Phase II Geoenvironmental Site Assessment
Egbert Street and Faversham Street

Reference:16-220-R1-1
Date: July 2023

PHASE II GEOENVIRONMENTAL SITE ASSESSMENT

Land Adjacent to Egbert and Faversham Street
Moston
Manchester
M40 5EL

Prepared for:

ON BEHALF OF

Report Ref: 16-220-r2
Date Issued: 31 July 2023

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EXECUTIVE SUMMARY

Site Address	Land adjacent to Egbert Street and Faversham Street, Moston, Manchester, M40 5EL	
Grid Reference	387561 E, 401157 N	
Site Area	0.064 Ha	
Proposed Development	E3P understands that Alan Johnston Partnership (AJP) is assisting their client, One Manchester, with the proposed acquisition and future redevelopment of two parcels of land off Egbert Street and Faversham Street in Moston, Greater Manchester for a presumed low-rise residential end-use with associated adopted estate roads and utility infrastructure. At the time of preparing this proposal, no proposed development plans were made available to E3P	
Current Site Use	The site comprises a roughly rectangular shape semi-enclosed parcel of land situated at the intersection of Egbert Street and Faversham Street. The site is lined with small wooden fences at the western and eastern site boundaries with large boulders placed at the eastern boundary. Surface coverage across the site comprises managed grasses with no areas of hardstanding and is topographically flat.	
Site History	A review of pertinent Ordnance Survey mapping circa 1848 shows the site was undeveloped with no significant identifiable features. Following mapping circa 1908, the site was occupied by residential dwellings which remained until circa 2020 mapping, where they were demolished. The present site composition is reflective of circa 2020 aerial imaging, with no notable structures or features recorded on the site.	
Environmental Setting	**Drift Geology**	Glacial Till – SAND, CLAY, and GRAVEL
	Bedrock Geology	Pennine Lower Coal Measures – SILTSTONE, SANDSTONE, and MUDSTONE
	Faults	No geological faults are recorded within an influencing distance to the site.
	Hydrogeology	Secondary Undifferentiated (superficial) and Secondary A (bedrock) aquifer.
	Hydrology	No surface water is recorded within 250 m of the site.
	Flood Risk	The site is situated within a Flood Risk Zone 1, therefore is considered to be at minimal risk from flooding.
Previous Reports	Curtins Phase 1 Preliminary Risk Assessment, Egbert Street and Faversham Street (REF: 077873-CUR-00-XX-RP-027-VO1) April 2021	

	• The site remained undeveloped until circa 1908 when residential dwellings were noted on the site. Dwellings remained until circa 2020 when they were demolished with present-day site composition first noted. • UXO risk is considered Moderate. • Risk from shallow coal mining is considered Low. • The risk of contamination from Made Ground deposits is considered to be **Moderate to Low**. • Risk to controlled waters is considered **Low**. • Risk of hazardous ground gases is considered **Moderate**.
Utility Locations	A low-pressure gas main and low-voltage electricity cables enter the site traversing north to south along the eastern boundary. Additionally, a low-voltage electricity cable is noted entering the site at the southwestern boundary and exiting the site at the centre of the western boundary.
Landfill Sites and Ground Gases	The site is situated 4 m E of a historical Inert and Industrial Waste site (1980 – 1981), therefore is a potential source generator of elevated hazardous ground gases on site.
Radon	The site is situated in an area where 1-3% of houses are affected by radon. Therefore, no special precautions are considered necessary in the construction of new residential dwellings.
Coal Mining/Land Stability	The site is situated within a Coal Mining Reporting Area, however, is not situated within a development high-risk zone. Therefore, the site is considered to be at low risk from coal mining-associated hazards.
Brine Workings	The site is not situated within the Cheshire Brine Compensation District.
Hazardous Installations	No hazardous installations have been identified within the site boundary.
Initial Conceptual Site Model	• **SOURCE**: Made Ground (Associated with former historic development) – Heavy Metals, non-volatile PAHs, volatile contaminants, hazardous ground gases, mobile contaminants, ACM, sulphates. • **PATHWAY**: Dermal contact/ingestions, vapour inhalation, inhalation/accumulation, Tainting of water supply, dust inhalation, vertical/lateral migration, sulphate attack on concrete. • **RECEPTOR**: Future site users, Groundwater (Secondary undifferentiated superficial, and secondary A bedrock aquifer), water pipes.

GROUND INVESTIGATION

Ground Investigation Works	E3P has completed an intrusive ground investigation comprising: • 7 x mechanically excavated trial pits, • 6 x window sample boreholes, • Construction of environmental monitoring installations.
Ground Conditions	**Made Ground – 0.0mbgl to 2.60mbgl** Made Ground deposits were encountered within all exploratory hole locations to depths of between 0.90 m and in excess of 3.00 m bgl although, in general, Made Ground was encountered to depths of less than 2.00 m bgl.

	Made Ground deposits typically comprised the following sequence: • Reworked topsoil of dark brown, gravelly, clayey medium sand with ash and sandstone (0.10-0.20 m thick). • Dark brown sandy gravel, with gravel of brick, concrete, glass, tile, sandstone and mudstone. Within TP104, WS101 and WS102, a soft, black-mottled blue gravelly clay with gravel of brick, concrete, and timber and tile inclusions was recorded at depths between 1.30 and 3.00 m bgl. Sweet odours and hydrocarbon odours were noted frequently in the Made Ground deposits.
Ground Conditions	**DRIFT – 0.90mbgl to 5.45mbgl** Drift deposits were encountered within the majority of exploratory locations with the exception of one location (TP103) where the full depth of Made Ground could not be proven due to underground obstructions. The drift deposits are uniform, generally comprising a firm to stiff, low strength, dark blueish grey, yellow-and-black mottled CLAY with gravel of sandstone and mudstone. Again, sweet odours and slight hydrocarbon odours were frequently noted within the natural deposits underlying the Made Ground.
	SOLID – Not Encountered The solid geology was not encountered within the exploratory holes. Nearby BGS boreholes indicate rockhead to be deeper than 8.5 m bgl.
	GROUNDWATER – 1.30mbgl to 3.00mbgl Groundwater was encountered within 4 nr of the exploratory hole locations as perched water strikes. Strikes were noted at depths ranging from 1.40 m 0 3.00 m bgl within the natural drift deposits.

CONTAMINATED LAND ASSESSMENT

Human Health	Sources • Made Ground • Natural Drift Deposits Pathways • Dermal Contact/Ingestions • Vapour Inhalation • Dust Inhalation Receptors • Future site-users • Groundworkers

	Mitigation • Cover System • Hotspot Removal of Naphthalene contamination • Removal of Made Ground
Controlled Waters	Sources • Made Ground • Natural Stratum Pathways • Preferential stratum Receptors • Secondary Undifferentiated (superficial) aquifer and Secondary A (bedrock) aquifer. Mitigation • Cohesive stratum present on-site reducing lateral and vertical migration of contaminants.
Ground Gas	Sources • Made Ground (associated with historic development) • Former Waste Site (4 m E) Pathways • Preferential Stratum (Granular Made Ground). Receptors • Future End users Mitigation • Cover system – Precautionary CS2 Amber classification until full ground gas monitoring is completed.
Potable Water Infrastructure	This will need to be confirmed following the completion of a UKWIR risk assessment. Post-remediation and enabling works ground conditions may be different from those identified during this site investigation.

COAL MINING ASSESSMENT

Coal Mining	The site is situated within a Coal Authority Reporting Area, but not within a development high-risk zone. Therefore, it is considered to be at low risk from coal mining-associated hazards.

GEOTECHNICAL ASSESSMENT

Underground Obstructions	Concrete and brick obstructions have been encountered within the Made Ground, indicative of relic foundations from the former building and potential infilled basements in the southern sector of the site. During a phase of cut-and-fill enabling works to create a developable platform, all below-ground obstructions will require grubbing out to the base of the Made Ground to enable the construction of proposed plots.
Allowable Bearing Pressure	The underlying natural clay drift deposits have been assessed as being stiff medium strength with a net allowable bearing pressure (ABP) in the order of 100 kN/m^2 at circa 2.00 m bgl increasing to > 200 kN/m^2 at circa 3 m bgl. However, soft very low-strength clay deposits were identified at depths ranging from 2.00 – 3.00 m bgl within the vicinity of WS103, WS104, and WS105, with an ABP of 28 – 37 kN/m^2.
Foundation Options	Due to the presence of deep Made Ground deposits (>1.50 m bgl) across the site, in addition to the soft to firm very low strength to low strength clay stratum with low ABP to depths in excess of 2.00 m bgl, it is likely driven pile foundations will be required within these areas. Foundation depths within the conjectured influence of former, existing or proposed trees will need to be deepened to ensure that structural loading bears within the underlying target founding stratum, which cannot be subject to volumetric instability associated with fluctuation in moisture content.
Building Floor Slabs	Ground-bearing floor slabs are unlikely to be viable given the anticipated depths or reworked Made Ground > 600 mm and shallow cohesive soils.
Heave Precautions	Given that the underlying clay is of low volume change potential, heave precautions will not be required for the internal face of a foundation less than 1.5 m in depth. Heave precautions will be required to the underside of floor slabs (where there is no 200 mm void) and pile ground beams are required within the modelled influencing distance of trees.
Soakaway Drainage	The Made Ground and underlying granular soils are cohesive in nature and impacted by low-level inorganic and hydrocarbon compounds which would preclude the use of infiltration drainage systems.
Sulphate Assessment	The concrete classification will be DS1 AC1s.
CBR Design %	Natural clay soils will provide a CBR in the order of 3–5% during drier climatic periods. However, if water is allowed to shed onto the formation, the CBR will reduce to < 2%, which will require specialist engineering of the subgrade.
Cut/Fill	Development levels are unknown at this time; however, cut-and-fill works may be required to reach a suitable development stratum.
Civil Engineering Excavations	Site observations indicated that excavations should be feasible in the near-surface with normal plant; however, obstructions were identified in the near-surface, including former foundations and former floor slabs. It is anticipated that any obstructions will be grubbed out during the reduced-level dig for the substructure works. However, due to the depth and variability of the Made Ground and the likelihood of trench collapse, it is considered that all excavations are supported or battered back in accordance with the guidance contained in CIRIA R97.

Waste Characterisation	Any material that is to be disposed off-site should undergo assessment using Technical Guidance WM3: *Waste Classification – Guidance on the classification and assessment of waste*.

RECOMMENDATIONS

Based on the findings of the geoenvironmental site assessment, the following additional works are recommended to be completed in due course:

- Plot-specific foundation schedule (upon receipt of the final development levels).
- Remediation and enabling works strategy.

Table of Contents

EXECUTIVE SUMMARY 1

1. INTRODUCTION 9
1.1. Background 9
1.2. Proposed Development 9
1.3. Objectives 9
1.4. Scope of Works 10
1.5. Limitations 10
1.6. Confidentiality 10
1.7. Previous Reports 10

2. GROUND INVESTIGATION 12
2.1. General Overview 12
2.2. Limitations of the Investigation 12
2.3. Scope of Investigation 12
2.4. In-Situ Standard Penetration Testing (SPT) 13
2.5. Laboratory Analysis 13

3. GROUND AND GROUNDWATER CONDITIONS 14
3.1. Summary of Ground Conditions 14
3.2. Made Ground 14
3.3. Drift Deposits 15
3.4. Solid Geology 15
3.5. Groundwater 15
3.6. Visual and Olfactory Evidence of Contamination 15
3.7. Soil Consistency 16
3.8. Side Stability and Ease of Excavation 17
3.9. Consolidation 20
3.10. Soil Plasticity 20
3.11. pH and Sulphate 21

4. TIER 2 QUALITATIVE CONTAMINATED LAND RISK ASSESSMENT 22
4.1. Human Health Risk Assessment 22
4.2. Controlled Waters Risk Assessment 27
4.2.1. Controlled Water Risk Assessment and Mitigation 31
4.2.2. Discussion of Controlled Waters Risk Assessment 31
4.3. Ground Gas Risk Assessment Methodology 32
4.4. Monitoring Methodology 33
4.5. Summary of Monitoring Results 35
4.5.1. Groundwater 35
4.5.2. Barometric pressure 35
4.5.3. Gas Flow 35
4.5.4. Gas Concentrations 35
4.6. Conclusion 35
4.7. Potable Water Supply 36
4.8. Conceptual Site Model 38

5. GEOTECHNICAL ASSESSMENT 42
5.1. Proposed Development 42
5.2. Summary of Ground Conditions 42
5.3. Site Preparation 42
5.4. Foundation Conditions and Assessment of Potential Bearing Capacities 43
5.5. Ground Floor Slabs 45
5.6. Heave Precautions 46

5.7. Highways Construction 47
5.8. Drainage 47
5.9. Concrete Durability 48
5.10. Excavations 48
5.11. Construction Activity and Inspection 49
5.12. Geotechnical Risk Register 50
5.13. Further Works 52

6. CONCLUSIONS AND RECOMMENDATIONS 53
6.1. Contaminated Land Assessment 53
6.2. Coal Mining 53
6.3. Geotechnical Assessment 54

APPENDIX I LIMITATIONS 55

APPENDIX II GLOSSARY 57

APPENDIX III DRAWINGS 60

APPENDIX IV PHOTOGRAPHS 62

APPENDIX V E3P EXPLORATORY HOLE LOGS 68

APPENDIX VI CHEMICAL TESTING RESULTS 69

APPENDIX VII ORIGIN OF TIER 2 GENERIC ASSESSMENT CRITERIA 70

APPENDIX VIII GEOTECHNICAL TESTING RESULTS 72

DRAWING LIST

16-220-001 - Site Location Plan
16-220-005 - Exploratory Hole Location Plan
16-220-006 - Depth of Made Ground Plan
16-220-008 - Depth to Founding Strata Plan
16-220-010 – Conceptual Site Model
16-220-015 – Development Constraints Plan
16-220-017 – Foundation Zoning Plan
16-220-018 – Contamination Issues Plan

1. INTRODUCTION

1.1. BACKGROUND

E3P has been commissioned by Alan Johnston Partnerships Ltd on behalf of One Manchester to undertake a detailed Phase II Geoenvironmental Site Assessment for a parcel of unoccupied land at the intersection of Egbert Street and Faversham Street, Moston, Manchester.

This report is required to determine potential contaminated land liabilities, remediation requirements and geotechnical engineering works that will be required as part of the proposed development for a proposed low-rise residential development.

1.2. PROPOSED DEVELOPMENT

It is understood One Manchester intend to construct residential dwellings on the site, however, at the time of writing no proposed development plan has been submitted to E3P for review. For the purposes of the human health assessment, it is considered that the proposed end use will be residential with gardens.

1.3. OBJECTIVES

The objectives of the geoenvironmental assessment are as follows:

- Review historical plans, geology, hydrogeology, site sensitivity, floodplain issues, mining records and any local authority information available in order to complete a desk study in line with Environment Agency (EA) document *Land Contamination: Risk Management (LCRM) (July 2023).*
- Undertake a preliminary stage of sampling and analysis to provide an overview of the environmental issues identified.
- Assess the implications of any potential environmental risks, liabilities and development constraints associated with the site in relation to the future use of the site and in relation to off-site receptors.
- Assess the geotechnical information and provide preliminary recommendations about foundations, pavement construction and floor slabs.
- Provide recommendations regarding future works required.

1.4. SCOPE OF WORKS

The scope of work includes the following elements:

- Detailed review of historic information;
- Design of suitable intrusive ground investigation;
- Window sample probeholes with, and construction of, environmental monitoring installations;
- Mechanically excavated trial pits;
- In-situ geotechnical testing;
- Chemical and geotechnical laboratory analysis;
- Groundwater monitoring and sampling;
- Ground gas monitoring;
- Contamination risk assessment and conceptual site model;
- Geotechnical assessment and interpretation; and
- Factual and interpretive reporting.

1.5. LIMITATIONS

The limitations of this report are presented in Appendix I.

1.6. CONFIDENTIALITY

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

1.7. PREVIOUS REPORTS

The following previous site investigation reports have been provided to E3P for review:

- **Curtins** - Phase I Preliminary Risk Assessment – Egbert Street & Faversham Street (Ref: 077873-CUR-00-XX-RP-GE-027, dated 28th April 2021). Prepared for One Manchester Housing.

The key findings of the previous site investigation reports are summarised below and where necessary data used to support the E3P geoenvironmental site assessment.

Current Site Use

- The site is located at the junction of Egbert Street and Faversham Street. The site is currently occupied by public open space, with grass surface cover, with a north to south orientated footpath along the site's eastern boundary. A small fence marks the roadside boundaries with large boulders lining the eastern boundary and the first property on Faversham Street marking the northern boundary.

Site History

- Earliest mapping (1848) shows that the site was undeveloped and surrounded by farmland. By 1908 the site and the immediate surrounding area is occupied by residential dwellings. The development site is shown to lie on the edge of a sloped feature, possibly a cutting, before the Lancashire & Yorkshire Railway was shown to the south. No changes are noted within the site boundary until the 2020 aerial map shows the residential properties previously on the site to have been demolished. The surrounding area has seen increased residential development with areas of the railway network to the south cleared and new residential dwellings constructed.

Environmental Site Setting

- BGS mapping indicates the site is underlain by Glacial Till Deposits, Devensian superficial deposits and Pennine Lower Coal Measures Formation bedrock. The BGS records four boreholes close to the site, located along Kenyon Lane 200m north of the site as part of the Kenyon Lane Sewer Reconstruction work. Made Ground over Sand, Silt and Clay was encountered to depth of 10.05m bgl.

- The site is underlain by a Secondary A Aquifer associated with the bedrock formation. The superficial deposits are designated as a Secondary Undifferentiated Aquifer. The site is not located within a Source Protection Zone (SPZ). There are no potable groundwater abstraction points within 1km.

- The nearest surface water feature is a drain 330m northeast of the site. There are no surface water abstractions within 1km. There are no active discharge consents within 500m of the site.

- The site is located in a low probability radon area where <1% of homes are estimated to be at or above the radon Action Level.

- The risk from Made Ground posed to the site's end-users and groundwater is considered to be **Moderate /Low** due to the anticipated lack of contamination in the Made Ground. The risk posed to surface water and groundwater is considered to be **Low** due to the distance to the nearest surface water feature and due to the lack of historic contaminative activities on site. The risk posed to site end-users from ground generating gases arising from organic / putrescible soils near the site is considered to be **Moderate**.

Geotechnical Considerations

- The site is located within a Coal Mining reporting area but not within a Development High Risk Area. A number of coal outcrops are shown within 1km of the site but there are no shafts or mine entries located within 1km. The risk from shallow coal mining is therefore considered to be Low.

- The risk from UXO associated with WWII bombing to construction workers is considered to be **Moderate.**

2. GROUND INVESTIGATION

2.1. GENERAL OVERVIEW

A ground investigation has been designed based on the findings of the desk study, with exploratory holes advanced to target specific potential contaminant sources identified within the previous site investigations. The investigation has also been used to collect geotechnical information to assist in the design and construction of the proposed development.

Exploratory fieldwork was completed on Tuesday 25th April 2023. The works are summarised in Table 2.1.

2.2. LIMITATIONS OF THE INVESTIGATION

Due to services entering the site at the eastern site boundary, including gas, water, and electricity, a 5 m easement had to be implemented, reducing site coverage in the east of the site.

Furthermore, underground obstructions were encountered within TP103, towards the northern site boundary, resulting in termination of theexploratory hole at a shallow depth.

2.3. SCOPE OF INVESTIGATION

TABLE 2.1 SUMMARY OF FIELDWORK

POTENTIAL SOURCE/RATIONALE	LOCATION HOLE	TYPE	MAXIMUM DEPTH (m bgl)	MONITORING WELLS RESPONSE ZONE (m bgl)
General Site Conditions	TP101	Mechanically excavated Trial Pit	3.10	*N/A*
	TP102		3.20	
	TP103		0.65	
	TP104		3.10	
	TP105		3.60	
	TP106		2.40	
	TP107		3.10	
	WS101	Window Sample Probeholes	3.40	*N/A*
	WS102		5.35	3.00 – 5.00
	WS103		3.45	1.00 – 4.00
	WS104		5.45	*N/A*
	WS105		3.35	1.00 – 2.00
	WS106		4.25	0.50 – 2.00

Mechanically excavated trial pits were advanced to investigate ground conditions and to retrieve environmental samples, spatially distributed to offer the maximum site coverage whilst also being advanced to target specific contaminant sources.

Window sample probeholes were advanced to undertake in-situ detailed geotechnical testing, obtain environmental samples and install groundwater and ground gas monitoring wells.

The sampling locations are illustrated in Drawing 16-220-005 (Appendix III). The ground conditions encountered are indicated on the logs, which are provided in Appendix IV.

Return visits were made to monitor installations for groundwater level and gas concentrations. In addition, selected wells were purged and samples of groundwater were recovered for chemical analysis.

2.4. IN-SITU STANDARD PENETRATION TESTING (SPT)

In-situ geotechnical testing was conducted using the standard penetration test (SPT) and, where the ground is granular, a 60° cone (SPT(C)) was used instead of the sampling tube. The results are shown in the probehole logs in Appendix V and presented in Table 3.6. and discussed in Section 3.

2.5. LABORATORY ANALYSIS

Selected soil samples were submitted for a range of chemical analyses comprising:

- Metals.
- pH, total sulphate, water-soluble sulphate (2:1 extract).
- Sulphide.
- Cyanide.
- Phenols.
- Total and speciated polycyclic aromatic hydrocarbons (PAHs).
- Semi-Volatile Organic Compounds (SVOC).
- Volatile Organic Compounds (VOC).
- Asbestos identification and quantification.
- Speciated and banded total petroleum hydrocarbon (TPH).

I2 Analytical undertook the analytical work and the testing results are included in Appendix VI and discussed in Section 4.

Selected samples were submitted to PSL Laboratory where the following geotechnical tests were undertaken:

- Atterberg limits determinations; and
- Single-stage triaxial tests.

Laboratory analysis sheets are included in Appendix VIII and are summarised in Section 3.

3. GROUND AND GROUNDWATER CONDITIONS

3.1. SUMMARY OF GROUND CONDITIONS

The ground investigation generally confirms the published geology and identifies the strata set out in Table 3.1.

TABLE 3.1 SUMMARY OF STRATA

HOLE	STRATUM			
	MADE GROUND	SOFT CLAY	FIRM CLAY	STIFF/VERY STIFF CLAY
TP101	0.00 – 1.20	1.20 – 3.10	-	-
TP102	0.00 – 1.40	-	1.40 – 3.20	-
TP103	0.00 – 0.65	-	-	-
TP104	0.00 – 2.60	-	2.60 – 3.00	-
TP105	0.00 – 2.30	-	2.30 – 2.80	2.80 – 3.60
TP106	0.00 – 1.30	1.30 – 2.40	-	-
TP107	0.00 – 0.90	-	0.90 – 2.90	2.90 – 3.10
WS101	0.00 – 2.10	-	-	2.10 – 3.40
WS102	0.00 – 3.00	-	-	3.00 – 5.35
WS103	0.00 – 1.80	1.80 – 3.00	3.00 – 4.00	4.00 – 4.45
WS104	0.00 – 1.60	1.60 – 3.00	3.00 – 4.00	4.00 – 5.45
WS105	0.00 – 1.50	1.50 – 3.00	-	3.00 – 3.45
WS106	0.00 – 2.00	-	2.00 – 3.00	3.00 – 4.45

3.2. MADE GROUND

Made Ground deposits were encountered within all exploratory hole locations to depths of between 0.90 m and in excess of 3.00 m bgl although, in general, Made Ground was encountered to depths of less than 2.00 m bgl.

Made Ground deposits typically comprised the following sequence:

- Reworked topsoil of dark brown, gravelly, clayey medium sand with ash and sandstone (0.10-0.20 m thick).
- Dark brown sandy gravel, with gravel of brick, concrete, glass, tile, sandstone and mudstone.

Within TP104, WS101 and WS102, a soft, black-mottled blue gravelly clay with gravel of brick, concrete, and timber and tile inclusions was recorded at depths between 1.30 and 3.00 m bgl.

Sweet odours and hydrocarbon odours were noted frequently in the Made Ground deposits.

A Depth of Made Ground Plan is presented as Drawing 16-220-006 in Appendix III.

3.3. DRIFT DEPOSITS

Drift deposits were encountered within the majority of exploratory locations with the exception of one location (TP103) where the full depth of Made Ground could not be proven due to underground obstructions.

The drift deposits are uniform, generally comprising a firm to stiff, low strength, dark blueish grey, yellow-and-black mottled CLAY with gravel of sandstone and mudstone.

Again, sweet odours and slight hydrocarbon odours were frequently noted within the natural deposits underlying the Made Ground.

3.4. SOLID GEOLOGY

The solid geology was not encountered within the exploratory holes. Nearby BGS boreholes indicate rockhead to be deeper than 8.5 m bgl.

3.5. GROUNDWATER

Groundwater strikes were encountered as seepages of perched water. The depth of the seepages are shown on the exploratory hole records in Appendix IV and is summarised in Table 3.2.

TABLE 3.2 SUMMARY GROUNDWATER STRIKES

LOCATION	DEPTH TO STRIKE (m)	NOTES
TP101	1.40	Perched Water
TP102	1.30	Perched Water
WS103	2.50	Perched Water
WS105	3.00	Perched Water

3.6. VISUAL AND OLFACTORY EVIDENCE OF CONTAMINATION

Visual and olfactory evidence of potential contamination has been identified during the site investigation and these are summarised in Table 3.3.

TABLE 3.3 SUMMARY VISUAL AND OLFACTORY EVIDENCE OF CONTAMINATION

LOCATION	DEPTH (m)	STRATUM	NOTES
TP101	0.10 – 1.20	Made Ground	Slight sweet odour
TP101	1.20 – 3.10	Gravelly CLAY	Strong hydrocarbon odour/slight sheen
TP102	0.10 – 1.40	Made Ground	Slight sweet odour
TP102	1.40 – 2.30	Gravelly CLAY	Strong hydrocarbon odour/slight sheen
TP103	0.10 – 0.65	Made Ground	Strong hydrocarbon odour
TP104	0.10 – 1.30	Made Ground	Slight sweet odour
TP104	1.30 – 2.60	Made Ground	Strong hydrocarbon odour

LOCATION	DEPTH (m)	STRATUM	NOTES
TP104	2.60 – 3.10	Gravelly CLAY	Slight hydrocarbon odour
TP105	0.10 – 3.60	Made Ground Gravelly CLAY	Strong hydrocarbon odour
TP106	0.20 – 1.30	Made Ground	Slight sweet odour
TP106	1.30 – 2.40	Gravelly CLAY	Strong hydrocarbon odour
TP107	0.05 – 0.90	Made Ground	Slight sweet odour/slight hydrocarbon odour
TP107	0.90 – 2.50	Gravelly CLAY	Slight hydrocarbon odour
WS101	0.20 – 2.10	Made Ground	Strong hydrocarbon odour
WS102	0.20 – 1.40	Made Ground	Slight sweet odour/slight hydrocarbon odour
WS102	1.40 – 3.00	Made Ground	Strong hydrocarbon odour
WS103	0.20 – 1.80	Made Ground	Slight sweet odour/slight hydrocarbon odour
WS103	1.80 – 3.45	Gravelly CLAY	Slight hydrocarbon odour
WS104	0.20 – 1.60	Made Ground	Slight hydrocarbon odour
WS104	1.60 – 2.10	Gravelly CLAY	Slight hydrocarbon odour
WS105	0.20 – 1.50	Made Ground	Slight sweet odour/slight hydrocarbon odour
WS105	1.50 – 3.35	Gravelly CLAY	Strong hydrocarbon odour
WS106	0.05 – 2.00	Made Ground	Strong hydrocarbon odour
WS106	2.00 – 2.60	Gravelly CLAY	Slight hydrocarbon odour

3.7. SOIL CONSISTENCY

Undrained shear strength values were measured using both field hand shear vane tests and laboratory undrained triaxial tests. Results of the tests are presented in Table 3.4 and Table 3.5, which indicate the clay soils vary between firm and very stiff. Strength test data is generally consistent with the field descriptions of the aforementioned soils.

TABLE 3.4 SUMMARY OF HAND SHEAR VANE TESTS

LOCATION	DEPTH	SHEAR STRENGTH (kPA)	CALCULATED ALLOWABLE BEARING PRESSURE (kN/m^2)
TP102	1.6	40	94
TP102	2.0	68	159.8
TP105	2.4	90	211.5
TP105	2.8	102	239.7
TP107	1.3	96	225.6
TP107	2.9	152	357.2
TP107	3.0	171	401.85

Notes
ABP Calculated using Stroud and Butler et al 1974.

Results of the standard penetration tests, including undrained shear strengths derived from SPTs are included in Table 3.6.

TABLE 3.5 SUMMARY OF UNDRAINED SHEAR STRENGTH TEST RESULTS

LOCATION	SAMPLE DEPTH (m)	LAB DESCRIPTION	UNDRAINED SHEAR STRENGTH (kN/m^2)	CONSISTENCY
WS102	1.60 – 2.00	Stiff brown slightly gravelly very sandy CLAY.	67	Stiff
WS103	2.50 – 3.00	Soft brown slightly gravelly sandy CLAY.	47	Soft

3.8. SIDE STABILITY AND EASE OF EXCAVATION

The sides of the exploratory trial pit excavations appeared to be generally stable during excavation, except TP106 and TP107 with instability noted within the Made Ground deposits < 0.50 m bgl.

The presence of brick and concrete cobbles within the Made Ground deposits meant that in certain places, excavation was slow through the Made Ground and in some places, Made Ground could not be fully penetrated. The natural strata was excavated with relative ease.

In areas of very stiff CLAY deposits within the vicinity of TP107, excavation was a lot slower in natural deposits in comparison to softer deposits towards the eastern site boundary.

TABLE 3.6 STANDARD/CONE PENETRATION TEST RESULTS

BOREHOLES	DEPTH (m bgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT "N" VALUE	CORRECTED "N" VALUE $(N_1)_{60}$	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS 5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m²)	ALLOWABLE BEARING PRESSURE (kN/m²)*
WS101	1.00	MADE GROUND	7	7.06	**Loose**	N/A	N/A	N/A	70.57
WS101	2.00	MADE GROUND	14	12.79	Medium Dense	N/A	N/A	N/A	127.90
WS101	3.00	CLAY	50	43.48	N/A	Very high strength	Very Stiff	217.41	447.00
WS102	1.00	MADE GROUND	10	10.08	Medium Dense	N/A	N/A	N/A	100.81
WS102	2.00	MADE GROUND	15	13.70	Medium Dense	N/A	N/A	N/A	137.03
WS102	3.00	CLAY	36	31.31	N/A	Very high strength	Very Stiff	156.54	321.84
WS102	4.00	CLAY	38	32.10	N/A	Very high strength	Very Stiff	160.52	330.03
WS102	5.00	CLAY	50	41.48	N/A	Very high strength	Very Stiff	207.41	426.43
WS103	1.00	MADE GROUND	2	2.02	**Very Loose**	N/A	N/A	N/A	20.16
WS103	2.00	CLAY	4	3.65	N/A	Very low strength	Soft	18.27	37.56
WS103	3.00	CLAY	6	5.22	N/A	**Low strength**	Firm	26.09	53.64
WS103	4.00	CLAY	15	12.67	N/A	Medium strength	Stiff	63.36	130.28
WS104	1.00	MADE GROUND	26	26.21	Medium Dense	N/A	N/A	N/A	262.12
WS104	2.00	Gravelly CLAY	4	3.65	N/A	Very low strength	Soft	18.27	37.56
WS104	3.00	Gravelly CLAY	6	5.22	N/A	**Low strength**	Firm	26.09	53.64
WS104	4.00	Gravelly CLAY	15	12.67	N/A	Medium strength	Stiff	63.36	130.28

BOREHOLES	DEPTH (m bgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT "N" VALUE	CORRECTED "N" VALUE $(N_1)_{60}$	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS 5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m^2)	ALLOWABLE BEARING PRESSURE (kN/m^2)*
WS104	5.00	Gravelly CLAY	22	18.25	N/A	High strength	Very Stiff	91.26	187.63
WS105	1.00	MADE GROUND	5	5.04	**Loose**	N/A	N/A	N/A	50.41
WS105	2.00	CLAY	3	2.74	N/A	Very low strength	Soft	13.70	28.17
WS105	3.00	CLAY	50	43.48	N/A	Very high strength	Very Stiff	217.41	447.00
WS106	1.00	MADE GROUND	5	5.04	**Loose**	N/A	N/A	N/A	50.41
WS106	2.00	CLAY	16	14.62	N/A	Medium strength	Stiff	73.08	150.26
WS106	3.00	CLAY	32	27.83	N/A	High strength	Very Stiff	139.14	286.08
WS106	4.00	CLAY	50	42.24	N/A	Very high strength	Very Stiff	211.21	434.25

Notes
* The Allowable Bearing Pressure (ABP) should be considered indicative.
The interpretation of in situ mass undrained shear strength (cu) data from SPT Blow Count (N) results and the influence of the Plasticity Index (PI) was reported in the Standard Penetration Test in Insensitive Clays and Soft Rocks. Stroud (1974). The standard penetration test and the engineering properties of glacial materials subsequently. Stroud and Butler (1975) and (1989).
Allowable bearing pressure on sands. Soil Mechanics in Engineering Practice Terzaghi, K. & Peck, R.B. 1996.

3.9. CONSOLIDATION

An undisturbed sample of Glacial Till was submitted for oedometer analysis. The results are provided in Table 3.7.

TABLE 3.7 OEDOMETER CONSOLIDATION RESULTS

LOCATION	DEPTH (m)	SAMPLE TYPE	MOISTURE CONTENT (%)	OEDOMETER CONSOLIDATION		
				PRESSURE RANGE (kPa)	Mv (m^2/MN)	Cv (m^2/year)
WS102	1.60	U100	16	0–12.5	0.513	12.340
				12.5–25	0.244	3.955
				25–50	0.157	2.111
				50–100	0.098	1.444
				100–200	0.028	1.699

When considered at over-burden pressure with an additional load of 110 kPa the coefficient of volume compressibility (Mv) ranged from 0.157 m^2/MN up to 0.513 m^2/MN. The material is considered to be low to medium compressibility.

The rate at which settlement is likely to occur is determined by the coefficient of consolidation (Cv). As shown in Table 3.7, the coefficient ranges from 1.44 m^2/yr to 12.340 m^2/yr.

3.10. SOIL PLASTICITY

The Atterberg limits determinations, summarised in Table 3.8., show the clay to be of predominantly low plasticity with discrete areas of high plasticity clay.

TABLE 3.8. SUMMARY OF PLASTICITY INDEX TEST RESULTS

LOCATION	DEPTH (m)	NATURAL MOISTURE CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	PASSING 425 µm SIEVE (%)	MODIFIED PLASTICITY INDEX	NHBC VOLUME CHANGE POTENTIAL
WS102	1.60 – 2.00	16	14	29	15	87	13.05	Low
WS104	1.00 – 1.45	25	21	44	23	85	19.55	Low
WS105	2.00 – 2.45	41	26	61	35	81	28.35	Medium

The results of the Atterberg limits testing confirmed that the soils would be deemed to be predominantly Low Volume Change Potential, with localised areas confirming Medium Volume Change Potential in accordance with the classification system utilised by the LABC/NHBC industry guidance.

3.11. pH AND SULPHATE

Chemical analyses for pH and soluble sulphate content contained in Appendix VI (summarised in Table 3.9), shows that the soils at the site generally meet Class DS-1, Aggressive Chemical Environment for Concrete Classification (ACEC) AC-1s in accordance with BRE *Special Digest 1* (2005).

TABLE 3.9 SUMMARY OF pH AND SULPHATE DATA

LOCATION	DEPTH (m)	SO_4 IN 2:1 WATER/SOIL (g/l)	pH VALUE	CLASSIFICATION
TP101	0.90	0.12	7.7	DS-1, AC-1s
TP104	1.00	0.096	7.8	DS-1, AC-1s
TP105	0.60	0.020	7.8	DS-1, AC-1s
TP106	0.10	0.007	8	DS-1, AC-1s
TP107	1.10	0.064	6.8	DS-1, AC-1s
WS101	0.10	0.023	7.9	DS-1, AC-1s
WS102	0.70	0.170	7.6	DS-1, AC-1s
WS103	0.50	0.015	8.0	DS-1, AC-1s

4. TIER 2 QUALITATIVE CONTAMINATED LAND RISK ASSESSMENT

E3P has undertaken a Tier 2 qualitative risk assessment to determine if any potential contaminants within the underlying soils and groundwater pose an unacceptable level of risk to the identified receptors.

4.1. HUMAN HEALTH RISK ASSESSMENT

At the Tier 2 stage, long-term (chronic) human health toxicity of the soil has been assessed by comparing the on-site concentrations of organic and inorganic compounds with reference values published in LQM/CIEH S4UL (S4UL3267).

Where Tier 2 screening values are not provided by LQM, other screening values have been used and these are referenced in Table 4.1.

The results of this comparison have been summarised in Table 4.1.

TABLE 4.1 SUMMARY OF INORGANIC AND HYDROCARBON TOXICITY ASSESSMENT FOR A RESIDENTIAL END USE

DETERMINANT	UNIT	GAC	N	MC	LOC. OF EX	PATH-WAY	ASSESSMENT
Arsenic	mg/kg	37	11	36	N/A	1	No Further Action
Cadmium	mg/kg	11	11	2.7	N/A	1	No Further Action
Chromium (VI)	mg/kg	6.0	11	3.1	N/A	1	No Further Action
Lead	mg/kg	200	11	900 350	TP101 0.90 m TP104 1.00 m	1	Further Action
Mercury	mg/kg	1.2	11	0.40	N/A	4	No Further Action
Nickel	mg/kg	130	11	39	N/A	1	No Further Action
Selenium	mg/kg	250	11	< 1.0	N/A	1	No Further Action
Copper	mg/kg	2400	11	130	N/A	1	No Further Action
Zinc	mg/kg	3700	11	410	N/A	1	No Further Action
Cyanide – Total	mg/kg	791	11	1.1	N/A	1	No Further Action
Phenols – Total	mg/kg	120	8	< 1.0	N/A	1	No Further Action
Asbestos	Fibres	NFD	8	1.30%	TP104 1.00 m	3	Further Action
Naphthalene	mg/kg	2.3	9	6.5 3.2	TP105 3.00 m WS103 0.50 m	4	Further Action
Acenaphthylene	mg/kg	170	9	1.4	N/A	2	No Further Action
Acenaphthene	mg/kg	210	9	5.7	N/A	1	No Further Action
Fluorene	mg/kg	170	9	7	N/A	1	No Further Action
Phenanthrene	mg/kg	95	9	32	N/A	2	No Further Action
Anthracene	mg/kg	2400	9	1.6	N/A	2	No Further Action
Fluoranthene	mg/kg	280	9	25	N/A	2	No Further Action
Pyrene	mg/kg	620	9	25	N/A	2	No Further Action
Benzo(a)Anthracene	mg/kg	7.2	9	11	TP105 3.00 m	2	Further Action
Chrysene	mg/kg	15	9	11	N/A	2	No Further Action
Benzo(b)Fluoranthene	mg/kg	2.6	9	10 3.8 3.6 3.6 3.5 3.0	TP105 3.00 m TP104 1.00 m WS103 0.50 m WS102 0.70 m TP105 0.60 m TP101 0.90 m	2	Further Action
Benzo(k)Fluoranthene	mg/kg	77	9	4.2	N/A	2	No Further Action
Benzo(a)Pyrene	mg/kg	2.2	9	9.1 3.5 3.2 3.1 3.1 2.9 2.3	TP101 2.00 m TP105 3.00 m TP106 0.10 m TP105 0.60 m WS102 0.70 m TP101 0.90 m WS103 0.50 m	2	Further Action
Indeno(123-cd)Pyrene	mg/kg	27	9	1.7	N/A	2	No Further Action

DETERMINANT	UNIT	GAC	N	MC	LOC. OF EX	PATH-WAY	ASSESSMENT
Dibenzo(a,h)Anthracene	mg/kg	0.24	9	1.3 0.39 0.38 0.36 0.33 0.24	TP105 3.00 m TP104 1.00 m WS103 0.50 m WS102 0.70 m TP101 0.90 m TP105 0.60 m	2	Further Action
Benzo(ghi)Perylene	mg/kg	320	9	2.0	N/A	2	No Further Action
TPH C5-C6 (aliphatic)*	mg/kg	42	3	< 0.1	N/A	4	No Further Action
TPH C6-C8 (aliphatic)*	mg/kg	100	3	< 0.1	N/A	4	No Further Action
TPH C8-C10 (aliphatic)*	mg/kg	27	3	< 0.1	N/A	4	No Further Action
TPH C10-C12 (aromatic)*	mg/kg	74	3	< 1.0	N/A	4	No Further Action
TPH C12-C16 (aromatic)*	mg/kg	140	3	6.9	N/A	4	No Further Action
TPH C16-C21 (aromatic)*	mg/kg	260	3	26	N/A	1	No Further Action
TPH C21-C35 (aromatic)*	mg/kg	1100	3	36	N/A	1	No Further Action

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

Abbreviations: GAC = general assessment criteria, n = number of samples, MC = maximum concentration; Loc of Ex = location of exceedance; NFD = no fibres detected.

* The Tier 2 GAC for the hydrocarbon fraction is derived from the CIEH assessment for petroleum hydrocarbons Criteria Working Group (CWG) for both aliphatic and aromatic compounds. E3P has utilised the Tier 2 values for aliphatic compounds for the volatile and semi-volatile fractions (C5-C12) and the Tier 2 values for aromatic compounds for the non-volatile fractions (C12-C35). The comparison of total (aliphatic/aromatic) compounds to an individual fraction is considered to be a conservative approach and satisfactory for the protection of human health.
** Atkins ATRISK
*** USEPA Risk Management Levels

Referring to Table 4.1, the results of this direct comparison indicate that the data exceeds the screening criteria for a residential end-use for the following contaminants:

- Heavy Metals: Lead
- Non-Volatile PAHs: Benzo(a)Anthracene, Benzo(b)Fluoranthene, Benzo(a)Pyrene, Dibenzo(a,h)Anthracene.
- Volatile PAHs: Naphthalene.
- Asbestos: Chrysotile (Quantification confirmed as Asbestos Cement: 1.30%)

Asbestos in the form of loose chrysotile fibres has been identified in the granular Made Ground in TP104.

No significant concentrations of VOCs were identified in the soils submitted for chemical analysis, although some SVOCs were identified at concentrations above the LOD (albeit generally <1 mg/kg). Most are degreasing or fuel derivatives. It is possible that these minor concentrations may be the source of the sweet odours. Hydrocarbon odours were also frequently noted, however, no TPH exceedances have been identified.

The laboratory analysis confirms the assessment within the initial conceptual site model that the main constituents of concern were likely to be asbestos, PAHs, and heavy metals.

In relation to these exceedances, the following can be determined:

- The main exposure pathways based on the Tier 2 exceedances are:
  - Soil ingestion;
  - Vapour inhalation (indoor);
  - Dermal contact and ingestion;
  - Consumption of homegrown vegetables; and
  - Fibre/dust inhalation.
- The exceedances for all determinants are associated predominantly with the Made Ground on site, with a localised sample within the natural deposits (TP105, 3.00 m).

HUMAN HEALTH RISK ASSESSMENT AND MITIGATION

The majority of the identified elevated concentrations have primary exposure pathways related to dermal contact and ingestion of soils, inhalation of particulate and consumption of homegrown vegetables. The risk to chronic human health associated with the elevated concentrations of inorganic heavy metals and non-volatile PAH compounds can be mitigated through the installation of a suitable cover system in all proposed private gardens, landscaping and public open space to remove any potential for direct exposure to impacted soils.

The specific design and installation process for the appropriate cover systems will be clearly defined within the site remediation and enabling works strategy.

With regards to the elevated naphthalene, these present potential volatilisation to indoor air risk. These elevated concentrations have been identified within WS103 and TP105 within the central region of the site between depths of 0.50 mbgl and 3.00 mbgl in both the underlying Made Ground and Natural deposits. No historic features are noted within this region to indicate a source of naphthalene, and therefore it can be considered to be a localised hotspot in this area. During a process of cut/fill enabling works, a delineation exercise should be completed to fully characterise the area of impact and then a hotspot removal can be undertaken where these soils may be chemically validated to assess chemical suitability for retention on-site in an area of no future sensitivity.

Asbestos in the form of chrysotile has also been identified within TP104 at 1.00 mbgl in shallow Made Ground deposits. Asbestos quantification identified a maximum concentration of 1.30% Chrysotile which is significantly above the hazardous waste threshold and will need to be excavated and removed from site.

Impacted soils should be managed according to the asbestos risk mitigation conceptual site model shown in Figure 4.1.

Chemical analysis of the natural clay drift deposits has identified these soils to be predominantly acceptable for use as subsoil within the proposed garden areas, with the exception of the noted exceedances in TP105 to be removed in enabling works. Further chemical validation samples will be required to confirm this. There are no suitable sources of topsoil available on the site.

FIGURE 4.1 ASBESTOS RISK MITIGATION CONCEPTUAL SITE MODEL



Notes

ND None Detect

0.001% Soils may contain ≤ 0.001% asbestos using composite testing to ensure there is no potential risk to human health. This value is present within areas where there may be a short-term low-level exposure of soils containing trace asbestos fibres by construction workers where an appropriate level of asbestos management is employed (dust suppression)

0.1% Soils at a depth of >1.00m bgl may contain <0.1% asbestos using composite testing where they will not be likely to be disturbed in the future and will therefore be in an area of low sensitivity. Risk assessment completed in accordance with Asbestos JIWG risk assessment tools.

Undefined- this will be dependent upon soils encountered during earthworks, which may be placed at these depths to ensure no potential risk to human health.

4.2. CONTROLLED WATERS RISK ASSESSMENT

E3P has undertaken a controlled waters risk assessment for the site based on the consideration of the conceptual site model and the sensitive receptors which are summarised in Table 4.2.

TABLE 4.2 CONTROLLED WATERS CONCEPTUAL MODEL AND SENSITIVITY PROFILE

DISCUSSION		SENSITIVITY RATING
Contaminant Source		
Made Ground Heavy metal and PAH contamination has been identified within the shallow Made Ground across the site, likely in association with historical developments.		**High**
Volatile Contaminants - Naphthalene Volatile Naphthalene has been identified within the central sector of the site within both the underlying Made Ground soils and underlying natural deposits.		**High**
Pathway		
Vertical Migration As the site is underlain by cohesive drift deposits, the potential for vertical migration is significantly reduced.		**Low**
Lateral migration As the site is underlain by cohesive drift deposits, the potential for lateral migration of contaminant sources is significantly reduced.		**Low**
Receptor		
Aquifer Classification in Superficial Drift Deposits	Secondary Undifferentiated aquifer	**Medium**
Aquifer Classification in Bedrock	Principal aquifer	**High**
Groundwater Source Protection Zone or Drinking Water Safeguard Zone	The site is not affected.	**Low**
Distance to the Closest Groundwater Abstraction Point	None were identified within a 1 km radius.	**Low**
Is the Site Located Within 50 m of a Surface Watercourse?	No surface water courses have been identified within 50m. The nearest surface water feature is a drain 330m northeast of the site.	**Low**
The ICSM developed within the context of the site setting has a limited pollutant pathway, due to the presence of low permeability drift deposits across the entirety of the site and the absence of any nearby surface water receptors.		

To ensure a robust appraisal of the identified risk to controlled waters, E3P has identified the sources of potential contamination that represent a risk to controlled waters from the initial CSM, we have then assessed the availability of ground investigation data in the form of analysis of the solid phase (soil) and dissolved phase within the perched groundwater or aquifer. The results of this assessment are presented in Table 4.3.

TABLE 4.3 QUALITATIVE RISK TO CONTROLLED WATERS FROM SOIL ANALYTICAL RESULTS

CONTAMINANT	ASSESSMENT RATING	DISCUSSION
BTEX > 1 mg/kg	The soil data analysis has not identified any detectable concentrations of VOCs above 1mg/kg or TPH C5 to C6 that might otherwise be indicative of VOC impact.	None
Total VOC > 1 mg/kg		
Total SVOC > 1 mg/kg	SVOC analysis recorded concentrations above the laboratory LOD.	**Further discussion**
C5-C10 > 5 mg/kg	All concentrations are below or slightly exceeding the laboratory LOD.	None
C10-C12 > 10 mg/kg	All concentrations are below the laboratory LOD.	None
C12-C16 > 50 mg/kg	All concentrations are below the laboratory LOD.	None
Phenols > 2 mg/kg	All concentrations are below the laboratory LOD.	None
Naphthalene > 2 mg/kg	Concentrations of naphthalene above 2 mg/kg have been recorded in WS103 (3.2 mg/kg) and TP105 (6.5 mg/kg) within the central region of the site between depths of 0.50 mbgl and 3.00 mbgl respectively.	**Further discussion**
Total PAH > 10 mg/kg	Total concentrations of low-solubility PAH compounds greater than 10 mg/kg have been detected throughout the site, with a maximum concentration recorded in TP105 at 165 mg/kg.	**Further discussion**
PCB > 1 mg/kg	No potential sources of PCB have been identified	None
Heavy metals > 500 mg/kg	Concentrations of heavy metals above 500 mg/kg have been recorded in TP101 0.90 m bgl.	**Further discussion**

The Tier 2 assessment has included a comparison of leachate analysis from samples of the Made Ground and groundwater samples to drinking water standards (DWS).

These are presented in Table 4.4.

TABLE 4.4 COMPARISON OF GROUNDWATER AND LEACHATE ANALYSIS WITH TIER 2 SCREENING LEVELS

DETERMINANT	UNIT	EQS [1, 2] AA	DWS [3,4]	NO. OF GW SAMPLES	MAX CONC. IN GROUNDWATER	LOCATION OF EXCEEDANCE	NO. OF LEACHATE SAMPLES	MAX CONC. IN LEACHATE	LOCATION OF EXCEEDANCE	ASSESSMENT
Arsenic	µg/l	50	10	1	3.1	-	2	3.1	-	No Further Action
Cadmium	µg/l	0.08-0.25	5	1	< 0.02	-	2	< 0.08	-	No Further Action
Chromium (VI)	µg/l	3.4	–	1	< 5.0	-	2	< 5.0	-	No Further Action
Chromium (III)	µg/l	4.7	50	1	< 0.2	-	2	2.4	-	No Further Action
Copper	µg/l	1	2000	1	0.7	-	2	14	TP101 0.90 m TP105 0.60 m	Further Action
Total Cyanide	µg/l	1	50	1	< 1.0	-	2	2.3	TP101 0.90 m TP105 0.60 m	Further Action
Lead	µg/l	1.2	10	1	< 0.2	-	2	8.1	TP101 0.90 m TP105 0.60 m	Further Action
Mercury	µg/l	–	1.0	1	< 0.05	-	2	< 0.5	-	No Further Action
Nickel	µg/l	4	20	1	0.9	-	2	1.3	-	No Further Action
Selenium	µg/l	–	10	1	< 0.6	-	2	<4.0	-	No Further Action
Zinc	µg/l	10.9	–	1	1.5	-	2	13	TP101 0.90 m TP105 0.60 m	Further Action
pH	6–9			1	7.1	-	2	7.8	-	No Further Action
Polycyclic Aromatic Hydrocarbons										
Naphthalene	µg/l	2	10*	1	-	-	2	<0.01	-	No Further Action
Anthracene	µg/l	0.1	10*	1	-	-	2	<0.01	-	No Further Action
Benzo[b]fluoranthene	µg/l	0.00017*	10*	1	-	-	2	<0.01	-	No Further Action
Benzo[k]fluoranthene	µg/l	0.00017*	10*	1	-	-	2	<0.01	-	No Further Action
Benzo(a)pyrene	µg/l	0.00017*	10*	1	-	-	2	<0.01	-	No Further Action
Indeno(123-cd)pyrene	µg/l	0.00017*	10*	1	-	-	2	<0.01	-	No Further Action
Fluoranthene	µg/l	0.0063	10*	1	-	-	2	<0.01	-	No Further Action



DETERMINANT	UNIT	EQS [1, 2] AA	DWS [3,4]	NO. OF GW SAMPLES	MAX CONC. IN GROUNDWATER	LOCATION OF EXCEEDANCE	NO. OF LEACHATE SAMPLES	MAX CONC. IN LEACHATE	LOCATION OF EXCEEDANCE	ASSESSMENT
Benzo(ghi)perylene	µg/l	1.7–4	10*	1	-	-	2	<0.01	-	No Further Action
Aromatic Hydrocarbon										
TPH C5-C7 (benzene)	µg/l	10	1	1	< 3.0	-	2	<3.0	-	No Further Action
TPH C7-C8 (toluene)	µg/l	74	700	1	< 3.0	-	2	<3.0	-	No Further Action
TPH C8-C10 (xylene)	µg/l	30	300	1	< 3.0	-	2	<3.0	-	No Further Action
TPH C10-C12 (naphthalene)	µg/l	2	90	1	< 3.0	-	2	<3.0	-	No Further Action
TPH C12-C16	µg/l	–	90	1	< 3.0	-	2	<10	-	No Further Action
TPH C16-C35	µg/l	–	90	1	< 3.0	-	2	<10	-	No Further Action
Aliphatic Hydrocarbon										
TPH C5-C6	µg/l	–	1000[5]	1	< 1.0	-	2	<1.0	-	No Further Action
TPH C6-C8	µg/l	–	1000[5]	1	< 1.0	-	2	<1.0	-	No Further Action
TPH C8-C10	µg/l	–	300	1	< 1.0	-	2	<1.0	-	No Further Action
TPH C10-C12	µg/l	–	300	1	>< 10	-	2	<10	-	No Further Action
TPH C12-C16	µg/l	–	300	1	< 10	-	2	<10	-	No Further Action
TPH C16-C21	µg/l	–	300**	1	< 10	-	2	<10	-	No Further Action
TPH C21-C35	µg/l	–	300**	1	< 10	-	2	<10	-	No Further Action

Notes
Solubility <0.01µg/l
AA – Annual Average
* Polyaromatic hydrocarbons (PAH) - Benzo(a)pyrene (BaP), Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(g,h,i)-perylene and Indeno(1,2,3-cd)-pyrene. Benzo(a)pyrene can be considered as a marker for the other PAHs, hence only benzo(a)pyrene needs to be monitored for comparison with the biota EQS or the corresponding AA-EQS in water
** There are no WHO Guideline Values for aliphatic fractions C16-C21 and C21-C35, therefore the guideline value for aliphatic fractions inclusive of C8-C16 (300µg/l) has been applied.
The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015 (legislation.gov.uk)
The Water Supply (Water Quality) Regulations 2018 (legislation.gov.uk)
Guidelines for drinking-water quality, 4th edition, incorporating the 1st addendum (who.int)
CL:AIRE publishes Petroleum Hydrocarbons in Groundwater guidance (claire.co.uk)
A total TPH criteria of 1000 mg/kg will act as a surrogate criterion for remaining aliphatic and aromatic TPH fractions.

4.2.1. CONTROLLED WATER RISK ASSESSMENT AND MITIGATION

This comparison indicates that the data exceeds the EQS and DWS values for the following inorganic compounds:

- Heavy Metals: Copper, Lead and Zinc
- Total Cyanide

Where leachate analysis has been undertaken, this can overstate the risk and is not wholly representative of the site characterisation, therefore following the receipt of supplementary groundwater samples which have sampled the true dissolved phase impact, within the vicinity of WS103 is not considered to be a significant site contaminant source.

4.2.2. DISCUSSION OF CONTROLLED WATERS RISK ASSESSMENT

Historically, the site was developed with residential dwellings. Moderate depths of Made Ground have been encountered on-site, which may suggest the former dwellings included basements which have since grubbed out and infilled.

The site is underlain by uniform geology; generally, cohesive clay. As the site is underlain by a cohesive stratum, the potential for lateral and vertical migration into aquifers is reduced. Controlled water receptors are therefore deemed to be at a low risk from on-site contamination.

Heavy metal and localised PAH contamination and limited naphthalene contamination has been identified in the soil analysis at the site. It is noted that where there are exceedances in soils, there are not exceedances within leachates in those locations. Thus, the source of the contaminants cannot be attributed to one area or point source and the majority of the contamination is considered present on a site-wide basis.

As the site is currently open, public space, with little hardstanding surface cover, rainfall is not being intercepted and subsequently infiltrates freely into the underlying Made Ground, potentially mobilising the identified contaminants.

The proposed development will create hardstanding cover across the site, thus reducing the amount of infiltration generated. This will in turn, reduce the amount of contaminants present in leachate off the site and reduce the risk further to the underlying aquifer and adjacent canal. Given that the north of the site is underlain by low permeability clay, the leaching of contaminants in this sector will be significantly reduced as the Made Ground will be contained beneath the impermeable surface covering, except garden areas, and above the natural clay aquitard.

Secondary A Aquifer

Table 4.4 shows leachable elevated impact at TP101 and TP105, however, given these locations are underlain by natural clays to a minimum of 5.00 m in thickness, the pathway to the underlying aquifer receptor is broken, due to the low permeability nature of the clay. As such, there is limited risk to the underlying aquifer in this area of the site.

The Tier 2 assessment (Table 4.4) shows elevated heavy metals, for only EQS values, on a localised basis. These contaminants may leach vertically through soils in the southwest of the site, where the underlying geology is generally granular, and into the underlying aquifer. However, due to the presence of a cohesive stratum, and the lack of substantial groundwater encountered at site, it is considered unlikely for these contaminants to be mobilised and leach through to the aquifer.

It must be noted that boreholes have not been advanced into the secondary A aquifer (bedrock) and so, it is not yet proven whether the source-pathway-receptor linkage is complete. Without samples of the aquifer, the extent, if any, of metalloid and PAH impact cannot be proven.

The results of the data review and Tier 2 qualitative risk assessment has allowed E3P to draw the following conclusions with respect to the risk to controlled waters:

- The primary receptors are identified as the underlying secondary A aquifer;
- It is probable that metalloid and PAH impact to the aquifer will occur through migration of perched water vertically however, this is reduced by the presence of a cohesive stratum;
- The site is a public open space consisting of soft standing surface cover which allows for extensive infiltration of rainfall into underlying Made Ground soils;

4.3. GROUND GAS RISK ASSESSMENT METHODOLOGY

The potential impact on the development of ground gases has been assessed with reference to standards and guidelines published in:

CIRIA Report 665 – Assessing risks posed by hazardous ground gases to buildings (2007)

BS8485:2015+A1:2019 – Code of Practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings

BS8485 provides guidance on the level of gas protection requirements based upon the characteristic situation (CS) and the proposed development based on building type.

Therefore, in accordance with BS8485, based on the measured flow rates and hazardous gas concentrations, individual hazardous gas flow rates (Q_{hg}) shall be derived for each monitoring point, from which the site characteristic hazardous gas flow rate (Q_{hgs}), and then the Characteristic Situation (CS) can be determined.

The following equation should be utilised:

$$Q_{hg} = q\left(\frac{C_{hg}}{100}\right)$$

Where:
q is the measured flow rate (in litres per hour) of combined gases from the monitoring standpipe
C_{hg} is the measured hazardous gas concentration (in percentage volume/volume).

The subsequent derived gas screening value (GSV) should be the maximum Q_{hg} (flow rate x concentration as a percentage volume) for all the monitoring events.

A 'worst case check' may be carried out using the maximum recorded flow in any hole with the maximum concentration in any hole to present the plausible worst-case conditions. Adoption of the worst case Q_{hg} requires thorough justification and reference to the CSM.

The final derived GSV can then be used to characterise the site as summarised in Table 4.5.

TABLE 4.5. SITE CHARACTERISATION BY GSV (BS8485:2015)

CS	HAZARD POTENTIAL	GSV (l/hr) FOR METHANE AND CARBON DIOXIDE	ADDITIONAL FACTORS
CS1	Very Low	< 0.07	Typically <1% methane concentration and <5% carbon dioxide concentration (otherwise consider an increase to CS2)
CS2	Low	< 0.70	Typical measured flow rate <70 l/h (otherwise consider an increase to CS3)
CS3	Moderate	< 3.5	N/A
CS4	Moderate to High	< 15	N/A
CS5	High	< 70	N/A
CS6	Very High	> 70	N/A

Notes
1. The CS is equivalent to the characteristic GSV in CIRIA C665.
2. The worst-case ground gas regime identified on the site, either methane or carbon dioxide, at the worst-case temporal conditions that the site may be expected to encounter should be considered.
3. Gas Screening Value is the Borehole Gas Volume Flow Rate, in litres per hour, multiplied by the concentration in the air stream of the particular gas being considered.
4. The Gas Screening Value thresholds should not generally be exceeded without the completion of a detailed ground gas risk assessment taking into account site-specific conditions.

4.4. MONITORING METHODOLOGY

Concentrations of methane (CH_4), carbon dioxide (CO_2) and oxygen (O_2) (hydrogen sulphide) were measured using a calibrated infrared gas analyser (GFM435) with gas flow rates measured using an integrated flow meter.

Gas measurements were recorded for a minimum of 500 seconds at each location, at which point the maximum concentration of CH_4 and CO_2, together with the lowest concentration of O_2 were recorded.

The results of the ground gas monitoring are presented in Table 4.6.

In addition to the raw data, the results for each individual standpipe have been assessed with reference to guidance provided in BS8485:2015. Based on the initial peak measured flow rates and hazardous gas concentrations, individual hazardous gas flow rates (Q_{hg}) have been derived for each monitoring point, from which an individual Characteristic Situation (CS) can ultimately be determined.

TABLE 4.6. SUMMARY OF GROUND GAS MONITORING RESULTS

WELL	STRATA	DATE	CH_4 PEAK (%V/V)	CH_4 STEADY (%V/V)	CH_4 Q_{hg} (l/hr)	CO_2 PEAK (%V/V)	CO_2 STEADY (%V/V)	CO_2 Q_{hg} (l/hr)	O_2 (%V/V)	ATMOS (mb)	ATMOS. DYNAMIC	PEAK FLOW (l/hr)	STEADY FLOW (l/hr)	RESPONSE ZONE (m bgl)	DEPTH TO BASE (m bgl)	DEPTH TO WATER (m bgl)
WS102	Natural CLAY Drift	09/05/2023	0.1	0.1	0.0001	0.1	0.1	0.0001	20.4	999	Falling	0.1	0.1	3.00-5.00	4.51	4.4
		25/05/2023	0.1	0.1	0.0001	0.1	0.1	0.0001	20.6	1020	Rising	0.1	0.1		4.53	Dry
		02/06/2023	0.1	0.1	0.0001	0.1	0.1	0.0001	19.9	1017	Falling	0.1	0.1		4.5	Dry
WS103	Natural CLAY Drift	09/05/2023	0.1	0.1	0.0001	0.1	0.1	0.0001	20.4	999	Falling	0.1	0.1	2.00-4.00	3.75	1.7
		25/05/2023	0.1	0.1	0.0001	0.1	0.1	0.0001	20.7	1020	Rising	0.1	0.1		3.75	2.1
		02/06/2023	0.1	0.1	0.0001	0.1	0.1	0.0001	20	1020	Falling	0.1	0.1		3.74	2.8
WS105	Natural CLAY Drift	09/05/2023	0.1	0.1	0.0001	0.1	0.1	0.0001	20.5	999	Falling	0.1	0.1	1.50-3.00	2.84	Dry
		25/05/2023	0.1	0.1	0.0001	0.1	0.1	0.0001	20.7	1019	Rising	0.1	0.1		2.84	Dry
		02/06/2023	0.1	0.1	0.0001	0.1	0.1	0.0001	20.1	1015	Falling	0.1	0.1		2.84	Dry
WS106	MADE GROUND	09/05/2023	0.1	0.1	0.0001	0.1	0.1	0.0001	20.5	998	Falling	0.1	0.1	0.50-2.50	2.5	2.32
		25/05/2023	0.1	0.1	0.0001	0.1	0.1	0.0001	20.7	1019	Rising	0.1	0.1		2.5	2.23
		02/06/2023	0.1	0.1	0.0001	0.1	0.1	0.0001	20.1	1015	Falling	0.1	0.1		2.5	2.3

Notes

CIRIA Characteristic Situation	Q_{hg}		
CS1	<0.07	Typical Max CO2 <5 % Typical Max CH4 <1 %	Values in **BOLD** exceed CS1 Thresholds
CS2	<0.7	Flow rate not to exceed 70 l/hr otherwise consider increase to CS3	Values in BLUE denote water above level of response zone (flooded)
CS3	<3.5		
CS4	<15	Quantitative Risk Assessment required to evaluate scope of protective measures	

4.5. SUMMARY OF MONITORING RESULTS

4.5.1. GROUNDWATER

The water level within all of the monitoring wells were recorded to be below the top of the response zone on all monitoring visits. This is likely due to the predominantly low permeability cohesive drift stratum, therefore it is likely that water levels are representative of surface water collecting within the standpipes and not a true representation of groundwater.

4.5.2. BAROMETRIC PRESSURE

Visits 2 was undertaken during a period of relatively high/rising pressure, with pressure recorded to be 1020 mbar.

Visits 1 and 3 were undertaken during periods of falling pressure with pressure recorded to be 999 and 1020 mbar respectively.

It is therefore considered that the visits have been undertaken over representative conditions.

4.5.3. GAS FLOW

Throughout the monitoring period, flow rates were recorded to be 0.1 l/hr (limit of detection of the analyser).

4.5.4. GAS CONCENTRATIONS

The maximum methane and Carbon Dioxide value recorded within the monitoring wells was 0.1% v/v (limit of detection of the analyser).

4.6. CONCLUSION

The determined Characteristic Situation for each standpipe for each visit is presented in Table 4.7. This indicates that based on the peak flow rates the majority of the monitoring visits classify as Characteristic Situation (CS)1 – Very Low Gas Risk.

TABLE 4.7. GAS RISK PROFILE AND LOCATION

WELL	DATE	DEPTH TO WATER (m bgl)	MAX FLOW (l/hr)	MAX CH_4 (%V/V)	MAX CH_4 Q_{hg} (l/hr)	MAX CO_2 (%V/V)	MAX CO_2 Q_{hg} (l/hr)	CHARACTERISTIC SITUATION	NHBC TRAFFIC LIGHT
WS102	09/05/2023	4.4	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	25/05/2023	Dry	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	02/06/2023	Dry	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
WS103	09/05/2023	1.7	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	25/05/2023	2.1	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	02/06/2023	2.8	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
WS105	09/05/2023	Dry	0.1	0.1	0.0001	0.1	0.0001	CS1	Green

WELL	DATE	DEPTH TO WATER (m bgl)	MAX FLOW (l/hr)	MAX CH_4 (%V/V)	MAX CH_4 Q_{hg} (l/hr)	MAX CO_2 (%V/V)	MAX CO_2 Q_{hg} (l/hr)	CHARACTERISTIC SITUATION	NHBC TRAFFIC LIGHT
	25/05/2023	Dry	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	02/06/2023	Dry	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
WS106	09/05/2023	2.32	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	25/05/2023	2.23	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	02/06/2023	2.3	0.1	0.1	0.0001	0.1	0.0001	CS1	Green

E3P has assessed the previous variables and come to the following conclusions:

- Ground gas monitoring suggests that the site can be classified as CS1, and in these areas it is considered that gas protection measures will not be required.
- The site is predominantly glacial till of CLAY at depths of 0.10m bgl to 5.45 mgl.
- Made Ground has been encountered in localised areas at a maximum depth of 3.00m bgl but more generally was encountered at a depth less than 2.00m bgl.
- With due consideration to the Conceptual Site Model and the absence of any persistent gas source and gas generation potential, it is considered by E3P that the site can be classified as CS1, and therefore no gas protection measures are required.

It is recommended that the full ground gas assessment and recommended protection measures (if applicable) are agreed upon with the local authority prior to their adoption on-site. Furthermore, all protection measures adopted should be validated by a suitably qualified engineer.

4.7. POTABLE WATER SUPPLY

This section provides a summary of the site investigation data with reference to the selection of potable water supply pipework. The assessment is made with reference to the UK Water Industry Research (UKWIR) publication "*Guidance on the selection of Water Supply Pipes to be used in Brownfield Sites*".

TABLE 4.8 PIPELINE SELECTION PE THRESHOLD CONCENTRATIONS

Contaminant Group	PE-threshold (mg/kg)	Concentrations at the Current pipeline depth (mg/kg)
Total VOC	0.5	<1.0
Total BTEX And MTBE	0.1	N/A
Total SVOCs (Excluding PAH and those substances marked with an *)	2	N/A
EC5-EC10 Aliphatic and Aromatic Hydrocarbons	2	<0.001
EC10-EC16- Aliphatic and Aromatic Hydrocarbons	10	4.2
EC16-EC40 Aliphatic and Aromatic Hydrocarbons	500	57
Phenols (From SVOC Analysis)*	2	< 1.0
Cresols and Chlorinated Phenols (From SVOC Analysis)	2	NA

Contaminant Group	PE-threshold (mg/kg)	Concentrations at the Current pipeline depth (mg/kg)
Ethers*	0.5	NA
Nitrobenzene*	0.5	< 0.3
Ketones*	0.5	NA
Aldehydes*	0.5	NA
Amines	Fail	NA
Other Consideration		
Are there any exceedances of the PE threshold outside of the pipeline depth?	Yes – PAH exceedances within the vicinity of TP105 at a depth of 3.00 m.	
Is free product present in soil and groundwater?	None	
Could hydrocarbon impact at greater depth than current pipeline depth be mobilised by rising groundwater levels?	No – heavy-end hydrocarbon impact and low solubility PAH has been identified within Made Ground. Groundwater levels are generally significantly deeper than pipeline depth. Where impact at greater depth has been identified (TP105) shallow groundwater has not been identified.	
Will soils impacted with above determinants likely be utilised elsewhere on site?	No	
Will soils be imported to the site as part of any future earthworks	Currently unknown, however, it is unlikely soils will be required to be imported to site.	

Notes - Pipe line depth normally between 0.75m–1.35m

Based on the assessment of current site conditions it is likely that PE pipe will be required at the proposed development.

4.8. CONCEPTUAL SITE MODEL

Following the completion of the intrusive site investigation, chemical analysis and risk assessment, the conceptual model shown in Table 4.9 has been prepared for the site.

TABLE 4.9 CONCEPTUAL MODEL

POLLUTANT LINKAGE	CONTAMINANT (SOURCE)	PATHWAY	RECEPTOR	PROBABILITY	CURRENT RISK	RESIDUAL RISK AFTER MITIGATION
PL1 PL2	Heavy Metals, non-volatile PAH (Made Ground)	Dermal contact. Dermal contact and ingestion.	Future site users. Off-site receptors.	Likely	High	LOW
Discussion: Heavy metals (lead) were identified within Made Ground between depths of 0.90m and 1.00m. **Recommendation:** Cover system to garden and landscaped areas will prevent exposure to future site users. Construction works completed with PPE and provision of welfare.						
PL3	ACM in Made Ground	Inhalation of dust.	Future site users. Buildings. Off-site land users.	Likely	High	LOW
Assessment: Asbestos in the form of loose chrysotile fibres has been identified in the Made Ground in TP104 at 1.00 m bgl. **Recommendation:** The soils will require placement in accordance with the asbestos CSM. Construction works completed with PPE and provision of welfare.						
PL4	Volatile Contaminants (Visual and Olfactory signs of contamination)	Inhalation of vapours.	Future site users. Off-site receptors.	Likely	Moderate	To be determined

POLLUTANT LINKAGE	CONTAMINANT (SOURCE)	PATHWAY	RECEPTOR	PROBABILITY	CURRENT RISK	RESIDUAL RISK AFTER MITIGATION
		Migration through permeable strata and preferential pathways.				
Assessment: No sources of elevated concentrations of volatile organic contaminants have been identified within any exploratory hole locations. **Recommendation:** Visual and olfactory evidence of contamination has been identified in several locations, therefore a watching brief should be completed during remediation works to monitor the locations where visual or olfactory hydrocarbon impact has been identified during all phases of investigation completed to date.						
PL4	Methane, carbon dioxide (Made Ground, Naphthalene)	Inhalation of gas. Migration through permeable strata and preferential pathways. Explosion in confined spaces.	Future site users. Buildings. Off-site land users.	Low likelihood	Moderate	**LOW**
Assessment: Deep Made Ground (> 1.50m) has been identified as a potential source of hazardous ground gas. Additionally, elevated concentrations of naphthalene have been identified within Made Ground (WS103 0.50 m), and within natural clay drift deposits (TP105, 3.00 m) Glacial till will likely restrict the migration of any elevated hazardous ground gas into shallow foundations. **Recommendation:** Initial monitoring suggests that the site can be classified as CS1/Green, however, this will be confirmed upon completion of the monitoring. Precautionary CS2/Amber 1 measures are required.						

POLLUTANT LINKAGE	CONTAMINANT (SOURCE)	PATHWAY	RECEPTOR	PROBABILITY	CURRENT RISK	RESIDUAL RISK AFTER MITIGATION
PL5	Mobile contaminants – Speciated PAHs (Made Ground)	Surface runoff. Migration through permeable strata and preferential pathways. Perched waters migration.	Groundwater (secondary A aquifer).	Likely	Moderate	To be determined
Assessment: Elevated sources of speciated PAHs have been identified, including Benzo(a)Anthracene, Naphthalene, Benzo(b)fluoranthene, and Benzo(a)pyrene. However, no elevated sources of PAHs have been identified within leachate samples, or groundwater samples obtained, therefore it is considered unlikely for the contaminates to be mobilised by groundwater. Furthermore, the presence of low permeability cohesive clay stratum across the site further reduces the potential for mobilisation of elevated concentrations. **Recommendation:** Sampling of groundwater and surface water is required.						
PL6	Sulphate (potential ash within Made Ground)	Sulphate attack on concrete.	Building structure.	Likely	Moderate/Low	
Assessment: The soils at the site meet class DS-1, AC-1s. **Recommendation:** Concrete should be designed in accordance with the chemical testing results.						
PL7	Organic contaminants	Ingestion of tainted water supply.	Future site users. Water pipes.	Likely	Moderate	
Assessment:						

POLLUTANT LINKAGE	CONTAMINANT (SOURCE)	PATHWAY	RECEPTOR	PROBABILITY	CURRENT RISK	RESIDUAL RISK AFTER MITIGATION
No elevated organic contaminants have been identified within any of the exploratory hole locations. **Recommendation:** Based on the assessment of current site conditions, it is likely that a barrier pipe will be required. This will need to be confirmed with a UKWIR risk assessment post-remediation.						
PL8	Phytotoxic contaminants (Made Ground)	Direct Contact (plant uptake).	Flora.	Likely	Low	
Assessment: Contamination has been encountered within shallow Made Ground across the site which may be taken up by flora in soft landscaping. **Recommendation:** Installation of a clean cover system within any areas of soft landscaping to prevent plant uptake of contaminants.						

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

5. GEOTECHNICAL ASSESSMENT

5.1. PROPOSED DEVELOPMENT

E3P understands that Alan Johnston Partnership (AJP) is assisting their client with the proposed acquisition and future redevelopment of two parcels of land off Egbert Street and Faversham Street in Moston, Greater Manchester for a presumed low-rise residential end-use with associated adopted estate roads and utility infrastructure. At the time of preparing this proposal, no proposed development plans were made available to E3P.

5.2. SUMMARY OF GROUND CONDITIONS

MADE GROUND

- Made Ground was encountered across the site, at depths ranging from 0.00 – 2.60 m bgl (WS102).
- Made Ground deposits were generally recovered as black sandy gravel with gravel of brick, concrete, tile, timber, glass, mudstone and sandstone with cobbles of brick, timber and concrete.
- Final depth of Made Ground was not confirmed within TP103 due to termination.

DRIFT

- Drift deposits recorded across the site were uniform, comprising blueish grey mottled black and yellowish-brown gravelly CLAY with gravel of mudstone at depths ranging from 0.80 – 5.45 m bgl.
- Localised areas of soft very low strength CLAY were recorded at WS103, WS104, and WS105 at depths of 2.00 – 3.00 m bgl.

SOLID

- No solid geology was encountered during the intrusive ground investigation.

GROUNDWATER

- Groundwater was encountered as perched water strikes at depth ranges 13.0 – 3.00 m bgl within the natural CLAY stratum of 4nr exploratory hole locations.

5.3. SITE PREPARATION

The site should be cleared and any vegetation below areas of proposed development stripped in accordance with Series 200 of the *Manual of Contract Documents for Highway Works (MCHW).* This should include the following:

- Redundant services should be sealed off and grubbed out and replaced with suitable compacted engineered fill.
- Buried structures and concrete obstructions have been encountered on site. These should be excavated from below the proposed development footprint with the resulting void backfilled.

5.4. FOUNDATION CONDITIONS AND ASSESSMENT OF POTENTIAL BEARING CAPACITIES

In due consideration of the identified ground conditions, in-situ and laboratory geotechnical testing, E3P has undertaken an assessment of the net safe allowable bearing pressure (ABP) within the underlying natural stratum to assist in the detailed design of foundations and infrastructure and determine the target founding stratum. The results of this assessment are summarised in Table 5.1.

TABLE 5.1 SUMMARY OF ABP

COHESIVE SOILS			
Description	**Depth (range m bgl)**	**Undrained Shear Strength (Cu) (kN/m^2)**	**Allowable Bearing Pressure (kN/m^2)**
Firm to Very Stiff, Gravelly CLAY	2.00–5.45	63–207	130–447
Soft, Gravelly CLAY (WS103, WS104, WS105)	2.00-3.00	13.70 - 18.27	28 - 37

Based on the assessment of the relative undrained shear strength, relative in-situ densities and corresponding safe net allowable bearing pressure, the suitable target founding stratum has been identified as the underlying firm to very stiff glacial clays.

However, given the historical site development and depth of the made ground, prior to the detailed design of suitable foundation solutions, a programme of remediation and enabling works will be required to remove the extensive buried obstructions and cut/fill the site to provide suitable development platform levels.

Therefore, upon completion of these enabling works, it is likely that the most cost-effective option for the majority of the site would be to re-engineer the Made Ground using vibro stone columns (VSCs) to support a shallow strip or spread foundation. To determine if VSC is viable at the subject site, E3P has completed a Ground Improvement Design Risk Matrix that is summarised in Table 6.2.

TABLE 5.2 GROUND IMPROVEMENT DESIGN RISK MATRIX

RISK ITEM	COMMENT	PASS/FAIL
Soft clays with an undrained shear strength less than 30 kN/m^2	CLAY soils are generally firm to stiff with Cu > 80 kN. Isolated areas of softer clay soils were encountered with Cu > 30 kN/m^2; however, it is considered that these will either be piled or soft material excavated to remove deposits.	**PASS**

RISK ITEM	COMMENT	PASS/FAIL
Ground with peat layers close to foundation level or the base of the stone column, or where intermediate layers of peat are thicker than 200 mm, either as a single layer or the sum of the thicknesses of individual layers throughout the length of the stone column	No Peat or organic deposits were identified across the site.	**PASS**
Voided filled ground, e.g. old water tanks, pottery, glass bottles, concrete rubble or brick fill of unsuitable grading	Made Ground beneath the entirety of the site from historical development.	**PASS – on completion of enabling works**
Loose or non-engineered fill not previously subject to rising or fluctuating water levels saturation	None identified.	**PASS**
The filled ground still settling or expected to settle under its own weight or due to the effects of surcharging/upfilling where there is a high organic content or where decay is continuing	None identified.	**PASS**
Fill, containing degradable material where organic material forms more than 15% of fill by volume	None identified.	**PASS**
Clays with a plasticity index greater than 40%	None identified.	**PASS**
Highly sensitive soils liable to collapse or remoulding	None identified.	**PASS**
Cohesive soils with trees in influencing distance	Plots where tree influence has been modelled and will either be subject to a piled or mass trench-fill solution.	**PASS**
Overall Risk Rating and Suitability for Vibratory Ground Improvement		**PASS**

Foundation depths should take account of the presence of existing and proposed trees, with foundations deepened locally to mitigate the potential for volumetric instability attributed to fluctuations in moisture content, in accordance with the requirements of NHBC standards.

It is recommended that at working drawing stage a foundation schedule is prepared for the development, taking account of the physical change of natural clay soils and the proposed locations of trees.

At this time it is not possible to accurately define the foundation types due to the absence of a detailed final development levels; however, based on our extensive experience of similar sites, we would anticipate that the final foundation solution would be a combination of the following:

- Vibro Stone Column foundations bearing on a firm to very stiff gravelly CLAY at circa 2.00 – 3.00 m bgl; and
- Trench fill to support reinforced strip foundations in areas of variable ground and/or potential tree influence.

A summary of anticipated foundations is presented in Table 6.3 and A detailed foundation zoning plan is included as Drawing 16-220-009 in Appendix XI.

TABLE 5.3 ANTICIPATED FOUNDATIONS

LOCATION	ANTICIPATED FOUNDING STRATA DEPTH (m bgl)	GROUNDWATER (m bgl)	TARGET STRATUM	TREES	COAL	FOUNDATION TYPE	TYPE OF CONCRETE
TP102	2.05	N/A	Gravelly CLAY	N/A	N/A	VSC	DS-1 AC-1s
TP105	2.85	N/A	Gravelly CLAY	N/A	N/A	VSC	DS-1 AC-1s
TP107	1.75	N/A	Gravelly CLAY	N/A	N/A	VSC	DS-1 AC-1s
WS101	3.45	N/A	Gravelly CLAY	N/A	N/A	VSC	DS-1 AC-1s
WS102	2.45	N/A	Gravelly CLAY	N/A	N/A	VSC	DS-1 AC-1s
WS103	3.45	N/A	Gravelly CLAY	N/A	N/A	VSC	DS-1 AC-1s
WS104	3.45	N/A	Gravelly CLAY	N/A	N/A	VSC	DS-1 AC-1s
WS105	3.45	N/A	Gravelly CLAY	N/A	N/A	VSC	DS-1 AC-1s
WS106	2.45	N/A	Gravelly CLAY	N/A	N/A	VSC	DS-1 AC-1s

It is recommended that, at the working drawing stage, a foundation schedule is prepared for the development taking account of the physical change of natural clay soils and the proposed locations of trees.

5.5. GROUND FLOOR SLABS

Current building control regulations require that where the infilled ground is present to depths in excess of 600 mm, or where the substratum is variable in terms of the structure and settlement potential, or where clay soils are present within the influence of existing or proposed trees, a suspended floor slab is required.

In this instance, it is considered that for the majority of substructures, the underlying stratum would have in excess of 600 mm of infill and, as such, a suspended floor slab will be required.

Where a cast in-situ suspended slab is utilised with no subfloor void, appropriate compressible material (heave precautions) will be required in the construction of the substructure.

5.6. HEAVE PRECAUTIONS

The site has been proven to be underlain by clay soils, which are susceptible to volumetric instability due to fluctuations in moisture content, particularly within an influencing distance of trees as per the NHBC/LABC conjectured zones of influence.

As the clay is deemed to be low plasticity, heave precautions are not required for the internal face of the external load-bearing walls (outside or within tree influence).

If a ground beam is to be constructed within the zone of tree influence, heave precautions are required for the underside of this and edge beams.

If the ground floor slab is to be constructed with a beam and block floor, a minimum subfloor void of 200 mm is required within any structures located in the zone of conjectured tree influence.

If the ground floor slab is constructed with a cast in-situ suspended floor slab, then heave precautions that can tolerate 50 mm of clay swelling are required within any part of the floor slab to be located within the zone of influence of a tree.

A summary of heave precautions is presented in Table 5.4.

TABLE 5.4 SUMMARY OF HEAVE PRECAUTIONS

		MINIMUM VOID DIMENSION FOR FOUNDATIONS, GROUND BEAMS AND SUSPENDED IN-SITU CONCRETE GROUND FLOORS		MINIMUM VOID DIMENSIONS UNDER PRECAST CONCRETE AND SUSPENDED TIMBER FLOORS
Plasticity Index of Soil	**Required Foundation Depth (m)**	**Thickness of Void Former Against Side of Foundation or Ground Beam (mm)**	**Thickness of Void Former on Underside of Edge Beam and Floor Slab (mm)**	**Void Dimension (mm)**
High Plasticity (> 40)	> 2.5	Engineer Design		Engineer Design
	2.0–2.5	35	150	300
	1.5–2.0	25	75	
Moderate Plasticity (20–40)	> 2.5	Engineer Design		Engineer Design
	2.0–2.5	25	100	250
	1.5–2.0	25	50	
Low Plasticity (< 20)	2.0–2.5	N/A	50	200
	> 2.0	No Special Precautions		

5.7. HIGHWAYS CONSTRUCTION

A programme of remediation and enabling works will be required to remediate the proposed road subgrade in accordance with the requirements of the Manual of Contract Documents for Highway Works Volume 1 Specification For Highway Works (Series 600-Earthworks) for a method compaction.

It is considered that the material can be re-engineered using method compaction to achieve a CBR in excess of 5% if works are completed in favourable climatic conditions.

5.8. DRAINAGE

The presence of substantial depths of Made Ground across some areas of the site may result in settlement. It is therefore recommended that drain runs are designed using steeper gradients and flexible joints to allow for some differential settlement.

Furthermore, the site is predominantly underlain by in excess of 2 m of likely low-permeability gravelly CLAY. Therefore, the use of soakaway drainage will be limited, and as the lateral continuity of the Made Ground cannot be assured, it is not recommended that soakaways are utilised for the disposal of surface water runoff.

If soakaway drainage is to be considered, full BRE 365 testing must be completed to inform the detailed design.

5.9. CONCRETE DURABILITY

Based upon the results of the chemical analyses it is considered that subsurface concrete can be designed in accordance with Design Sulphate Class DS-1, Aggressive Chemical Environment for Concrete Classification (ACEC) AC-1s in accordance with the recommendations provided in BRE *Special Digest 1* (2005).

5.10. EXCAVATIONS

Trial pits were generally stable in both granular Made Ground and natural strata; with the exception of TP106 and TP107 towards the southern boundaries which experienced instability in upper Made Ground deposits. As such, it is considered that near-surface excavations will be feasible.

Site observations indicated that excavations should be feasible in the near-surface with normal plant; however, obstructions were identified in the near-surface, including former foundations and former floor slabs. It is anticipated that any obstructions will be grubbed out during the reduced-level dig for the substructure works.

However, due to the depth and variability of the Made Ground and the likelihood of trench collapse, it is considered that all excavations are supported or battered back in accordance with guidance contained in CIRIA R97.

If local pumping of groundwater is required during the advancement of excavations for the proposed foundations then consideration should be given to the potential for dewatering gravels in the surrounding areas that may cause structural damage to building substructures in close proximity to the site.

TABLE 5.5 CIVIL ENGINEERING EXCAVATION RISK MATRIX

RISK ITEM	PRESENT	COMMENT
Running Sands	No	No running sand has been identified.
Minor Water Ingress	No	Small, perched water strikes were noted, however, no substantial source of water was identified.
Shallow Bedrock	No	Shallow bedrock has not been identified on-site.

5.11. CONSTRUCTION ACTIVITY AND INSPECTION

The following activities and inspections should be incorporated into the site works:

- Due to the variability of the soils at the site, it is recommended that sufficient allowance is made for the inspection of formations and sub-formations to foundations and pavement construction.
- Excavations where access is required should be subject to a risk assessment from a competent person and, where appropriate, mitigation measures such as benching back the sides or use of support systems in accordance with CIRIA R97 should be utilised.
- It is considered that dewatering may be required, especially following periods of heavy rainfall. Removal of surface water and water within trenches should be possible with conventional sump pumping. Discharge of any water should be agreed with the relevant regulatory body and be undertaken under a trade effluent discharge, where required. Measures to remove silt and suspended solids may be required and consideration should be given to provision of space for settling tanks or an attenuation pond.
- The presence of potential contamination and mitigation measures should be addressed as part of the construction stage health and safety plan and should include measures to design out the risks, reduce their impact and, finally, to include the use of personnel protective equipment (PPE).

5.12. GEOTECHNICAL RISK REGISTER

POTENTIAL ABNORMAL CONSTRAINT	LOCATION ON-SITE	ESTIMATED AREA OF SITE AT RISK (%)	ASSESSMENT AND MITIGATION
Remediation of contaminated soils	On-site	TBC	Material deemed to have a potential vapour risk may require hotspot removal, resulting in the requirement to backfill the resulting void. Should significant backfill be needed deeper or specialist foundations may be required in those areas.
Bedrock			Shallow bedrock has not been identified on-site, therefore does not pose a significant risk.
Obstructions	All	100	The site has been subject to significant historical development and, while above-ground structures have been removed, potential subsurface obstruction from relict foundations, and slabs remain.
Artificially levelled and filled platforms	N/A	N/A	The site appears to have been levelled and artificially backfilled.
Mature trees	Adjacent to the north-eastern boundary	10	An arboriculture survey is required to determine areas of potential tree influence within proximity to the site boundary. The site is predominantly surfaced by the soft cover, however, a number of mature trees are present adjacent to the north eastern site boundary.
Volume change potential clay	On site	100	The site is underlain by cohesive soils, therefore, requiring an assessment of the volume change potential to determine the need for heave precautions may be required at the site. Based upon laboratory testing, the volume change potential has been identified as low to moderate, reducing the risk posed to the proposed development.
Peat	N/A	N/A	No peat deposits have been identified on site.
Running sands	N/A	N/A	Data searches indicate low risk.
Ground dissolution	N/A	N/A	Data searches indicate no hazard.

POTENTIAL ABNORMAL CONSTRAINT	LOCATION ON-SITE	ESTIMATED AREA OF SITE AT RISK (%)	ASSESSMENT AND MITIGATION
Concrete design	TBC	-	Chemical analyses for pH and soluble sulphate content shows that the soils at the site generally meet Class DS-1, Aggressive Chemical Environment for Concrete Classification (ACEC) AC-1s in accordance with BRE *Special Digest 1* (2005).
Low-permeability ground	On site	100	Soakaways unlikely to be effective in areas where low permeability cohesive deposits are present or where areas of potentially contaminated soil and groundwater are present.
Services/sensitive structures	Northern boundary	15	A review of online services has identified a number of services within the site boundary. Piling may not be possible within close proximity to any sensitive infrastructure.
Abnormal foundation solutions	Northern boundary	25	Soft very low strength clays have been identified within WS103 and WS104 at 2.00 m bgl, and WS104 towards the northern boundary. Therefore, deeper foundations are required in these areas.
Areas not investigated	South Eastern	5	Small area adjacent to the south western corner of the site was not conducted due to potential service and insufficent easement from a low voltage electricity cable traversing south east through the corner.

5.13. FURTHER WORKS

Based on the findings of the intrusive site investigation, the following additional works are recommended to be completed in due course:

- Plot-specific foundation schedule (upon receipt of the final development levels).
- Remediation and enabling works strategy.

6. CONCLUSIONS AND RECOMMENDATIONS

6.1. CONTAMINATED LAND ASSESSMENT

Human Health	The Tier 2 human health risk assessment identified site-wide concentrations of non-volatile, insoluble heavy metals and PAH compounds that would present unacceptable degrees of theoretical risk to the identified receptors associated with direct exposure pathways. As such, it will be necessary to design and construct the proposed development in a manner that will ensure suitably validated cover systems to all areas of private gardens, soft landscaping and public open space. Trace asbestos fibres have been identified within the vicinity of TP105 within the Made Ground. While further quantification analysis will be required to determine the definitive risk from different soil types, it is considered that the development will be suitable for the intended use, subject to the careful management and placement of anthropogenic materials in accordance with the developed CSM. Localised areas of volatile/semi-volatile hydrocarbon impact have been identified within discreet locations (hotspots); these compounds pose a theoretical risk associated with volatilisation and subsequent ingress into the proposed dwellings (indoor air). As such it will be necessary to delineate the extent of impact and ensure all material is excavated, analysed, and treated for either reuse within an area of no sensitivity (post-treatment) or, alternatively, removed from site.
Controlled Waters	Low risk to controlled waters.
Ground Gas	Characteristic Situation 1 (pending completion of gas monitoring).
Potable Water	This will need to be confirmed following the completion of a UKWIR risk assessment. Post-remediation and enabling works ground conditions may be different from those identified during this site investigation.

6.2. COAL MINING

Coal Mining	The site is situated within a Coal Authority Reporting Area, however not within a Development High Risk zone, therefore the overall risk posed to the site is considered low.

6.3. GEOTECHNICAL ASSESSMENT

Concrete and brick obstructions have been encountered within the Made Ground, indicative of relic foundations from the former building and potential infilled basements in the eastern sector of the site.

During a phase of cut-and-fill enabling works to create a developable platform, all below-ground obstructions will require grubbing out to the base of the Made Ground to enable the construction of proposed plots.

Due to the presence of substantial Made Ground deposits (>1.50 m bgl) across the site, in addition to the soft to firm very low strength to low strength clay stratum with low ABP to depths in excess of 2.00 m bgl, it is likely driven pile foundations will be required within these areas.

Foundation depths within the conjectured influence of former, existing or proposed trees will need to be deepened to ensure that structural loading bears within the underlying target founding stratum, which cannot be subject to volumetric instability associated with fluctuation in moisture content.

END OF REPORT

APPENDIX I
LIMITATIONS

1. This report and its findings should be considered in relation to the terms of reference and objectives agreed between E3P and the client as indicated in Section 1.3.

2. For the work, reliance has been placed on publicly available data obtained from the sources identified. The information is not necessarily exhaustive and further information relevant to the site may be available from other sources. When using the information it has been assumed it is correct. No attempt has been made to verify the information.

3. This report has been produced in accordance with current UK policy and legislative requirements for land and groundwater contamination which are enforced by the local authority and the Environment Agency. Liabilities associated with land contamination are complex and require advice from legal professionals.

4. During the site walkover, reasonable effort has been made to obtain an overview of the site conditions. However, during the site walkover, no attempt has been made to enter areas of the site that are unsafe or present a risk to health and safety, are locked, barricaded, overgrown, or the location of the area has not been made known or accessible.

5. Access considerations, the presence of services and the activities being carried out on the site limited the locations where sampling locations could be installed and the techniques that could be used.

6. Site sensitivity assessments have been made based on available information at the time of writing and are ultimately for the decision of the regulatory authorities.

7. Where mention has been made to the identification of Japanese Knotweed and other invasive plant species and asbestos or asbestos-containing materials, this is for indicative purposes only and do not constitute or replace full and proper surveys.

8. The executive summary, conclusions and recommendations sections of the report provide an overview and guidance only and should not be specifically relied upon without considering the context of the report in full.

9. E3P cannot be held responsible for any use of the report or its contents for any purpose other than that for which it was prepared. The copyright in this report and other plans and documents prepared by E3P is owned by them and no such plans or documents may be reproduced, published or adapted without written consent. Complete copies of this may, however, be made and distributed by the client as is expected in dealing with matters related to its commission. Should the client pass copies of the report to other parties for information, the whole report should be copied, but no professional liability or warranties shall be extended to other parties by E3P in this connection without their explicit written agreement there to by E3P.

10. New information, revised practices or changes in legislation may necessitate the re-interpretation of the report, in whole or in part.

APPENDIX II
GLOSSARY

TERMS

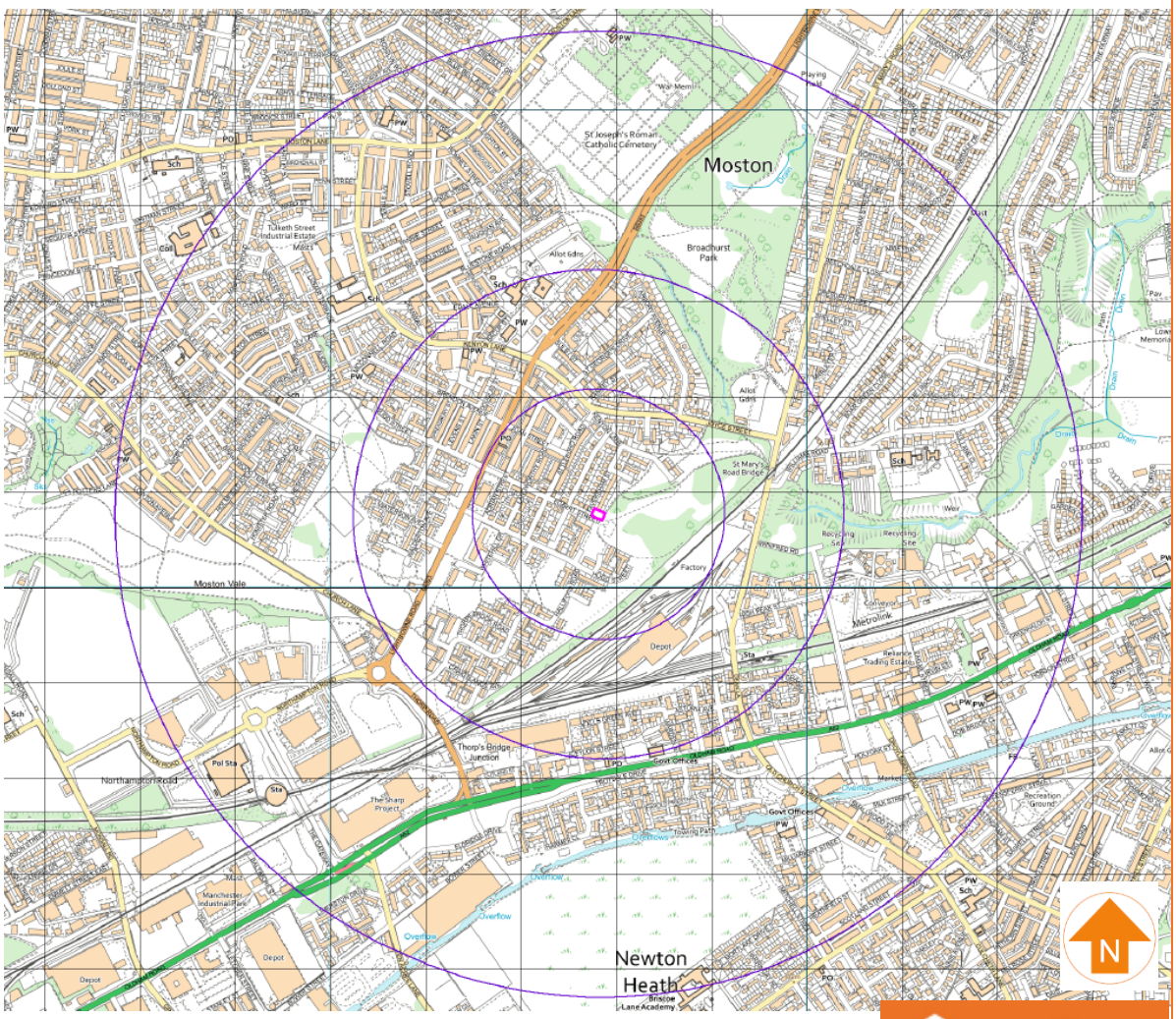
ACM	Asbestos-containing material	**MMP**	Materials management plan
ADS	Acoustic design statement	**ND**	Not detected
AST	Above-ground storage tank	**NDP**	Nuclear density probe
BGS	British Geological Survey	**NMP**	Noise management plan
BSI	British Standards Institute	**NPSE**	Noise policy statement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

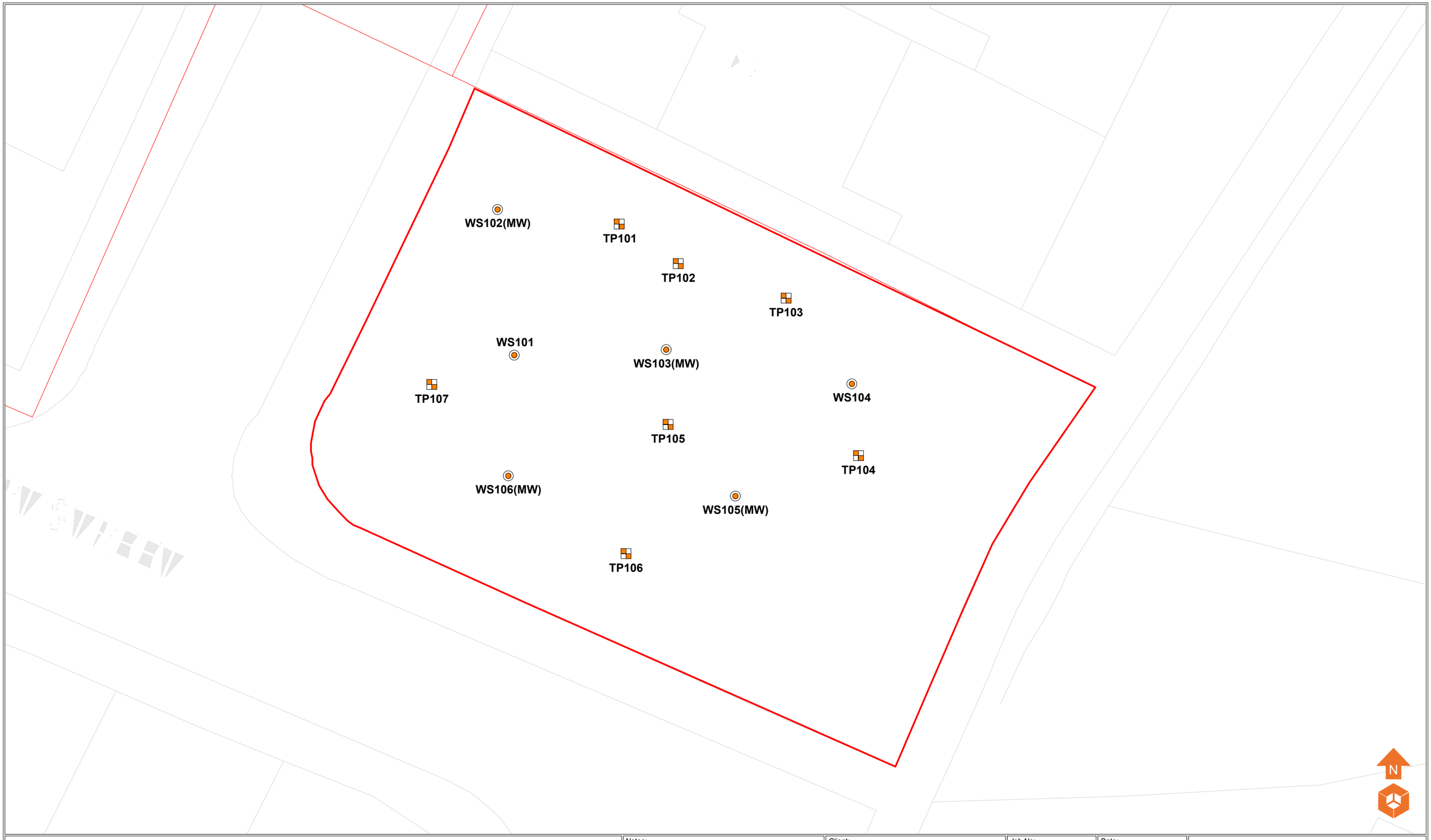


MIBK	Methyl isobutyl ketone	**WTE**	Water table elevation
m	Metres	**ppm**	Parts per million
km	Kilometres	**mg/m^3**	Milligram per metre cubed
% v/v	Percent volume in air	**m bgl bgl**	Metres below ground level
mb	Millibars (atmospheric pressure)	**m bcl**	Metre below cover level
l/hr	Litres per hour	**mAOD**	Metres above ordnance datum (sea level)
µg/l	Micrograms per litre (parts per billion)	**kN/m^2**	Kilonewtons per metre squared
ppb	Parts per billion	**µm**	Micrometre
mg/kg	Milligrams per kilogram (parts per million)	**SSRT**	Site Specific Remediation Target
PSD	Particle Size Distribution	**DD**	Dry Density
CL:AIRE	Contaminated Land: Applications in Real Environments	**Mc**	Moisture Content
ρ	Bulk Density	**GPR**	Ground Penetrating Radar
NDP	Nuclear Density Probe	**FFL**	Finished Floor Level
LEL	Lower Explosive Limit	**UKWIR**	UK Water Industry Research
CIRIA	Construction Industry Research and Information Association	**LOD**	Limit of Detection

APPENDIX III
DRAWINGS

DRAWING 16-220-001 – SITE LOCATION PLAN





Location Symbols

- Approximate Window Sample Probehole Location
- Approximate Trial Pit Location

Notes:

P1	REVA	02.05.2023	LM	ID
Phase	Issue	Date	Drawn	Checked

Client: AJP

Job No: 16-220

Date: 02.05.2023

Drawing No: 005

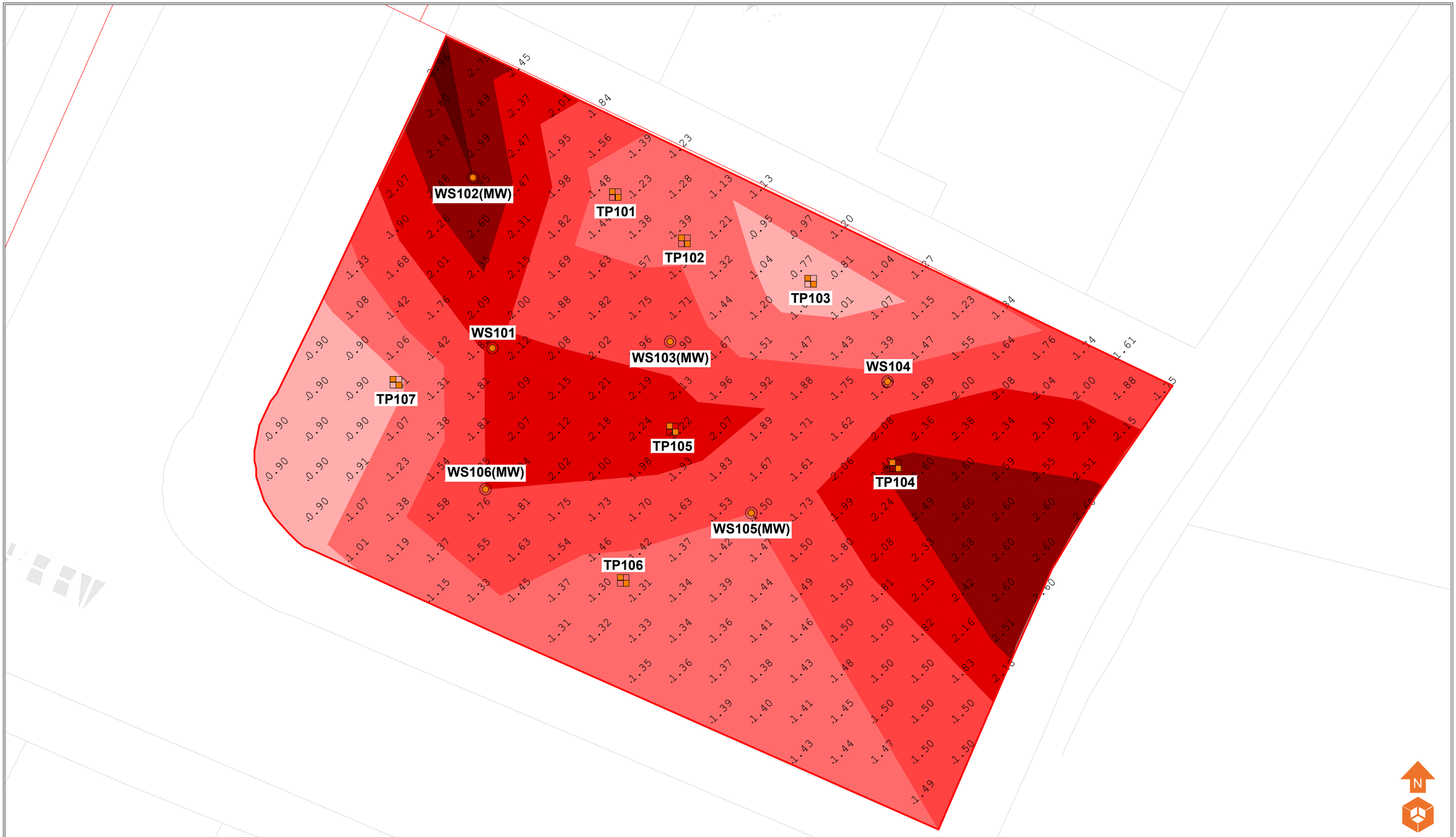
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Job Title: Egbert St and Favershame St, Moston

Drawing Title: Exploratory Hole Location Plan

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Location Symbols

- Approximate Window Sample Probehole Location
- Approximate Trial Pit Location

Made Ground Depth (m)

- Depth of Made Ground 0.50 - 0.99m
- Depth of Made Ground 1.00 - 1.49m
- Depth of Made Ground 1.50 - 1.99m
- Depth of Made Ground 2.00 - 2.49m
- Depth of Made Ground 2.50 - 2.99m
- Depth of Made Ground >3.00m

Notes:

Client: AJP

Job No: 16-220

Date: 02.05.2023

Drawing No: 006

Scale: 1:1000 @ A3

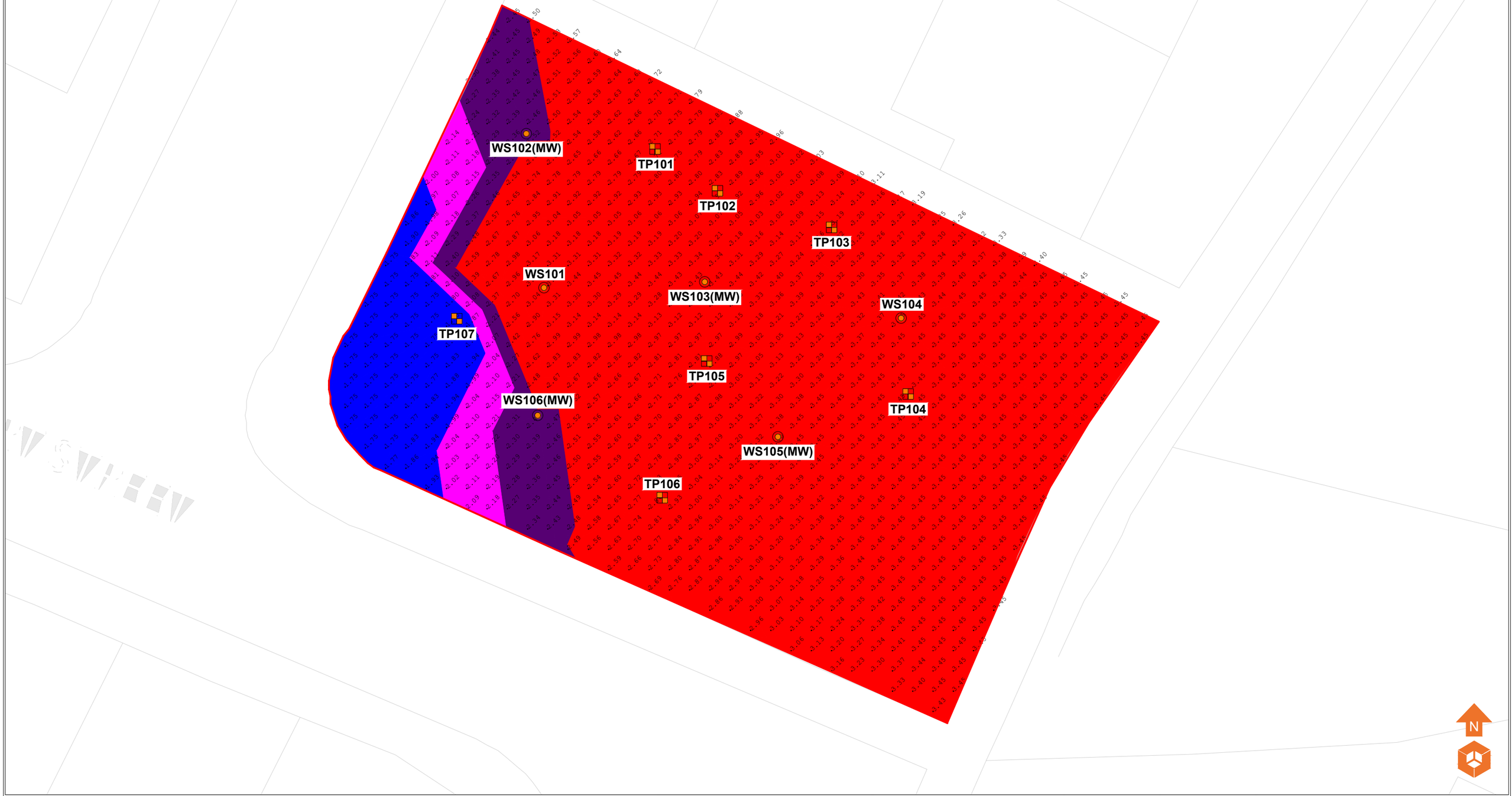
Phase	Issue	Date	Drawn	Checked
P1	REVA	02.05.2023	LM	ID

Job Title: Egbert St and Favershame St, Moston

Drawing Title: Depth of Made Ground Plan

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Location Symbols

- WS101 — Approximate Window Sample Probehole Location
- TP101 — Approximate Trial Pit Location

Shallow Spread Footings

- Depth to Founding Strata 0.00 - 1.24m
- Depth to Founding Strata 1.25 - 1.49m

Mass Trench Fill Footings

- Depth to Founding Strata 1.50 - 1.74m
- Depth to Founding Strata 1.75 - 1.99m
- Depth to Founding Strata 2.00 - 2.24m

Engineered Footings

- Depth to Founding Strata 2.25 - 2.49m
- Depth to Founding Strata >2.50m

Notes:

P1	REVA	30.06.2023	OW	ID
Phase	Issue	Date	Drawn	Checked

Client: AJP

Job No: 16-220

Date: 30.06.2023

Drawing No: 008

Scale: 1:1000 @ A3

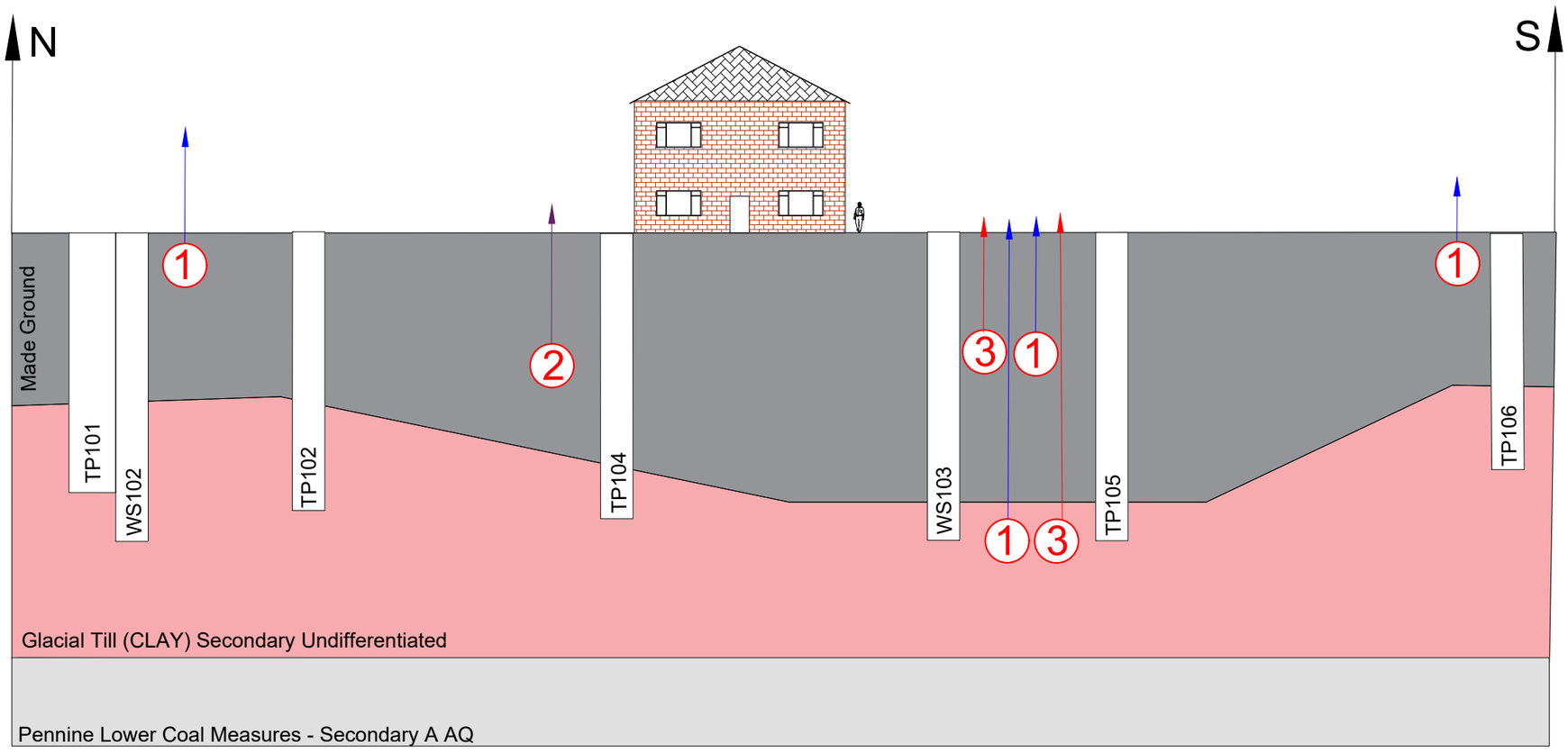
Job Title: Egbert St and Favershame St, Moston

Drawing Title: Depth to Founding Strata Plan

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Geology Key

- Made Ground
- Sandstone (Wilmslow Sandstone Formation Principal Aquifer)
- Sand & Gravels (Glaciofluvial Sheet Deposits Secondary A Aquifer)
- Groundwater
- Pennine Lower Coal Measures
- Glacial Till

Sources

1. Heavy Metals, Non Volatile PAH's, Non Volatile TPH's (Made Ground)
2. Asbestos (Made Ground, Infilled Pond)
3. Volatile Contaminants (UST-TPH, VOC)
4. Ground Gases (Infilled Pond)
5. Mobile Contaminants (UST-TPH, VOC)
6. Sulphate (Made Ground)
7. Phytotoxic Contaminants (Made Ground)

Pathways

- Dermal Contact / Ingestion
- Vapour Inhalation
- Inhalation / Accumulation
- Tainting of Water Supplies
- Dust Inhalation
- Vertical / Lateral Migration
- Sulphate Attack on Concrete
- Plant Uptake

Receptors

1. Future End Users
2. Water Pipes
3. Groundwater (Secondary B Aquifer)
4. Surface Water Features
5. Off-site Receptors
6. Building Structure
7. Flora

Site Features

- A Historical Residential Building
- B Current Industrial Unit
- C Infilled Pond
- D Off-site Pond

Notes:

P1	REVA	30.06.2023	OW	ID
Phase	Issue	Date	Drawn	Checked

Client: AJP

Job No: 16-220

Date: 30.06.2023

Drawing No: 010

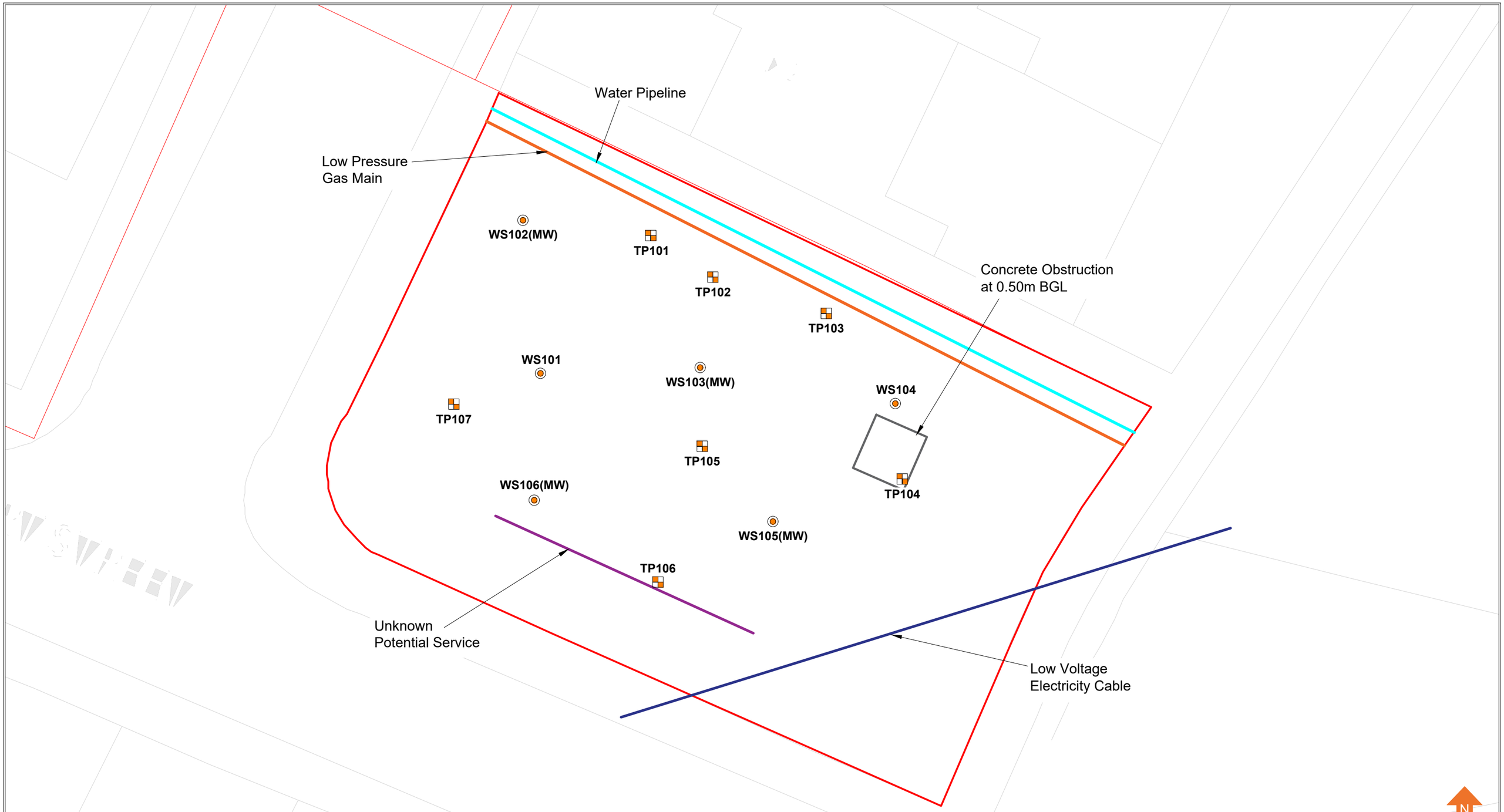
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Job Title: Egbert St and Favershame St, Moston

Drawing Title: Conceptual Site Model

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Location Symbols

- Approximate Window Sample Probehole Location
- Approximate Trial Pit Location

Development Constraints

- Concrete Obstruction
- Low Pressure Gas Main
- Water Pipeline
- Low Voltage Electricity Cable
- Unknown Potential Service

Notes:

P1	REVA	02.05.2023	LM	ID
Phase	Issue	Date	Drawn	Checked

Client: AJP

Job No: 16-220

Date: 02.05.2023

Drawing No: 015

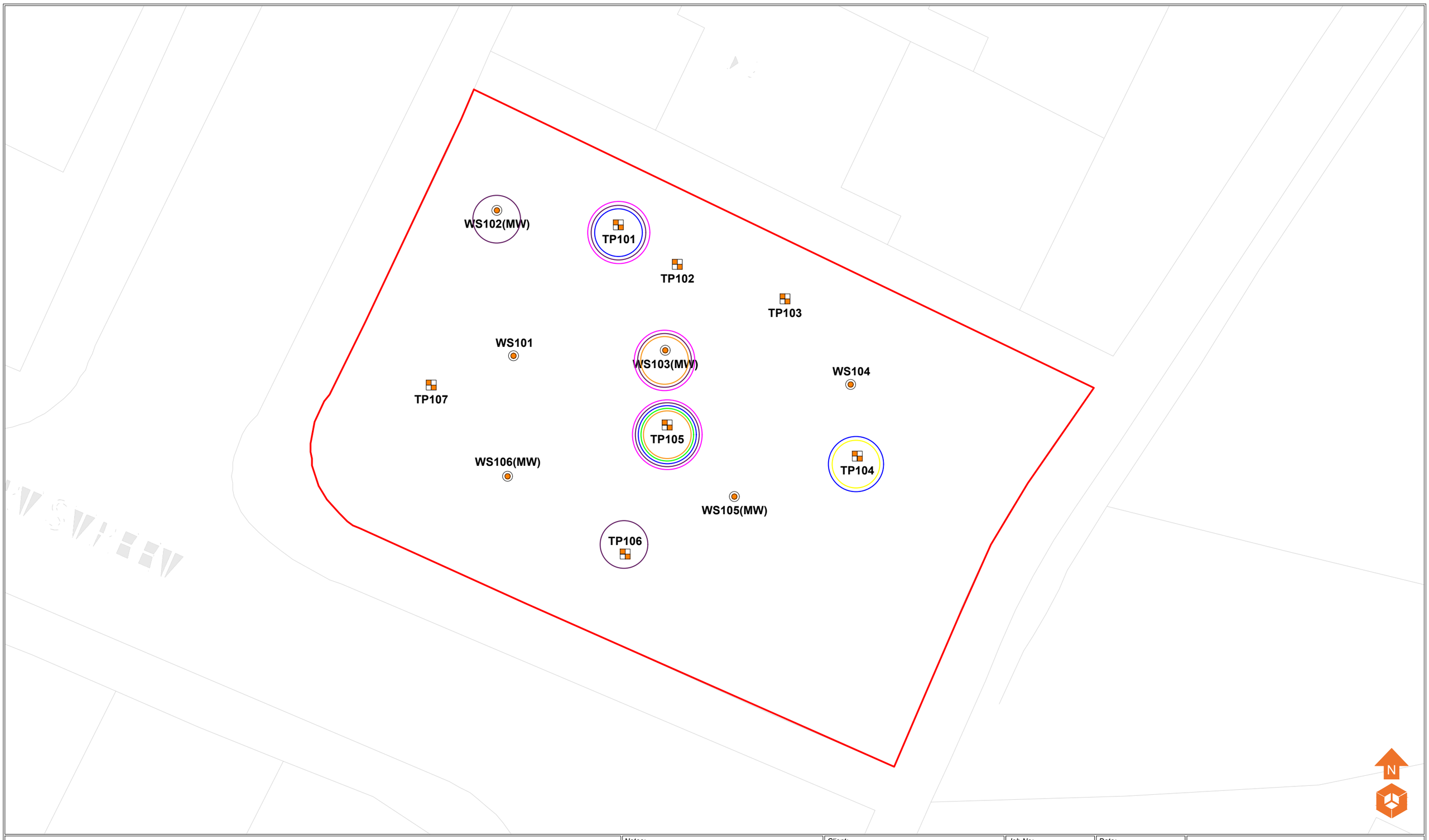
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Job Title: Egbert St and Favershame St, Moston

Drawing Title: Development Constraints Plan

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Location Symbols

- Approximate Window Sample Probehole Location
- Approximate Trial Pit Location

Contaminants Exceedances

- Naphalene
- Asbestos Fibres
- Lead
- Benzo(A)anthracene
- Benzo(A)pyrene
- Dibenzo(A,H)anthracene
- Benzo(B)fluranthene

Notes:

Client: AJP

Job No: 16-220

Date: 30.06.2023

Drawing No: 018

Scale: 1:1000 @ A3

Phase	Issue	Date	Drawn	Checked
P1	REVA	30.06.2023	OW	ID

Job Title: Egbert St and Favershame St, Moston

Drawing Title: Contamination Issues Plan

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APPENDIX IV
PHOTOGRAPHS

PLATE 1 SOUTHERN BOUNDARY



PLATE 2 VIEW OF SITE FACING NORTH



LATE 3 Manhole Cover at North Eastern sector



PLATE 4 EASTERN BOUNDARY FACING NORTH

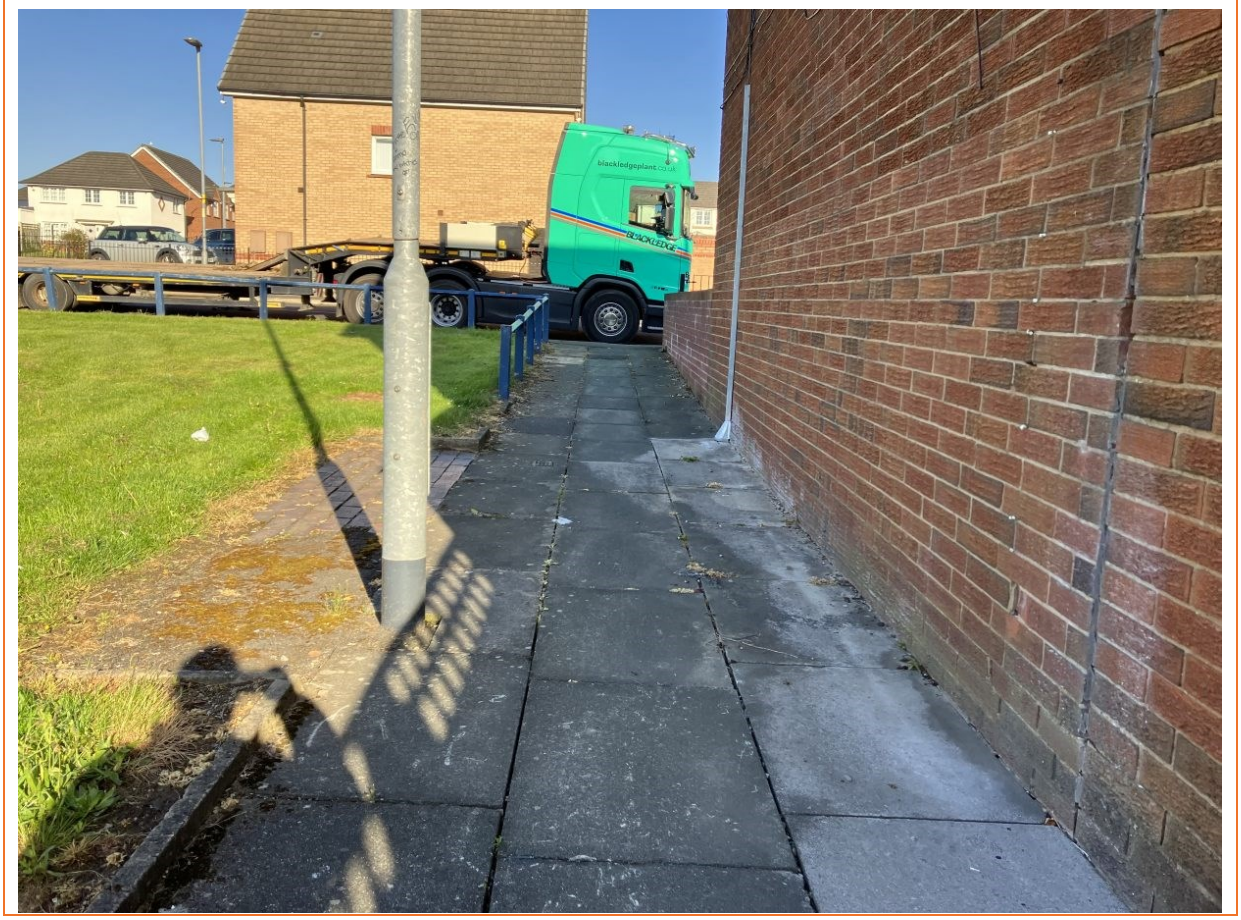


PLATE 5 HARDSTANDING FOOTPATH ADJACENT TO THE EASTERN BOUNDARY



APPENDIX V
E3P EXPLORATORY HOLE LOGS

Trial Pit Log

TrialPit No: TP101
Sheet 1 of 1

Project Name: Egbert St & Favershame St	Project No. 16220	Co-ords: 387560.00 - 401164.00 Level:	Date 25/04/2023
Location: Moston		Dimensions (m): 2.00 x 0.70 Depth 3.10	Scale 1:30
Client: AJP			Logged I.Diack

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10			MADE GROUND: Dark brown sandy clay with frequent rootlets (reworked topsoil).
	0.90	ES					MADE GROUND: Dark brown sandy gravel with frequent cobbles. Gravel is fine to coarse, angular to subrounded of brick, concrete, glass, tile, sandstone and mudstone. Cobbles are angular of brick. (Slight sweet odour).
1.40				1.20			Soft very low strength dark blueish grey mottled yellow and black slightly gravelly CLAY. Gravel is fine to coarse, subangular to subrounded of mudstone. (Strong hydrocarbon odour).
	2.00	ES					
				3.10			End of Pit at 3.10m

1
2
3
4

Trial Pit Photographs



TP101 Pit



TP101 AR

Remarks: 1. Complete. 2. Stable. 3. Perched water strike at 1.40 m bgl. 4. Sweet odour encountered from 0.10 - 1.20 m bgl. 5. Strong hydrocarbon odour encountered from 1.20 - 3.10 m bgl.

Stability: 1. Stable

Trial Pit Log

TrialPit No: TP102
Sheet 1 of 1

Project Name: Egbert St & Favershame St	Project No. 16220	Co-ords: 387562.00 - 401162.00 Level:	Date 25/04/2023
Location: Moston		Dimensions (m): 2.00 x 0.70 Depth 3.20	Scale 1:30
Client: AJP			Logged I.Diack

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10			MADE GROUND: Dark brown sandy clay with frequent rootlets (reworked topsoil).
							MADE GROUND: Dark brown sandy gravel with frequent cobbles. Gravel is fine to coarse, angular to subrounded of brick, concrete, glass, tile, sandstone and mudstone. Cobbles are angular of brick. (Slight sweet odour).
1.30	1.20	ES					
				1.40			Firm low strength dark blueish grey mottled yellow and black slightly gravelly CLAY. Gravel is fine to coarse, subangular to subrounded of mudstone. (Strong hydrocarbon odour from 1.40 - 2.30 m bgl).
	1.60	HVP	40				
	1.90	ES					
	2.00	HVP	68				
				3.20			End of Pit at 3.20m

1
2
3
4

Trial Pit Photographs



TP102 Pit



TP102 AR

Remarks: 1. Complete. 2. Stable. 3. Perched water strike at 1.30 m bgl. 4. Sweet odour encountered from 0.10 - 1.40 m bgl. 5. Strong hydrocarbon odour encountered from 1.40 - 2.30 m bgl.

Stability: 1. Stable

Trial Pit Log

TrialPit No: TP103
Sheet 1 of 1

Project Name: Egbert St & Favershame St	Project No. 16220	Co-ords: 387566.00 - 401161.00 Level:	Date 25/04/2023
Location: Moston		Dimensions (m): 2.00 x 0.70 Depth 0.65	Scale 1:30
Client: AJP			Logged I.Diack

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.40	ES		0.10			MADE GROUND: Dark brown sandy clay with frequent rootlets (reworked topsoil).
				0.65			MADE GROUND: Grey sandy gravel. Gravel is fine to coarse, angular to subrounded of concrete and limestone. (Strong hydrocarbon odour).
							End of Pit at 0.65m

Trial Pit Photographs



TP103 Pit

Remarks: 1. Terminated at 0.65 m bgl due to potential service. 2. Stable. 3. Strong hydrocarbon odour encountered from 0.10 - 0.65 m bgl.

Stability: 1. Stable

Trial Pit Log

TrialPit No: TP104
Sheet 1 of 1

Project Name: Egbert St & Favershame St	Project No. 16220	Co-ords: 387569.00 - 401155.00 Level:	Date 25/04/2023
Location: Moston		Dimensions (m): 2.00 × 0.70 Depth 3.10	Scale 1:30
Client: AJP			Logged I.Diack

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10			MADE GROUND: Dark brown sandy clay with frequent rootlets (reworked topsoil).
	1.00	ES					MADE GROUND: Dark brown sandy gravel with frequent cobbles. Gravel is fine to coarse, angular to subrounded of brick, concrete, glass, tile, plastic membrane, asbestos, sandstone and mudstone. Cobbles are subangular of brick and concrete. (Slight sweet odour)
				1.30			MADE GROUND: Black mottled yellowish brown very gravelly clay. Gravel is fine to coarse, angular to subrounded of brick and concrete. (Strong hydrocarbon odour).
	2.20	ES					
				2.60			Firm low strength dark blueish grey mottled black and yellowish brown CLAY. (Slight hydrocarbon odour).
				3.10			End of Pit at 3.10m

1
2
3
4

Trial Pit Photographs



TP104 Pit



TP104 AR

Remarks: 1. Complete. 2. Stable. 3. Concrete/brick obstruction encountered at south of trial pit at 0.4 m bgl. 4. Slight hydrocarbon odour encountered from 0.10 - 2.60 m bgl. 5. Slight sweet odour encountered from 0.10 - 1.30 m bgl. 6. Slow digging from 0.10 m bgl.

Stability: 1. Stable

Trial Pit Log

TrialPit No: TP105
Sheet 1 of 1

Project Name: Egbert St & Favershame St	Project No. 16220	Co-ords: 387562.00 - 401156.00 Level:	Date 25/04/2023
Location: Moston		Dimensions (m): 2.00 x 0.70 Depth 3.60	Scale 1:30
Client: AJP			Logged I.Diack

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10			MADE GROUND: Dark brown sandy clay with frequent rootlets (reworked topsoil).
	0.60	ES					MADE GROUND: Black sandy gravel with frequent cobbles and boulders. Gravel is fine to coarse, angular to rounded of brick, timber, plastic membrane, tile, glass, concrete, limestone and mudstone. Cobbles are angular of brick and timber. Boulder is angular of timber. (Strong hydrocarbon odour).
				2.30			
	2.40	HVP	90				Firm to stiff medium strength dark blueish grey mottled black and yellowish brown CLAY. (Strong hydrocarbon odour). (becoming stiff high-strength at 2.80 m bgl).
	2.80	HVP	102				
	3.00	ES					
				3.60			End of Pit at 3.60m

1
2
3
4

Trial Pit Photographs



TP105 Pit



TP105 AR

Remarks: 1. Complete. 2. Stable. 3. Strong hydrocarbon odour encountered from 0.10 - 3.60 m bgl. 4. Sweet odour encountered from 2.30 - 3.60 m bgl.

Stability: 1. Stable

Trial Pit Log

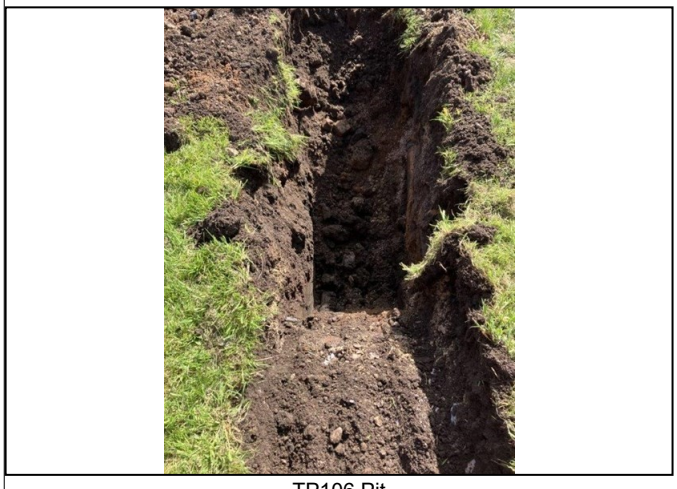
TrialPit No: TP106
Sheet 1 of 1

Project Name: Egbert St & Favershame St	Project No. 16220	Co-ords: 387560.00 - 401151.00 Level:	Date 25/04/2023
Location: Moston		Dimensions (m): 2.00 x 0.70 Depth 2.40	Scale 1:30
Client: AJP			Logged I.Diack

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	ES		0.20			MADE GROUND: Dark brown sandy clay with frequent rootlets (reworked topsoil).
				1.30			MADE GROUND: Black very sandy gravel with frequent cobbles. Gravel is fine to coarse, angular to subrounded of brick, concrete, timber, concrete, limestone, mudstone and sandstone. Cobbles are angular of brick. (Slight sweet and hydrocarbon odour).
	1.40	ES		2.40			Firm low strength dark blueish grey mottled black and yellowish brown CLAY. (Strong hydrocarbon odour).
							End of Pit at 2.40m

1
2
3
4

Trial Pit Photographs



TP106 Pit

Remarks: 1. Terminated at 2.40 m bgl due to service. 2. Unstable from 0.40 m bgl. 3. Slight hydrocarbon odour was encountered from 0.20 - 1.30 m bgl (becoming strong hydrocarbon odour at 1.30 m bgl). 4. Slight sweet odour was encountered from 0.20 - 1.30 m bgl.

Stability: 1. Unstable from 0.4 m bgl.

Trial Pit Log

TrialPit No: TP107
Sheet 1 of 1

Project Name: Egbert St & Favershame St	Project No. 16220	Co-ords: 387553.00 - 401158.00	Date 25/04/2023
Location: Moston		Dimensions (m): 2.00 x 0.70	Scale 1:30
Client: AJP		Depth 3.10	Logged I.Diack

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.05			MADE GROUND: Dark brown sandy clay with frequent rootlets (reworked topsoil).
							MADE GROUND: Black very sandy gravel with frequent cobbles. Gravel is fine to coarse, angular to subrounded of brick, concrete, timber, concrete, limestone, mudstone and sandstone. Cobbles are angular of brick. (Slight sweet and hydrocarbon odour).
				0.90			
	1.10	ES					Firm to stiff medium strength dark blueish grey mottled yellowish-brown and black slightly gravelly CLAY. Gravel is fine to medium of subrounded of mudstone. (Slight hydrocarbon odour encountered from 0.90 - 2.50 m bgl).
	1.30	HVP	96				
				2.70			Very stiff light brown very gravelly CLAY. Gravel is fine to coarse, subrounded to rounded of mudstone.
	2.90	ES					
	2.90	HVP	152				
	3.00	HVP	171	3.10			End of Pit at 3.10m

Trial Pit Photographs



TP107 Pit



TP107 AR

Remarks: 1. Complete. 2. Unstable from 0.20 m bgl. 3. Slight hydrocarbon odour encountered from 0.05 - 2.50 m bgl. 4. Slow digging in friable clay from 2.70 m bgl. 4. Slight sweet odour encountered from 0.05 - 0.90 m bgl.

Stability: 1. Unstable from 0.2 m bgl.

Borehole Log

Borehole No. **WS101**

Sheet 1 of 1

Project Name: Egbert St & Favershame St	Project No. 16220	Co-ords: 387556.00 - 401159.00	Hole Type WS
Location: Moston		Level:	Scale 1:50
Client: AJP		Dates: 25/04/2023 -	Logged By I.Diack

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.10	ES		0.20			MADE GROUND: Dark brown sandy clay with frequent rootlets (reworked topsoil).
					0.50			MADE GROUND: Grey very sandy gravel with occasional cobbles. Gravel is fine to coarse, angular to subrounded of concrete and limestone. Cobbles are subangular of concrete. (Strong hydrocarbon odour).
		1.00		N=7 (1,1/2,1,2,2)				MADE GROUND: Dark blueish brown mottled grey very gravelly clay. Gravel is fine to coarse, subangular to subrounded of brick, concrete, mudstone, timber, tile, and sandstone. (Strong hydrocarbon odour).
		1.50	ES					
		2.00		N=14 (2,3/3,3,3,5)	2.10			Very stiff high strength dark brown mottled orange CLAY.
		3.00		50 (6,8/50 for 280mm)				
					3.40			End of borehole at 3.40 m

Remarks

1. Refusal at 3.40 m bgl. 2. Strong hydrocarbon odour encountered from 0.20 - 2.10 m bgl.

Borehole Log

Borehole No. **WS102**

Sheet 1 of 1

Project Name: Egbert St & Favershame St	Project No. 16220	Co-ords: 387555.00 - 401164.00	Hole Type WS
Location: Moston		Level:	Scale 1:50
Client: AJP		Dates: 25/04/2023 -	Logged By I.Diack

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.20			MADE GROUND: Dark brown sandy clay with frequent rootlets (reworked topsoil).
		0.70	ES					MADE GROUND: Dark brown very gravelly clay with occasional cobbles. Gravel is fine to coarse, angular to subrounded of brick, concrete, sandstone, tile, glass, mudstone, and sandstone. Cobbles are subangular of brick. (Slight sweet and hydrocarbon odour).
		1.00		N=10 (2,3/3,2,2,3)				
					1.40			Stiff medium strength dark blueish grey slightly gravelly clay. Gravel is fine to coarse, angular to subrounded of mudstone. (Strong hydrocarbon odour).
		2.00		N=15 (2,2/3,3,4,5)				
		3.00		N=36 (6,7/8,8,9,11)	3.00			Very stiff very high strength dark brown mottled yellowish orange CLAY.
		4.00		N=38 (6,7/9,9,10,10)				
		4.70	ES					
		5.00		39 (7,7/39 for 280mm)				
					5.35			End of borehole at 5.35 m

Remarks

1. Refusal at 5.35 m bgl. 2. Monitoring well installed. 3. Monitoring well response zone 3.00 - 5.00 m bgl. 4. Slight sweet odour encountered from 0.20 - 1.40 m bgl. 5. Slight hydrocarbon odour encountered from 0.20 - 1.40 m bgl (becoming strong odour from 1.40 - 3.00 m bgl.)

Borehole Log

Borehole No. **WS103**

Sheet 1 of 1

Project Name: Egbert St & Favershame St	Project No. 16220	Co-ords: 387562.00 - 401159.00	Hole Type WS
Location: Moston		Level:	Scale 1:50
Client: AJP		Dates: 25/04/2023 -	Logged By I.Diack

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.20			MADE GROUND: Dark brown sandy clay with frequent rootlets (reworked topsoil).
		0.50	ES					MADE GROUND: Dark brown very gravelly clay with occasional cobbles. Gravel is fine to coarse, angular to subrounded of brick, concrete, sandstone, tile, glass, mudstone, and sandstone. Cobbles are subangular of brick. (Slight sweet and hydrocarbon odour).
		1.00		N=2 (1,1/1,0,1,0)				
					1.80			
		2.00		N=6 (2,1/2,2,1,1)				Soft very low strength dark blueish grey mottled black and yellowish brown CLAY. (Slight hydrocarbon odour). (Becoming firm low strength at 3.00 m bgl). (Becoming stiff medium strength at 4.00 m bgl).
		3.00		N=13 (3,3/3,3,3,4)				
		3.60	ES					
		4.00		50 (6,8/50 for 280mm)				
					4.43			End of borehole at 4.43 m

Remarks

1. Refusal at 4.43 m bgl. 2. Monitoring well installed. 3. Monitoring well response zone from 2.00 - 4.00. 4. Water strike encountered at 2.5 m bgl. 4. Slight sweet odour encountered from 0.20 - 1.80 m bgl. 5. Slight hydrocarbon odour encountered from 0.20 - 3.45 m bgl.

Borehole Log

Borehole No. **WS104**

Sheet 1 of 1

Project Name: Egbert St & Favershame St	Project No. 16220	Co-ords: 387569.00 - 401158.00	Hole Type WS
Location: Moston		Level:	Scale 1:50
Client: AJP		Dates: 25/04/2023 -	Logged By I.Diack

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.20			MADE GROUND: Dark brown sandy clay with frequent rootlets (reworked topsoil).
		0.80	ES					MADE GROUND: Black sandy gravel with occasional cobbles. Gravel is fine to coarse, angular to rounded of brick, timber, plastic membrane, tile, glass, concrete, limestone and mudstone. Cobbles are angular of brick and timber. (Slight hydrocarbon odour).
		1.00		N=26 (7,8/7,6,6,7)				
					1.60			Soft very low strength dark blueish brown mottled black gravelly CLAY. Gravel is fine to coarse, subangular to rounded of mudstone. (Strong hydrocarbon odour). (Becoming firm low strength at 3.00 m bgl). (Becoming stiff medium strength at 4.00 m bgl). (Becoming very stiff high strength at 5.00 m bgl).
		2.00		N=4 (0,0/1,1,1,1)				
		3.00		N=6 (1,2/1,1,2,2)				
		3.60	ES					
		4.00		N=15 (2,2/3,3,4,5)				
		5.00		N=22 (4,5/5,6,5,6)				
					5.45			End of borehole at 5.45 m

Remarks

1. Complete. 2. Slight hydrocarbon odour encountered from 0.20 - 2.10 m bgl.

Borehole Log

Borehole No. **WS105**

Sheet 1 of 1

Project Name: Egbert St & Favershame St	Project No. 16220	Co-ords: 387564.00 - 401153.00	Hole Type WS
Location: Moston		Level:	Scale 1:50
Client: AJP		Dates: 25/04/2023 -	Logged By I.Diack

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.20			MADE GROUND: Dark brown sandy clay with frequent rootlets (reworked topsoil).
		0.70	ES					MADE GROUND: Dark brown very gravelly clay with occasional cobbles. Gravel is fine to coarse, angular to subrounded of brick, concrete, sandstone, tile, glass, mudstone, and sandstone. Cobbles are subangular of brick. (Slight sweet and hydrocarbon odour).
		1.00		N=5 (1,1/2,1,1,1)				
					1.50			Soft very low strength dark brown mottled grey CLAY. (Strong hydrocarbon odour). (Becoming very stiff very high strength at 3.00 m bgl).
		1.70	ES					
		2.00		N=3 (1,0/1,0,1,1)				
	▼	3.00		50 (1,3/50 for 285mm)				
					3.35			End of borehole at 3.35 m

1 2 3 4 5 6 7 8 9 10

Remarks

1. Refusal at 3.35 m bgl. 2. Monitoring well installed. 3. Monitoring well response zone from 1.50 - 3.00 m bgl. 4. Water strike encountered at 3.00 m bgl. 5. Strong hydrocarbon odour encountered from 0.20 - 4.35 m bgl. 6. Slight sweet odour encountered from 0.20 - 1.50 m bgl.

Borehole Log

Borehole No. **WS106**

Sheet 1 of 1

Project Name: Egbert St & Favershame St	Project No. 16220	Co-ords: 387556.00 - 401154.00	Hole Type WS
Location: Moston		Level:	Scale 1:50
Client: AJP		Dates: 25/04/2023 -	Logged By I.Diack

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.05			MADE GROUND: Dark brown sandy clay with frequent rootlets (reworked topsoil).
					0.50			MADE GROUND: Grey sandy gravel. Gravel is fine to coarse, angular to subrounded of concrete and limestone. (Strong hydrocarbon odour).
		0.70	ES					
		1.00		N=5 (1,0/1,2,1,1)				MADE GROUND: Dark brown sandy very gravelly clay. Gravel is fine to coarse, angular to subrounded of brick, concrete, sandstone, tile, glass, mudstone, and plastic membrane. (Strong hydrocarbon odour)
		2.00		N=16 (2,2/3,4,4,5)	2.00			Stiff medium strength dark brown mottled yellowish orange CLAY. (Slight hydrocarbon odour encountered from 2.00 - 2.60 m bgl). (Becoming very stiff high strength at 3.00 m bgl). (Becoming very stiff very high strength at 4.00 m bgl)
		2.60	ES					
		3.00		N=32 (6,6/7,8,8,9)				
		4.00		50 (7,8/50 for 275mm)				
					4.25			End of borehole at 4.25 m

1 2 3 4 5 6 7 8 9 10

Remarks

1. Refusal at 4.25 m bgl. 2. Monitoring well installed. 3. Monitoring well response zone from 0.50 - 2.0 m bgl. 4. Perched water strike encountered at 3.0 m bgl. 5. Strong hydrocarbon odour encountered from 0.05 - 0.50 m bgl. 6. Slight hydrocarbon odour encountered from 0.50 - 2.60 m bgl.

APPENDIX VI
CHEMICAL TESTING RESULTS

Iona Diack
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Manchester
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Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 23-31107

Project / Site name:	Egbert Street and Faversham Street	**Samples received on:**	27/04/2023
Your job number:	16-220	**Samples instructed on/ Analysis started on:**	27/04/2023
Your order number:	004678	**Analysis completed by:**	08/05/2023
Report Issue Number:	1	**Report issued on:**	08/05/2023
Samples Analysed:	2 leachate samples - 11 soil samples		

Signed:

Dominika Warjan
Junior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 23-31107
Project / Site name: Egbert Street and Faversham Street
Your Order No: 004678

Lab Sample Number				2663632	2663633	2663634	2663635	2663636
Sample Reference				TP101	TP101	TP104	TP104	TP105
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.90	2.00	1.00	2.20	0.60
Date Sampled				23/04/2023	25/04/2023	25/04/2023	25/04/2023	25/04/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	18	25	14	21	16
Total mass of sample received	kg	0.001	NONE	0.8	0.8	0.4	0.4	0.8

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	Chrysotile	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	Detected	-	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	1.297	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	1.3	-	-
Asbestos Analyst ID	N/A	N/A	N/A	EC	N/A	EC	N/A	EC

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.7	-	7.8	-	7.8
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO4	mg/kg	50	MCERTS	1500	-	1500	-	570
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.12	-	0.096	-	0.02
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	240	-	190	-	39
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	122	-	96.1	-	19.7
Sulphide	mg/kg	1	MCERTS	10	-	43	-	3.5
Total Sulphur	mg/kg	50	MCERTS	890	-	1200	-	390
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	1.9	2	2.2	1.5	1.7

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	-	< 0.05	0.8	< 0.05	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	< 0.05	0.16	< 0.05	-
Acenaphthene	mg/kg	0.05	MCERTS	-	< 0.05	0.63	< 0.05	-
Fluorene	mg/kg	0.05	MCERTS	-	< 0.05	0.57	< 0.05	-
Phenanthrene	mg/kg	0.05	MCERTS	-	0.23	5.3	< 0.05	-
Anthracene	mg/kg	0.05	MCERTS	-	0.06	1.2	< 0.05	-
Fluoranthene	mg/kg	0.05	MCERTS	-	0.24	7.6	0.21	-
Pyrene	mg/kg	0.05	MCERTS	-	0.25	7.1	0.24	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	0.11	3.4	0.13	-
Chrysene	mg/kg	0.05	MCERTS	-	0.13	3.5	0.15	-
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	-	0.14	3.8	0.18	-
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	-	0.05	1.5	0.1	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	0.11	3.2	0.15	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	< 0.05	1.6	< 0.05	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	< 0.05	0.39	< 0.05	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	< 0.05	1.9	< 0.05	-

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	-	1.32	42.7	1.16	-

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Analytical Report Number: 23-31107
Project / Site name: Egbert Street and Faversham Street
Your Order No: 004678

Lab Sample Number				2663632	2663633	2663634	2663635	2663636
Sample Reference				TP101	TP101	TP104	TP104	TP105
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.90	2.00	1.00	2.20	0.60
Date Sampled				23/04/2023	25/04/2023	25/04/2023	25/04/2023	25/04/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	23	13	36	17	14
Barium (aqua regia extractable)	mg/kg	1	MCERTS	-	120	-	120	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	1.3	-	1.1	-
Boron (water soluble)	mg/kg	0.2	MCERTS	-	0.7	-	1.5	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	2.7	< 0.2	1
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	3.1	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	24	-	27	-	19
Copper (aqua regia extractable)	mg/kg	1	MCERTS	120	36	130	34	43
Lead (aqua regia extractable)	mg/kg	1	MCERTS	900	35	350	45	120
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	0.4
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	28	32	33	24	17
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	34	-	33	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	390	76	410	59	100
Monoaromatics & Oxygenates								
Benzene	µg/kg	5	MCERTS	-	-	< 5.0	-	< 5.0
Toluene	µg/kg	5	MCERTS	-	-	< 5.0	-	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	-	-	< 5.0	-	< 5.0
p & m-xylene	µg/kg	5	MCERTS	-	-	< 5.0	-	< 5.0
o-xylene	µg/kg	5	MCERTS	-	-	< 5.0	-	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	-	-	< 0.001	-	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	-	-	< 0.001	-	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	-	-	< 0.001	-	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	-	-	< 1.0	-	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	-	-	< 2.0	-	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	-	-	< 8.0	-	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	-	-	16	-	9.4
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	-	-	18	-	< 10
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	-	-	< 0.001	-	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	-	-	< 0.001	-	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	-	-	< 0.001	-	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	-	-	< 1.0	-	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	-	-	4.2	-	6.9
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	-	-	19	-	26
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	-	-	33	-	36
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	-	-	57	-	69
TPH (C5 - C6) $_{HS\_1D\_TOTAL}$	mg/kg	1	NONE	< 1.0	< 1.0	-	< 1.0	-
TPH (C6 - C8) $_{HS\_1D\_TOTAL}$	mg/kg	0.1	NONE	< 0.1	< 0.1	-	< 0.1	-
TPH (C8 - C10) $_{HS\_1D\_TOTAL}$	mg/kg	0.1	NONE	< 0.1	< 0.1	-	< 0.1	-
TPH (C10 - C12) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	2	MCERTS	< 2.0	< 2.0	-	< 2.0	-
TPH (C12 - C16) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	4	MCERTS	< 4.0	< 4.0	-	< 4.0	-
TPH (C16 - C21) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	1	MCERTS	14	< 1.0	-	< 1.0	-
TPH (C21 - C35) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	1	MCERTS	19	< 1.0	-	< 1.0	-
TPH (C35 - C40) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	MCERTS	< 10	< 10	-	< 10	-
TPH Total C5 - C40 $_{EH\_CU+HS\_1D\_TOTAL}$	mg/kg	10	NONE	37	< 10	-	< 10	-

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Analytical Report Number: 23-31107
Project / Site name: Egbert Street and Faversham Street
Your Order No: 004678

Lab Sample Number				2663632	2663633	2663634	2663635	2663636
Sample Reference				TP101	TP101	TP104	TP104	TP105
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.90	2.00	1.00	2.20	0.60
Date Sampled				23/04/2023	25/04/2023	25/04/2023	25/04/2023	25/04/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	5	ISO 17025	< 5.0	-	-	-	< 5.0
Chloroethane	µg/kg	5	NONE	< 5.0	-	-	-	< 5.0
Bromomethane	µg/kg	5	ISO 17025	< 5.0	-	-	-	< 5.0
Vinyl Chloride	µg/kg	5	NONE	< 5.0	-	-	-	< 5.0
Trichlorofluoromethane	µg/kg	5	NONE	< 5.0	-	-	-	< 5.0
1,1-Dichloroethene	µg/kg	5	NONE	< 5.0	-	-	-	< 5.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	5	NONE	< 5.0	-	-	-	< 5.0
Cis-1,2-dichloroethene	µg/kg	5	ISO 17025	< 5.0	-	-	-	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0	-	-	-	< 5.0
1,1-Dichloroethane	µg/kg	5	ISO 17025	< 5.0	-	-	-	< 5.0
2,2-Dichloropropane	µg/kg	5	ISO 17025	< 5.0	-	-	-	< 5.0
Trichloromethane	µg/kg	5	ISO 17025	< 5.0	-	-	-	< 5.0
1,1,1-Trichloroethane	µg/kg	5	ISO 17025	< 5.0	-	-	-	< 5.0
1,2-Dichloroethane	µg/kg	5	ISO 17025	< 5.0	-	-	-	< 5.0
1,1-Dichloropropene	µg/kg	5	ISO 17025	< 5.0	-	-	-	< 5.0
Trans-1,2-dichloroethene	µg/kg	5	NONE	< 5.0	-	-	-	< 5.0
Benzene	µg/kg	5	MCERTS	< 5.0	-	-	-	< 5.0
Tetrachloromethane	µg/kg	5	NONE	< 5.0	-	-	-	< 5.0
1,2-Dichloropropane	µg/kg	5	ISO 17025	< 5.0	-	-	-	< 5.0
Trichloroethene	µg/kg	5	ISO 17025	< 5.0	-	-	-	< 5.0
Dibromomethane	µg/kg	5	ISO 17025	< 5.0	-	-	-	< 5.0
Bromodichloromethane	µg/kg	5	ISO 17025	< 5.0	-	-	-	< 5.0
Cis-1,3-dichloropropene	µg/kg	5	ISO 17025	< 5.0	-	-	-	< 5.0
Trans-1,3-dichloropropene	µg/kg	5	ISO 17025	< 5.0	-	-	-	< 5.0
Toluene	µg/kg	5	MCERTS	< 5.0	-	-	-	< 5.0
1,1,2-Trichloroethane	µg/kg	5	ISO 17025	< 5.0	-	-	-	< 5.0
1,3-Dichloropropane	µg/kg	5	ISO 17025	< 5.0	-	-	-	< 5.0
Dibromochloromethane	µg/kg	5	ISO 17025	< 5.0	-	-	-	< 5.0
Tetrachloroethene	µg/kg	5	NONE	< 5.0	-	-	-	< 5.0
1,2-Dibromoethane	µg/kg	5	ISO 17025	< 5.0	-	-	-	< 5.0
Chlorobenzene	µg/kg	5	ISO 17025	< 5.0	-	-	-	< 5.0
1,1,1,2-Tetrachloroethane	µg/kg	5	ISO 17025	< 5.0	-	-	-	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	-	-	-	< 5.0
p & m-Xylene	µg/kg	5	MCERTS	< 5.0	-	-	-	< 5.0
Styrene	µg/kg	5	ISO 17025	< 5.0	-	-	-	< 5.0
Tribromomethane	µg/kg	5	NONE	< 5.0	-	-	-	< 5.0
o-Xylene	µg/kg	5	MCERTS	< 5.0	-	-	-	< 5.0
1,1,2,2-Tetrachloroethane	µg/kg	5	ISO 17025	< 5.0	-	-	-	< 5.0
Isopropylbenzene	µg/kg	5	ISO 17025	< 5.0	-	-	-	< 5.0
Bromobenzene	µg/kg	5	ISO 17025	< 5.0	-	-	-	< 5.0
n-Propylbenzene	µg/kg	5	ISO 17025	< 5.0	-	-	-	< 5.0
2-Chlorotoluene	µg/kg	5	ISO 17025	< 5.0	-	-	-	< 5.0
4-Chlorotoluene	µg/kg	5	ISO 17025	< 5.0	-	-	-	< 5.0
1,3,5-Trimethylbenzene	µg/kg	5	ISO 17025	< 5.0	-	-	-	< 5.0
tert-Butylbenzene	µg/kg	5	ISO 17025	< 5.0	-	-	-	< 5.0
1,2,4-Trimethylbenzene	µg/kg	5	ISO 17025	< 5.0	-	-	-	< 5.0
sec-Butylbenzene	µg/kg	5	ISO 17025	< 5.0	-	-	-	< 5.0
1,3-Dichlorobenzene	µg/kg	5	ISO 17025	< 5.0	-	-	-	< 5.0
p-Isopropyltoluene	µg/kg	5	ISO 17025	< 5.0	-	-	-	< 5.0
1,2-Dichlorobenzene	µg/kg	5	ISO 17025	< 5.0	-	-	-	< 5.0
1,4-Dichlorobenzene	µg/kg	5	ISO 17025	< 5.0	-	-	-	< 5.0
Butylbenzene	µg/kg	5	NONE	< 5.0	-	-	-	< 5.0

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Analytical Report Number: 23-31107
Project / Site name: Egbert Street and Faversham Street
Your Order No: 004678

Lab Sample Number				2663632	2663633	2663634	2663635	2663636
Sample Reference				TP101	TP101	TP104	TP104	TP105
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.90	2.00	1.00	2.20	0.60
Date Sampled				23/04/2023	25/04/2023	25/04/2023	25/04/2023	25/04/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
1,2-Dibromo-3-chloropropane	µg/kg	5	ISO 17025	< 5.0	-	-	-	< 5.0
1,2,4-Trichlorobenzene	µg/kg	5	ISO 17025	< 5.0	-	-	-	< 5.0
Hexachlorobutadiene	µg/kg	5	NONE	< 5.0	-	-	-	< 5.0
1,2,3-Trichlorobenzene	µg/kg	5	ISO 17025	< 5.0	-	-	-	< 5.0
SVOCs								
Aniline	mg/kg	0.1	NONE	< 0.1	-	-	-	0.7
Phenol	mg/kg	0.2	ISO 17025	< 0.2	-	-	-	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	-	-	-	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	-	-	-	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	0.3	-	-	-	0.4
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	-	-	-	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	-	-	-	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	-	-	-	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	-	-	-	< 0.3
Hexachloroethane	mg/kg	0.05	ISO 17025	< 0.05	-	-	-	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	-	-	-	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	-	-	-	< 0.2
Isophorone	mg/kg	0.2	MCERTS	< 0.2	-	-	-	< 0.2
2-Nitrophenol	mg/kg	0.3	NONE	< 0.3	-	-	-	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	-	-	-	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	-	-	-	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	-	-	-	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	0.5	-	-	-	0.18
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	-	-	-	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	-	-	-	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	-	-	-	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	-	-	-	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	NONE	< 0.1	-	-	-	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	NONE	< 0.2	-	-	-	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	0.3	-	-	-	0.2
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	-	-	-	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	-	-	-	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	NONE	< 0.1	-	-	-	< 0.1
Acenaphthylene	mg/kg	0.05	MCERTS	0.16	-	-	-	0.08
Acenaphthene	mg/kg	0.05	MCERTS	0.31	-	-	-	0.57
2,4-Dinitrotoluene	mg/kg	0.2	NONE	< 0.2	-	-	-	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	-	-	-	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	MCERTS	< 0.3	-	-	-	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	-	-	-	< 0.2
4-Nitroaniline	mg/kg	0.2	NONE	< 0.2	-	-	-	< 0.2
Fluorene	mg/kg	0.05	MCERTS	0.28	-	-	-	0.36
Azobenzene	mg/kg	0.3	NONE	< 0.3	-	-	-	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	-	-	-	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	-	-	-	< 0.3
Phenanthrene	mg/kg	0.05	MCERTS	2.9	-	-	-	4.4
Anthracene	mg/kg	0.05	MCERTS	0.58	-	-	-	0.96
Carbazole	mg/kg	0.3	MCERTS	< 0.3	-	-	-	< 0.3
Dibutyl phthalate	mg/kg	0.2	NONE	< 0.2	-	-	-	< 0.2
Anthraquinone	mg/kg	0.3	NONE	< 0.3	-	-	-	< 0.3
Fluoranthene	mg/kg	0.05	MCERTS	4.9	-	-	-	7.4
Pyrene	mg/kg	0.05	MCERTS	5.2	-	-	-	7.2
Butyl benzyl phthalate	mg/kg	0.3	NONE	< 0.3	-	-	-	< 0.3

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Analytical Report Number: 23-31107
Project / Site name: Egbert Street and Faversham Street
Your Order No: 004678

Lab Sample Number				2663632	2663633	2663634	2663635	2663636
Sample Reference				TP101	TP101	TP104	TP104	TP105
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.90	2.00	1.00	2.20	0.60
Date Sampled				23/04/2023	25/04/2023	25/04/2023	25/04/2023	25/04/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Benzo(a)anthracene	mg/kg	0.05	MCERTS	2.5	-	-	-	3.1
Chrysene	mg/kg	0.05	MCERTS	2.9	-	-	-	3.3
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	3	-	-	-	3.5
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	1.5	-	-	-	1.4
Benzo(a)pyrene	mg/kg	0.05	MCERTS	2.9	-	-	-	3.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	1.7	-	-	-	1.6
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.33	-	-	-	0.24
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	2.2	-	-	-	2

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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Analytical Report Number: 23-31107
Project / Site name: Egbert Street and Faversham Street
Your Order No: 004678

Lab Sample Number				2663637	2663638	2663639	2663640	2663641
Sample Reference				TP105	TP106	TP107	WS101	WS102
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				3.00	0.10	1.10	0.10	0.70
Date Sampled				25/04/2023	25/04/2023	25/04/2023	25/04/2023	25/04/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	21	15	24	13	17
Total mass of sample received	kg	0.001	NONE	0.4	0.4	0.8	0.4	0.4
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	-	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Analyst ID	N/A	N/A	N/A	N/A	EC	JSW	JSW	JSW
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	-	8	6.8	7.9	7.6
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	1.1
Total Sulphate as SO4	mg/kg	50	MCERTS	-	450	610	660	740
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	-	0.007	0.064	0.023	0.17
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	-	14	130	45	340
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	-	7	64.1	22.7	168
Sulphide	mg/kg	1	MCERTS	-	5.7	2.9	3	41
Total Sulphur	mg/kg	50	MCERTS	-	340	810	360	860
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	1.2	2.2	2.4	1.7	1
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	-	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	6.5	1.9	< 0.05	0.25	1.8
Acenaphthylene	mg/kg	0.05	MCERTS	1.4	0.16	< 0.05	0.08	0.36
Acenaphthene	mg/kg	0.05	MCERTS	5.7	0.68	< 0.05	0.22	0.98
Fluorene	mg/kg	0.05	MCERTS	7	0.88	< 0.05	0.22	1.3
Phenanthrene	mg/kg	0.05	MCERTS	32	5.1	0.35	1.7	7.5
Anthracene	mg/kg	0.05	MCERTS	7.7	1.1	< 0.05	0.39	1.7
Fluoranthene	mg/kg	0.05	MCERTS	25	5.3	0.41	2.3	8.7
Pyrene	mg/kg	0.05	MCERTS	25	5.4	0.44	2.2	8.8
Benzo(a)anthracene	mg/kg	0.05	MCERTS	11	2.4	0.18	1.1	4.2
Chrysene	mg/kg	0.05	MCERTS	11	2.4	0.24	1.2	3.9
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	10	2.6	0.21	1.3	3.6
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	4.2	0.81	0.09	0.48	1.8
Benzo(a)pyrene	mg/kg	0.05	MCERTS	9.1	2.3	0.15	1.1	3.5
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	3.7	1.1	< 0.05	0.57	1.7
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	1.3	0.23	< 0.05	0.14	0.36
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	5.3	1.3	< 0.05	0.64	2
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	165	33.5	2.07	13.9	52.2

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Analytical Report Number: 23-31107
Project / Site name: Egbert Street and Faversham Street
Your Order No: 004678

Lab Sample Number				2663637	2663638	2663639	2663640	2663641
Sample Reference				TP105	TP106	TP107	WS101	WS102
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				3.00	0.10	1.10	0.10	0.70
Date Sampled				25/04/2023	25/04/2023	25/04/2023	25/04/2023	25/04/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	12	11	20	12	16
Barium (aqua regia extractable)	mg/kg	1	MCERTS	100	-	-	-	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.1	-	-	-	-
Boron (water soluble)	mg/kg	0.2	MCERTS	0.5	-	-	-	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	0.8	< 0.2	0.6	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	2.1	2.6	2.6	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	22	23	18	29
Copper (aqua regia extractable)	mg/kg	1	MCERTS	32	47	44	45	44
Lead (aqua regia extractable)	mg/kg	1	MCERTS	37	110	63	120	41
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	27	15	23	16	39
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	33	-	-	-	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	58	97	68	120	81
Monoaromatics & Oxygenates								
Benzene	µg/kg	5	MCERTS	-	-	< 5.0	-	-
Toluene	µg/kg	5	MCERTS	-	-	< 5.0	-	-
Ethylbenzene	µg/kg	5	MCERTS	-	-	< 5.0	-	-
p & m-xylene	µg/kg	5	MCERTS	-	-	< 5.0	-	-
o-xylene	µg/kg	5	MCERTS	-	-	< 5.0	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	-	-	< 5.0	-	-
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	-	-	< 0.001	-	-
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	-	-	< 0.001	-	-
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	-	-	< 0.001	-	-
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	-	-	< 1.0	-	-
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	-	-	< 2.0	-	-
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	-	-	< 8.0	-	-
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	-	-	< 8.0	-	-
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	-	-	< 10	-	-
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	-	-	< 0.001	-	-
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	-	-	< 0.001	-	-
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	-	-	< 0.001	-	-
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	-	-	< 1.0	-	-
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	-	-	< 2.0	-	-
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	-	-	< 10	-	-
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	-	-	< 10	-	-
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	-	-	15	-	-
TPH (C5 - C6) $_{HS\_1D\_TOTAL}$	mg/kg	1	NONE	< 1.0	< 1.0	-	< 1.0	< 1.0
TPH (C6 - C8) $_{HS\_1D\_TOTAL}$	mg/kg	0.1	NONE	< 0.1	< 0.1	-	< 0.1	< 0.1
TPH (C8 - C10) $_{HS\_1D\_TOTAL}$	mg/kg	0.1	NONE	< 0.1	< 0.1	-	< 0.1	< 0.1
TPH (C10 - C12) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	2	MCERTS	4.7	< 2.0	-	< 2.0	< 2.0
TPH (C12 - C16) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	4	MCERTS	30	< 4.0	-	< 4.0	5.6
TPH (C16 - C21) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	1	MCERTS	75	12	-	7.1	20
TPH (C21 - C35) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	1	MCERTS	56	66	-	27	30
TPH (C35 - C40) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	MCERTS	< 10	18	-	< 10	< 10
TPH Total C5 - C40 $_{EH\_CU+HS\_1D\_TOTAL}$	mg/kg	10	NONE	160	99	-	41	59

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Analytical Report Number: 23-31107
Project / Site name: Egbert Street and Faversham Street
Your Order No: 004678

Lab Sample Number				2663637	2663638	2663639	2663640	2663641
Sample Reference				TP105	TP106	TP107	WS101	WS102
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				3.00	0.10	1.10	0.10	0.70
Date Sampled				25/04/2023	25/04/2023	25/04/2023	25/04/2023	25/04/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	5	ISO 17025	-	-	-	-	< 5.0
Chloroethane	µg/kg	5	NONE	-	-	-	-	< 5.0
Bromomethane	µg/kg	5	ISO 17025	-	-	-	-	< 5.0
Vinyl Chloride	µg/kg	5	NONE	-	-	-	-	< 5.0
Trichlorofluoromethane	µg/kg	5	NONE	-	-	-	-	< 5.0
1,1-Dichloroethene	µg/kg	5	NONE	-	-	-	-	< 5.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	5	NONE	-	-	-	-	< 5.0
Cis-1,2-dichloroethene	µg/kg	5	ISO 17025	-	-	-	-	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	-	-	-	-	< 5.0
1,1-Dichloroethane	µg/kg	5	ISO 17025	-	-	-	-	< 5.0
2,2-Dichloropropane	µg/kg	5	ISO 17025	-	-	-	-	< 5.0
Trichloromethane	µg/kg	5	ISO 17025	-	-	-	-	< 5.0
1,1,1-Trichloroethane	µg/kg	5	ISO 17025	-	-	-	-	< 5.0
1,2-Dichloroethane	µg/kg	5	ISO 17025	-	-	-	-	< 5.0
1,1-Dichloropropene	µg/kg	5	ISO 17025	-	-	-	-	< 5.0
Trans-1,2-dichloroethene	µg/kg	5	NONE	-	-	-	-	< 5.0
Benzene	µg/kg	5	MCERTS	-	-	-	-	< 5.0
Tetrachloromethane	µg/kg	5	NONE	-	-	-	-	< 5.0
1,2-Dichloropropane	µg/kg	5	ISO 17025	-	-	-	-	< 5.0
Trichloroethene	µg/kg	5	ISO 17025	-	-	-	-	< 5.0
Dibromomethane	µg/kg	5	ISO 17025	-	-	-	-	< 5.0
Bromodichloromethane	µg/kg	5	ISO 17025	-	-	-	-	< 5.0
Cis-1,3-dichloropropene	µg/kg	5	ISO 17025	-	-	-	-	< 5.0
Trans-1,3-dichloropropene	µg/kg	5	ISO 17025	-	-	-	-	< 5.0
Toluene	µg/kg	5	MCERTS	-	-	-	-	< 5.0
1,1,2-Trichloroethane	µg/kg	5	ISO 17025	-	-	-	-	< 5.0
1,3-Dichloropropane	µg/kg	5	ISO 17025	-	-	-	-	< 5.0
Dibromochloromethane	µg/kg	5	ISO 17025	-	-	-	-	< 5.0
Tetrachloroethene	µg/kg	5	NONE	-	-	-	-	< 5.0
1,2-Dibromoethane	µg/kg	5	ISO 17025	-	-	-	-	< 5.0
Chlorobenzene	µg/kg	5	ISO 17025	-	-	-	-	< 5.0
1,1,1,2-Tetrachloroethane	µg/kg	5	ISO 17025	-	-	-	-	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	-	-	-	-	< 5.0
p & m-Xylene	µg/kg	5	MCERTS	-	-	-	-	< 5.0
Styrene	µg/kg	5	ISO 17025	-	-	-	-	< 5.0
Tribromomethane	µg/kg	5	NONE	-	-	-	-	< 5.0
o-Xylene	µg/kg	5	MCERTS	-	-	-	-	< 5.0
1,1,2,2-Tetrachloroethane	µg/kg	5	ISO 17025	-	-	-	-	< 5.0
Isopropylbenzene	µg/kg	5	ISO 17025	-	-	-	-	< 5.0
Bromobenzene	µg/kg	5	ISO 17025	-	-	-	-	< 5.0
n-Propylbenzene	µg/kg	5	ISO 17025	-	-	-	-	< 5.0
2-Chlorotoluene	µg/kg	5	ISO 17025	-	-	-	-	< 5.0
4-Chlorotoluene	µg/kg	5	ISO 17025	-	-	-	-	< 5.0
1,3,5-Trimethylbenzene	µg/kg	5	ISO 17025	-	-	-	-	< 5.0
tert-Butylbenzene	µg/kg	5	ISO 17025	-	-	-	-	< 5.0
1,2,4-Trimethylbenzene	µg/kg	5	ISO 17025	-	-	-	-	< 5.0
sec-Butylbenzene	µg/kg	5	ISO 17025	-	-	-	-	< 5.0
1,3-Dichlorobenzene	µg/kg	5	ISO 17025	-	-	-	-	< 5.0
p-Isopropyltoluene	µg/kg	5	ISO 17025	-	-	-	-	< 5.0
1,2-Dichlorobenzene	µg/kg	5	ISO 17025	-	-	-	-	< 5.0
1,4-Dichlorobenzene	µg/kg	5	ISO 17025	-	-	-	-	< 5.0
Butylbenzene	µg/kg	5	NONE	-	-	-	-	< 5.0

Analytical Report Number: 23-31107
Project / Site name: Egbert Street and Faversham Street
Your Order No: 004678

Lab Sample Number				2663637	2663638	2663639	2663640	2663641
Sample Reference				TP105	TP106	TP107	WS101	WS102
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				3.00	0.10	1.10	0.10	0.70
Date Sampled				25/04/2023	25/04/2023	25/04/2023	25/04/2023	25/04/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
1,2-Dibromo-3-chloropropane	µg/kg	5	ISO 17025	-	-	-	-	< 5.0
1,2,4-Trichlorobenzene	µg/kg	5	ISO 17025	-	-	-	-	< 5.0
Hexachlorobutadiene	µg/kg	5	NONE	-	-	-	-	< 5.0
1,2,3-Trichlorobenzene	µg/kg	5	ISO 17025	-	-	-	-	< 5.0
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	-	-	1.1
Phenol	mg/kg	0.2	ISO 17025	-	-	-	-	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	-	-	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	-	-	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	-	-	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	-	< 0.3
Hexachloroethane	mg/kg	0.05	ISO 17025	-	-	-	-	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	-	-	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	-	< 0.2
Isophorone	mg/kg	0.2	MCERTS	-	-	-	-	< 0.2
2-Nitrophenol	mg/kg	0.3	NONE	-	-	-	-	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	-	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	-	-	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	1.8
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	-	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	-	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	-	-	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	-	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	NONE	-	-	-	-	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	NONE	-	-	-	-	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	-	1
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	-	-	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	-	-	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	NONE	-	-	-	-	< 0.1
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	-	-	0.36
Acenaphthene	mg/kg	0.05	MCERTS	-	-	-	-	0.98
2,4-Dinitrotoluene	mg/kg	0.2	NONE	-	-	-	-	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	-	0.6
4-Chlorophenyl phenyl ether	mg/kg	0.3	MCERTS	-	-	-	-	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	< 0.2
4-Nitroaniline	mg/kg	0.2	NONE	-	-	-	-	< 0.2
Fluorene	mg/kg	0.05	MCERTS	-	-	-	-	1.3
Azobenzene	mg/kg	0.3	NONE	-	-	-	-	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	-	-	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	< 0.3
Phenanthrene	mg/kg	0.05	MCERTS	-	-	-	-	7.5
Anthracene	mg/kg	0.05	MCERTS	-	-	-	-	1.7
Carbazole	mg/kg	0.3	MCERTS	-	-	-	-	0.5
Dibutyl phthalate	mg/kg	0.2	NONE	-	-	-	-	< 0.2
Anthraquinone	mg/kg	0.3	NONE	-	-	-	-	< 0.3
Fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	8.7
Pyrene	mg/kg	0.05	MCERTS	-	-	-	-	8.8
Butyl benzyl phthalate	mg/kg	0.3	NONE	-	-	-	-	< 0.3

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Analytical Report Number: 23-31107
Project / Site name: Egbert Street and Faversham Street
Your Order No: 004678

Lab Sample Number				2663637	2663638	2663639	2663640	2663641
Sample Reference				TP105	TP106	TP107	WS101	WS102
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				3.00	0.10	1.10	0.10	0.70
Date Sampled				25/04/2023	25/04/2023	25/04/2023	25/04/2023	25/04/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	4.2
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	3.9
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	-	-	-	-	3.6
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	-	-	-	-	1.8
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	-	-	3.5
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	-	-	1.7
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	0.36
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	2

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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Analytical Report Number: 23-31107
Project / Site name: Egbert Street and Faversham Street
Your Order No: 004678

Lab Sample Number				2663642
Sample Reference				WS103
Sample Number				None Supplied
Depth (m)				0.50
Date Sampled				25/04/2023
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	15
Total mass of sample received	kg	0.001	NONE	0.4

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-
Asbestos Quantification Total	%	0.001	ISO 17025	-
Asbestos Analyst ID	N/A	N/A	N/A	JSW

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8
Total Cyanide	mg/kg	1	MCERTS	< 1.0
Total Sulphate as SO4	mg/kg	50	MCERTS	530
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.051
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	100
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	51.3
Sulphide	mg/kg	1	MCERTS	2.8
Total Sulphur	mg/kg	50	MCERTS	420
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	1.1

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	3.2
Acenaphthylene	mg/kg	0.05	MCERTS	0.61
Acenaphthene	mg/kg	0.05	MCERTS	1
Fluorene	mg/kg	0.05	MCERTS	1.6
Phenanthrene	mg/kg	0.05	MCERTS	8.1
Anthracene	mg/kg	0.05	MCERTS	1.9
Fluoranthene	mg/kg	0.05	MCERTS	7.9
Pyrene	mg/kg	0.05	MCERTS	7.4
Benzo(a)anthracene	mg/kg	0.05	MCERTS	3.8
Chrysene	mg/kg	0.05	MCERTS	3.8
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	3.6
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	1.3
Benzo(a)pyrene	mg/kg	0.05	MCERTS	3.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	1.2
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.38
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.5

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	50.3

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Analytical Report Number: 23-31107
Project / Site name: Egbert Street and Faversham Street
Your Order No: 004678

Lab Sample Number				2663642
Sample Reference				WS103
Sample Number				None Supplied
Depth (m)				0.50
Date Sampled				25/04/2023
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Heavy Metals / Metalloids				
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	18
Barium (aqua regia extractable)	mg/kg	1	MCERTS	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-
Boron (water soluble)	mg/kg	0.2	MCERTS	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	24
Copper (aqua regia extractable)	mg/kg	1	MCERTS	44
Lead (aqua regia extractable)	mg/kg	1	MCERTS	57
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	29
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	110
Monoaromatics & Oxygenates				
Benzene	µg/kg	5	MCERTS	-
Toluene	µg/kg	5	MCERTS	-
Ethylbenzene	µg/kg	5	MCERTS	-
p & m-xylene	µg/kg	5	MCERTS	-
o-xylene	µg/kg	5	MCERTS	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	-
Petroleum Hydrocarbons				
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	-
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	-
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	-
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	-
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	-
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	-
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	-
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	-
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	-
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	-
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	-
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	-
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	-
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	-
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	-
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	-
TPH (C5 - C6) $_{HS\_1D\_TOTAL}$	mg/kg	1	NONE	< 1.0
TPH (C6 - C8) $_{HS\_1D\_TOTAL}$	mg/kg	0.1	NONE	< 0.1
TPH (C8 - C10) $_{HS\_1D\_TOTAL}$	mg/kg	0.1	NONE	< 0.1
TPH (C10 - C12) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	2	MCERTS	2.8
TPH (C12 - C16) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	4	MCERTS	11
TPH (C16 - C21) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	1	MCERTS	30
TPH (C21 - C35) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	1	MCERTS	39
TPH (C35 - C40) $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	MCERTS	< 10
TPH Total C5 - C40 $_{EH\_CU+HS\_1D\_TOTAL}$	mg/kg	10	NONE	87

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Analytical Report Number: 23-31107
Project / Site name: Egbert Street and Faversham Street
Your Order No: 004678

Lab Sample Number				2663642
Sample Reference				WS103
Sample Number				None Supplied
Depth (m)				0.50
Date Sampled				25/04/2023
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
VOCs				
Chloromethane	µg/kg	5	ISO 17025	-
Chloroethane	µg/kg	5	NONE	-
Bromomethane	µg/kg	5	ISO 17025	-
Vinyl Chloride	µg/kg	5	NONE	-
Trichlorofluoromethane	µg/kg	5	NONE	-
1,1-Dichloroethene	µg/kg	5	NONE	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	5	NONE	-
Cis-1,2-dichloroethene	µg/kg	5	ISO 17025	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	-
1,1-Dichloroethane	µg/kg	5	ISO 17025	-
2,2-Dichloropropane	µg/kg	5	ISO 17025	-
Trichloromethane	µg/kg	5	ISO 17025	-
1,1,1-Trichloroethane	µg/kg	5	ISO 17025	-
1,2-Dichloroethane	µg/kg	5	ISO 17025	-
1,1-Dichloropropene	µg/kg	5	ISO 17025	-
Trans-1,2-dichloroethene	µg/kg	5	NONE	-
Benzene	µg/kg	5	MCERTS	-
Tetrachloromethane	µg/kg	5	NONE	-
1,2-Dichloropropane	µg/kg	5	ISO 17025	-
Trichloroethene	µg/kg	5	ISO 17025	-
Dibromomethane	µg/kg	5	ISO 17025	-
Bromodichloromethane	µg/kg	5	ISO 17025	-
Cis-1,3-dichloropropene	µg/kg	5	ISO 17025	-
Trans-1,3-dichloropropene	µg/kg	5	ISO 17025	-
Toluene	µg/kg	5	MCERTS	-
1,1,2-Trichloroethane	µg/kg	5	ISO 17025	-
1,3-Dichloropropane	µg/kg	5	ISO 17025	-
Dibromochloromethane	µg/kg	5	ISO 17025	-
Tetrachloroethene	µg/kg	5	NONE	-
1,2-Dibromoethane	µg/kg	5	ISO 17025	-
Chlorobenzene	µg/kg	5	ISO 17025	-
1,1,1,2-Tetrachloroethane	µg/kg	5	ISO 17025	-
Ethylbenzene	µg/kg	5	MCERTS	-
p & m-Xylene	µg/kg	5	MCERTS	-
Styrene	µg/kg	5	ISO 17025	-
Tribromomethane	µg/kg	5	NONE	-
o-Xylene	µg/kg	5	MCERTS	-
1,1,2,2-Tetrachloroethane	µg/kg	5	ISO 17025	-
Isopropylbenzene	µg/kg	5	ISO 17025	-
Bromobenzene	µg/kg	5	ISO 17025	-
n-Propylbenzene	µg/kg	5	ISO 17025	-
2-Chlorotoluene	µg/kg	5	ISO 17025	-
4-Chlorotoluene	µg/kg	5	ISO 17025	-
1,3,5-Trimethylbenzene	µg/kg	5	ISO 17025	-
tert-Butylbenzene	µg/kg	5	ISO 17025	-
1,2,4-Trimethylbenzene	µg/kg	5	ISO 17025	-
sec-Butylbenzene	µg/kg	5	ISO 17025	-
1,3-Dichlorobenzene	µg/kg	5	ISO 17025	-
p-Isopropyltoluene	µg/kg	5	ISO 17025	-
1,2-Dichlorobenzene	µg/kg	5	ISO 17025	-
1,4-Dichlorobenzene	µg/kg	5	ISO 17025	-
Butylbenzene	µg/kg	5	NONE	-

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Analytical Report Number: 23-31107
Project / Site name: Egbert Street and Faversham Street
Your Order No: 004678

Lab Sample Number				2663642
Sample Reference				WS103
Sample Number				None Supplied
Depth (m)				0.50
Date Sampled				25/04/2023
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
1,2-Dibromo-3-chloropropane	µg/kg	5	ISO 17025	-
1,2,4-Trichlorobenzene	µg/kg	5	ISO 17025	-
Hexachlorobutadiene	µg/kg	5	NONE	-
1,2,3-Trichlorobenzene	µg/kg	5	ISO 17025	-

SVOCs

Aniline	mg/kg	0.1	NONE	-
Phenol	mg/kg	0.2	ISO 17025	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-
2-Methylphenol	mg/kg	0.3	MCERTS	-
Hexachloroethane	mg/kg	0.05	ISO 17025	-
Nitrobenzene	mg/kg	0.3	MCERTS	-
4-Methylphenol	mg/kg	0.2	NONE	-
Isophorone	mg/kg	0.2	MCERTS	-
2-Nitrophenol	mg/kg	0.3	NONE	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-
Naphthalene	mg/kg	0.05	MCERTS	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-
4-Chloroaniline	mg/kg	0.1	NONE	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-
2,4,6-Trichlorophenol	mg/kg	0.1	NONE	-
2,4,5-Trichlorophenol	mg/kg	0.2	NONE	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-
2,6-Dinitrotoluene	mg/kg	0.1	NONE	-
Acenaphthylene	mg/kg	0.05	MCERTS	-
Acenaphthene	mg/kg	0.05	MCERTS	-
2,4-Dinitrotoluene	mg/kg	0.2	NONE	-
Dibenzofuran	mg/kg	0.2	MCERTS	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	MCERTS	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-
4-Nitroaniline	mg/kg	0.2	NONE	-
Fluorene	mg/kg	0.05	MCERTS	-
Azobenzene	mg/kg	0.3	NONE	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-
Phenanthrene	mg/kg	0.05	MCERTS	-
Anthracene	mg/kg	0.05	MCERTS	-
Carbazole	mg/kg	0.3	MCERTS	-
Dibutyl phthalate	mg/kg	0.2	NONE	-
Anthraquinone	mg/kg	0.3	NONE	-
Fluoranthene	mg/kg	0.05	MCERTS	-
Pyrene	mg/kg	0.05	MCERTS	-
Butyl benzyl phthalate	mg/kg	0.3	NONE	-

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Analytical Report Number: 23-31107
Project / Site name: Egbert Street and Faversham Street
Your Order No: 004678

Lab Sample Number				2663642
Sample Reference				WS103
Sample Number				None Supplied
Depth (m)				0.50
Date Sampled				25/04/2023
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-
Chrysene	mg/kg	0.05	MCERTS	-
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	-
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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UKAS TESTING
4041

Analytical i2 Environmental Science

Analytical Report Number: 23-31107
Project / Site name: Egbert Street and Faversham Street
Your Order No: 004678

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006-PL based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
2663634	TP104	1.00	152	Asbestos Cement	**Chrysotile**	1.297	**1.30**

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 23-31107
Project / Site name: Egbert Street and Faversham Street

Your Order No: 004678

Lab Sample Number				2663643	2663644
Sample Reference				TP101	TP105
Sample Number				None Supplied	None Supplied
Depth (m)				0.90	0.60
Date Sampled				23/04/2023	25/04/2023
Time Taken				None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
General Inorganics					
pH (automated)	pH Units	N/A	ISO 17025	7.7	7.8
Total Cyanide (Low Level 1 µg/l)	µg/l	1	ISO 17025	2.3	2.1
Total Phenols					
Total Phenols (monohydric)	µg/l	1	ISO 17025	1.6	2.4
Speciated PAHs					
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01	< 0.01
Total PAH					
Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2	< 0.2
Heavy Metals / Metalloids					
Arsenic (dissolved)	µg/l	1	ISO 17025	2.7	3.1
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0
Chromium (dissolved)	µg/l	0.4	ISO 17025	1.6	2.4
Copper (dissolved)	µg/l	0.7	ISO 17025	8.7	14
Lead (dissolved)	µg/l	1	ISO 17025	4.3	8.1
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5
Nickel (dissolved)	µg/l	0.3	ISO 17025	0.7	1.3
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0
Zinc (dissolved)	µg/l	0.4	ISO 17025	11	13
Monoaromatics & Oxygenates					
Benzene	µg/l	3	ISO 17025	< 3.0	< 3.0
Toluene	µg/l	3	ISO 17025	< 3.0	< 3.0
Ethylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0
p & m-xylene	µg/l	3	ISO 17025	< 3.0	< 3.0
o-xylene	µg/l	3	ISO 17025	< 3.0	< 3.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	10	NONE	< 10	< 10

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Analytical Report Number: 23-31107
Project / Site name: Egbert Street and Faversham Street

Your Order No: 004678

Lab Sample Number				2663643	2663644
Sample Reference				TP101	TP105
Sample Number				None Supplied	None Supplied
Depth (m)				0.90	0.60
Date Sampled				23/04/2023	25/04/2023
Time Taken				None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
Petroleum Hydrocarbons					
TPH1 (C10 - C40) EH_1D_TOTAL_MS	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aliphatic >C5 - C6 HS_1D_AL	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8 HS_1D_AL	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10 HS_1D_AL	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH-CWG - Aliphatic >C10 - C12 EH_1D_AL_MS	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16 EH_1D_AL_MS	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21 EH_1D_AL_MS	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35 EH_1D_AL_MS	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35) HS+EH_1D_AL_MS	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aromatic >C5 - C7 HS_1D_AR	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8 HS_1D_AR	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10 HS_1D_AR	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12 EH_1D_AR_MS	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aromatic >C12 - C16 EH_1D_AR_MS	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aromatic >C16 - C21 EH_1D_AR_MS	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aromatic >C21 - C35 EH_1D_AR_MS	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aromatic (C5 - C35) HS+EH_1D_AR_MS	µg/l	10	NONE	< 10	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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Analytical Report Number : 23-31107
Project / Site name: Egbert Street and Faversham Street

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2663632	TP101	None Supplied	0.9	Brown sand with gravel and vegetation.
2663633	TP101	None Supplied	2	Brown clay with vegetation.
2663634	TP104	None Supplied	1	Brown sand with gravel.
2663635	TP104	None Supplied	2.2	Brown clay and sand with gravel.
2663636	TP105	None Supplied	0.6	Brown clay and sand with gravel and vegetation.
2663637	TP105	None Supplied	3	Brown clay and sand with gravel.
2663638	TP106	None Supplied	0.1	Brown loam and sand with gravel and vegetation.
2663639	TP107	None Supplied	1.1	Brown clay and sand with gravel.
2663640	WS101	None Supplied	0.1	Brown loam and sand with gravel and vegetation.
2663641	WS102	None Supplied	0.7	Brown clay and sand with gravel.
2663642	WS103	None Supplied	0.5	Brown clay and sand with gravel and brick.

Analytical Report Number : 23-31107
Project / Site name: Egbert Street and Faversham Street

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
BS EN 12457-1 (2:1) Leachate Prep	2:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-1.	L043-PL	W	NONE
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	ISO 17025
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in leachate - LOW LEVEL 1 ug/l	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	ISO 17025
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
pH at 20oC in leachate (automated)	Determination of pH in leachate by electrometric measurement.	In house method.	L099B	W	ISO 17025
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE

Analytical Report Number : 23-31107
Project / Site name: Egbert Street and Faversham Street

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
TPH1 (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	NONE
TPHCWG (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	ISO 17025
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS. Individual components MCERTS accredited	In-house method based on USEPA8260	L073B-PL	W	MCERTS
BTEX and MTBE in leachates (Monoaromatics)	Determination of BTEX and MTBE in leachates by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS
Total cyanide in leachate - 1µg/l	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE

Analytical Report Number : 23-31107
Project / Site name: Egbert Street and Faversham Street

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (1hr extraction)	Sulphate, water soluble, in soil (1hr extraction)	In-house method	L038-PL	D	MCERTS

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

UKAS TESTING
4041

Environmental Science

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Analytical Report Number : 23-32998

Project / Site name:	Egbert Street	**Samples received on:**	10/05/2023
Your job number:	16-220	**Samples instructed on/ Analysis started on:**	10/05/2023
Your order number:	004780	**Analysis completed by:**	17/05/2023
Report Issue Number:	1	**Report issued on:**	17/05/2023
Samples Analysed:	1 water sample		

Signed:

Dominika Warjan
Junior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

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The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 23-32998
Project / Site name: Egbert Street

Your Order No: 004780

Lab Sample Number				2674496
Sample Reference				WS103
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				09/05/2023
Time Taken				None Supplied
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
General Inorganics				
pH (L005B)	pH Units	N/A	ISO 17025	7.1
Total Cyanide (Low Level 1 µg/l)	µg/l	1	ISO 17025	< 1.0
Dissolved Organic Carbon (DOC)	mg/l	0.1	ISO 17025	6.03
Total Phenols				
Total Phenols (monohydric)	µg/l	1	ISO 17025	1.5
Heavy Metals / Metalloids				
Calcium (dissolved)	mg/l	0.012	ISO 17025	170
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0
Arsenic (dissolved)	µg/l	0.15	ISO 17025	3.06
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02
Chromium (dissolved)	µg/l	0.2	ISO 17025	< 0.2
Copper (dissolved)	µg/l	0.5	ISO 17025	0.7
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2
Manganese (dissolved)	µg/l	0.05	ISO 17025	2800
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	0.9
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6
Zinc (dissolved)	µg/l	0.5	ISO 17025	1.5
Monoaromatics & Oxygenates				
Benzene	µg/l	3	ISO 17025	< 3.0
Toluene	µg/l	3	ISO 17025	< 3.0
Ethylbenzene	µg/l	3	ISO 17025	< 3.0
p & m-xylene	µg/l	3	ISO 17025	< 3.0
o-xylene	µg/l	3	ISO 17025	< 3.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	3	ISO 17025	< 3.0
Petroleum Hydrocarbons				
TPH1 (C10 - C40) $_{EH\_1D\_TOTAL\_MS}$	µg/l	10	ISO 17025	< 10
TPH-CWG - Aliphatic >C5 - C6 $_{HS\_1D\_AL}$	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aliphatic >C6 - C8 $_{HS\_1D\_AL}$	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aliphatic >C8 - C10 $_{HS\_1D\_AL}$	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aliphatic >C10 - C12 $_{EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10
TPH-CWG - Aliphatic >C12 - C16 $_{EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10
TPH-CWG - Aliphatic >C16 - C21 $_{EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10
TPH-CWG - Aliphatic >C21 - C35 $_{EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10
TPH-CWG - Aliphatic (C5 - C35) $_{HS+EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10
TPH-CWG - Aromatic >C5 - C7 $_{HS\_1D\_AR}$	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aromatic >C7 - C8 $_{HS\_1D\_AR}$	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aromatic >C8 - C10 $_{HS\_1D\_AR}$	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aromatic >C10 - C12 $_{EH\_1D\_AR\_MS}$	µg/l	10	NONE	< 10
TPH-CWG - Aromatic >C12 - C16 $_{EH\_1D\_AR\_MS}$	µg/l	10	NONE	< 10
TPH-CWG - Aromatic >C16 - C21 $_{EH\_1D\_AR\_MS}$	µg/l	10	NONE	< 10
TPH-CWG - Aromatic >C21 - C35 $_{EH\_1D\_AR\_MS}$	µg/l	10	NONE	< 10
TPH-CWG - Aromatic (C5 - C35) $_{HS+EH\_1D\_AR\_MS}$	µg/l	10	NONE	< 10

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Analytical Report Number: 23-32998
Project / Site name: Egbert Street

Your Order No: 004780

Lab Sample Number				2674496
Sample Reference				WS103
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				09/05/2023
Time Taken				None Supplied
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
VOCs				
Chloromethane	µg/l	3	ISO 17025	< 3.0
Chloroethane	µg/l	3	ISO 17025	< 3.0
Bromomethane	µg/l	3	ISO 17025	< 3.0
Vinyl Chloride	µg/l	3	NONE	< 3.0
Trichlorofluoromethane	µg/l	3	NONE	< 3.0
1,1-Dichloroethene	µg/l	3	ISO 17025	< 3.0
1,1,2-Trichloro-1,2,2-trifluoroethane##	µg/l	3	ISO 17025	< 3.0
Cis-1,2-dichloroethene	µg/l	3	ISO 17025	< 3.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	3	ISO 17025	< 3.0
1,1-Dichloroethane	µg/l	3	ISO 17025	< 3.0
2,2-Dichloropropane	µg/l	3	ISO 17025	< 3.0
Trichloromethane	µg/l	3	ISO 17025	< 3.0
1,1,1-Trichloroethane	µg/l	3	ISO 17025	< 3.0
1,2-Dichloroethane	µg/l	3	ISO 17025	< 3.0
1,1-Dichloropropene	µg/l	3	ISO 17025	< 3.0
Trans-1,2-dichloroethene	µg/l	3	ISO 17025	< 3.0
Benzene	µg/l	3	ISO 17025	< 3.0
Tetrachloromethane	µg/l	3	ISO 17025	< 3.0
1,2-Dichloropropane	µg/l	3	ISO 17025	< 3.0
Trichloroethene	µg/l	3	ISO 17025	< 3.0
Dibromomethane	µg/l	3	ISO 17025	< 3.0
Bromodichloromethane	µg/l	3	ISO 17025	< 3.0
Cis-1,3-dichloropropene	µg/l	3	ISO 17025	< 3.0
Trans-1,3-dichloropropene	µg/l	3	ISO 17025	< 3.0
Toluene	µg/l	3	ISO 17025	< 3.0
1,1,2-Trichloroethane	µg/l	3	ISO 17025	< 3.0
1,3-Dichloropropane	µg/l	3	ISO 17025	< 3.0
Dibromochloromethane	µg/l	3	ISO 17025	< 3.0
Tetrachloroethene	µg/l	3	ISO 17025	< 3.0
1,2-Dibromoethane	µg/l	3	ISO 17025	< 3.0
Chlorobenzene	µg/l	3	ISO 17025	< 3.0
1,1,1,2-Tetrachloroethane	µg/l	3	ISO 17025	< 3.0
Ethylbenzene	µg/l	3	ISO 17025	< 3.0
p & m-Xylene	µg/l	3	ISO 17025	< 3.0
Styrene	µg/l	3	ISO 17025	< 3.0
Tribromomethane	µg/l	3	ISO 17025	< 3.0
o-Xylene	µg/l	3	ISO 17025	< 3.0
1,1,2,2-Tetrachloroethane	µg/l	3	ISO 17025	< 3.0
Isopropylbenzene	µg/l	3	ISO 17025	< 3.0
Bromobenzene	µg/l	3	ISO 17025	< 3.0
n-Propylbenzene	µg/l	3	ISO 17025	< 3.0
2-Chlorotoluene	µg/l	3	ISO 17025	< 3.0
4-Chlorotoluene	µg/l	3	ISO 17025	< 3.0
1,3,5-Trimethylbenzene	µg/l	3	ISO 17025	< 3.0
tert-Butylbenzene	µg/l	3	ISO 17025	< 3.0
1,2,4-Trimethylbenzene	µg/l	3	ISO 17025	< 3.0
sec-Butylbenzene	µg/l	3	ISO 17025	< 3.0
1,3-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0
p-Isopropyltoluene	µg/l	3	ISO 17025	< 3.0
1,2-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0
1,4-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0

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Analytical Report Number: 23-32998
Project / Site name: Egbert Street

Your Order No: 004780

Lab Sample Number				2674496
Sample Reference				WS103
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				09/05/2023
Time Taken				None Supplied
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Butylbenzene	µg/l	3	ISO 17025	< 3.0
1,2-Dibromo-3-chloropropane	µg/l	3	ISO 17025	< 3.0
1,2,4-Trichlorobenzene	µg/l	3	ISO 17025	< 3.0
Hexachlorobutadiene	µg/l	3	ISO 17025	< 3.0
1,2,3-Trichlorobenzene	µg/l	3	ISO 17025	< 3.0

SVOCs

Aniline	µg/l	0.05	NONE	< 0.05
Phenol	µg/l	0.05	NONE	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	< 0.05
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05
2-Methylphenol	µg/l	0.05	NONE	< 0.05
Hexachloroethane	µg/l	0.05	NONE	< 0.05
Nitrobenzene	µg/l	0.05	NONE	< 0.05
4-Methylphenol	µg/l	0.05	NONE	< 0.05
Isophorone	µg/l	0.05	NONE	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05
Naphthalene	µg/l	0.01	ISO 17025	< 0.01
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05
4-Chloroaniline	µg/l	0.05	NONE	< 0.05
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05
2-Methylnaphthalene	µg/l	0.05	NONE	< 0.05
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05
Dimethylphthalate	µg/l	0.05	NONE	< 0.05
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05
Dibenzofuran	µg/l	0.05	NONE	< 0.05
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05
Diethyl phthalate	µg/l	0.05	NONE	< 0.05
4-Nitroaniline	µg/l	0.05	NONE	< 0.05
Fluorene	µg/l	0.01	ISO 17025	< 0.01
Azobenzene	µg/l	0.05	NONE	< 0.05
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05
Hexachlorobenzene	µg/l	0.05	NONE	< 0.05
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01
Carbazole	µg/l	0.05	NONE	< 0.05
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05
Anthraquinone	µg/l	0.05	NONE	< 0.05
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01

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Analytical Report Number: 23-32998
Project / Site name: Egbert Street

Your Order No: 004780

Lab Sample Number				2674496
Sample Reference				WS103
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				09/05/2023
Time Taken				None Supplied
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01

3&4-Methylphenol	µg/l	0.1	NONE	< 0.10

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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4041

Environmental Science

Analytical Report Number : 23-32998
Project / Site name: Egbert Street

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW.(Al, Cu,Fe,Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method by continuous flow analyser. Accredited Matrices SW, GW, PW.	L080-PL	W	ISO 17025
Monohydric phenols in water - LOW LEVEL 1 ug/l	Determination of phenols in water by continuous flow analyser. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
Semi-volatile organic compounds in water	Determination of semi-volatile organic compounds in leachate by extraction in dichloromethane followed by GC-MS.	In-house method based on USEPA 8270	L102B-PL	W	ISO 17025
TPHCWG (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation.	In-house method	L070-PL	W	ISO 17025
Volatile organic compounds in water	Determination of volatile organic compounds in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Dissolved Organic Carbon in water	Determination of dissolved inorganic carbon in water by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	ISO 17025
BTEX and MTBE in water (Monoaromatics)	Determination of BTEX and MTBE in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Low level total cyanide in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
pH at 20oC in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In house method.	L099-PL	W	ISO 17025

4041

Analytical Report Number : 23-32998
Project / Site name: Egbert Street

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
TPH1 (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS.	In-house method	L070-PL	W	ISO 17025

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

##Quality control parameter has a high recovery (outside of limit); however the associated result is below the reporting limit, other checks applied prior to reporting the data have been accepted. The result should be considered as being deviating and may be compromised.

APPENDIX VII
ORIGIN OF TIER 2 GENERIC ASSESSMENT CRITERIA

CONSTITUENT	ORIGIN OF RISK ASSESSMENT VALUE
Arsenic	2014 LQM/CIEH S4ULs
Cadmium	2014 LQM/CIEH S4ULs
Chromium	2014 LQM/CIEH S4ULs
Lead	2014 LQM/CIEH S4ULs
Mercury	2014 LQM/CIEH S4ULs – methylmercury
Nickel	2014 LQM/CIEH S4ULs
Selenium	2014 LQM/CIEH S4ULs
Copper	2014 LQM/CIEH S4ULs
Zinc	2014 LQM/CIEH S4ULs
Cyanide – Total	2014 LQM/CIEH S4ULs
Phenols – Total	2014 LQM/CIEH S4ULs
Naphthalene	General assessment criteria (GAC) developed by CIEH/LQM Suitable 4 Use Levels with supporting data from SR3, SR7 and existing Tox report where applicable. 1% SOM.
Acenaphthylene	
Acenaphthene	
Fluorene	
Phenanthrene	
Anthracene	
Fluoranthene	
Pyrene	
Benzo(a)Anthracene	
Chrysene	
Benzo(b/k)Fluoranthene [iii]	
Benzo(a)Pyrene	
Indeno(123-cd)Pyrene	
Dibenzo(a,h)Anthracene	
Benzo(ghi)Perylene	
TPH C_5-C_6 (aliphatic)	
TPH C_6-C_8 (aliphatic)	
TPH C_8-C_{10} (aliphatic)	
TPH C_{10}-C_{12} (aliphatic)	
TPH C_{12}-C_{16} (aromatic)	
TPH C_{16}-C_{21} (aromatic)	
TPH C_{21}-C_{35} (aromatic)	

APPENDIX VIII
GEOTECHNICAL TESTING RESULTS

LABORATORY REPORT

Contract Number: PSL23/3074

Report Date: 23 May 2023

Client's Reference: 16-220

Client Name: E3P
Taylor Road
Urmston
Manchester
M41 7JQ

For the attention of: I.Diack/J.Sheridan

Contract Title: Egbert Street and Faversham Street

Date Received: 27/4/2023
Date Commenced: 27/4/2023
Date Completed: 23/5/2023

Notes: Opinions and Interpretations are outside the UKAS Accreditation

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced other than in full, without the prior written approval of the laboratory.

Checked and Approved Signatories:

A Watkins (Director)	R Berriman (Quality Manager)	S Royle (Laboratory Manager)
L Knight (Assistant Laboratory Manager)	S Eyre (Senior Technician)	T Watkins (Senior Technician)

5 – 7 Hexthorpe Road,
Hexthorpe,
Doncaster,
DN4 0AR
Tel: 01302 768098
Email: rberriman@prosoils.co.uk
awatkins@prosoils.co.uk

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
WS102		Liner	1.60	2.00	Firm brown slightly gravelly very sandy CLAY.
WS104		Tub	1.00	1.45	Brown gravelly sandy CLAY.
WS105		Tub	2.00	2.45	Dark brown gravelly slightly sandy CLAY.
WS106		Liner	2.50	3.00	Firm brown slightly gravelly sandy CLAY.

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Egbert Street and Faversham Street

Contract No:
PSL23/3074
Client Ref:
16-220

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
WS102		Liner	1.60	2.00	16			29	14	15	87	Low Plasticity CL
WS104		Tub	1.00	1.45	25			44	21	23	85	Intermediate Plasticity CI
WS105		Tub	2.00	2.45	41			61	26	35	81	High Plasticity CH

SYMBOLS : NP : Non Plastic *** : Liquid Limit and Plastic Limit Wet Sieved.**

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Egbert Street and Faversham Street

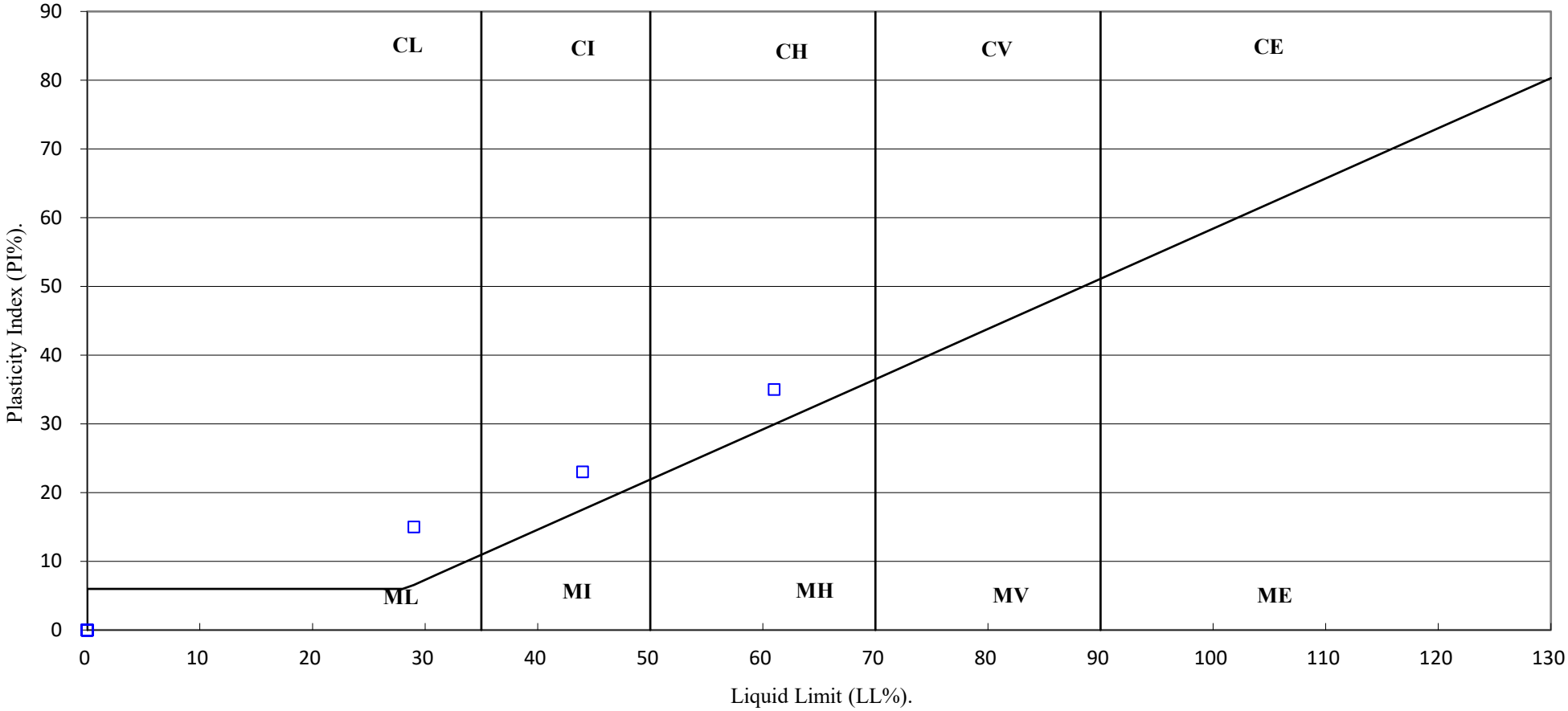
Contract No:

PSL23/3074

Client Ref:

16-220

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY	Egbert Street and Faversham Street	Contract No: PSL23/3074 Client Ref: 16-220

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

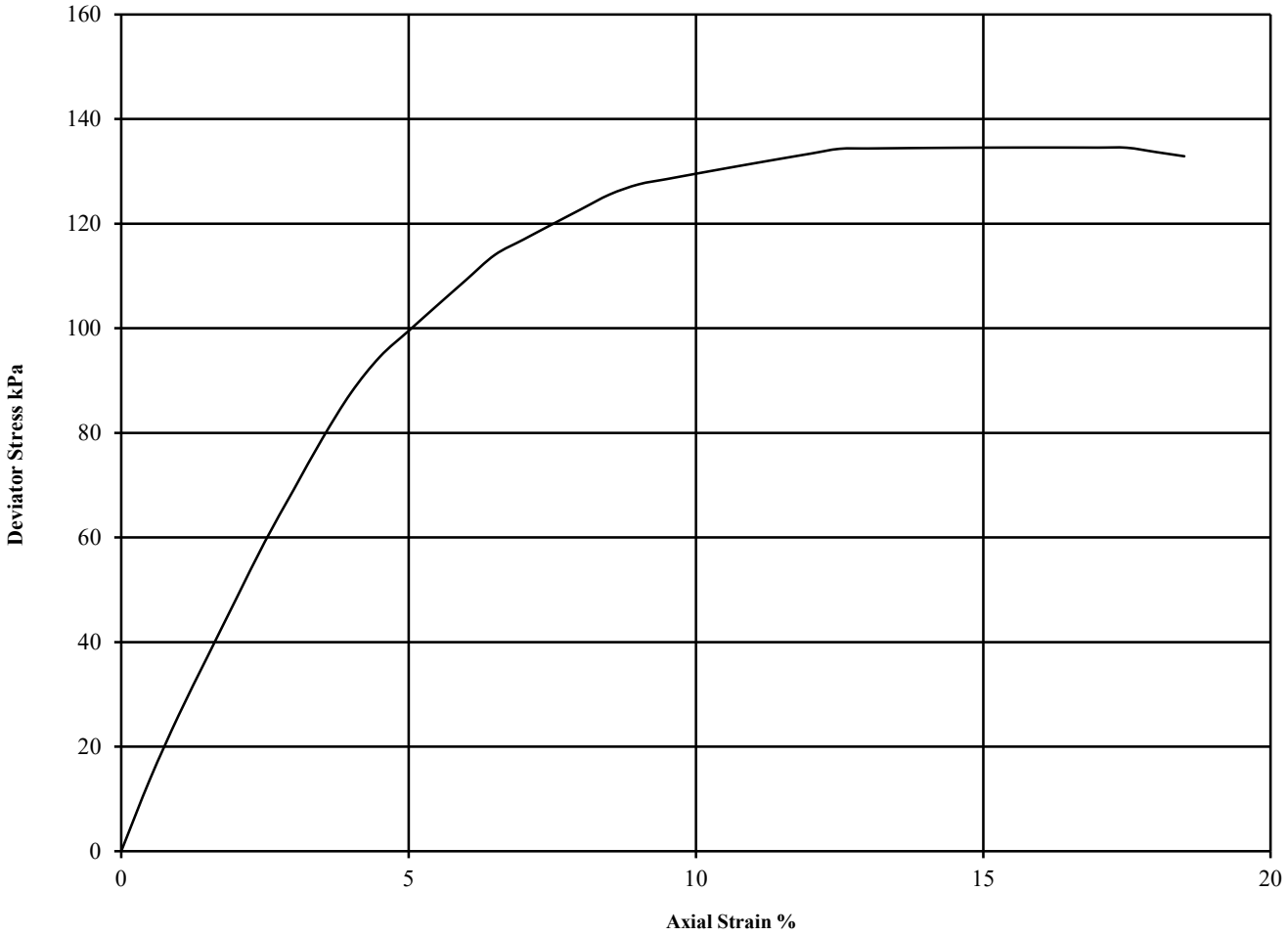
WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 8

Hole Number: WS102 **Top Depth (m):** 1.60

Sample Number: **Base Depth (m):** 2.00

Sample Type Liner



Diameter (mm):		73	Height (mm):		146	Test:	UU Single Stage		Remarks:
Specimen	Moisture Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Cell Pressure (kPa) θ_3	Corr. Max. Deviator Stress (kPa) $(\theta_1-\theta_3)_f$	Shear Strength Cu (kPa) $^1/_2(\theta_1-\theta_3)_f$	Failure Strain (%)	Mode of Failure	Undisturbed Sample Sample taken from top of tube Rate of strain = 2 %/min Latex Membrane used 0.2 mm thick, Correction applied 0.46
1	16	2.18	1.88	30	135	67	16.0	Plastic	See summary of soil descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Egbert Street and Faversham Street

Contract No: PSL23/3074

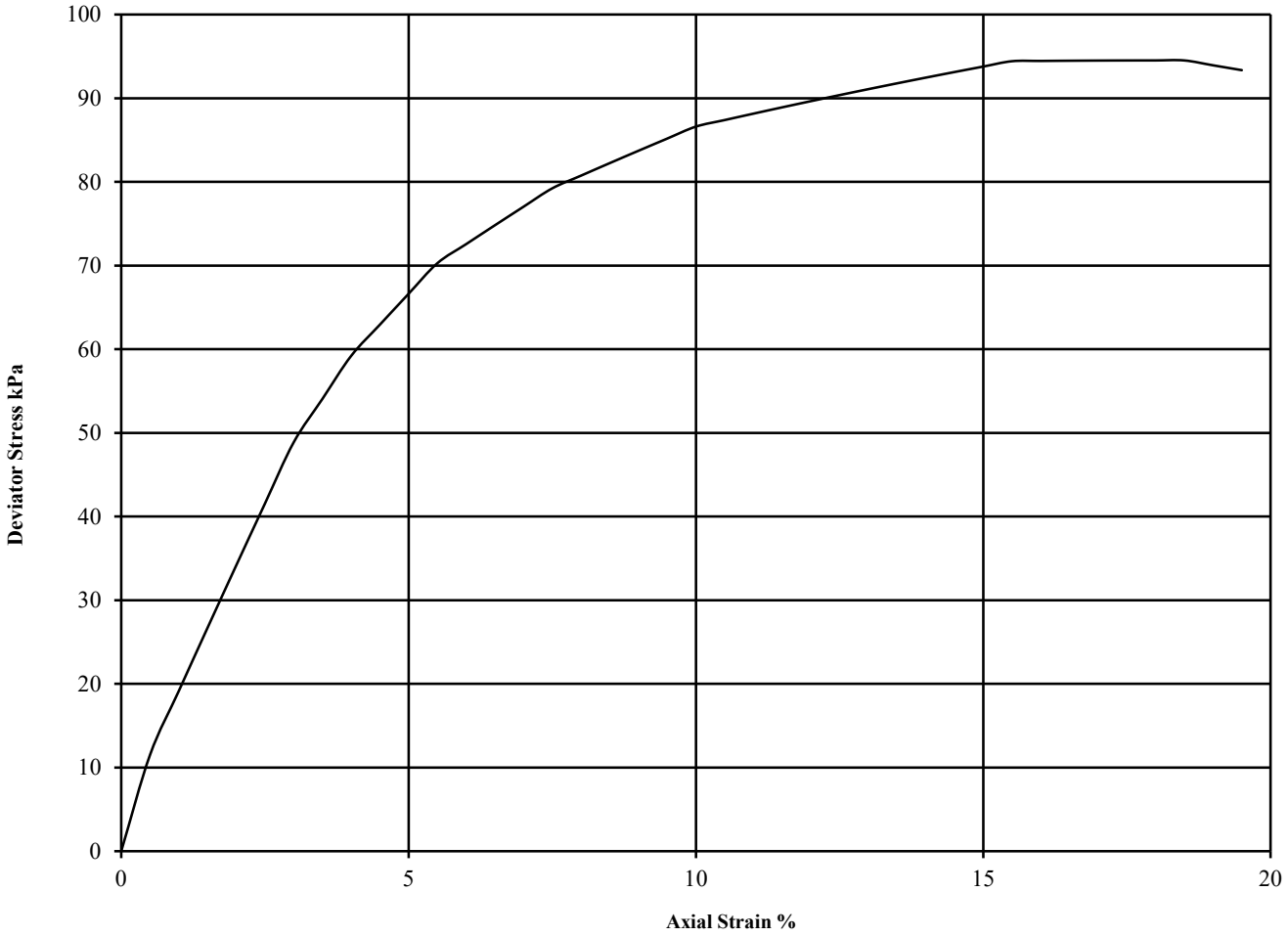
Client Ref: 16-220

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 8

Hole Number:	**WS106**	**Top Depth (m):**	**2.50**
Sample Number:		**Base Depth (m):**	**3.00**
Sample Type	**Liner**		



Diameter (mm):		85	Height (mm):		170	Test:	UU Single Stage		Remarks:
Specimen	Moisture Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Cell Pressure (kPa) θ_3	Corr. Max. Deviator Stress (kPa) $(\theta_1-\theta_3)_f$	Shear Strength Cu (kPa) $^1/_2(\theta_1-\theta_3)_f$	Failure Strain (%)	Mode of Failure	Undisturbed Sample Sample taken from top of tube Rate of strain = 2 %/min Latex Membrane used 0.2 mm thick, Correction applied 0.40
1	25	1.91	1.53	55	95	47	18.0	Plastic	See summary of soil descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Egbert Street and Faversham Street

Contract No: PSL23/3074

Client Ref: 16-220

ONE DIMENSIONAL CONSOLIDATION TEST

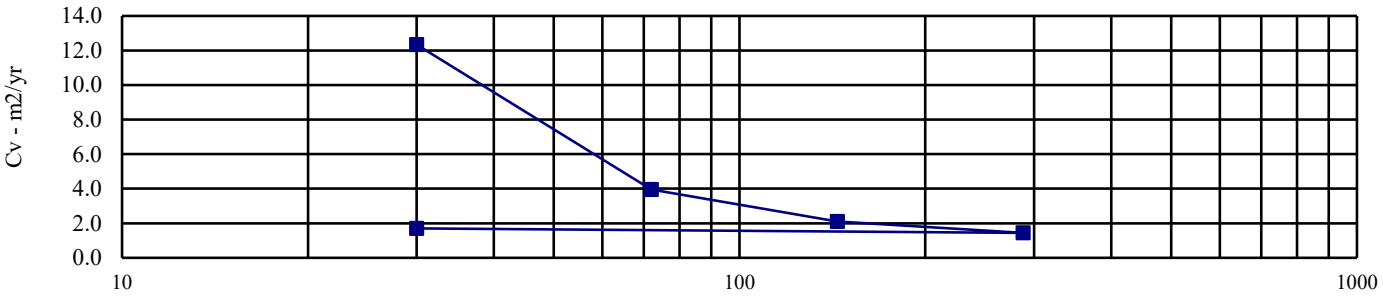
BS 1377: Part 5: 1990: Clause 3

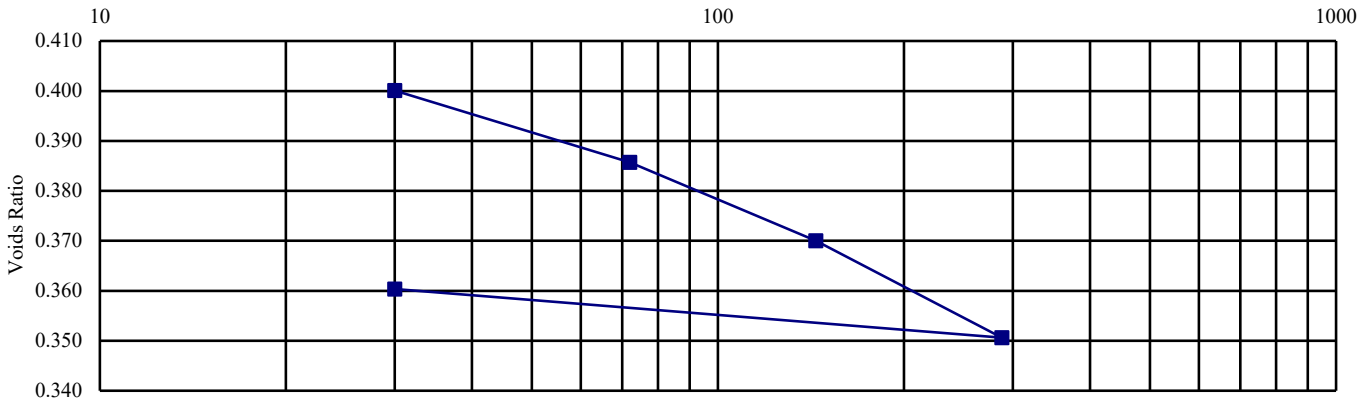
Hole Number: WS102 **Top Depth (m):** 1.60

Sample Number: **Base Depth (m) :** 2.00

Sample Type: Liner

Initial Conditions		Pressure Range kPa		Mv m2/MN	Cv m2/yr	Specimen location within tube:	Top
Moisture Content (%):	16						
Bulk Density (Mg/m3):	2.16	0	30	0.513	12.340	Method used to determine CV:	T90
Dry Density (Mg/m3):	1.86	30	72	0.244	3.955		
Voids Ratio:	0.422	72	144	0.157	2.111	Nominal temperature during test ' C:	20
Degree of saturation:	99.4	144	288	0.098	1.444		
Height (mm):	20.014	288	30	0.028	1.699	Remarks: See summary of soil descriptions	
Diameter (mm)	50.015						
Particle Density (Mg/m3): Assumed	2.65						





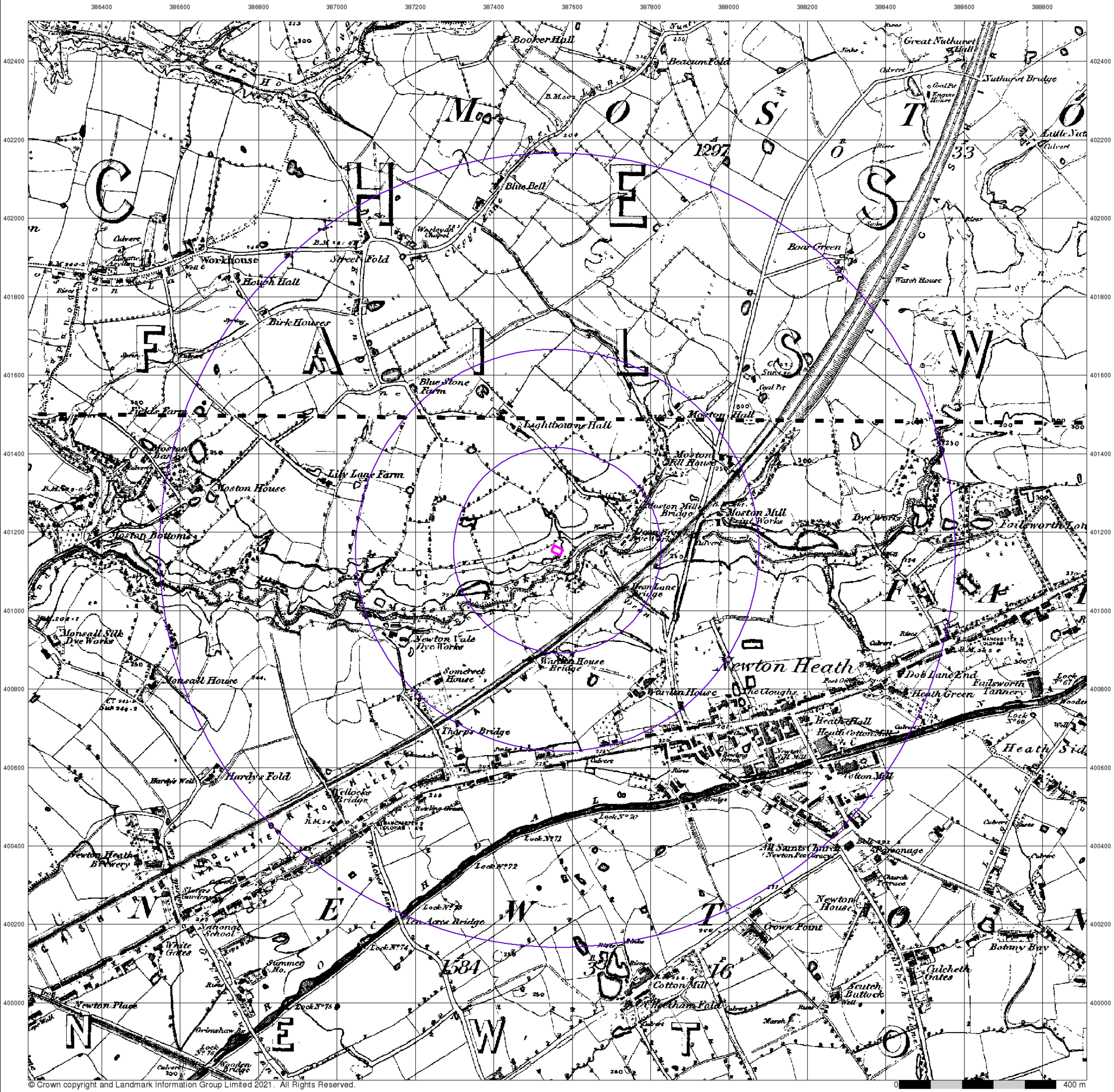
UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Egbert Street and Faversham Street

Contract No: PSL23/3074

Client Ref: 16-220



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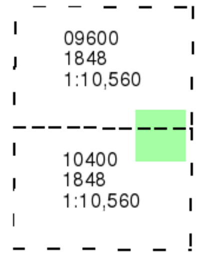
Lancashire And Furness

Published 1848

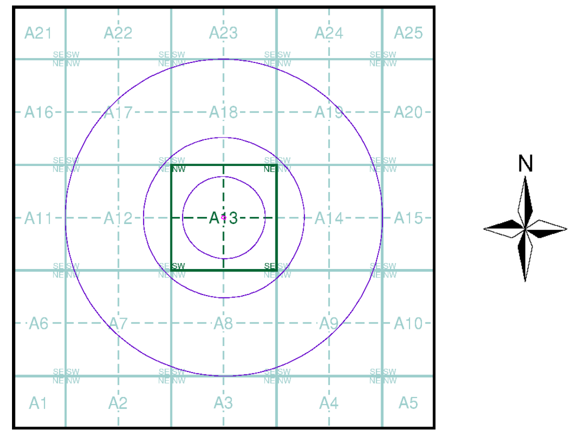
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The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

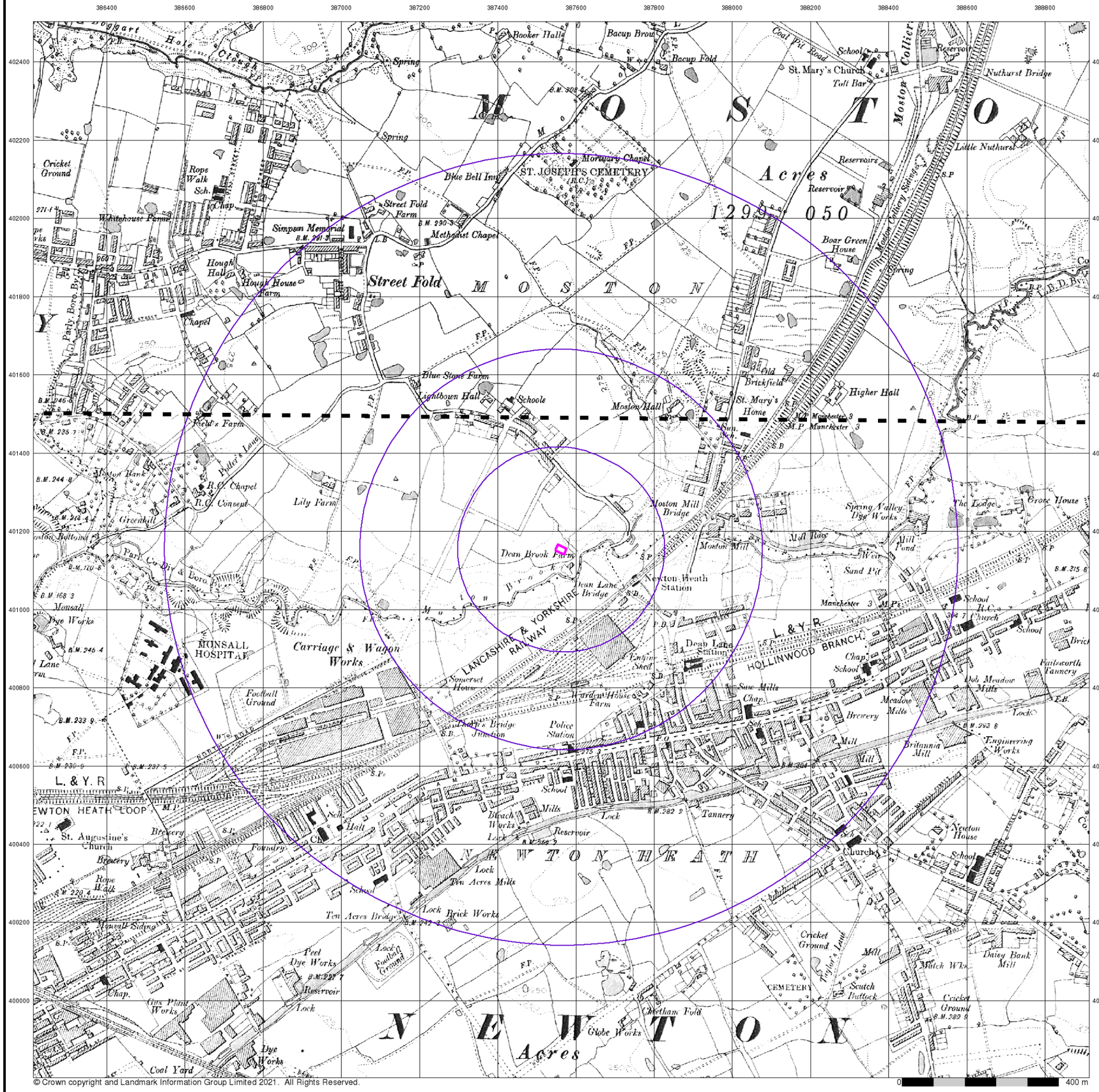
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Search Buffer (m): 1000

Site Details

Site located at 387560,401150, M40 5NW

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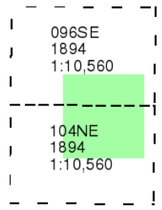
Lancashire And Furness

Published 1894

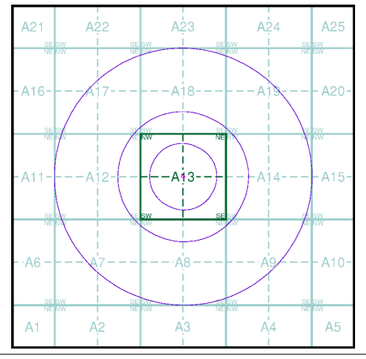
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Historical Map - Slice A



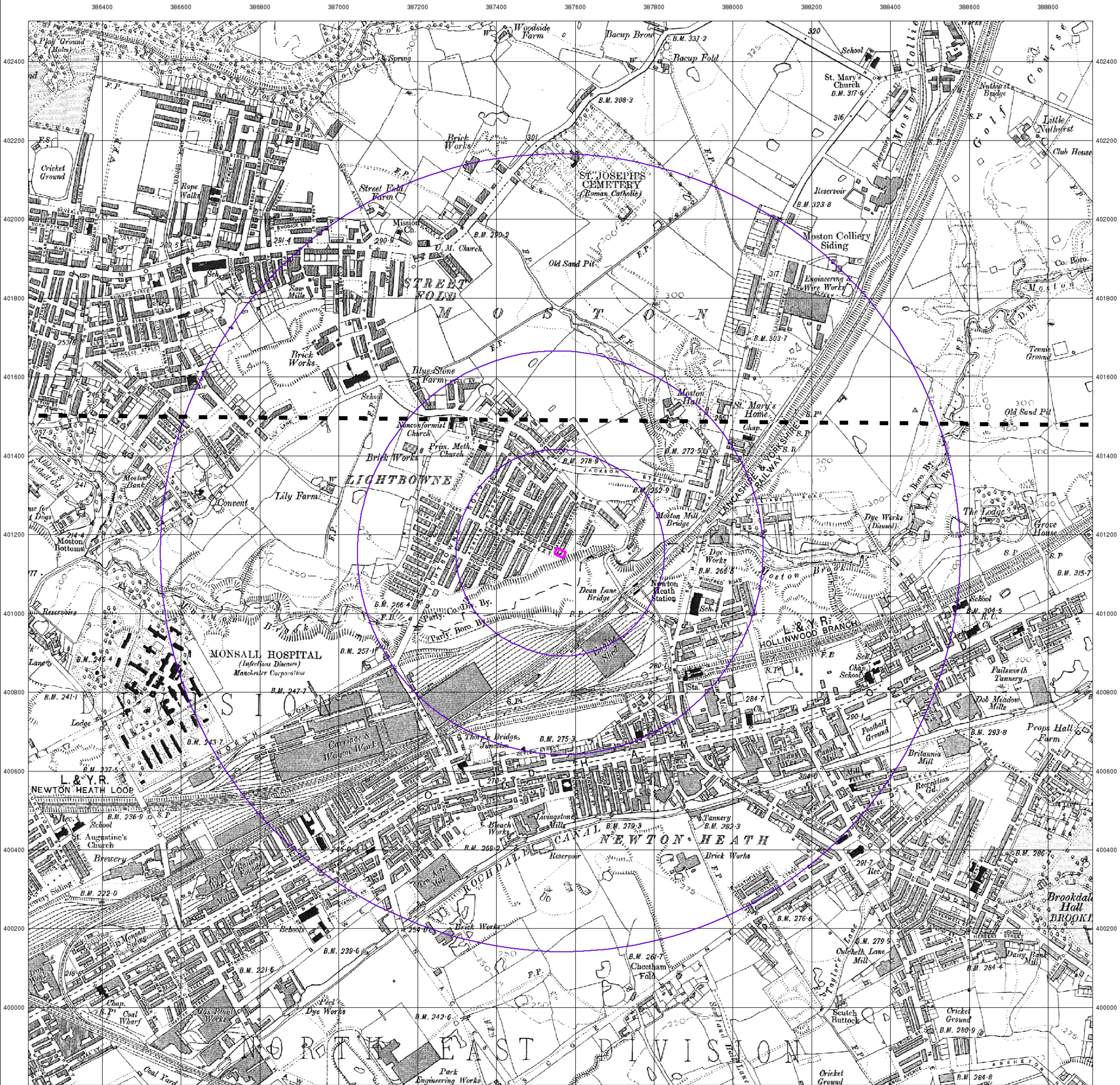
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Site Details

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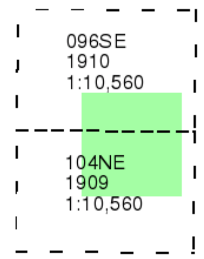
Lancashire And Furness

Published 1909 - 1910

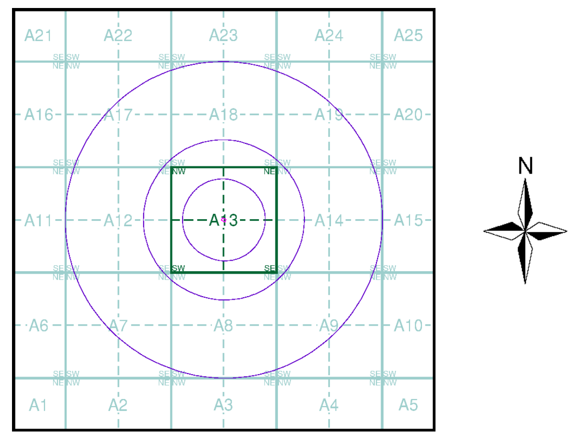
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Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

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National Grid Reference: 387560, 401150
Slice: A
Site Area (Ha): 0.04
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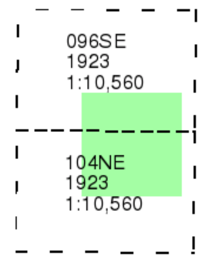
Lancashire And Furness

Published 1923

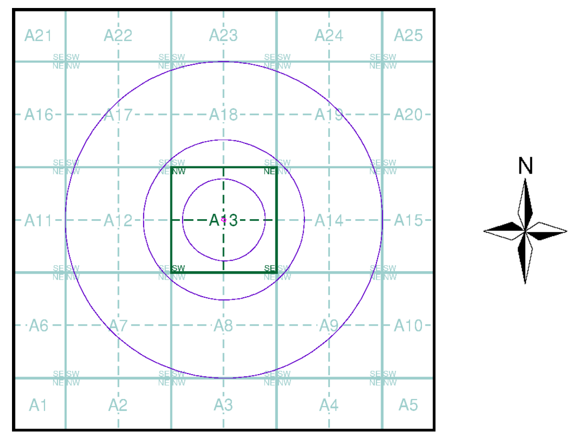
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Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

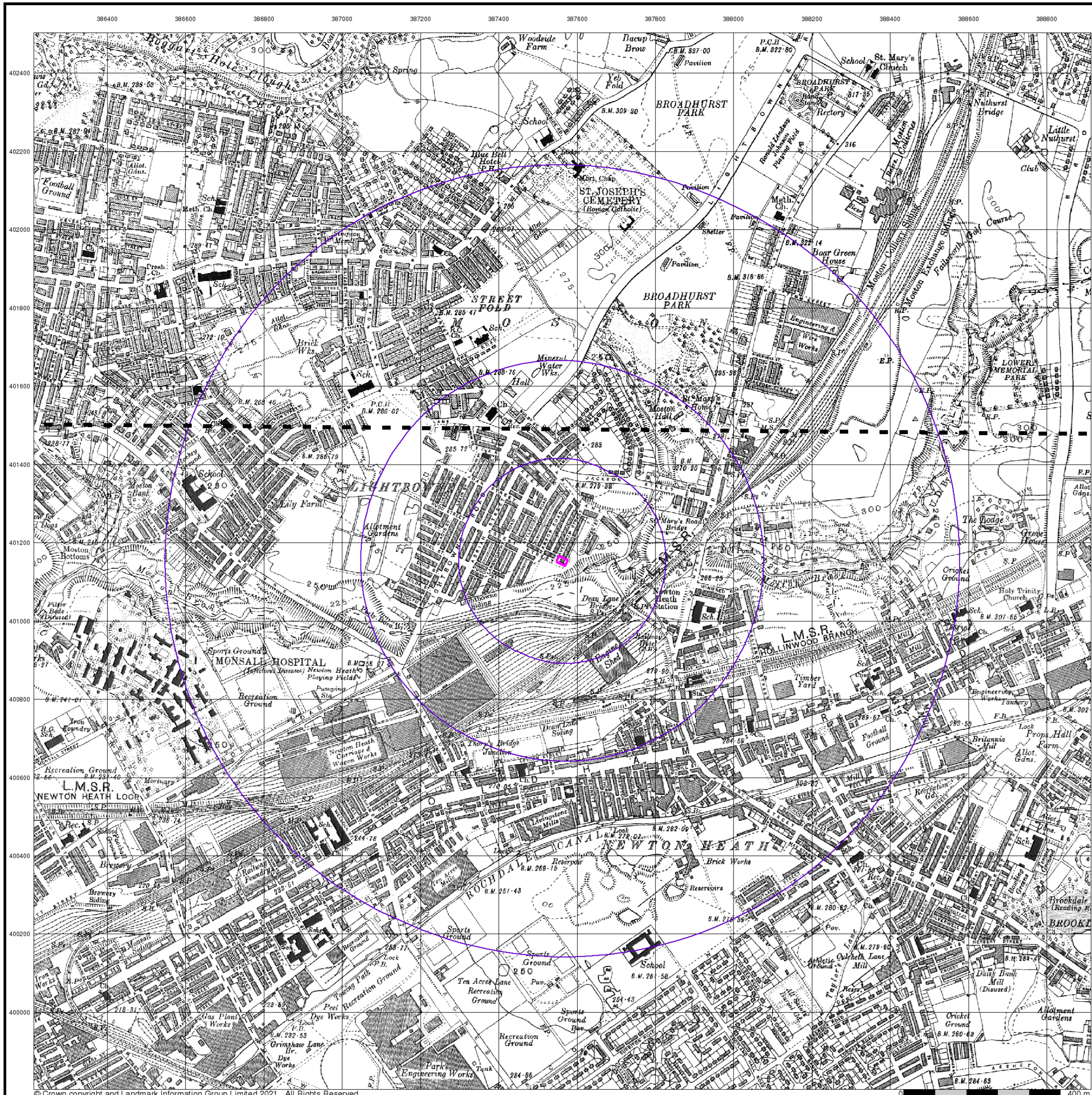
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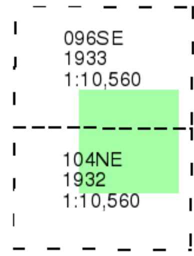
Lancashire And Furness

Published 1932 - 1933

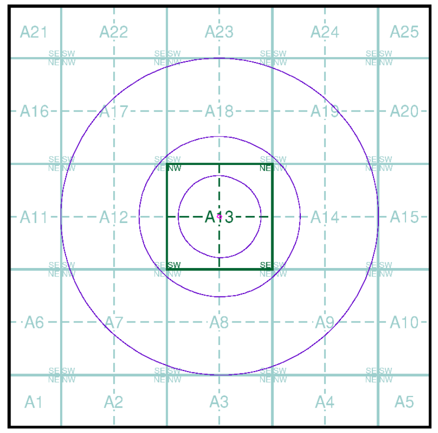
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Map Name(s) and Date(s)



Historical Map - Slice A



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Order Details

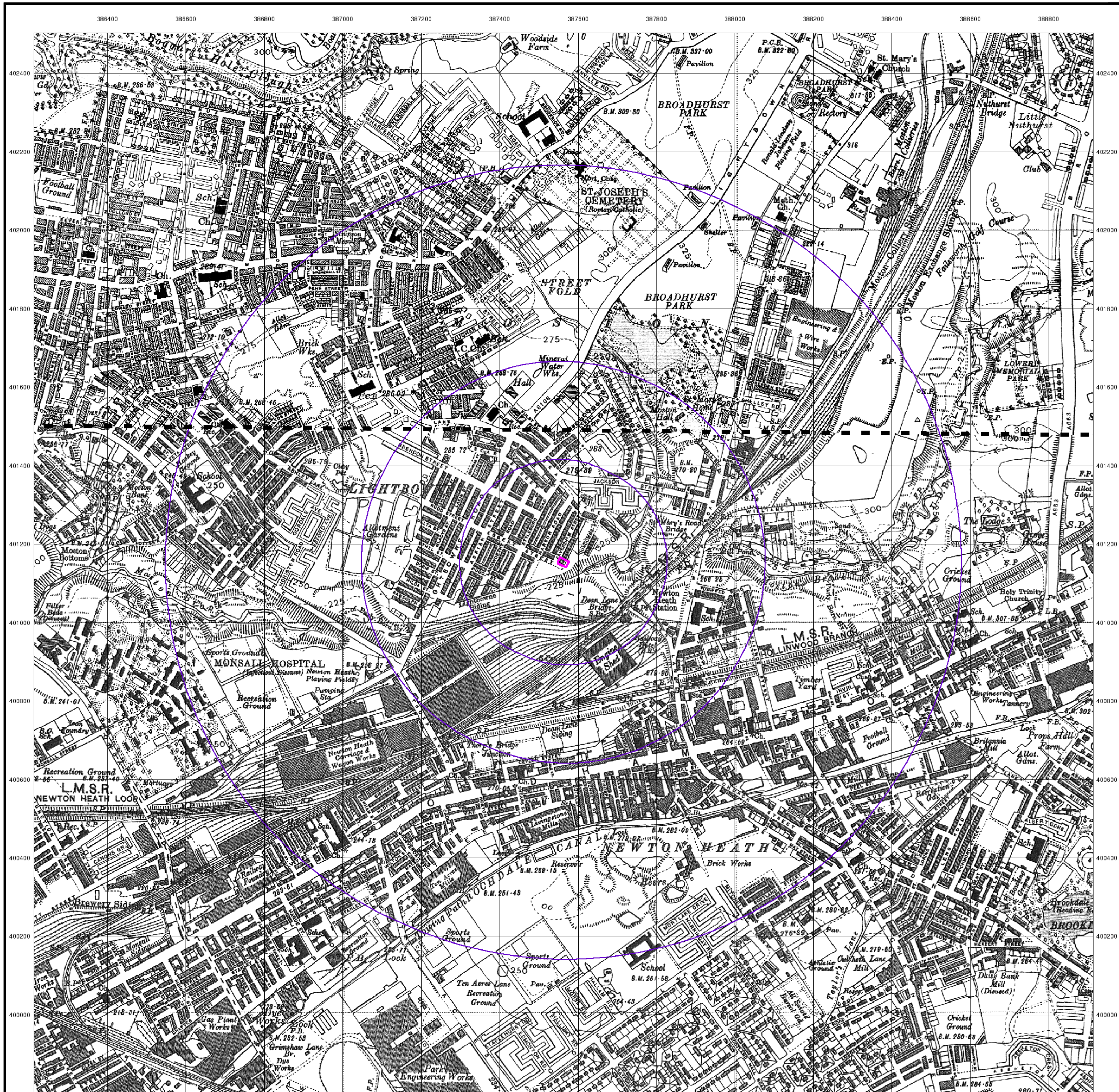
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Slice: A
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Search Buffer (m): 1000

Site Details

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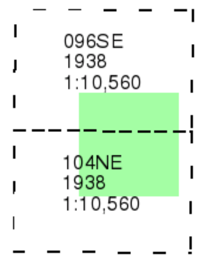
Lancashire And Furness

Published 1938

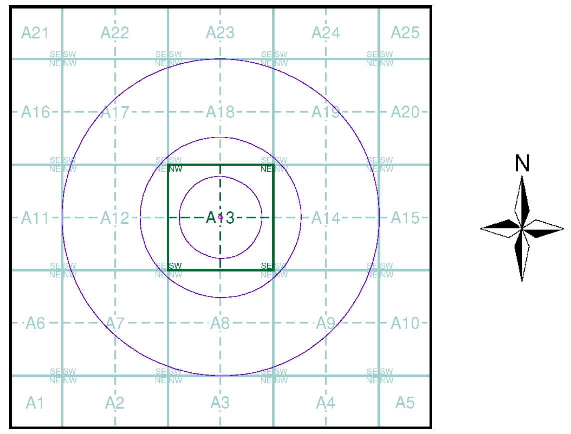
Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

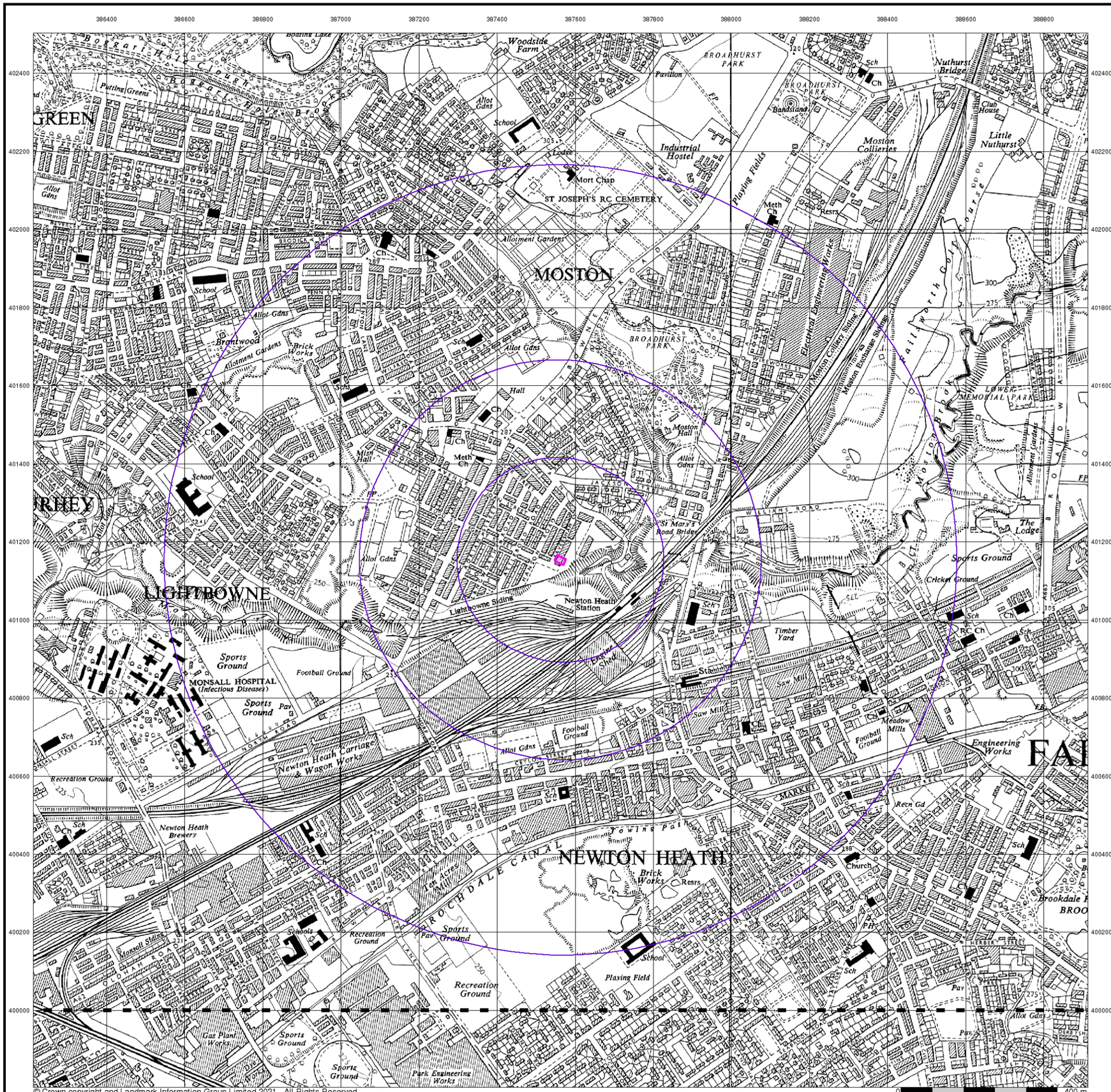
Order Number: 273931122_1_1
Customer Ref: EBMA2711
National Grid Reference: 387560, 401150
Slice: A
Site Area (Ha): 0.04
Search Buffer (m): 1000

Site Details

Site located at 387560,401150, M40 5NW

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Ordnance Survey Plan

Published 1956

Source map scale - 1:10,000

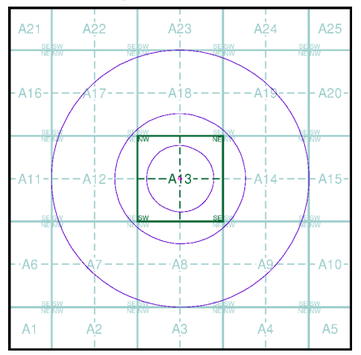
The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)

SD80SE
1956
1:10,560

SJ89NE
1956
1:10,560

Historical Map - Slice A



Order Details

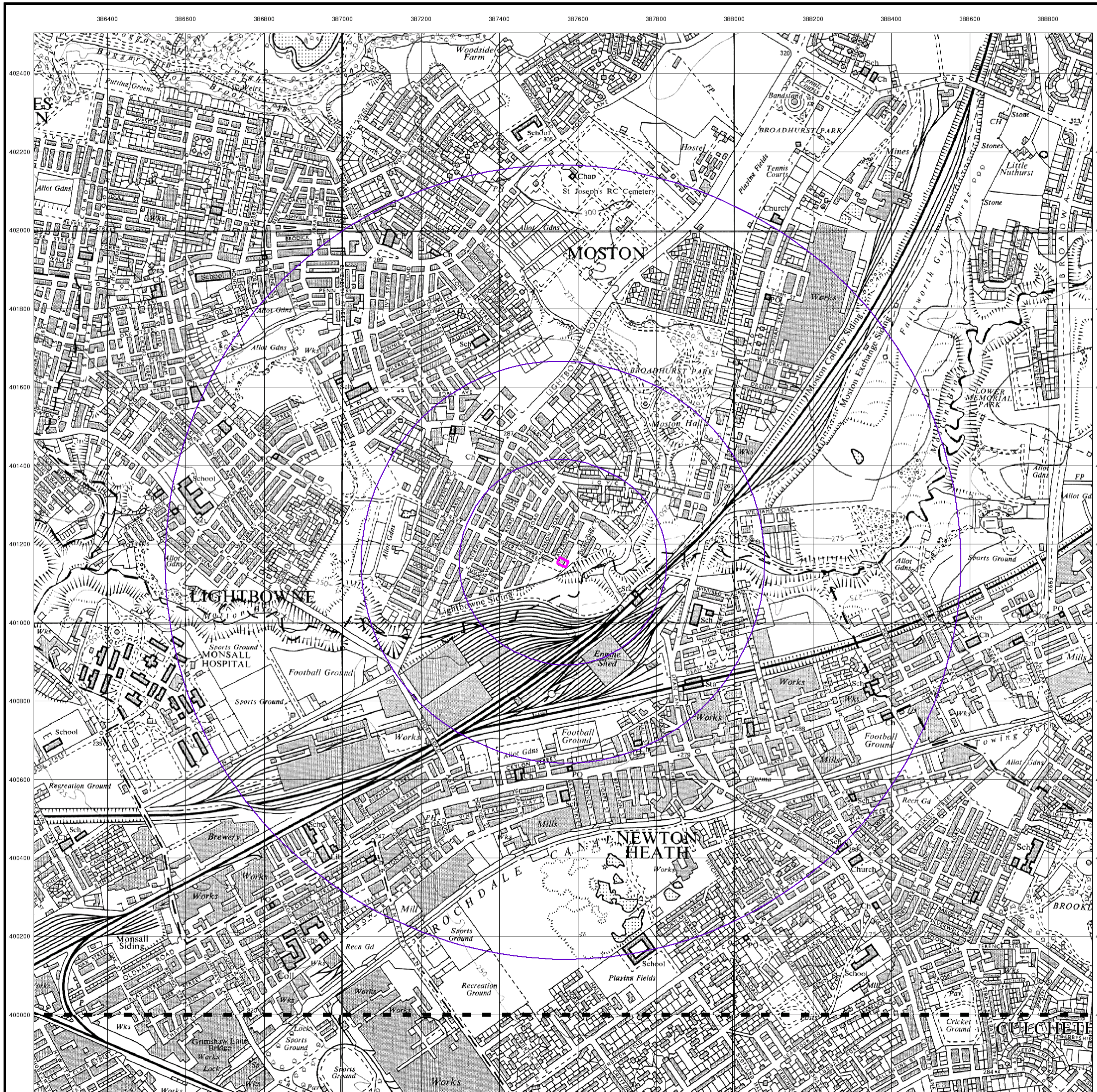
Order Number:	273931122_1_1
Customer Ref:	EBMA2711
National Grid Reference:	387560, 401150
Slice:	A
Site Area (Ha):	0.04
Search Buffer (m):	1000

Site Details

Site located at 387560,401150, M40 5NW

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0 400 m

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Ordnance Survey Plan

Published 1966 - 1968

Source map scale - 1:10,000

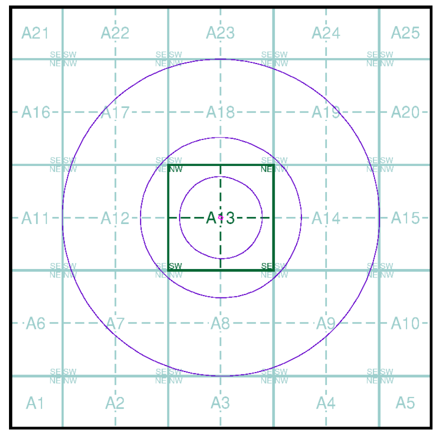
The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)

SD80SE
1966
1:10,560

SJ89NE
1968
1:10,560

Historical Map - Slice A



N

Order Details

Order Number: 273931122_1_1
Customer Ref: EBMA2711
National Grid Reference: 387560, 401150
Slice: A
Site Area (Ha): 0.04
Search Buffer (m): 1000

Site Details

Site located at 387560,401150, M40 5NW

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Manchester

Published 1975

Source map scale - 1:25,000

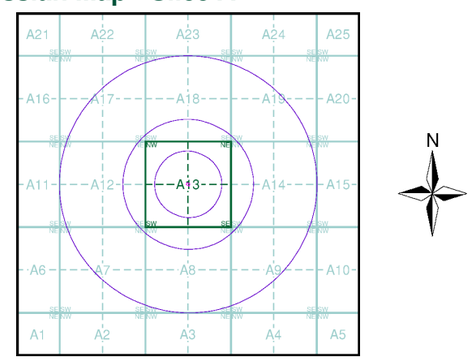
These maps were produced by the Russian military during the Cold War between 1950 and 1997, and cover 103 towns and cities throughout the U.K. The maps are produced at 1:25,000, 1:10,000 and 1:5,000 scale, and show detailed land use, with colour-coded areas for development, green areas, and non-developed areas. Buildings are coloured black and important building uses (such as hospitals, post offices, factories etc.) are numbered, with a numbered key describing their use.
They were produced by the Russians for the benefit of navigation, as well as strategic military sites and transport hubs, for use if they were to have invaded the U.K. The detailed information provided indicates that the areas were surveyed using land-based personnel, on the ground, in the cities that are mapped.

Map Name(s) and Date(s)

SD80
1975
1:25,000

SJ89
1975
1:25,000

Russian Map - Slice A



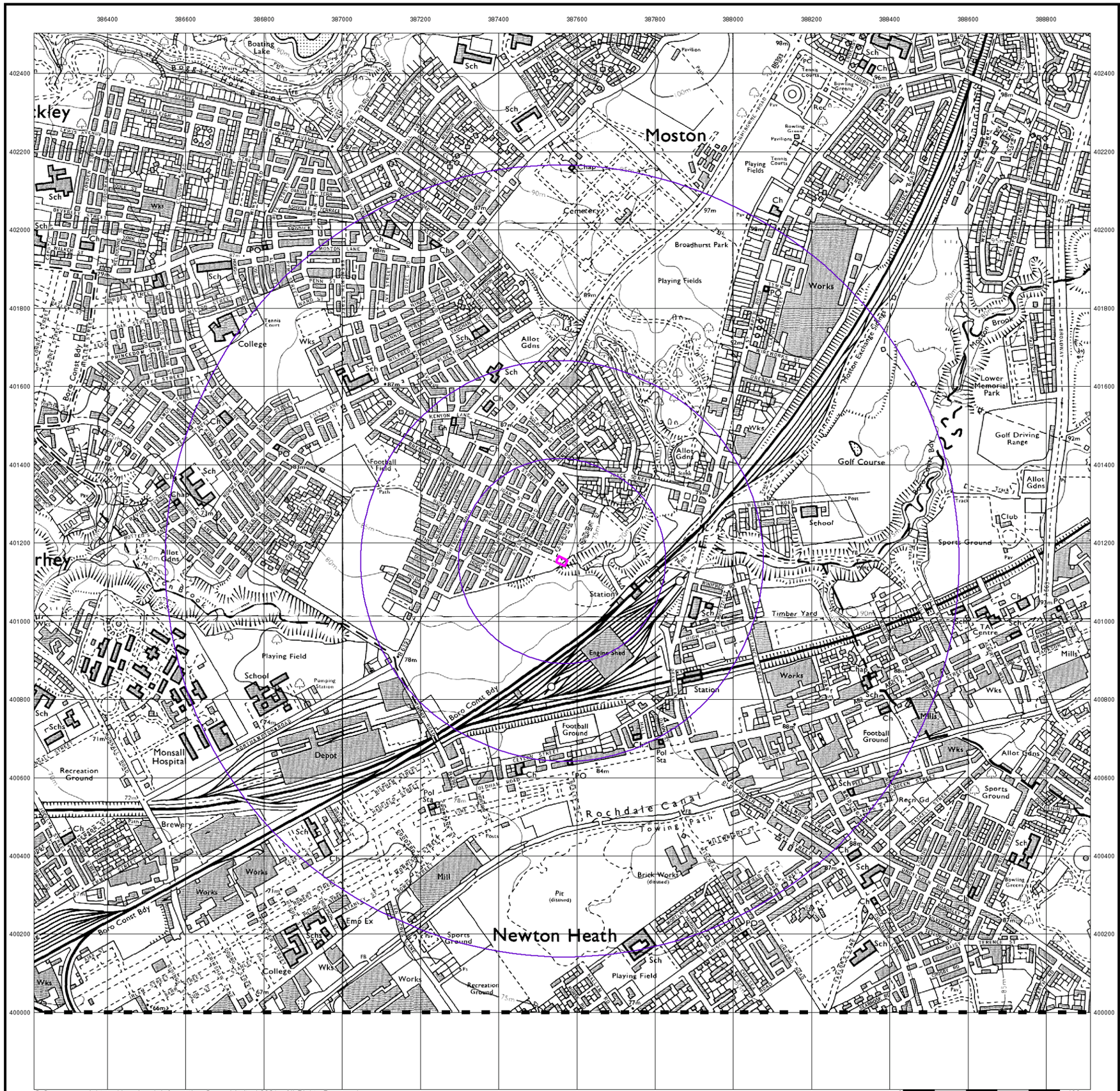
Order Details

Order Number:	273931122_1_1
Customer Ref:	EBMA2711
National Grid Reference:	387560, 401150
Slice:	A
Site Area (Ha):	0.04
Search Buffer (m):	1000

Site Details

Site located at 387560,401150, M40 5NW

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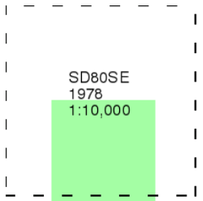
Ordnance Survey Plan

Published 1978

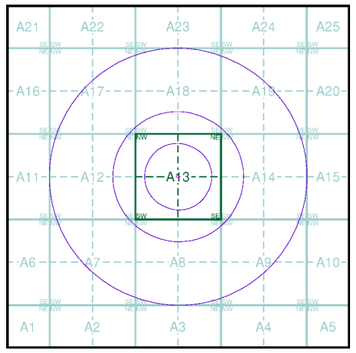
Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

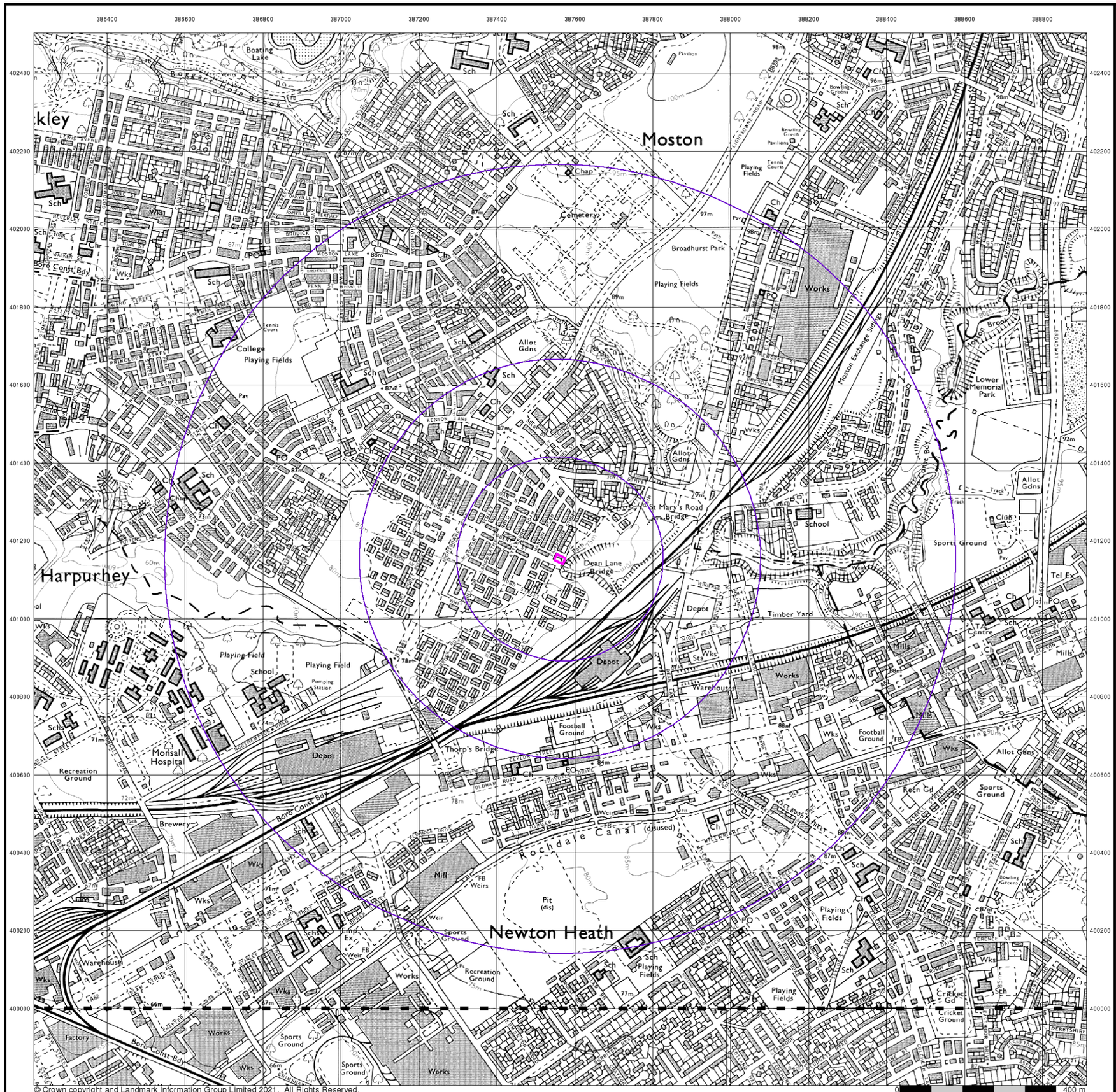
Order Number:	273931122_1_1
Customer Ref:	EBMA2711
National Grid Reference:	387560, 401150
Slice:	A
Site Area (Ha):	0.04
Search Buffer (m):	1000

Site Details

Site located at 387560,401150, M40 5NW

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Ordnance Survey Plan

Published 1981 - 1982

Source map scale - 1:10,000

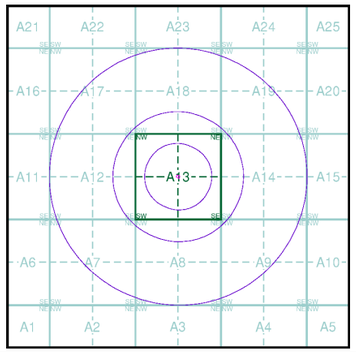
The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)

SD80SE
1982
1:10,000

SJ89NE
1981
1:10,000

Historical Map - Slice A



Order Details

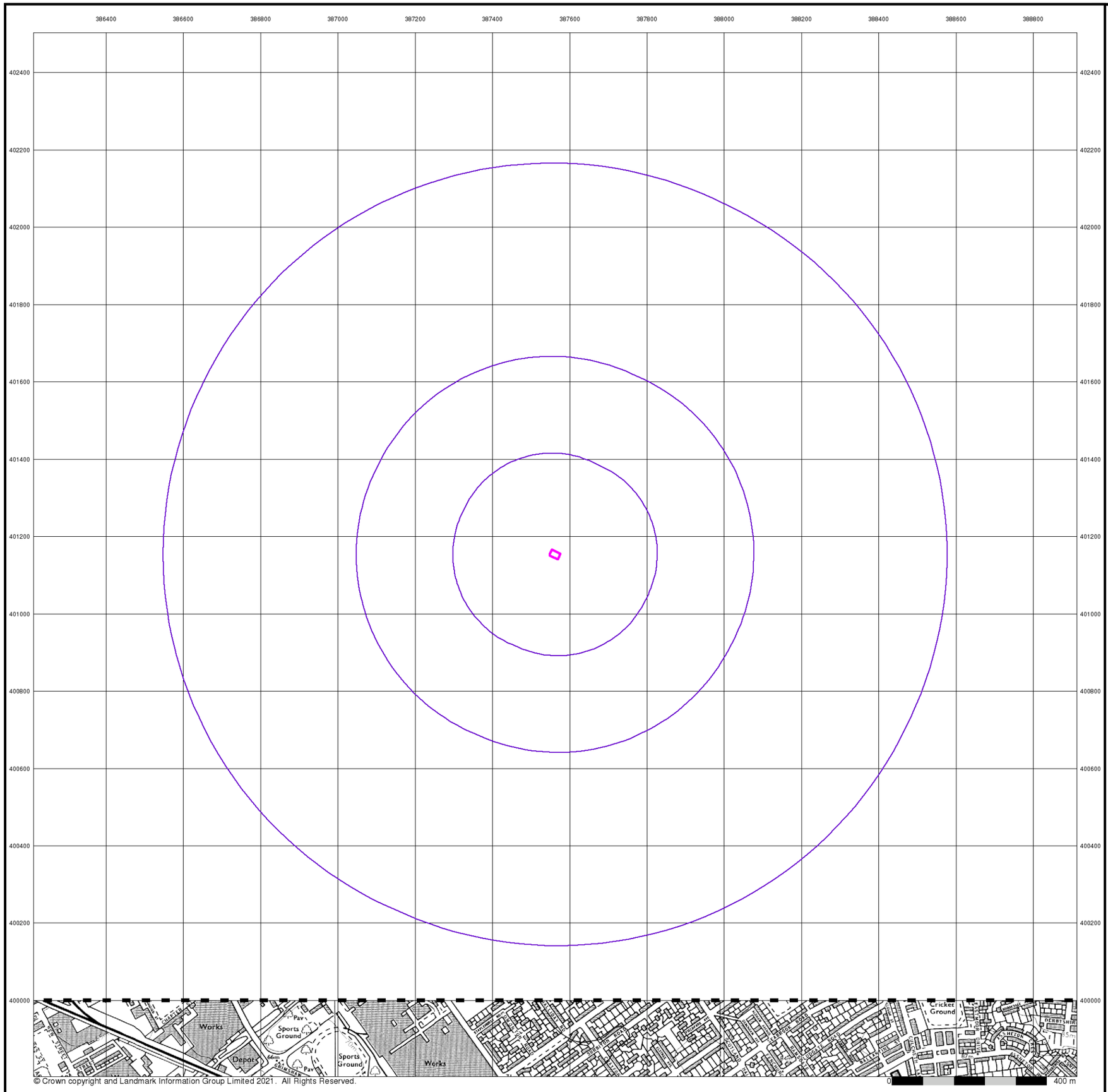
Order Number:	273931122_1_1
Customer Ref:	EBMA2711
National Grid Reference:	387560, 401150
Slice:	A
Site Area (Ha):	0.04
Search Buffer (m):	1000

Site Details

Site located at 387560,401150, M40 5NW

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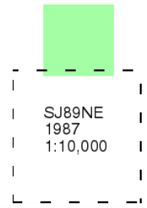
Ordnance Survey Plan

Published 1987

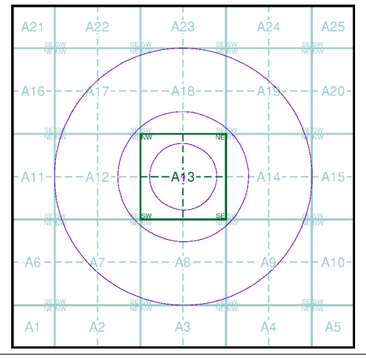
Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

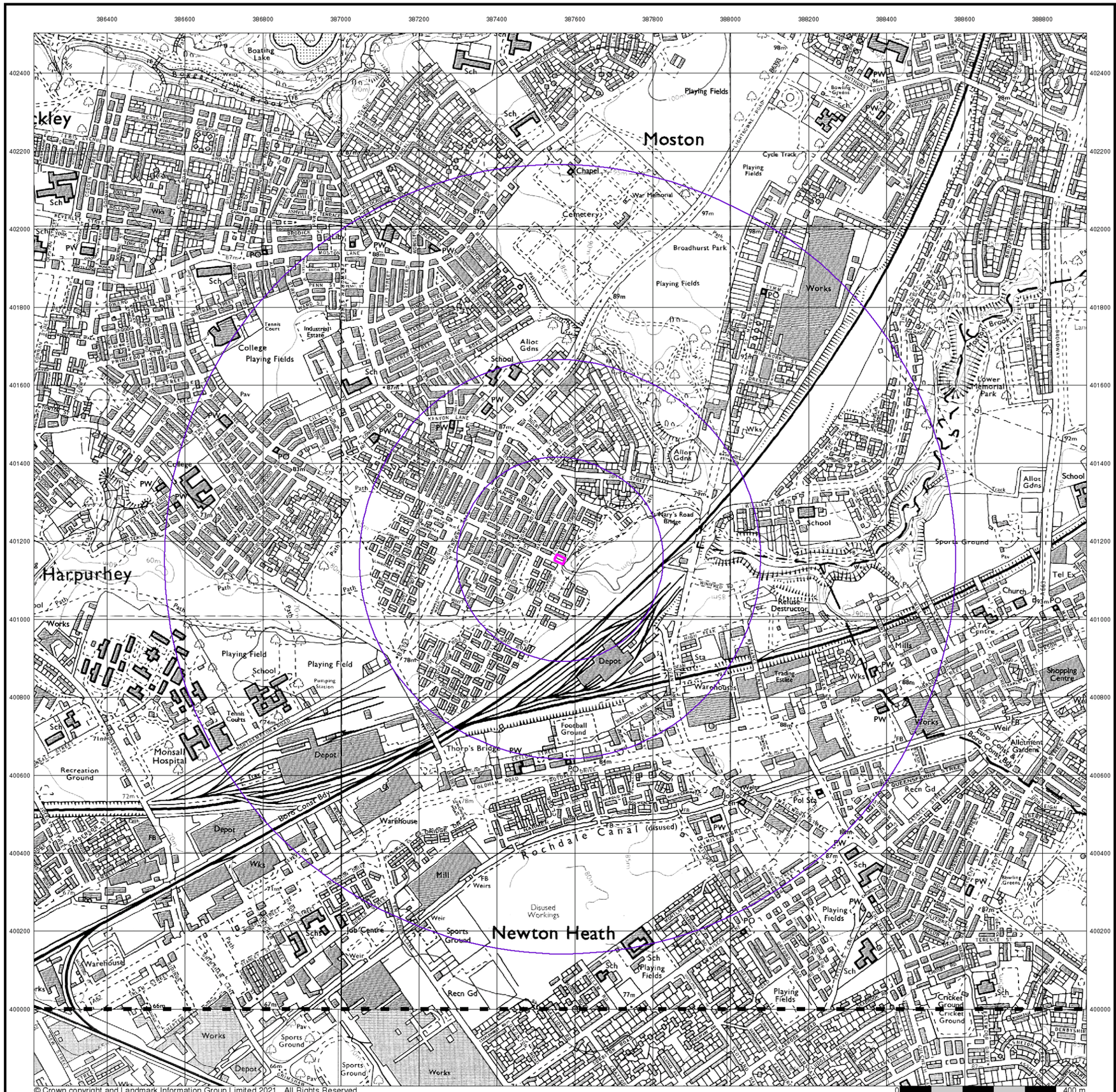
Order Number:	273931122_1_1
Customer Ref:	EBMA2711
National Grid Reference:	387560, 401150
Slice:	A
Site Area (Ha):	0.04
Search Buffer (m):	1000

Site Details

Site located at 387560,401150, M40 5NW

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0 400 m

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Ordnance Survey Plan

Published 1990 - 1993

Source map scale - 1:10,000

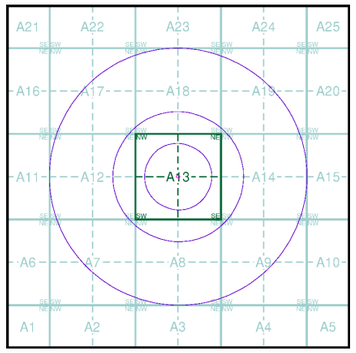
The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)

SD80SE
1990
1:10,000

SJ89NE
1993
1:10,000

Historical Map - Slice A



Order Details

Order Number:	273931122_1_1
Customer Ref:	EBMA2711
National Grid Reference:	387560, 401150
Slice:	A
Site Area (Ha):	0.04
Search Buffer (m):	1000

Site Details

Site located at 387560,401150, M40 5NW

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10k Raster Mapping

Published 1999

Source map scale - 1:10,000

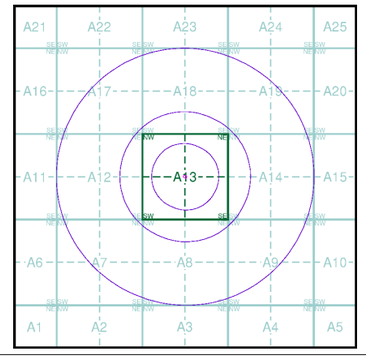
The historical maps shown were produced from the Ordnance Survey`s 1:10,000 colour raster mapping. These maps are derived from Landplan which replaced the old 1:10,000 maps originally published in 1970. The data is highly detailed showing buildings, fences and field boundaries as well as all roads, tracks and paths. Road names are also included together with the relevant road number and classification. Boundary information depiction includes county, unitary authority, district, civil parish and constituency.

Map Name(s) and Date(s)

SD80SE
1999
1:10,000

SJ89NE
1999
1:10,000

Historical Map - Slice A



Order Details

Order Number:	273931122_1_1
Customer Ref:	EBMA2711
National Grid Reference:	387560, 401150
Slice:	A
Site Area (Ha):	0.04
Search Buffer (m):	1000

Site Details

Site located at 387560,401150, M40 5NW

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10k Raster Mapping

Published 2006

Source map scale - 1:10,000

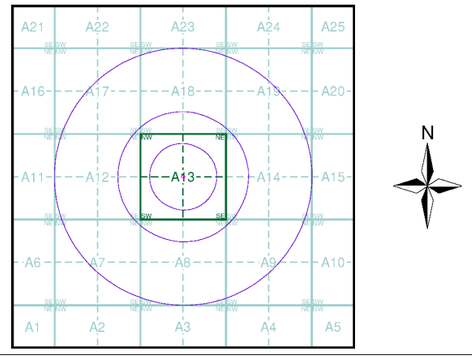
The historical maps shown were produced from the Ordnance Survey`s 1:10,000 colour raster mapping. These maps are derived from Landplan which replaced the old 1:10,000 maps originally published in 1970. The data is highly detailed showing buildings, fences and field boundaries as well as all roads, tracks and paths. Road names are also included together with the relevant road number and classification. Boundary information depiction includes county, unitary authority, district, civil parish and constituency.

Map Name(s) and Date(s)

SD80SE
2006
1:10,000

SJ89NE
2006
1:10,000

Historical Map - Slice A



Order Details

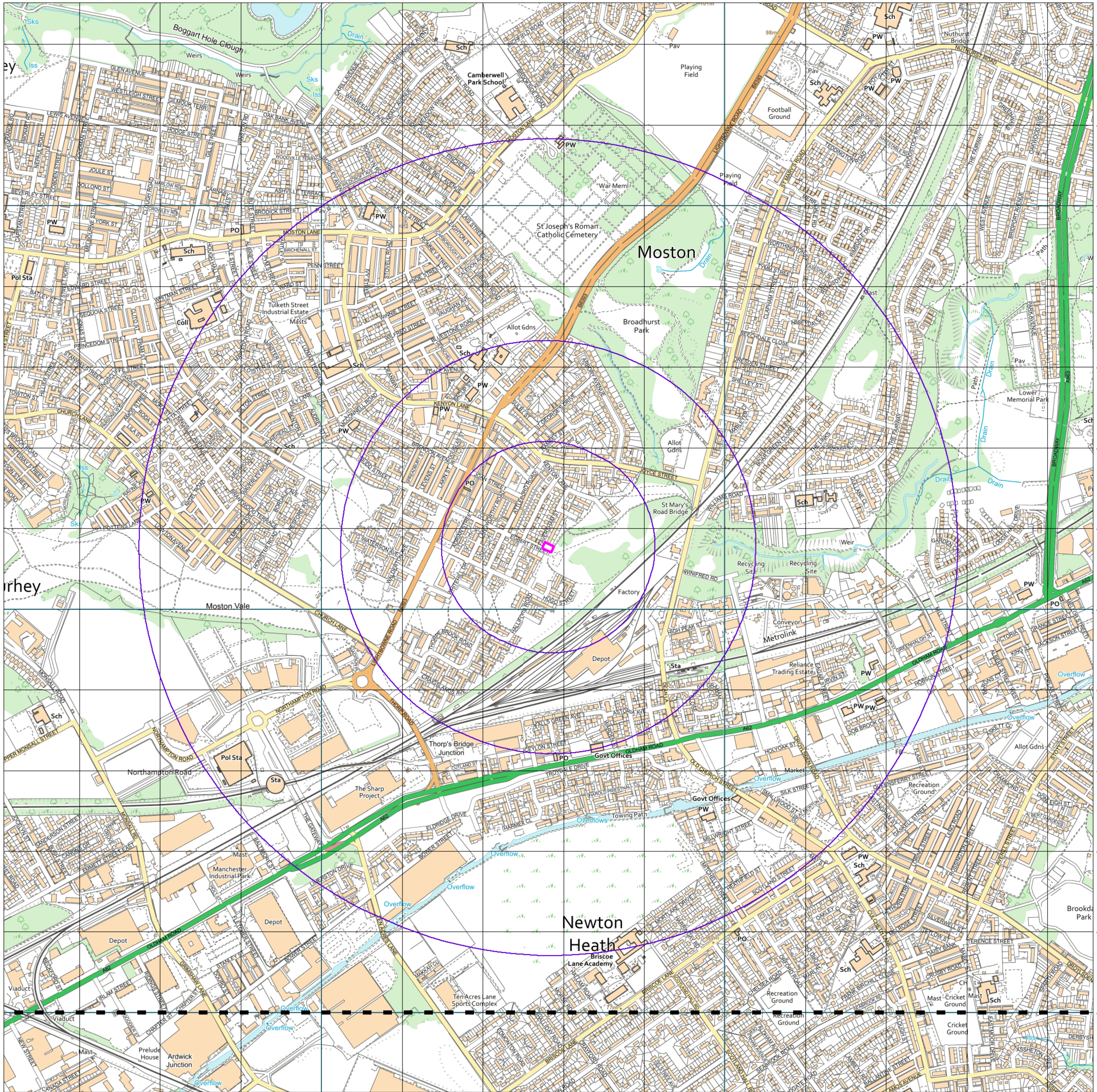
Order Number:	273931122_1_1
Customer Ref:	EBMA2711
National Grid Reference:	387560, 401150
Slice:	A
Site Area (Ha):	0.04
Search Buffer (m):	1000

Site Details

Site located at 387560,401150, M40 5NW

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VectorMap Local

Published 2020

Source map scale - 1:10,000

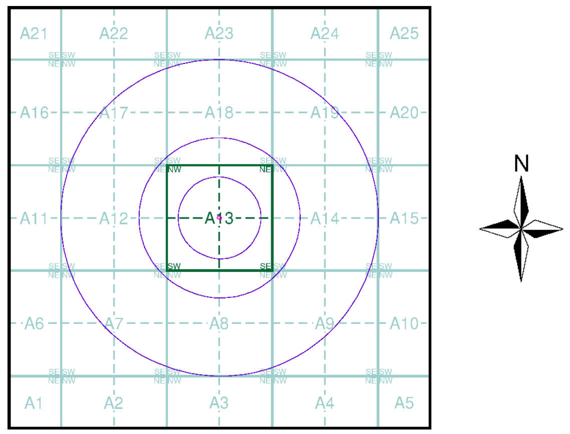
VectorMap Local (Raster) is Ordnance Survey's highest detailed 'backdrop' mapping product. These maps are produced from OS's VectorMap Local, a simple vector dataset at a nominal scale of 1:10,000, covering the whole of Great Britain, that has been designed for creating graphical mapping. OS VectorMap Local is derived from large-scale information surveyed at 1:1250 scale (covering major towns and cities),1:2500 scale (smaller towns, villages and developed rural areas), and 1:10 000 scale (mountain, moorland and river estuary areas).

Map Name(s) and Date(s)

SD80SE
2020
Variable

SJ89NE
2020
Variable

Historical Map - Slice A



Order Details

Order Number: 273931122_1_1
Customer Ref: EBMA2711
National Grid Reference: 387560, 401150
Slice: A
Site Area (Ha): 0.04
Search Buffer (m): 1000

Site Details

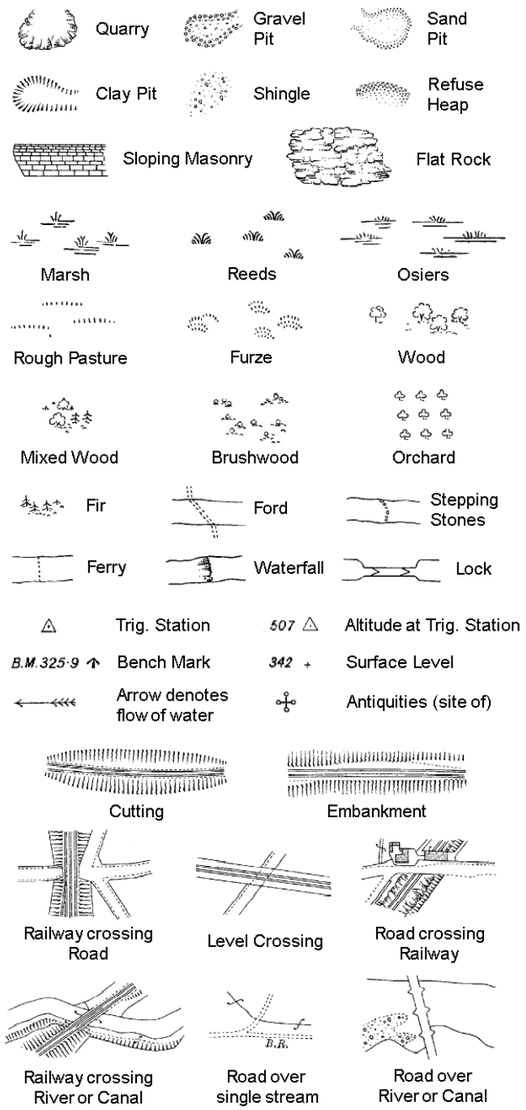
Site located at 387560,401150, M40 5NW

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Historical Mapping Legends

Ordnance Survey County Series and Ordnance Survey Plan 1:2,500



County Boundary (Geographical)

County & Civil Parish Boundary

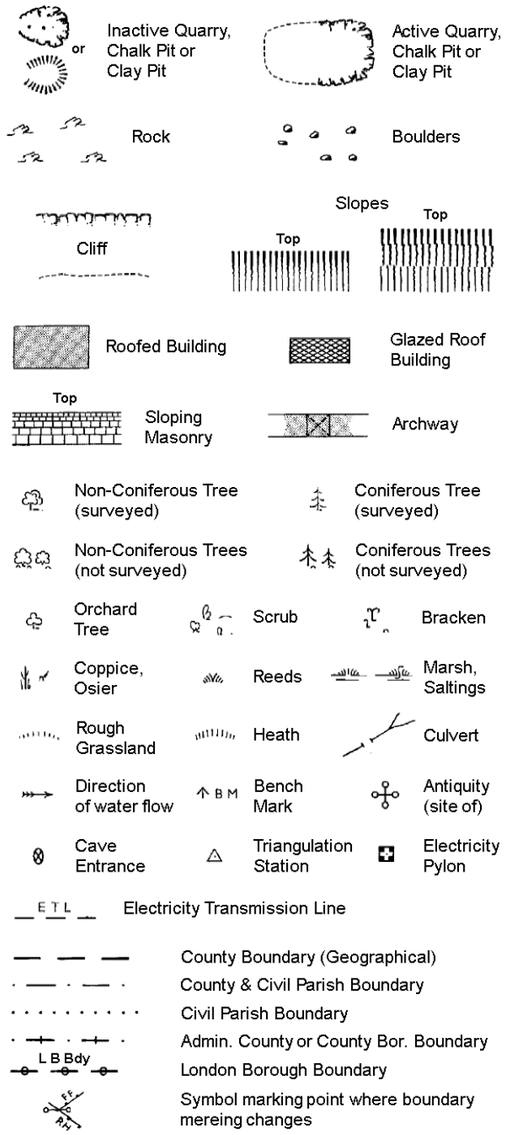
Administrative County & Civil Parish Boundary

Co. Boro. Bdy. County Borough Boundary (England)

Co. Burgh Bdy. County Burgh Boundary (Scotland)

BP BS	Boundary Post or Stone	P.C.B	Police Call Box
B.R.	Bridle Road	P	Pump
E.P	Electricity Pylon	S.P	Signal Post
F.B.	Foot Bridge	St.	Sluice
F.P.	Foot Path	Sp.	Spring
G.P	Guide Post or Board	T.C.B	Telephone Call Box
M.S	Mile Stone	Tr.	Trough
M.P M.R	Mooring Post or Ring	W	Well

Ordnance Survey Plan, Additional SIMs and Supply of Unpublished Survey Information 1:2,500 and 1:1,250



County Boundary (Geographical)

County & Civil Parish Boundary

Civil Parish Boundary

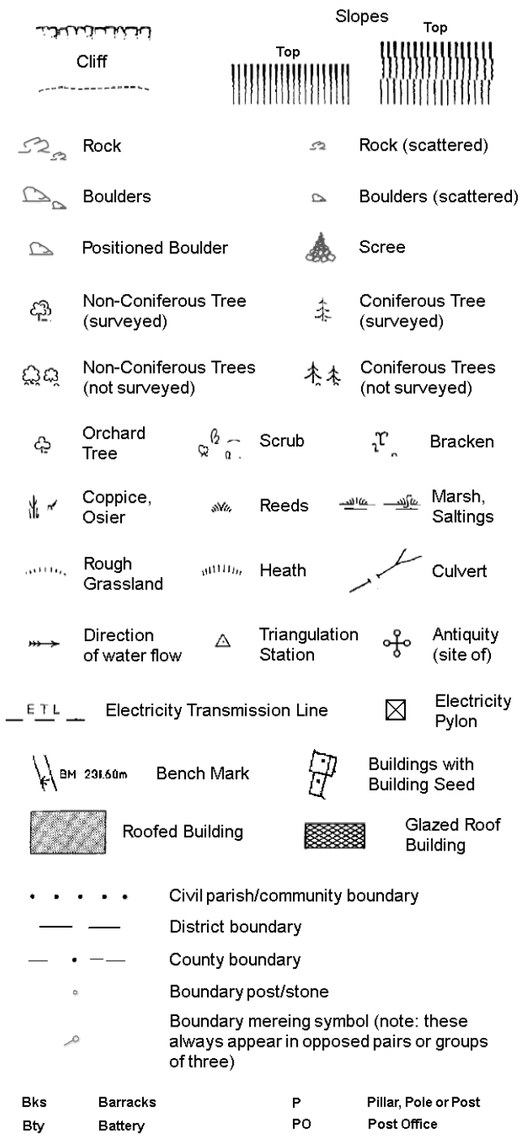
Admin. County or County Bor. Boundary

L B Bdy London Borough Boundary

Symbol marking point where boundary mereing changes

BH	Beer House	P	Pillar, Pole or Post
BP, BS	Boundary Post or Stone	PO	Post Office
Cn, C	Capstan, Crane	PC	Public Convenience
Chy	Chimney	PH	Public House
D Fn	Drinking Fountain	Pp	Pump
El P	Electricity Pillar or Post	SB, S Br	Signal Box or Bridge
FAP	Fire Alarm Pillar	SP, SL	Signal Post or Light
FB	Foot Bridge	Spr	Spring
GP	Guide Post	Tk	Tank or Track
H	Hydrant or Hydraulic	TCB	Telephone Call Box
LC	Level Crossing	TCP	Telephone Call Post
MH	Manhole	Tr	Trough
MP	Mile Post or Mooring Post	Wr Pt, Wr T	Water Point, Water Tap
MS	Mile Stone	W	Well
NTL	Normal Tidal Limit	Wd Pp	Wind Pump

Large-Scale National Grid Data 1:2,500 and 1:1,250



Civil parish/community boundary

District boundary

County boundary

Boundary post/stone

Boundary mereing symbol (note: these always appear in opposed pairs or groups of three)

Bks	Barracks	P	Pillar, Pole or Post
Bty	Battery	PO	Post Office
Cemy	Cemetery	PC	Public Convenience
Chy	Chimney	Pp	Pump
Cis	Cistern	Ppg Sta	Pumping Station
Dismtd Rly	Dismantled Railway	PW	Place of Worship
El Gen Sta	Electricity Generating Station	Sewage Ppg Sta	Sewage Pumping Station
El P	Electricity Pole, Pillar	SB, S Br	Signal Box or Bridge
El Sub Sta	Electricity Sub Station	SP, SL	Signal Post or Light
FB	Filter Bed	Spr	Spring
Fn / D Fn	Fountain / Drinking Ftn.	Tk	Tank or Track
Gas Gov	Gas Valve Compound	Tr	Trough
GVC	Gas Governer	Wd Pp	Wind Pump
GP	Guide Post	Wr Pt, Wr T	Water Point, Water Tap
MH	Manhole	Wks	Works (building or area)
MP, MS	Mile Post or Mile Stone	W	Well

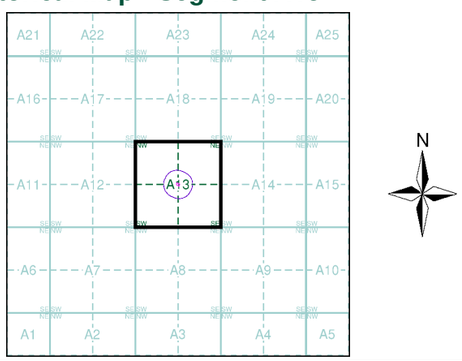
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Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Lancashire And Furness	1:2,500	1893	2
Lancashire And Furness	1:2,500	1908 - 1909	3
Lancashire And Furness	1:2,500	1931 - 1933	4
Ordnance Survey Plan	1:1,250	1951	5
Ordnance Survey Plan	1:2,500	1951	6
Ordnance Survey Plan	1:1,250	1960 - 1980	7
Supply of Unpublished Survey Information	1:1,250	1976	8
Additional SIMs	1:1,250	1977 - 1988	9
Ordnance Survey Plan	1:1,250	1980	10
Additional SIMs	1:1,250	1987 - 1991	11
Large-Scale National Grid Data	1:1,250	1992	12
Large-Scale National Grid Data	1:1,250	1993	13
Large-Scale National Grid Data	1:1,250	1996	14
Historical Aerial Photography	1:2,500	2000	15

Historical Map - Segment A13



Order Details

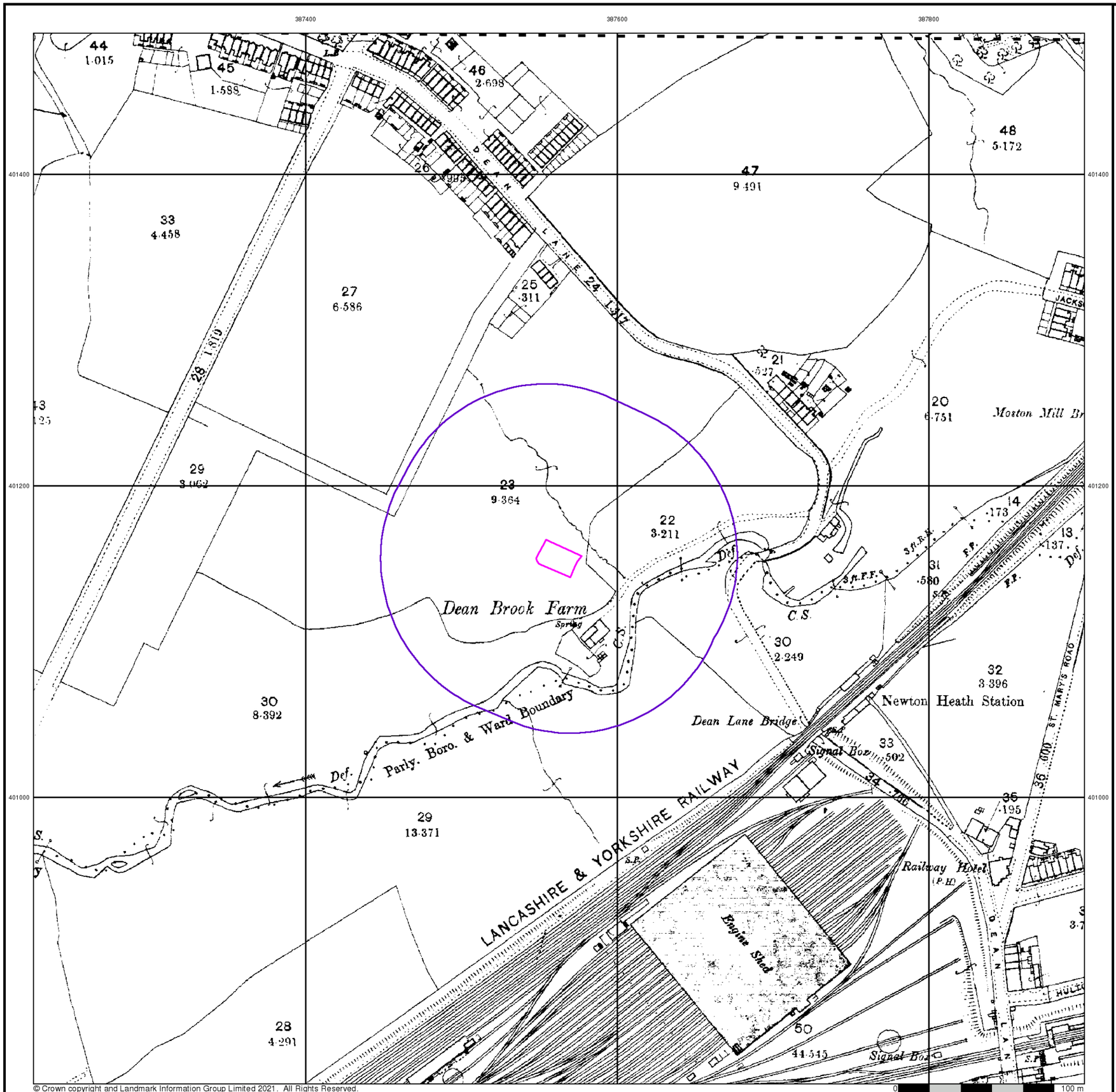
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Customer Ref:	EBMA2711
National Grid Reference:	387560, 401150
Slice:	A
Site Area (Ha):	0.04
Search Buffer (m):	100

Site Details

Site located at 387560,401150, M40 5NW

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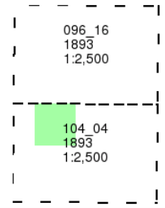
Lancashire And Furness

Published 1893

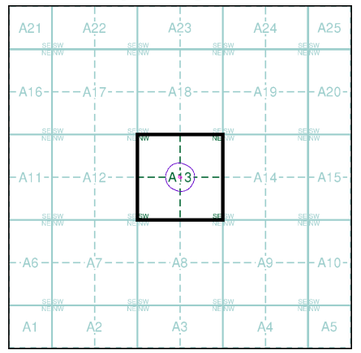
Source map scale - 1:2,500

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Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

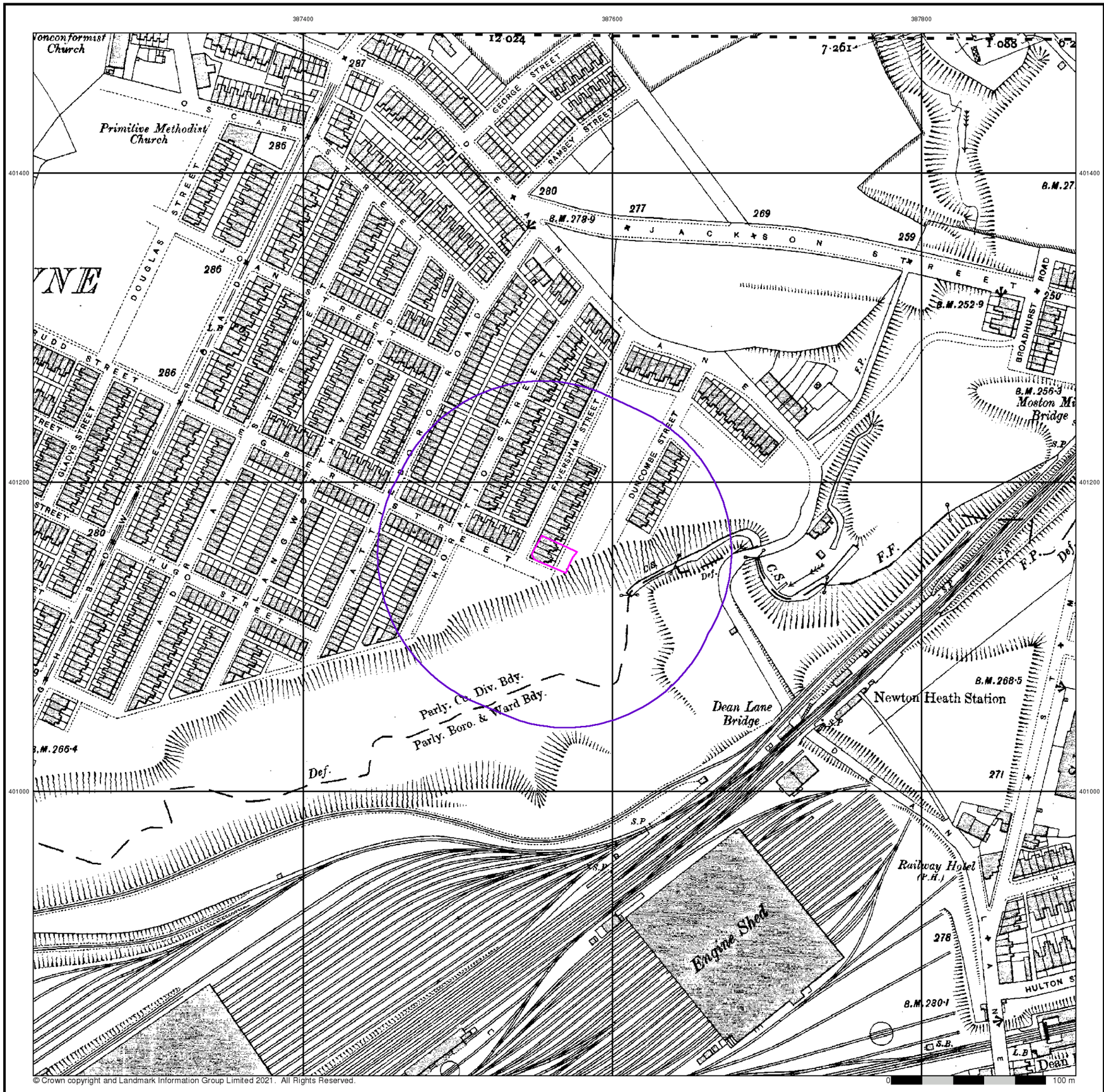
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Customer Ref:	EBMA2711
National Grid Reference:	387560, 401150
Slice:	A
Site Area (Ha):	0.04
Search Buffer (m):	100

Site Details

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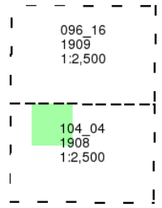
Lancashire And Furness

Published 1908 - 1909

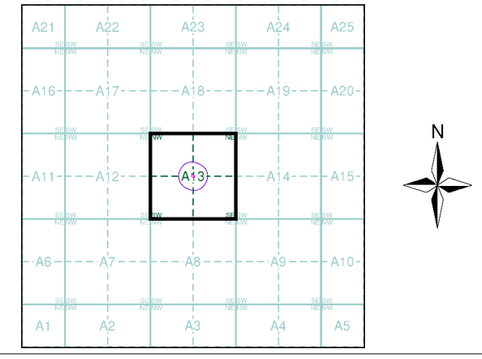
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

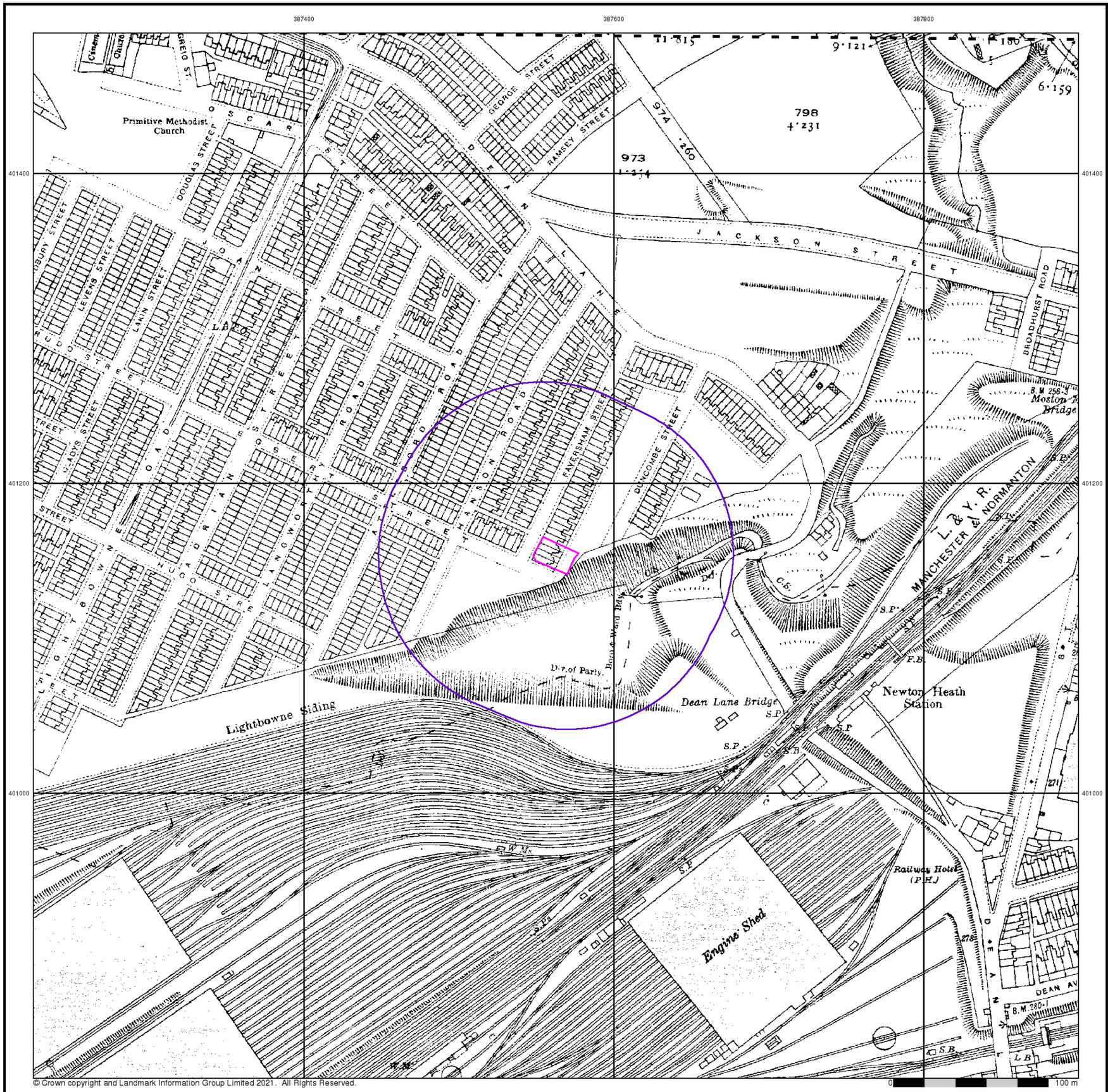
Order Number:	273931122_1_1
Customer Ref:	EBMA2711
National Grid Reference:	387560, 401150
Slice:	A
Site Area (Ha):	0.04
Search Buffer (m):	100

Site Details

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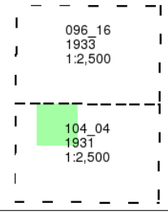
Lancashire And Furness

Published 1931 - 1933

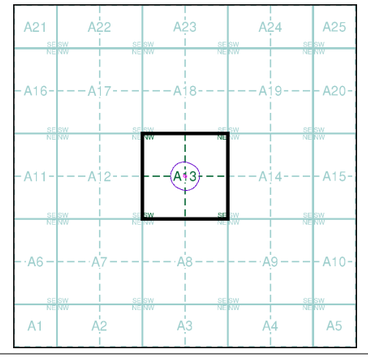
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

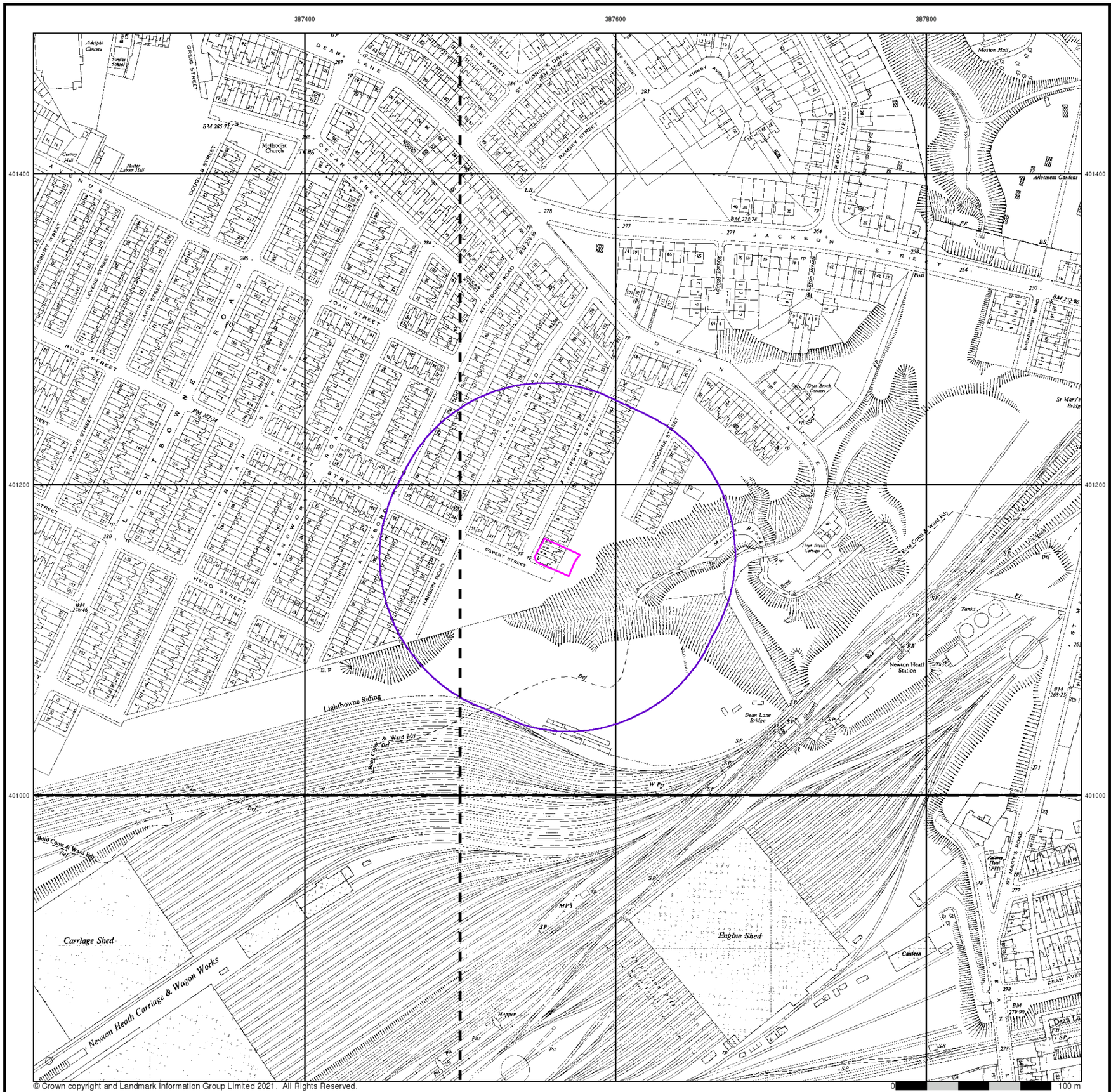
Order Number:	273931122_1_1
Customer Ref:	EBMA2711
National Grid Reference:	387560, 401150
Slice:	A
Site Area (Ha):	0.04
Search Buffer (m):	100

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Ordnance Survey Plan

Published 1951

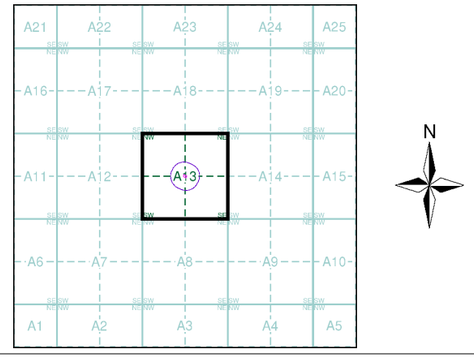
Source map scale - 1:1,250

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)

SD8701SW 1951 1:1,250
SD8701SE 1951 1:1,250
SD8700NW 1951 1:1,250
SD8700NE 1951 1:1,250

Historical Map - Segment A13



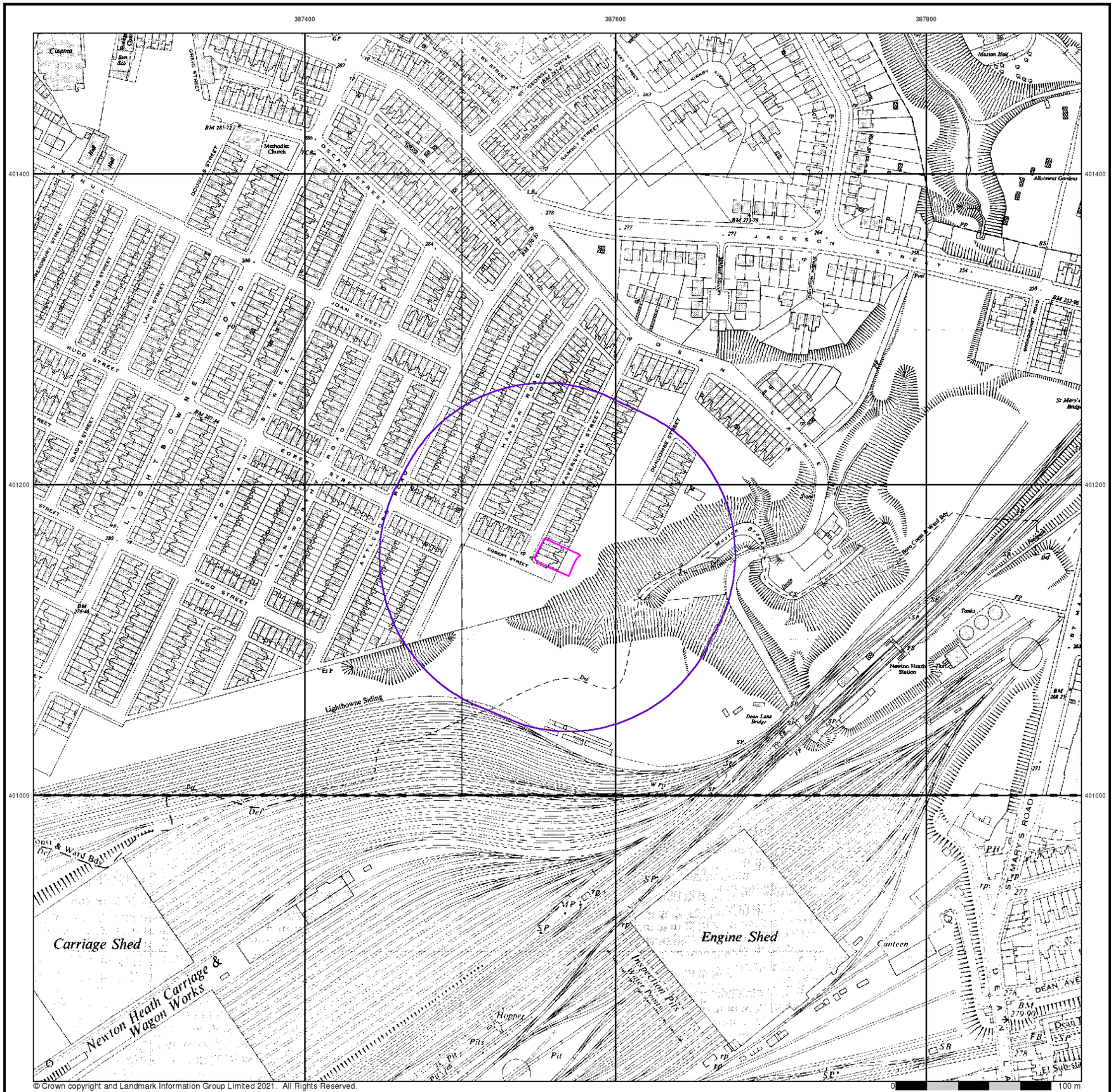
Order Details

Order Number:	273931122_1_1
Customer Ref:	EBMA2711
National Grid Reference:	387560, 401150
Slice:	A
Site Area (Ha):	0.04
Search Buffer (m):	100

Site Details

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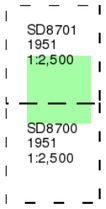
Ordnance Survey Plan

Published 1951

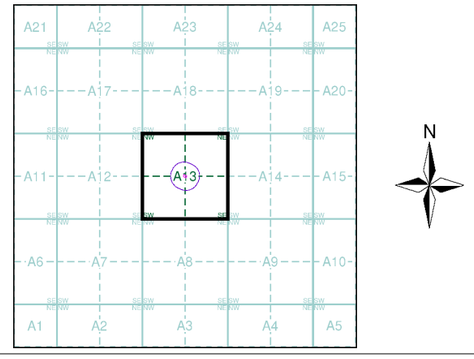
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

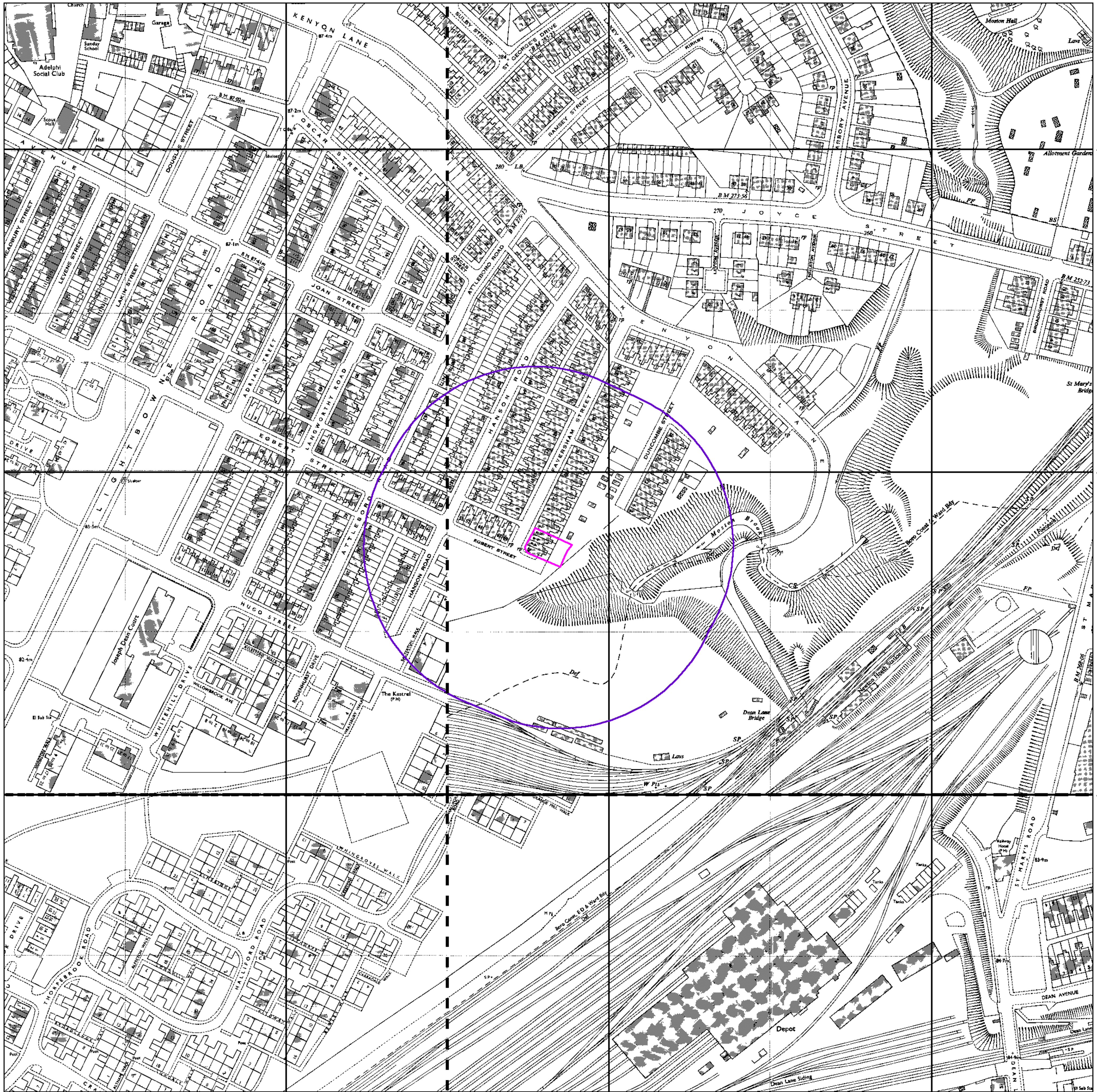
Order Number:	273931122_1_1
Customer Ref:	EBMA2711
National Grid Reference:	387560, 401150
Slice:	A
Site Area (Ha):	0.04
Search Buffer (m):	100

Site Details

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0 100 m

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Ordnance Survey Plan

Published 1960 - 1980

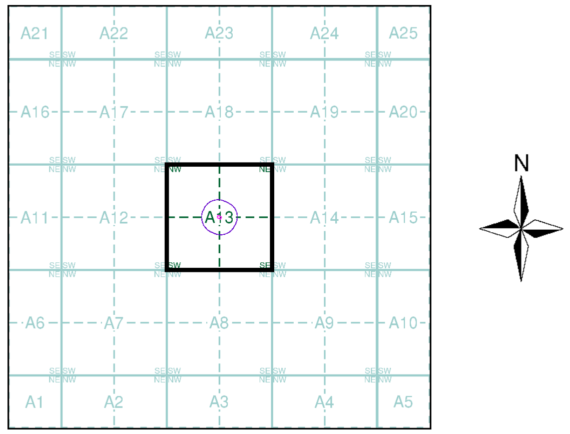
Source map scale - 1:1,250

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)

SD8701SW 1980 1:1,250	SD8701SE 1960 1:1,250
SD8700NW 1980 1:1,250	SD8700NE 1980 1:1,250

Historical Map - Segment A13



Order Details

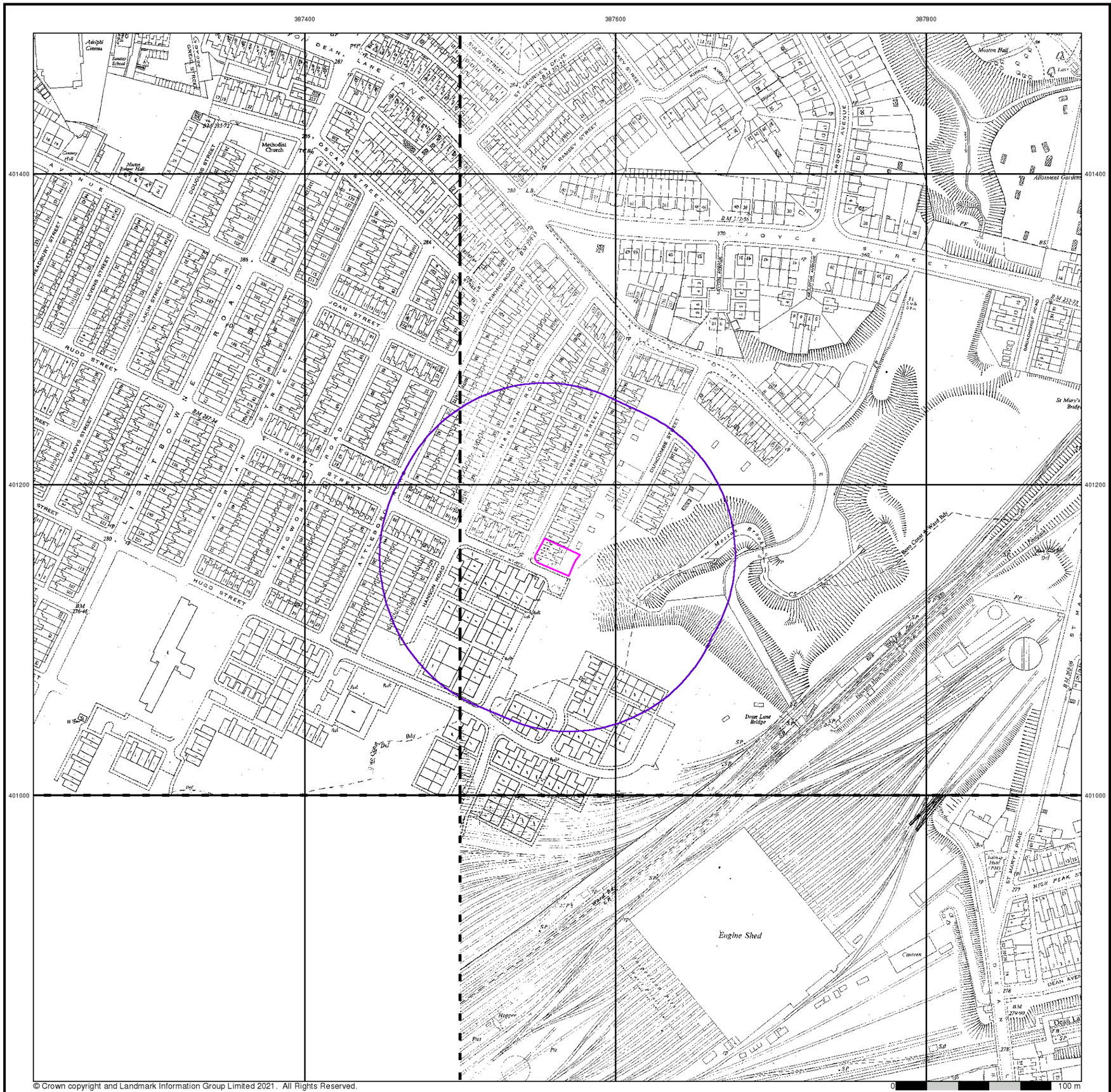
Order Number:	273931122_1_1
Customer Ref:	EBMA2711
National Grid Reference:	387560, 401150
Slice:	A
Site Area (Ha):	0.04
Search Buffer (m):	100

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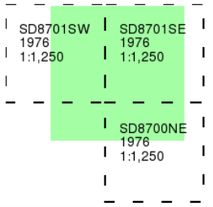
Supply of Unpublished Survey Information

Published 1976

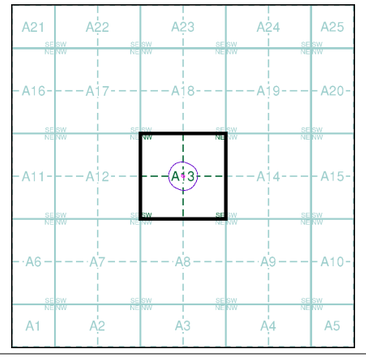
Source map scale - 1:1,250

SUSI maps (Supply of Unpublished Survey Information) were produced between 1972 and 1977, mainly for internal use at Ordnance Survey. These were more of a `work-in-progress' plan as they showed updates of individual areas on a map. These maps were unpublished, and they do not represent a single moment in time. They were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

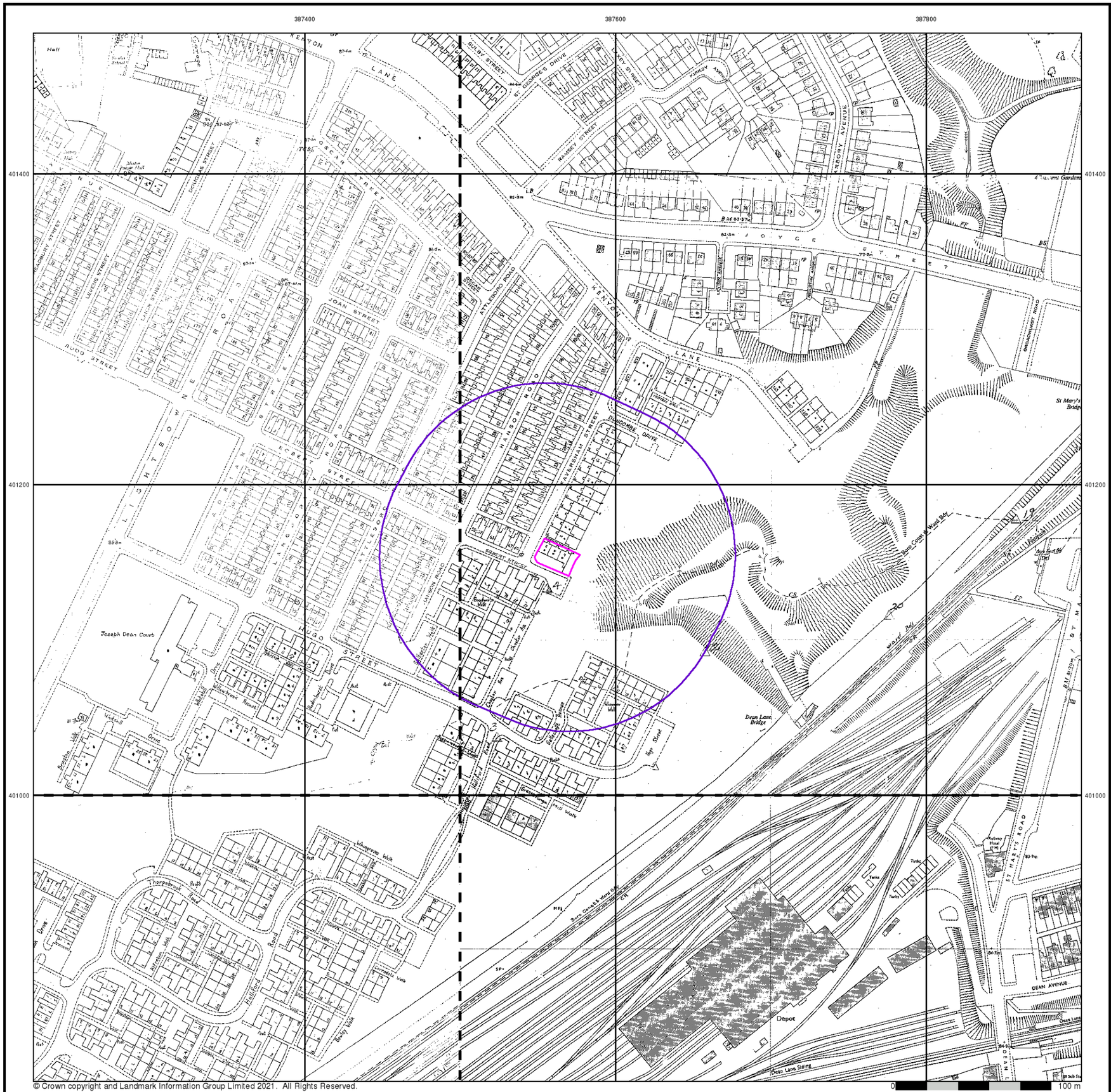
Order Number:	273931122_1_1
Customer Ref:	EBMA2711
National Grid Reference:	387560, 401150
Slice:	A
Site Area (Ha):	0.04
Search Buffer (m):	100

Site Details

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Additional SIMs

Published 1977 - 1988

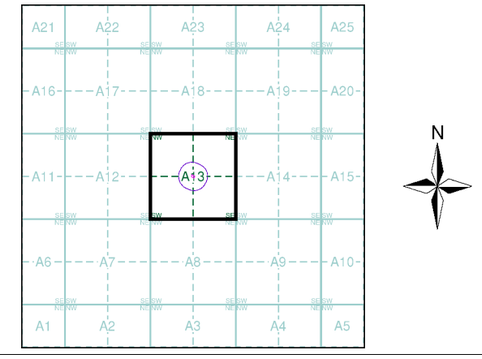
Source map scale - 1:1,250

The SIM cards (Ordnance Survey's `Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)

SD8701SW 1977 1:1,250	SD8701SE 1977 1:1,250
SD8700NW 1977 1:1,250	SD8700NE 1988 1:1,250

Historical Map - Segment A13



Order Details

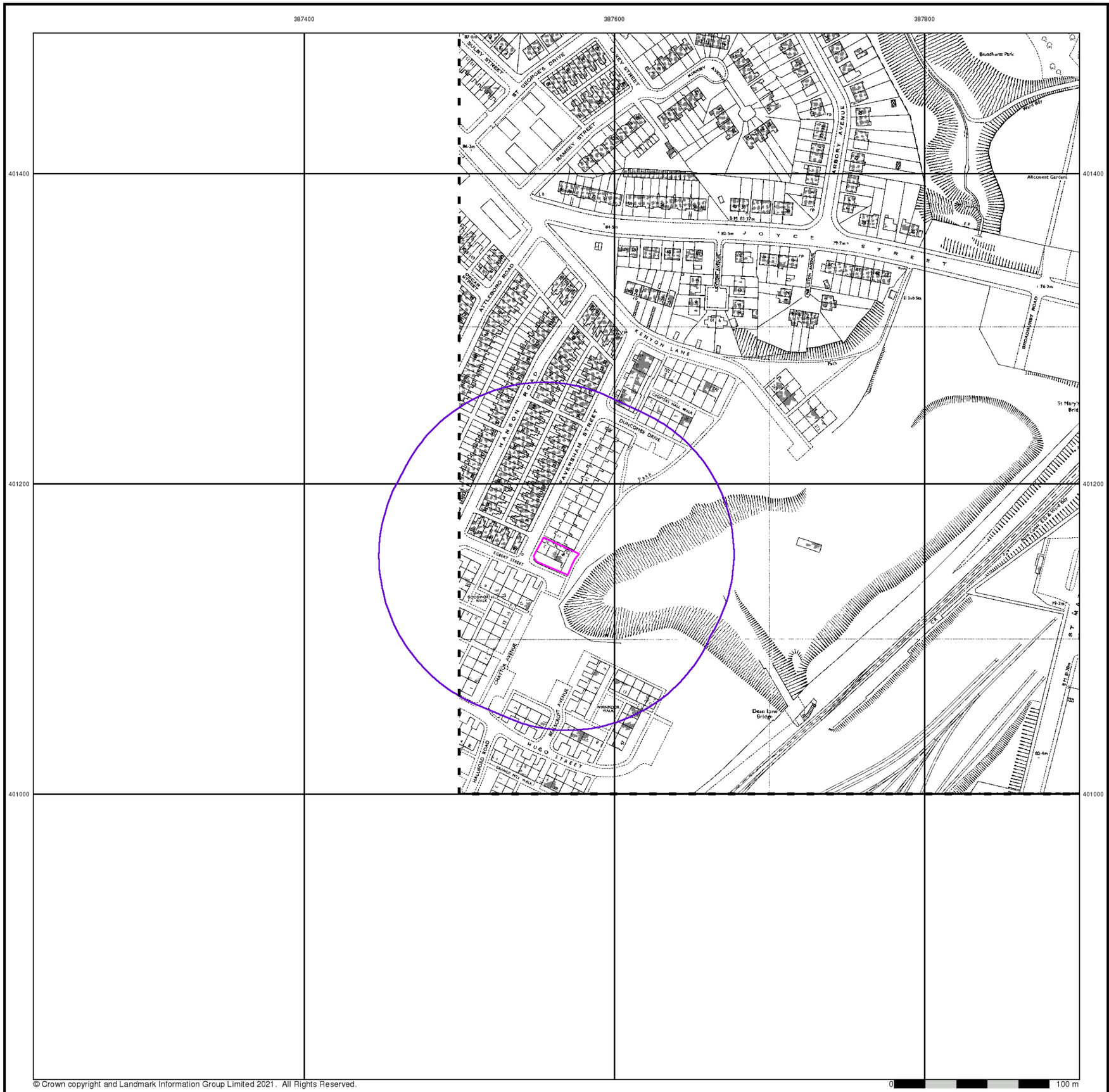
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Customer Ref:	EBMA2711
National Grid Reference:	387560, 401150
Slice:	A
Site Area (Ha):	0.04
Search Buffer (m):	100

Site Details

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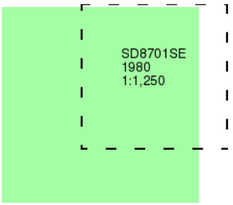
Ordnance Survey Plan

Published 1980

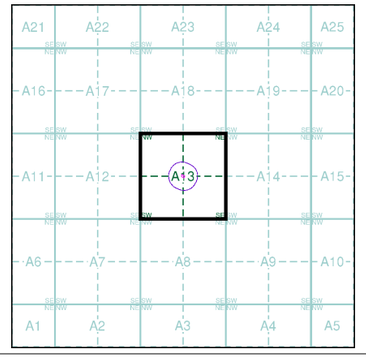
Source map scale - 1:1,250

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Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

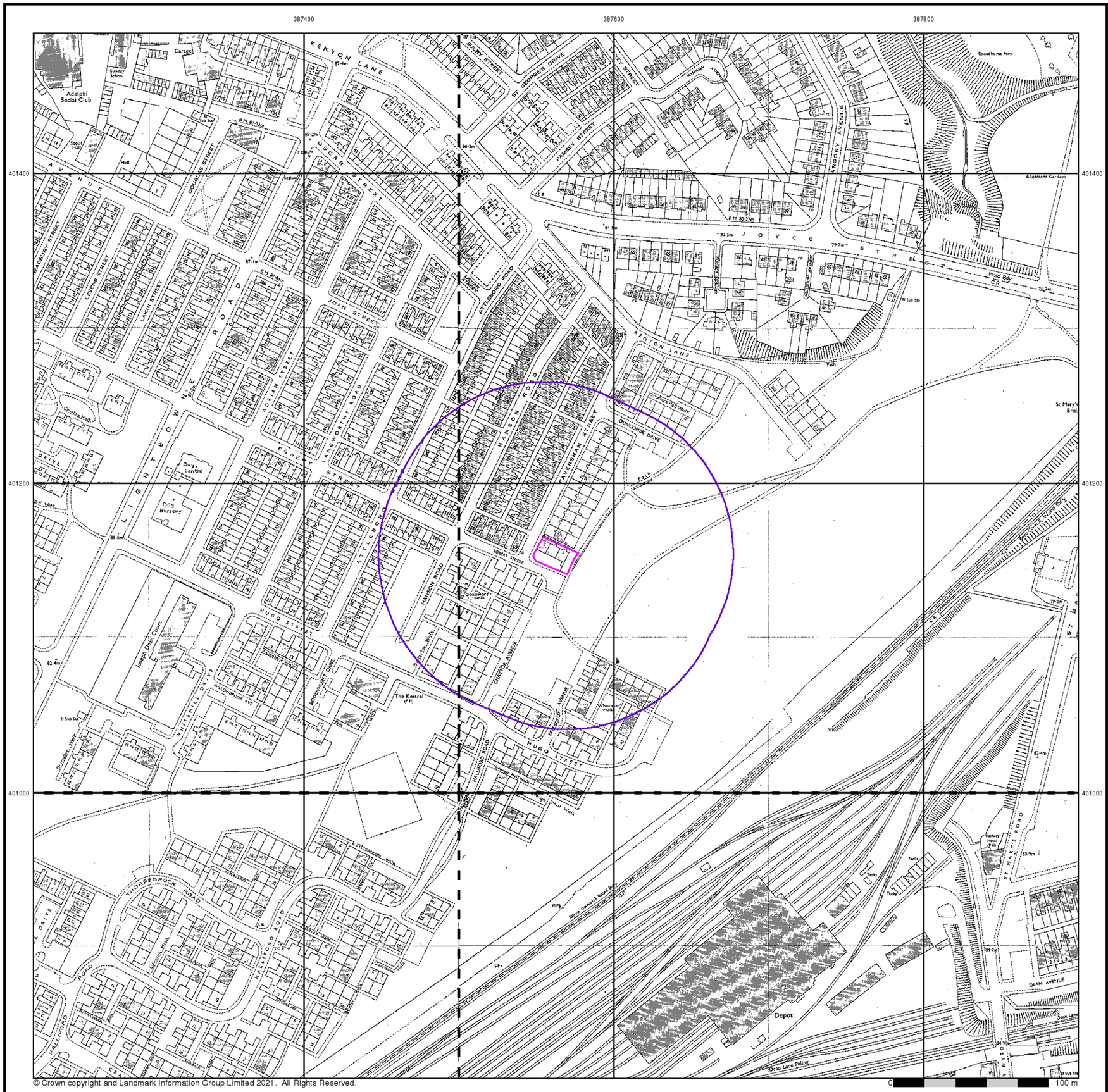
Order Number:	273931122_1_1
Customer Ref:	EBMA2711
National Grid Reference:	387560, 401150
Slice:	A
Site Area (Ha):	0.04
Search Buffer (m):	100

Site Details

Site located at 387560,401150, M40 5NW

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Additional SIMs

Published 1987 - 1991

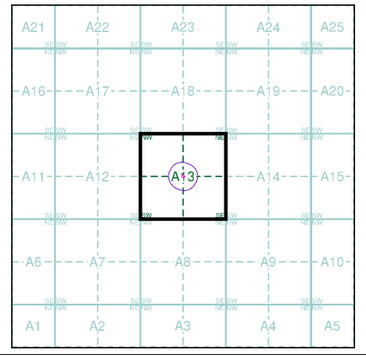
Source map scale - 1:1,250

The SIM cards (Ordnance Survey's `Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)

SD8701SW 1987 1:1,250	SD8701SE 1990 1:1,250
SD8700NW 1991 1:1,250	SD8700NE 1990 1:1,250

Historical Map - Segment A13



Order Details

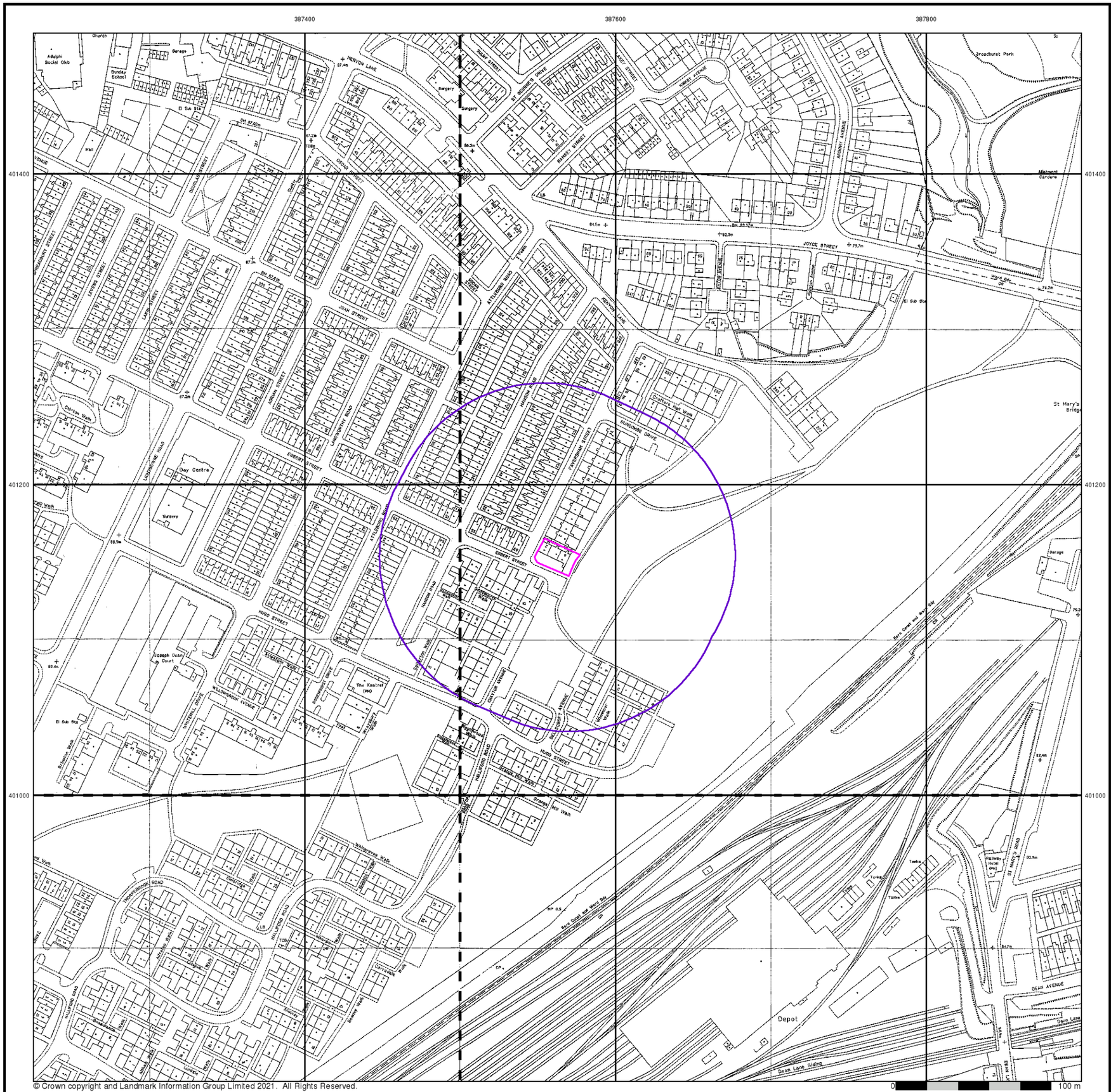
Order Number:	273931122_1_1
Customer Ref:	EBMA2711
National Grid Reference:	387560, 401150
Slice:	A
Site Area (Ha):	0.04
Search Buffer (m):	100

Site Details

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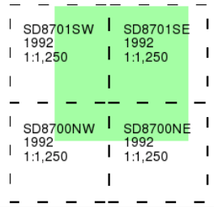
Large-Scale National Grid Data

Published 1992

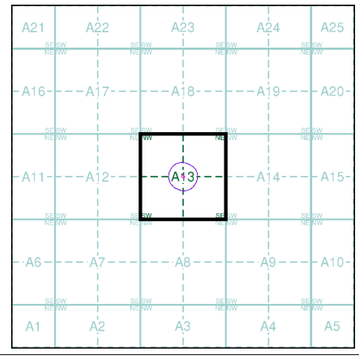
Source map scale - 1:1,250

'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number:	273931122_1_1
Customer Ref:	EBMA2711
National Grid Reference:	387560, 401150
Slice:	A
Site Area (Ha):	0.04
Search Buffer (m):	100

Site Details

Site located at 387560,401150, M40 5NW

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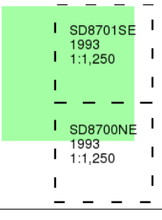
Large-Scale National Grid Data

Published 1993

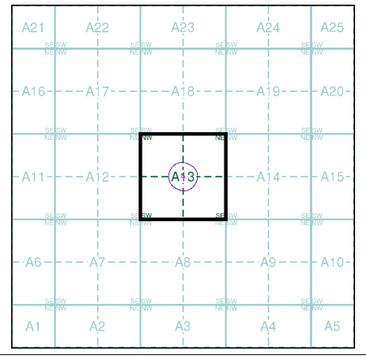
Source map scale - 1:1,250

'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

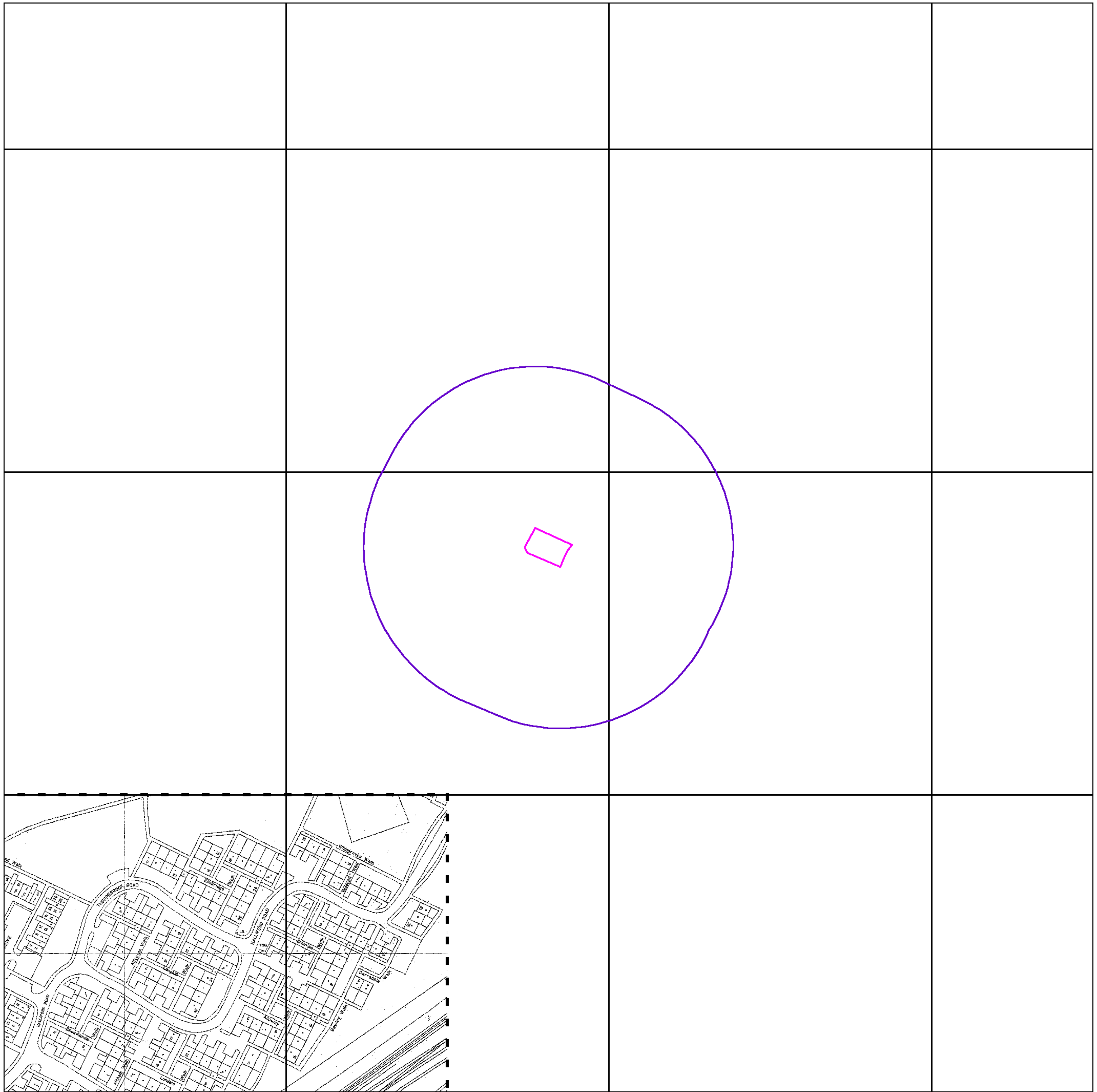
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Customer Ref:	EBMA2711
National Grid Reference:	387560, 401150
Slice:	A
Site Area (Ha):	0.04
Search Buffer (m):	100

Site Details

Site located at 387560,401150, M40 5NW

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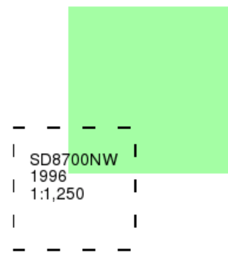
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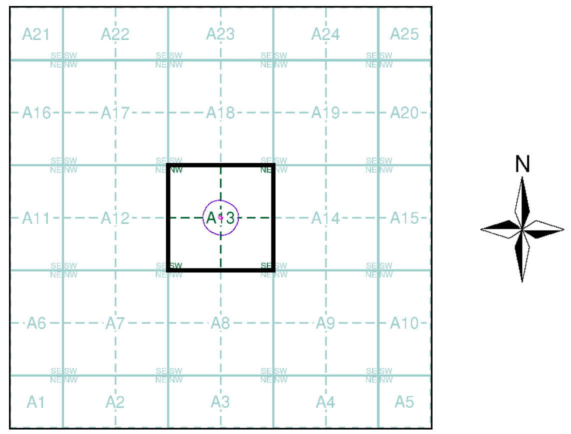
Large-Scale National Grid Data
Published 1996
Source map scale - 1:1,250

'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



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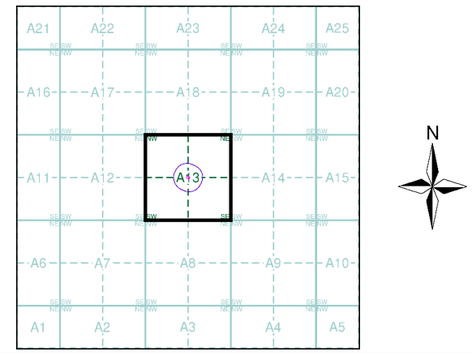
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Historical Aerial Photography

Published 2000

This aerial photography was produced by Getmapping, these vertical aerial photographs provide a seamless, full colour survey of the whole of Great Britain

Historical Aerial Photography - Segment A13



Order Details

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Geology 1:50,000 Maps Legends

Artificial Ground and Landslip

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	MGR	Made Ground (Undivided)	Artificial Deposit	Not Supplied - Holocene
	WMGR	Infilled Ground	Artificial Deposit	Not Supplied - Holocene
	WGR	Worked Ground (Undivided)	Void	Not Supplied - Holocene

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
		Rock Segments		

Superficial Geology

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	ALV	Alluvium	Clay, Silt, Sand and Gravel	Not Supplied - Holocene
	TILLD	Till, Devensian	Diamicton	Not Supplied - Devensian
	GFSDD	Glaciofluvial Sheet Deposits, Devensian	Sand and Gravel	Not Supplied - Devensian
	GFDUD	Glaciofluvial Deposits, Devensian	Sand and Gravel	Not Supplied - Devensian
	PEAT	Peat	Peat	Not Supplied - Quaternary

Bedrock and Faults

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	CHES	Chester Formation	Sandstone	Not Supplied - Olenekian
	MM	Manchester Marls Formation	Mudstone	Not Supplied - GUADALUPIAN
	CS	Collyhurst Sandstone Formation	Sandstone	Not Supplied - Cisuralian
	NHSS	Newton Heath Sandstone	Sandstone	Not Supplied - Westphalian
	PUCM	Pennine Upper Coal Measures Formation	Mudstone, Siltstone and Sandstone	Not Supplied - Westphalian
	WDR	Worsley Delf Rock	Sandstone	Not Supplied - Westphalian
	PMCM	Pennine Middle Coal Measures Formation	Mudstone, Siltstone and Sandstone	Not Supplied - Westphalian
	BAR	Bardsley Rock	Sandstone	Not Supplied - Westphalian
		Faults		

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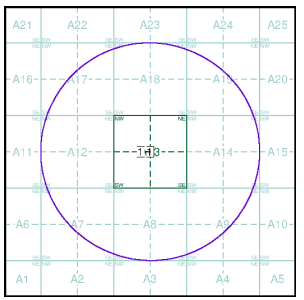
Geology 1:50,000 Maps

This report contains geological map extracts taken from the BGS Digital Geological map of Great Britain at 1:50,000 scale and is designed for users carrying out preliminary site assessments who require geological maps for the area around the site. This mapping may be more up to date than previously published paper maps.
The various geological layers - artificial and landslip deposits, superficial geology and solid (bedrock) geology are displayed in separate maps, but superimposed on the final 'Combined Surface Geology' map. All map legends feature on this page. Not all layers have complete nationwide coverage, so availability of data for relevant map sheets is indicated below.

Geology 1:50,000 Maps Coverage

Map ID: 1
Map Sheet No: 085
Map Name: Manchester
Map Date: 2010
Bedrock Geology: Available
Superficial Geology: Not Available
Artificial Geology: Not Available
Faults: Not Supplied
Landslip: Not Available
Rock Segments: Not Supplied

Geology 1:50,000 Maps - Slice A



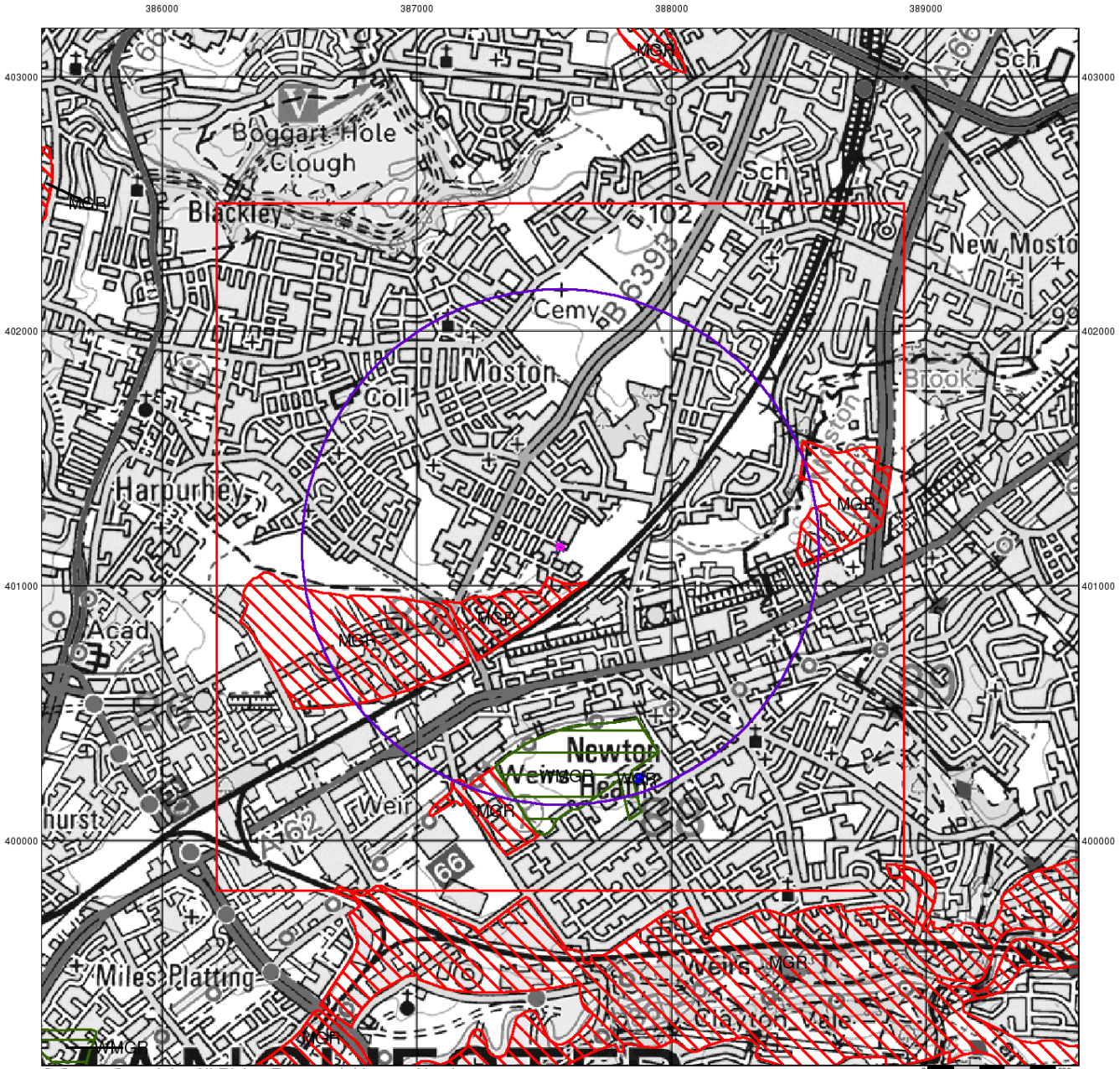
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Artificial Ground and Landslip

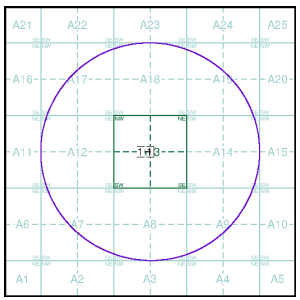
Artificial ground is a term used by BGS for those areas where the ground surface has been significantly modified by human activity. Information about previously developed ground is especially important, as it is often associated with potentially contaminated material, unpredictable engineering conditions and unstable ground.

Artificial ground includes:

- Made ground - man-made deposits such as embankments and spoil heaps on the natural ground surface.
- Worked ground - areas where the ground has been cut away such as quarries and road cuttings.
- Infilled ground - areas where the ground has been cut away then wholly or partially backfilled.
- Landscaped ground - areas where the surface has been reshaped.
- Disturbed ground - areas of ill-defined shallow or near surface mineral workings where it is impracticable to map made and worked ground separately.

Mass movement (landslip) deposits on BGS geological maps are primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground. The dataset also includes foundered strata, where the ground has collapsed due to subsidence.

Artificial Ground and Landslip Map - Slice A



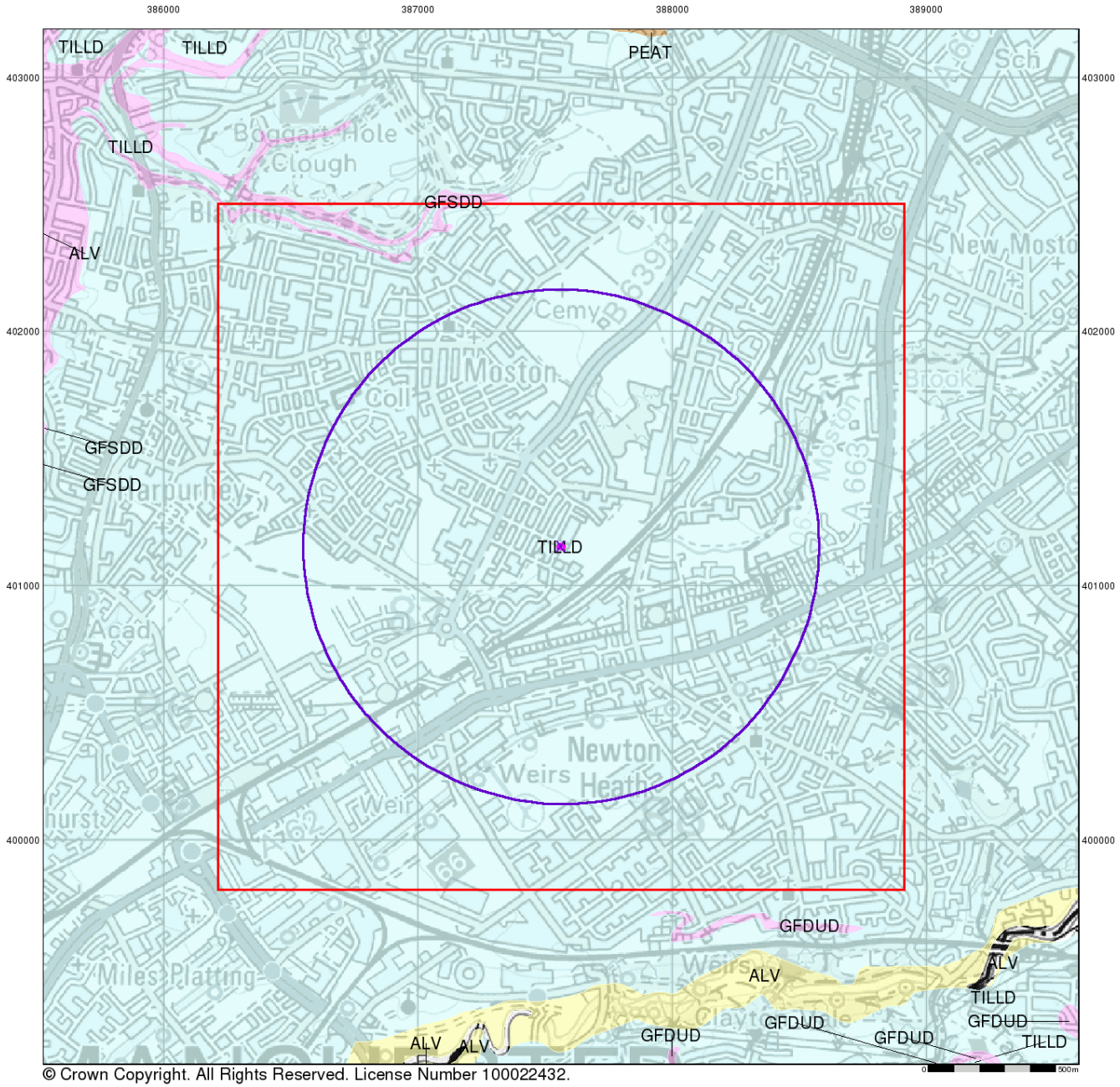
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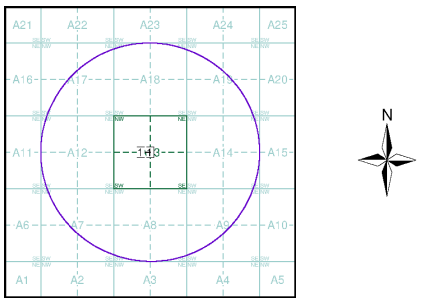
Superficial Geology

Superficial Deposits are the youngest geological deposits formed during the most recent period of geological time, the Quaternary, which extends back about 1.8 million years from the present.

They rest on older deposits or rocks referred to as Bedrock. This dataset contains Superficial deposits that are of natural origin and 'in place'. Other superficial strata may be held in the Mass Movement dataset where they have been moved, or in the Artificial Ground dataset where they are of man-made origin.

Most of these Superficial deposits are unconsolidated sediments such as gravel, sand, silt and clay, and onshore they form relatively thin, often discontinuous patches or larger spreads.

Superficial Geology Map - Slice A



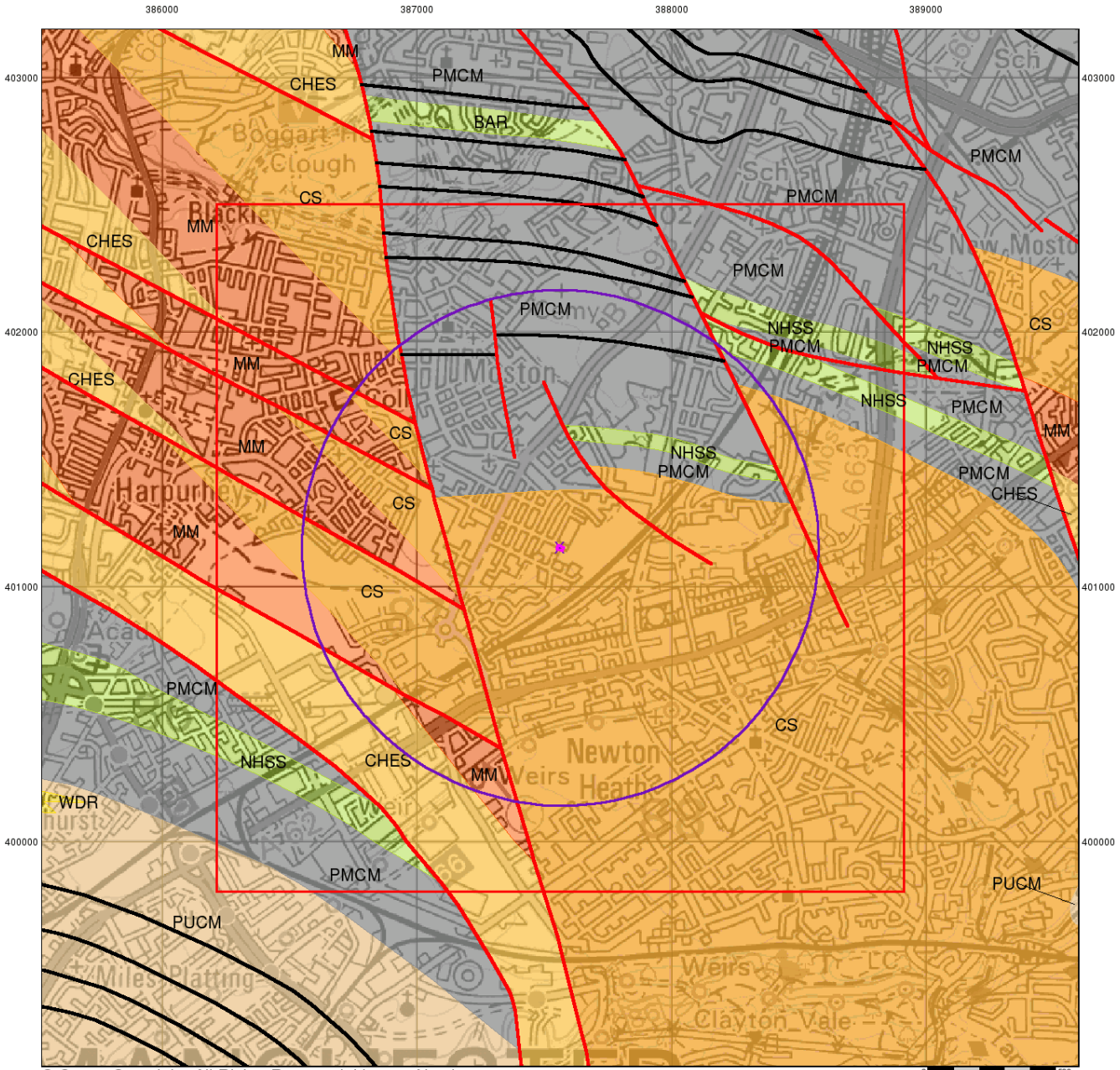
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Bedrock and Faults

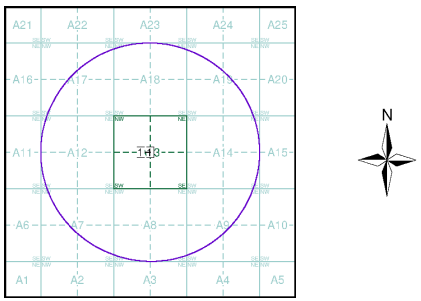
Bedrock geology is a term used for the main mass of rocks forming the Earth and are present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

The bedrock has formed over vast lengths of geological time ranging from ancient and highly altered rocks of the Proterozoic, some 2500 million years ago, or older, up to the relatively young Pliocene, 1.8 million years ago.

The bedrock geology includes many lithologies, often classified into three types based on origin: igneous, metamorphic and sedimentary.

The BGS Faults and Rock Segments dataset includes geological faults (e.g. normal, thrust), and thin beds mapped as lines (e.g. coal seam, gypsum bed). Some of these are linked to other particular 1:50,000 Geology datasets, for example, coal seams are part of the bedrock sequence, most faults and mineral veins primarily affect the bedrock but cut across the strata and post date its deposition.

Bedrock and Faults Map - Slice A



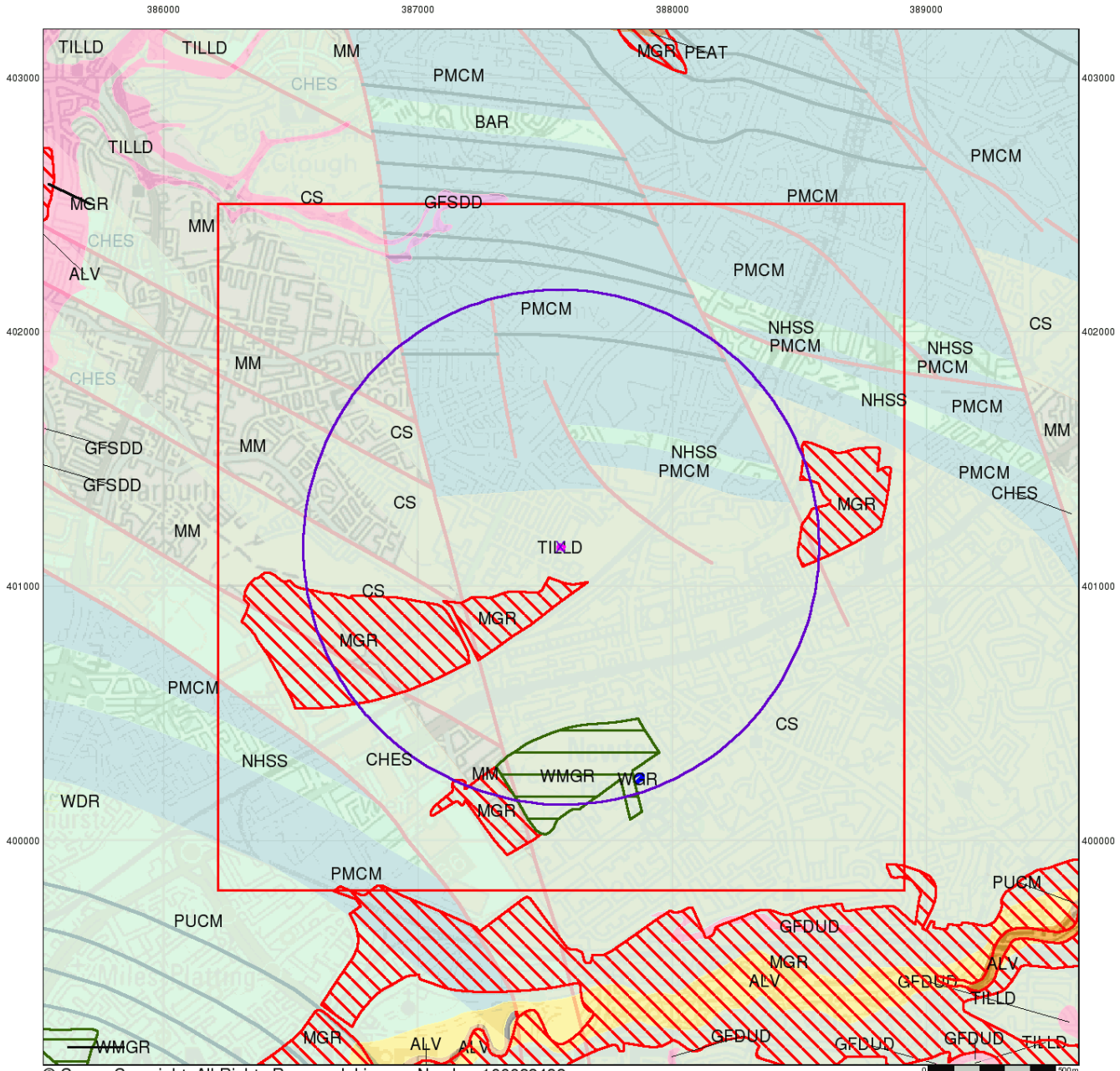
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Combined Surface Geology

The Combined Surface Geology map combines all the previous maps into one combined geological overview of your site.

Please consult the legends to the previous maps to interpret the Combined "Surface Geology" map.

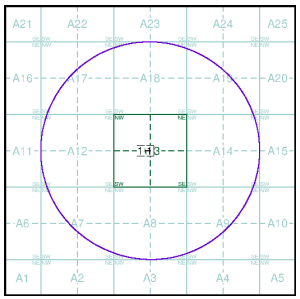
Additional Information

More information on 1:50,000 Geological mapping and explanations of rock classifications can be found on the BGS website. Using the LEX Codes in this report, further descriptions of rock types can be obtained by interrogating the 'BGS Lexicon of Named Rock Units'. This database can be accessed by following the 'Information and Data' link on the BGS website.

Contact

British Geological Survey
Kingsley Dunham Centre
Keyworth
Nottingham
NG12 5GG
Telephone: 0115 936 3143
Fax: 0115 936 3276
email: enquiries@bgs.ac.uk
website: www.bgs.ac.uk

Combined Geology Map - Slice A

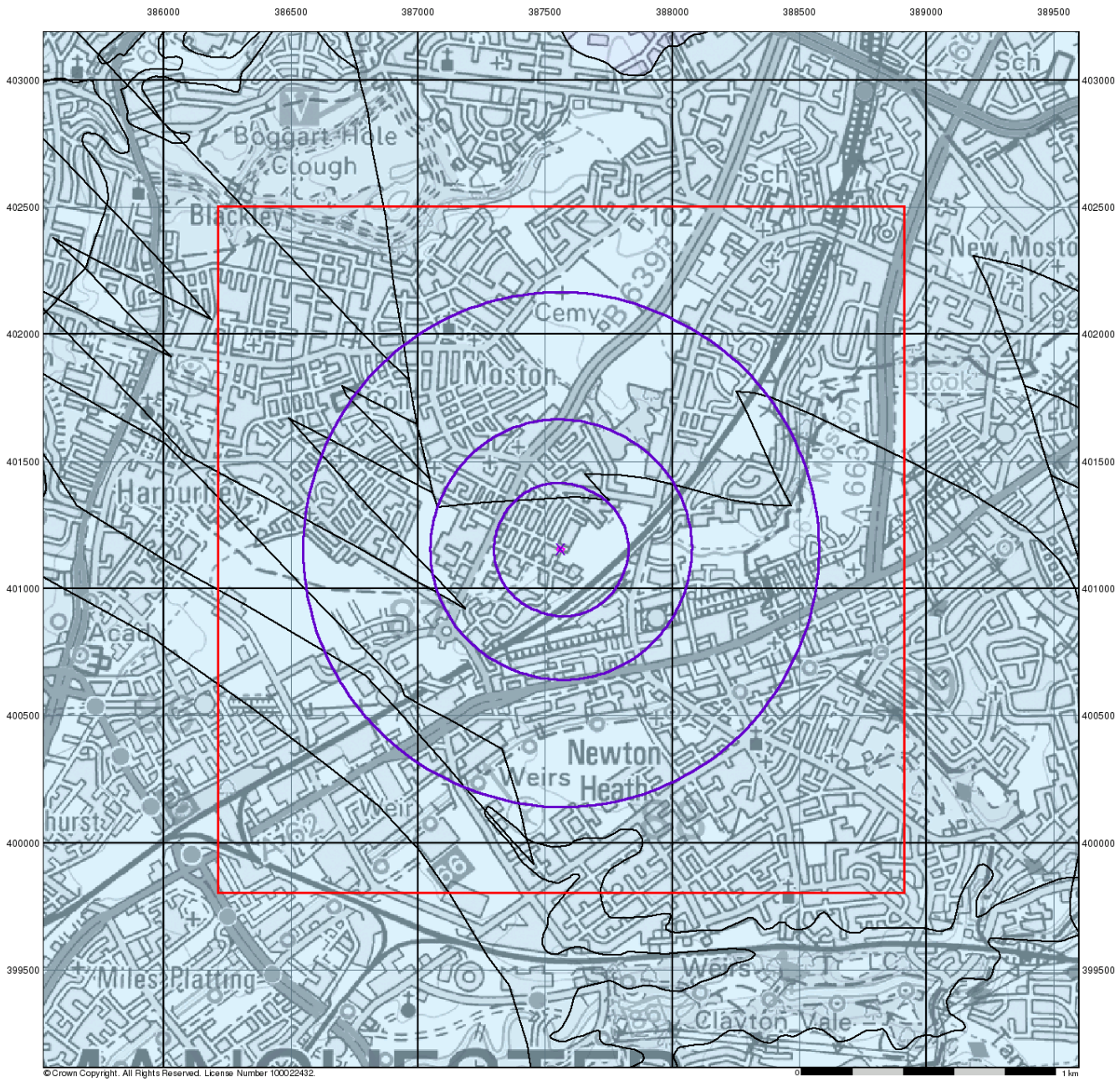


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Customer Reference:	EBMA2711
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Search Buffer (m):	1000

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Groundwater Vulnerability

General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

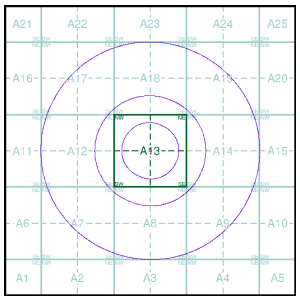
Agency and Hydrological

Bedrock Aquifers	Superficial Aquifers
High Vulnerability, Principal Aquifer	High Vulnerability, Principal Aquifer
High Vulnerability, Secondary Aquifer	High Vulnerability, Secondary Aquifer
Medium Vulnerability, Principal Aquifer	Medium Vulnerability, Principal Aquifer
Medium Vulnerability, Secondary Aquifer	Medium Vulnerability, Secondary Aquifer
Low Vulnerability, Principal Aquifer	Low Vulnerability, Principal Aquifer
Low Vulnerability, Secondary Aquifer	Low Vulnerability, Secondary Aquifer

Unproductive Aquifer

Soluble Rock

Site Sensitivity Context Map - Slice A



Order Details

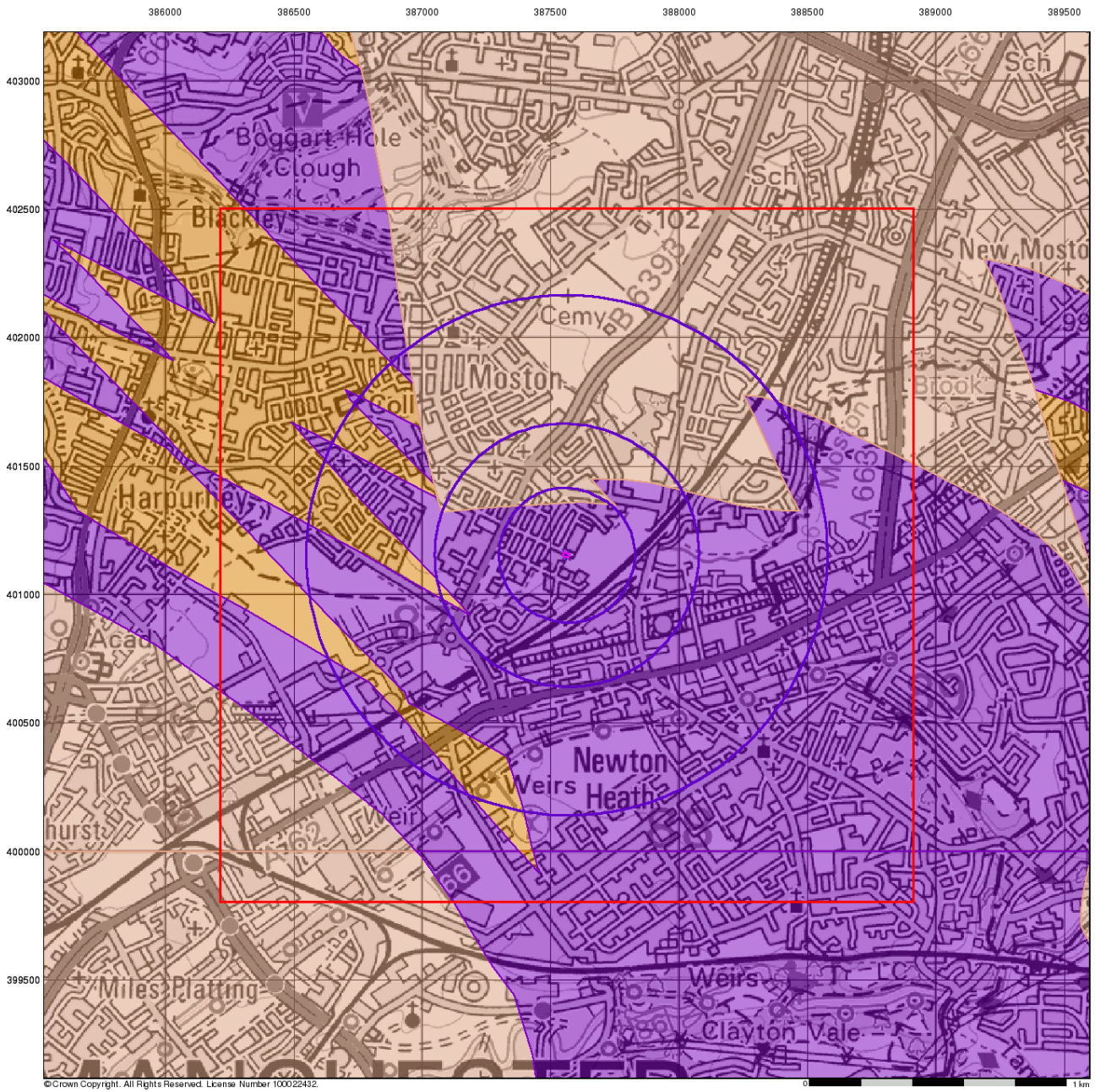
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Bedrock Aquifer Designation

General

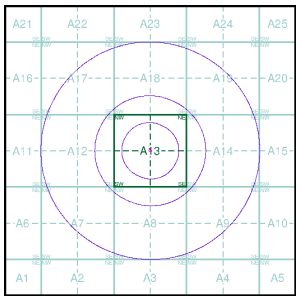
Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

Agency and Hydrological

Geological Classes

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown
- Unknown (Lakes and Landslip)

Site Sensitivity Context Map - Slice A



Order Details

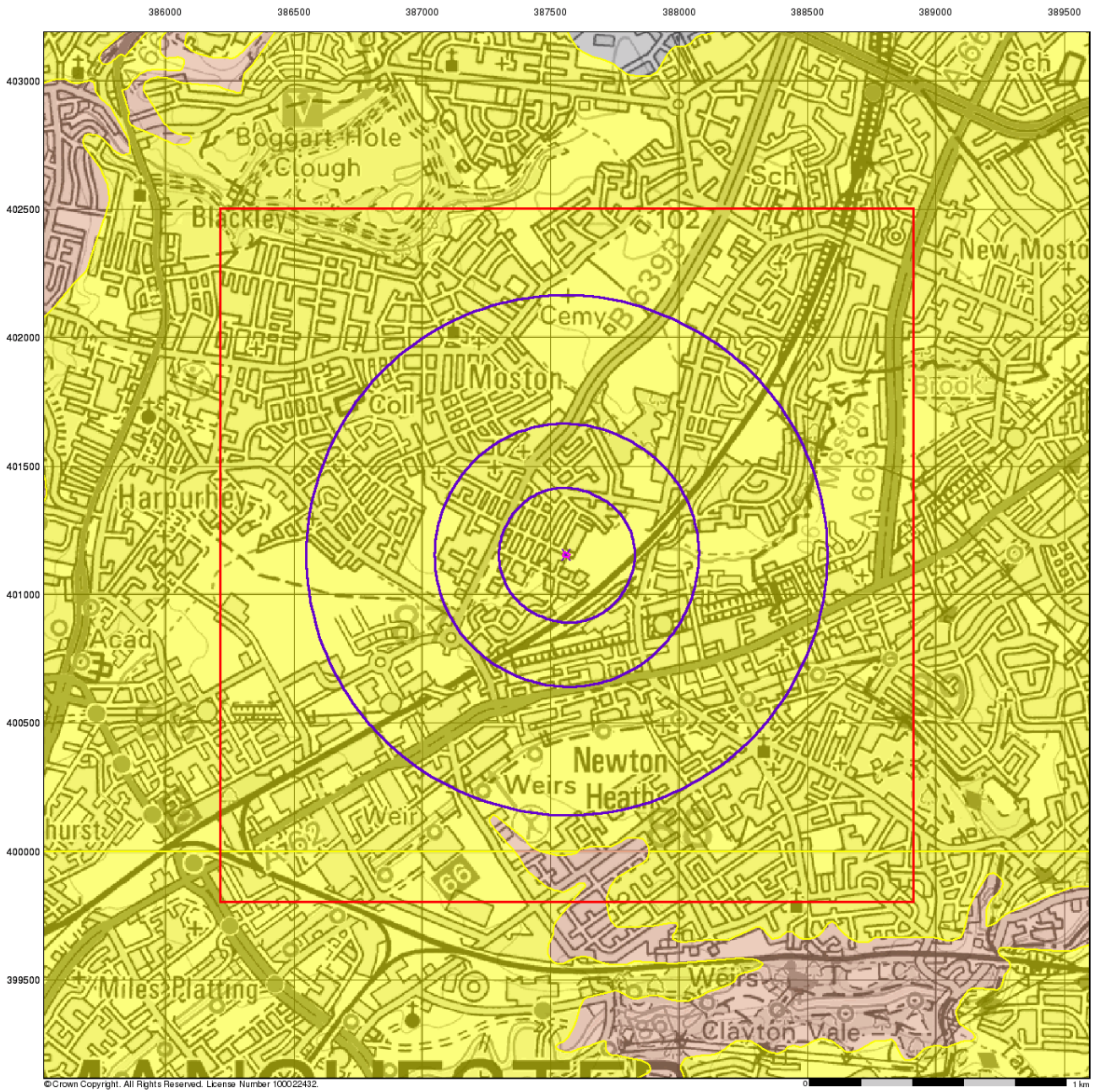
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Superficial Aquifer Designation

General

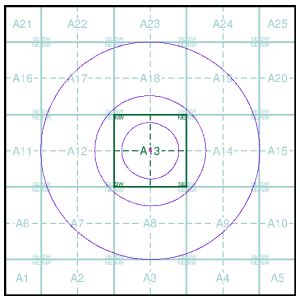
Specified Site | Specified Buffer(s) | Bearing Reference Point
Slice | Map ID

Agency and Hydrological

Geological Classes

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown
- Unknown (Lakes and Landslip)

Site Sensitivity Context Map - Slice A



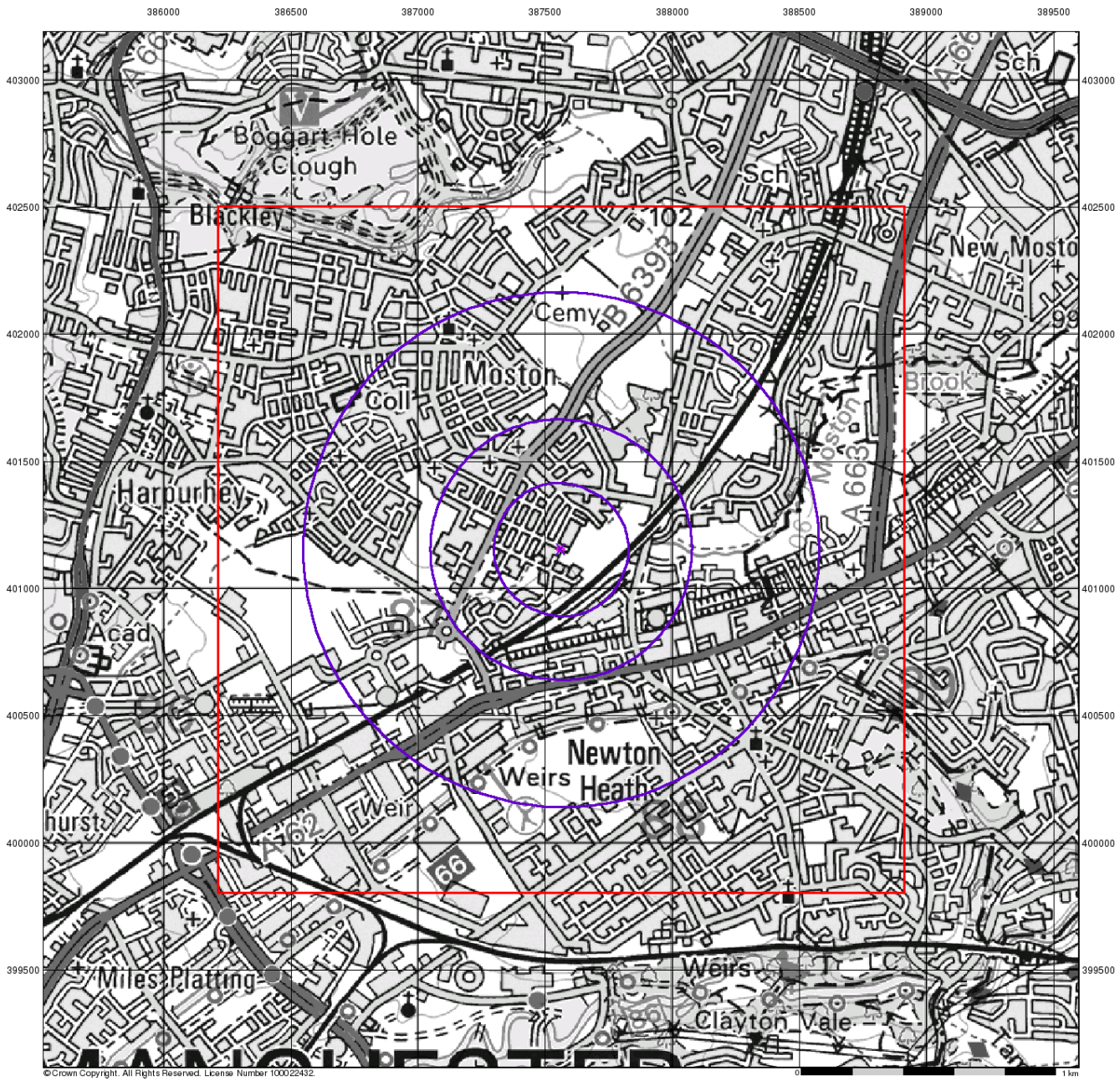
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Source Protection Zones

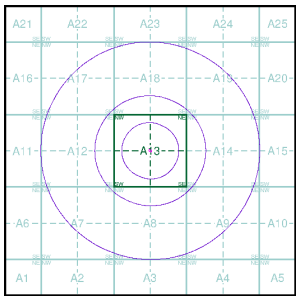
General

Specified Site | Specified Buffer(s) | Bearing Reference Point
Slice | Map ID

Agency and Hydrological

- Inner zone (Zone 1)
- Inner zone - subsurface activity only (Zone 1c)
- Outer zone (Zone 2)
- Outer zone - subsurface activity only (Zone 2c)
- Total catchment (Zone 3)
- Total catchment - subsurface activity only (Zone 3c)
- Special interest (Zone 4)

Site Sensitivity Context Map - Slice A



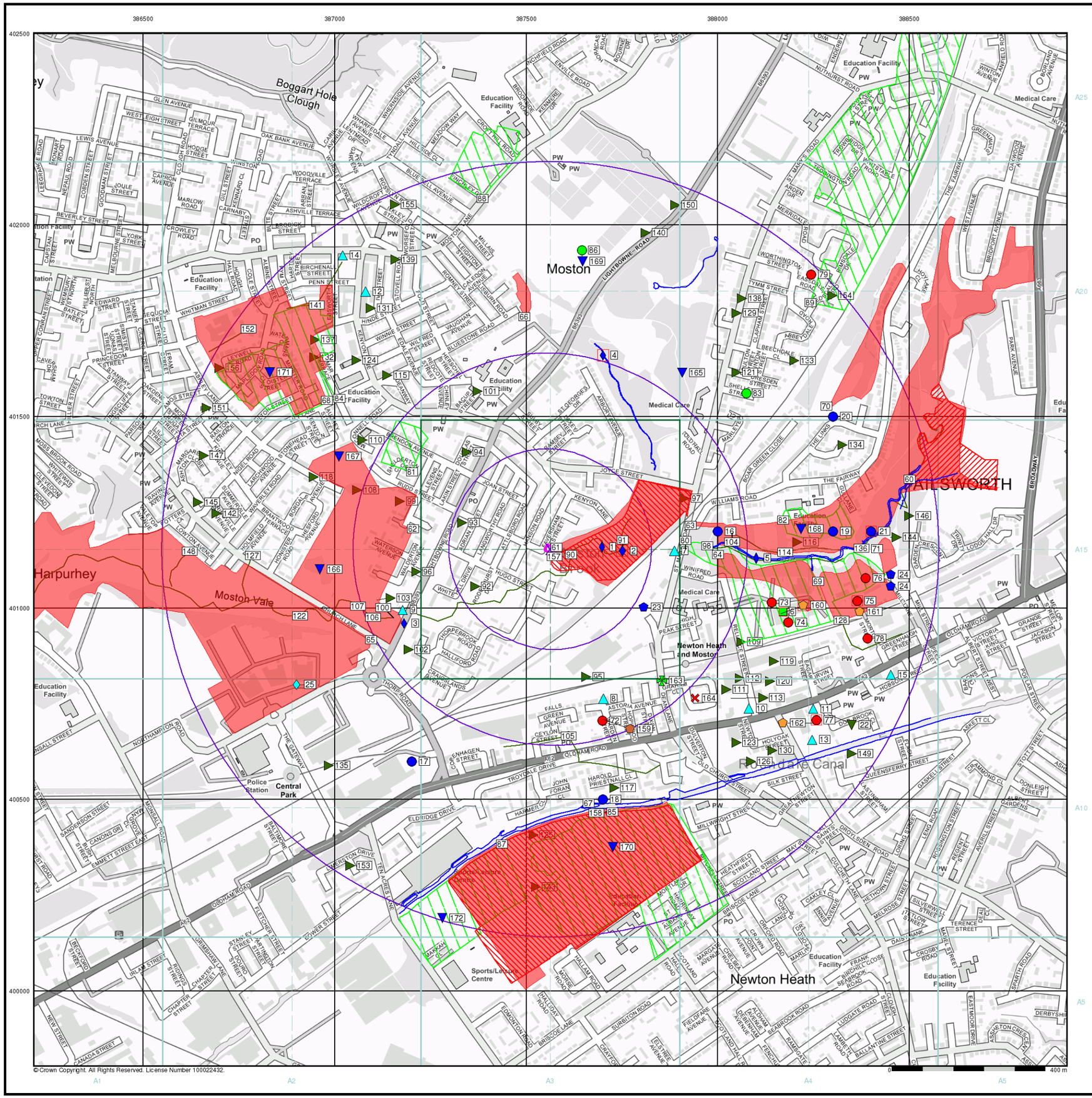
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General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Map ID
- Several of Type at Location

Agency and Hydrological

- Contaminated Land Register Entry or Notice (Location)
- Contaminated Land Register Entry or Notice
- Discharge Consent
- Enforcement or Prohibition Notice
- Integrated Pollution Control
- Integrated Pollution Prevention Control
- Local Authority Integrated Pollution Prevention and Control
- Local Authority Pollution Prevention and Control
- Local Authority Pollution Prevention and Control Enforcement
- Pollution Incident to Controlled Waters
- Prosecution Relating to Authorised Processes
- Prosecution Relating to Controlled Waters
- Registered Radioactive Substance
- River Network or Water Feature
- River Quality Sampling Point
- Substantiated Pollution Incident Register
- Water Abstraction
- Water Industry Act Referral

Hazardous Substances

- COMAH Site
- Explosive Site
- NIHHS Site
- Planning Hazardous Substance Consent
- Planning Hazardous Substance Enforcement

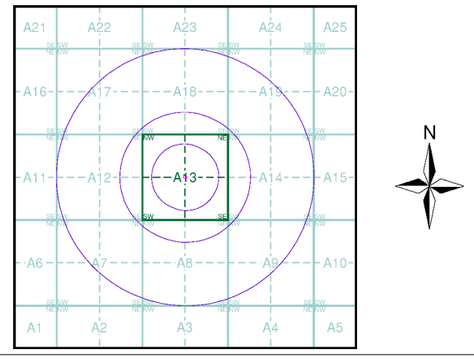
Geological

- BGS Recorded Mineral Site

Waste

- BGS Recorded Landfill Site (Location)
- BGS Recorded Landfill Site
- EA Historic Landfill (Buffered Point)
- EA Historic Landfill (Polygon)
- Integrated Pollution Control Registered Waste Site
- Licensed Waste Management Facility (Landfill Boundary)
- Licensed Waste Management Facility (Location)
- Local Authority Recorded Landfill Site (Location)
- Local Authority Recorded Landfill Site
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Water)
- Potentially Infilled Land (Water)
- Potentially Infilled Land (Water)
- Registered Landfill Site
- Registered Landfill Site (Location)
- Registered Landfill Site (Point Buffered to 100m)
- Registered Landfill Site (Point Buffered to 250m)
- Registered Waste Transfer Site (Location)
- Registered Waste Transfer Site
- Registered Waste Treatment or Disposal Site (Location)
- Registered Waste Treatment or Disposal Site

Site Sensitivity Map - Slice A



Order Details

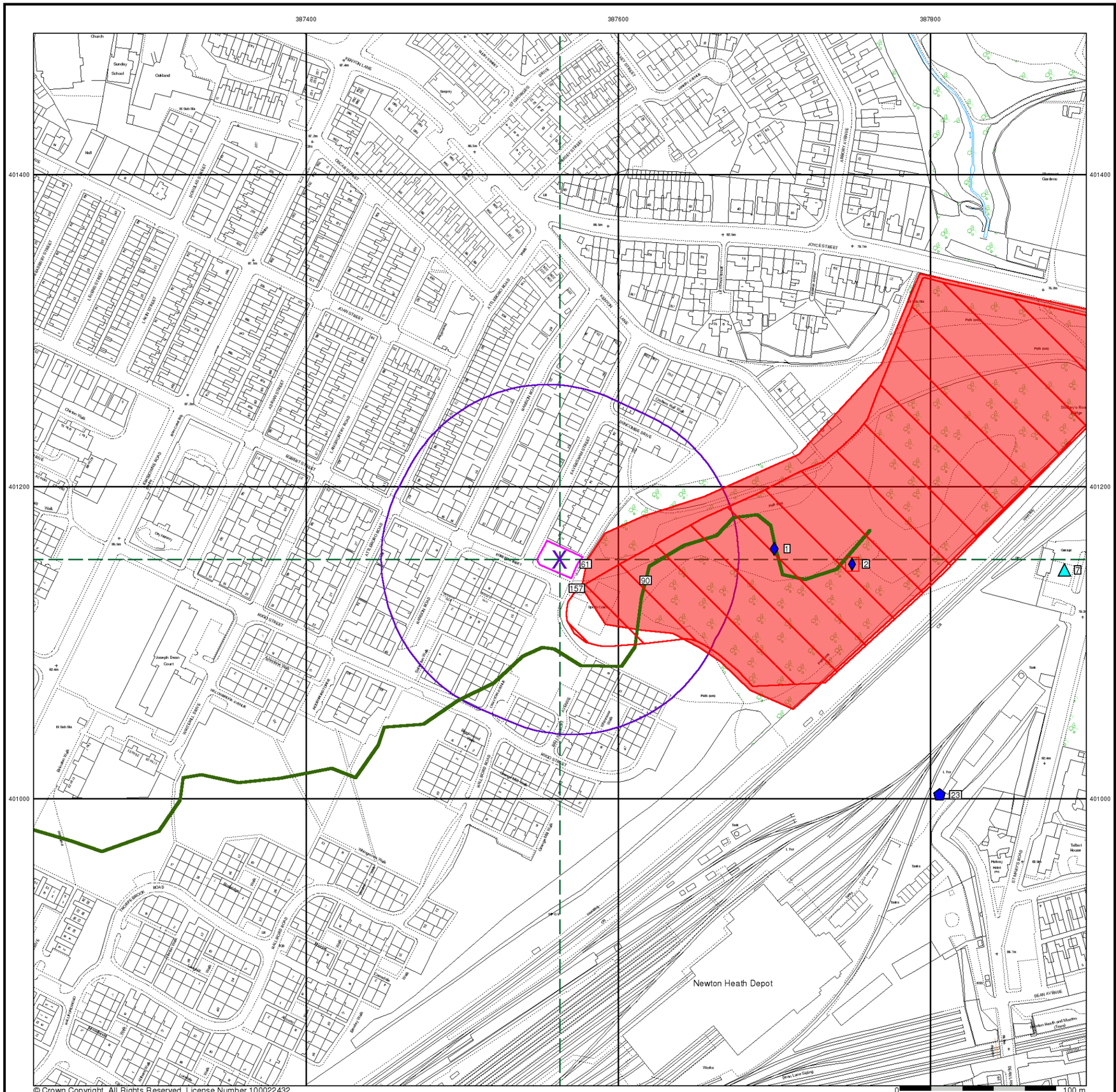
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LANDMARK INFORMATION GROUP®

General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Map ID
- Several of Type at Location
- Pylon
- Overhead Transmission Line

Agency and Hydrological

- Contaminated Land Register Entry or Notice (Location)
- Contaminated Land Register Entry or Notice
- Discharge Consent
- Enforcement or Prohibition Notice
- Integrated Pollution Control
- Integrated Pollution Prevention Control
- Local Authority Integrated Pollution Prevention and Control
- Local Authority Pollution Prevention and Control
- Local Authority Pollution Prevention and Control Enforcement
- Pollution Incident to Controlled Waters
- Prosecution Relating to Authorised Processes
- Prosecution Relating to Controlled Waters
- Registered Radioactive Substance
- River Network or Water Feature
- River Quality Sampling Point
- Substantiated Pollution Incident Register
- Water Abstraction
- Water Industry Act Referral

Hazardous Substances

- COMAH Site
- Explosive Site
- NIHHS Site
- Planning Hazardous Substance Consent
- Planning Hazardous Substance Enforcement

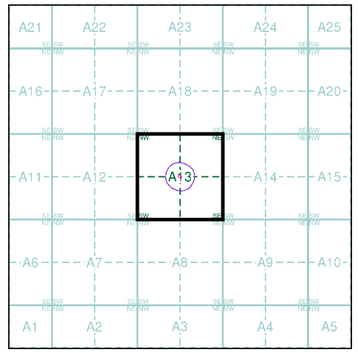
Geological

- BGS Recorded Mineral Site

Waste

- BGS Recorded Landfill Site (Location)
- BGS Recorded Landfill Site
- EA Historic Landfill (Buffered Point)
- EA Historic Landfill (Polygon)
- Integrated Pollution Control Registered Waste Site
- Licensed Waste Management Facility (Landfill Boundary)
- Licensed Waste Management Facility (Location)
- Local Authority Recorded Landfill Site (Location)
- Local Authority Recorded Landfill Site
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Water)
- Potentially Infilled Land (Water)
- Potentially Infilled Land (Water)
- Registered Landfill Site
- Registered Landfill Site (Location)
- Registered Landfill Site (Point Buffered to 100m)
- Registered Landfill Site (Point Buffered to 250m)
- Registered Waste Transfer Site (Location)
- Registered Waste Transfer Site
- Registered Waste Treatment or Disposal Site (Location)
- Registered Waste Treatment or Disposal Site

Site Sensitivity Map - Segment A13



Order Details

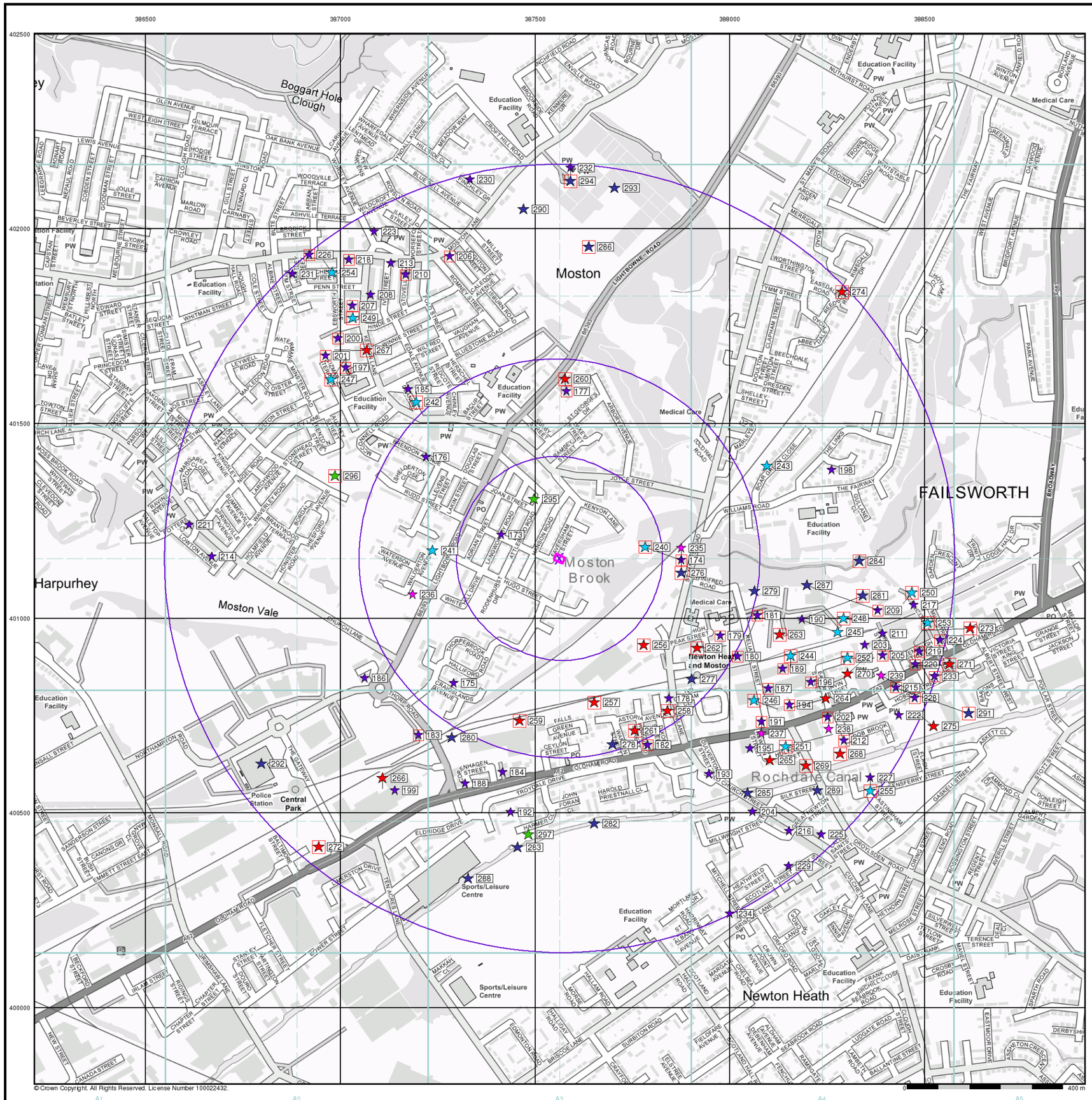
Order Number:	273931122_1_1
Customer Ref:	EBMA2711
National Grid Reference:	387560, 401150
Slice:	A
Site Area (Ha):	0.04
Plot Buffer (m):	100

Site Details

Site located at 387560,401150, M40 5NW

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Industrial Land Use Map

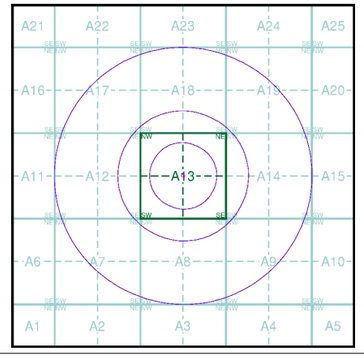
General

Specified Site
Specified Buffer(s)
Bearing Reference Point
Slice
Map ID

Industrial Land Use

- Contemporary Trade Directory Entry
- Fuel Station Entry
- Gas Pipeline
- Points of Interest - Commercial Services
- Points of Interest - Education and Health
- Points of Interest - Manufacturing and Production
- Points of Interest - Public Infrastructure
- Points of Interest - Recreational and Environmental
- Underground Electrical Cables

Industrial Land Use Map - Slice A



Order Details

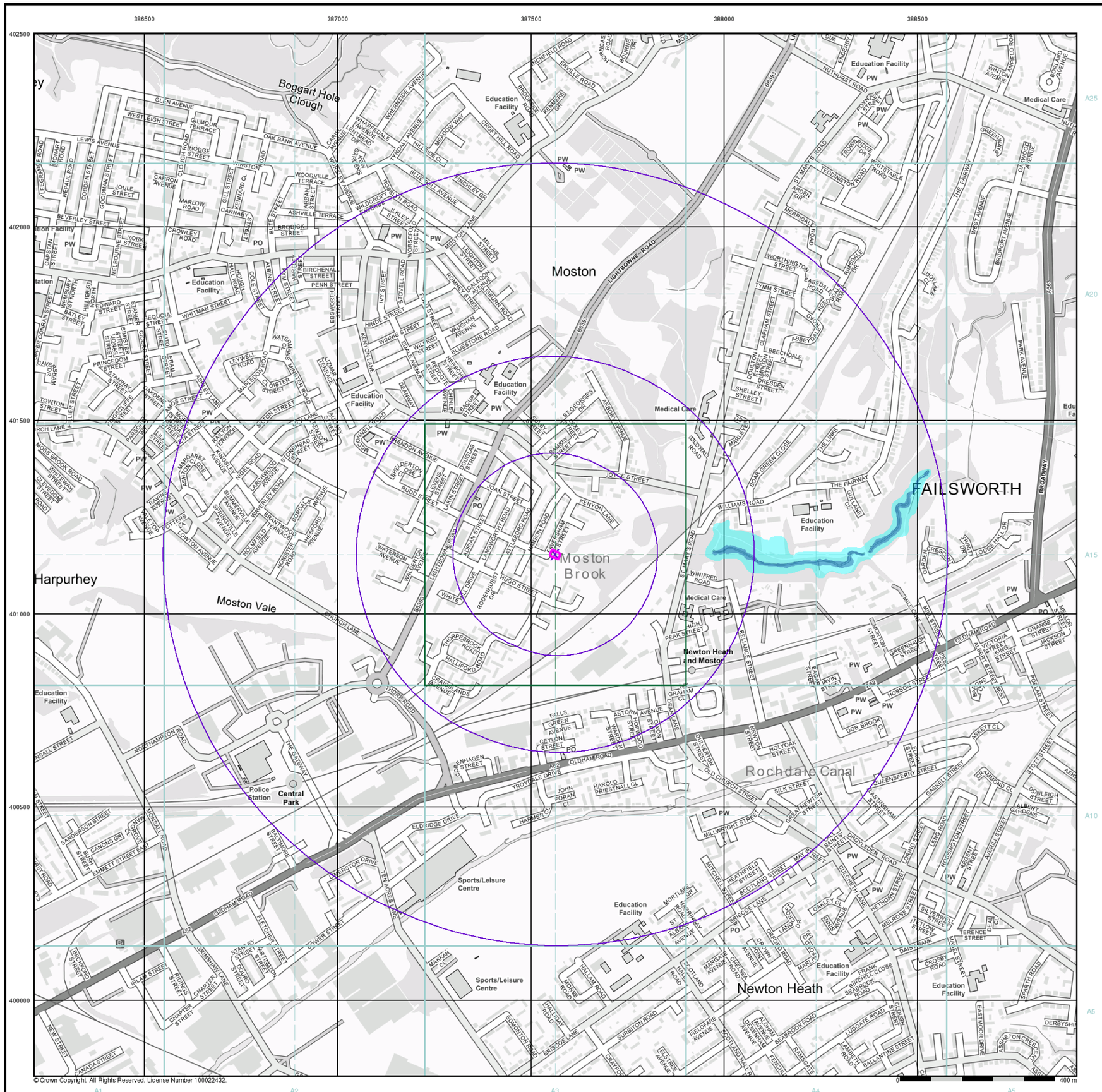
Order Number:	273931122_1_1
Customer Ref:	EBMA2711
National Grid Reference:	387560, 401150
Slice:	A
Site Area (Ha):	0.04
Search Buffer (m):	1000

Site Details

Site located at 387560,401150, M40 5NW

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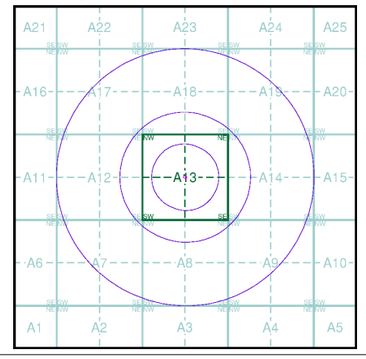
General

- Specified Site
- Specified Buffer(s)
- X Bearing Reference Point

Agency and Hydrological (Flood)

- Extreme Flooding from Rivers or Sea without Defences (Zone 2)
- Flooding from Rivers or Sea without Defences (Zone 3)
- Area Benefiting from Flood Defence
- Flood Water Storage Areas
- Flood Defence

Flood Map - Slice A



Order Details

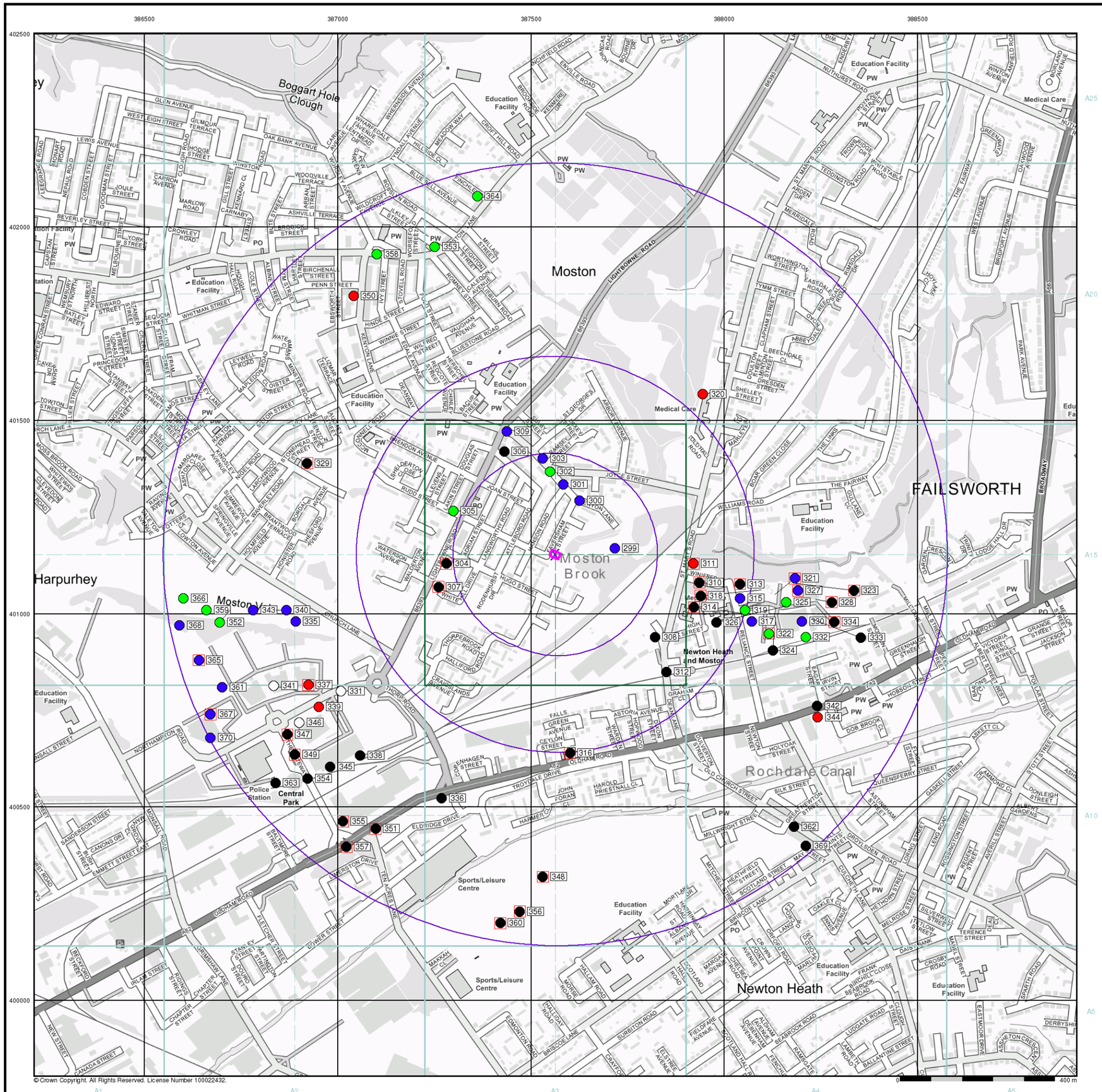
Order Number:	273931122_1_1
Customer Ref:	EBMA2711
National Grid Reference:	387560, 401150
Slice:	A
Site Area (Ha):	0.04
Search Buffer (m):	1000

Site Details

Site located at 387560,401150, M40 5NW

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0 400 m

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General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Map ID
- Several of Type at Location

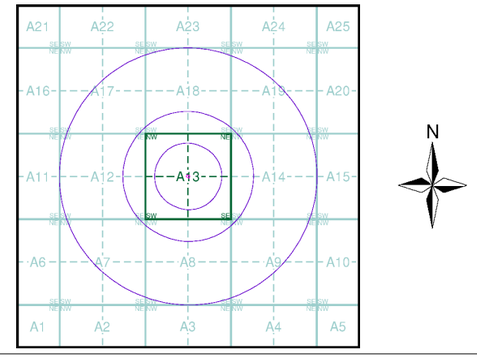
Agency and Hydrological (Boreholes)

- BGS Borehole Depth 0 - 10m
- BGS Borehole Depth 10 - 30m
- BGS Borehole Depth 30m +
- Confidential
- Other

For Borehole information please refer to the Borehole .csv file which accompanied this slice.

A copy of the BGS Borehole Ordering Form is available to download from the Support section of www.envirocheck.co.uk.

Borehole Map - Slice A



Order Details

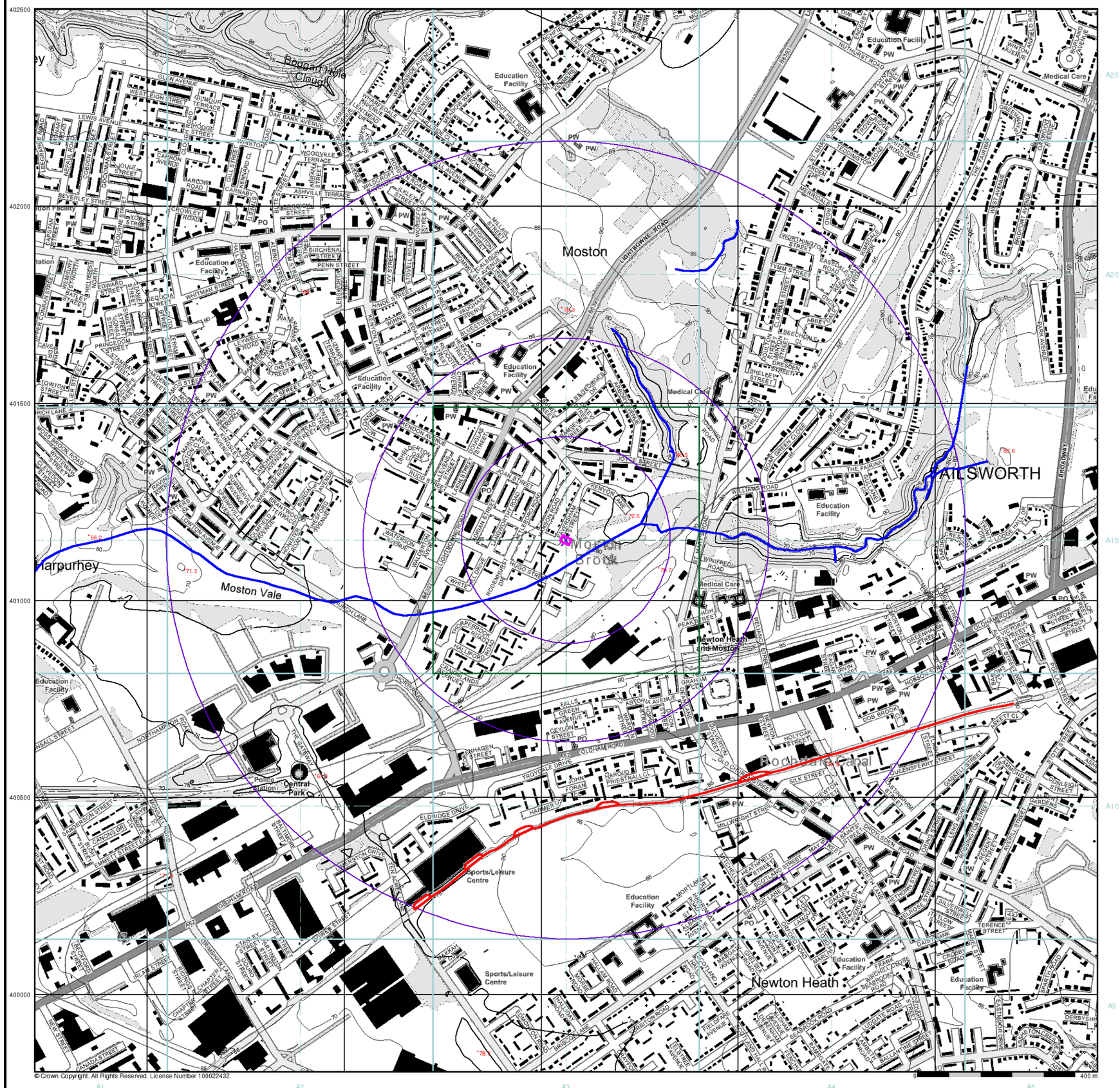
Order Number:	273931122_1_1
Customer Ref:	EBMA2711
National Grid Reference:	387560, 401150
Slice:	A
Site Area (Ha):	0.04
Search Buffer (m):	1000

Site Details

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General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point

OS Water Network Data

- Canal
- Reservoir
- Foreshore
- Marsh
- Tidal River
- Inland River
- Drain
- Other
- Lake
- Transfer
- Lock Or Flight Of Locks
- Sea

Contours (height in meters)

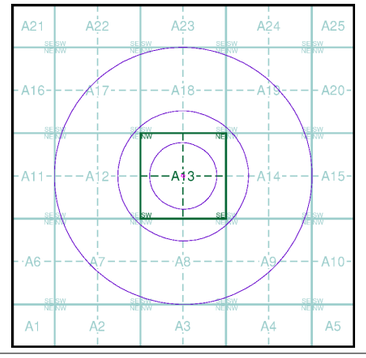
Standard Contour 105 100 95

Master Contour

Spot Height 167.3

- MLW Mean Low Water
- MHW Mean High Water

OS Water Network Map - Slice A



Order Details

Order Number:	273931122_1_1
Customer Ref:	EBMA2711
National Grid Reference:	387560, 401150
Slice:	A
Site Area (Ha):	0.04
Search Buffer (m):	1000

Site Details

Site located at 387560,401150, M40 5NW

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General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point

Risk of Flooding from Surface Water

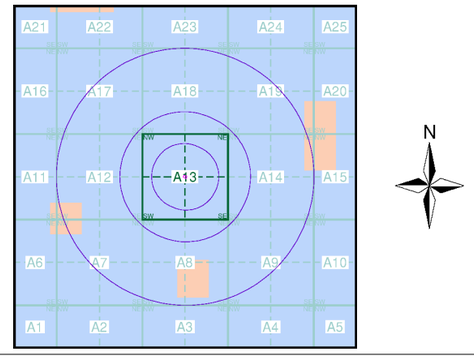
- High - 30 Year Return
- Medium - 100 Year Return
- Low - 1000 Year Return

Suitability

See the suitability map below

- National to county
- County to town
- Town to street
- Street to parcels of land
- Property

EA/NRW Suitability Map - Slice A



Order Details

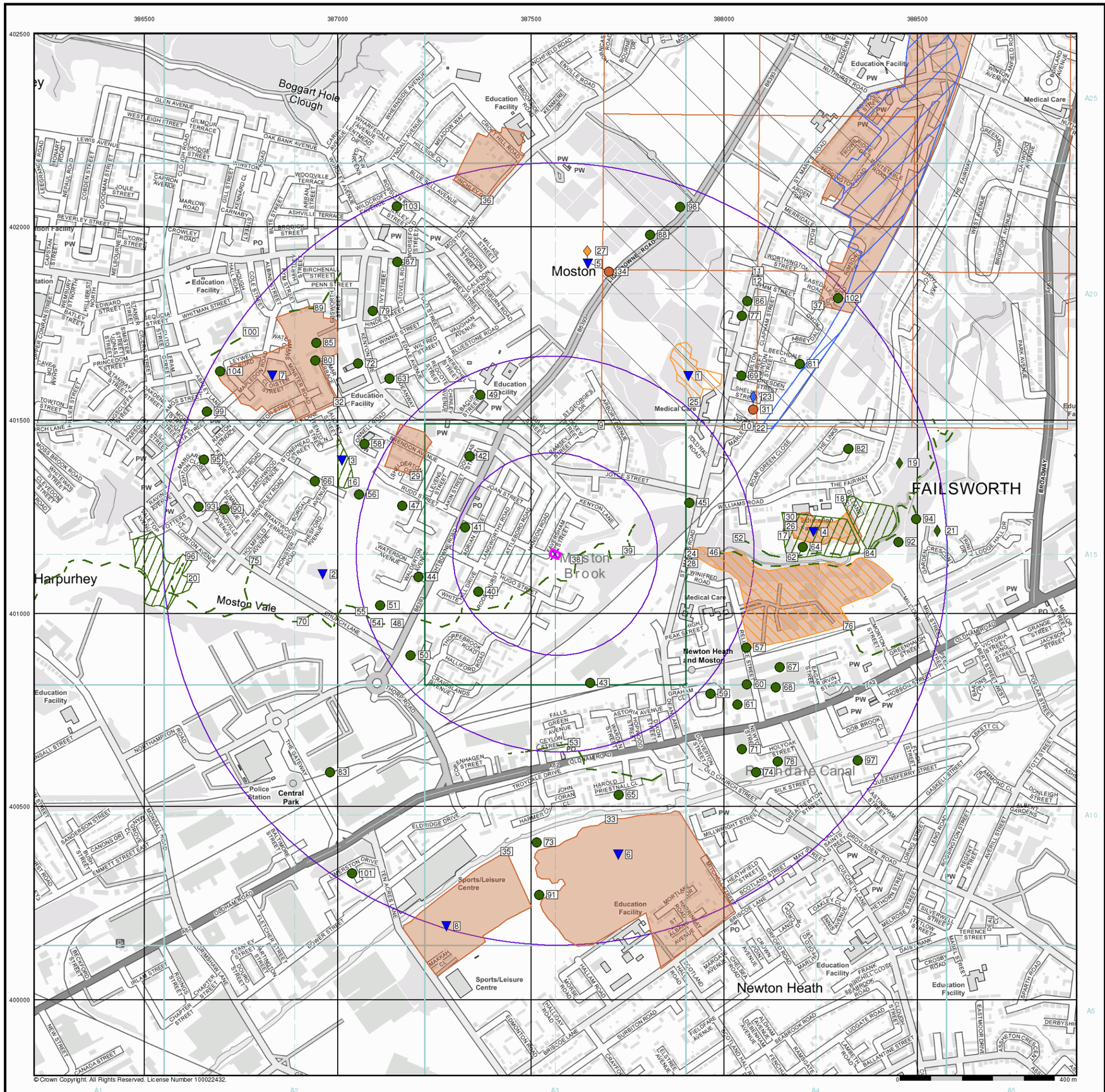
Order Number:	273931122_1_1
Customer Ref:	EBMA2711
National Grid Reference:	387560, 401150
Slice:	A
Site Area (Ha):	0.04
Search Buffer (m):	1000

Site Details

Site located at 387560,401150, M40 5NW

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Historical Land Use Information (1:10,000)

General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Map ID

Several of Type at Location

Potentially Contaminative Industrial Uses (Past Land Uses - Mining)

	Point	Line	Polygon
Air Shafts	◆		
Disturbed Ground	◆		
General Quarrying	◆		
Heap, unknown constituents	◆		
Mineral Railway	◆		
Mining and Quarrying General	◆		
Mining of Coal & Lignite	◆		
Quarrying of Sand and Clay, Operation of Sand and Gravel Pits	◆		

Historical Land Use

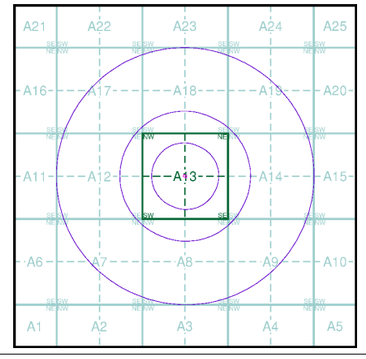
	Point	Line	Polygon
Potentially Infilled Land (Non-Water)	●		
Potentially Infilled Land (Water)	●		
Former Marsh	✠		

Mining Data

Potential Mining Area

BGS Recorded Mineral Site

Mining and Ground Stability - Slice A



Order Details

Order Number:	273931122_1_1
Customer Ref:	EBMA2711
National Grid Reference:	387560, 401150
Slice:	A
Site Area (Ha):	0.04
Search Buffer (m):	1000

Site Details

Site located at 387560,401150, M40 5NW

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Historical Mapping Legends

Ordnance Survey County Series 1:10,560

Gravel Pit
Sand Pit
Other Pits
Quarry
Shingle
Orchard
Osiers
Reeds
Marsh
Mixed Wood
Deciduous
Brushwood
Fir
Furze
Rough Pasture
Arrow denotes flow of water
Trigonometrical Station
Site of Antiquities
Bench Mark
Pump, Guide Post, Signal Post
Well, Spring, Boundary Post
·285 Surface Level
Sketched Contour
Instrumental Contour
Main Roads
Fenced
Un-Fenced
Minor Roads
Fenced
Un-Fenced
Sunken Road
Raised Road
Road over Railway
Railway over River
Railway over Road
Level Crossing
Road over River or Canal
Road over Stream
Road over Stream
County Boundary (Geographical)
County & Civil Parish Boundary
Administrative County & Civil Parish Boundary
Co. Boro. Bdy. County Borough Boundary (England)
Co. Burgh Bdy. County Burgh Boundary (Scotland)
R.D. Bdy. Rural District Boundary
Civil Parish Boundary

Ordnance Survey Plan 1:10,000

Chalk Pit, Clay Pit or Quarry
Gravel Pit
Sand Pit
Disused Pit or Quarry
Refuse or Slag Heap
Lake, Loch or Pond
Dunes
Boulders
Coniferous Trees
Non-Coniferous Trees
Orchard
Scrub
Coppice
Bracken
Heath
Rough Grassland
Marsh
Reeds
Saltings
Building
Direction of Flow of Water
Shingle
Sand
Glasshouse
Pylon
Electricity Transmission Line
Pole
Sloping Masonry
Cutting
Embankment
Standard Gauge Multiple Track
Road Under
Road Over
Level Crossing
Foot Bridge
Standard Gauge Single Track
Siding, Tramway or Mineral Line
Narrow Gauge
Geographical County
Administrative County, County Borough or County of City
Municipal Borough, Urban or Rural District, Burgh or District Council
Borough, Burgh or County Constituency
Shown only when not coincident with other boundaries
Civil Parish
Shown alternately when coincidence of boundaries occurs

BP, BS	Boundary Post or Stone	Pol Sta	Police Station
Ch	Church	PO	Post Office
CH	Club House	PC	Public Convenience
F E Sta	Fire Engine Station	PH	Public House
FB	Foot Bridge	SB	Signal Box
Fn	Fountain	Spr	Spring
GP	Guide Post	TCB	Telephone Call Box
MP	Mile Post	TCP	Telephone Call Post
MS	Mile Stone	W	Well

1:10,000 Raster Mapping

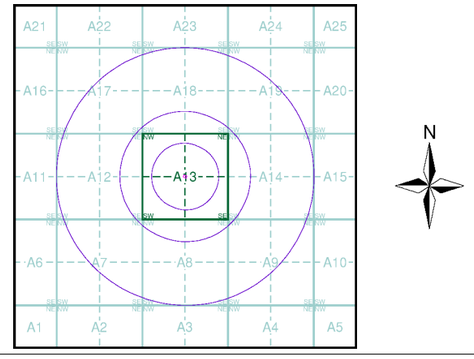
Gravel Pit
Refuse tip or slag heap
Rock
Rock (scattered)
Boulders
Boulders (scattered)
Shingle
Mud
Sand
Sand Pit
Slopes
Top of cliff
General detail
Underground detail
Overhead detail
Narrow gauge railway
Multi-track railway
Single track railway
County boundary (England only)
Civil, parish or community boundary
District, Unitary, Metropolitan, London Borough boundary
Constituency boundary
Area of wooded vegetation
Non-coniferous trees
Non-coniferous trees (scattered)
Coniferous trees
Coniferous trees (scattered)
Positioned tree
Orchard
Coppice or Osiers
Rough Grassland
Heath
Scrub
Marsh, Salt Marsh or Reeds
Water feature
Flow arrows
MHW(S) Mean high water (springs)
MLW(S) Mean low water (springs)
Telephone line (where shown)
Electricity transmission line (with poles)
BM 123.45 m Bench mark (where shown)
Triangulation station
Point feature (e.g. Guide Post or Mile Stone)
Pylon, flare stack or lighting tower
Site of (antiquity)
Glasshouse
General Building
Important Building

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Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Lancashire And Furness	1:10,560	1848	3
Cheshire	1:10,560	1882	4
Lancashire And Furness	1:10,560	1894	5
Lancashire And Furness	1:10,560	1909 - 1910	6
Lancashire And Furness	1:10,560	1923	7
Lancashire And Furness	1:10,560	1932 - 1933	8
Lancashire And Furness	1:10,560	1938	9
Ordnance Survey Plan	1:10,000	1956	10
Ordnance Survey Plan	1:10,000	1966 - 1968	11
Manchester	1:25,000	1975	12
Ordnance Survey Plan	1:10,000	1978	13
Ordnance Survey Plan	1:10,000	1981 - 1982	14
Ordnance Survey Plan	1:10,000	1987	15
Ordnance Survey Plan	1:10,000	1990 - 1993	16
10K Raster Mapping	1:10,000	1999	17
10K Raster Mapping	1:10,000	2006	18
VectorMap Local	1:10,000	2020	19

Historical Map - Slice A



Order Details

Order Number: 273931122_1_1
Customer Ref: EBMA2711
National Grid Reference: 387560, 401150
Slice: A
Site Area (Ha): 0.04
Search Buffer (m): 1000

Site Details

Site located at 387560,401150, M40 5NW

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Russian Military Mapping Legends

1:5,000 and 1:10,000 mapping

a. Not drawn to scale b. Drawn to scale

- Government and Administrative Buildings
- Military and Industrial Buildings
- Military and Communication Areas
- Subway Entrance
- Fireproof Building
- Prominent Fireproof Building
- Non-fireproof Building
- Non-fireproof Building (non-dwelling)
- Factory, mill, and flour mill, with chimneys
- Factory, mill, and flour mill, without chimneys
- Power Station, drawn to scale
- Hydroelectric Power Station
- Radio Station, drawn to scale
- Telephone Station, drawn to scale
- Abandoned Open-pit Mine or Quarry
- Open-pit Salt Mine
- Pit
- Oil Deposit or Well
- Oil Seepage
- Tailings Pile
- Fuel Storage Tanks
- Natural Gas Tank
- Bench Mark
- Drill Hole
- Burial Mound
- Triangulation Point on Burial Mound
- Single-track Railroad
- Double-track Railroad and Station Building
- Coniferous Forest
- Deciduous Forest
- Mixed Forest
- Lawns
- Citrus Orchard
- Wet Ground
- Scattered Vegetation

243,8 — Values for prominent elevations

186.0 — Numbers for spot elevations, depth soundings, contour lines, etc.

0,2 — Velocity of the current, width of river bed, depth of river

Fractional terms: length and capacity of bridges; depth of fords and condition of the river bottom; height of forest and the diameter of trees

Russian Alphabet (For reference and phonetic interpretation of map text)

А а (A)	З з (Z)	П п (P)	Ч ч (CH)
Б б (B)	И и (I)	Р р (R)	Ш ш (SH)
В в (V)	Й й (Y)	С с (S)	Щ щ (SHCH)
Г г (G)	К к (K)	Т т (T)	ъ (–)
Д д (D)	Л л (L)	У у (U)	ы (Y)
Е е (E)	М м (M)	Ф ф (F)	ь (')
Ё ё (YO)	Н н (N)	Х х (KH)	Э э (E)
Ж ж (ZH)	О о (O)	Ц ц (TS)	Ю ю (YU or IU)
			Я я (YA or IA)

1:25,000 mapping

a. Not drawn to scale b. Drawn to scale

- Government and Administrative Buildings
- Military and Industrial Buildings
- Military and Communication Areas
- Subway Entrance
- Partly Demolished Buildings
- Demolished Buildings
- Built-Up Area with Fireproof Buildings Predominant
- Built-Up Area with Non-Fireproof Buildings Predominant
- Individual Fireproof Building
- Prominent Industrial Building
- Individual Dwelling, Fireproof
- Ruins of an Individual Dwelling
- Factory or Mill Chimney
- Factory or Mill with Chimney
- Factory or Mill without Chimney
- Mine or Open Pit Mine
- Operating Shaft or Mine
- Non-Operating Shaft or Mine
- Salt Mine
- Tailings Pile
- Pit
- Stone Quarry
- Gas Pump or Service Station
- Fuel Storage or Natural Gas Tank
- Oil or Natural Gas Derrick
- Small Hydroelectric Power Station
- Power Station
- Transformer Station
- Cemetery
- Burial Mound (height in metres)
- Triangulation Point on Burial Mound
- Triangulation Point
- Bench Mark
- Bench Mark (monumented)
- Telegraph Office
- Telephone Station
- Radio Station
- Radio Tower
- Airfield or Seaplane Base
- Landing Strip
- Main Highway
- Highway under Construction
- Improved Dirt Road (former truck road)
- Double-track Railroad with First Class Station
- Dismantled Railroad
- Railroad Under Construction
- Shore Embankment
- River or Ditch with Embankment
- Well
- Water Reservoir or Rain Water Pit
- Spring
- Isobath with value
- Heavy (Index) Contour Line
- Contour Line and Value
- Half Contour Line
- Spot Elevation Value
- Coniferous
- Deciduous
- Mixed
- Scrub

Key to Numbers on Mapping

SD80_Manchester

No.	Description
24	Depot (Railway)
75	Factory (Locomotives And Railway Carriage Repairs)
111	Factory (Radio Electronics)
233	Factory (Textiles)

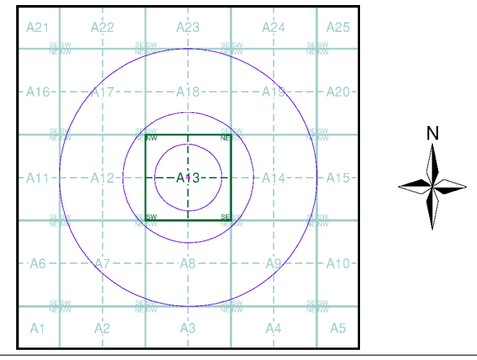
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Ordnance Survey Plan	1:10,000	1981 - 1982	14
Ordnance Survey Plan	1:10,000	1987	15
Ordnance Survey Plan	1:10,000	1990 - 1993	16
10K Raster Mapping	1:10,000	1999	17
10K Raster Mapping	1:10,000	2006	18
VectorMap Local	1:10,000	2020	19

Russian Map - Slice A



Order Details

Order Number: 273931122_1_1
Customer Ref: EBMA2711
National Grid Reference: 387560, 401150
Slice: A
Site Area (Ha): 0.04
Search Buffer (m): 1000

Site Details

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