



GEO-ENVIRONMENTAL AUDIT

PHASE 1 PRELIMINARY RISK ASSESSMENT

PHASE 2 SITE INVESTIGATIONS

PHASE 3 REMEDIATION STATEMENT

PROPOSED RESIDENTIAL DEVELOPMENT
LAND AT 26 FALCON CLOSE
NORDEN
ROCHDALE
OL12 7RY

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Client: Fairway Building & Remedial Contractors Ltd
Reference: rep-tjba-fairway-26 falcon cl-Phs1_2_3Env-200125.docx

Revision	Date	Reason
0	Jan 2025	Original to address planning condition.

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1. PHASE 1 - PRELIMINARY RISK ASSESSMENT.

1.1. Introduction.

T. J. Booth Associates have been appointed by Fairway Building & Remedial Contractors Ltd to undertake a Phase 1 Preliminary Risk Assessment (PRA), Phase 2 Site Investigations, and to provide a Phase 3 Remediation Statement, to address a planning condition prior to development.

The Site has until recently existed as part of the garden area to No.26 Falcon Close.

Planning was obtained in December 2024 under reference number 24/00759/FUL, for the 'Erection of 2 detached dwellings following demolition of existing garage, including alterations to site access and associated boundary treatments'.

Condition No.4 of the planning permission related to environmental assessment of the site as follows:

- 4 Notwithstanding any information submitted with the application, no development (except demolition of the garage hereby approved), shall take place until an investigation has been submitted to and approved in writing by the Local Planning Authority. The assessment shall investigate the nature and extent of any contamination on the site (whether or not it originates on the site). The assessment shall be undertaken by competent persons and a written report of the findings submitted to and approved in writing by the Local Planning Authority before any development takes place. The submitted report shall comprise:
- ii) where potential risks are identified by the Preliminary Risk Assessment, a site investigation survey of the extent, scale and nature of contamination and;
 - ii) an assessment of the potential risks to:
 - o human health,
 - o property (existing or proposed) including buildings, crops, livestock, pets, woodland, and service lines and pipes,
 - o adjoining land,
 - o groundwaters and surface waters,
 - o ecological systems,
 - o archeological sites and ancient monuments;
 - iii) where unacceptable risks are identified, an appraisal of remedial options and proposal of the preferred option(s) to form a remediation strategy for the site.

The development shall thereafter be carried out in full accordance with the duly approved remediation strategy.

This report provides a desk-based study & intrusive ground investigation based on current UK guidance for environmental investigation within the construction industry. Principal to the assessment is the potential for contamination pollutant linkages via the Land Contamination Risk Management (LCRM) source-pathway-receptor methodology. Assessment of potential pollution linkages is primarily undertaken in strict accordance with BS 5930:2015, BS 10175:2011+A2:2017, CIRIA C665, and BS 8485:2015+A1:2019 et al.

1.2. Proposed Development.

The proposal is for the development of 2No. detached two storey dwellings.

Each property will have a small garden and driveway to the front, and garden/lawns to the rear.

The properties will be accessed via Woodhouse Lane.

1.3. Historic Maps.

DATE	ON-SITE	OFF-SITE/SURROUNDING AREA
c1851	Building nominally central to the Site, possibly a barn.	Woodhouse lane to the north, Woodhouse Lane Brook c25m west. Site primarily surrounded by agricultural land with the closest development comprising farm/associated buildings approximately 50m northwest. Shepherd & Woodhouse Mills (bleaching) with associated ponds and tenter's fields, as well as quarries care located 250m southwest – all on the opposite side of Woodhouse Lane Brook.

c1893	Building still shown, with an additional smaller building to the south east site corner. Track noted nominally through the site centre to the farm to the northwest.	Quarries no longer shown. Tenters fields within 100m of the development. Shepherds Mill disused.
c1910	Smaller building now removed.	Filter tanks noted as part of the mill complex nominally 150m southwest.
c1929	Additional smaller building to the south east site corner shown on map again.	Woodhouse Mills Oil Works noted approximately 100m southwest.
c1938	No change.	No overall change.
c1961-63	No overall change.	No overall change. Woodhouse Mills Oil Works now demolished/not shown on maps.
c1965	Not on map.	Residential housing estates built to the southeast within 150m of the Application Site.
c1979	Site is part of garden area to No.26 Falcon Close.	Residential housing estate now surrounding the Site.
1990	No change.	Wider area much as in the present day.

1.4. Present Day Maps.

Site boundaries, outlines of structures and buildings:	Present day maps show an open plot of land recently used as the garden area to No.26. The Application Site generally comprises a lawn garden area with vegetation/trees to the perimeter, surrounded by a stone boundary wall, and existing access driveway from Woodhouse Lane.
Ground contours, natural drainage features:	Topographic survey indicates there is a fall of approximately 1m north to south. Overall topography falls to the south.
Water courses:	Woodhouse Lane Brook is located 25m west, flowing south.
Below ground obstructions:	None noted on current maps/plans.

1.5. Geology.

Bedrock geology:	Rough Rock Sandstone. Sedimentary bedrock formed between 320 and 319 million years ago during the Carboniferous period.
Superficial geology:	Till, Devensian - Diamicton. Sedimentary superficial deposit formed between 116 and 11.8 thousand years ago during the Quaternary period.
Coal seams:	No known coal seams underlie the Application Site at shallow depth.
Radon Maps:	Updated current radon maps indicate the maximum radon potential to be 3-5% based upon the worst case in a 1km grid square.

1.6. Boreholes Records.

No relevant boreholes in close proximity to the site boundaries.

1.7. Planning Data.

No past planning applications were noted that are pertinent to the environmental assessment.

1.8. Landmark Environmental Data.

1.8.1. Agency & Hydrological.

Discharge consents:	5 noted within a 250m radius. None noted within a 250m Site radius, generally all relating to WWTW and private sewage discharges to watercourse not related to the Application Site..
Substantiated pollution incident register:	1 noted within a 250m radius, and related to an incident in 2010 238m southwest.
Water abstractions:	4 No. records noted within a 250-500m radius. All related to works on or around Naden Brook to the west over 350m distant.
Bedrock aquifer:	Secondary Aquifer – A. Secondary A aquifers comprise permeable layers that can support local water supplies, and may form an important source of base flow to rivers.
Superficial aquifer:	Secondary Aquifer – Undifferentiated.
Source protection zone:	Not within a Source Protection Zone.

1.8.2. Waste.

BGS recorded landfill sites:	None noted within a 250m radius.
Historic landfill sites:	1 record noted 187m southwest relating to Tack Lea Works comprising inert & industrial wastes between 1987-1991. Refs: D030, RD/LIC/460/87.
Registered landfill sites:	1 record noted 214m southwest relating to Tack Lea Works comprising inert & industrial wastes from June 1987. Authorised wastes were as follows: ceramic materials, construction ind. wastes, glass, metals, similar, non-leachate forming materials, soil, clay, sand, stone, brick, concrete, & slate. Refs: 00460/87/M1.

1.8.3. Hazardous Substances.

Planning hazardous substance consents:	No records within a 250m radius of the Site.
Planning hazardous substance enforcements:	No records within a 250m radius of the Site.

1.8.4. Geological.

Coal mining affected areas:	Site is within a coal mining area.
CBSCB compensation district:	Not within the CBSCB brine district.
Potential for collapsible ground stability hazards:	Very low risk.
Potential for compressible ground stability hazards:	No hazard.
Potential for ground dissolution stability hazards:	No hazard.
Potential for landslide ground stability hazards:	Very low risk.
Potential for running sand ground stability hazards:	No hazard to very low risk.
Potential for shrinking or swelling clay ground stability hazards:	No hazard to very low risk.
Radon potential - radon affected areas:	The property is in an Intermediate probability radon area (1 to 3% of homes are estimated to be at or above the Action Level).

	The level of accuracy is based upon a much more refined grid square analysis than BGS free mapping, giving Site specific risk analysis.
Radon potential - radon protection measures:	No radon protection measures are required.

1.9. Environment Agency Data.

Flood Zone:	Site is in flood zone 1.
Drinking Water Protected Area (Surface Water):	Not in area.
Drinking Water Safeguard Zone (Surface Water):	Not in area.
Drinking Water Safeguard Zone (Groundwater):	Not in area.
Source Protection Zone:	Not in area.

1.10. Coal Authority.

Mine Shafts, Pits, Adits/Entries:	No coal entries within 20m of the site boundaries. Closest is a coal adit nominally 220m north.
Past Recorded Underground Mining.	No recorded workings noted beneath the Site.
Present/Future Underground Mining.	Not known to be a risk.
Unrecorded Probable/Potential Shallow Underground Workings:	No probable coal workings locally.
Past/Present/Future Surface Mining/Opencast:	None noted locally.
Mining Geology and Subsidence:	Not noted.
Hazards and Mine Gas:	Unknown.
Development High Risk Area:	The Site is NOT within a Development High Risk Area.
Abandonment Plan Data:	No data available.

1.11. Industry Profiles.

N/A.

1.12. Site Reconnaissance (July 2024).

Details of existing structures:	The Application Site was accessed from Falcon Close and comprised a residential garden area. No work had yet started on Site, which was as per the existing topographic survey in the Appendix. It generally comprised a garden/lawn & shrubbery to the majority of the Site, and some general hardstanding to the west side (garage, driveway and patio). There was a small ornamental pond to the southwest adjacent the patio area. There was no visual or olfactory evidence of contamination, nor any storage of chemicals etc noted.
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	Around the north of the lawn some trees, presumably conifers had been felled.
Adjacent properties:	The Site is surrounded by residential properties.
Water levels, directions of flow and rates in rivers:	Woodhouse Lane Brook was noted to the west, approximately 25m away from the red line boundary.
Old mine or quarry workings:	None noted.
Obvious/immediate hazards to health/safety:	None noted.
Areas of discoloured soil, polluted water, vegetation, and significant odours:	None noted.

1.13. Identification of Source-Pathway-Receptor.

1.13.1. Potential Contaminant Sources.

CURRENT SOURCE/S	ORIGINAL ASSOCIATED SOURCE	CONTAMINANT/S
Existing Site soil, minor areas of made ground.	Demolition of historic dwellings, and associated minor made ground.	Metals, PAHs, sulphates, asbestos.

1.13.2. Potential Pathways.

The potential pathways to/from the Development Site include (not an exhaustive list but a summary of the main points):

PATHWAY	MEDIA
Soil and dust ingestion	Soil and indoor dust
Consumption of home-grown fruit and vegetables	Produce
Skin contact (indoors)	Indoor dust
Skin contact (outdoors)	Soil
Inhalation of dust (indoors)	Air
Inhalation of dust (outdoors)	Air
Vapours (indoors)	Air
Vapours (outdoors)	Air

1.13.3. Potential Receptors.

Construction phase workforce.

Residents as the proposed end users.

Controlled waters: river & aquifers.

1.14. Preliminary Conceptual Model.

POLLUTANT RISK IDENTIFIER	SOURCE	CONTAMINANT TYPE	PATHWAY	RECEPTOR	POLLUTION LINKAGE	CONSEQUENCE	PROBABILITY	RISK
PL1	General contaminants in upper site soil/made ground, and effects on humans/animals /ecology as a receptor.	Metals, PAHs, inorganics, organics, asbestos.	Direct ingestion, aerial ingestion, dermal contact, drinking water. Crops.	Primarily human - Site construction operatives & future residential Site occupants. Pets. Ecological systems.	There is a potential pollutant linkage with minor areas of made ground expected which are a likely source of metals, PAH, sulphates, and asbestos.	Medium.	High likelihood.	High risk.
PL2	Potential for mortars/plasters and associated effects on concrete.	Sulphates.	Contact with underground structures.	Building structures /concrete.	Limited potential across the Site. Only minor areas of made ground expected (if any), and limited thickness of topsoil expected.	Medium.	Likely.	Moderate risk.
PL3	Potential historic use of hazardous PSRAS chemicals & effects on PE water pipes.	Hydrocarbons, BTEX & MTBE, VOCs/SVOCs, phenols, cresols and chlorinated phenols.	Contact with water pipes/services.	Water pipes/services & human/pet end users.	No credible pollutant linkage. Although the Site has a former use as a driveway & garage, the likelihood of hydrocarbon contamination is low. Site has never been used for industrial purposes and previous use was agricultural.	Mild.	Low likelihood.	Low risk.
PL4	Hydrocarbon contaminants in upper site soil/made ground, and effects on groundwater or watercourses as a receptor.	Potential hydrocarbons.	Groundwater via potential leaching and transport of potential contaminants.	Underlying aquifer or watercourse as a receptor.	No credible pollutant linkage. Although the Site has a former use as a driveway & garage, the likelihood of hydrocarbon contamination is low. Site has never been used for industrial purposes and previous use was agricultural. The superficial aquifer is Secondary Undifferentiated which will act as an aquitard to the underlying Secondary A aquifer. It is unlikely that significant contamination will be found on site, and subsequently the risk is low – although there is a pollutant linkage.	Mild.	Low likelihood.	Low risk.
PL5	Geological ground gas from coal seams/workings.	CH ₄ , CO ₂ , other trace gases.	Diffusion through soil, substructures, aerial inhalation.	Human - future residential Site occupants.	No credible pollutant linkage. No shallow coal mines or seams. Source missing, no pollutant linkage.	Mild.	Unlikely.	Very low risk.

				Explosion, suffocation.				
PL6	Geological ground gas, radon sources in Namurian deposits.	Rn.	Diffusion through soil, substructures, aerial inhalation.	Human - future Site residential occupants.	No credible pollutant linkage. The landmark data report is based on a refined site-specific risk analysis which has identified that the property is within a lower probability radon area (1-3% of homes estimated to be at or above the action level). No radon protection measures are required.	Mild.	Unlikely.	Low risk.
PL7	Anthropogenic ground gas from historic/present landfill.	CH ₄ , CO ₂ , other trace gases.	Diffusion through soil, substructures, aerial inhalation.	Human - future Site residential occupants. Explosion, suffocation.	No credible pollutant linkage. The only landfill Site in the local area is the Tack Lea Works inert landfill from 1987. Authorised wastes were as follows: ceramic materials, construction ind. wastes, glass, metals, similar, non-leachate forming materials, soil, clay, sand, stone, brick, concrete, & slate. The landfill is also on the opposite side of Woodhouse Land Brook against the hydraulic gradient, and the local area is underlain by glacial clay The above points suggest both the source and pathways are missing from the pollutant linkage.	Mild.	Unlikely.	Low risk.
PL8	Anthropogenic ground gas sources from alluvium.	CH ₄ , CO ₂ .	Diffusion through soil, substructures, aerial inhalation.	Human - future Site residential occupants. Explosion, suffocation.	No alluvial deposits noted beneath the Site. Source missing, no pollutant linkage.	Mild.	Unlikely.	Low risk.

2. PHASE 2 – SITE INVESTIGATIONS & ASSESSMENT.

2.1. Site Investigations.

2.1.1. Investigation Summary.

A single investigation has been undertaken to date, on the 22.01.2025. The investigation comprised hand excavated trial holes and soil sampling for contamination purposes only.

2.1.2. Site Investigation Plan.

An excerpt of the Site Investigation Plan is given below (refer to full plan in Appendix):



2.1.3. 22.01.2025.

Site Investigations were undertaken by T J Booth Associates and comprised 4No. hand excavated trial holes (THs 1-4). 4No. soil samples were also taken for chemical analysis of the upper site soils (S1-4).

Trial holes & soil samples were located in nominally equidistant positions where possible across the Site, to gain an understanding of the general background contamination levels.

In summary the Application Site is generally underlain by MADE GROUND, generally comprising a slightly gravelly, occasionally sandy silt/clay topsoil with inclusions of brick, stone, slate, rare glass & ash. This was found to be underlain by glacial CLAY noted at approximately 250mm depth in TP4 only. Trial pit & soil sample descriptions are noted below:

TP1/S1

0-390mm Dark brown, slightly gravelly clayey topsoil MADE GROUND. Gravel is brick, stone, slate & glass.

TP2/S2

0-350mm Dark brown, slightly gravelly clayey topsoil MADE GROUND. Gravel is brick, stone, slate, coal & ash.

TP3/S3

0-310mm Dark brown, slightly sandy, slightly gravelly silt topsoil MADE GROUND. Gravel is brick & stone.

TP4/S4

0-250mm Dark brown, slightly sandy, slightly gravelly silt topsoil MADE GROUND. Gravel is brick & stone.

250-450mm Soft to firm light brown/grey mottled, slightly gravelly CLAY

No visual or olfactory evidence of hydrocarbon contamination was noted in any of the trial holes, and there was no groundwater noted.

Soil samples were sealed in 1kg white plastic snap top containers & amber jars & vials and sent to Envirolab Ltd to be tested for a range of common contaminants.

Samples were tested for metals, speciated PAH, inorganics & sulphates, SOM, & asbestos screening in accordance with the conceptual model.

2.2. Final Risk Assessment.

2.2.1. Human Health Risk.

2.2.1.1. Shallow soil contamination.

On return the samples were assessed by TJ Booth Associates to common threshold comparison data in the following order: Defra Category 4 Screening Levels (C4SLs) > LQM/CIEH (S4ULs) > EIC/AGS/CL:AIRE 2010.

Testing of made ground revealed contaminant levels above residential threshold values with elevated levels of the following contaminants of concern, (refer to testing certificates, and full analysis spreadsheets in the Appendix):

Trial Hole/Soil Sample	Made ground horizon	Mitigation/Action
TP1/S1	Dibenz[ah]anthracene.	FURTHER ACTION
TP2/S2	Benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, chrysene, dibenz[ah]anthracene.	FURTHER ACTION
TP3/S3	Chromium III, lead.	FURTHER ACTION
TP4/S4	Lead	FURTHER ACTION

Due to above elevated levels noted, existing upper made ground is considered mildly contaminated and unsuitable for the proposed end use.

The existing made ground will either need to be remediated, or pathways removed to remove the pollutant linkage.

2.2.1.2. Ground Gas Risk.

2.2.1.2.1. Historic landfill sites.

No pollutant linkage identified.

2.2.1.2.2. On-site refuse tips/infilled ponds/infilled land.

No pollutant linkage identified.

2.2.1.2.3. Radon.

No pollutant linkage identified.

2.2.1.2.4. Alluvium.

No pollutant linkage identified.

2.2.1.3. Buildings & services.

2.2.1.3.1. Water pipes.

United Utilities pipeline risk assessment methodology states the following:

"The application of the source, pathway, receptor concept will be an integral part of any pipeline risk assessment. For each potential source (the contamination), and each potential receptor (the water pipe), consideration shall be given to whether a potential pathway between source and receptor exists, or may exist in the future, linking the two.

There are normally only three pathways by which contamination may come into contact with water pipes. These are direct contact with the soil or backfill, an excessive vapour phase or a contaminated groundwater regime. If none of these conditions exist on site (adopting the source, pathway, receptor concept) then it is likely that extended and/or targeted soil testing will not be required, and a simple risk assessment will suffice."

There are no historic site uses that may have contributed VOC/SVOC (inc. BTEX, MTBE, phenols, cresols & chlorinated phenols) or hydrocarbon contamination into the ground profile.

Only a minimal depth of made ground was noted, and virgin clay noted at shallow depth.

Any potable water pipeline through the Site will be routed through virgin clay.

Normal PE pipe will suffice for potable water supplies.

2.2.1.3.2. Sulphate.

Sulphate was recorded below action level (DS1) for all soil samples taken across the Site.

No groundwater was noted.

The risk from sulphate attack is low.

2.2.2. Controlled Waters Risk.

Where ground/surface water sampling is undertaken, samples are assessed by TJ Booth Associates to common threshold comparison data. Groundwater samples are generally compared against the drinking water standards (UK DWI 2016 & WHO 2022), and Environment Quality Standards for Freshwater (EQS). Surface water samples are primarily compared against the against the EQS.

2.2.2.1. Groundwater.

No groundwater noted on Site & no samples taken.

There was no evidence of mobile contaminants of concern such as hydrocarbons on site investigations.

Risk is low, as per the preliminary risk assessment.

2.2.2.2. Watercourses.

Only minor made ground noted on Site.

No particular mobile contamination noted which may negatively impact the adjacent watercourse & no groundwater noted.

Risk is considered as low, as per the preliminary risk assessment.



2.3. Final Conceptual Model.

POLLUTANT RISK IDENTIFIER	SOURCE	CONTAMINANT TYPE	PATHWAY	RECEPTOR	POLLUTION LINKAGE	CONSEQUENCE	PROBABILITY	RISK	MITIGATION PROPOSED
PL1	General contaminants in upper site soil/made ground, and effects on humans/animals /ecology as a receptor.	Metals, PAHs, inorganics, organics, asbestos.	Direct ingestion, aerial ingestion, dermal contact, drinking water. Crops.	Primarily human - Site construction operatives & future residential Site occupants. Pets. Ecological systems.	4No. soil samples were taken in accessible soft landscaped locations of the existing Site. The existing soil was found to be mildly contaminated above residential threshold values for residential sites with metals & PAH noted for all samples.	Medium.	High likelihood.	High risk.	EITHER REMOVAL & REPLACEMENT OF EXISTING SITE SOIL (REMOVAL OF SOURCE), OR SUITABLE COVER LAYER PROVIDED (REMOVAL OF PATHWAY).
PL2	Potential for mortars/plasters and associated effects on concrete.	Sulphates.	Contact with underground structures.	Building structures /concrete.	No exceedances found.	Medium.	Unlikely.	Low risk.	NONE REQUIRED.

3. PHASE 3 - REMEDIATION STATEMENT.

3.1. Basic Site Details.

Full details included in the Phase 1 & 2 PRA/Site Investigation Introduction & subsequent sections.

3.2. Site & Remedial Objectives.

There is one remedial objective for the Site:

- Ensure the garden areas are suitable for the residential end use.

3.3. Conceptual Model (Final) & Relevant Pollution Linkages.

Site investigations undertaken as part of the Phase 2, comprised soil sampling, with minor areas of made ground noted.

Only 1 pollutant linkage from the Phase 2 site investigation was confirmed in the ground investigation:

- PL1: General contaminants in upper site soil/made ground, and effects on humans/animals/ecology as a receptor.

The risk is specific to the end use, and required to ensure Site soils are safe for the end user.

3.4. Recommended Remediation.

Made Ground/Soil Risk:

PL1: General contaminants in upper site soil/made ground, and effects on humans/animals/ecology as a receptor.

Existing Site soils have been found to be mildly contaminated with metals & PAH and are not considered suitable for a proposed residential end use.

While made ground may remain on site beneath permanent hardstandings (such as buildings, roads, pavements & pathways etc); to mitigate the risk to receptors, it is advised that a cover layer of clean inert soil is imported for garden and soft landscaping areas ONLY.

Dependent on the final finished levels, existing topsoils/made ground within proposed soft landscaping areas, should either be covered with 600mm of imported soil, or excavated to 600mm from finish levels and replaced with a clean imported cover soil to suit finishes. The 600mm cover system is adopted for the following reasons:

Root systems for shrubs are typically up to 600 mm;

Excavations are unlikely to be deeper than 600 mm in typical gardening activities;

Bio-turbation is typically limited to the top 600 mm of the soil profile;

Excavations by children or pets are unlikely to exceed 600 mm.

Imported soil should be clean/inert and free from deleterious materials and should be suitable for use in a residential end use setting. It should be able to pass testing of metals, speciated PAH, inorganics & sulphates, SOM, and asbestos screening to current Defra Category 4 Screening Levels (C4SLs) where available, and then to the LQM/CIEH (S4ULs), for use in a residential end use setting.

3.5. Verification (Phase 4 requirements).

Verification of the imported soil may be required for Planning or Building Control/Building Regulations submission. Should this be required, it will need to be undertaken by suitably qualified consultants and comprise the following:

- Import source material.
- Characterisation & suitability of material.
- Soil sampling should be undertaken as per YALPAG Guidelines as per the following ratios:
 - Virgin quarried materials, 1-2 samples to confirm inert nature.
 - Crushed hardcore, stone, brick, min 1 sample per 500cum.
 - Greenfield/manufactured, generally 1 sample per 250cum (min 3 samples).
 - Brownfield, generally 1 sample per 50cum (min 6 samples).

Samples should be tested for the following contamination suites: metals, inorganics, PAH USEPA16 speciated, and asbestos screening. Defra Category 4 Screening Levels (C4SLs) > LQM/CIEH (S4ULs) > EIC/AGS/CL:AIRE 2010; for use in a residential end use setting..

- Verification Depth.
- Reporting (including photographic evidence).

3.6. Additional Notes.

Before any further work is undertaken, this report should be submitted to and agreed by the Local Planning Authority Contaminated Land Department/Building Control Department as necessary.

We trust that the above clear, but should you require further advice please contact the undersigned.

Signed.....



D.S. Slattery BSc (Hons).

T J Booth Associates.

Authorised...

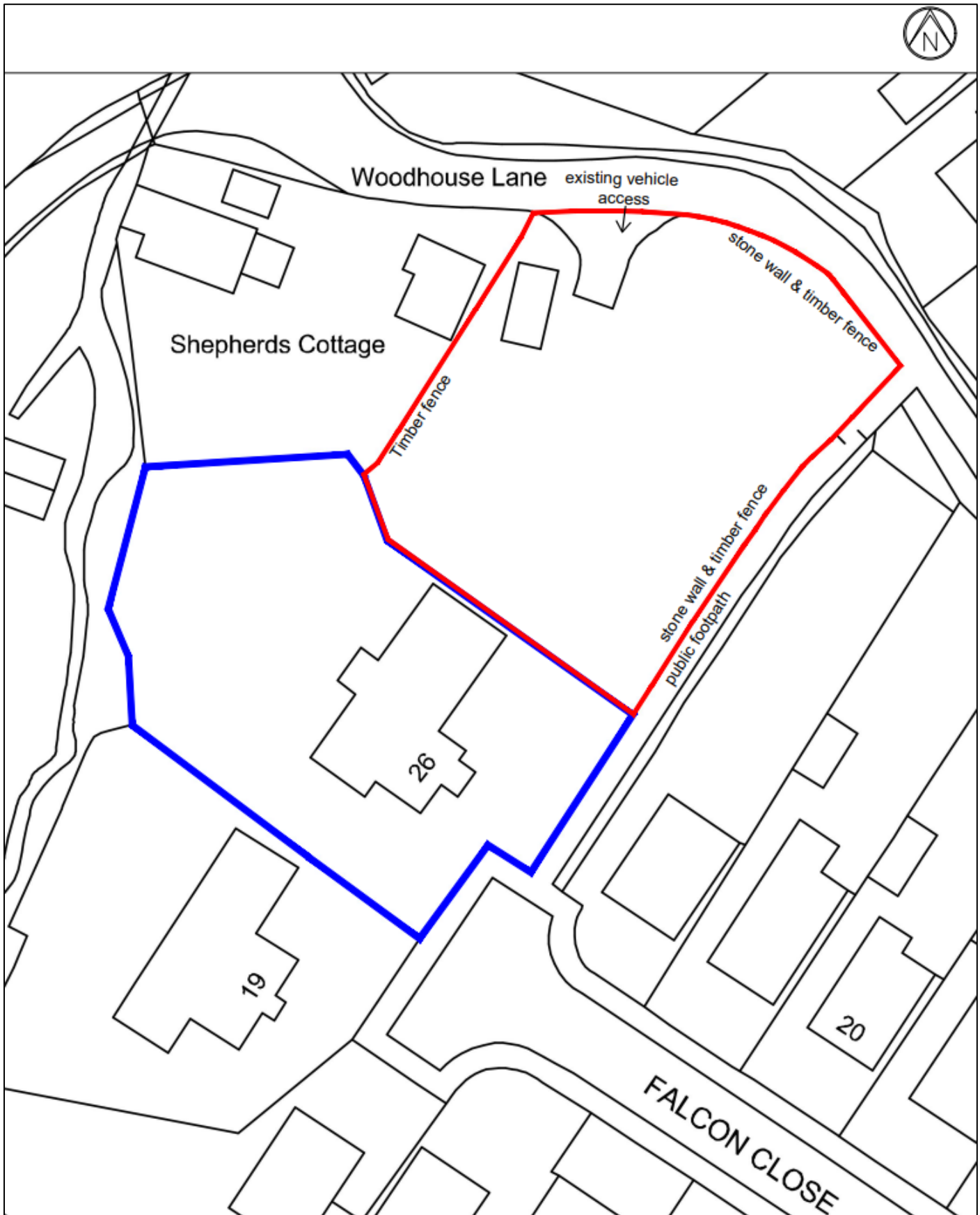


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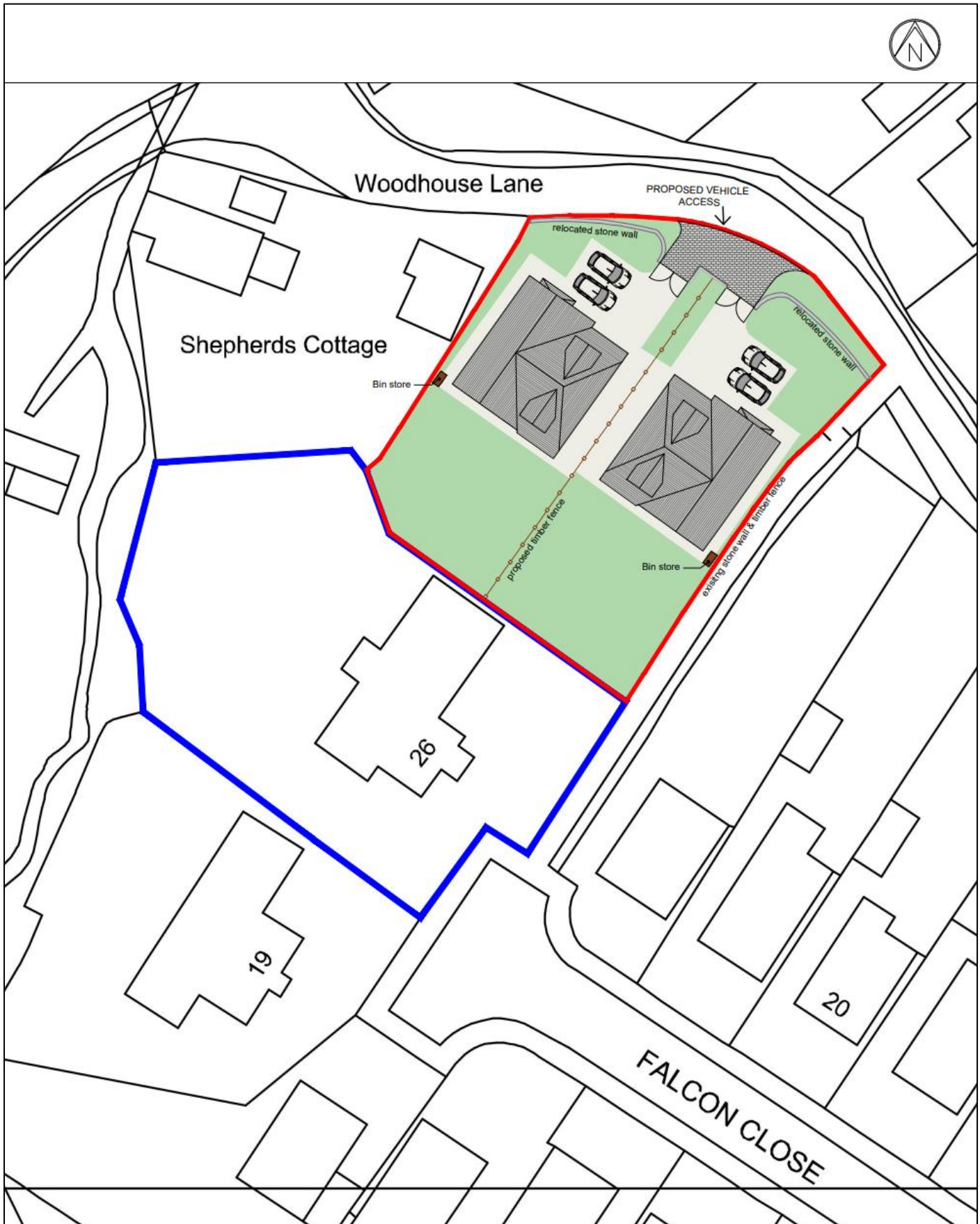
T J Booth Associates.

4. APPENDIX A: FIGURES.

4.1. Location Plan.



4.3. Proposed Development.



4.5. TJBA Soil Analysis.

CLIENT/SITE:		Fairway - 26 Falcon Close, Norden, Rochdale						
SAMPLE TYPE:		SOILS						
SAMPLING DATE:		22.01.2025						
Contaminant		No	Max	Mean	t 95	RESIDENTIAL (with or without plant uptake)		
							Pass/Fail	Comment
METAL	Arsenic	4	28	23	27.7	37	PASS	
METAL	Boron	4	1.9	1.225	1.765	290	PASS	
METAL	Cadmium	4	4	1.725	3.55	22	PASS	
METAL	Chromium as Cr(III)	4	1100	296.25	939.65	910	FURTHER ACTION	S3
METAL	Chromium as Cr(VI)	4	1	1	1	21	PASS	
METAL	Copper	4	361	129.25	315.4	2400	PASS	
METAL	Lead	4	297	212.25	283.5	200	FURTHER ACTION	S3 & S4
METAL	Mercury (inorganic)	4	1.12	0.53	1.024	40	PASS	
METAL	Nickel	4	37	27.75	35.35	130	PASS	
METAL	Selenium	4	1	1	1	250	PASS	
METAL	Zinc as Zn	4	205	132.75	192.25	3700	PASS	
INORGANIC	Cyanide (Total)	4	3	1.5	2.7	34	PASS	
INORGANIC	Sulphate (Total) as SO4	4	0.089	0.0653	0.0856	0.24	PASS	
INORGANIC	Sulphide	4	100	50	92.5	250	PASS	
INORGANIC	pH	4	6.19	5.9275	6.1525	6 to 8	ACIDIC	S1, S3, S4 <6
INORGANIC	Sulphur (Elemental)	4	15	8.5	14.1	100	PASS	
INORGANIC	Asbestos Identification	4	0	0	0	0	PASS	
ORGANIC	SOM	4	6	6	6			
PAH	acenaphthene	4	3.54	0.9525	3.0285	1100	PASS	
PAH	acenaphthylene	4	0.24	0.0975	0.219	920	PASS	
PAH	anthracene	4	8.32	2.1675	7.096	11000	PASS	
PAH	benzo[a]anthracene	4	30.3	8.1925	25.925	13	FURTHER ACTION	S2
PAH	benzo[a]pyrene (BaP)	4	24.5	6.745	21.019	5	FURTHER ACTION	S2
PAH	benzo[b]fluoranthene	4	29	8.1225	24.919	3.7	FURTHER ACTION	S2
PAH	benzo[g,h,i]perylene	4	15.8	4.3375	13.55	350	PASS	
PAH	benzo[k]fluoranthene	4	12.5	3.4625	10.73	100	PASS	
PAH	chrysene	4	34.3	9.2725	29.331	27	FURTHER ACTION	S2
PAH	dibenz[ah]anthracene	4	4.23	1.205	3.6555	0.3	FURTHER ACTION	S1 & S2
PAH	fluoranthene	4	54.6	14.958	46.76	890	PASS	
PAH	fluorene	4	1.97	0.5375	1.6895	860	PASS	
PAH	indeno[123-cd]pyrene	4	16.5	4.5325	14.139	41	PASS	
PAH	naphthalene	4	1.12	0.405	0.997	13	PASS	
PAH	phenanthrene	4	27	7.4075	23.153	440	PASS	
PAH	pyrene	4	50.3	13.738	43.063	2000	PASS	
PHENOLS AND CHLOROPHENOLS (SVOC)	Phenol	4	0.2	0.2	0.2	380	PASS	
Comments Key Asbestos: A=amosite (brown), CH=chrysotile (white), CR=crocidolite (blue)								

4.6. Envirolab Ltd Certificates.



Hattersley Science & Technology Park
Stockport Road, Hattersley, SK14 3QU

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 25/00547
Issue Number: 1
Date: 04 February, 2025

Client: T J Booth Associates
20a East Gate Street
Rochdale
Rochdale
Greater Manchester
UK
OL16 1DH

Project Manager: Daniel Slattery
Project Name: Fairway - Land at 26 Falcon Close, Norden, Rochdale
Project Ref: n/a
Order No: N/A
Date Samples Received: 23/01/25
Date Instructions Received: 23/01/25
Date Analysis Completed: 04/02/25

Approved by:

Danielle Brierley
Client Services Supervisor





Envirolab Job Number: 25/00547

Client Project Name: Fairway - Land at 26 Falcon Close,
Norden, Rochdale

Client Project Ref: n/a

Lab Sample ID	25/00547/1	25/00547/2	25/00547/3	25/00547/4				Units	Limit of Detection	Method ref
Client Sample No	S1	S2	S3	S4						
Client Sample ID	TP1	TP2	TP3	TP4						
Depth to Top	0.00	0.00	0.00	0.00						
Depth To Bottom	0.39	0.35	0.31	0.25						
Date Sampled	22-Jan-25	22-Jan-25	22-Jan-25	22-Jan-25						
Sample Type	SOIL	SOIL	SOIL	SOIL						
Sample Matrix Code	6AE	6AE	4AE	6AE						
% Stones >10mm _A	<0.1	<0.1	<0.1	<0.1				% w/w	0.1	A-T-044
pH _D ^{MS}	5.94	6.19	5.64	5.94				pH	0.01	A-T-031s
Sulphate (acid soluble) _D ^{MS}	450	610	890	660				mg/kg	200	A-T-028s
Cyanide (total) _A ^{MS}	<1	<1	3	<1				mg/kg	1	A-T-042sTCN
Phenols - Total by HPLC _A	<0.2	<0.2	<0.2	<0.2				mg/kg	0.2	A-T-050s
Sulphide _A	<50	<25	<100	<25				mg/kg	5	A-T-043-s
Sulphur (elemental) _D ^{MS}	9	15	<5	<5				mg/kg	5	A-T-029s
Organic Matter _D ^{MS}	10.9	19.4	22.6	14.5				% w/w	0.14	A-T-032s
Arsenic _D ^{MS}	17	28	21	26				mg/kg	1	A-T-024s
Boron (water soluble) _D ^{MS}	1.9	<1.0	<1.0	<1.0				mg/kg	1	A-T-027s
Cadmium _D ^{MS}	1.0	0.9	4.0	1.0				mg/kg	0.5	A-T-024s
Copper _D ^{MS}	44	55	361	57				mg/kg	1	A-T-024s
Chromium _D ^{MS}	27	27	1100	31				mg/kg	1	A-T-024s
Chromium (hexavalent) _D	<1	<1	<1	<1				mg/kg	1	A-T-040s
Lead _D ^{MS}	167	178	297	207				mg/kg	1	A-T-024s
Mercury _D	0.48	0.18	1.12	0.34				mg/kg	0.17	A-T-024s
Nickel _D ^{MS}	22	26	37	26				mg/kg	1	A-T-024s
Selenium _D ^{MS}	<1	<1	1	<1				mg/kg	1	A-T-024s
Zinc _D ^{MS}	120	102	205	104				mg/kg	1	A-T-024s



Envirolab Job Number: 25/00547

Client Project Name: Fairway - Land at 26 Falcon Close,
Norden, Rochdale

Client Project Ref: n/a

Lab Sample ID	25/00547/1	25/00547/2	25/00547/3	25/00547/4						
Client Sample No	S1	S2	S3	S4						
Client Sample ID	TP1	TP2	TP3	TP4						
Depth to Top	0.00	0.00	0.00	0.00						
Depth To Bottom	0.39	0.35	0.31	0.25						
Date Sampled	22-Jan-25	22-Jan-25	22-Jan-25	22-Jan-25						
Sample Type	SOIL	SOIL	SOIL	SOIL						
Sample Matrix Code	6AE	6AE	4AE	6AE						
Asbestos in Soil (inc. matrix)										
Asbestos in soil ^o	NAD	NAD	NAD	NAD						A-T-045
Asbestos Matrix (visual) _o	-	-	-	-						A-T-045
Asbestos Matrix (microscope) _o	-	-	-	-						A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _o	N/A	N/A	N/A	N/A						A-T-045



Envirolab Job Number: 25/00547

Client Project Name: Fairway - Land at 26 Falcon Close,
Norden, Rochdale

Client Project Ref: n/a

Lab Sample ID	25/00547/1	25/00547/2	25/00547/3	25/00547/4				Units	Limit of Detection	Method ref
Client Sample No	S1	S2	S3	S4						
Client Sample ID	TP1	TP2	TP3	TP4						
Depth to Top	0.00	0.00	0.00	0.00						
Depth To Bottom	0.39	0.35	0.31	0.25						
Date Sampled	22-Jan-25	22-Jan-25	22-Jan-25	22-Jan-25						
Sample Type	SOIL	SOIL	SOIL	SOIL						
Sample Matrix Code	6AE	6AE	4AE	6AE						
PAH-16MS										
Acenaphthene _A ^{MS}	0.13	3.54	0.03	0.11				mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{MS}	<0.10	0.24	0.04	0.01				mg/kg	0.01	A-T-019s
Anthracene _A ^{MS}	<0.20	8.32	0.09	0.16				mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{MS}	1.13	30.3	0.46	0.88				mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{MS}	1.29	24.5	0.43	0.76				mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{MS}	1.79	29	0.73	0.97				mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{MS}	0.80	15.8	0.34	0.41				mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{MS}	<0.70	12.5	0.30	0.35				mg/kg	0.07	A-T-019s
Chrysene _A ^{MS}	1.17	34.3	0.59	1.03				mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{MS}	<0.40	4.23	0.08	0.11				mg/kg	0.04	A-T-019s
Fluoranthene _A ^{MS}	2.33	54.6	0.90	2.00				mg/kg	0.08	A-T-019s
Fluorene _A ^{MS}	<0.10	1.97	0.03	0.05				mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{MS}	0.76	16.5	0.42	0.45				mg/kg	0.03	A-T-019s
Naphthalene _A ^{MS}	<0.30	1.12	0.15	0.05				mg/kg	0.03	A-T-019s
Phenanthrene _A ^{MS}	1.35	27	0.40	0.88				mg/kg	0.03	A-T-019s
Pyrene _A ^{MS}	2.05	50.3	0.84	1.76				mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{MS}	12.8	314	5.83	9.98				mg/kg	0.01	A-T-019s



Report Notes

General

- This report shall not be reproduced, except in full, without written approval from Envirolab.
- The client Sample No, Client Sample ID, Depth to top, Depth to Bottom and Date Sampled are all provided by the client and can affect the validity of results.
- The results reported herein relate only to the material supplied to the laboratory.
- The residue of any samples contained within this report, and any received within the same delivery, will be disposed of **four weeks** after the initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of **six months** after the initial Asbestos testing is completed.
- Analytical results reflect the quality of the sample at the time of analysis only.
- Opinions and Interpretations expressed are outside our scope of accreditation.
- A deviating sample report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.
- If a sample is outside of the calibration range or affected by interferences then it may need diluting. This will result in the limit of detection (LOD) being raised.
- Subcontracted Analysis: Please see the appended report for any deviations, current LODs and accreditation status of the test.

Key

Superscript "#"	Accredited to ISO 17025
Superscript "M"	Accredited to MCertS
Superscript "U"	Individual result not accredited
None of the above symbols	Analysis unaccredited
Subscript "A"	Analysis performed on as-received Sample
Subscript "D"	Analysis performed on the dried sample, crushed to pass 2mm sieve.
Subscript "D" on Asbestos	Analysis performed on a dried aliquot of sample provided.
Subscript "A"	Analysis has dependant options against results. Details appear in the comments of your Sample receipt
IS	Insufficient Sample for analysis
US	Unsuitable Sample for analysis
NDP	No Determination Possible
NAD	No Asbestos Detected
Trace	Asbestos found not suitable for Gravimetric Quantification – not enough to accurately weigh.
N/A	Not applicable

Asbestos

Identification: Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis

"Trace Asbestos Identified" will be reported if there is not enough present to verify the type.

Quantification: Generally a 2 stage process including visual identification, hand picking and weighing, and fibre counting. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres). "TRACE" will be reported as a quantification result.

PLEASE INFORM THE LABORATORY IF YOU WOULD LIKE THE STAGE 3 SEDIMENTATION PROCESS CARRIED OUT. Note this will be subcontracted.

Assigned Matrix Codes

1	SAND	6	CLAY/LOAM	A	Contains Stones
2	LOAM	7	OTHER	B	Contains Construction Rubble
3	CLAY	8	Asbestos Bulk (Only Asbestos ID accredited)	C	Contains visible hydrocarbons
4	LOAM/SAND	9	Incinerator Ash (some Metals accredited)	D	Contains glass / metal
5	SAND/CLAY			E	Contains roots / twigs

Note: 7,8,9 matrices are not covered by our ISO 17025 or MCertS accreditation, unless stated above.

Soil Chemical Analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as "% stones >10mm".

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH by method A-T-007:

For waters, free and visible oils are excluded from the sample used for analysis, so the reported result represents the dissolved phase only. Results "with Clean up" indicates samples cleaned up with Silica during extraction.

EPH CWG (method A-T-055) from TPH CWG:

EPH CWG results have humics mathematically subtracted through instrument calculation.

Where these humic substances have been identified in any IDs from "TPH CWG with clean up" please note that the concentration is **NOT** included in the quantified results but present in the ID for information.

Electrical Conductivity of water by method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Please contact your client manager if you require any further information.



Envirolab Deviating Samples Report

Hattersley Science & Technology Park, Stockport Road, Hattersley, SK14 3QU
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client: T J Booth Associates, 20a East Gate Street, Rochdale, Rochdale, Greater Manchester, UK, OL16 1DH
Project: Fairway - Land at 26 Falcon Close, Norden, Rochdale
Clients Project No: n/a

Project No: 25/00547
Date Received: 23/01/2025 (pm)
Cool Box Temperatures (°C): 8.5

NO DEVIATIONS IDENTIFIED

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

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Envirolab Analysis Dates

Lab Sample ID	25/00547/1	25/00547/2	25/00547/3	25/00547/4
Client Sample No	S1	S2	S3	S4
Client Sample ID/Depth	TP1 0.00-0.39m	TP2 0.00-0.35m	TP3 0.00-0.31m	TP4 0.00-0.25m
Date Sampled	22/01/25	22/01/25	22/01/25	22/01/25
A-T-019s	29/01/2025	29/01/2025	04/02/2025	28/01/2025
A-T-024s	03/02/2025	03/02/2025	03/02/2025	03/02/2025
A-T-027s	30/01/2025	30/01/2025	30/01/2025	30/01/2025
A-T-028s	29/01/2025	29/01/2025	29/01/2025	29/01/2025
A-T-029s	31/01/2025	31/01/2025	31/01/2025	31/01/2025
A-T-031s	29/01/2025	29/01/2025	29/01/2025	29/01/2025
A-T-032s	30/01/2025	30/01/2025	30/01/2025	30/01/2025
A-T-040s	30/01/2025	30/01/2025	30/01/2025	30/01/2025
A-T-042sTCN	27/01/2025	27/01/2025	27/01/2025	27/01/2025
A-T-043-s	27/01/2025	27/01/2025	27/01/2025	27/01/2025
A-T-044	28/01/2025	28/01/2025	28/01/2025	28/01/2025
A-T-045	24/01/2025	24/01/2025	24/01/2025	24/01/2025
A-T-050s	27/01/2025	27/01/2025	27/01/2025	27/01/2025

The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

End of Report

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5. APPENDIX B: PHASE 1 PRA PHOTOS.





TP1/S1



TP2/S2

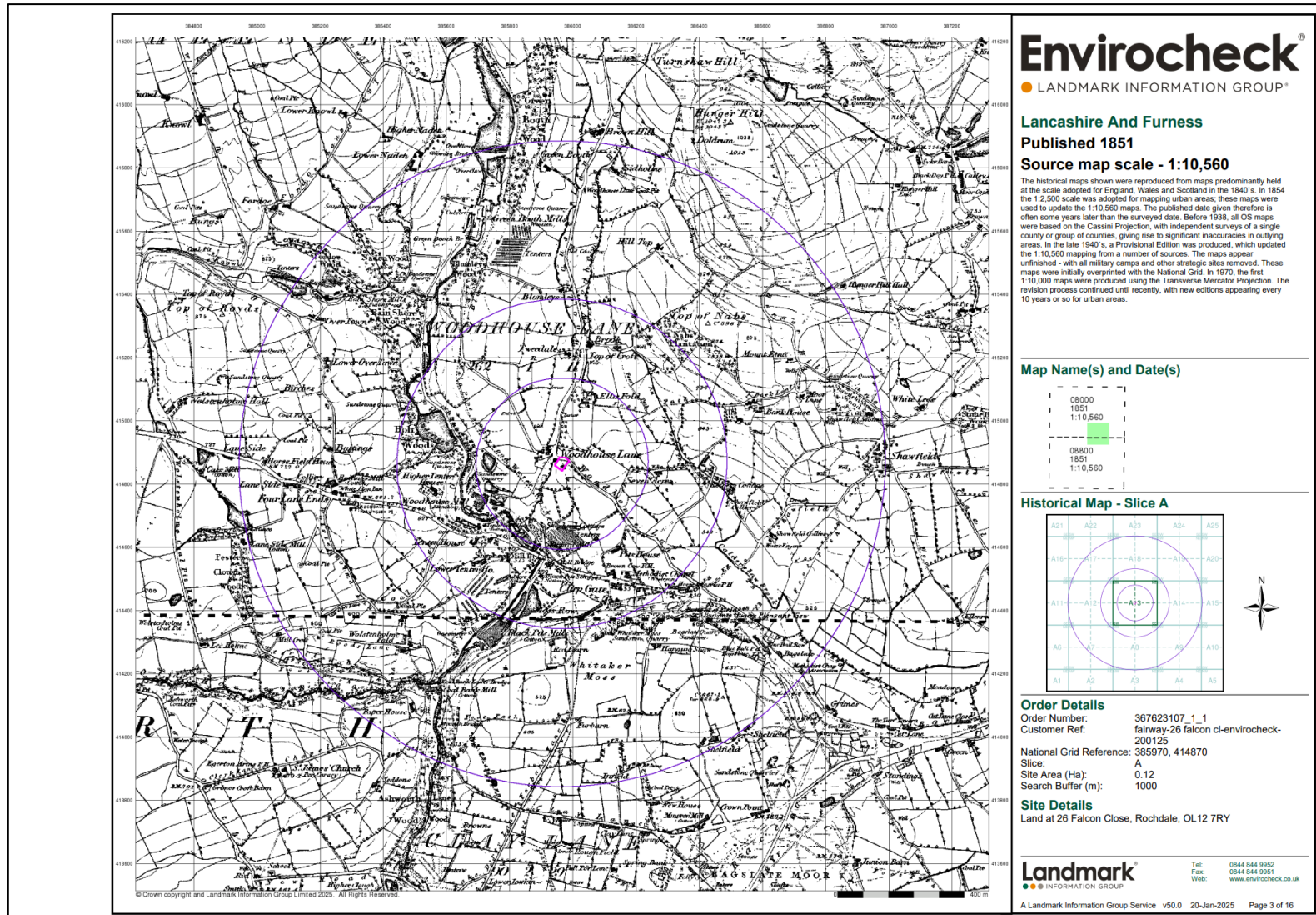


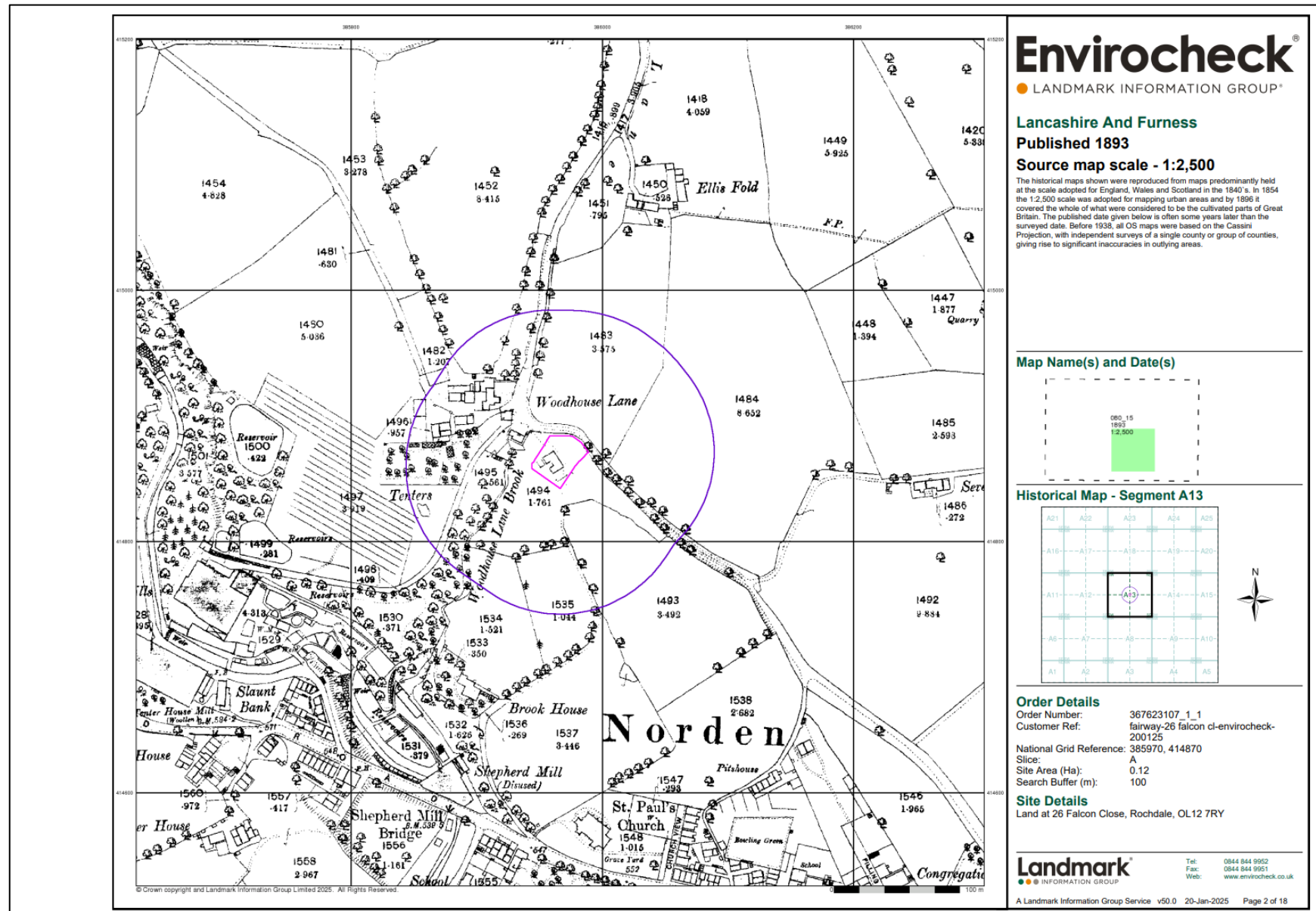
TP3/S3

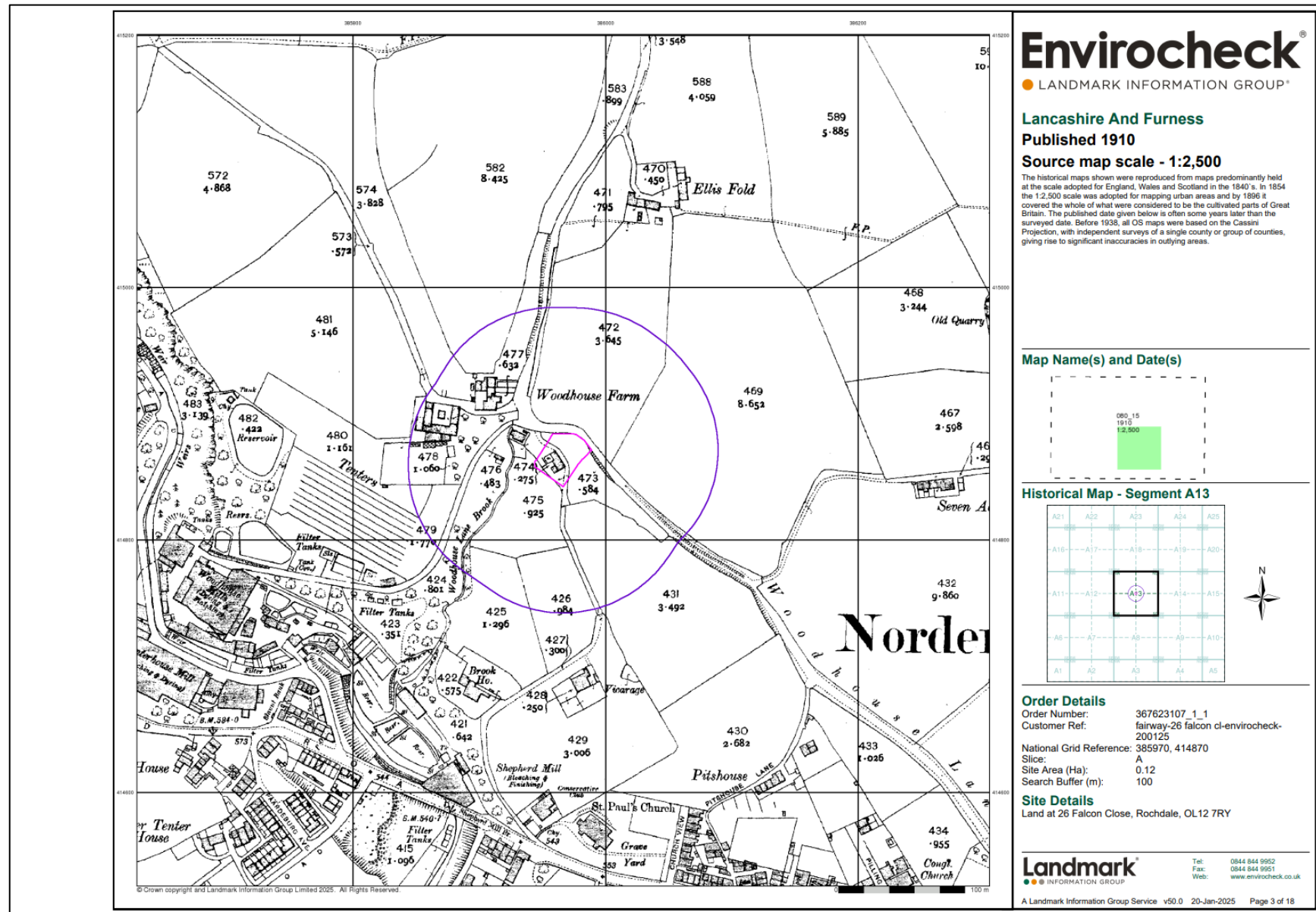


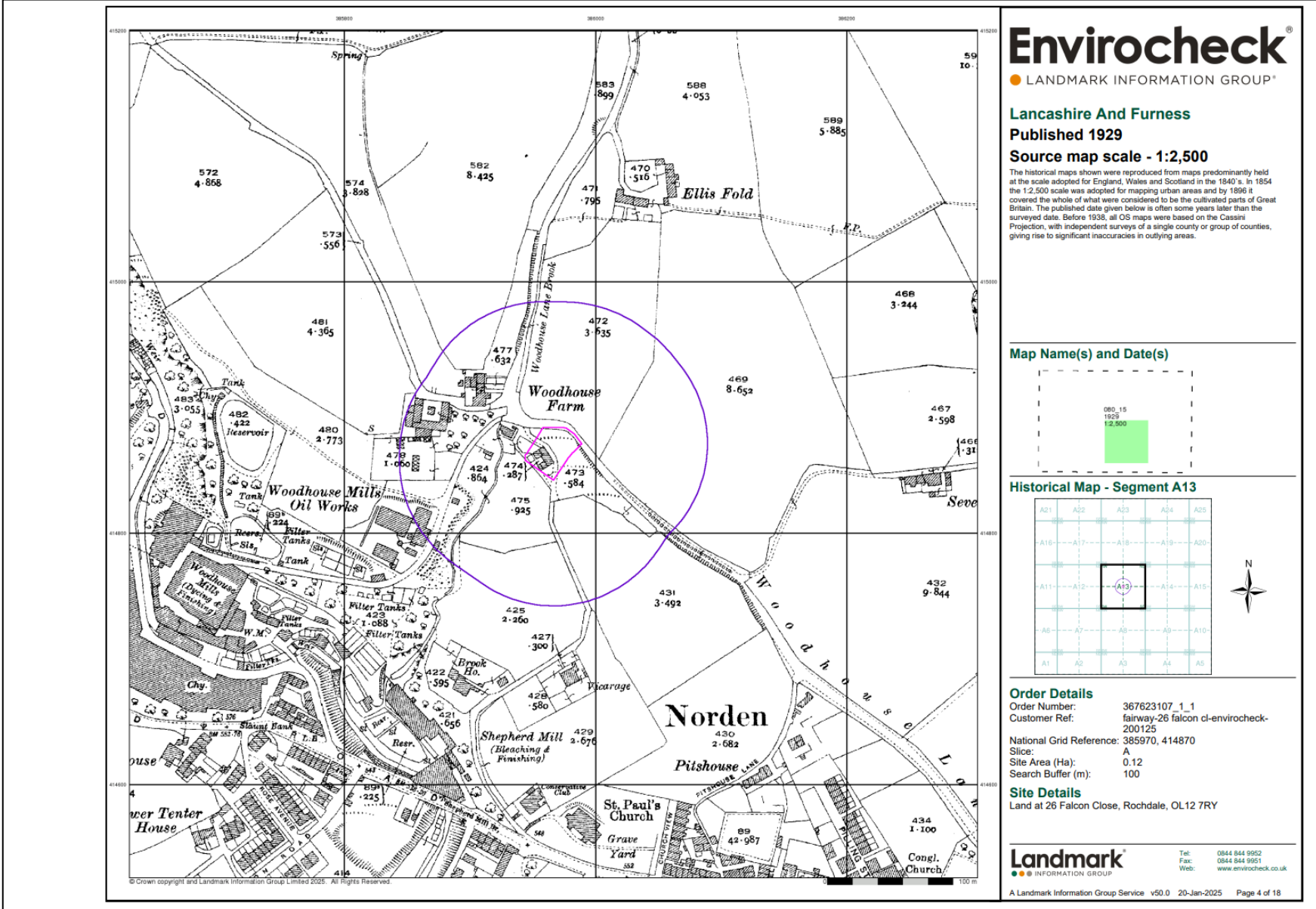
TP4/S4

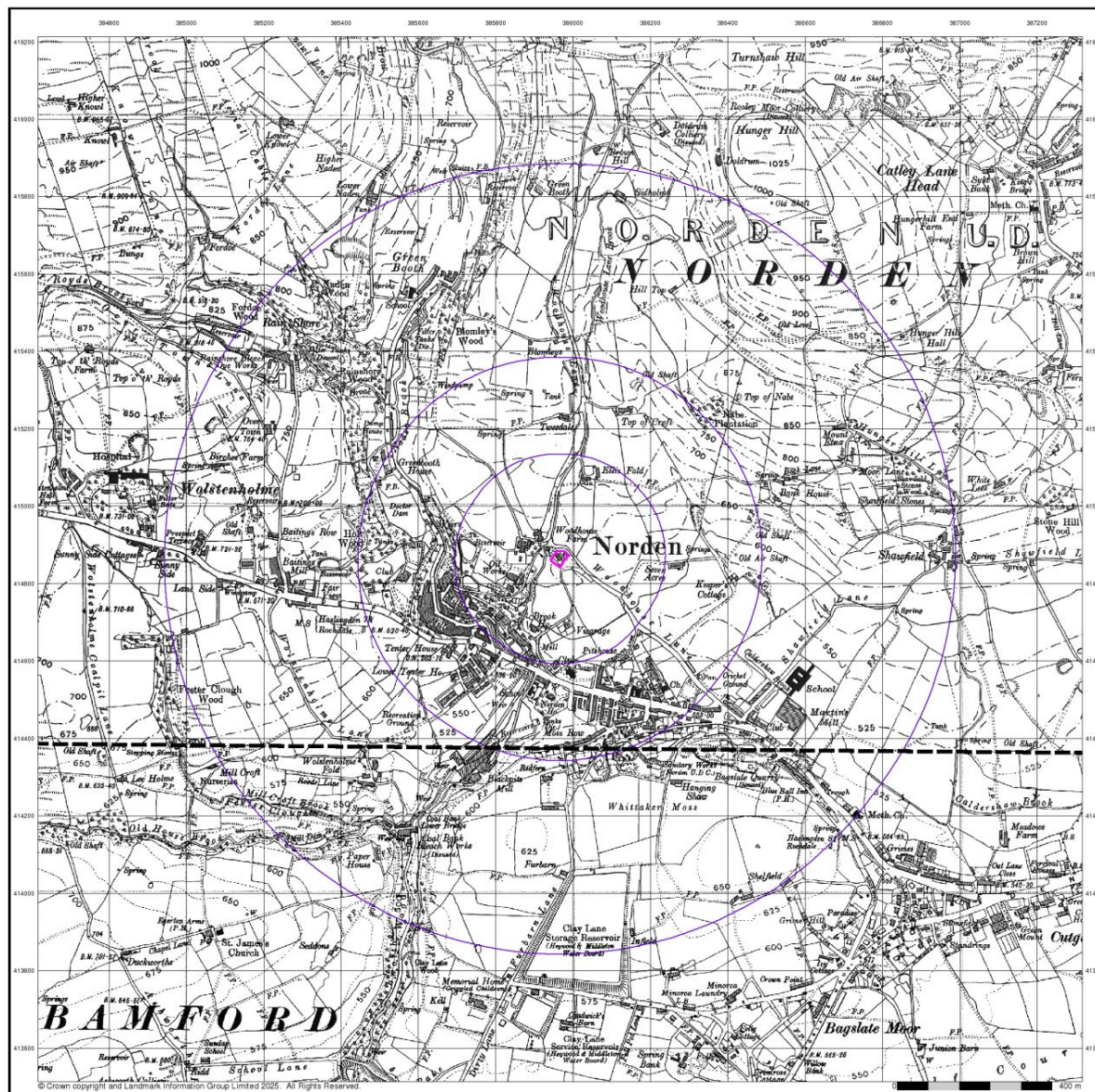
6. APPENDIX C: LANDMARK ENVIROCHECK.











Envirocheck®

LANDMARK INFORMATION GROUP®

Lancashire And Furness

Published 1938

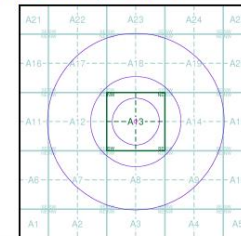
Source map scale - 1:10,560

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)

080SE	1938
1:10,560	
088NE	1938
1:10,560	

Historical Map - Slice A



Order Details

Order Number: 367623107_1_1
 Customer Ref: fairway-26 falcon cl-envirocheck-200125
 National Grid Reference: 385970, 414870
 Slice: A
 Site Area (Ha): 0.12
 Search Buffer (m): 1000

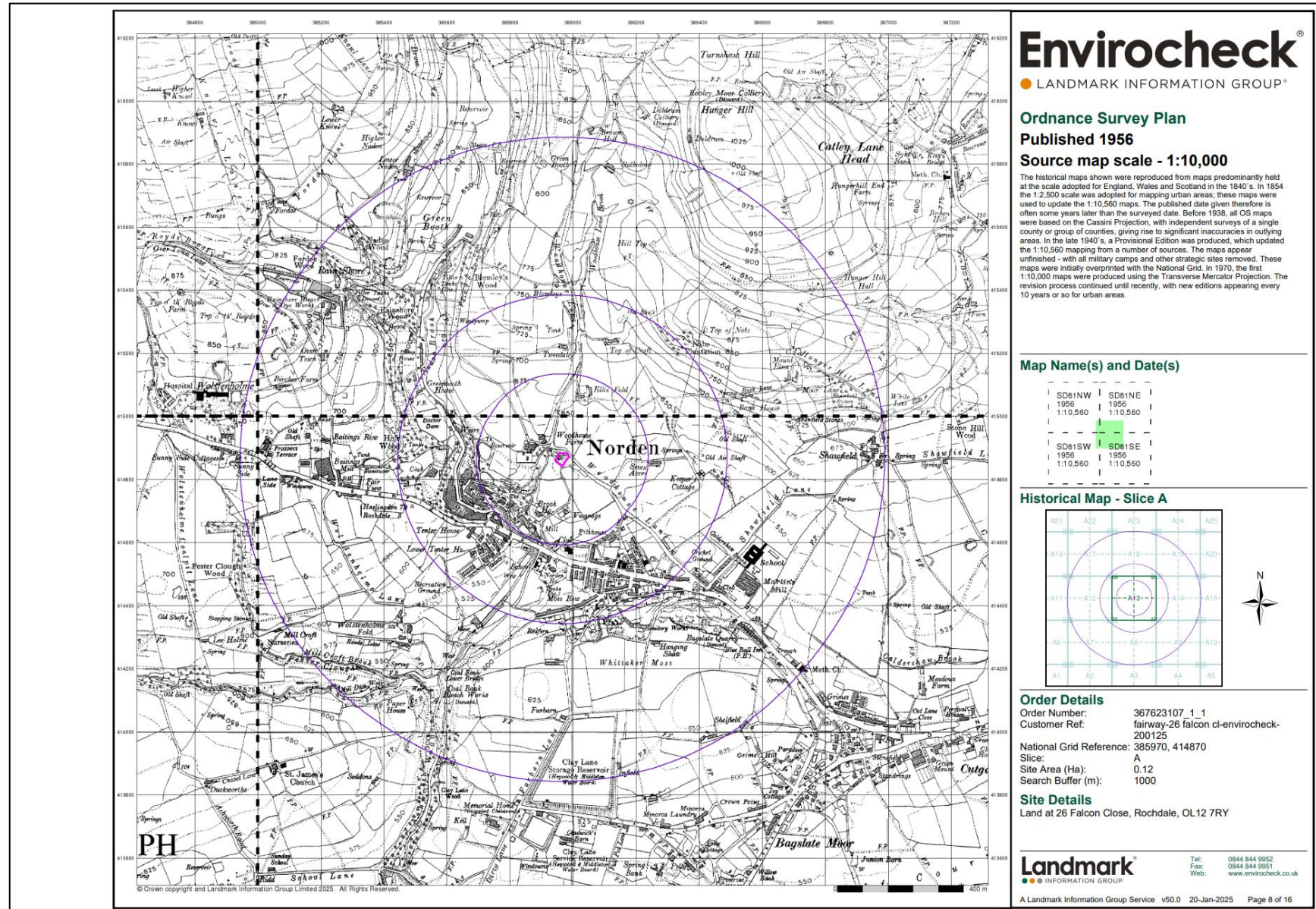
Site Details

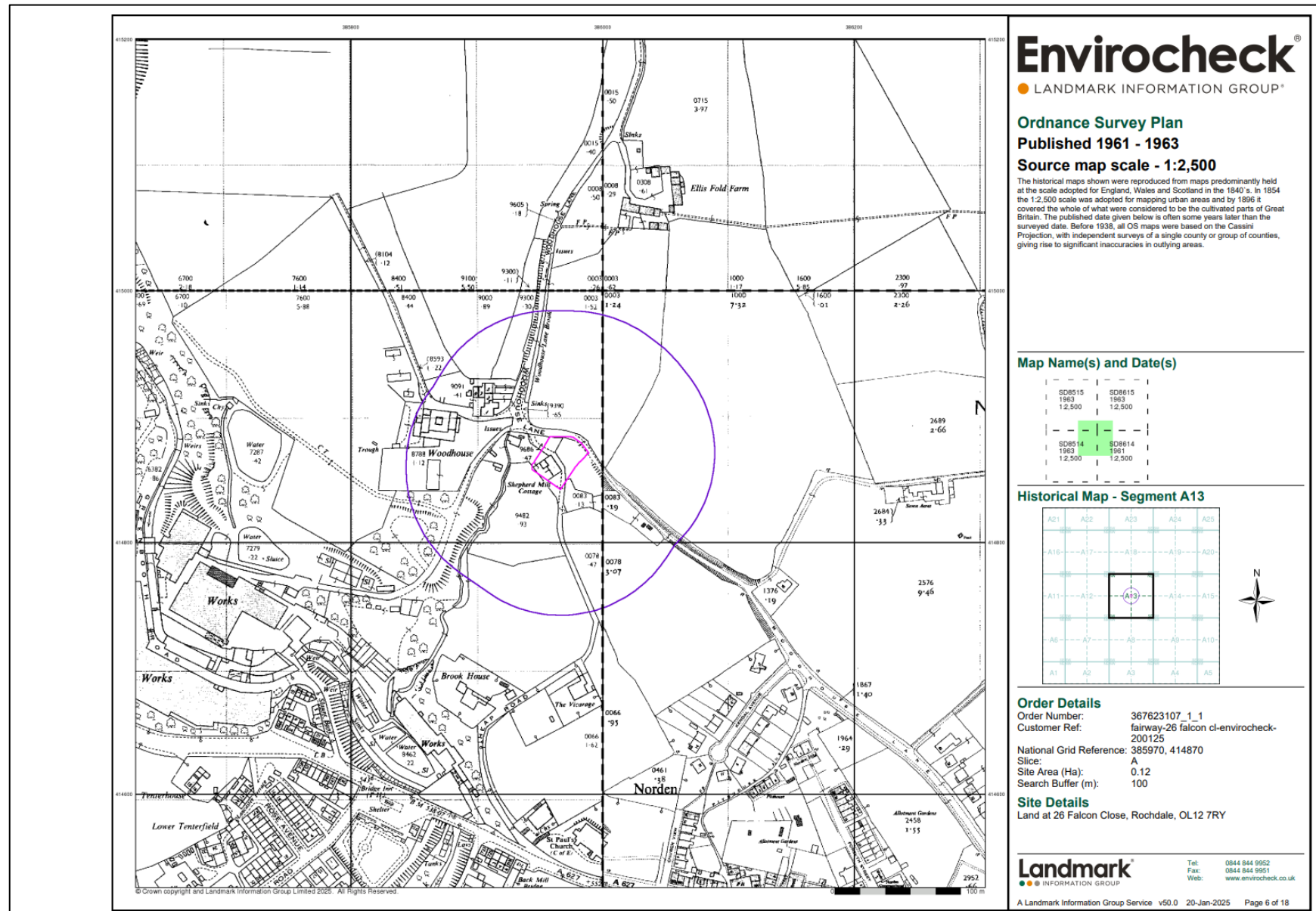
Land at 26 Falcon Close, Rochdale, OL12 7RY

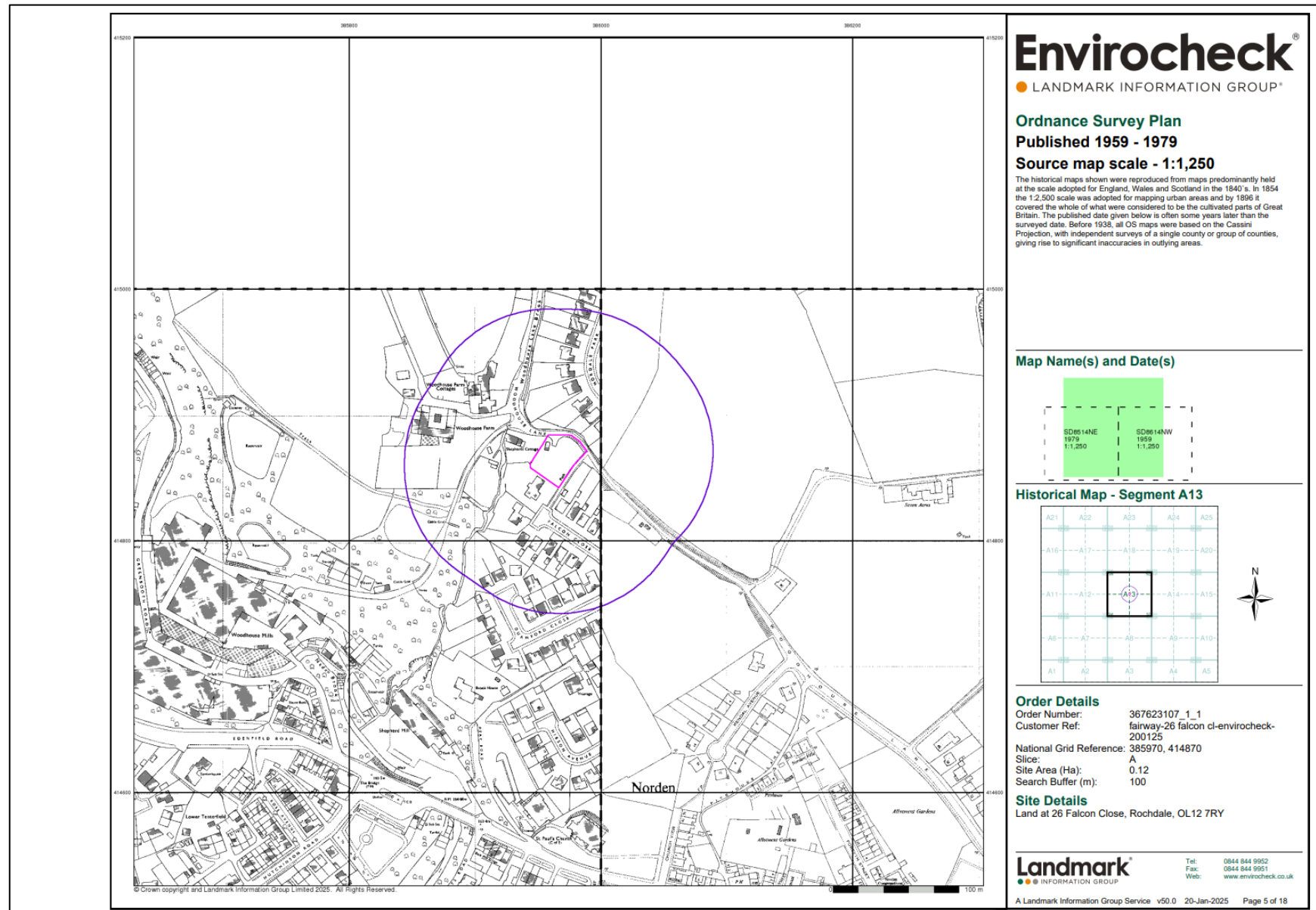
Landmark®
 INFORMATION GROUP

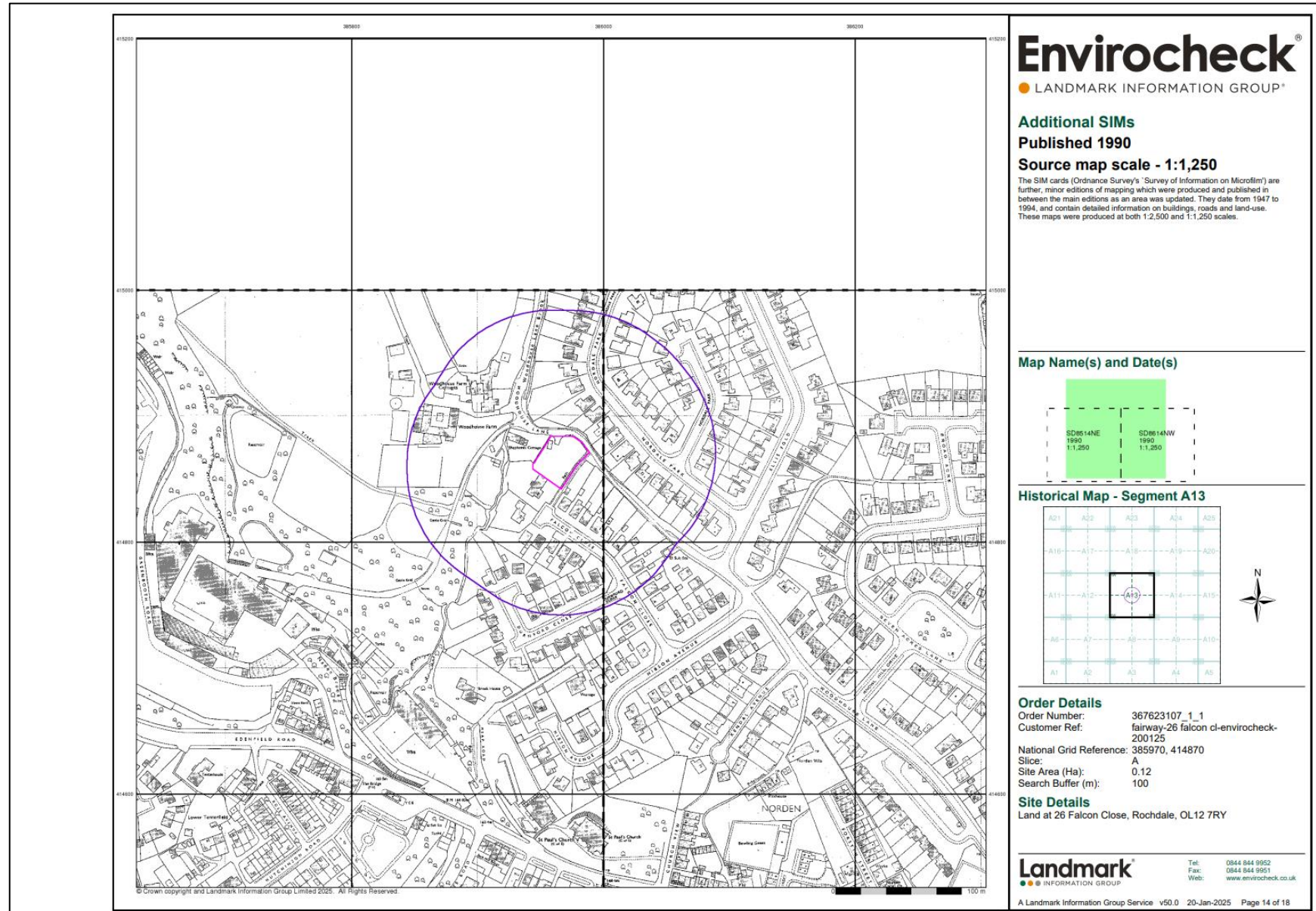
Tel: 0844 844 9952
 Fax: 0844 844 9951
 Web: www.envirocheck.co.uk

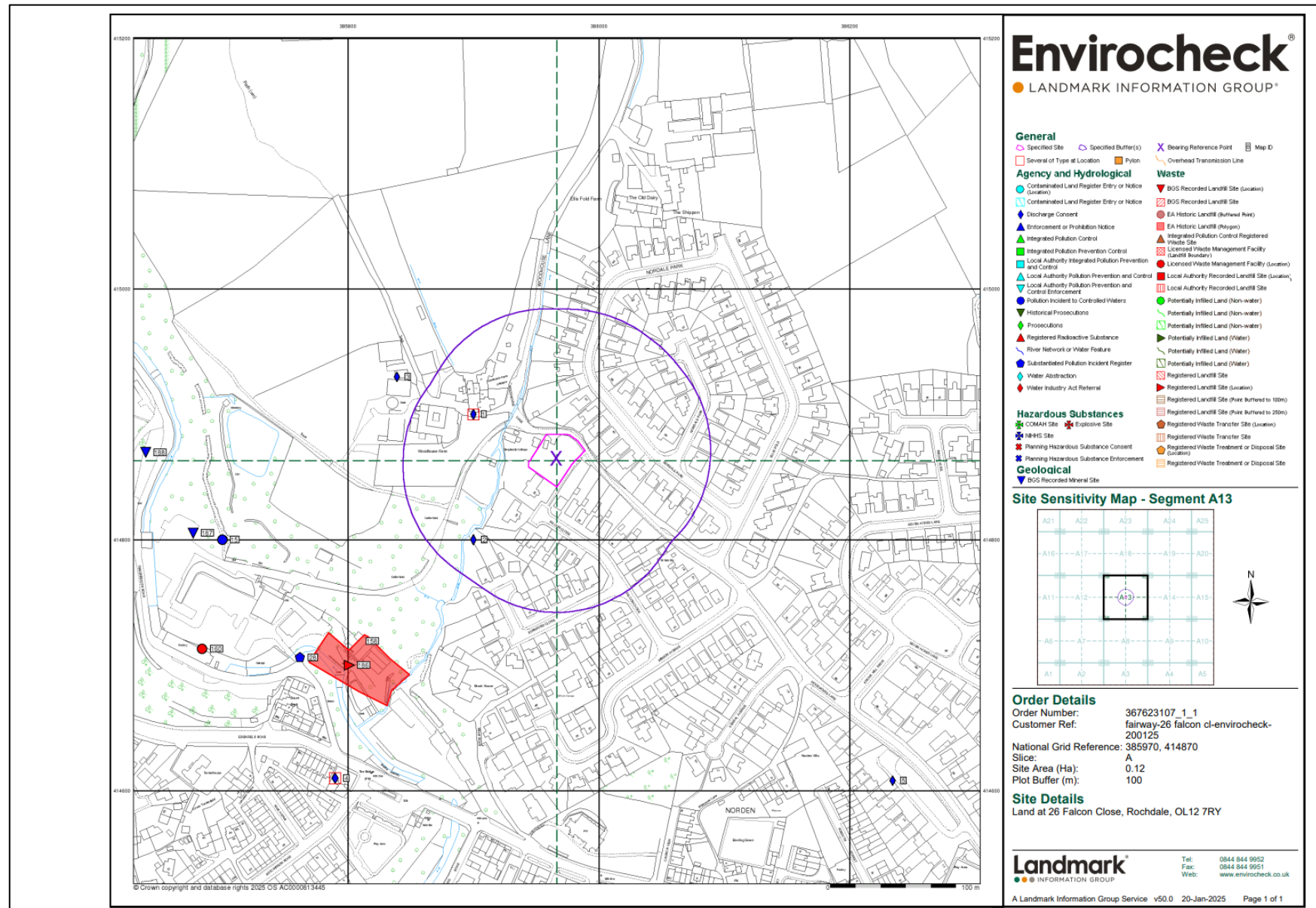
A Landmark Information Group Service v50.0 20-Jan-2025 Page 7 of 16

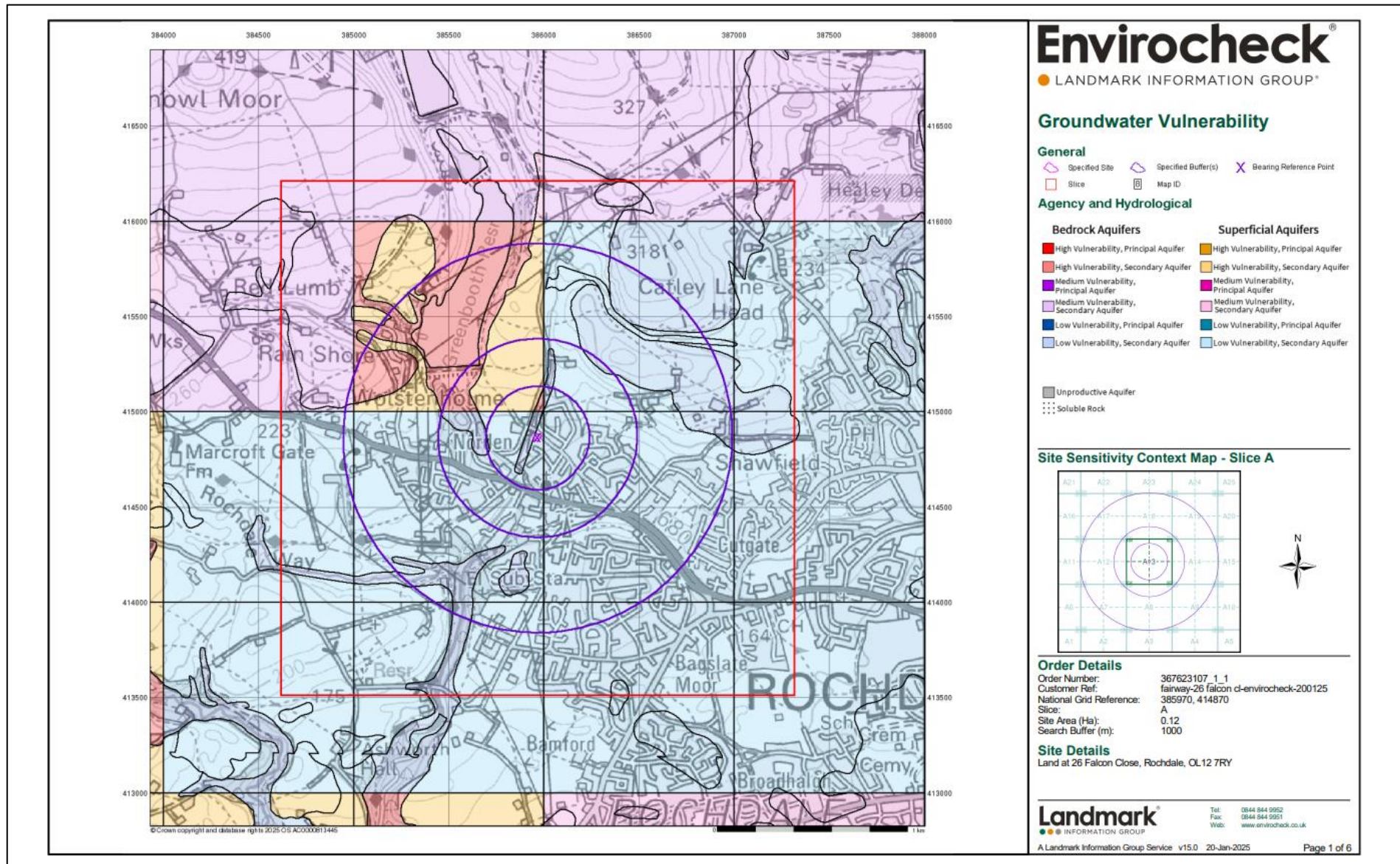


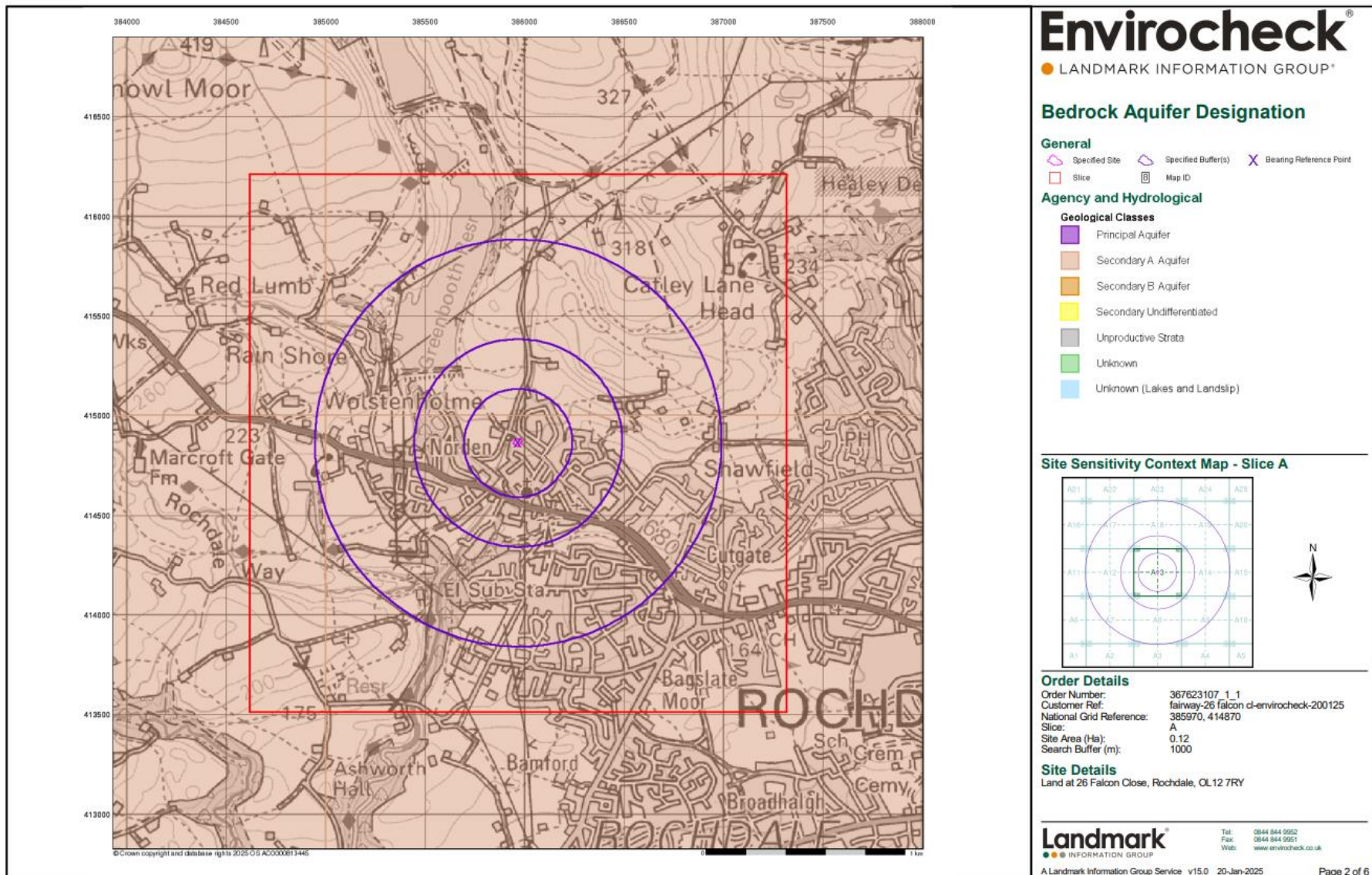


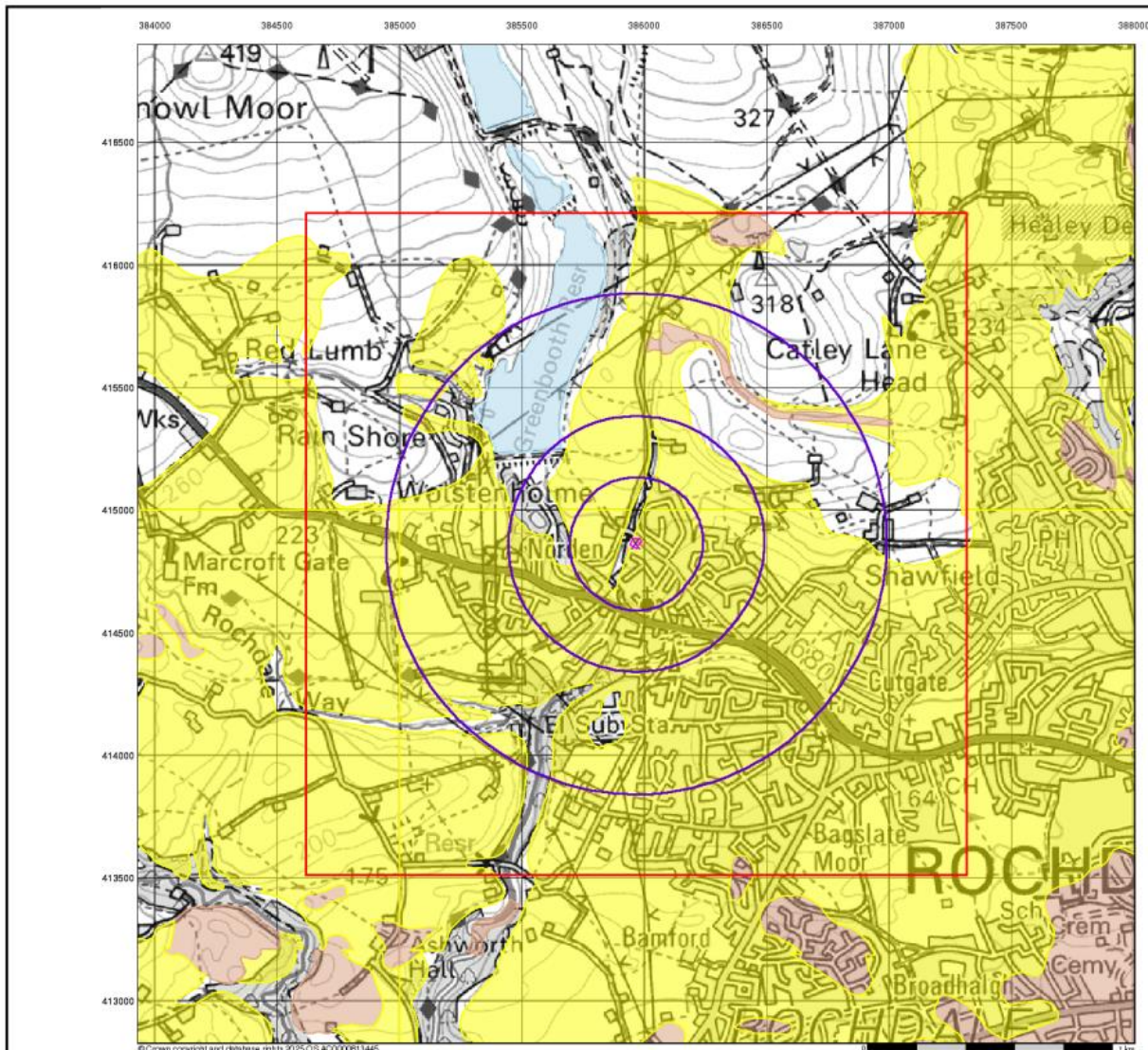












Envirocheck®

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Superficial Aquifer Designation

General

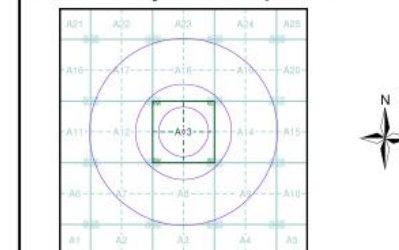
- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice
- Map ID

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



Order Details

Order Number: 367623107 1.1
 Customer Ref: fairway-26 falcon cl-envirocheck-200125
 National Grid Reference: 385970, 414870
 Slice: A
 Site Area (Ha): 0.12
 Search Buffer (m): 1000

Site Details

Land at 26 Falcon Close, Rochdale, OL12 7RY

Landmark
 INFORMATION GROUP

A Landmark Information Group Service v15.0 20-Jan-2025

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 Web: www.envirocheck.co.uk

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