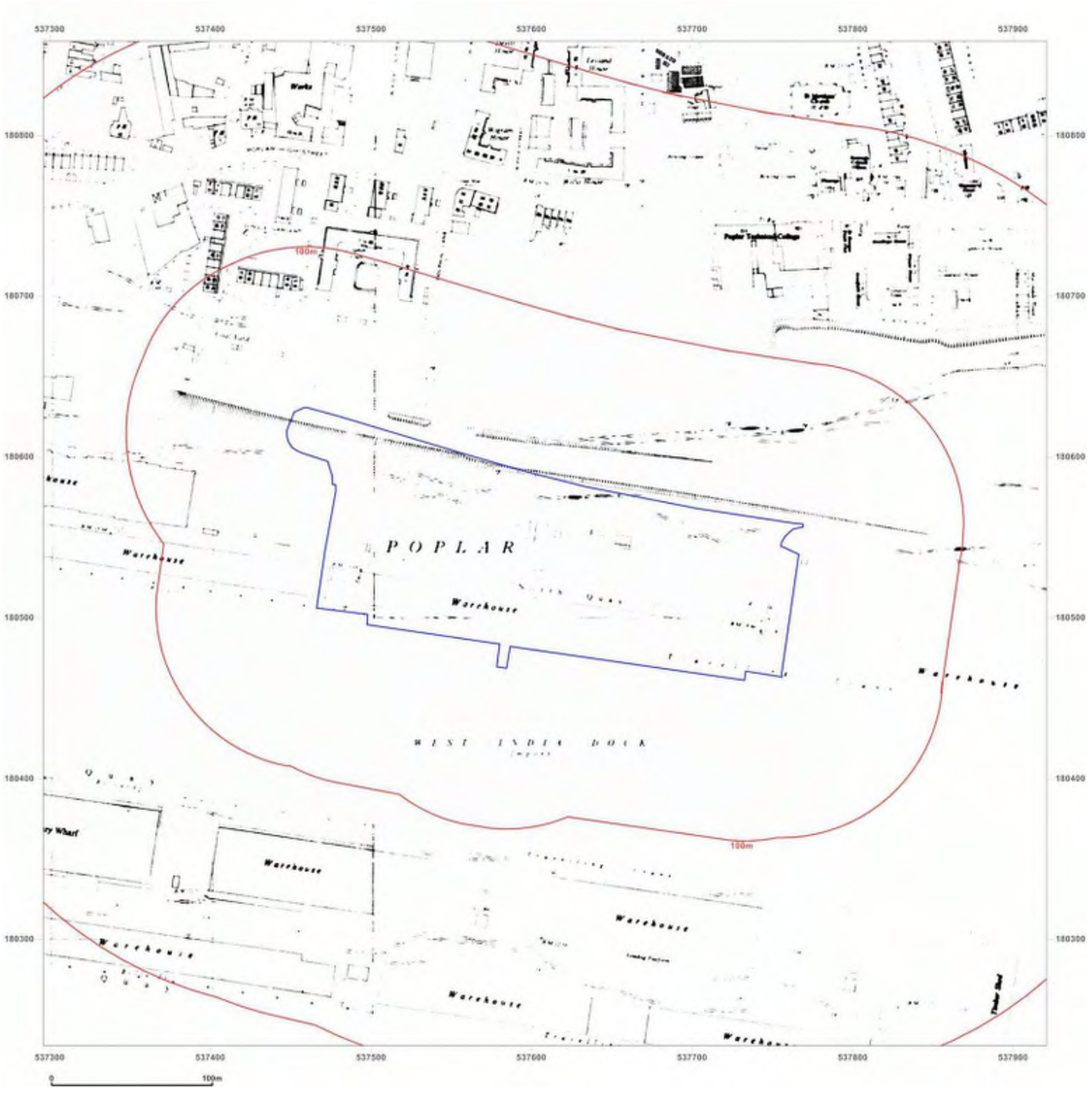

Groundsure INSIGHTS

Site Details:

NORTH QUAY, ASPEN WAY,
LONDON, E14

Client Ref: 250169-00
Report Ref: GS-6734107
Grid Ref: 537608, 180546

Map Name: National Grid

Map date: **1969**

Scale: 1:2,500

Printed at: 1:2,500

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

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Production date: 09 April 2020

Map legend available at:
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Groundsure INSIGHTS

Site Details:

NORTH QUAY, ASPEN WAY,
LONDON, E14

Client Ref: 250169-00
Report Ref: GS-6734107
Grid Ref: 537608, 180546

Map Name: National Grid
Map date: **1970-1972**
Scale: 1:1,250
Printed at: 1:2,000

N
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Surveyed 1950
Revised 1969
Edition N/A
Copyright 1970
Levelled 1953

Surveyed 1949
Revised 1972
Edition N/A
Copyright 1972
Levelled 1953

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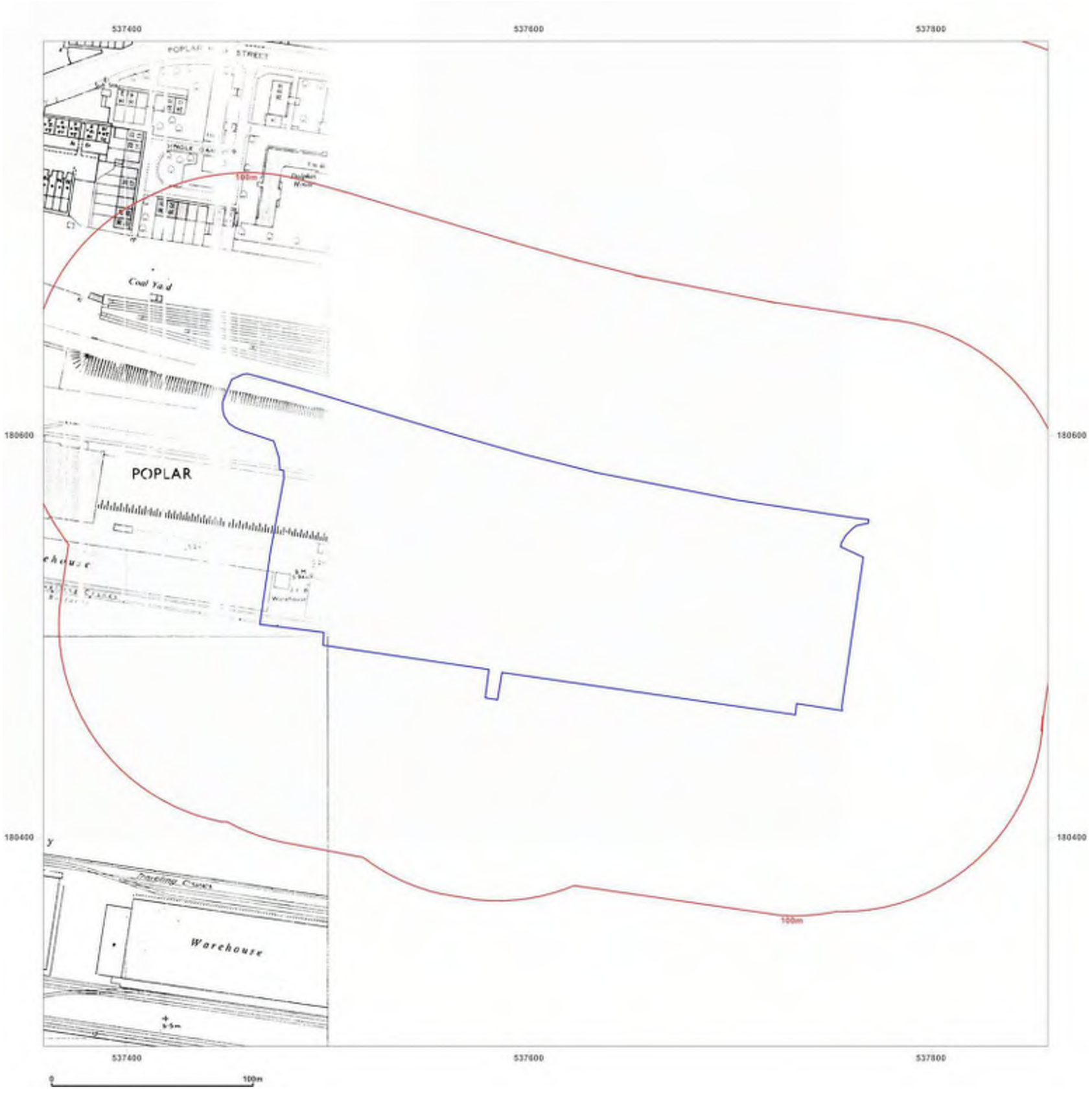
Production date: 09 April 2020

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



Groundsure INSIGHTS

Site Details:

NORTH QUAY, ASPEN WAY,
LONDON, E14

Client Ref: 250169-00
Report Ref: GS-6734107
Grid Ref: 537608, 180546

Map Name: National Grid

Map date: **1978-1981**

Scale: 1:1,250

Printed at: 1:2,000

N
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Surveyed N/A
Revised N/A
Edition N/A
Copyright 1978
Levelled N/A

Surveyed 1971
Revised 1981
Edition N/A
Copyright 1981
Levelled 1971

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Production date: 09 April 2020

Map legend available at:
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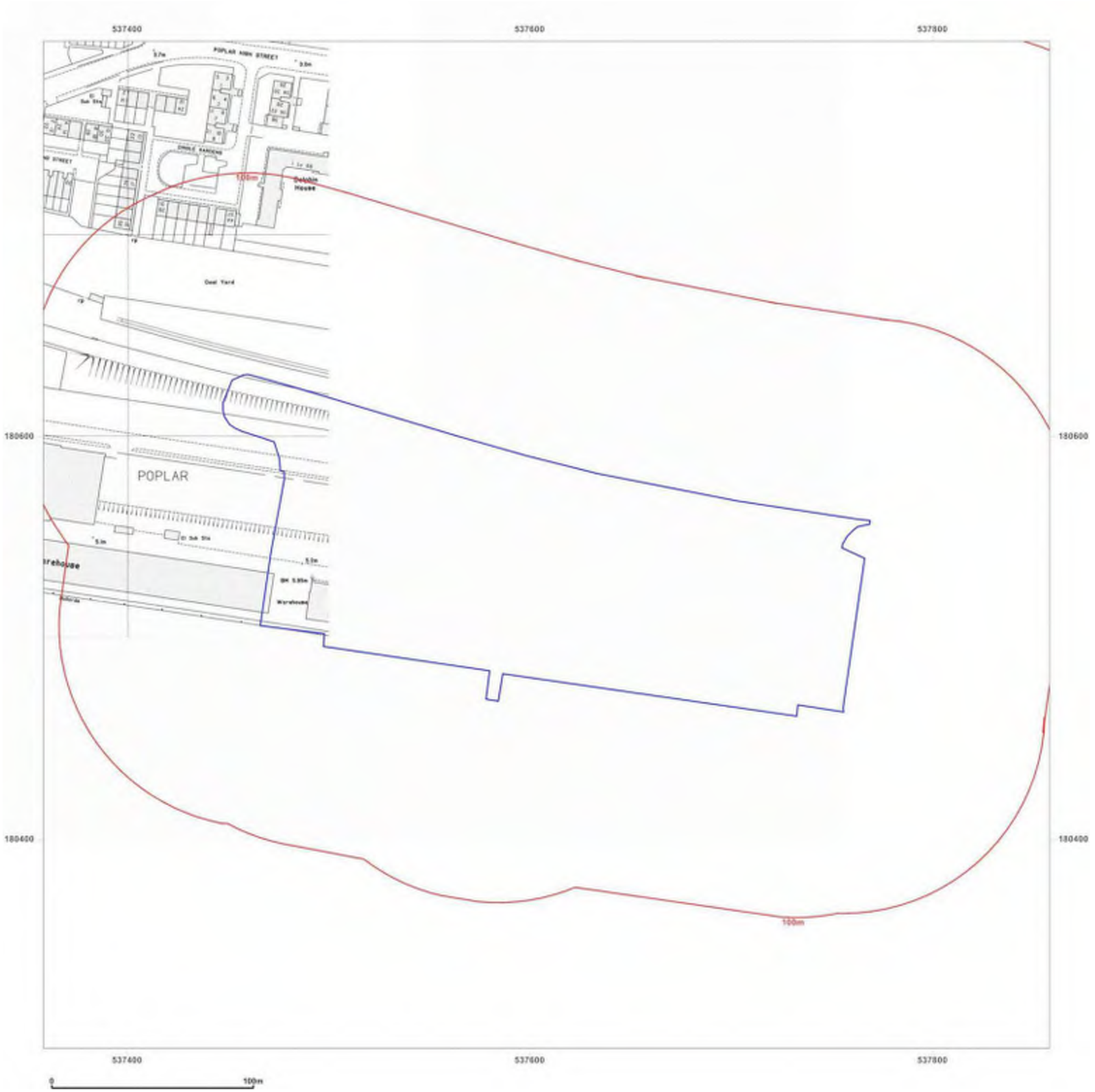

Groundsure INSIGHTS

Site Details:

NORTH QUAY, ASPEN WAY,
LONDON, E14

Client Ref: 250169-00
Report Ref: GS-6734107
Grid Ref: 537608, 180546

Map Name: National Grid

Map date: **1984**

Scale: 1:1,250

Printed at: 1:2,000

N
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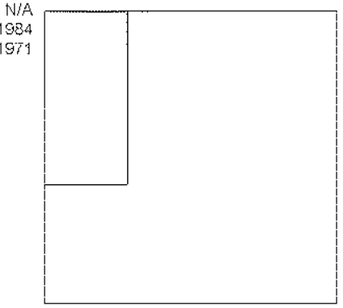
Surveyed 1950
Revised 1983
Edition N/A
Copyright 1984
Levelled 1971



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W: www.groundsure.com

Production date: 09 April 2020

Map legend available at:
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Groundsure INSIGHTS

Site Details:

NORTH QUAY, ASPEN WAY,
LONDON, E14

Client Ref: 250169-00
Report Ref: GS-6734107
Grid Ref: 537608, 180546

Map Name: National Grid

Map date: **1984**

Scale: 1:1,250

Printed at: 1:2,000

N
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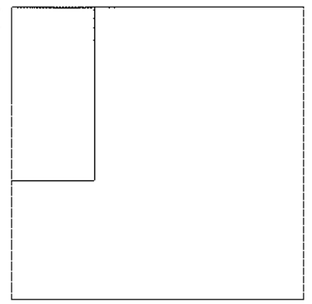
Surveyed 1980
Revised 1983
Edition N/A
Copyright 1984
Levelled 1971



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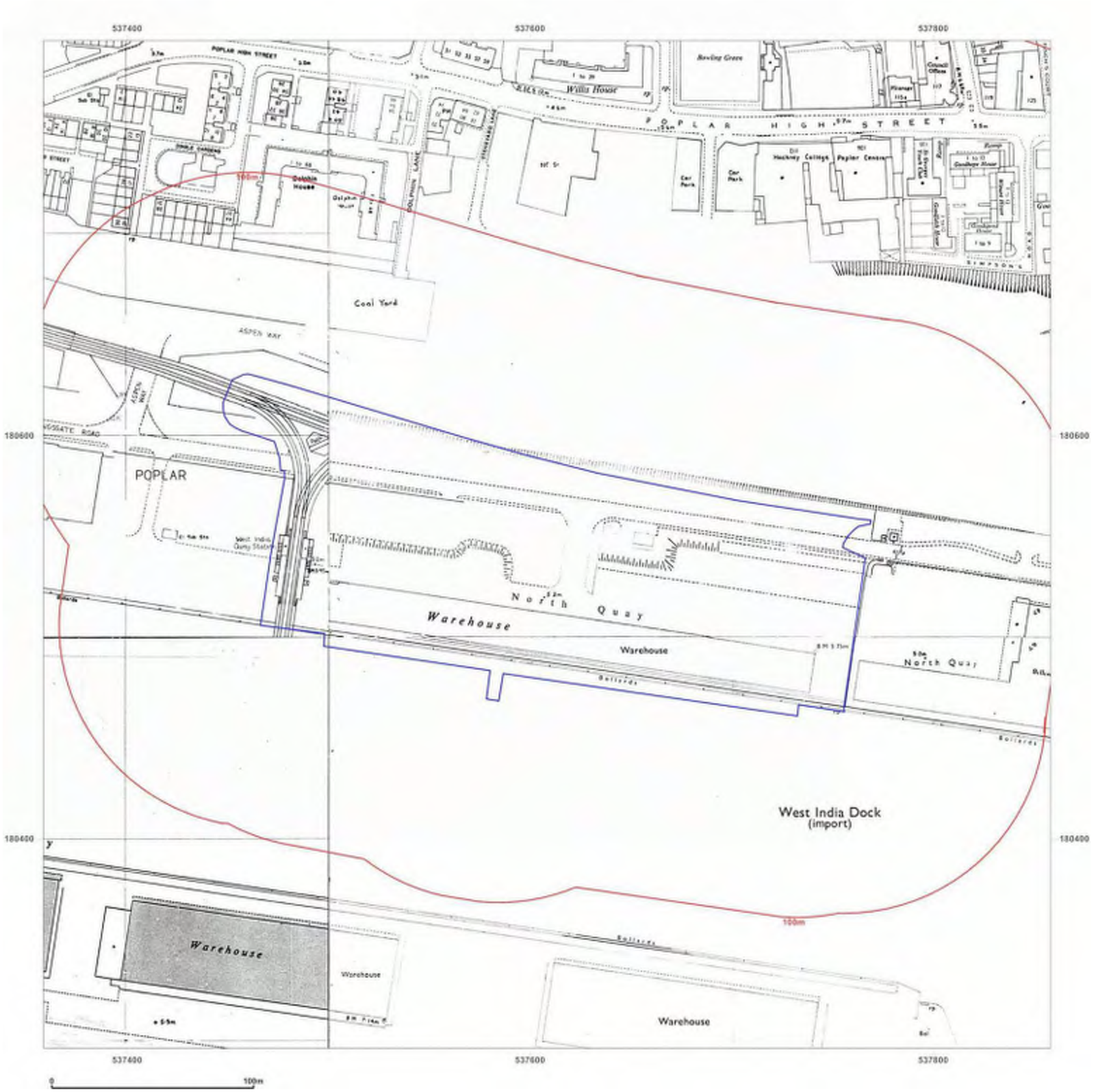

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Report Ref: GS-6734107
Grid Ref: 537608, 180546

Map Name: National Grid

Map date: **1983-1985**

Scale: 1:1,250

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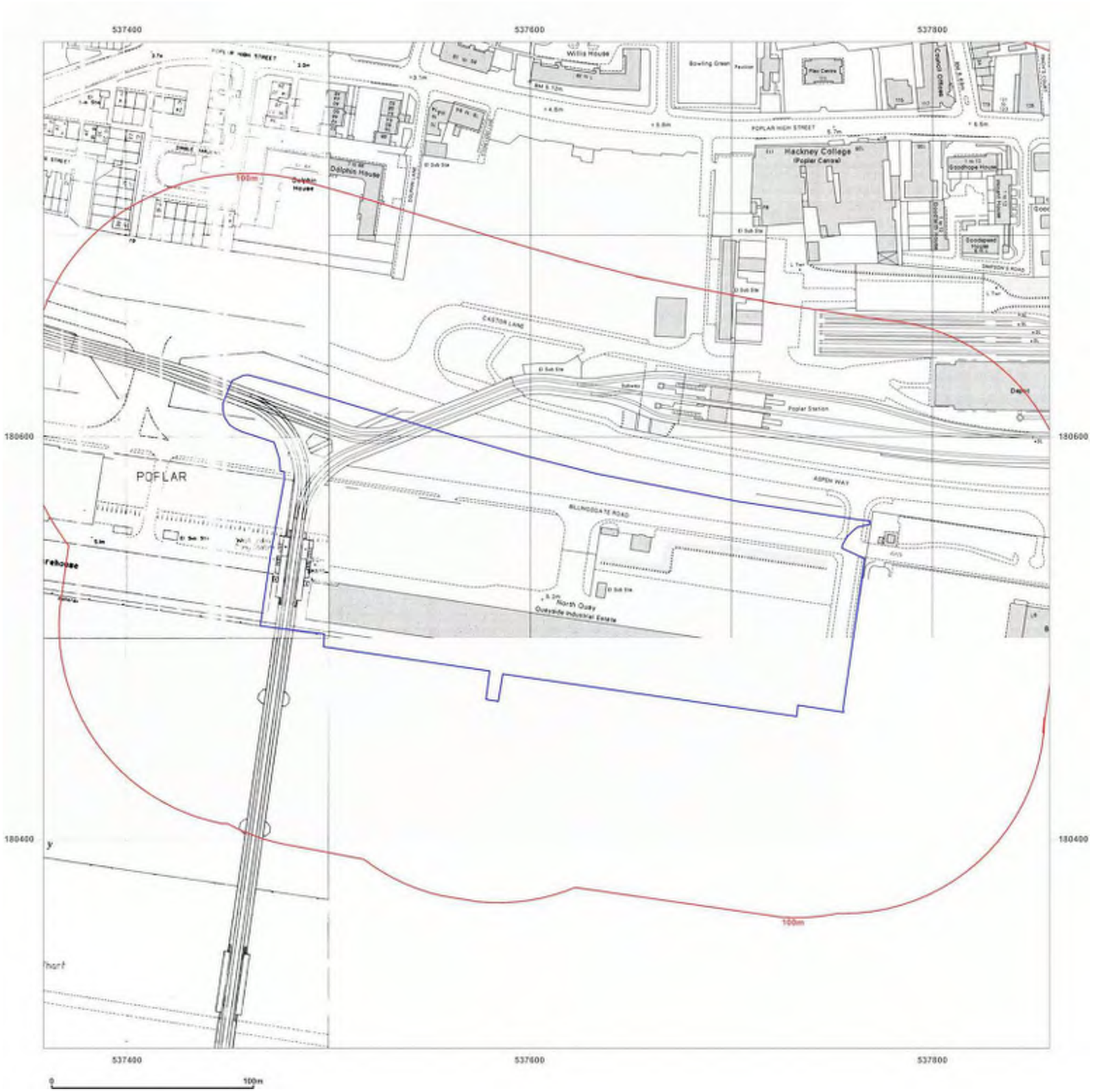

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Report Ref: GS-6734107
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Map Name: National Grid

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Scale: 1:1,250

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Client Ref: 250169-00
Report Ref: GS-6734107
Grid Ref: 537608, 180546

Map Name: National Grid

Map date: **1991**

Scale: 1:1,250

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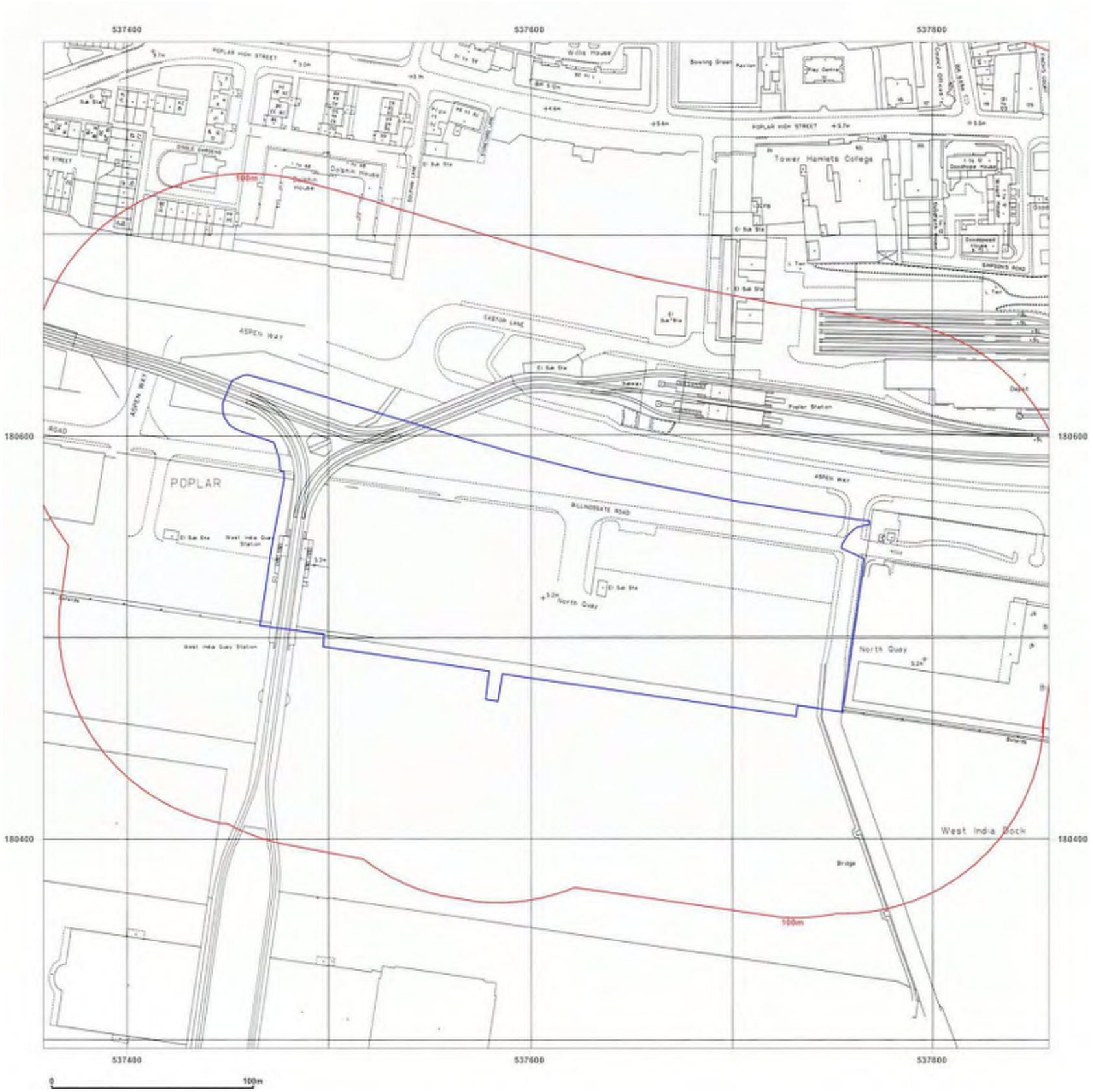

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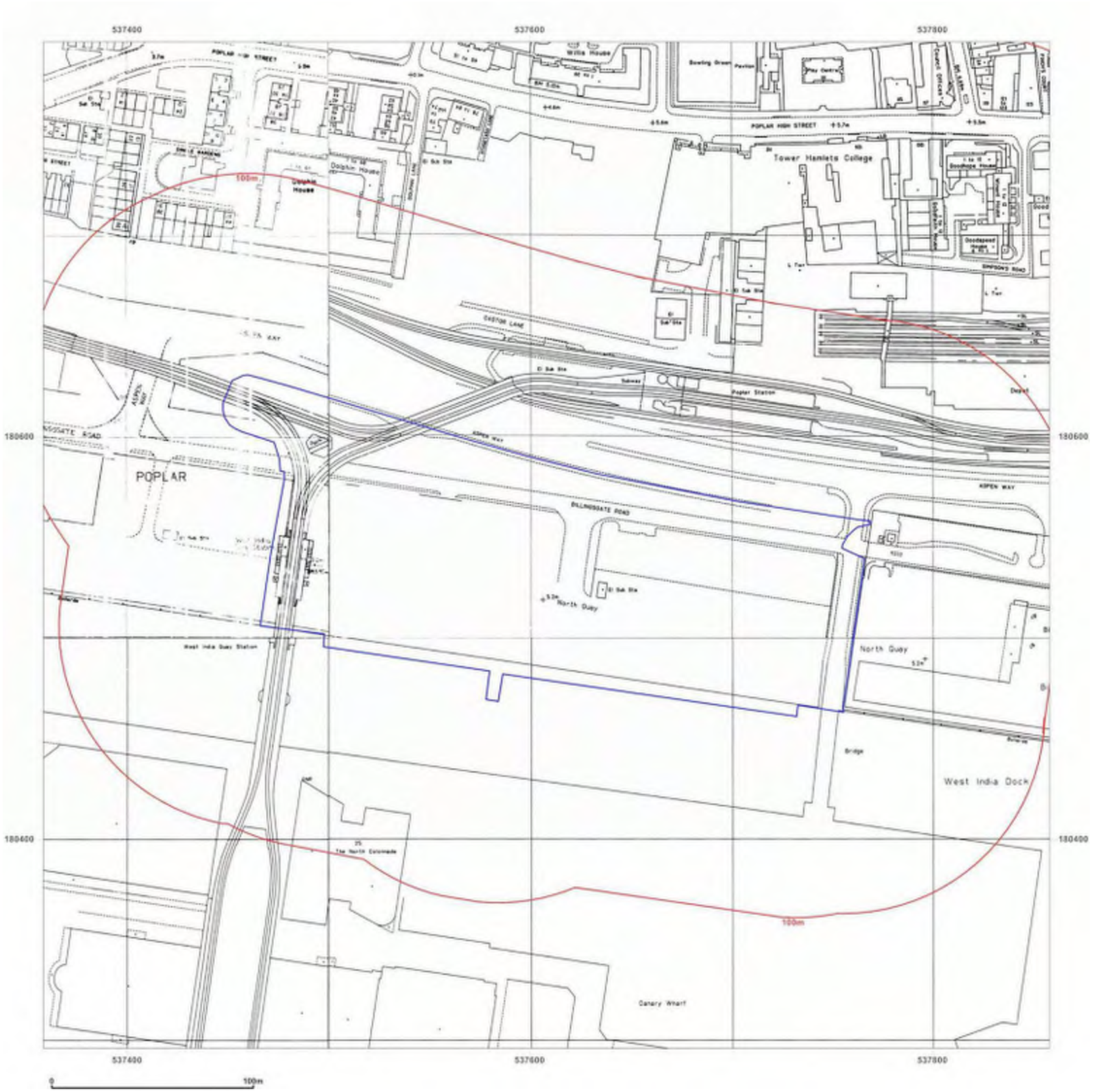

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Grid Ref: 537608, 180546

Map Name: National Grid

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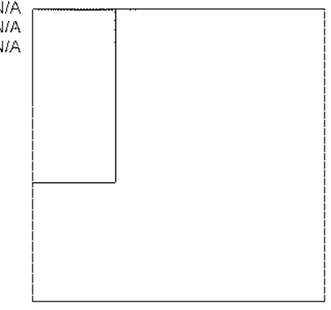

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Site Details:

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LONDON, E14

Client Ref: 250169-00
Report Ref: GS-6734107
Grid Ref: 537608, 180546

Map Name: National Grid

Map date: **1992-1994**

Scale: 1:1,250

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Site Details:

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Client Ref: 250169-00
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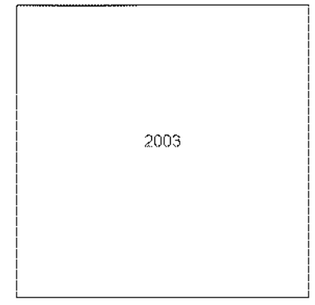

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Appendix B

Assessment methodology

B1 Risk assessment methodology

The potential risks to human health and environmental receptors have been considered in accordance with the current UK approach to contaminated land assessment taking into consideration the available information on the construction and operational phases of the development. The approach to assessing risks posed by contamination is outlined in the Environment Agency's land contamination guidance [30].

The method for risk evaluation takes into consideration the magnitude of the potential severity of the risk as well as the probability of the risk occurring. The risk characterisations have been assessed based on the qualitative method of interpretation set out in CIRIA guidance C552 [24] and NHBC/EA/CIEH risk classification methodology [31]. The method for risk evaluation involves the classification of the:

- magnitude of the potential consequence (severity) of the risk occurring (refer to Table B1-1); and
- magnitude of the probability (likelihood) of the risk occurring (refer to Table B1-2).

Table B1-1 Classification of consequence

Classification	Definition
Severe	Short-term (acute) risk to human health likely to result in 'significant harm' as defined by the Environmental Protection Act 1990, Part IIA. Short-term risk of pollution of a sensitive water resource. Catastrophic damage to buildings or property. A short-term risk to an ecosystem, or organism forming part of such ecosystem.
Medium	Chronic damage to human health. Pollution of a sensitive water resource. A significant change to an ecosystem, or organism forming part of such ecosystem.
Mild	Pollution of a non-sensitive water resource, such as non-classified groundwater. Damage to buildings, structures and services.
Minor	Harm, which may result in a financial loss, or expenditure to resolve. Non-permanent effects to human health, which could easily be prevented by means such as personal protective clothing. Easily repairable effects of damage to buildings, structures and services.

Table B1-3 presents the risk assessment matrix and Table B1-4 defines the risk classifications.

Table B1-2 Classification of probability

Classification	Definition
High likelihood	There is a pollution linkage and an event that either appears very likely in the short term and almost inevitable over the long-term, or there is evidence at the receptor of harm or pollution.
Likely	There is a pollution linkage and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible over the short term and likely over the long term.
Low likelihood	There is a pollution linkage and circumstances are possible under which an event could occur. However, it is not certain that such an event would take place.
Unlikely	There is a pollution linkage, but circumstances are such that it is improbable that an event would occur even in the very long term.

Table B1-3 Comparison of consequence against probability

		Consequence			
		Severe	Medium	Mild	Minor
Probability	High likelihood	Very High Risk	High risk	Moderate risk	Moderate / low risk
	Likely	High risk	Moderate risk	Moderate / low risk	Low risk
	Low likelihood	Moderate risk	Moderate / low risk	Low risk	Very low risk
	Unlikely	Moderate / low risk	Low risk	Very low risk	Very low risk

Table B1-4 Risk classifications

Risk classification	Description of risk
Very high	There is a high probability that severe harm could arise to a designated receptor from an identified pollutant linkage at the Site without appropriate remediation action. OR there is evidence that severe harm to a designated receptor is currently happening. The risk, if realised, is likely to result in substantial liability.
High	Harm is likely linkage at the to arise to a designated receptor from an identified pollutant Site without appropriate remediation action. Realisation of the risk is likely to present a substantial liability.
moderate	It is possible that without appropriate remediation action harm could arise to a designated receptor from an identified pollutant linkage. It is relatively unlikely that any such harm would be severe, and if any harm were to occur it is more likely that such harm would be relatively mild.
Low	It is possible that harm could arise to a designated receptor from an identified pollutant linkage.

Risk classification	Description of risk
	It is likely that if any harm was realised, at worst any effects would be mild.
Very low	The presence of an identified pollutant linkage does not give rise to the potential to cause harm to a designated receptor.

B2 Human health

The UK statutory guidance suggests that generic soil quality guideline values may be used for an initial screening of soil contamination results in relation to human health risk assessment. Generic assessment criteria (GAC) provide an indication of concentrations in soil below which the long-term human health risks for various generic land-use scenarios are considered to be minimal. Concentrations above GAC do not necessarily indicate that significant contamination is present, but rather that further assessment or risk management measures may be warranted.

A generic commercial end use has been considered in the assessment to provide an initial appraisal of the results. The generic commercial end use is based on assessing risks to a female office worker, spending her entire working life (full time) on Site. She frequently uses soft landscaping and is directly exposed to soils being assessed via ingestion, dermal contact, and inhalation of dust and vapour both outside and inside the building. Future users of the Site will not come into direct contact with potential contamination in soils or dust on the Site because there is no soft landscaping.

Arup has derived GAC using CLEA 1.07 which use C4SL exposure parameters but maintain the traditional minimal risk toxicological benchmarks. Input data for the toxicological effects, physical characteristics and contaminant fate and transport parameters for the determinands have been taken from sources published by the Environment Agency and other industry sources (including LQM/CIEH and CL:AIRE). Further details of the derivation of the Arup GACs including changes made to the default user chemical database and exposure assumptions are available on request.

B2.1 Asbestos in soil

Work with asbestos in the UK is controlled by the Health and Safety Executive (HSE) and the Control of Asbestos Regulations (CAR) 2012. Certain activities, such as working with asbestos insulation, coatings, and insulting board require licensing and notification to the appropriate authority before work commences. All work with asbestos materials must be initially assessed by a competent person and various requirements arise from that assessment.

The HSE has published a Code of Practice for CAR 2012 which does not include specific guidance regulating asbestos in soils. In March 2014, CIRIA published C733 Asbestos in Soil and Made Ground: A guide to understanding and managing risks [18].

In order for asbestos found within soil to pose a risk to health, it has to be present in a form that can release fibres to air for inhalation (or may do after it has been disturbed). The potential for fibre release is likely to be relatively lower when asbestos is present in soil in the form of cements or other 'bonded' materials and higher when friable forms or unconsolidated forms such as 'free fibres' are present. However, even cemented and bonded ACM may eventually degrade and release fibres and can be disturbed and broken during construction for instance.

The release of fibres from the soil into the air can occur via wind-blown disturbance or physical disturbance either during Site development (e.g. construction, remediation or earthworks) or during Site use after development. The concentration of airborne fibres released is influenced by many factors including asbestos type, ACM type and condition/state, depth, distribution and concentration in soil, soil type, and soil moisture content. There is limited data on the release of airborne fibres from soils in real world environments, but soil moisture content has a particularly significant impact. In laboratory studies, the addition of 5% moisture to a dry soil reduced airborne fibre release by 80-95% and no airborne fibre were detected when the soil moisture content was greater than 15%.

There are currently no generic assessment criteria for asbestos in soils and C733 makes it clear that such criteria are unlikely in the near future due to uncertainties on the mechanisms for fibre release, calculating the likely exposure and the risk of harm at low levels of exposure. Instead the report recommends Site specific assessment based on multiple lines of evidence.

In 2016 a guide was published by CL:AIRE referred to as 'Interpretation for managing and working with asbestos in soils CAR-SOIL™'[17], which is currently the most authoritative guide on the topic and should be followed. CAR-SOIL™ confirms that all work with asbestos in soil should be carried out under a 'plan of work' and defines the contents of that plan.

Analysis has been performed to the lowest possible accredited detection limit routinely reported by laboratories (0.001%) and a robust strategy to sever plausible pollutant linkages will be adopted in the remediation strategy, to reduce exposure as low as reasonably practicable during development and prevent exposure after development.

B3 Controlled waters

Assessment of risks to water resources is completed in general accordance with the Environment Agency (2017) Groundwater Protection guides [20] for England and Wales.

The Environment Agency has developed specific guidance known as the Remedial Targets Methodology (RTM) [31] for the tiered assessment of risks to controlled waters. The first stage of quantitative risk assessment is undertaken by an initial screening of reported leachate and/or groundwater/surface water concentrations against selected published water quality standards (WQS) for potential contaminants of concern to identify those contaminants which warrant further detailed investigation.

The WQS are selected to assess potential risks to the controlled water receptors identified in the preliminary conceptual Site model. The WQS can be derived in several ways with consideration to:

- whether the substance is classified as hazardous or non-hazardous under the Water Framework Directive (2006/118/EC); (2000/60/EC) and Groundwater Daughter Directive
- background concentrations in the aquifer; and
- published guidance such as Environmental Quality Standards (EQS) that are protective of surface waters or the Water Supply (Water Quality) Regulations 2016 that are protective of drinking water.

Where groundwater contamination has been identified, the general approach is to use a published environmental standard which is relevant to the current or intended use of the aquifer. The following regulations and guidance have been referenced to select appropriate WQS for controlled waters:

- Environmental Quality Standards (EQS) for fresh water and saltwater listed in the Water Framework Directive (WFD) 2015 [32]
- Other values not listed in WFD and taken from EA operational EQS [33]
- UK Drinking Water Standards (UK DWS) [34]
- EU Drinking Water Standards (EU DWS) [35]
- World Health Organisation (WHO) drinking water standards [36][37]
- United States Environmental Protection Agency (USEPA) 2018 drinking water standards [38] and national aquatic life criteria [39]

The use of published conservative WQS allows for an initial assessment of results. Results that are above the WQS do not necessarily represent a risk to controlled waters; alternative lines of evidence should be considered, such as (but not limited to):

- Background / upgradient groundwater and surface water concentrations or regional water quality. Assessment of the downgradient water quality.
- Assessment against alternative EQS, for example based on an average or hardness corrected WQS.
- Review of trends in concentrations (e.g. seasonal, tidal) and lateral/vertical distribution.
- Assessment of whether the concentration is erroneous or anomalous and has been biased, for example, because of high sediment content.
- Comparison against compound properties, such as solubility limit.
- Review of soil, soil leachate and groundwater concentrations and field records (e.g. logs, in situ monitoring) to establish whether there is a correlation.
- Consideration of the conceptual Site model with assessment of contaminant linkages to establish whether there is a plausible pathway and/or receptor.
- Where a potentially unacceptable linkage remains, generation of Site specific controlled waters assessment criteria should be considered based on a detailed quantitative risk assessment.

The controlled water receptors include surface water in the neighbouring dock and groundwater within the RTD secondary A aquifer and Chalk principal aquifer. The freshwater EQS value has been prioritised as the most appropriate WQS for the potential contaminants of concern. Where no UK published value exists then other published values have been selected in the following hierarchy:

- UK DWS
- EU DWS
- WHO
- USEPA

No criteria are available at all for certain PAH and for TPH. In the absence of criteria for TPH the withdrawn DWS of 0.01mg/l has been considered as an initial assessment.

B4 Ground gas

The following published guidance on the assessment of ground gas has been used in the assessment:

- CIRIA 2007 Report C665 Assessing risks posed by hazardous ground gases to buildings [21];
- BS 8485 (2019) Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings [22]; and
- Card, Wilson and Haines (2009) Ground gas handbook [23].

The Ground gas handbook describes a process of deriving gas screening values (GSV) for hazardous ground gases (it summarises the guidance presented in above). The method uses both gas concentrations and borehole flow rates to define a range of characteristic situations (CS1 to CS6) based on limiting borehole gas volume flow for methane and carbon dioxide. The GSV is calculated by multiplying the borehole flow rate (litres per hour) by the gas concentration.

B5 Waste assessment methodology

B5.1 Framework

There are three types of permitted landfill (inert, non-hazardous and hazardous) and four principal types of waste, as outlined below:

- Inert; generally uncontaminated natural soils and certain clean construction materials such as crushed concrete. The material may be disposed of to an inert landfill without testing. If the natural soils are suspected as contaminated then it may be classed as inert if it satisfies the inert waste acceptance criteria (WAC). Made Ground would typically be required to be tested and pass the WAC in order to be classed as inert. Inert materials may also be used as a construction material in other Sites given appropriate waste management permitting;

- Hazardous; defined by the analysis of 'total' chemical parameters to assess the hazard properties. The classified waste may only be disposed of to a hazardous landfill (following treatment) if in addition it satisfies the TOC and leachability WAC;

- Stable non-reactive hazardous waste; defined in a similar manner to hazardous waste (i.e. classed as hazardous) but then satisfying a stricter set of WAC. Following treatment, it may be disposed of in specifically designed separate cells in non- hazardous landfills (if the operator has obtained a permit to operate these cells); and

- Non-hazardous waste; if the waste is not classified as inert or hazardous then it is non-hazardous. There is no WAC for non-hazardous waste.

B5.2 Hazardous waste classification

The following documents were used to carry out the initial waste classification and disposal assessment of Made Ground and natural soil arisings generated by the development:

- Environment Agency (2018), Waste Classification, Guidance on the classification and assessment of waste (1st Edition v1.1), Technical guidance WM3 [40];

- The Hazardous Waste (England and Wales) Regulations [41]; and

- Table 3.2 of Annex VI to Regulation (EC) No. 1272/2008 [42].

Metals may be classified as hazardous based on a number of potential hazardous properties including carcinogenic (HP7 lowest threshold 1,000mg/kg), ecotoxic (HP14 lowest threshold 2,500mg/kg), acute toxicity (HP6 lowest threshold 2,500mg/kg), toxic for reproduction (HP10 lowest threshold 3,000mg/kg) and specific organ toxicity (HP5 lowest threshold 100,000mg/kg). With the exception of HP7, the other classifications are additive i.e. the concentrations are converted to the worst case (for harm) compound and added together before comparison with the thresholds.

Hydrocarbons in contaminated soils are generally categorised against the hazardous properties carcinogenic (HP7) and ecotoxic (HP14). For HP7, waste would be defined as hazardous if category 1 or 2 carcinogenic compounds (e.g. benzene) exceeded 0.1% (1,000mg/kg), or category 3 compounds (e.g. diesel) exceeded 1% (10,000mg/kg). TPH is an aggregate parameter that includes a range of category 1, 2 and 3 compounds, along with other elements not classified as carcinogenic. In most circumstances TPH contaminated soil and stones should be assessed as 'unknown oil' (unless there is a specific documented record or a consistent hydrocarbon profile to indicate diesel or weathered diesel being the contaminating oil) and a worst case should be assumed.

For an unknown oil if the concentration of TPH is ≥0.1% the waste will be HP7 Carcinogenic and HP11 Mutagenic unless the concentration of benzo[a]pyrene is <0.01% of the TPH concentration.

The hazardous waste threshold for asbestos is 0.1% w/w. It is noted that the quantification weight percentage of asbestos is difficult to achieve as asbestos can be present in a wide range of forms. While it is likely that ACM, such as cemented asbestos, board or lagging, will exceed such a threshold, the quantity of ACM in a bulk sample will often be below this level. WM3 states that where a waste contains identifiable pieces of ACM (that can be identified as potentially being asbestos by a competent

person if examined by the naked eye) then these pieces must be assessed separately. If the ACM cannot be segregated the waste is regarded as hazardous if the concentration of asbestos in the ACM pieces alone is greater than 0.1%w/w.

Appendix C

Chemical data screening tables

C1 Soil screening tables

Appendix C1: Human Health Risk Assessment (2001 Ground Investigation)

Concentration exceeds Screening Criteria

Limit of Detection exceeds Screening Criteria

Key at bottom of table

Exploratory Hole						BH516	BH516	BH516	BH516	BH519	BH519	BH519	BH520	BH520	TP602	TP602	TP602	TP604	TP604	TP611	TP611	TP611	TP612	TP612	TP612	TP612	TP613
Depth (m)						**2.1**	**3.1**	**4.1**	**4.4**	**3.1**	**4.1**	**5.0**	**2.15**	**4.1**	**1.1**	**2.0**	**3.0**	**0.15**	**1.2**	**0.15**	**2.1**	**4.0**	**0.15**	**1.0**	**2.0**	**4.0**	**0.15**
Strata						**Made Ground**	**Made Ground**	**Made Ground**	**Made Ground**	**Made Ground**	**Made Ground**	**Alluvium**	**Made Ground**	**Made Ground**	**Made Ground**	**Made Ground**	**Made Ground**	**Made Ground**	**Made Ground**	**Made Ground**	**Made Ground**	**Made Ground**	**Made Ground**	**Made Ground**	**Alluvium**	**Alluvium**	**Made Gorund**
Determinand	**Units**	**Screening Criteria[*1] Commercial (1% SOM)**	**No. of Tests**	**Minimum**	**Maximum**																						
Arsenic	mg/kg	**635**	**37**	**7.0**	**210**	18	16	16	17	11	13	7	17	27	20	19	17	18	20	20	19	23	36	34	20	15	20
Boron (Soluble)	mg/kg	**236000**	**37**	**0.5**	**5.1**	3.8	4.3	2.5	4.3	0.93	2.9	2	0.95	2	0.73	1	0.53	0.82	0.68	1.1	0.7	0.73	1.3	1.4	3.6	5.1	1.1
Cadmium	mg/kg	**190**	**37**	**<0.50**	**1.2**	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	<0.5	<0.5	< 0.50	0.53	< 0.50	< 0.50	< 0.50
Chromium (Total)	mg/kg	**8570**	**37**	**11**	**120**	20	21	24	17	42	23	20	18	30	28	45	34	55	31	22	81	29	17	36	22	19	20
Copper	mg/kg	**68300**	**37**	**5.6**	**500**	24	24	20	19	31	25	10	39	160	25	20	15	19	13	120	15	12	49	74	330	24	87
Lead	mg/kg	**2300**	**37**	**8.8**	**790**	64	59	30	8.8	33	54	15	140	200	140	76	44	120	100	790	22	24	160	370	730	58	400
Mercury	mg/kg	**1120**	**37**	**<0.10**	**1.6**	0.11	0.12	< 0.10	< 0.10	0.25	0.41	0.24	0.51	0.45	0.41	0.31	0.28	0.31	0.24	0.91	<0.1	<0.1	0.81	0.65	0.97	0.41	1.5
Selenium	mg/kg	**12261**	**37**	**0.1**	**1.6**	0.68	0.78	1	1.6	0.35	0.88	0.57	0.59	1.6	0.3	0.33	0.18	0.36	0.21	0.37	0.19	0.13	0.57	0.63	0.81	0.76	0.52
Zinc	mg/kg	**730000**	**37**	**23**	**700**	68	70	66	30	28	69	45	190	180	93	75	38	87	71	340	38	51	140	330	130	63	140
Cyanide	mg/kg	**16200**	**37**	**<0.50**	**2.4**	< 0.50	< 0.50	< 0.50	1.6	< 0.50	1	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	1.3	< 0.50	< 0.50	0.98	0.67	0.62	2.4	< 0.50	1.2	< 0.50	1.1
Phenols (Total)	mg/kg	**26000**	**37**	**<0.50**	**2.9**	1.6	1.4	1.5	0.86	0.76	0.78	0.54	0.61	1.3	0.58	0.74	< 0.50	< 0.50	< 0.50	< 0.50	<0.5	<0.5	0.74	< 0.50	< 0.50	1.4	0.63
pH	pH units	**-**	**37**	**6.0**	**11**	8.2	8.5	8.5	7.6	9.3	8.3	8.5	9.4	10.2	10.8	9.2	10.7	9.4	9.1	9.6	8.9	6	9.2	9.1	8.1	8	9.5
Asbestos Identification		**Presence**	**37**	**0.0**	**0.0**	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Sulphate (Total) as S03	mg/kg	**-**	**37**	**640**	**5100**	2500	1400	1400	4400	1000	1600	810	3400	2600	1300	920	980	1200	1200	1900	990	980	4400	1500	3400	3500	1500
Sulphate (W/S) as S03	g/l	**-**	**15**	**0.1**	**0.9**	0.26			0.24				0.82	0.91									0.36		0.38	0.36	
Sulphide as S	mg/kg	**-**	**37**	**<5.0**	**76**	20	12	12	20	40	16	< 5.0	12	52	8	20	< 5.0	8	< 5.0	8	16	<5	16	16	8	8	16
Sulphur (Elemental)	mg/kg	**-**	**37**	**<100**	**600**	460	110	280	170	260	< 100	< 100	< 100	300	< 100	< 100	< 100	< 100	< 100	< 100	<100	<100	< 100	< 100	120	450	< 100
TPH (Total)	mg/kg	**-**	**2**	**340**	**490**																						
TPH by GC (C6 - C40)	mg/kg	**-**	**30**	**<50**	**1700**	< 50	< 50	< 50	< 50	< 50	< 50		79		< 50	< 50	< 50		< 50	83	<50	<50	67	< 50		< 50	270
TPH by GC (C6-Cl0)	mg/kg	**-**	**30**	**<50**	**<50**	< 50	< 50	< 50	< 50	< 50	< 50		< 50		< 50	< 50	< 50		< 50	< 50	<50	<50	< 50	< 50		< 50	< 50
TPH by GC (ClO - C20)	mg/kg	**-**	**30**	**<50**	**210**	< 50	< 50	< 50	< 50	< 50	< 50		<50		< 50	< 50	< 50		< 50	< 50	<50	<50	< 50	< 50		< 50	< 50
TPH by GC (C20-C40)	mg/kg	**-**	**30**	**<50**	**1600**	< 50	< 50	< 50	< 50	< 50	< 50		79		< 50	< 50	< 50		< 50	83	<50	<50	67	< 50		< 50	270
PAH (Total)	mg/kg	**-**	**31**	**<10**	**1000**	< 10	< 10	< 10	1000	12	< 10		57		< 10	19	63		< 10	13	<10	<10	31	15		< 10	48

Notes:

[*1] - All Screening Criteria based upon Commercial land use at 1% SOM

Appendix C1: Human Health Risk Assessment (2001 Ground Investigation)

Concentration exceeds Screening Criteria

Limit of Detection exceeds Screening Criteria

Key at bottom of table

Exploratory Hole						TP613	TP613	TP614	TP614	TP614	TP614	TP614	TP621	TP621	TP621	TP622	TP622	TP622	TP623	TP623	TP623
Depth (m)						1.1	3.0	0.25	1.0	2.0	2.6	3.3	0.25	0.75	2.0	1.1	2.1	3.1	0.25	1.1	2.4
Strata						Made Gorund	Made Gorund	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground
Determinand	**Units**	**Screening Criteria[*1] Commercial (1% SOM)**	**No. of Tests**	**Minimum**	**Maximum**																
Arsenic	mg/kg	**635**	**37**	**7.0**	**210**	11	17	20	17	19		23	19	210	22	16	18	17	13	14	14
Boron (Soluble)	mg/kg	**236000**	**37**	**0.5**	**5.1**	1.3	1.6	1.1	1.3	0.97		1.5	1.2	0.88	0.52	1.4	2.1	2.1	1.7	0.71	3.6
Cadmium	mg/kg	**190**	**37**	**<0.50**	**1.2**	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50		1.2	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Chromium (Total)	mg/kg	**8570**	**37**	**11**	**120**	23	11	31	20	25		47	19	120	34	20	25	22	25	53	20
Copper	mg/kg	**68300**	**37**	**5.6**	**500**	44	5.6	69	70	58		500	42	120	30	54	68	65	100	11	24
Lead	mg/kg	**2300**	**37**	**8.8**	**790**	130	11	430	380	390		430	220	480	28	280	370	400	170	19	72
Mercury	mg/kg	**1120**	**37**	**<0.10**	**1.6**	0.59	0.23	1.1	1.1	1.6		0.54	0.14	< 0.10	< 0.10	0.87	0.75	1.3	< 0.10	< 0.10	0.11
Selenium	mg/kg	**12261**	**37**	**0.1**	**1.6**	0.49	0.65	0.47	0.54	0.54		0.84	0.33	0.28	0.13	0.57	0.35	0.36	0.49	0.29	0.72
Zinc	mg/kg	**730000**	**37**	**23**	**700**	96	23	200	130	190		200	180	700	57	130	150	200	170	38	69
Cyanide	mg/kg	**16200**	**37**	**<0.50**	**2.4**	0.7	< 0.50	< 0.50	< 0.50	0.52		< 0.50	< 0.50	1	< 0.50	1.2	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Phenols (Total)	mg/kg	**26000**	**37**	**<0.50**	**2.9**	0.51	0.6	0.65	0.76	0.88		0.56	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	2.9	< 0.50	1.7
pH	pH units	**-**	**37**	**6.0**	**11**	8.8	7.8	9.0	8.6	8.7		8.4	10.6	8.6	9	9.9	8.5	8.3	9.9	8.9	8.5
Asbestos Identification		**Presence**	**37**	**0.0**	**0.0**	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Sulphate (Total) as S03	mg/kg	**-**	**37**	**640**	**5100**	1100	3800	690	810	1100		1900	2200	2400	640	5100	4400	4800	3400	1500	2200
Sulphate (W/S) as S03	g/l	**-**	**15**	**0.1**	**0.9**		0.3						0.08	0.07		0.4	0.39	0.34	0.17		0.17
Sulphide as S	mg/kg	**-**	**37**	**<5.0**	**76**	16	48	8	12	< 5.0		16	< 5.0	20	< 5.0	8	12	12	76	12	20
Sulphur (Elemental)	mg/kg	**-**	**37**	**<100**	**600**	< 100	600	< 100	< 100	< 100		160	< 100	< 100	< 100	< 100	< 100	< 100	110	< 100	480
TPH (Total)	mg/kg	**-**	**2**	**340**	**490**						490	340									
TPH by GC (C6 - C40)	mg/kg	**-**	**30**	**<50**	**1700**	< 50	< 50		< 50	< 50		340	660	98		150		87	1700	97	< 50
TPH by GC (C6-Cl0)	mg/kg	**-**	**30**	**<50**	**<50**	< 50	< 50		< 50	< 50		< 50	< 50	< 50		< 50		< 50	< 50	< 50	< 50
TPH by GC (ClO - C20)	mg/kg	**-**	**30**	**<50**	**210**	< 50	< 50		< 50	< 50		210	< 50	< 50		< 50		< 50	170	< 50	< 50
TPH by GC (C20-C40)	mg/kg	**-**	**30**	**<50**	**1600**	< 50	< 50		< 50	< 50		130	660	98		150		87	1600	97	< 50
PAH (Total)	mg/kg	**-**	**31**	**<10**	**1000**	11	< 10		11	< 10	59	< 10	71	15		32		26	890	< 10	< 10

Notes:

[*1] - All Screening Criteria based upon Commercial land use at 1% SOM

Appendix C1: Human Health Risk Assessment (2016 Ground Investigation)

Concentration exceeds Screening Criteria

Limit of Detection exceeds Screening Criteria

Key at bottom of table

Exploratory Hole						BH801A	BH801A	BH801A	BH802	BH802	BH802	BH802	WS803	WS803	WS803	WS805	WS805	WS805	WS806	WS806	WS806	WS807	WS807	WS807	WS808	WS808	WS808	WS809	WS809	WS809
Soil Sample						609232	609233	609234	609089	609090	609091	609092	609083	609084	609085	609080	609081	609082	608559	608560	608561	609086	609087	609088	608553	608554	608555	608556	608557	608558
Depth (m)						0.8	3.5	6.0	0.8	1.3	4.0	8.5	0.4	1.7	3.5	0.3	1.7	2.7	0.3	0.8	1.5	0.3	1.5	2.5	0.3	1.5	2.5	0.3	1.5	3.5
Strata						Made Ground	Made Ground	River Terrace Deposits	Made Ground	Made Ground	Made Ground	River Terrace Deposits	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Alluvium
Determinand	**Units**	**Screening Criteria[*1] Commercial (1% SOM)**	**No. of Tests**	**Minimum**	**Maximum**																									
Antimony	mg/kg	**7350**	**25**	**1.1**	**13**	4.7	5.5	< 1.0	11	8.2	1.1	< 1.0	4.8	1.4	1.8	5.1	4	2.4	< 1.0	4.1	1.7	1.7	< 1.0	< 1.0	3.3	7.1	13	< 1.0	< 1.0	1.3
Arsenic	mg/kg	**635**	**25**	**6.8**	**25**	21	23	9.7	17	14	12	11	25	12	15	14	22	21	11	22	16	20	16	15	21	16	22	9.4	6.8	11
Beryllium	mg/kg	**12**	**25**	**0.36**	**1.4**	0.86	1	0.38	0.91	0.83	1.4	0.36	1.2	0.68	0.48	0.64	0.81	0.61	0.79	1.1	0.93	0.57	0.54	0.48	0.99	0.85	1.2	0.54	0.47	0.78
Boron	mg/kg	**236000**	**25**	**0.2**	**3.4**	2.5	2.6	0.2	1.4	0.9	1.5	0.3	1.6	1.7	0.9	2.7	3.4	1.3	1.9	2.7	2.9	3.4	< 0.2	1.5	0.8	1.1	0.7	1.1	0.4	3.1
Cadmium	mg/kg	**190**	**25**	**<0.2**	**0.6**	0.3	0.4	< 0.2	0.3	0.3	< 0.2	< 0.2	0.6	0.2	0.3	0.4	0.5	0.3	< 0.2	0.3	0.5	< 0.2	0.2	< 0.2	0.5	0.3	0.5	< 0.2	0.2	0.3
Chromium (Total)	mg/kg	**8570**	**25**	**12**	**49**	22	37	32	30	28	48	39	35	21	19	24	26	20	21	36	27	22	23	19	26	35	49	18	12	20
Copper	mg/kg	**68300**	**25**	**9.4**	**170**	70	170	16	78	37	25	12	100	22	26	49	59	34	23	93	77	22	13	9.4	76	85	110	14	21	24
Lead	mg/kg	**2300**	**25**	**8.8**	**1100**	160	210	26	140	110	47	14	1100	47	50	200	170	110	22	320	230	46	16	8.8	740	390	950	20	24	27
Mercury	mg/kg	**1120**	**25**	**<0.3**	**8.8**	0.9	8.8	< 0.3	0.4	0.6	< 0.3	< 0.3	1.5	< 0.3	< 0.3	0.8	0.8	0.5	0.4	1.5	1.2	0.3	< 0.3	< 0.3	0.6	0.5	1	< 0.3	< 0.3	< 0.3
Nickel	mg/kg	**983**	**25**	**11**	**40**	27	40	38	28	29	16	39	33	25	19	21	26	26	18	31	28	25	30	20	24	30	32	21	11	15
Selenium	mg/kg	**12261**	**25**	**<1.0**	**2.6**	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.6	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	2.6
Vanadium	mg/kg	**6360**	**25**	**20**	**61**	30	48	29	49	48	61	24	56	45	33	45	46	33	30	55	48	40	46	43	45	50	61	32	20	37
Zinc	mg/kg	**730000**	**25**	**16**	**430**	160	320	34	170	130	39	16	410	85	61	270	160	79	64	240	200	53	48	32	430	180	250	30	34	46
Total Cyanide	mg/kg	**16200**	**25**	**<1**	**<1**	< 1	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Total Phenols (monohydric)	mg/kg	**26000**	**25**	**<1.0**	**<1.0**	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
pH	pH Units	**-**	**25**	**7.9**	**12.1**	9.5	8.7	9.2	8.9	8.6	9.7	8.4	8.9	10.1	12.1	10.7	8.4	8.9	9.6	8.3	8.4	11.3	10	8.3	9.8	8.2	8.5	7.9	11.2	11
Total Organic Carbon (TOC)	%	**-**	**25**	**<0.1**	**1.5**	0.5	1.2	0.2	0.7	0.6	1.1	< 0.1	1.1	0.8	0.2	1.1	1.3	0.3	0.4	1.5	1.3	< 0.1	0.1	< 0.1	0.6	0.9	1.3	0.4	0.5	0.1
Soil Organic Matter[*2]	%	**-**	**-**	**<0.2**	**2.6**	0.9	2.1	0.3	1.2	1.0	1.9	<0.2	1.9	1.4	0.3	1.9	2.2	0.5	0.7	2.6	2.2	<0.2	0.2	<0.2	1.0	1.5	2.2	0.7	0.9	0.2
Asbestos in Soil	-	**Presence**	**22**	**Not-detected**	**Detected**	Not-detected	-	Not-detected	Not-detected	Detected	Not-detected	-	Not-detected	Detected	Not-detected	Not-detected	Detected	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected	Detected	-
Asbestos Type	-	**Presence**	**-**	**-**	**-**	-	-	-	-	Chrysotile - Loose Fibres	-	-	-	Chrysotile - Loose Fibres	-	-	Chrysotile - Loose Fibres	-	-	-	-	-	-	-	-	-	-	-	-	Anthophyllite - Loose Fibres	-
Asbestos Quantification Total	%	**Presence**	**4**	**<0.001**	**<0.001**	-	-	-	-	< 0.001	-	-	-	< 0.001	-	-	< 0.001	-	-	-	-	-	-	-	-	-	-	-	-	< 0.001	-
TPH - Aliphatic (EC5 - EC35)	mg/kg	**-**	**25**	**<10**	**240**	98	240	13	56	< 10	220	< 10	< 10	13	21	90	50	17	< 10	33	61	< 10	< 10	< 10	41	37	140	< 10	49	< 10
TPH - Aliphatic (EC5 - EC44)	mg/kg	**-**	**25**	**<10**	**350**	120	300	13	69	< 10	350	< 10	< 10	13	21	180	97	17	16	33	140	< 10	< 10	< 10	63	51	240	< 10	100	< 10
TPH - Aliphatic EC5-EC6	mg/kg	**3190**	**25**	**<0.1**	**<0.1**	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH - Aliphatic >EC6-EC8	mg/kg	**7780**	**25**	**<0.1**	**<0.1**	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH - Aliphatic >EC8-EC10	mg/kg	**2000**	**25**	**<0.1**	**<0.1**	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH - Aliphatic >EC10-EC12	mg/kg	**9690**	**25**	**<1.0**	**<1.0**	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH - Aliphatic >EC12-EC16	mg/kg	**58800**	**25**	**<2.0**	**8.6**	< 2.0	2.2	< 2.0	< 2.0	< 2.0	8.6	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	5.6	< 2.0	< 2.0	< 2.0
TPH - Aliphatic >EC16-EC35	mg/kg	**648000**	**25**	**<8.0**	**236**	97	236	13	48	< 8.0	213	< 8.0	< 8.0	< 8.0	19.2	88.2	45	14	< 8.0	27	55	< 8.0	< 8.0	< 8.0	37	31	143	< 8.0	47	< 8.0
TPH - Aliphatic >EC35-EC44	mg/kg	**648000**	**25**	**<8.4**	**130**	24	68	< 8.4	13	< 8.4	130	< 8.4	< 8.4	< 8.4	< 8.4	91	47	< 8.4	16	< 8.4	76	< 8.4	< 8.4	< 8.4	23	14	95	< 8.4	54	< 8.4
TPH - Aromatic (EC5 - EC35)	mg/kg	**-**	**25**	**<10**	**1000**	63	280	24	91	89	730	< 10	40	32	42	220	110	< 10	54	61	200	18	< 10	< 10	100	83	1000	< 10	170	15
TPH - Aromatic (EC5 - EC44)	mg/kg	**-**	**25**	**<10**	**1300**	120	420	47	110	150	1300	< 10	40	32	42	320	160	< 10	100	84	480	18	< 10	< 10	140	120	1300	< 10	330	30
TPH - Aromatic >EC5-EC7	mg/kg	**27**	**25**	**<0.1**	**<0.1**	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH - Aromatic >EC7-EC8	mg/kg	**56294**	**25**	**<0.1**	**<0.1**	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH - Aromatic >EC8-EC10	mg/kg	**3460**	**25**	**<0.1**	**<0.1**	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH - Aromatic >EC10-EC12	mg/kg	**16200**	**25**	**<1.0**	**1.9**	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.6	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.9	< 1.0	< 1.0	< 1.0
TPH - Aromatic >EC12-EC16	mg/kg	**36200**	**25**	**<2.0**	**50**	< 2.0	3.8	< 2.0	2.2	< 2.0	23	< 2.0	< 2.0	< 2.0	2.7	4.2	2.8	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	2.7	2.4	50	< 2.0	4	< 2.0
TPH - Aromatic >EC16-EC21	mg/kg	**26600**	**25**	**<10**	**300**	13	61	< 10	16	23	140	< 10	< 10	< 10	13	29	13	< 10	< 10	13	< 10	< 10	< 10	< 10	20	14	300	< 10	26	< 10
TPH - Aromatic >EC21-EC35	mg/kg	**28400**	**25**	**<10**	**690**	49	210	23	72	64	560	< 10	30	24	25	180	95	< 10	45	46	190	15	< 10	< 10	78	67	690	< 10	140	< 10
TPH - Aromatic >EC35-EC44	mg/kg	**28400**	**25**	**<8.4**	**580**	60	140	23	16	58	580	< 8.4	< 8.4	< 8.4	< 8.4	110	46	< 8.4	48	23	280	< 8.4	< 8.4	< 8.4	37	38	240	< 8.4	160	15
Benzene	ug/kg	**27**	**25**	**<1.0**	**<1.0**	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	**56294**	**25**	**<1.0**	**<1.0**	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	**5706**	**25**	**<1.0**	**<1.0**	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	**5923**	**25**	**<1.0**	**<1.0**	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	**6603**	**25**	**<1.0**	**<1.0**	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	**-**	**25**	**<1.0**	**<1.0**	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated Total EPA-16 PAHs	mg/kg	**-**	**25**	**<1.60**	**260**	11.3	82.5	< 1.60	27.6	28.6	78.2	< 1.60	8.1	5.66	< 1.60	31.1	14.3	< 1.60	8.4	10.4	9.69	< 1.60	< 1.60	< 1.60	17.3	10.2	260	< 1.60	19.7	13.5

Soil Sample						609232	609233	609234	609089	609090	609091	609092	609083	609084	609085	609080	609081	609082	608559	608560	608561	609086	609087	609088	608553	608554	608555	608556	608557	608558
Depth (m)						0.8	3.5	6.0	0.8	1.3	4.0	8.5	0.4	1.7	3.5	0.3	1.7	2.7	0.3	0.8	1.5	0.3	1.5	2.5	0.3	1.5	2.5	0.3	1.5	3.5
Strata						Made Ground	Made Ground	River Terrace Deposits	Made Ground	Made Ground	Made Ground	River Terrace Deposits	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Alluvium
Naphthalene	mg/kg	**193**	**25**	**<0.05**	**2.1**	< 0.05	0.44	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	2.1	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	**83200**	**25**	**<0.10**	**2.8**	< 0.10	0.54	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	2.8	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	**83700**	**25**	**<0.10**	**4.3**	< 0.10	0.41	< 0.10	0.59	< 0.10	0.91	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	4.3	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	**63000**	**25**	**<0.10**	**6.0**	< 0.10	0.62	< 0.10	0.39	< 0.10	1.1	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	6	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	**21900**	**25**	**<0.10**	**31**	1.1	7.5	< 0.10	3.7	3.3	9.1	< 0.10	0.55	< 0.10	< 0.10	2.9	1	< 0.10	0.66	1.2	0.65	< 0.10	< 0.10	< 0.10	1.4	0.68	31	0.28	1.7	1.9
Anthracene	mg/kg	**523000**	**25**	**<0.10**	**8.1**	0.21	1.7	< 0.10	0.61	0.69	2.9	< 0.10	< 0.10	< 0.10	< 0.10	0.75	0.24	< 0.10	0.18	0.22	0.39	< 0.10	< 0.10	< 0.10	0.33	0.21	8.1	< 0.10	0.41	0.35
Fluoranthene	mg/kg	**22600**	**25**	**<0.10**	**45**	1.9	14	< 0.10	5.1	6	15	< 0.10	1.5	0.64	< 0.10	5.7	2.3	< 0.10	1.7	2	1.5	< 0.10	< 0.10	< 0.10	3.2	1.7	45	0.47	3.7	2.6
Pyrene	mg/kg	**54200**	**25**	**<0.10**	**39**	1.7	13	< 0.10	4.3	5.1	13	< 0.10	1.3	0.7	< 0.10	5.1	2	< 0.10	1.5	1.7	1.4	< 0.10	< 0.10	< 0.10	2.7	1.5	39	0.38	3.2	2.2
Benzo(a)anthracene	mg/kg	**167**	**25**	**<0.10**	**22**	0.96	6.6	< 0.10	2.4	2.5	6.6	< 0.10	0.75	0.49	< 0.10	2.6	1.3	< 0.10	0.93	0.95	0.97	< 0.10	< 0.10	< 0.10	1.9	1	22	0.21	1.8	1.3
Chrysene	mg/kg	**346**	**25**	**<0.05**	**18**	1	6.5	< 0.05	1.9	2.1	5	< 0.05	0.66	0.39	< 0.05	2.5	1	< 0.05	0.57	0.76	0.96	< 0.05	< 0.05	< 0.05	1.2	0.78	18	0.18	1.4	0.98
Benzo[b]fluoranthene	mg/kg	**44**	**25**	**<0.10**	**23**	1.4	8.9	< 0.10	2.2	2.2	5.9	< 0.10	0.9	0.72	< 0.10	2.9	1.6	< 0.10	0.77	0.89	0.99	< 0.10	< 0.10	< 0.10	1.6	1.2	23	< 0.10	1.6	1.2
Benzo[k]fluoranthene	mg/kg	**1170**	**25**	**<0.10**	**13**	0.78	5.2	< 0.10	1.5	1.8	4.5	< 0.10	0.55	0.59	< 0.10	1.6	1.1	< 0.10	0.51	0.7	0.63	< 0.10	< 0.10	< 0.10	1.2	0.62	13	< 0.10	1.2	0.71
Benzo[a]pyrene	mg/kg	**35**	**25**	**<0.10**	**22**	0.94	7.3	< 0.10	2	2.1	6.4	< 0.10	0.75	0.86	< 0.10	2.7	1.5	< 0.10	0.69	0.78	0.92	< 0.10	< 0.10	< 0.10	1.5	0.98	22	< 0.10	1.8	1
Indeno[123-cd]pyrene	mg/kg	**501**	**25**	**<0.10**	**10**	0.67	4.1	< 0.10	1.1	1.1	3.1	< 0.10	0.46	0.51	< 0.10	1.8	0.87	< 0.10	0.42	0.47	0.54	< 0.10	< 0.10	< 0.10	0.91	0.68	10	< 0.10	1.1	0.54
Dibenz[ah]anthracene	mg/kg	**4**	**25**	**<0.10**	**2.5**	< 0.10	0.99	< 0.10	0.29	0.31	0.84	< 0.10	< 0.10	< 0.10	< 0.10	0.43	0.2	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.26	< 0.10	2.5	< 0.10	0.26	< 0.10
Benzo[ghi]perylene	mg/kg	**3930**	**25**	**<0.05**	**12**	0.74	5.4	< 0.05	1.5	1.4	4	< 0.05	0.64	0.76	< 0.05	2.3	1.1	< 0.05	0.53	0.62	0.75	< 0.05	< 0.05	< 0.05	1.2	0.83	12	< 0.05	1.4	0.73
Total PCBs	mg/kg	**-**	**25**	**<0.012**	**<0.012**	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012
PCB Congener 077	mg/kg	**-**	**25**	**<0.001**	**<0.001**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
PCB Congener 081	mg/kg	**-**	**25**	**<0.001**	**<0.001**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
PCB Congener 105	mg/kg	**-**	**25**	**<0.001**	**<0.001**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
PCB Congener 114	mg/kg	**-**	**25**	**<0.001**	**<0.001**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
PCB Congener 118	mg/kg	**-**	**25**	**<0.001**	**<0.001**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
PCB Congener 123	mg/kg	**-**	**25**	**<0.001**	**<0.001**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
PCB Congener 126	mg/kg	**-**	**25**	**<0.001**	**<0.001**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
PCB Congener 156	mg/kg	**-**	**25**	**<0.001**	**<0.001**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
PCB Congener 157	mg/kg	**-**	**25**	**<0.001**	**<0.001**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
PCB Congener 167	mg/kg	**-**	**25**	**<0.001**	**<0.001**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
PCB Congener 169	mg/kg	**-**	**25**	**<0.001**	**<0.001**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
PCB Congener 189	mg/kg	**-**	**25**	**<0.001**	**<0.001**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Glyphosate	µg/kg	**-**	**13**	**<10**	**68**	< 10	< 10	< 10	< 10	-	< 10	< 10	68	-	< 10	-	< 10	-	-	< 10	-	< 10	-	-	-	< 10	-	-	-	< 10
Atrazine	mg/kg	**9190**	**13**	**<0.10**	**<0.10**	< 0.10	< 0.10	< 0.10	< 0.10	-	< 0.10	< 0.10	< 0.10	-	< 0.10	-	< 0.10	-	-	< 0.10	-	< 0.10	-	-	-	< 0.10	-	-	-	< 0.10
Prometryn	mg/kg	**-**	**13**	**<0.10**	**<0.10**	< 0.10	< 0.10	< 0.10	< 0.10	-	< 0.10	< 0.10	< 0.10	-	< 0.10	-	< 0.10	-	-	< 0.10	-	< 0.10	-	-	-	< 0.10	-	-	-	< 0.10
Propazine	mg/kg	**-**	**13**	**<0.10**	**<0.10**	< 0.10	< 0.10	< 0.10	< 0.10	-	< 0.10	< 0.10	< 0.10	-	< 0.10	-	< 0.10	-	-	< 0.10	-	< 0.10	-	-	-	< 0.10	-	-	-	< 0.10
Terbuthylazine	mg/kg	**-**	**13**	**<0.10**	**<0.10**	< 0.10	< 0.10	< 0.10	< 0.10	-	< 0.10	< 0.10	< 0.10	-	< 0.10	-	< 0.10	-	-	< 0.10	-	< 0.10	-	-	-	< 0.10	-	-	-	< 0.10
Terbutryn	mg/kg	**-**	**13**	**<0.10**	**<0.10**	< 0.10	< 0.10	< 0.10	< 0.10	-	< 0.10	< 0.10	< 0.10	-	< 0.10	-	< 0.10	-	-	< 0.10	-	< 0.10	-	-	-	< 0.10	-	-	-	< 0.10
Trietazine	mg/kg	**-**	**13**	**<0.10**	**<0.10**	< 0.10	< 0.10	< 0.10	< 0.10	-	< 0.10	< 0.10	< 0.10	-	< 0.10	-	< 0.10	-	-	< 0.10	-	< 0.10	-	-	-	< 0.10	-	-	-	< 0.10
Cyanazine	mg/kg	**-**	**13**	**<0.10**	**<0.10**	< 0.10	< 0.10	< 0.10	< 0.10	-	< 0.10	< 0.10	< 0.10	-	< 0.10	-	< 0.10	-	-	< 0.10	-	< 0.10	-	-	-	< 0.10	-	-	-	< 0.10
2,4,5-T	ug/kg	**-**	**13**	**<20**	**<20**	< 20	< 20	< 20	< 20	-	< 20	< 20	< 20	-	< 20	-	< 20	-	-	< 20	-	< 20	-	-	-	< 20	-	-	-	< 20
2,4,5-TP	ug/kg	**-**	**13**	**<20**	**<20**	< 20	< 20	< 20	< 20	-	< 20	< 20	< 20	-	< 20	-	< 20	-	-	< 20	-	< 20	-	-	-	< 20	-	-	-	< 20
2,4-D	ug/kg	**-**	**13**	**<20**	**<20**	< 20	< 20	< 20	< 20	-	< 20	< 20	< 20	-	< 20	-	< 20	-	-	< 20	-	< 20	-	-	-	< 20	-	-	-	< 20
2,4-DB	ug/kg	**-**	**13**	**<20**	**<20**	< 20	< 20	< 20	< 20	-	< 20	< 20	< 20	-	< 20	-	< 20	-	-	< 20	-	< 20	-	-	-	< 20	-	-	-	< 20
Dicamba	ug/kg	**-**	**13**	**<20**	**<20**	< 20	< 20	< 20	< 20	-	< 20	< 20	< 20	-	< 20	-	< 20	-	-	< 20	-	< 20	-	-	-	< 20	-	-	-	< 20
Dichlorprop	ug/kg	**-**	**13**	**<20**	**<20**	< 20	< 20	< 20	< 20	-	< 20	< 20	< 20	-	< 20	-	< 20	-	-	< 20	-	< 20	-	-	-	< 20	-	-	-	< 20
Dinoseb	ug/kg	**-**	**13**	**<20**	**<20**	< 20	< 20	< 20	< 20	-	< 20	< 20	< 20	-	< 20	-	< 20	-	-	< 20	-	< 20	-	-	-	< 20	-	-	-	< 20
MCPA	ug/kg	**-**	**13**	**<20**	**<20**	< 20	< 20	< 20	< 20	-	< 20	< 20	< 20	-	< 20	-	< 20	-	-	< 20	-	< 20	-	-	-	< 20	-	-	-	< 20
MCPB	ug/kg	**-**	**13**	**<20**	**<20**	< 20	< 20	< 20	< 20	-	< 20	< 20	< 20	-	< 20	-	< 20	-	-	< 20	-	< 20	-	-	-	< 20	-	-	-	< 20
MCPP (Mecoprop)	ug/kg	**-**	**13**	**<20**	**29**	< 20	20	< 20	< 20	-	29	< 20	< 20	-	< 20	-	< 20	-	-	< 20	-	< 20	-	-	-	< 20	-	-	-	< 20
Picloram	ug/kg	**-**	**13**	**<20**	**<20**	< 20	< 20	< 20	< 20		< 20	< 20	< 20		< 20		< 20			< 20		< 20				< 20				< 20

Notes:
[*1] - All Screening Criteria based upon Commercial land use at 1% SOM
[*2] - Calculated from TOC from SOM = TOC x 1.72

C2 Groundwater screening tables

Appendix C2: Groundwater Screening Assessment (2001 Ground Investigation)

Concentration exceeds Screening Criteria

Limit of Detection exceeds Screening Criteria

Key at bottom of table

Exploratory Hole					BH514	BH514	BH516	BH517	BH517	BH520	BH520
Sample Identity					199026	202034	199027	199028	204338	199029	202036
Depth of Response Zone(m)					12.0 - 13.0	12.0 - 13.0	0.8 - 3.6	9.4 - 10.4	9.4 - 10.4	1.0 - 4.7	1.0 - 4.7
Date					12/11/2001	22/11/2001	12/11/2001	12/11/2001	28/11/2001	12/11/2001	22/11/2001
Strata					River Terrace Deposits	River Terrace Deposits	Made Ground / Alluvium	River Terrace Deposits	River Terrace Deposits	Made Ground / Alluvium	Made Ground / Alluvium
Determinand	Units	Screening Criteria	Standard	Number of samples							
pH	pH units	6.5 to 9	EQS	7	7.9	8	7.6	7.4	7.9	7.7	7.8
Cyanide (Total)	mg/l	0.001	EQS	7	0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chloride as Cl-	mg/l	250	EQS	7	390	400	110	630	720	45	54
BOD	mg/l	-	-	7	1.3	7.1	2.7	< 1.0	5	2	1.3
COD	mg/l	-	-	7	< 10	< 10	21	< 10	20	14	13
Ammonia as N	mg/l	0.3	EQS	7	1.5	1.6	6.5	3.9	5.1	1.6	0.85
Sulphate as S03	mg/l	-	-	7	72	51	100	79	77	180	220
Sulphide as S	mg/l	-	-	7	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	<0.050
Arsenic	µg/l	50	EQS	7	8.7	< 1.0	3.6	2.3	< 1.0	3.4	< 1.0
Cadmium	µg/l	0.25	EQS	7	< 0.50	< 0.500	< 0.50	< 0.50	< 0.500	< 0.50	< 0.500
Chromium	µg/l	4.7	EQS	7	2.54	< 2.00	5.62	3.02	< 2.00	3.47	< 2.00
Chromium (Hexavalent)	µg/l	3.4	EQS	7	-	-	-	-	-	-	-
Copper	µg/l	10.97	EQS	7	< 10	< 10	13	< 10	< 10	20	21
Lead	µg/l	3.8	EQS	7	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Mercury	µg/l	1	DWS	7	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Nickel	µg/l	4	EQS	7	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Selenium	µg/l	10	DWS	7	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Zinc	µg/l	23.16	EQS	7	< 10	16	16	30	< 10	18	22
Phenols (monohydric)	mg/l	0.0077	EQS	7	< 0.10	0.12	< 0.10	< 0.10	< 0.10	< 0.10	0.12
Total speciated Phenols	µg/l	7.7	EQS	7	<0.5	< 0.50	<0.5	<0.5	<0.5	<0.5	< 0.50
Phenols	µg/l	7.7	EQS	7	<0.1	< 0.10	<0.1	<0.1	<0.1	<0.1	< 0.10
Cresols	µg/l	-	-	7	<0.1	< 0.10	<0.1	<0.1	<0.1	<0.1	< 0.10
Xylenols	µg/l	-	-	7	<0.1	< 0.10	<0.1	<0.1	<0.1	<0.1	< 0.10
Trimethylphenol	µg/l	-	-	7	<0.1	< 0.10	<0.1	<0.1	<0.1	<0.1	< 0.10
TPH by GC (C6 - C40)	µg/1	10	DWS*	7	33	17	49	75	31	35	12
TPH by GC (C6 - C10)	µg/l	10	DWS*	7	< 10	<10	< 10	< 10	< 10	< 10	<10
TPH by GC (C1O - C20)	µg/l	10	DWS*	7	13	<10	15	18	11	12	<10
TPH by GC (C20 - C40)	µg/l	10	DWS*	7	20	17	34	57	20	23	12
PAH (Total)	µg/l	-	-	7	< 20	<20	< 20	< 20	<20	< 20	<20
Naphthalene	µg/l	2	EQS	7	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Acenaphthylene	µg/l			7	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Acenaphthene	µg/l	2000	USEPA	7	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Fluorene	µg/l	-	-	7	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Phenanthrene	µg/l	-	-	7	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Anthracene	µg/1	0.1	EQS	7	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Fluoranthene	µg/1	0.0063	EQS	7	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Pyrene	µg/1	-	-	7	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Benzo(a)anthracene	µg/l	-	-	7	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Chrysene	µg/1	-	-	7	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Benzo(b)fluoranthene	µg/l			7	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Benzo(k)fluoranthene	µg/l			7	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Benzo(a)pyrene	µg/l	0.00017	EQS	7	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Dibenzo(a,h)anthracene	µg/l	-	-	7	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Benzo(g,h,i)perylene	µg/1			7	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Indeno(1,2,3-cd)pyrene	µg/l			7	< 2.0	< 2.0	< 2.0	< 2.0	<2.0	< 2.0	< 2.0

Notes:

*1 - Screening Criteria comprise Water Quality Standards from sources indicated below, in the order of priority listed:

EQS - Environmental Quality Standards. Based upon Annual Average EQS

DWS - UK Drinking water standards

DWS* - Withdrawn 1989 UK Drinking water standard, in absence of other suitable criteria

WHO - World Health Organisation Drinking water standards

US EPA - United States Environmental Protection Agency

- Screening criteria for Copper, Lead, Manganese, Nickel and Zinc adjusted for bioavailability using M-BAT tool
- Where appropriate, screening are based upon typical recorded hardness of groundwater of c. 300mg/l

Appendix C2: Groundwater Screening Assessment (2016 Ground Investigation)

Concentration exceeds Screening Criteria

Limit of Detection exceeds Screening Criteria

Key at bottom of table

Exploratory Hole					BH801A	BH802
Sample Identity					609507	609508
Depth of Response Zone(m)					5.5-13.9	6.3-13.5
Date					28/07/2016	28/07/2016
Strata					River Terrace Deposits	River Terrace Deposits
Determinand	Units	Screening Criteria	Standard	Number of samples		
pH	pH Units	6.5 to 9	EQS	2	7.8	8.1
Total Cyanide	µg/l	1	EQS	2	< 10	< 10
Chloride	mg/l	250	EQS	2	770	1300
Ammoniacal Nitrogen as N	µg/l	300	EQS	2	1500	1500
Dissolved Organic Carbon (DOC)	mg/l	-	-	2	3.85	3.19
Hardness - Total	mgCaCO3/l	-	-	2	310	314
Calcium	mg/l	-	-	2	120	130
Magnesium	mg/l	-	-	2	0.05	0.078
Antimony	µg/l	5	DWS	2	1.7	1.1
Arsenic	µg/l	50	EQS	2	3.53	2.31
Beryllium	µg/l	-	-	2	< 0.1	< 0.1
Cadmium	µg/l	0.25	EQS	2	< 0.02	0.04
Chromium	µg/l	4.7	EQS	2	< 0.2	0.4
Copper	µg/l	11.0	EQS	2	1.4	2.7
Lead	µg/l	3.8	EQS	2	< 0.2	0.4
Manganese	µg/l	123	EQS	2	280	100
Mercury	µg/l	1	DWS	2	0.14	0.13
Nickel	µg/l	4	EQS	2	4.3	6
Selenium	µg/l	10	DWS	2	11	23
Vanadium	µg/l	20	EQS	2	2.9	4
Zinc	µg/l	23.16	EQS	2	6.9	1.3
Total Phenols (monohydric)	µg/l	7.7	EQS	2	< 10	< 10
TPH - Aliphatic (C5 - C35)	µg/l	-	-	2	< 10	< 10
TPH - Aliphatic (C5 - C44)	µg/l	-	-	2	< 10	< 10
TPH - Aliphatic >C5 - C6	µg/l	15000	WHO	2	< 10	< 10
TPH - Aliphatic >C6 - C8	µg/l	15000	WHO	2	< 10	< 10
TPH - Aliphatic >C8 - C10	µg/l	300	WHO	2	< 10	< 10
TPH - Aliphatic >C10 - C12	µg/l	300	WHO	2	< 10	< 10
TPH - Aliphatic >C12 - C16	µg/l	300	WHO	2	< 10	< 10
TPH - Aliphatic >C16 - C21	µg/l	-		2	< 10	< 10
TPH - Aliphatic >C21 - C35	µg/l	-		2	< 10	< 10
TPH - Aliphatic >C35 - C44	µg/l	-		2	< 10	< 10
TPH - Aromatic (C5 - C35)	µg/l	-		2	< 10	< 10
TPH - Aromatic (C5 - C44)	µg/l	-		2	< 10	< 10
TPH - Aromatic >C5 - C7	µg/l	10	WHO	2	< 10	< 10
TPH - Aromatic >C7 - C8	µg/l	700	WHO	2	< 10	< 10
TPH - Aromatic >C8 - C10	µg/l	300	WHO	2	< 10	< 10
TPH - Aromatic >C10 - C12	µg/l	90	WHO	2	< 10	< 10
TPH - Aromatic >C12 - C16	µg/l	90	WHO	2	< 10	< 10
TPH - Aromatic >C16 - C21	µg/l	90	WHO	2	< 10	< 10
TPH - Aromatic >C21 - C35	µg/l	90	WHO	2	< 10	< 10
TPH - Aromatic >C35 - C44	µg/l	-		2	< 10	< 10
Benzene	µg/l	10	EQS	2	< 1.0	< 1.0
Toluene	µg/l	74	EQS	2	< 1.0	< 1.0
Ethylbenzene	µg/l	20	EQS	2	< 1.0	< 1.0
p & m-xylene	µg/l	30	EQS	2	< 1.0	< 1.0
o-xylene	µg/l	30	EQS	2	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	15	UK DWS	2	< 1.0	< 1.0
Total PAHs	µg/l	-	-	2	< 0.16	< 0.16
Naphthalene	µg/l	2	EQS	2	< 0.01	< 0.01
Acenaphthylene	µg/l			2	< 0.01	< 0.01
Acenaphthene	µg/l	2000	USEPA	2	< 0.01	< 0.01
Fluorene	µg/l	-	-	2	< 0.01	< 0.01
Phenanthrene	µg/l	-	-	2	< 0.01	< 0.01
Anthracene	µg/l	0.1	EQS	2	< 0.01	< 0.01
Fluoranthene	µg/l	0.0063	EQS	2	< 0.01	< 0.01
Pyrene	µg/l	-	-	2	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	-	-	2	< 0.01	< 0.01
Chrysene	µg/l	-	-	2	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l			2	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l			2	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.00017	EQS	2	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l			2	< 0.01	< 0.01
Dibenzo(a,h)anthracene	µg/l	-	-	2	< 0.01	< 0.01
Benzo(g,h,i)perylene	µg/l			2	< 0.01	< 0.01
Total PCBs	µg/l	25	EQS	2	< 0.14	< 0.14
PCB Congener 28	µg/l	-	-	2	< 0.02	< 0.02
PCB Congener 52	µg/l	-	-	2	< 0.02	< 0.02
PCB Congener 101	µg/l	-	-	2	< 0.02	< 0.02
PCB Congener 118	µg/l	-	-	2	< 0.02	< 0.02
PCB Congener 138	µg/l	-	-	2	< 0.02	< 0.02
PCB Congener 153	µg/l	-	-	2	< 0.02	< 0.02
PCB Congener 180	µg/l	-	-	2	< 0.02	< 0.02
Glyphosate	µg/l	196	EQS	2	< 0.02	< 0.02
Atrazine	µg/l	0.6	EQS	2	< 0.05	< 0.05
Simazine	µg/l	1	EQS	2	< 0.05	< 0.05
Prometryn	µg/l	-	-	2	< 0.05	< 0.05
Propazine	µg/l	-	-	2	< 0.05	< 0.05
Terbuthylazine	µg/l	-		2	< 0.05	< 0.05
Terbutryn	µg/l	0.065	EQS	2	< 0.05	< 0.05
Trietazine	µg/l	-	-	2	< 0.05	< 0.05
Cyanazine	µg/l	-	-	2	< 0.05	< 0.05
2,4,5-T	µg/l	-	-	2	< 0.02	< 0.02
2,4,5-TP	µg/l	-	-	2	< 0.02	< 0.02
2,4-D	µg/l	0.3	EQS	2	9.8	< 0.02
2,4-DB	µg/l	-	-	2	< 0.02	< 0.02
Dicamba	µg/l	-	-	2	< 0.02	< 0.02
Dichlorprop	µg/l	-	-	2	< 0.02	< 0.02
Dinoseb	µg/l	-	-	2	< 0.02	< 0.02
MCPA	µg/l	80	EQS	2	< 0.02	< 0.02
MCPB	µg/l	-	-	2	< 0.02	< 0.02

Notes:

*1 - Screening Criteria comprise Water Quality Standards from sources indicated below, in the order of priority listed:
EQS - Environmental Quality Standards. Based upon Annual Average EQS
UK DWS - UK Drinking water standards
WHO - World Health Organisation Drinking water standards
US EPA - United States Environmental Protection Agency

- Screening criteria for Copper, Manganese, Nickel and Zinc adjusted for bioavailability using M-BAT tool
- Where appropriate, screening are based upon typical recorded hardness of groundwater of c. 300mg/l

C3 Leachability screening tables

Appendix C3: Soils Leachability Assessment (2016 Ground Investigation)

Concentration exceeds Screening Criteria

Limit of Detection exceeds Screening Criteria

Key at bottom of table

Exploratory Hole						WS808	WS808	WS808	WS809	WS809	WS809	WS806	WS806	WS806	WS805	WS805	WS803	WS803	WS807	WS807	BH802	BH802	BH801A	BH801A	BH801A
Sample Identity						608562	608563	608564	608565	608566	608567	608568	608569	608570	609111	609112	609113	609114	609115	609116	609117	609118	609235	609236	609237
Depth						0.30	1.50	2.30	0.30	1.50	3.50	0.30	0.80	1.50	0.30	2.70	0.40	1.70	0.30	2.50	1.30	8.50	0.80	3.50	6.00
Strata						Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Alluvium	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Terrace Deposits	Made Ground	Made Ground	Terrace Deposits
Determinant	**Units**	**Screening Criteria*1**	**Standard*1**	**Number of samples**	**Number of Exceedences**																				
Antimony	mg/l	0.005	**DWS**	**21**	**10**	0.018	0.029	0.039	0.043	0.036	< 0.0017	< 0.0017	< 0.0017	0.025	0.028	0.033	< 0.0017	< 0.0017	0.042	< 0.0017	< 0.0017	0.024	< 0.0017	< 0.0017	< 0.0017
Arsenic	mg/l	0.05	**EQS**	**21**	**0**	0.0199	0.0171	0.0103	< 0.0011	0.0196	< 0.0011	< 0.0011	0.0273	0.0093	0.004	0.011	0.0033	0.0145	0.0099	0.0069	0.0087	0.0074	0.0229	0.0257	0.0143
Barium	mg/l	0.7	**WHO**	**21**	**0**	0.0529	0.0331	0.0382	0.056	0.0257	0.0856	0.0574	0.05	0.0437	0.0674	0.0147	0.0387	0.0337	0.0403	0.0274	0.0443	0.0084	0.0379	0.0425	0.0329
Cadmium	mg/l	0.00025	**EQS**	**21**	**2**	0.0003	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0004	< 0.0001	< 0.0001	< 0.0001
Chromium	mg/l	0.0047	**EQS**	**21**	**3**	0.0053	0.0029	0.0022	0.0005	0.0005	0.0049	0.0021	0.0043	0.0038	0.0073	< 0.0004	0.0044	0.0019	0.0037	0.0013	0.0015	0.0016	0.0035	0.003	0.0016
Copper	mg/l	0.011	**EQS**	**21**	**7**	0.0062	0.019	0.023	< 0.0007	0.007	< 0.0007	0.017	0.0043	0.0097	0.021	0.0022	0.0092	0.015	0.0051	0.01	0.018	0.0039	0.0088	0.02	0.004
Lead	mg/l	0.0038	**EQS**	**21**	**12**	0.095	0.027	0.055	< 0.0010	0.0022	0.0035	0.0043	0.0077	0.012	0.003	< 0.0010	0.11	0.015	< 0.0010	0.0022	0.043	0.0025	0.044	0.013	0.014
Mercury	mg/l	0.001	**DWS**	**21**	**0**	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.001	< 0.0005	0.0006	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Molybdenum	mg/l	0.07	**WHO**	**21**	**0**	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	0.0074	0.0012	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004
Nickel	mg/l	0.01	**EQS**	**21**	**0**	0.0018	0.0048	0.0015	0.0019	0.0019	0.0062	0.0031	0.0024	0.0037	0.0027	< 0.0003	0.0029	0.003	0.0009	0.0004	0.003	0.002	0.0023	0.0024	0.0054
Selenium	mg/l	0.01	**DWS**	**21**	**2**	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	0.013	< 0.0040	< 0.0040	< 0.0040	0.016
Zinc	mg/l	0.023	**EQS**	**21**	**2**	0.067	0.023	0.021	0.0042	0.0066	0.0098	0.0055	0.0097	0.009	0.0049	0.0061	0.055	0.021	0.0042	0.0073	0.02	0.0074	0.021	0.017	0.012
Chloride	mg/l	250	**EQS**	**20**	**0**	2.6	22	2	2.4	3.7	4.8	0.65	0.78	2.8	3.9	1.6	1.3	0.65	2	0.39	1.2	2.6	1.6	6.9	1.9
Fluoride	mg/l	-	-	**20**	-	0.18	0.26	0.29	0.29	0.28	0.3	0.26	0.27	0.54	0.32	0.3	0.44	0.49	0.36	0.32	0.36	0.34	0.33	0.31	0.29
Sulphate	mg/l	-	-	**20**	-	4.4	3.1	12	89	8.7	49	33	65	28	89	5.6	3.4	4.5	7.4	0.55	5	4.8	23	48	1.2
Total dissolved solids	mg/l	-	-	**20**	-	60	100	60	170	70	180	130	130	100	190	50	60	60	80	10	50	40	80	110	20
Total monohydric phenols	mg/l	-	-	**20**	-	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Dissolved organic carbon	mg/l	-	-	**20**	-	7.21	7.85	6.09	3.35	7.37	3.41	2.61	2.39	10.1	7.43	2.45	3.6	4.38	2.88	2.19	4.14	2.52	3.56	3.4	1.53

Notes:

*1 - Screening Criteria comprise Water Quality Standards from sources indicated below, in the order of priority listed:

EQS - Environmental Quality Standards. Based upon Annual Average EQS

DWS - UK Drinking water standards

WHO - World Health Organisation Drinking water standards

- Screening criteria for Copper, Lead, Manganese, Nickel and Zinc adjusted for bioavailability using M-BAT tool
- Where appropriate, screening are based upon typical recorded hardness of groundwater of c. 300mg/l

Appendix C3 Waste Acceptance Criteria Leachate Assessment (2016 Ground Investigation)

Concentration exceeds Screening Criteria

Limit of Detection exceeds Screening Criteria

Key at bottom of table

Exploratory Hole			BH801A	BH801A	BH801A	BH802	BH802	WS803	WS803	WS805	WS805	WS806	WS806	WS806	WS807	WS807	WS808	WS808	WS808	WS809	WS809	WS809
Sample Identity			609235	609236	609237	609117	609118	609113	609114	609111	609112	608568	608569	608570	609115	609116	608562	608563	608564	608565	608566	608567
Depth			0.80	3.50	6.00	1.30	8.50	0.40	1.70	0.30	2.70	0.30	0.80	1.50	0.30	2.50	0.30	1.50	2.30	0.30	1.50	3.50
Strata			Made Ground	Made Ground	Terrace Deposits	Made Ground	Terrace Deposits	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Alluvium
Determinant[*1]	Units	Inert WAC[*2]																				
Arsenic	mg/kg	0.5	0.201	0.24	0.136	0.0764	0.0673	0.0283	0.124	0.0368	0.0956	< 0.0110	0.244	0.0792	0.0905	0.0614	0.169	0.142	0.0866	< 0.0110	0.165	< 0.0110
Barium	mg/kg	20	0.332	0.397	0.315	0.387	0.076	0.332	0.288	0.612	0.128	0.51	0.448	0.372	0.369	0.242	0.45	0.277	0.322	0.482	0.217	0.711
Cadmium	mg/kg	0.04	< 0.0008	< 0.0008	< 0.0008	< 0.0008	0.004	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	0.0028	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008
Chromium	mg/kg	0.5	0.03	0.028	0.015	0.014	0.014	0.038	0.016	0.066	< 0.0040	0.019	0.039	0.032	0.034	0.012	0.045	0.024	0.019	< 0.0040	< 0.0040	0.041
Copper	mg/kg	2	0.078	0.18	0.038	0.16	0.035	0.079	0.13	0.19	0.019	0.15	0.039	0.082	0.047	0.091	0.053	0.16	0.19	< 0.0070	0.059	< 0.0070
Mercury	mg/kg	0.01	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.005	< 0.0050	0.009	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050
Molybdenum	mg/kg	0.5	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	0.0114	< 0.0040	< 0.0040	< 0.0040	0.0629	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040
Nickel	mg/kg	0.4	0.02	0.022	0.051	0.026	0.018	0.025	0.025	0.024	< 0.0030	0.028	0.021	0.032	0.0084	0.0034	0.016	0.04	0.013	0.017	0.016	0.052
Lead	mg/kg	0.5	0.38	0.13	0.13	0.38	0.022	0.95	0.13	0.027	< 0.010	0.039	0.069	0.1	< 0.010	0.02	0.81	0.22	0.46	< 0.010	0.018	0.029
Antimony	mg/kg	0.06	< 0.017	< 0.017	< 0.017	< 0.017	0.21	< 0.017	< 0.017	0.25	0.28	< 0.017	< 0.017	0.21	0.39	< 0.017	0.15	0.24	0.33	0.37	0.31	< 0.017
Selenium	mg/kg	0.1	< 0.040	< 0.040	0.15	0.11	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040
Zinc	mg/kg	4	0.18	0.16	0.12	0.17	0.067	0.47	0.18	0.045	0.053	0.049	0.087	0.077	0.039	0.065	0.57	0.19	0.18	0.037	0.056	0.081
Chloride	mg/kg	800	14	64	18	11	24	11	5.6	36	14	5.8	7	23	18	3.4	22	180	17	21	31	40
Fluoride	mg/kg	10	2.9	2.9	2.8	3.2	3.1	3.8	4.2	2.9	2.6	2.3	2.4	4.6	3.3	2.9	1.6	2.2	2.4	2.5	2.4	2.5
Sulphate	mg/kg	1000	200	450	12	43	43	29	39	810	48	290	580	240	68	4.8	37	26	100	760	74	410
Total dissolved solids	mg/kg	4000	700	1000	190	440	360	510	510	1700	430	1200	1200	850	730	89	510	840	510	1500	590	1500
Total monohydric phenols	mg/kg	1	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dissolved organic carbon	mg/kg	500	31.2	31.8	14.6	36.2	22.9	30.9	37.4	67.5	21.2	23.2	21.4	85.8	26.4	19.4	61.2	65.5	51.3	28.9	62.2	28.3

Notes:

[*1] - Leachability testing carried out in accordance with BS EN 12457 Part 2

[*2] - Leachate results screened against Waste Acceptance Criteria for Inert Waste